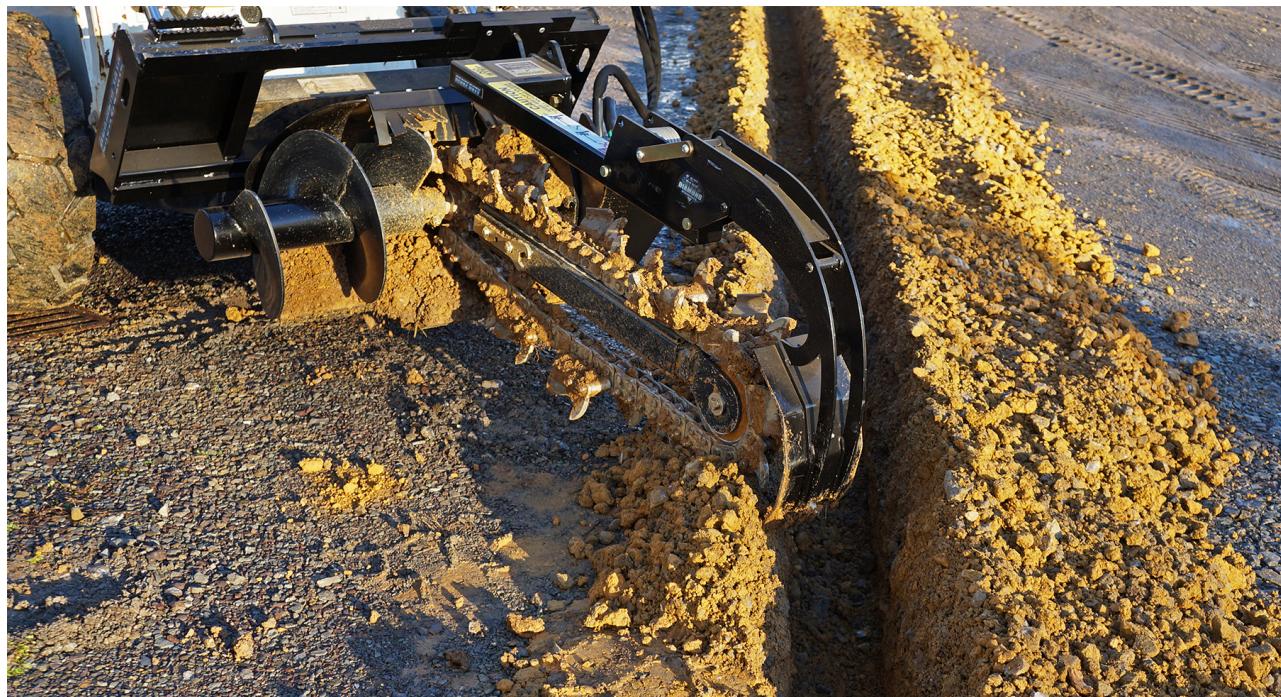


Trenchers

Operation and Maintenance Manual



Register your
WARRANTY
within 30 days
of purchase



888-376-7027 | BlueDiamondAttachments.com

Introduction: Owner Information

Thank you for your decision to purchase a Blue Diamond® Trencher. 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: _____

Trencher Serial Number: _____

Gearbox Serial Number: _____

Hydraulic Motor Serial Number: _____

Dealer Name: _____

Dealer Number: _____

Date of Purchase: _____

The serial number plate (above) is located on the left side of the frame.

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

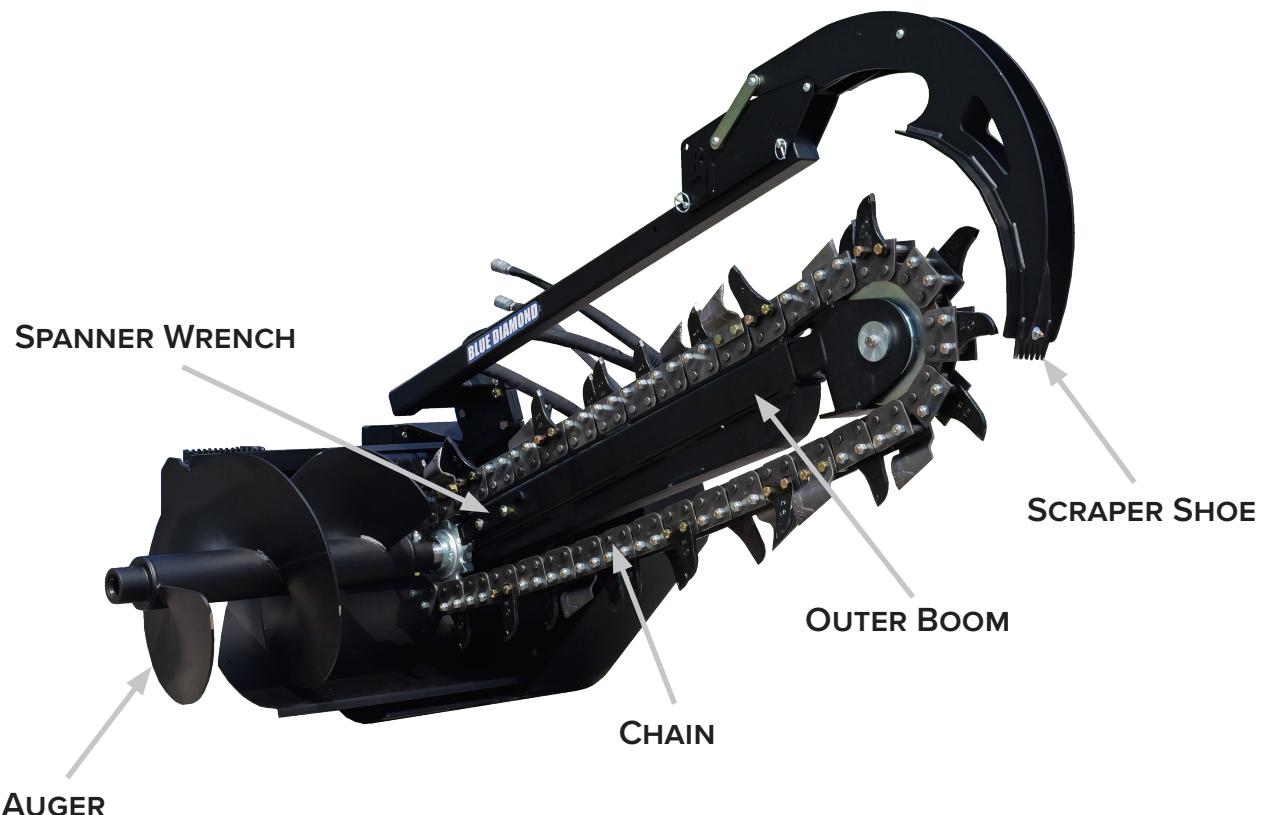
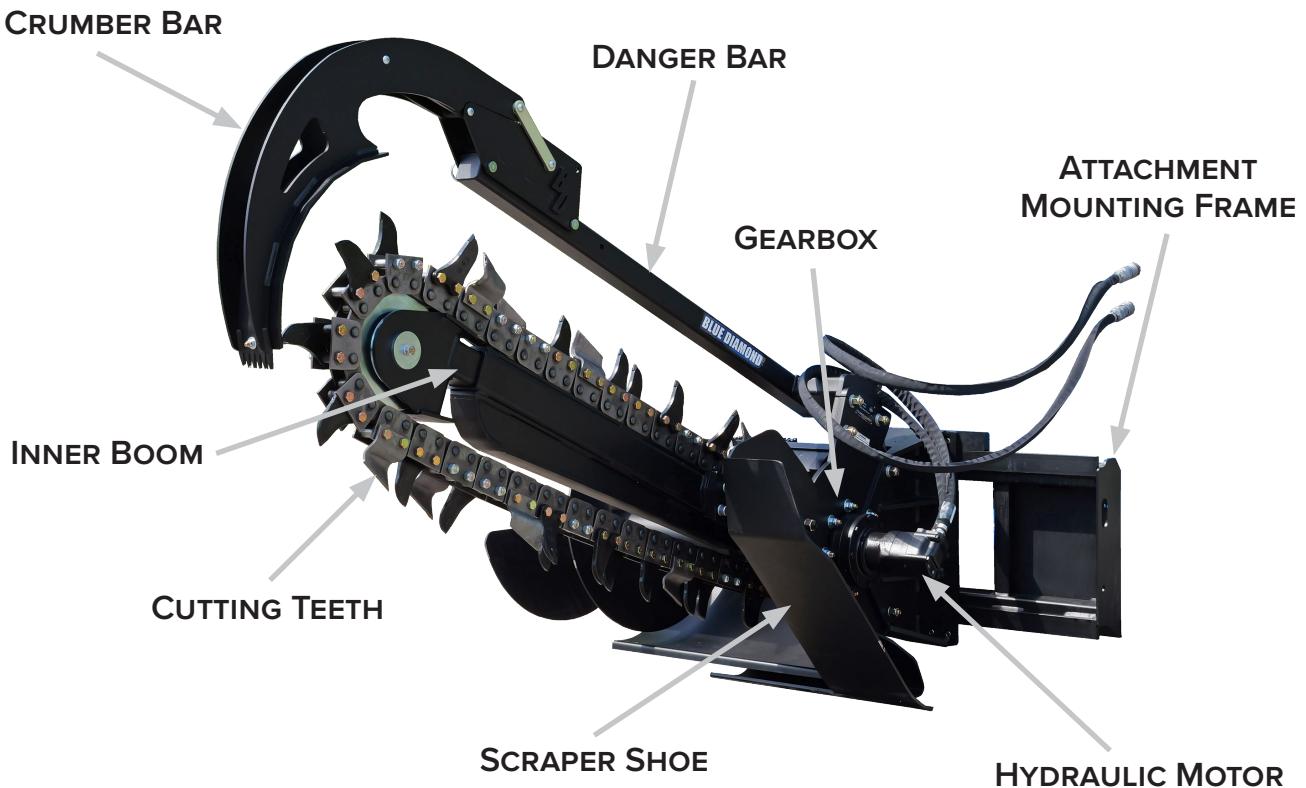
NOTE: The directions left, right, front and rear, as mentioned throughout this manual, are as viewed from the operator's position.

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1. Introduction

1.1 Attachment Identification



1. Introduction

1.2 About this Attachment

Blue Diamond® recommends that you carefully read and understand this manual before putting the machine into operation. Follow all safety measures and maintenance procedures described in this manual to ensure proper and efficient use of machine.

NOTE: Blue Diamond® cannot be held liable if specified limits are exceeded.

Trenchers for Excavators, Skid Steer Loaders and Backhoes

The Blue Diamond trenchers are not just for Skid Steer Loaders, there are also models available for Excavators and Backhoes.

An Adjustable Skid Foot provides the operator with precision depth control. This ensures the spoil auger has optimum ground clearance to take full advantage of horsepower while trenching. The trencher is powered by a hydraulic motor, and a compact planetary gearbox drives the chain.

The crumber's unique geometry and heavy-duty spring ensures it travels with maximum engagement with the bottom of the trench from start to finish.

Six various models are available for trenching depths from 36" to 60" and widths from 4" to 12". Standard flow and high flow options are also available.

The anti-back flex design prevents the chain links from flexing back in tough soil conditions. Chains are available in a number of different tooth configurations for soft ground, mixed ground and even permafrost to get the job done.

DIRT - Best used in soft ground like dirt and clay.

COMBO - Best used in dry, hard or medium ground conditions.

ROCK - Best used in hard or frozen ground conditions and asphalt.

All trenchers are covered by Blue Diamond's industry leading warranty. To find out more about our lifetime warranty see warranty page at the end of this manual.

1. Introduction

1.3 Trencher Model Numbers

MINI SERIES			
Model	Depth	Chain	Mount
131500-25	36"	4" Dirt	Mini Universal*
331500		4" Dirt	Varies**
131501-25		6" Dirt	Mini Universal*
331501		6" Dirt	Varies**
131502-25		8" Dirt	Mini Universal*
331502		8" Dirt	Varies**
131503-25		4" Combo	Mini Universal*
331503		4" Combo	Varies**
131504-25		6" Combo	Mini Universal*
331504		6" Combo	Varies**
131505-25		8" Combo	Mini Universal*
331505		8" Combo	Varies**
131506-25		4" Rock	Mini Universal*
331506		4" Rock	Varies**
131507-25		6" Rock	Mini Universal*
331507		6" Rock	Varies**
131508-25		8" Rock	Mini Universal*
331508		8" Rock	Varies**

*Mini Universal mount is fixed. No sideshift option available.

**Sideshift mount options used for Universal Skid Steer and other machine mounts. Contact your local dealer or Blue Diamond for assistance.

HEAVY DUTY			
Model	Depth	Chain	Mount
131520-25	36"	4" Dirt	Mini Universal*
331520		4" Dirt	Varies**
131521-25		6" Dirt	Mini Universal*
331521		6" Dirt	Varies**
131522-25		8" Dirt	Mini Universal*
331522		8" Dirt	Varies**
131523-25		4" Combo	Mini Universal*
331523		4" Combo	Varies**
131524-25		6" Combo	Mini Universal*
331524		6" Combo	Varies**
131525-25		8" Combo	Mini Universal*
331525		8" Combo	Varies**
131526-25		4" Rock	Mini Universal*
331526		4" Rock	Varies**
131527-25		6" Rock	Mini Universal*
331527		6" Rock	Varies**
131528-25		8" Rock	Mini Universal*
331528		8" Rock	Varies**

EXTREME DUTY			
Model	Depth	Chain	Mount
331570	48"	6" Dirt	Varies**
331571		8" Dirt	
331572		10" Dirt	
331573		12" Dirt	
331574		6" Combo	
331575		8" Combo	
331576		10" Combo	
331577		12" Combo	
331578		6" Rock	
331579		8" Rock	
331580		10" Rock	
331581		12" Rock	

SEVERE DUTY			
Model	Depth	Chain	Mount
331620	60"	6" Combo	Varies**
331621		8" Combo	
331622		10" Combo	
331623		12" Combo	
331624		6" Rock	
331625		8" Rock	
331626		10" Rock	
331627		12" Rock	

1. Introduction

1.4 Key Parts of the Trenchers

Crumber System

The Crumber System [Figure 1] draws the spoil up from the bottom of the trench, onto the chain for a clear, clean trench.

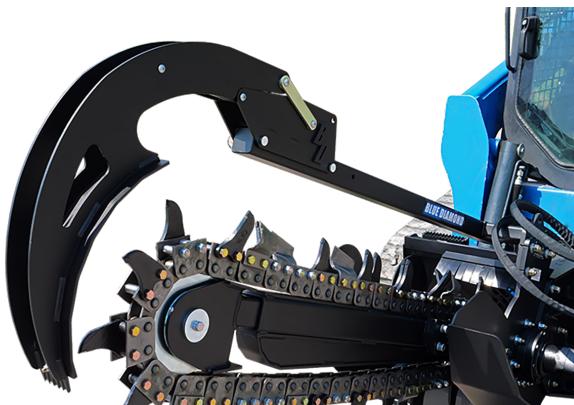


Figure 1

Adjustable Foot Depth Control

Adjustable foot depth control [Figure 2] features 3 or 4 preset digging depths (Item 1).



Figure 2

Chain Options - 3

Dirt Chain

The Dirt Chain [Figure 3] has a cup tooth on every second station of the chain. Best for soft, clean ground with no floaters or tree roots.

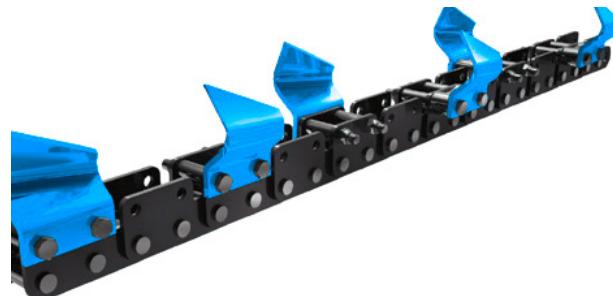


Figure 3

Combo Chain

The Combo Chain [Figure 4] includes 70% Rock Teeth and 30% Dirt Teeth. Suitable for most applications. Cuts through hard soils, roots, soft shale & rocky ground.

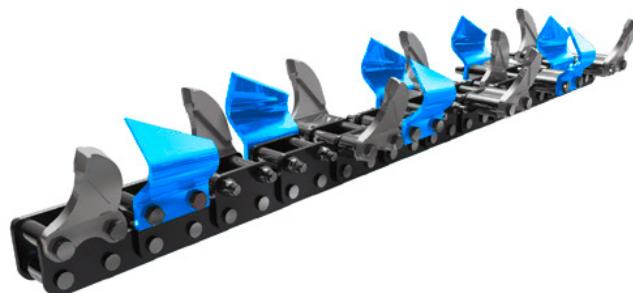


Figure 4

Rock Chain

The Rock Chain [Figure 5] includes 100% Rock Teeth on every station. Best for rocky hard shale, asphalt and frozen ground.



Figure 5

1. Introduction

1.4 Key Parts of the Trenchers Con't

Hydraulic Motor

The Trencher is powered by an EATON hydraulic motor [Figure 6].



Figure 6

Planetary Gearbox

The Planetary Gearbox receives power from the hydraulic motor to provide the drive power for the chain [Figure 7].



Figure 7

Frame Mount

The Frame Mount is designed to reduce trencher flexing for increased stability [Figure 8].



Figure 8

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.

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 damage to shields, replace them immediately.
- 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 possibly an auxiliary lighting system.



WARNING



Before performing any of the actions in this section, section 2.0 Safety must be read in its entirety and understood fully to avoid any type of risk or accident. If you do not fully understand this manual, DO NOT connect or operate the machine or carry out any maintenance operations. Contact your local dealer or Blue Diamond® Product Support immediately to ensure your safety and that of the machine.

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

2. Safety



DANGER



- The machine may only be operated, maintained, repaired, serviced, or handled by qualified personnel or an authorized service technician.
- DO NOT approach the trencher, carry out maintenance, inspections, or connect or disconnect components while the machine is running. Before carrying out any of the aforementioned tasks, disengage the hydraulics to stop the motor. Once the motor has stopped, rest the trencher on a level, flat, and firm surface. Park the machine, set the parking brake, turn the machine off, and remove the key from the ignition. Wait until all moving parts have come to a complete stop before approaching the machine.

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, minimum consumption, and maximum safety for himself and for others.

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

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.

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, causing 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 caught or entangled in parts of the machine.
- DO NOT operate the implement when tired, not in good condition, or under the influence of alcohol or drugs.



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

2. Safety

2.3 Operational Safety

Operating Safety

- Follow all laws and regulations in your jurisdiction when operating and maintaining your equipment.
- Users must strictly observe all safety regulations indicated in this user manual and all warning signs indicated on the machine.
- Correct use of the machine implies compliance with all maintenance and operating instructions described in this manual and the use of original Blue Diamond® spare parts.
- Prolonged use of the machine causes components to become hot, and there is a burn hazard from direct contact with them. Avoid direct contact with the machine until these components have cooled down.
- DO NOT handle hydraulic components until the pressure in the hydraulic circuit has been relieved. Avoid direct contact with the machine until these components have cooled down.
- The operator must ensure at all times that there are no persons, animals, or obstacles within 20 feet (6 meters) of the machine's location while in operation.
- Make sure that the machine is in a proper state of repair (cleaning), maintenance (lubrication), and components.
- If the machine vibrates, behaves strangely, or makes unusual noises, stop operation and contact your local dealer or Blue Diamond® Product Support immediately.
- When operating on sloping terrain, check that you are working safely and that there is no risk of tipping over.
- The machine must be stopped and inspected for damage after striking an object. In the event of damage, it must be repaired before continuing with the machine operation.

Operator Training

- Read and follow instructions in this manual and the machine's Operators 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 utility lines before operating equipment (if applicable).
- 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. This attachment discharges debris that can be hazardous.
- 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.

2. Safety

2.3 Operational Safety Con't

- DO NOT operate equipment in poor visibility conditions such as fog, darkness, or any conditions that limit clear visibility less than 20 ft (6 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 optimal 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 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 the machines operating pressure.
- Use caution on slopes and near banks and ditches to prevent overturn.

Fire Prevention Safety

- Flammable debris (leaves, grass, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it can cause a fire hazard. Clean often to avoid this accumulation.
- The equipment's hydraulic motor area 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.

- Power equipment can cause sparks and start fires. Be especially careful on hot, dry days. Exercise caution while operating and watch for sparks.
- Keep a working fire extinguisher and shovel should be kept near the working area.

Transporting Safety

- Blue Diamond® Attachments cannot be held responsible for any damage due to transport that was carried out by the customer and/or operator or by carriers chosen by the customer and/or operator.
- Comply with state and local laws governing highway safety and movement of machine 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 trencher on a truck or trailer, make sure the trencher is properly secured to the transport vehicle.

Tie Down Safety

- Do not attach tie down accessories around cylinders or in any way that may damage hoses or hydraulic components.
- Check unit stability before transporting.
- Verify that all tie down accessories (chains, slings, ropes, shackles and etc.) are capable of maintaining attachment stability during transporting and are attached in such a way to prevent unintended disengagement or shifting of the unit. Failure to do so could result in serious personal injury or death.

2. Safety

2.3 Operational Safety Con't

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.



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.

- DO NOT exceed the machine's power capacity as specified by the manufacturer.
- Keep a sufficient distance from utility lines and pipes.
- When the trencher is in operation, fire may occur. Keep a fire extinguisher nearby the work area.



DANGER



- Before any maneuver, the operator must ensure that there are no persons, animals, or obstacles within 20 ft (6 m) of the machine's location.
- DO NOT work with the machine at a distance of less than 20 ft (6 m) from roads on which motor vehicles, lorries, or horse-drawn vehicles may travel if the operator does not comply with all the safety procedures in this manual.
- DO NOT work with the machine at a distance of less than 20 ft (6 m) from public areas (parks and/or gardens), civil, residential, or industrial buildings if the operator does not comply with all the safety procedures in this manual.

2.4 Safety Regulations

Precautions and Hazards during Machine Operation

- When moving the machine from the transport position to the working position, the operator must keep all persons and animals in the operation area at least 20 ft (6 m) away from the outer contour of the machine.
- Keep away from crushing or shearing zones between moving parts driven by mechanical, hydraulic, or pneumatic power.
- DO NOT operate the machine without its safety devices and guards in place.
- DO NOT operate the machine if the safety devices and guards are not in perfect condition. Replace them before continuing to work with the machine.
- DO NOT climb on the machine while it is in operation or when it is off.
- DO NOT transport persons or animals or to load or transport goods on the machine.

- DO NOT handle hydraulic hoses and connections when the machine is running, as there is a high risk of penetration into the skin and eyes due to oil pressure.



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.

2. Safety

2.4 Safety Regulations Con't

Precautions and Hazards during Machine Operation Con't

- DO NOT leave the host machine until the motor of the trencher is stopped, the machine is placed on a flat, level, and firm surface, parking brake is engaged, the machine is off, and the key is removed from the ignition.
- Use Blue Diamond® approved spare parts for better performance and increased safety.

Precautions during Maintenance

- Refer to the user manual of the machine.
- A qualified operator must carefully read the entire safety manual and fully understand and follow the information before connecting or disconnecting the machine.
- Use appropriate PPE including but not limited to eye and ear protection, work gloves, work boots, safety hat, dust mask, and work clothes.
- The machine may only be operated, maintained, repaired, serviced, and/or handled by qualified personnel or an authorized service technician.
- DO NOT conduct maintenance work while in the field. All maintenance must be completed as authorized technical service in the proper environment with all safety precautions.
- DO NOT stand between the skid steer and the machine.
- Before carrying out any maintenance, all hardware (fittings, screws, nuts, bolts, pins, etc.) must be checked for tightness to prevent moving parts from coming loose on the operator.
- There is a risk of leaks in hoses or hydraulic components.
- Before performing maintenance, lower the attachment to the ground, apply the parking brakes, turn off the engine, and remove the key.
- Never adjust a relief valve for pressure higher than recommended by the machine's manufacturer.



Storage of the Machine

- When the machine is not in operation and must be stored for a certain time, the trencher must be separated from the skid steer according to all the safety rules in this manual.
- For storage, the trencher must be placed on a level, flat, and firm surface.
- It is advisable to store the machine in a covered and dry place.
- Before storing the machine, clean, dry, and lubricate all components.
- Always use original greases and lubricants recommended by Blue Diamond®.
- Once the machine has been positioned and cleaned on a flat, level, and firm surface, a general inspection must be made to ensure that there are no anomalies (i.e., condition of the teeth).
- Before storage, check that all fasteners (fittings, screws, nuts, pins, bolts, etc.) are tight, and check for leaks in the hydraulic circuit.
- Use original Blue Diamond® spare parts for better performance and increased safety.
- Check that the safety decals are in perfect condition. Otherwise, replace them before operating the machine.
- When operating or maintaining the machine again, the safety rules mentioned in this manual must be followed.

3. Operation

3.1 General Information

Before starting up the machine, the operator must carefully read and understand the installation and operating instructions of the machine.



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.

- Check the trencher mounting plate for damage. Check for loose or missing parts. Repair as needed before operation.
- Check that teeth are in good condition. Sharpen or replace them, if necessary.
- Check that all shields and guards are in place.
- Check for loose bolts and tighten them if necessary.
- Check all welds on the attachment for wear and damage each time the attachment is removed from the machine.
- Check for damaged or missing safety decals. Replace if necessary.
- Inspect the machine's mounting frame. (See the machine's Operator's Manual for inspecting the mounting frame). Replace any parts that are damaged, bent, or missing. Keep all fasteners tight. Look for cracked welds.

Pre-Operation Inspection

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



WARNING



AVOID SERIOUS INJURY OR DEATH

- Disengage machine's auxiliary hydraulics, engage the machine's parking brake, stop the engine and make sure all 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 machine's auxiliary hydraulics for road travel.
- Keep hands, feet and clothing away from rotating parts.

Fully clean the attachment. See “4.2 Cleaning” on page 22.

- Lubricate the attachment per the schedule outline in the Maintenance Section. See “4.12 Service Schedule” on page 29.



WARNING



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

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

NOTE: DO NOT operate with hydraulic leaks.

- Verify that the Trencher is properly connected to the machine.

3. Operation

3.2 Entering and Exiting the Prime Mover



IMPORTANT



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

Entering The Operator's Position

Use the 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 parking brake.
- Stop the engine, and remove the key.
- Wait for all moving parts to stop.

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

Park the machine / attachment on a flat level surface.

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

3.3 Attachment Installation with Skid Steer

Connecting Attachment To The Machine



WARNING



CRUSH HAZARD

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

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

Enter the operator's position. See "Entering The Operator's Position" on page 16.

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 16.

3. Operation

3.3 Attachment Installation with Skid Steer Con't

Connecting Attachment to the Machine Con't



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



Thoroughly 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. The hydraulic hoses must be connected in the following order: return hose, and pressure hose.

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.



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.

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

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

Disconnecting Attachment From the Machine

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

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

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

Disconnect attachment hydraulic hoses from the machine.

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

Enter the operator's position. See "Entering The Operator's Position" on page 16.

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.

3. Operation

3.4 Attachment Installation with Excavator

Connecting Attachment to the Machine



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.

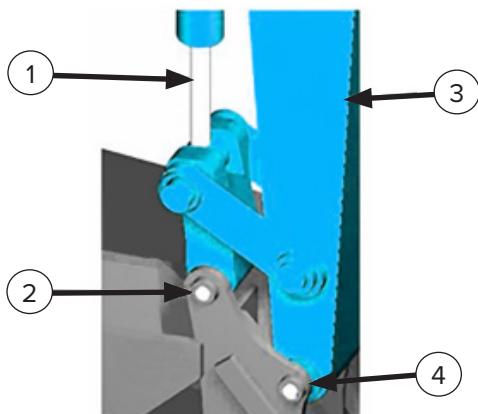


Figure 9

Extend the tool cylinder (Item 1, Figure 9) and paddle until the pin position (Item 2, Figure 9) is aligned.

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

Install the pin through the attachment and paddle. Secure with appropriate hardware.

Enter the operator's position. See "Entering The Operator's Position" on page 16.

Adjust the height of the excavator's dipperstick (Item 3, Figure 9) to align with the pin position (Item 4, Figure 9).

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

Install the pin through the attachment and paddle and secure with appropriate hardware.

Connecting Hydraulic Hoses

IMPORTANT

Thoroughly 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. The hydraulic hoses must be connected in the following order: return hose, and pressure hose.

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.

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.

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

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

3. Operation

3.4 Attachment Installation with Excavator Con't

Disconnecting Attachment From the Machine

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

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

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

Disconnect attachment hydraulic hoses from the machine.

Remove hardware securing the pins and remove the pins from the paddle and attachment.

Enter the operator's position. See "Entering The Operator's Position" on page 16.

Raise the dipperstick to clear the attachment.

Drive the machine slowly backward, away from the attachment.

3.5 Trench Depth

Setting the Required Trench Depth



WARNING



AVOID SERIOUS INJURY OR DEATH

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

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

1. Remove the two 5/8" nuts and washers (Shown red in charts below) fastening the skid plate to the side plate.
2. Remove the skid plate and rotate it until the two fixed bolts align with the holes for the required trench depth setting. The illustrations below highlight the nut positions according to trench depths.
3. Reassemble the skid plate onto the side plate, making sure the star washers are in good condition and tighten the nuts [Figure 10].

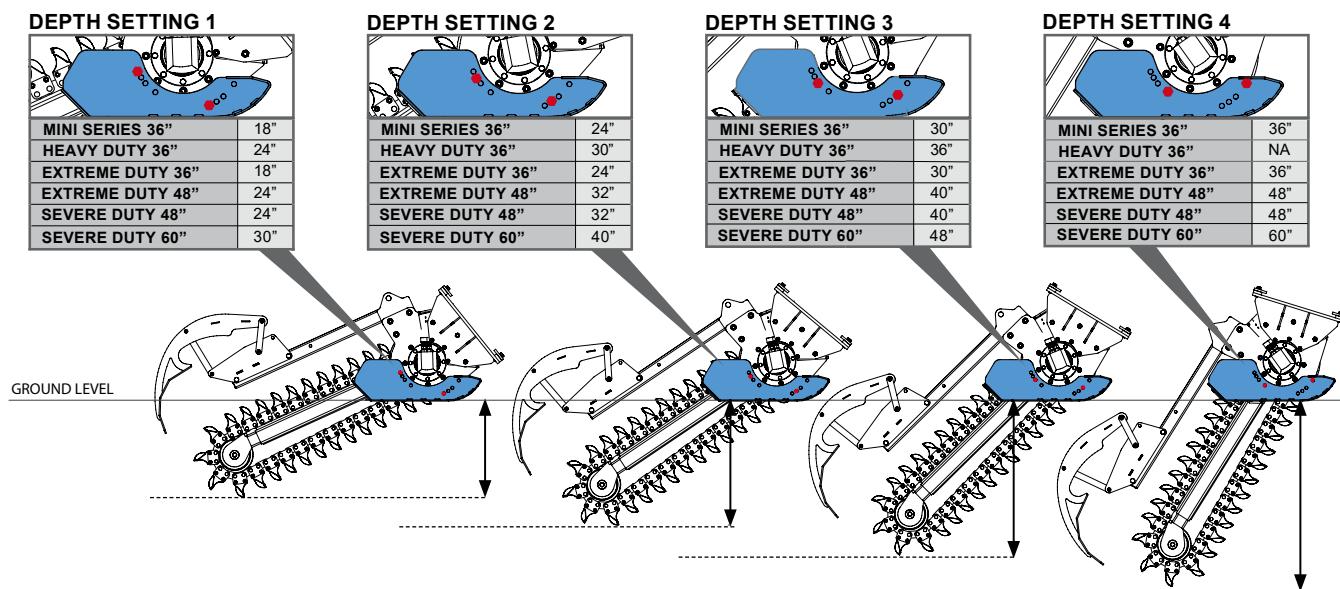


Figure 10

3. Operation

3.6 Operating Instructions

Do not apply excessive downward pressure on the Crumber Bar when starting a trench. This will over extend the spring as it enters the first part of the trench, resulting in Crumber and Danger bar failure.

- The trencher is designed to operate with the adjustable depth 'foot' resting on the ground. Do not apply excessive pressure to the foot.
- Under no circumstances should the front of the machine be lifted off the ground by the trencher.
- The trencher is designed to cut straight trenches; it cannot be used for cutting trenches around corners. However, if desired, a curved trench can be achieved by cutting in a slow, shallow wide arc.
- The host machine must be driven in reverse while trenching. You cannot trench while driving forward.
- If the trencher stalls while digging, raise slightly and move forward to free the trencher then continue. Do not continually stall the trencher. Allow the trencher time to cut and clear spoil.
- Never use Dirt chains when digging in difficult hard ground conditions.
- Always check chain condition and ensure teeth and chain tension are tightened before use. Ensure all worn parts are replaced
- Never continue to dig if the chain begins to jump (due to incorrect style/type of teeth used in harder ground conditions).



CAUTION



Do not rapidly engage forward and reverse or on/off rotational movement to clear the trencher. This action can cause cavitation of the motor and void the motor warranty.

3.7 Machine Operation

Cutting a Trench



WARNING



- If the headstart crumber bar is installed, the Trencher can be lowered to the ground prior to engaging the motor.
- The movement of the host machine arm must be as near to the ground as possible to avoid the risk of overturning.

1. Confirm the Trencher is attached and properly connected to the host machine.
2. Ensure the foot of the trencher is set in the correct depth position.
3. The crumber is an essential component of the trencher and must be installed for a clean cut.
4. Raise the Trencher so it is horizontal to the ground, with the bottom of the auger approximately 8 in (20.2 cm) off the ground. Start the rotation of the chain. Make sure the chain is rotating freely and in the proper direction before increasing RPM.
5. Increase the machines RPM and engage the trencher slowly into the ground with a slight forward tilt, so that the nose of the trencher engages first.



WARNING



While the chain is moving, all bystanders must be a minimum of 20 ft (6 m) away from the Trencher. It is the responsibility of the operator to ensure all safety procedures are followed.

3. Operation

3.7 Machine Operation Con't

Cutting a Trench Con't

6. Slowly lower the trencher and allow it to engage into the ground. DO NOT attempt to reach your full depth immediately, as you will potentially damage the crumber and danger bar. While slowly reversing your machine, continue lowering the trencher until the foot of your trencher is flat to the ground. This process should be done over a 6 ft to 12 ft (1.8 m to 3.6 m) distance until you reach the required depth. (It will take approximately 6 ft (1.8 m) of trenching before you can operate at desired depth).

7. Efficient trenching is a combination of power and speed. Once the required trenching depth has been achieved, continue driving in reverse, trenching in a straight line.
8. If your trencher has the headstart crumber bar, you can start trenching with the Trencher in the down position. Reverse the machine slowly from the start of the trench. Never attempt to reach desired depth without driving in reverse [Figure 11].

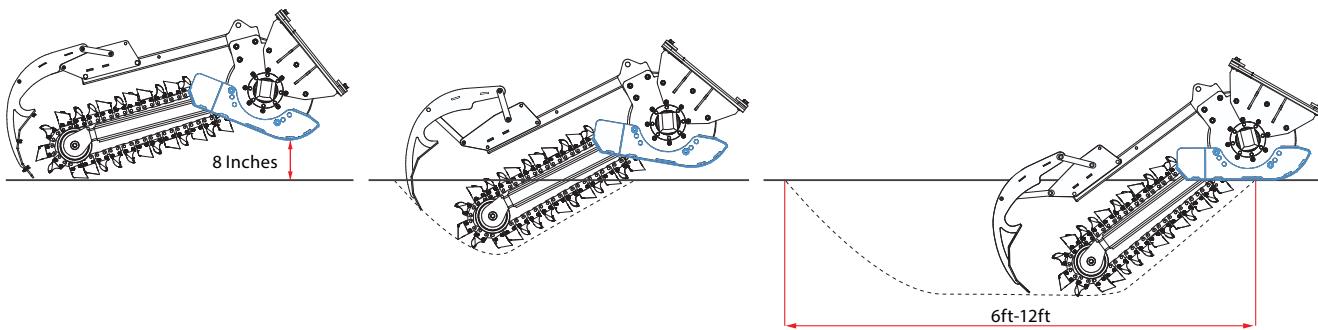


Figure 11

4. Maintenance

Before carrying out any maintenance operations, the operator must carefully read and understand the instructions contained in this manual.

Regular and thorough maintenance keeps the machine in optimal condition and prolongs its service life.



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.

maintenance personnel.

- Use original Blue Diamond® spare parts for better performance and increased safety.
- Always use original greases and lubricants recommended by Blue Diamond®
- Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death. Hydraulic leaks under pressure may not be visible!
- Wear safety glasses, protective clothing, and use a sound piece of cardboard or wood when searching for hydraulic leaks. DO NOT USE YOUR HANDS!
- If any fluid penetrates the skin, GET IMMEDIATE MEDICAL ATTENTION!!
- Before connecting or disconnecting hydraulic hoses, read your machine or the power unit's operator's manual for detailed instructions.



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.

4.1 Precautions During Maintenance

- If a safety device is removed during maintenance of the machine, it must be replaced and checked for correct operation of the machine.
- Check that the safety symbols are in perfect condition. Otherwise, replace them before operating the machine.
- Before and after all maintenance work on the machine, check that all hardware (fittings, screws, nuts, pins, bolts, etc.) are tight, and check for leaks in the hydraulic circuit.
- Before carrying out any welding work (with Blue Diamond's approval) on the machine, the trencher must be disconnected from the skid steer.
- Cleaning of the trencher and its parts must be done with the machine stopped and disconnected from the skid steer.
- DO NOT throw away, dump, or burn products that could pollute the environment.
- Blue Diamond® shall not be held responsible in the event of poor waste management by any

4.2 Cleaning

- Seal hydraulic couplers from contaminants and secure all hydraulic hoses off the ground.
- Remove any debris from the machine.
- Clean the unit thoroughly, removing all mud, dirt, and grease.
- Inspect for visible signs of wear, breakage, or damage. Order any parts required and make the necessary repairs.
- After the Trencher has been cleaned, coat the output shaft and collar, extension shaft and collar, and all connecting pins with grease to prevent rust and reduce wear.

4. Maintenance

4.3 Lubrication

Gearbox Lubrication

The Trencher gearbox must have an oil change within the **first 30 hours (extreme use) or 50 hours (moderate use) or 3 months (whichever comes first)** of operation to ensure the proper break-in of the gearbox.

If the first oil change is not performed within this period, excessive wear within the gearbox can occur that will cause premature failure. This will void the warranty.

Oil must then be changed thereafter every 300/500 hrs and a full service every 12 months must be performed by an authorized service agent to ensure Warranty requirements are achieved.

Check Gearbox Oil Level

1. Stabilize the machine on a level, flat surface and shut it off.
2. Clean the area around the level plug to prevent dirt from contaminating the oil.
3. Remove the level plug on the side of gearbox.
4. If oil comes out the level hole the oil level is correct, if not, add oil to fill port [Figure 12].



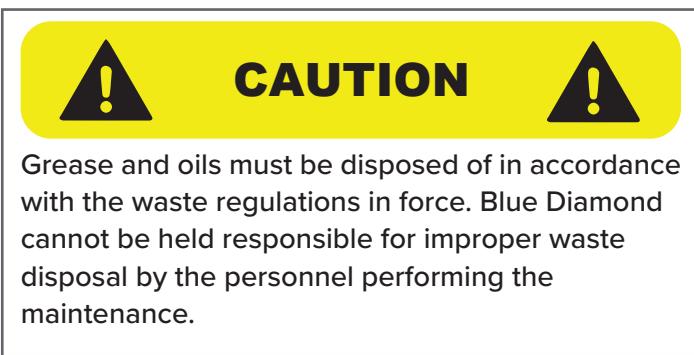
Figure 12

Drain Gearbox Oil

1. Before draining, run the motor for a few minutes to raise the oil temperature.
2. Stabilize the machine on a level, flat surface and shut it off.
3. Unscrew the bottom drain plug, and drain the oil into a catch pan.
4. When finished draining, install the plug.

Fill Gearbox Oil

1. Clean the area around the level plug and filler plug to prevent dirt from contaminating the oil.
2. Remove the level plug and filler cap.
3. Use a funnel to pour oil into the fill hole until it comes out the level hole.
4. Use only "extreme pressure" Gear Oil CHEVRON MEROPA ISO 320.
5. Allow excess oil to drain from the level hole, and install the level plug and filler plug.
6. Wipe off any oil residue.



4.4 Hydraulic Hoses

Connecting Hydraulic Hoses

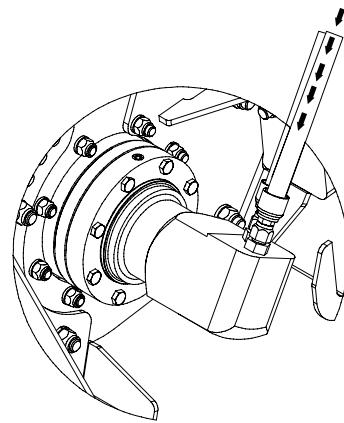


Figure 13

NOTE: The Trencher chain must rotate in a counter-clockwise direction (when viewed from the motor side of the Trencher). The Host machine Supply Line must be connected to the 'A' port on the Trencher Motor.

4. Maintenance

4.4 Hydraulic Hoses Con't

Connecting Hydraulic Hoses Con't



CAUTION



Always ensure that the hydraulic motor is primed with hydraulic fluid prior to use following any repairs to the trencher, or the parent machine. Do not allow the trencher to run without oil at any time.

1. Connect the Return Line from the host machine to the port next to the "A" port on the hydraulic motor.
2. Connect the Supply Line to the "A" port on the hydraulic motor. (Hose shown with directional arrows) [Figure 13].

NOTE: Disconnect the hoses in reverse order.

3. After connecting hydraulic lines to host unit:
 - Slowly and carefully raise the loaders arm/s and cycle the rollback / dump cylinders to check hose clearances and/or interference.
 - Operate the hydraulics for the trencher to determine chain direction.
 - Make sure hoses cannot be pinched or interfere with the quick-attach mechanism.
4. Do not lock the auxiliary hydraulics of the power unit in the "ON" position.

4.5 Nose Roller Bearing

Replace Nose Roller Bearing

1. Remove the circlip [Figure 14].

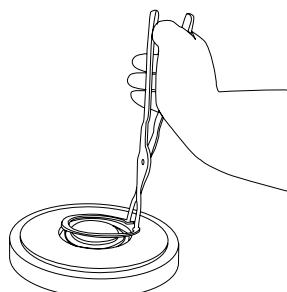


Figure 14



A hammer is not recommended for this procedure as it can damage the new bearing.

2. Place a larger sized pipe than the bearing underneath the bearing, and remove the bearing with a press [Figure 15].

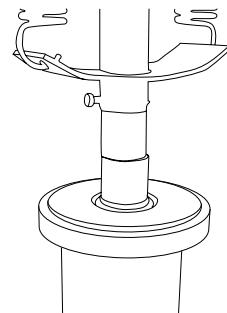


Figure 15

3. Use the correct size drift and press in the new bearing.

NOTE: The drift must sit against the outside shell of the bearing. Be careful not to damage the ring that holds the bearing together.

4. Confirm the bearing is sitting against the lip on the opposite side of the nose roller [Figure 16].

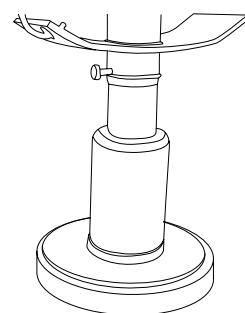


Figure 16

5. Install the circlip.

4. Maintenance

4.6 Scraper Shoe

Replace Scraper Shoe



DANGER



Shut down the Trencher & machine before any adjustments are made.

1. Remove the 3 nuts and bolts and the scraper shoe [Figure 17].

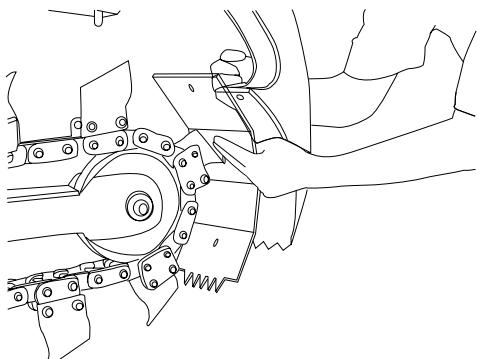


Figure 17

2. Replace the Scraper Shoe, install and tighten the bolts using hand tools [Figure 17].

4.7 Chain Sprocket

Replace Sprocket

1. Remove the $\frac{1}{2}$ " bolt from the auger and remove auger.
2. Using a 3/16" Allen key, loosen the 2 set screws in the retaining collar and slide the collar off the shaft [Figure 18].

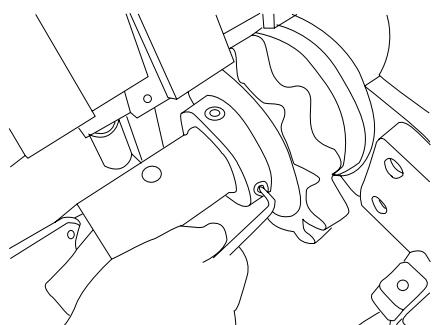


Figure 18

! IMPORTANT !

If the sprocket cannot be removed by tapping with a hammer, then a puller may have to be used.

3. Lightly tap the sprocket with a hammer or use a puller to remove the sprocket from the shaft [Figure 19].

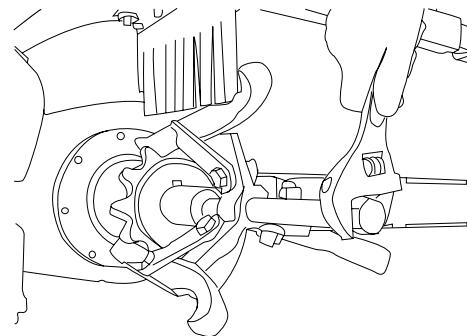


Figure 19

4. Apply Anti-seize to the shaft.
5. Install the new sprocket to the shaft.

4.8 Boom

Adjust Boom

1. To adjust the Boom – remove the $\frac{1}{2}$ " bolt and the spanner wrench from the outer boom.
2. Use spanner wrench to turn adjuster nut clockwise to loosen, and counter-clockwise to tighten [Figure 20].

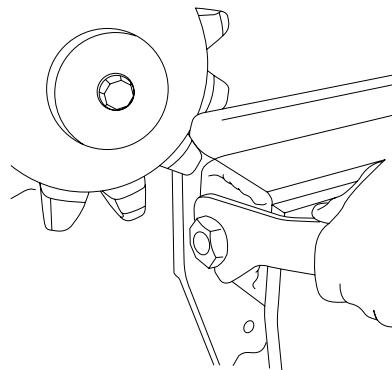


Figure 20

4. Maintenance

4.9 Shaft Seal

Replace Seal

1. Drain the Gearbox oil (See “4.3 Lubrication” on page 23).
2. Before replacing the seal, remove the retaining collar and sprocket (See “4.7 Chain Sprocket” on page 25).
3. Remove the key and seal protector.

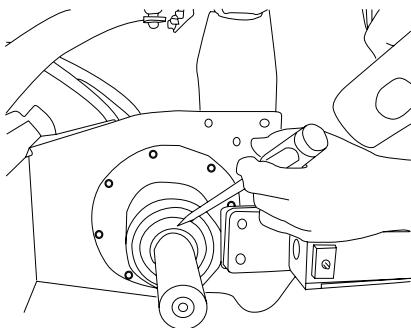


Figure 21

4. Using a pointed punch and hammer, tap gently to break through the seal face and remove the seal [Figure 21].
5. Inspect the inside of the housing for damage. If damaged or burred, smooth it with emery cloth.
6. Before replacing the seal, apply a bead of grease around the inside lip of the seal for shaft lubrication.
7. Ensure there are no burrs on the shaft between the end of the shaft and the end of the housing. Use a file if necessary. Use loctite 243 (or equivalent) and apply a small bead around the outside of the seal [Figure 22].

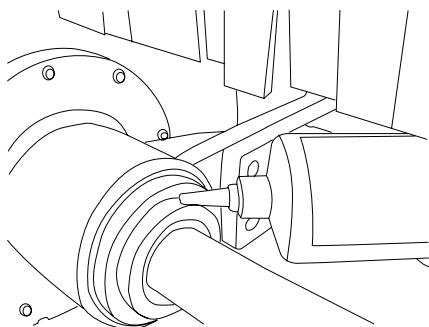


Figure 22

! IMPORTANT !

Make sure all gear oil is drained by this time.

1. Use a large punch/sleeve/collar to gently tap the seal to ensure its installed evenly [Figure 23].

NOTE: It's very important to install the seal evenly, as any misalignment could cause damage to the seal creating a leak.

2. Install the seal to be flush with the end of the housing.
3. Replace the seal protector, key, sprocket and retaining collar.
4. Refill the Gearbox with the correct grade of gear oil (See section “4.3 Lubrication” on page 23).

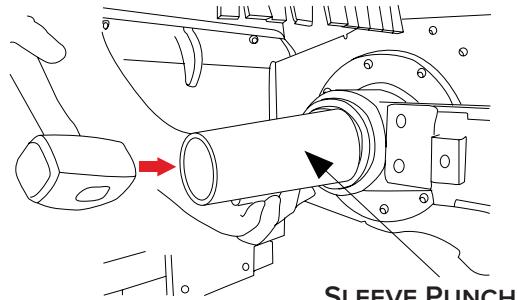


Figure 23

4. Maintenance

4.10 Spoil Auger

Adjust Spoil Auger for 6" or 8" Chain



NOTE: When a 6" or 8" chain is used, the spoil auger must be set as close to the chain as possible.

1. Install the bolt in the hole closest to the auger flights. The auger flights should be set as close to the chain as possible [Figure 24].

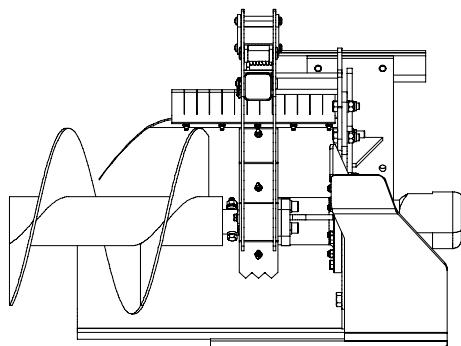


Figure 24

Adjust Spoil Auger for 10" or 12" Chain

NOTE: When a 10" or 12" chain is used, the spoil auger must be set further away from the chain.

1. Install the bolt in the hole furthest from the auger flights. The auger flights should be at least 4 in (102 mm) from the chain [Figure 25].

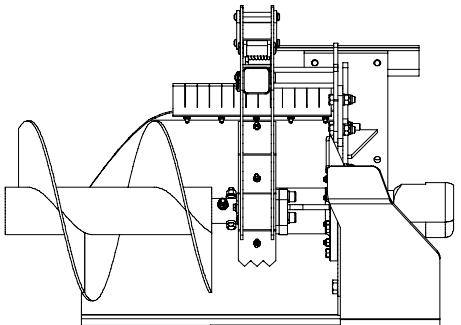


Figure 25

4.11 Trencher Chain

Adjust Chain

1. To adjust or remove the chain – remove the 1/2" bolt and the spanner wrench from the outer boom [Figure 26].

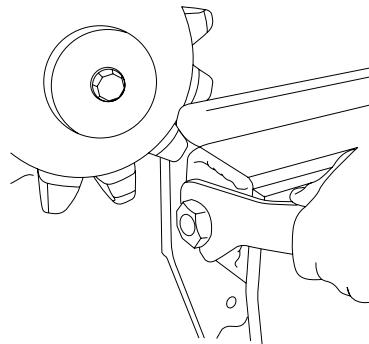


Figure 26

2. Use the spanner wrench to turn adjuster nut clockwise to loosen, and counter-clockwise to tighten [Figure 26].
3. To achieve the correct chain tension: Adjust the tension on the lower chain section at the midway point between the sprockets to allow 3/4"-1" of vertical movement [Figure 27].

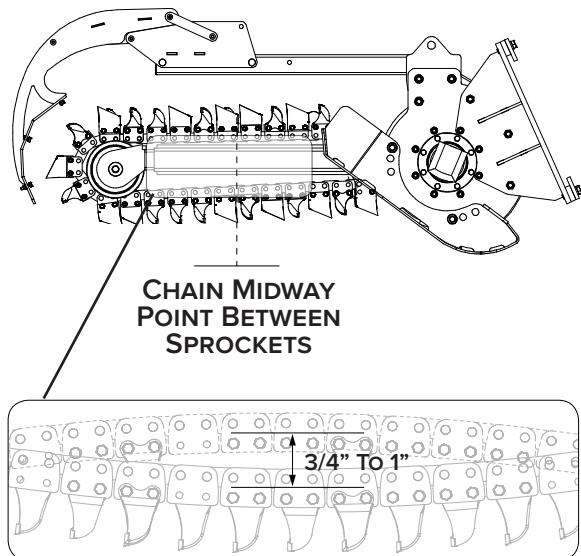


Figure 27

4. Maintenance

4.11 Trencher Chain Con't

Fitting a Trencher Chain

1. Securely attach the Trencher to a lifting device or machine, ensure the adjustable boom is fully retracted.
2. Place Trencher on the ground, position chain in front of the nose roller with cutting edge of the tooth facing away from the Trencher [Figure 28].



Figure 28

3. Lift chain onto Nose Roller - A suitable lifting device may need to be used for the larger heavier chains [Figure 29].



Figure 29

4. Slide the chain along the boom and over the drive sprocket [Figure 30].



Figure 30

5. Raise the Trencher and support it from falling. Bring both ends of the chain under the boom [Figure 31].



Figure 31

6. Bring both ends of the chain together and insert the joining pin. The joining pin must be inserted from the correct side. Identify by matching the head of the other link pins and install it through the same side [Figure 32].



Figure 32

7. Tap the joining pin fully home using a soft head mallet [Figure 33].



Figure 33

8. Slide the chain along the boom and over the drive sprocket [Figure 34].



Figure 34

9. Slide the chain along the boom and over the drive sprocket [Figure 35].



Figure 35

4. Maintenance

4.12 Service Schedule

DESCRIPTION	SERVICE PROCEDURES					
	Check	Clean	Lube	Change	Adjust	Drain
Daily Maintenance (or every 8 hours)						
Hydraulic Fittings	•					
Hydraulic Hoses	•					
Hydraulic Motor	•	•				
Cutting Teeth (wear, damage, and loosening)	•					
Trenching Boom	•					
All Hardware	•					
Danger Bar	•					
Chain (wear, damage, loosened)	•					
Gearbox Oil Level	•					
Weekly Maintenance (or every 40 hours)						
Chain Adjustment	•				•	
All Hardware	•					
Auger	•					
Frame (cracks, bends, or damage)	•					
Cutting Teeth (wear/damage)	•					
Scraper Shoe (wear)	•					
Monthly Maintenance						
Cutting Teeth (cracks, bends, or excessive wear)	•					
All Hardware	•					
Quarterly Maintenance						
Gearbox Oil (initial change 30/50 hrs)				•		
NOTE: See Gearbox Lubrication under “4.3 Lubrication” on page 23 for service interval information.						

4. Maintenance

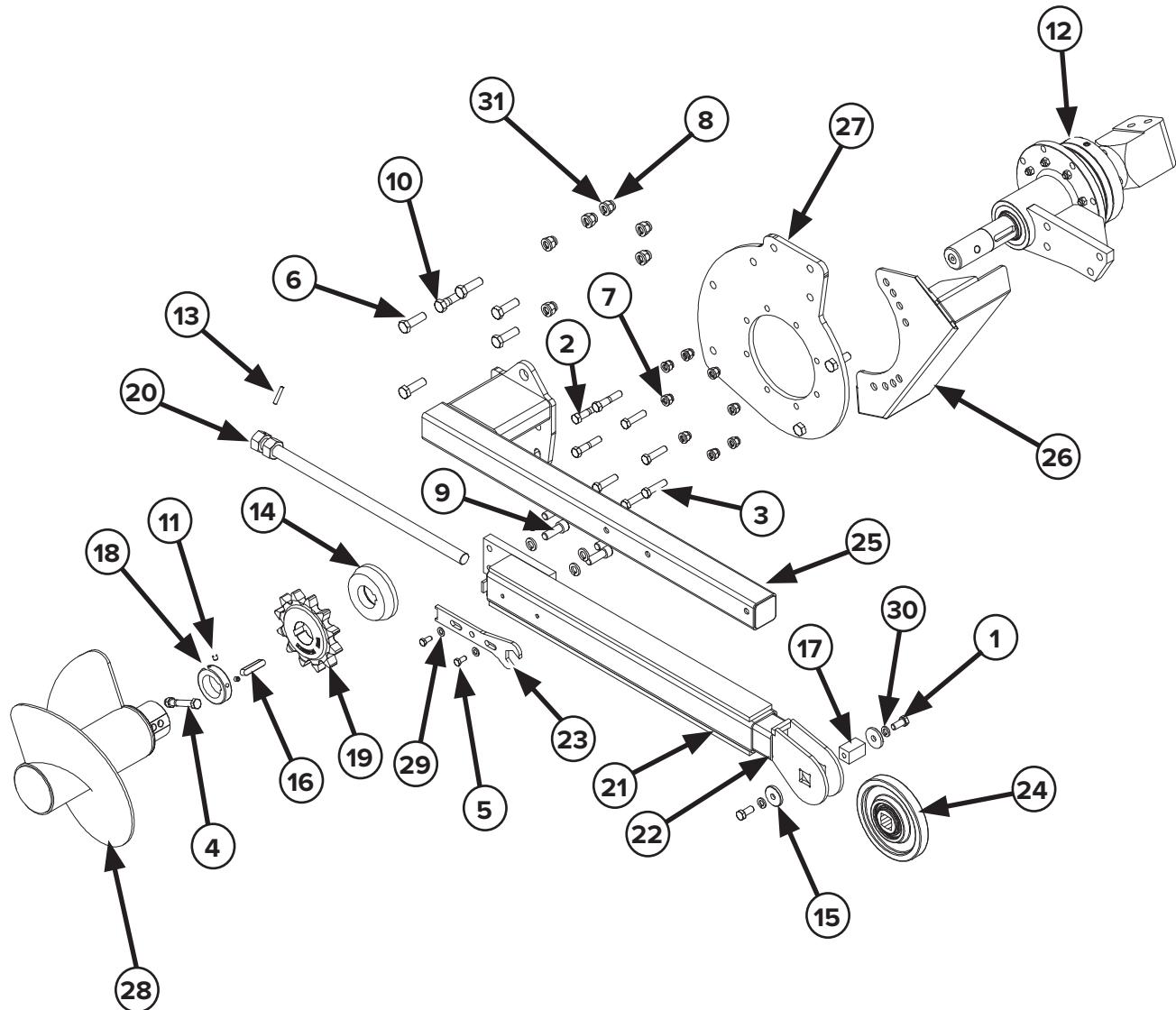
4.13 Troubleshooting

PROBLEM	CAUSE	SOLUTION
CHAIN		
Chain does not turn.	Hydraulic Quick Coupler not completely engaged.	Check for complete connection of both couplers.
	Hydraulic Quick Coupler failure.	Replace faulty coupler.
	An obstruction in one of the hoses.	Remove obstruction.
	Hydraulic Motor failure.	Repair or replace. Contact Blue Diamond dealer.
	Chain drive failure.	Check & repair. Contact Blue Diamond dealer.
	Nose roller bearing failed.	Replace bearing.
	Digging chain too tight.	Loosen chain tension.
	Sand or spoil material build up in tooth root of sprocket.	Raise out of ditch, reverse chain & run to clear build up or loosen chain tension.
DIGGING		
Does not dig fast enough.	Worn Teeth.	Replace Teeth if necessary.
	Relief valve set below specifications.	Test and reset if necessary.
	Hydraulic Quick coupler or Hose restriction.	Inspect and repair as needed.
	Hydraulic system too hot.	Shut down and cool.
	Cutting a ditch size beyond the machine capabilities.	REMEMBER: Your Trencher only has the horsepower transmitted through the Hydraulic Hoses, NOT the full horsepower of the engine.
	Auger is running on the ground.	Raise Trencher - Keep Auger off the ground.
	Chain too tight.	Adjust to proper tension.
BOOM, DANGER BAR, CRUMBER BAR		
Trenching Boom bent.	Too much downward pressure on the trencher or trench is not straight.	Use less downward pressure on the trencher and allow more distance to get to full trenching depth. Do not attempt to dig a curved trench or around corners. See Sections 3.6 and 3.7.
Danger Bar bent.		
Fold back Crumber Bar bent.		
HYDRAULIC OIL		
Hydraulic oil overheating.	Relief valve set too low on Host Machine.	Test & set as needed.
	Restriction in Quick Release Coupler or hose.	Inspect and repair as needed.
	Hydraulic Motor or hoses not size balanced to Host Machine.	Check flows and recommendations and change if necessary. Contact your Blue Diamond® Dealer.
	Host Machine not equipped with oil cooler or sufficient sump capacity.	Stop and allow to cool naturally when it gets hot.

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5. Parts

5.1 Main Components - Mini Series



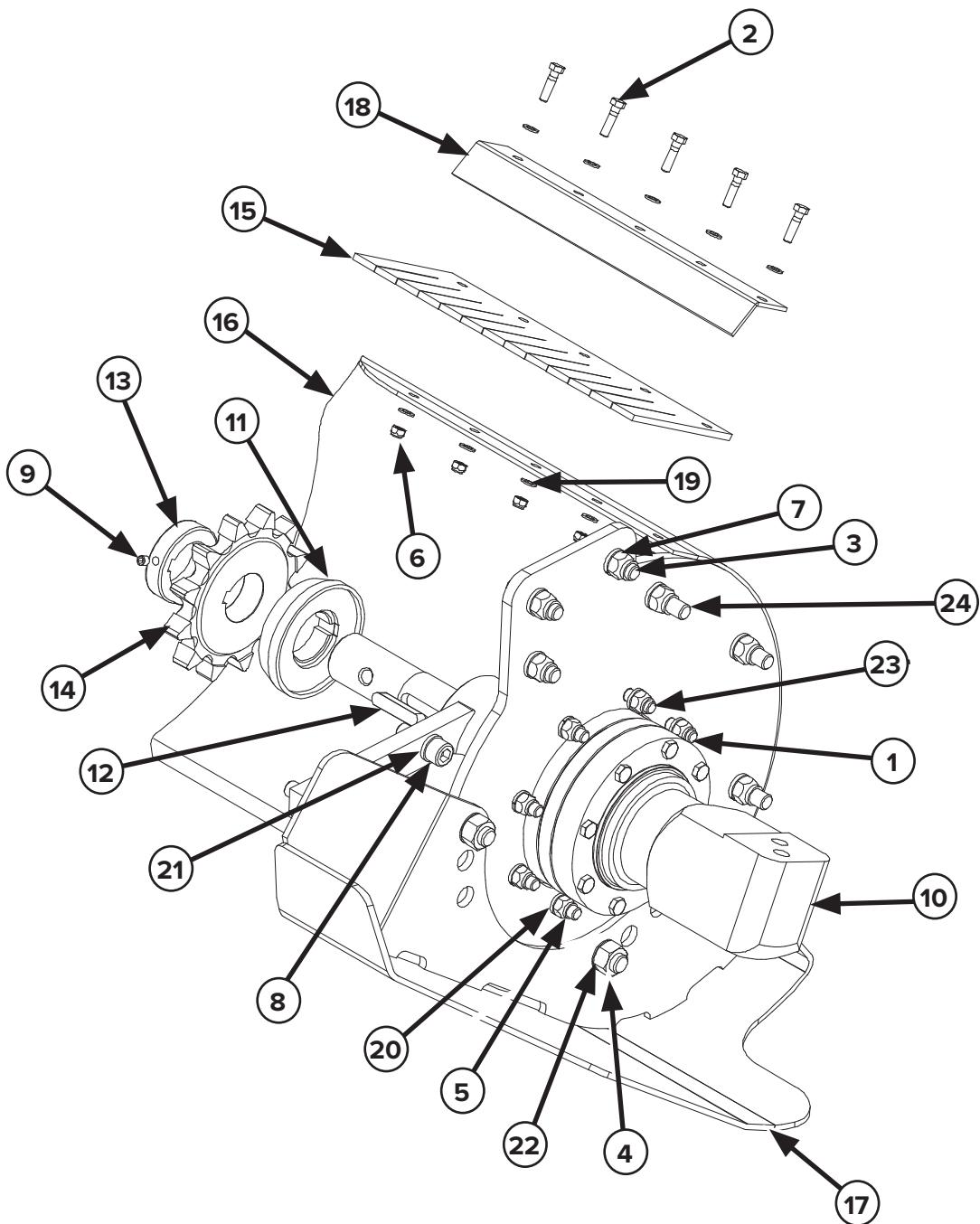
5. Parts

5.1 Main Components - Mini Series Con't

ITEM	PART NUMBER	DESCRIPTION	QTY
1	299430	1/2"-13 X 1" BOLT HEX HEAD GRADE 8	2
2	299474	1/2"-13 X 2 1/2" BOLT HEX HEAD GRADE 8	3
3	232265	1/2"-13 X 2" BOLT HEX HEAD GRADE 8	5
4	231060	1/2"-13 X 3 1/2" BOLT HEX HEAD GRADE 8	1
5	231182	3/8"-16 X 3/4" BOLT HEX HEAD GRADE 8	2
6	-	5/8"-11 X 2" BOLT HEX HEAD GRADE 8	5
7	231070	1/2"-13 NYLOCK NUT	9
8	-	5/8"-11 NYLOCK NUT	8
9	299353	5/8"-11 X 1 3/4" BOLT SOCKET HEAD	4
10	-	5/8"-11 X 2 1/4" BOLT HEX HEAD GRADE 8	1
11	231254	3/8"-16 X 3/8" SET SCREW	2
12	231312	MOTOR AND GEARBOX ASSY (SEE PG 42 FOR PARTS)	1
13	231705	ADJUSTMENT NUT SPRING PIN 1/4" X 1 1/2"	1
14	231259	GEARBOX SEAL PROTECTOR	1
15	231091	NOSE ROLLER PIN WASHER	2
16	231309	SPROCKET KEY 1/2" X 60MM	1
17	231093	NOSE ROLLER SQUARE PIN	1
18	231251	DRIVE SPROCKET COLLAR	1
19	231260	DRIVE SPROCKET 1 5/8" PITCH 12 TOOTH	1
20	231700	BOOM ADJUSTMENT ROD	1
21	231710	36" OUTER BOOM	1
22	231715	INNER BOOM	1
23	231183	CHAIN ADJUSTMENT SPANNER	1
	231184	ADJUSTMENT NUT LOCK RING	1
24	231092	NOSE ROLLER	1
25	231116	36" DANGER BAR	1
26	231192	SKID SHOE	1
27	231193	SIDE PLATE	1
28	231194	SPOIL AUGER	1
29	216495	3/8" FLAT WASHER	2
30	299731	1/2" LOCK WASHER	10
31	-	5/8" LOCK WASHER	12
NS	-	1/2" HOSE SET 1/2" FLAT FACED COUPLERS 87" LONG	1

5. Parts

5.2 Main Components 1 - Heavy Duty



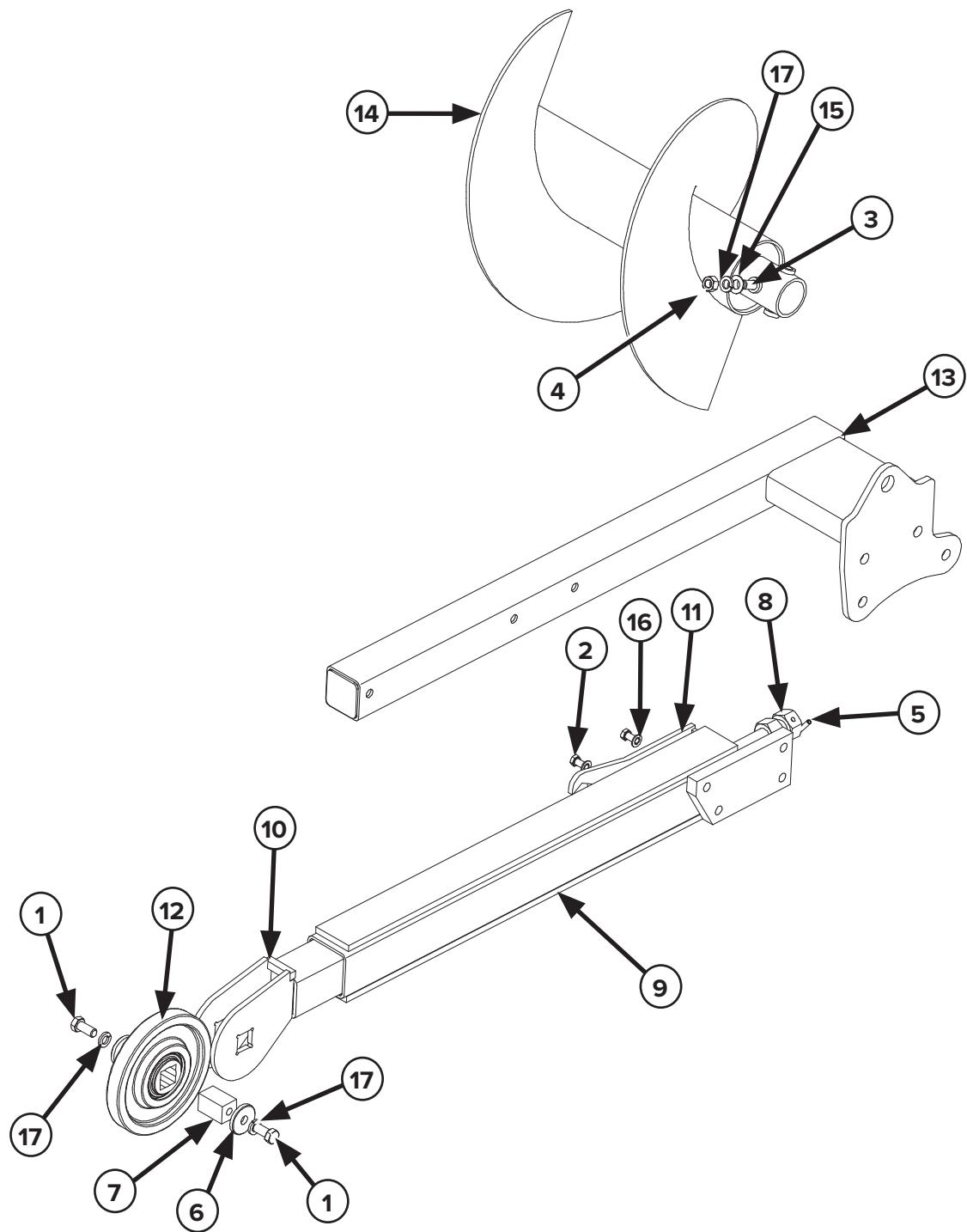
5. Parts

5.2 Main Components 1 - Heavy Duty Con't

ITEM	PART NUMBER	DESCRIPTION	QTY
1	299474	1/2"-13 X 2 1/2" BOLT HEX HEAD GRADE 8	3
2	-	5/16"-18 X 1 1/4" BOLT HEX HEAD GRADE 8	5
3	-	5/8"-11 X 2" BOLT HEX HEAD GRADE 8	5
4	-	3/4"-10 X HEX NUT GRADE 8	2
5	231070	1/2"-13 NYLOCK NUT	8
6	-	5/16"-18 NYLOCK NUT	5
7	-	5/8"-11 NYLOCK NUT	6
8	299353	5/8"-11 X 1 3/4" BOLT SOCKET HEAD	4
9	231254	3/8"-16 X 3/8" SET SCREW	2
10	231250	MOTOR AND GEARBOX ASSEMBLY	1
11	231259	GEARBOX SEAL PROTECTOR	1
12	231309	SPROCKET KEY 1/2" X 60MM	1
13	231251	DRIVE SPROCKET COLLAR	1
14	231260	DRIVE SPROCKET 1 5/8" PITCH 12 TOOTH	1
15	231405	CHAIN RUBBER	1
16	231103	BARREL AND SIDE PLATE	1
17	231004	SKID SHOE	1
18	231410	CHAIN RUBBER RETAINING PLATE	1
19	-	5/16" FLAT WASHER	10
20	299731	1/2" LOCK WASHER	8
21	-	5/8" LOCK WASHER	10
22	-	3/4" SHAKE PROOF WASHER	2
23	-	1/2"-13 X 2 1/4" BOLT HEX HEAD GRADE 8	5
24	-	5/8"-11 X 2 1/2" BOLT HEX HEAD GRADE 8	1
NS	-	1/2" HOSE SET 1/2" FLAT FACED COUPLERS 87" LONG	1

5. Parts

5.3 Main Components 2 - Heavy Duty



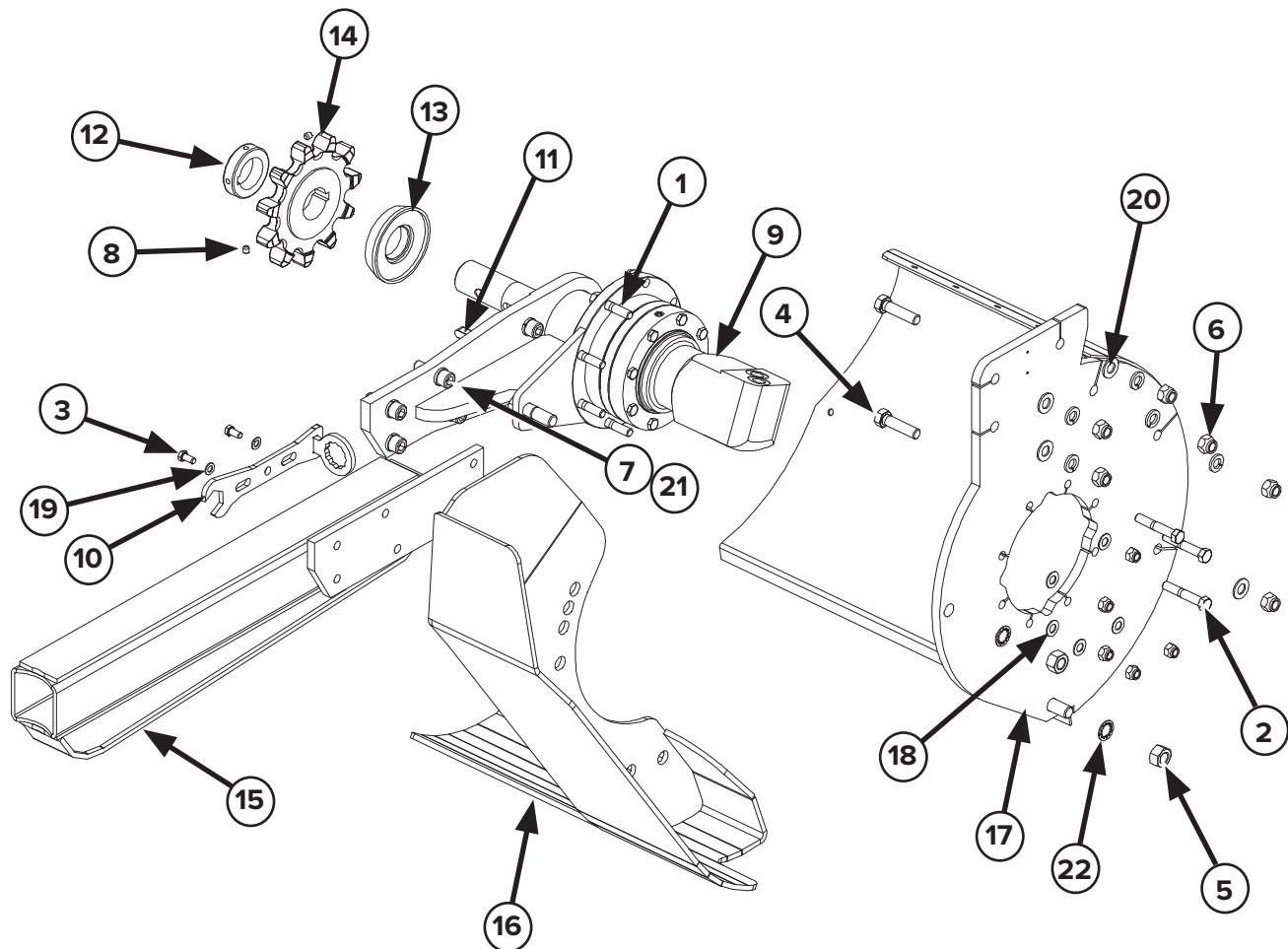
5. Parts

5.3 Main Components 2 - Heavy Duty Con't

ITEM	PART NUMBER	DESCRIPTION	QTY
1	299430	1/2"-13 X 1" BOLT HEX HEAD GRADE 8	2
2	231182	3/8"-16 X 3/4" BOLT HEX HEAD GRADE 8	2
3	231400	1/2"-13 X 3 3/4" BOLT HEX HEAD GRADE 8	1
4	-	1/2"-13 X HEX NUT GRADE 8	1
5	231705	ADJUSTMENT NUT SPRING PIN 1/4" X 1 1/2"	1
6	231091	NOSE ROLLER PIN WASHER	2
7	231093	NOSE ROLLER SQUARE PIN	1
8	231700	BOOM ADJUSTMENT ROD	1
9	231710	36" OUTER BOOM	1
10	231715	INNER BOOM	1
11	231183	CHAIN ADJUSTMENT SPANNER	1
	231184	ADJUSTMENT NUT LOCK RING	1
12	231092	NOSE ROLLER	1
13	231116	36" DANGER BAR	1
14	231191	SPOIL AUGER	1
15	-	1/2" FLAT WASHER	1
16	216495	3/8" FLAT WASHER	2
17	299731	1/2" LOCK WASHER	3

5. Parts

5.4 Main Components 1 - Extreme Duty / Severe Duty



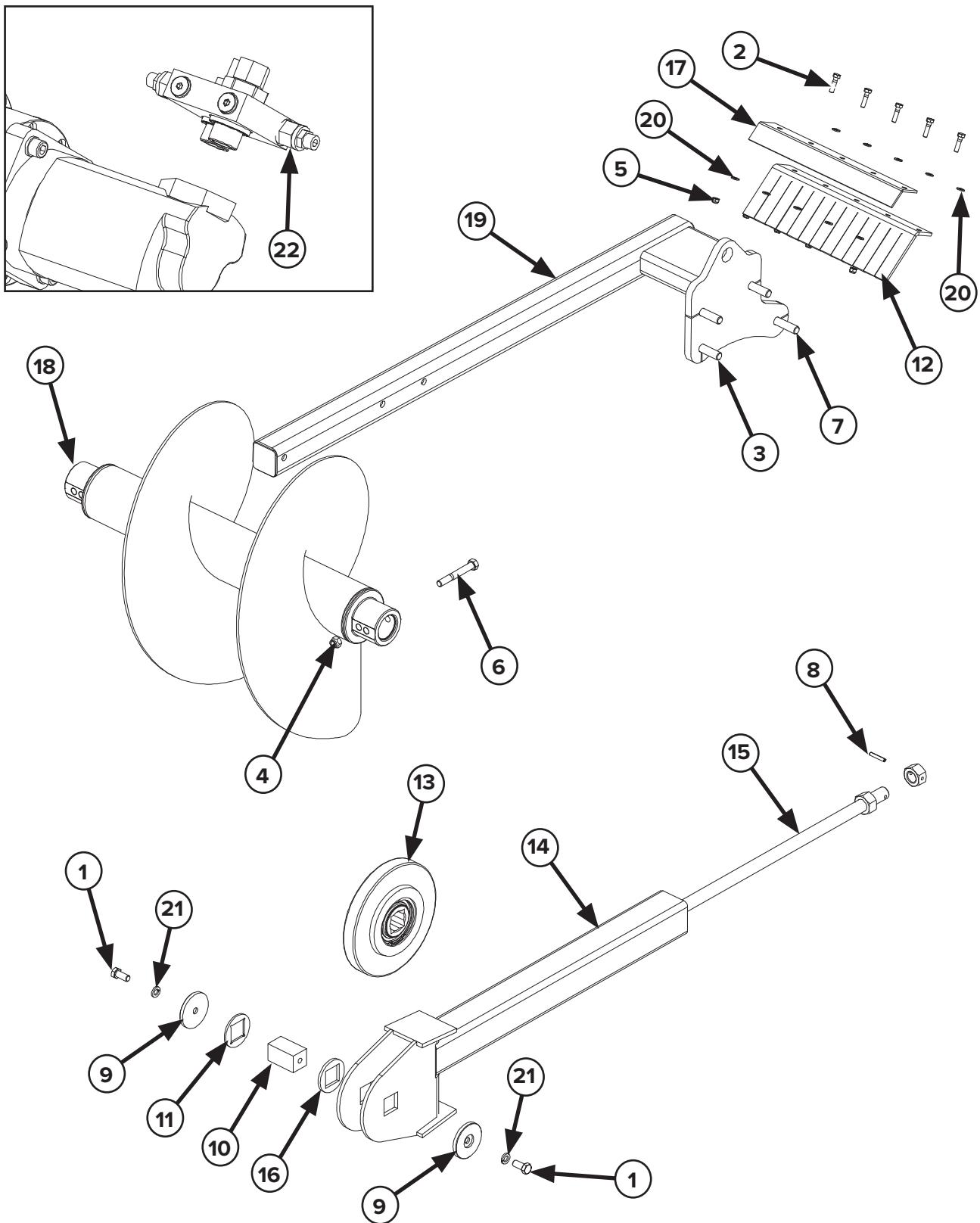
5. Parts

5.4 Main Components 1 - Extreme Duty / Severe Duty Con't

ITEM	PART NUMBER	DESCRIPTION	QTY
1	299474	1/2"-13 X 2 1/2" BOLT HEX HEAD GRADE 8	5
2	231065	1/2"-13 X 3" BOLT HEX HEAD GRADE 8	3
3	231182	3/8"-16 X 3/4" BOLT HEX HEAD GRADE 8	2
4	-	5/8"-11 X 2 1/2" BOLT HEX HEAD GRADE 8	2
5	-	3/4"-10 X HEX NUT GRADE 8	2
6	-	5/8"-11 NYLOCK NUT	6
7	-	5/8"-11 X 2" BOLT SOCKET HEAD	6
8	231254	3/8"-16 X 3/8" SET SCREW	2
9	231701	MOTOR AND GEARBOX ASSEMBLY	1
10	231183	CHAIN ADJUSTMENT SPANNER	1
	231184	ADJUSTMENT NUT LOCK RING	1
11	231309	SPROCKET KEY 1/2" X 60MM	1
12	231251	DRIVE SPROCKET COLLAR	1
13	231456	GEARBOX SEAL PROTECTOR	1
14	231261	DRIVE SPROCKET 2" PITCH 11 TOOTH	1
15	-	36" OUTER BOOM	1
	231711	48" OUTER BOOM	1
	-	60" OUTER BOOM	1
16	231704	SKID SHOE	1
17	231706	BARREL AND SIDE PLATE	1
18	-	1/2" FLAT WASHER	8
19	216495	3/8" FLAT WASHER	2
20	-	5/8" FLAT WASHER	4
21	-	5/8" LOCK WASHER	11
22	-	3/4" SHAKE PROOF WASHER	2
NS	-	1/2" HOSE SET 1/2" FF COUPLERS 87" LONG	1
	-	SEVERE DUTY 3/4" HOSE SET 1/2" FF COUPLERS 87" LONG	
	-	SEVERE DUTY 3/4" HOSE SET 3/4" FF COUPLERS 87" LONG	

5. Parts

5.5 Main Components 2 - Extreme Duty / Severe Duty



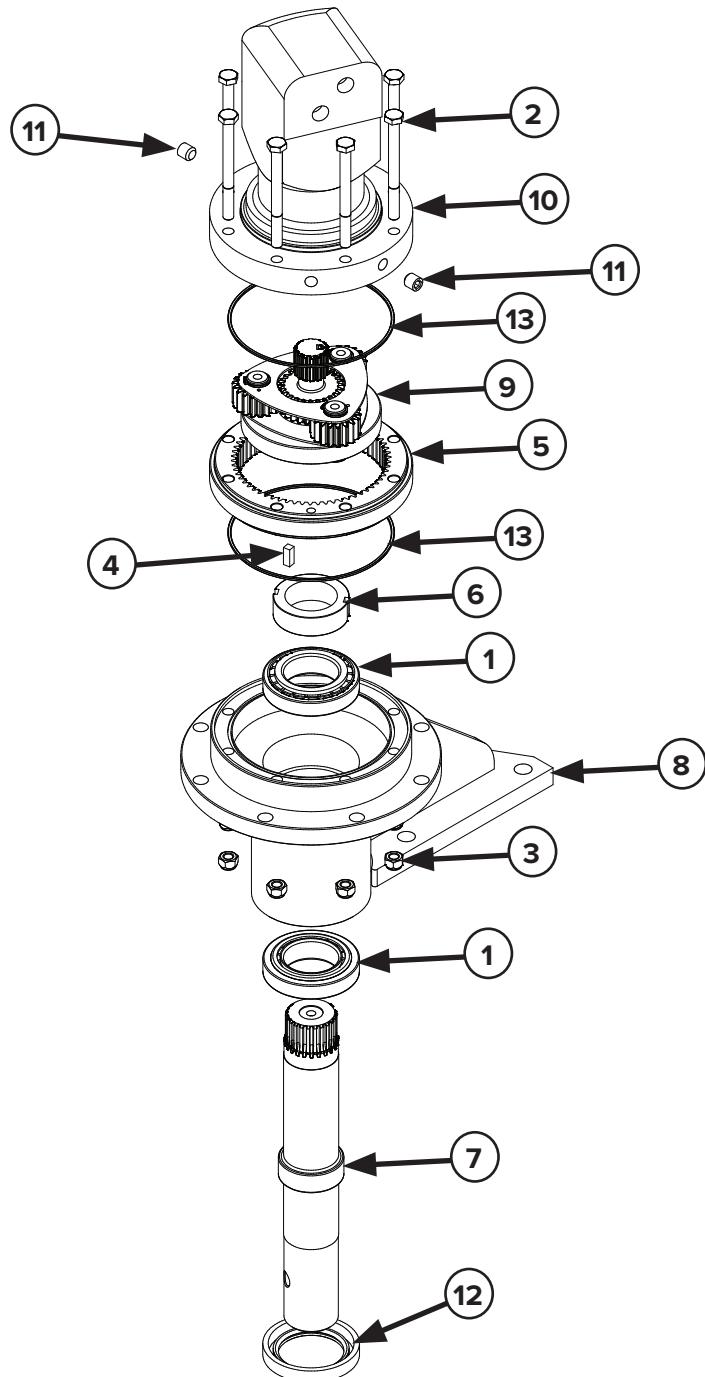
5. Parts

5.5 Main Components 2 - Extreme Duty / Severe Duty Con't

ITEM	PART NUMBER	DESCRIPTION	QTY
1	299430	1/2"-13 X 1" BOLT HEX HEAD GRADE 8	2
2	-	5/16"-18 X 1 1/4" BOLT HEX HEAD GRADE 8	5
3	-	5/8"-11 X 2 1/2" BOLT HEX HEAD GRADE 8	3
4	231070	1/2"-13 NYLOCK NUT	9
5	-	5/16"-18 NYLOCK NUT	5
6	231400	1/2"-13 X 3 3/4" BOLT HEX HEAD GRADE 8	1
7	-	5/8"-11 X 3" BOLT HEX HEAD GRADE 8	1
8	231705	ADJUSTMENT NUT SPRING PIN 1/4" X 1 1/2"	1
9	231095	NOSE ROLLER PIN WASHER	2
10	231089	NOSE ROLLER SQUARE PIN	1
11	231096	NOSE ROLLER 4MM SPACER	1
12	231405	CHAIN RUBBER	1
13	231094	NOSE ROLLER	1
14	231712	36"/48" INNER BOOM	1
	-	60" INNER BOOM	1
15	231703	BOOM ADJUSTMENT ROD	1
16	231097	NOSE ROLLER 6MM SPACER	1
17	231410	CHAIN RUBBER RETAINING PLATE	1
18	231190	SPOIL AUGER	1
19	-	36" DANGER BAR	1
	231117	48" DANGER BAR	1
	231118	60" DANGER BAR	1
20	-	5/16" FLAT WASHER	10
21	299731	1/2" LOCK WASHER	2
22	231310	VALVE BLOCK (SEVERE DUTY ONLY)	1

5. Parts

5.6 Gearbox Components - Mini Series / Heavy Duty



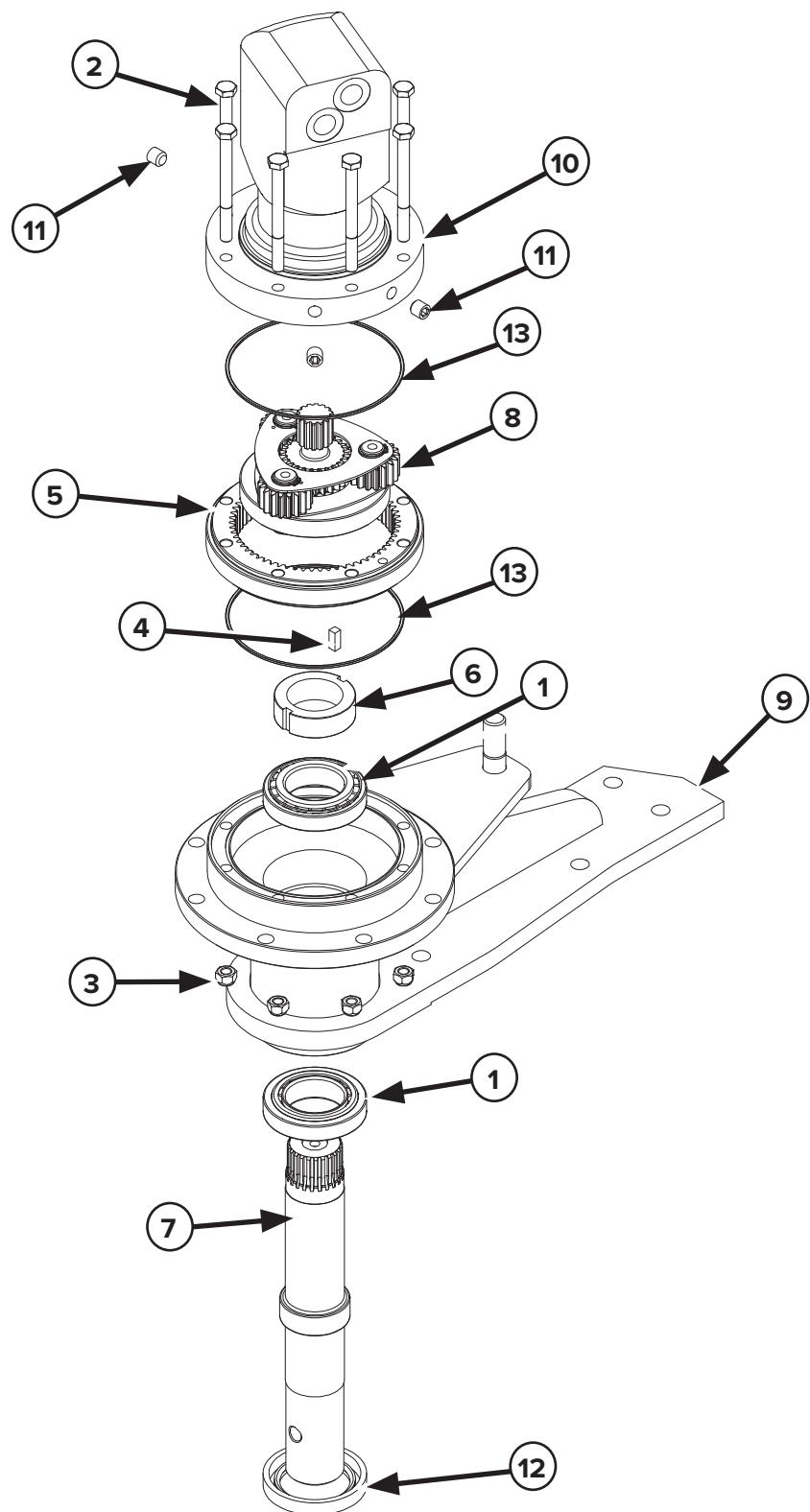
5. Parts

5.6 Gearbox Components - Mini Series / Heavy Duty Con't

ITEM	PART NUMBER	DESCRIPTION	QTY
1	231306	BEARING TAPERED ROLLER	2
2	299014	M10 X 110MM BOLT HEX HEAD	8
3	299020	M10 NYLOCK NUT	8
4	231258	KEY	1
5	231253	RING GEAR	1
6	231252	LOCKNUT WITH BUILT IN SPACER	1
7	231257	OUTPUT SHAFT	1
8	231256	OUTPUT HOUSING	1
9	231255	GEARSET RATIO 3.48 MALE 14T INPUT SPLINE	1
10	-	MINI SERIES MOTOR 100CC	1
	231303	HEAVY DUTY MOTOR 130CC	
11	-	OIL PLUG 1/4" BSP	3
12	231308	OUTPUT SHAFT SEAL 2.375" ID X 3.5" OD X 0.5" THICK	1
13	231307	O-RING DURO R70162	2

5. Parts

5.7 Gearbox Components - Extreme Duty



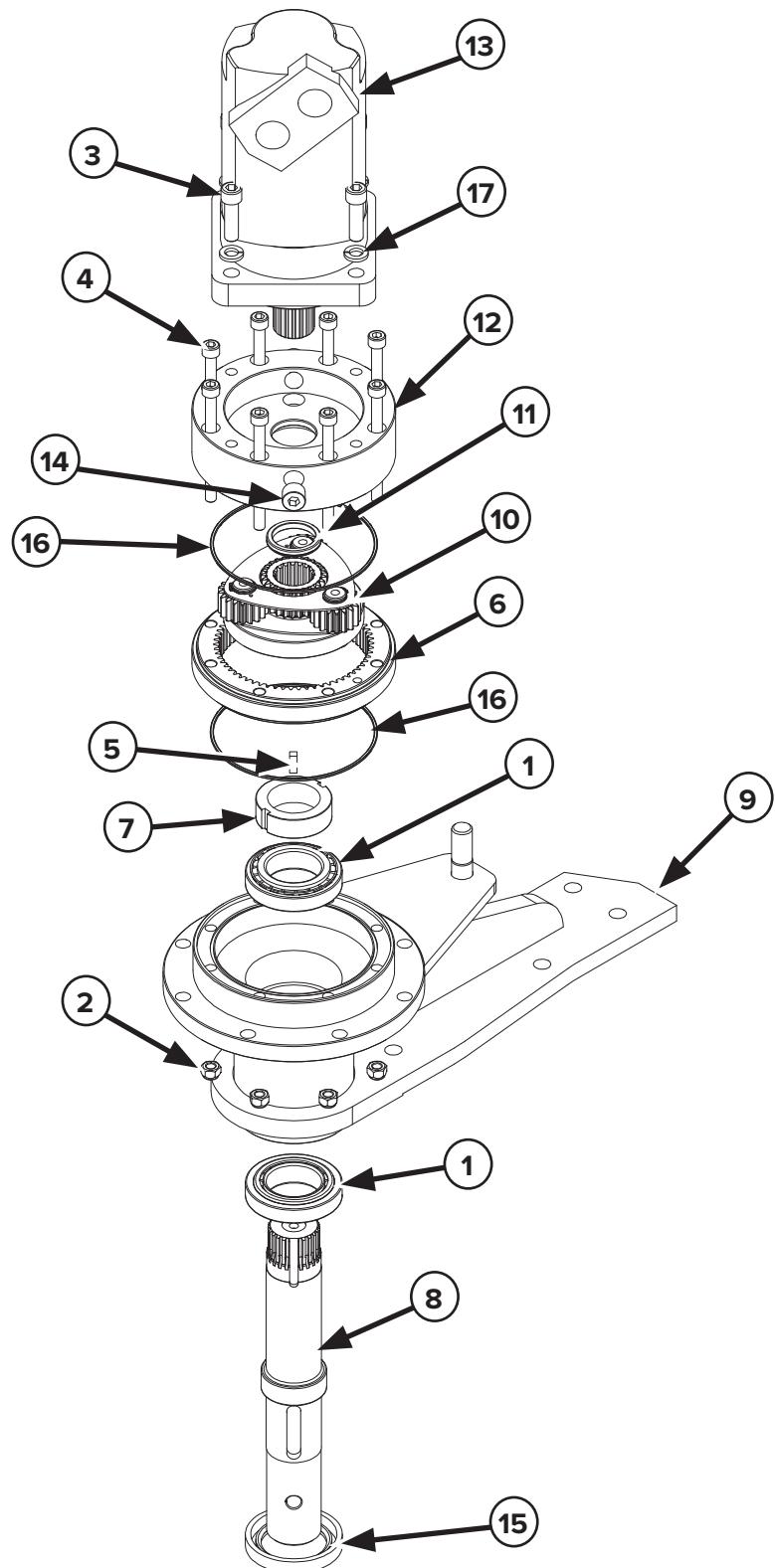
5. Parts

5.7 Gearbox Components - Extreme Duty Con't

ITEM	PART NUMBER	DESCRIPTION	QTY
1	231306	TAPERED ROLLER BEARING 368A/362A	2
2	299014	M10 X 120MM BOLT SOCKET HEAD	8
3	299020	M10 NYLOCK NUT	8
4	231258	KEY	1
5	231253	RING GEAR	1
6	231252	LOCKNUT WITH BUILT IN SPACER	1
7	231257	OUTPUT SHAFT	1
8	231255	GEARSET RATIO 3.48 FEMALE 14T INPUT SPLINE	1
9	231305	OUTPUT HOUSING	1
10	231320	MOTOR 160CC	1
11	-	OIL PLUG 1/4" BSP	3
12	231308	OUTPUT SHAFT SEAL 2.375" ID X 3.5" OD X 0.5" THICK	1
13	231307	O-RING DURO R70162	2

5. Parts

5.8 Gearbox Components - Severe Duty



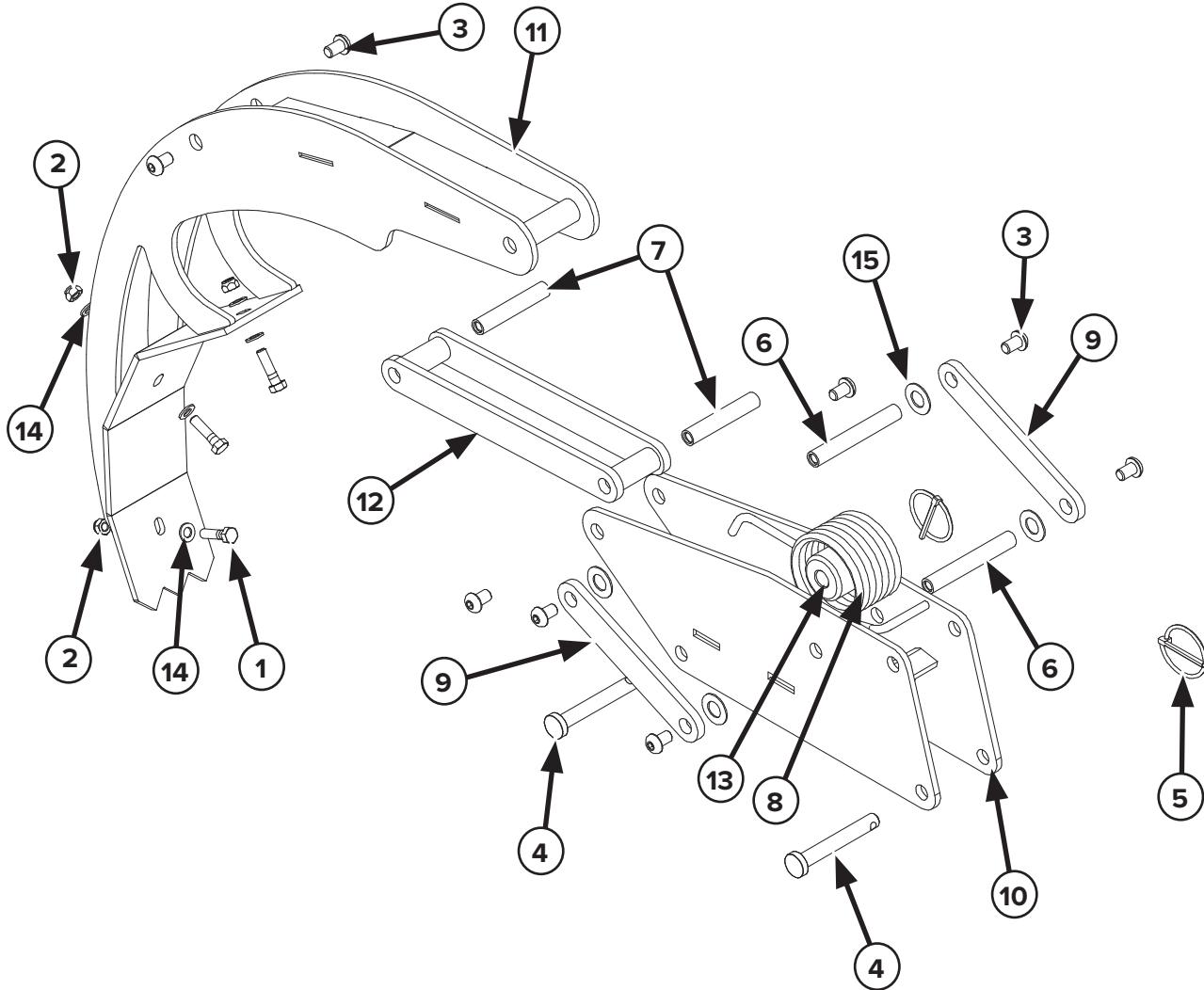
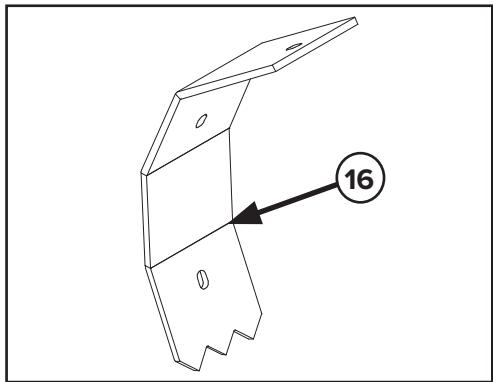
5. Parts

5.8 Gearbox Components - Severe Duty Con't

ITEM	PART NUMBER	DESCRIPTION	QTY
1	231306	TAPERED ROLLER BEARING 368A/362A	2
2	299020	M10 NYLOCK NUT	8
3	-	1/2"-13 X 1 3/4" BOLT SOCKET HEAD	4
4	-	M10 X 120MM BOLT SOCKET HEAD	8
5	231258	KEY	1
6	231253	RING GEAR	1
7	231252	LOCKNUT WITH BUILT IN SPACER	1
8	231257	OUTPUT SHAFT	1
9	231305	OUTPUT HOUSING	1
10	-	GEARSET RATIO 3.48 FEMALE 17T INPUT SPLINE	1
11	-	THRUST WASHER	1
12	-	MOTOR TO GEARBOX ADAPTER FLANGE	1
13	231300	MOTOR 250CC	1
14	-	OIL PLUG 1/4" BSPT	2
15	231308	OUTPUT SHAFT SEAL 2.375" ID X 3.5" OD X 0.5" THICK	1
16	231307	O-RING DURO R70162	2
17	299731	1/2" LOCK WASHER	4

5. Parts

5.9 Crumber Bar - Mini Series / Heavy Duty



5. Parts

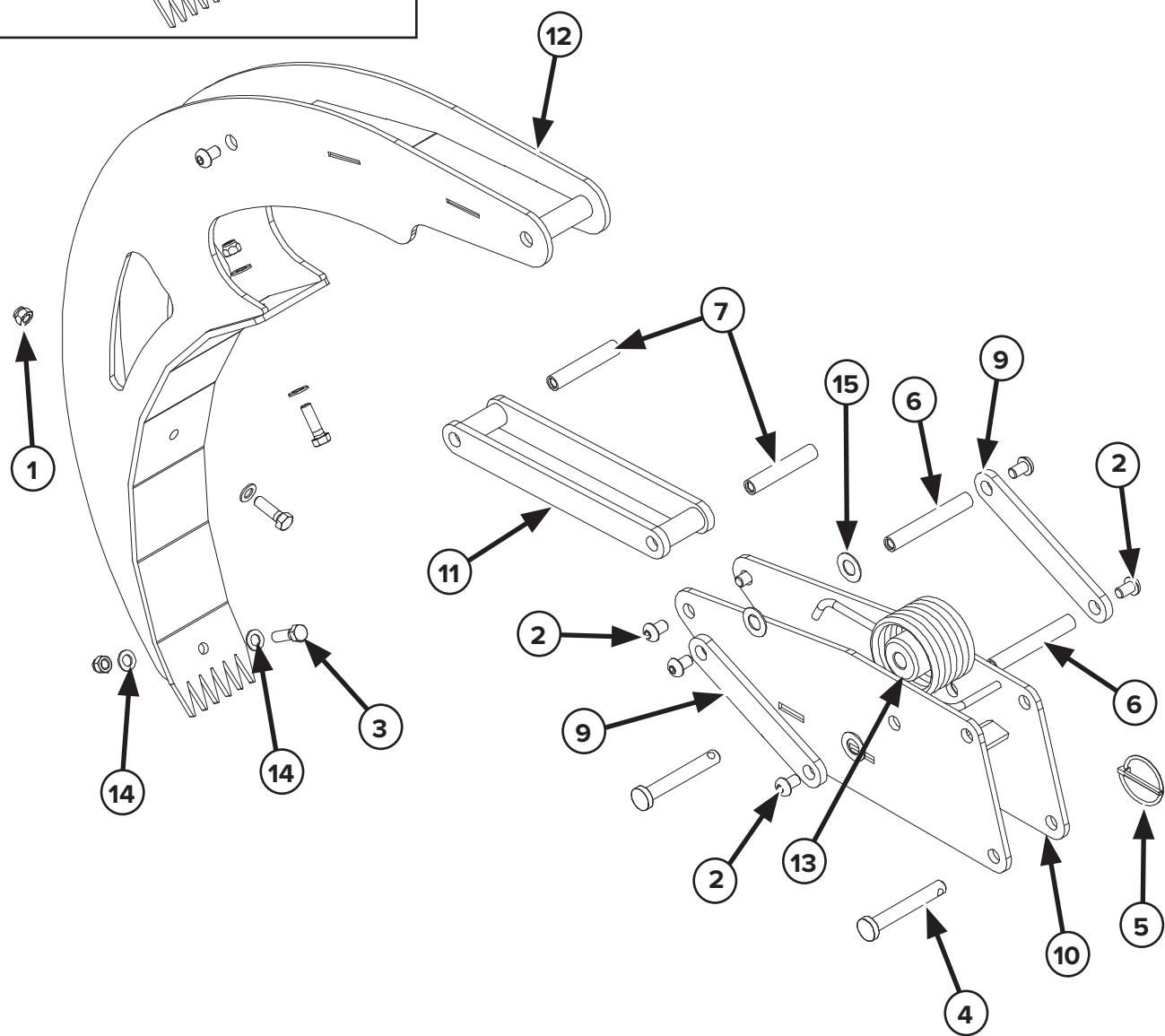
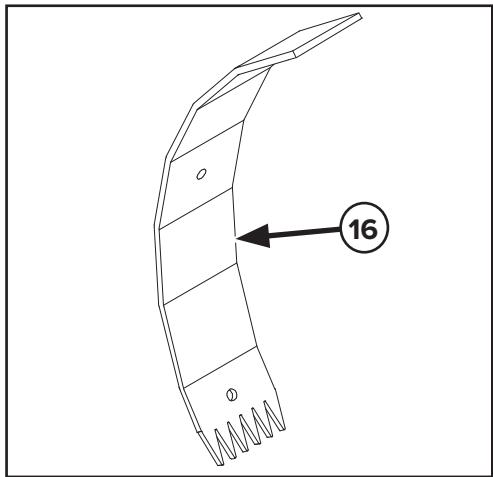
5.9 Crumber Bar - Mini Series / Heavy Duty Con't

ITEM	PART NUMBER	DESCRIPTION	QTY
1	-	5/16"-18 X 1 1/4" BOLT HEX HEAD GRADE 8	3
2	-	5/16"-18 NYLOCK NUT	3
3	231122	M10 X 16MM BOLT BUTTON HEAD ALLEN DRIVE	8
4	231100	CLEVIS PIN 12.7MM DIA X 97MM OAL X 91MM LENGTH	2
5	231105	LINCH PIN 4.5MM DIA	2
6	231126	LINKAGE PIN (LONG) 14MM DIA X 98.5MM OAL	2
7	231127	LINKAGE PIN (SHORT) 14MM DIA X 79MM OAL	2
8	231104	SPRING	1
9	231135	SHORT LINKAGE ARM	2
10	231119	MOUNT BRACKET	1
11	231124	SCRAPER ARM WELDMENT (WITH 4" SCRAPER)	1
12	231131	LONG LINKAGE ARM	1
13	231102	SPRING SUPPORT BUSHING	1
14	-	5/16" FLAT WASHER	6
15	231123	CRUMBER BAR PIVOT LINK WASHER 9/16" ID X 1 1/8" OD	4
16*	231128	SCRAPER SHOE KIT 6"	1
	231129	SCRAPER SHOE KIT 8"	1
NS	231120	CRUMBER BAR COMPLETE ASSEMBLY	1

*NOTE: No Scraper Shoe used for 4" width.

5. Parts

5.10 Crumber Bar - Extreme Duty / Severe Duty



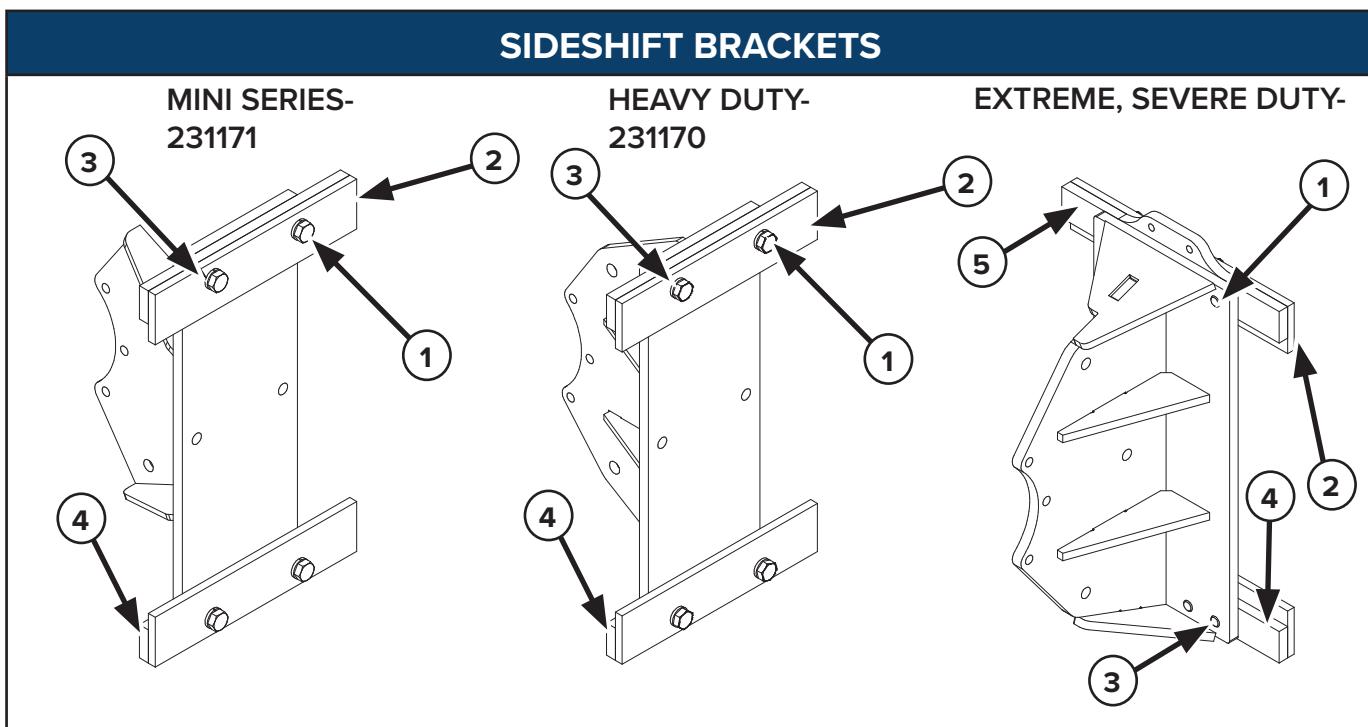
5. Parts

5.10 Crumber Bar - Extreme Duty / Severe Duty Con't

ITEM	PART NUMBER	DESCRIPTION	QTY
1	231080	3/8"-16 NYLOCK NUT	3
2	231122	M10 X 16MM BOLT BUTTON HEAD ALLEN DRIVE	8
3	-	3/8"-16 X 1 1/4" BOLT HEX HEAD	3
4	231100	CLEVIS PIN 12.7MM DIA X 97MM OAL X 91MM LENGTH	2
5	231105	LINCH PIN 4.5MM DIA	2
6	231126	LINKAGE PIN (LONG) 14MM DIA X 98.5MM OAL	2
7	231127	LINKAGE PIN (SHORT) 14MM DIA X 79MM OAL	2
8	231104	SPRING	1
9	231135	SHORT LINKAGE ARM	2
10	231119	MOUNT BRACKET	1
11	231131	LONG LINKAGE ARM	1
12	-	SCRAPER ARM WELDMENT	1
13	231102	SPRING SUPPORT BUSHING	1
14	216495	3/8" FLAT WASHER	6
15	231123	CRUMBER BAR PIVOT LINK WASHER 9/16" ID X 1 1/8" OD	4
16	231110	SCRAPER SHOE KIT 6"	1
	231112	SCRAPER SHOE KIT 8"	1
	231138	SCRAPER SHOE KIT 10"	1
	231106	SCRAPER SHOE KIT 12"	1
NS	231121	CRUMBER BAR COMPLETE ASSEMBLY	1

5. Parts

5.11 Mount Options



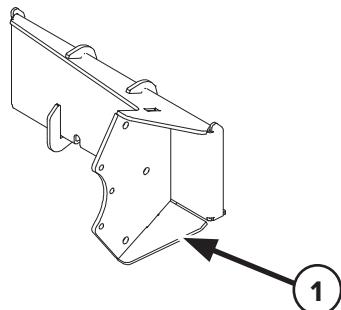
ITEM	PART NUMBER	DESCRIPTION	QTY MINI, HD	QTY EXTREME SEVERE
1	-	5/8"-11 X 2" BOLT HEX HEAD GRADE 8	4	4
2	231147	SIDE SHIFT RETAINING PLATE	2	
	-	SIDE SHIFT RETAINING PLATE		2
3	-	5/8" LOCK WASHER	4	4
4	231146	SPACER RETAINING PLATE	2	
	-	BOTTOM SPACER PLATE		1
5	-	TOP SPACER PLATE		1

5. Parts

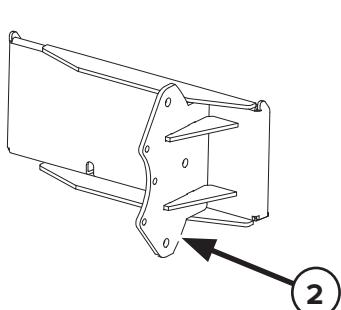
5.11 Mount Options Con't

FIXED MOUNTS

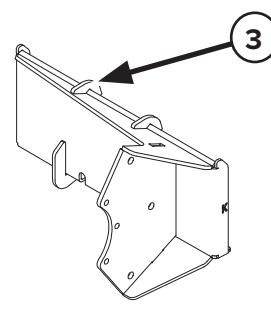
MINI SERIES-
231162



HEAVY DUTY-
131005-25



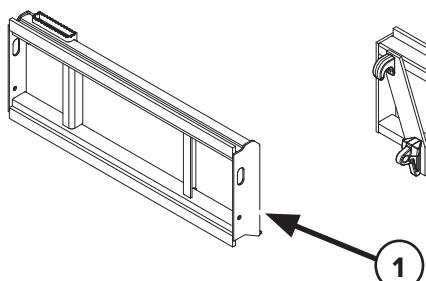
KUBOTA SCL1000-
231161



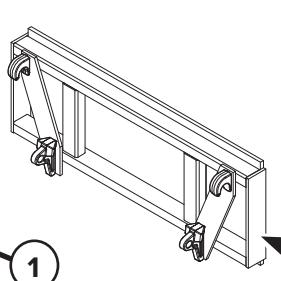
ITEM	PART NUMBER	DESCRIPTION	QTY
1	231162	MINI SERIES FIXED MOUNT MINI UNIVERSAL	1
2	131005-25	HEAVY DUTY FIXED MOUNT MINI UNIVERSAL	1
3	231161	FIXED MOUNT KUBOTA SCL1000	1

SIDEShift MOUNTS

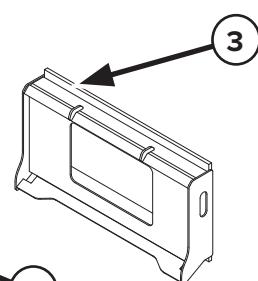
SKID STEER-
131005



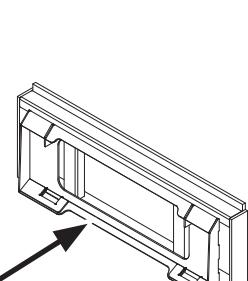
EURO AG-
131005-16



BOBCAT MT-
231155



ASV RC30-
131005-36



ITEM	PART NUMBER	DESCRIPTION	QTY
1	131005	SIDESHIFT MOUNT UNIVERSAL (SKID STEER)	1
2	131005-16	SIDESHIFT MOUNT (EURO AG)	1
3	231155	SIDESHIFT MOUNT (BOBCAT MT)	1
4	131005-36	SIDESHIFT MOUNT (ASV RC30)	1
NS	131055	EXCAVATOR ADAPTER PLATE REQUIRES -00 BLANK BACK MOUNT (MINI / HEAVY DUTY)	1
	131060	EXCAVATOR REQUIRES -00 BLANK BACK MOUNT (EXTREME / SEVERE DUTY)	

5. Parts

5.12 Chains - Mini Series/Heavy Duty, Extreme Duty/Severe Duty

1 5/8" TRENCHER CHAINS - MINI SERIES / HEAVY DUTY		
	DESCRIPTION	PART NUMBER
36" DEPTH	DIRT CHAIN	
	1 5/8" PITCH X 36" DEPTH X 4" DIRT	231500
	1 5/8" PITCH X 36" DEPTH X 6" DIRT	231505
	1 5/8" PITCH X 36" DEPTH X 8" DIRT	231510
	COMBO CHAIN	
	1 5/8" PITCH X 36" DEPTH X 4" COMBO	231515
	1 5/8" PITCH X 36" DEPTH X 6" COMBO	231520
	1 5/8" PITCH X 36" DEPTH X 8" COMBO	231525
	ROCK CHAIN	
	1 5/8" PITCH X 36" DEPTH X 4" ROCK	231530
	1 5/8" PITCH X 36" DEPTH X 6" ROCK	231535
	1 5/8" PITCH X 36" DEPTH X 8" ROCK	231540

2" TRENCHER CHAINS - EXTREME DUTY / SEVERE DUTY		
	DESCRIPTION	PART NUMBER
36" DEPTH	DIRT CHAIN	
	2" PITCH X 36" DEPTH X 6" DIRT	231541
	2" PITCH X 36" DEPTH X 8" DIRT	231542
	2" PITCH X 36" DEPTH X 10" DIRT	231543
	2" PITCH X 36" DEPTH X 12" DIRT	231544
	COMBO CHAIN	
	2" PITCH X 36" DEPTH X 6" COMBO	231545
	2" PITCH X 36" DEPTH X 8" COMBO	231546
	2" PITCH X 36" DEPTH X 10" COMBO	231547
	ROCK CHAIN	
	2" PITCH X 36" DEPTH X 6" ROCK	231548
	2" PITCH X 36" DEPTH X 8" ROCK	231549
	2" PITCH X 36" DEPTH X 10" ROCK	231552
	2" PITCH X 36" DEPTH X 12" ROCK	231553

5. Parts

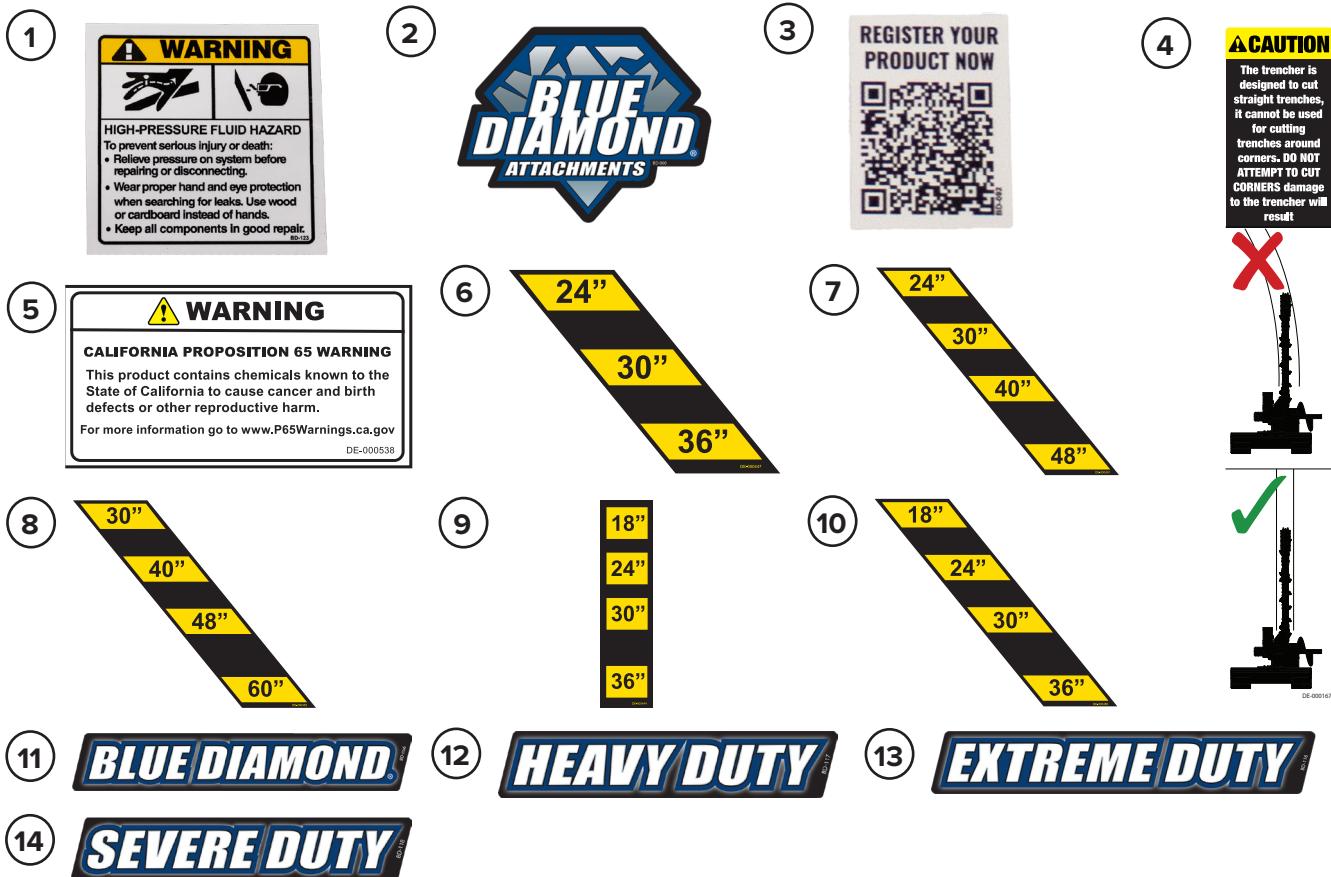
5.12 Chains - Extreme Duty/Severe Duty Con't

2" TRENCHER CHAINS - EXTREME DUTY / SEVERE DUTY CONT'D		
	DESCRIPTION	PART NUMBER
48" DEPTH	DIRT CHAIN	
	2" PITCH X 48" DEPTH X 6" DIRT	231550
	2" PITCH X 48" DEPTH X 8" DIRT	231555
	2" PITCH X 48" DEPTH X 10" DIRT	231560
	2" PITCH X 48" DEPTH X 12" DIRT	231565
	COMBO CHAIN	
	2" PITCH X 48" DEPTH X 6" COMBO	231570
	2" PITCH X 48" DEPTH X 8" COMBO	231575
	2" PITCH X 48" DEPTH X 10" COMBO	231580
	2" PITCH X 48" DEPTH X 12" COMBO	231585
	ROCK CHAIN	
	2" PITCH X 48" DEPTH X 6" ROCK	231590
	2" PITCH X 48" DEPTH X 8" ROCK	231595
	2" PITCH X 48" DEPTH X 10" ROCK	231596
	2" PITCH X 48" DEPTH X 12" ROCK	231597

2" TRENCHER CHAINS - SEVERE DUTY		
	DESCRIPTION	PART NUMBER
60" DEPTH	COMBO CHAIN	
	2" PITCH X 60" DEPTH X 6" COMBO	231643
	2" PITCH X 60" DEPTH X 8" COMBO	231645
	2" PITCH X 60" DEPTH X 10" COMBO	231642
	2" PITCH X 60" DEPTH X 12" COMBO	231646
	ROCK CHAIN	
	2" PITCH X 60" DEPTH X 6" ROCK	231644
	2" PITCH X 60" DEPTH X 8" ROCK	231648
	2" PITCH X 60" DEPTH X 10" ROCK	231649
	2" PITCH X 60" DEPTH X 12" ROCK	231647

5. Parts

5.13 Decals



ITEM	PART NUMBER	DESCRIPTION	QTY
1	BD-123	DECAL - WARNING - HIGH PRESSURE FLUID	1
2	BD-060	DECAL - BLUE DIAMOND ATTACHMENTS	1
3	BD-092	DECAL - REGISTER PRODUCT	1
4	231003	DECAL - TRENCH STRAIGHT	1
5	BD-126	DECAL- PROP 65	1
6	-	HEAVY DUTY 36" DECAL - DEPTH 24", 30", 36"	1
7	-	EXTREME DUTY / SEVERE DUTY 48" DECAL - DEPTH 24", 30", 40", 48"	
8	-	SEVERE DUTY 60" DECAL - DEPTH 30", 40", 48", 60"	
9	-	MINI SERIES 36" DECAL - DEPTH 18", 24", 30", 36"	
10	-	EXTREME DUTY 36" DECAL - DEPTH 18", 24", 30", 36"	
11	BD-056	DECAL - BLUE DIAMOND (WORD)	1
12	BD-117	DECAL - HEAVY DUTY	1
13	BD-116	DECAL - EXTREME DUTY	1
14	BD-118	DECAL - SEVERE DUTY	1

6. Specifications

6.1 Attachment Specifications

DESCRIPTION	Mini Series 36"	Heavy Duty 36"	Extreme Duty 36"	Extreme Duty 48"	Severe Duty 48"	Severe Duty 60"
Cutting Depth	Up to 36"			Up to 48"		Up to 60"
Cutting Widths	4"/ 6"/ 8"		6"/ 8"/ 10"/ 12"			
Foot Depth Presets	18"/ 24"/ 30"/ 36"	24"/ 30"/ 36"	18"/ 24"/ 30"/ 36"	24"/ 32"/ 40"/ 48"	30"/ 40"/ 48"/ 60"	
Recommended Flow - gpm	10-25	13-25	16-30		28-45	
Motor Type	2K Bell Eaton			6K Bell Eaton		
Max Pressure - psi (Do Not Exceed)	3500 PSI @ 16 gpm				3500 PSI @ 34 gpm	
Max Flow - gpm (Do Not Exceed)	25 GPM @ 2900 psi				45 GPM @ 2800 psi	
Max Continuous Power	34 hp			67 hp		
Length	74"	76"	100"		106"	
Horizontal Height	32"	26"	31"		33"	
Width	38"	48"	48"		45"	
Weight - lbs With 6" Chain	320 lbs	575 lbs	575 lbs	855 lbs	935 lbs	1016 lbs

6. Specifications

6.2 Torque Specifications - Imperial

Standard Hardware and Lock Nuts

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

6. Specifications

6.3 Torque Specifications - Metric

Metric Hardware and Lock Nuts

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

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Warranty

MANUFACTURER'S LIMITED WARRANTY

BLUE DIAMOND® ATTACHMENTS, a manufacturer of quality attachments, warrants new BLUE DIAMOND® ATTACHMENTS products and/or attachments at the time of delivery to the original purchaser, to be free from defects in material and workmanship when properly set up and operated in accordance with the recommendations set forth by BLUE DIAMOND® ATTACHMENTS, LLC.

BLUE DIAMOND® ATTACHMENTS liability for any defect with respect to accepted goods shall be limited to repairing the goods at a BLUE DIAMOND® ATTACHMENTS designated location or at an authorized dealer location, or replacing them, as BLUE DIAMOND® ATTACHMENTS shall elect. The above shall be in accordance with BLUE DIAMOND® ATTACHMENTS warranty adjustment policies. BLUE DIAMOND® ATTACHMENTS obligation shall terminate twelve (12) months for the Trencher, (24) months for the hydraulic motor, and (36) months for the gearbox after the delivery of the goods to the 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.

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