9 INCH CHIPPER
OWNER'S MANUAL

CH911DH
1.1L DIESEL KUBOTA®

P/N: 78636-00
Revision: 20230329
VIN Range: 5VJAA0413NW006993 - Current

Companion to P/N: 78640-00

CRARY®
BEAR CAT®
UNLEASH THE POWER.™

BEARCATPRODUCTS.COM// 888.625.4520

ENGLISH

WARNING: Cancer and Reproductive Harm
www.P65Warnings.ca.gov

Before You Begin

DEAR Crary Bear Cat® CUSTOMER

Thank you for purchasing an Crary Bear Cat product. The Crary Bear Cat line is designed, tested, and manufactured to give years of dependable performance. To keep your machine operating at peak efficiency, it is necessary to adjust it correctly and make regular inspections. The following pages will assist you in the operation and maintenance of your machine. Please read and understand this manual before operating your machine.

If you have any questions or comments about this manual, please call us toll-free at 888-625-4520.

If you have any questions or problems with your machine, please call or write your local authorized Crary Bear Cat dealer.

This document is based on information available at the time of its publication. Crary Bear Cat is continually making improvements and developing new equipment. In doing so, we reserve the right to make changes or add improvements to our product without obligation for equipment previously sold.

IMPORTANT WARRANTY REGISTRATION

IF YOU HAVE NOT REGISTERED YOUR CRARY BEAR CAT PRODUCT, PLEASE DO SO TODAY. TO REGISTER YOUR CRARY BEAR CAT PRODUCT ON-LINE AT HTTPS://WWW.BEARCATPRODUCTS.COM/SUPPORT/PRODUCT-REGISTRATION/ OR CALL OUR CUSTOMER SERVICE LINE AT (888) 625-4520 FOR ASSISTANCE IN REGISTRATION.

CARB Preemption Statement

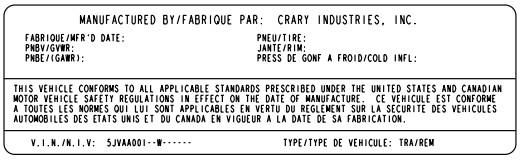
Your Crary Industries (Crary) gasoline or diesel fueled engine powered equipment (Equipment) is certified and compliant to applicable U.S. Environmental Protection Agency (EPA) standards. Your Crary Equipment matches an Equipment Type "preempted" from California Air Resources Board (CARB) jurisdiction. Farm and Construction equipment such as your Crary Equipment is beyond CARB's authority to regulate and therefore subject only to EPA standards in the US, including in California. Please reference the CARB List to Determine Preempt Off-Road Applications on http://www.arb.ca.gov/msprog/offroad/preempt.htm for more information. As the owner, you must still follow all engine and Equipment operating, maintenance and repair instructions. Other local use or national standards and registration requirements, such as the CARB Portable Equipment Registration Program may apply.

IDENTIFICATION NUMBER LOCATION

Your machine will have a vehicle identification number (VIN). VINs are located on the left side of the trailer frame near the hitch. They are 17-digit numbers of the format: 5VJAA001XXWXXXXXX. For the exact location of the VIN, see the parts manual available at bearcatproducts.com/Product-Support/Find-A-Product-Manual.

Record your identification number in the space provided.

VEHICLE IDENTIFICATION NUMBER


MANUFACTURED BY/FABRIQUE PAR: CRARY INDUSTRIES, INC.

FABRIQUE/MFR'D DATE:
PNBV/GVWR:
PNBE/(GAWR):

PNEU/TIRE:
JANTE/RIM:
PRESS DE GONF A FROID/COLD INFL:

THIS VEHICLE CONFORMS TO ALL APPLICABLE STANDARDS PRESCRIBED UNDER THE UNITED STATES AND CANADIAN MOTOR VEHICLE SAFETY REGULATIONS IN EFFECT ON THE DATE OF MANUFACTURE. CE VEHICULE EST CONFORME A TOUTES LES NORMES QUI LUI SONT APPLICABLES EN VERTU DU REGLEMENT SUR LA SECURITE DES VEHICULES AUTOMOBILES DES ETATS UNIS ET DU CANADA EN VIGUEUR A LA DATE DE SA FABRICATION.

V.I.N./N.I.V: 5JVAA001--W-----

TYPE/TYPE DE VEHICULE: TRA/REM

HOW TO CONTACT Crary Bear Cat			
ADDRESS	**PHONE**	**E-MAIL**	**HOURS**
237 NW 12th Street P.O. Box 849 West Fargo, ND 58078	888-625-4520 701-282-5520 Fax: 701-282-9522	sales@bearcatproducts.com service@bearcatproducts.com	Monday - Friday 8 a.m. to 5 p.m. Central Time

LIMITED WARRANTY

This warranty applies to all Crary® Bear Cat® Outdoor Power Equipment manufactured by Crary Industries, Inc. and does not include gas engine or electric powered pressure washers under the Crary Bear Cat brand. See Crary Bear Cat Pressure Washer Limited Warranty for complete warranty details on those products.

Crary Industries, Inc. warrants to the original owner each new Crary Bear Cat product to be free from defects in material and workmanship, under normal use and service. The warranty shall extend, from date of purchase, three years (U.S. and Canada only [two years outside U.S. and Canada]) for Consumer use of the product, one year for Commercial applications and six months for Rental applications. Replacement parts and accessories are warranted for 90 days from date of installation. Batteries for Inverters and Generators are warranted for 90 days from the date of purchase.

“Consumer” defined as:Complete unit for personal, residential, or non-income producing use.

“Commercial” defined as:Complete unit for commercial, institutional, property management, agricultural,horticultural or income producing use.

“Rental” defined as:Complete unit for rental purposes to produce income.

The product is warranted to the original owner by either a completed warranty registration on file at Crary Industries, Inc. and/or proof of sale. Warranty coverage begins on the date of purchase. The warranty registration can be registered on-line by visiting bearcatproducts.com/Product-Support/Product-Registration.

In the event of a failure, return the product, at your cost, along with proof of purchase to the selling Crary Bear Cat dealer. Crary Industries, Inc. will, at its option, repair or replace any parts found to be defective in material or workmanship. Warranty on any repairs will not extend beyond the product warranty. Repair or attempted repair by anyone other than an authorized Crary Bear Cat dealer as well as subsequent failure or damage that may occur as a result of that work will not be paid under this warranty. Crary Industries, Inc. does not warrant replacement components not manufactured or sold by Crary Industries, Inc.

1. This warranty applies only to parts or components that are defective in material or workmanship.
2. This warranty does not cover normal wear items including, but not limited to: batteries, bearings, belts, pulleys, filters, chipper blades, shredder knives.
3. This warranty does not cover normal maintenance, service, or adjustments.
4. This warranty does not cover depreciation or damage due to misuse, negligence, accident, or improper maintenance.
5. This warranty does not cover damage due to improper setup, installation, or adjustment.
6. This warranty does not cover damage due to unauthorized modifications of the product.
7. Engines are warranted by the respective engine manufacturer and are not covered by this warranty.

Crary Industries, Inc. is not liable for any property damage, personal injury or death resulting from the unauthorized modification or alteration of an Crary Bear Cat product or from the owner’s failure to assemble, install, maintain, or operate the product in accordance with the provisions of the Owner’s manual.

Crary Industries, Inc. is not liable for indirect, incidental, or consequential damages or injuries including but not limited to loss of crops, loss of profits, rental of substitute equipment or other commercial loss. This warranty gives you specific legal rights. You may have other rights that may vary from area to area.

Crary Industries, Inc. makes no warranties, representations or promises, expressed, or implied as to the performance of its products other than those set forth in this warranty. Neither the dealer nor any other person has any authority to make any representations, warranties or promises on behalf of Crary Industries, Inc. or to modify the terms or limitations of this warranty in any way. Crary Industries, Inc., at its discretion, may periodically offer limited, written enhancements to this warranty.

CRARY INDUSTRIES, INC. RESERVES THE RIGHT TO CHANGE THE DESIGN AND/OR SPECIFICATIONS OF ITS PRODUCTS AT ANY TIME WITHOUT OBLIGATION TO PREVIOUS PURCHASERS OF ITS PRODUCTS.

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1 SAFETY
Section

1.1 SAFETY ALERT SYMBOL

The Owner/Operator's manual uses this symbol to alert you of potential hazards. Whenever you see this symbol, read and obey the safety message that follows it. Failure to obey the safety message could result in personal injury, death or property damage.

DANGER

Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.

1.2 FIRE HAZARD INFORMATION

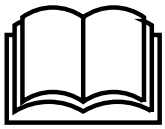
Federal, state, and local laws may prohibit the operation of an internal combustion engine using hydrocarbon fuels on any forest covered, brush covered or grass covered land or on land covered with grain, hay or other flammable agricultural crops, without an engine spark arrestor in continuous effective working order.

The engine on your power equipment, like most outdoor power equipment, is an internal combustion engine that burns gasoline or diesel fuel (hydrocarbons). If operating your power equipment in affected areas, it must be equipped with a spark arrestor in continuous effective working order. The spark arrestor must be attached to the engine exhaust system in such a manner that flames or heat from the system will not ignite flammable material.

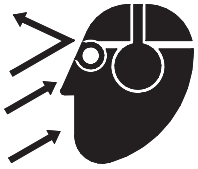
Failure of the owner/operator of the equipment to comply with federal, state, and local laws may subject him or her to fines and/or other penalties. Contact your local fire marshal or forest service for specific information about which regulations apply in your area.

Contact local fire authorities for laws or regulations regarding fire prevention requirements.

1.3 BEFORE OPERATING

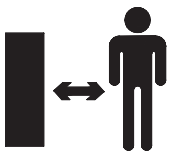


1. Read and understand this owner's manual. Be completely familiar with the controls and the proper use of this equipment.
2. Familiarize yourself with all of the safety and operating decals on this equipment and on any of its attachments or accessories.
3. Keep safety decals clean and legible. Replace missing or illegible safety decals.



4. Obtain and wear safety glasses and use hearing protection at all times when operating this machine.
5. Avoid wearing loose fitted clothing. Never operate this machine while wearing clothing with drawstrings that could wrap around or get caught in the machine.
6. Do not operate this machine if you are under the influence of alcohol, medications, or substances that can affect your vision, balance or judgement. Do not operate if tired or ill. You must be in good health to operate this machine safely.

7. Do not operate this equipment in the vicinity of bystanders. Keep the area of operation clear of all persons, particularly small children. It is recommended that bystanders keep at least 50 feet (15 meters) away from the area of operation.



8. Do not allow children to operate this equipment.
9. Use only in daylight or good artificial light.
10. Do not run this equipment in an enclosed area. Engine exhaust contains carbon monoxide gas, a deadly poison that is odorless, colorless and tasteless. Do not operate this equipment in or near buildings, windows or air conditioners.
11. Always use an approved fuel container. Do not remove gas cap or add fuel when engine is running. Add fuel to a cool engine only.
12. Do not fill fuel tank indoors. Keep open flames, sparks, smoking materials and other sources of combustion away from fuel.
13. Do not operate machine without shields in place. Failure to do so may cause serious injury or death.
14. Keep all guards, deflectors, and shields in good working condition.
15. Before inspecting or servicing any part of this machine, shut off the machine and make sure all moving parts have come to a complete stop. Disconnect the battery and remove the ignition key where applicable.
16. Check that all screws, nuts, bolts, and other fasteners are secured, tightened and in proper working condition before starting the machine.
17. Do not transport or move machine while it is operating or running.

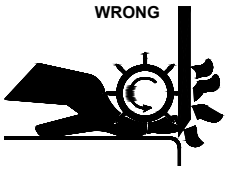
1.4 OPERATION SAFETY

1. Always stand clear of discharge area when operating this machine. Keep face and body away from feed and discharge openings.
2. Keep hands and feet out of feed and discharge openings while machine is operating to avoid serious personal injury. Stop and allow machine to come to a complete stop before clearing obstructions.
3. Set up your work site so you are not endangering traffic and the public. Take great care to provide adequate warnings.

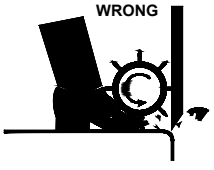
4. Do not climb on machine when operating. Keep proper balance and footing at all times.
5. Check cutting chamber to verify it is empty before starting the machine.
6. The rotor will continue to rotate after being disengaged. Shut off the machine and make sure all moving parts have come to a complete stop before inspecting or servicing any part of the machine. Disconnect the battery and remove the ignition key if applicable.
7. Do not insert branches with a diameter larger than the max chipper capacity into machine or machine damage may occur.
8. When feeding material into machine, do not allow metal, rocks, bottles, cans or any other foreign material to be fed into the machine.
9. Ensure debris does not blow into traffic, parked cars, or pedestrians.
10. Keep the machine clear of debris and other accumulations.
11. Do not allow processed material to build up in the discharge area. This may prevent proper discharge and can result in kickback of material through the feed opening.
12. If the machine becomes clogged, the cutting mechanism strikes any foreign object, or the machine starts vibrating or making an unusual noise, shut off machine immediately and make sure all moving parts have come to a complete stop. Disconnect the battery and remove the ignition key if applicable. After the machine stops: A) Inspect for damage, B) Replace or repair any damaged parts, and C) Check for and tighten any loose parts.
13. On electric start models, disconnect cables from battery before doing any inspection or service. Remove key.
14. Check blade bolts for proper torque after every 8 hours of operation. Check blades and rotate or resharpen daily or as required to keep blades sharp. Failure to do so may cause poor performance, damage or personal injury and will void the machine warranty.

1.5 FEED ROLLER SAFETY

1. The feed roller can cause serious injury or death. Keep hands, feet and clothing away from the feed roller and chipper rotor blades.
2. Never climb onto the feed chute when the unit is operating or running.



3. Do not overreach. Keep proper balance and footing at all times.
4. Never allow anyone to sit on the feed chute.



5. When feeding material into the feed roller wear eye, face and hearing protection.

6. Stand to side of feed chute when feeding material and release material quickly.
7. When inspecting or servicing the feed roller, secure the feed roller in the raised position using the lock pin, if applicable.

1.6 BATTERY SAFETY

Improper use and care of the battery on electric start models can result in serious personal injury or property damage. Always observe the following safety precautions.

- **Poison/Danger – Causes Severe Burns.** The battery contains sulfuric acid. Avoid contact with skin, eyes or clothing. Keep out of reach of children.
- **ANTIDOTE – External Contact:** Flush immediately with water.
- **ANTIDOTE – Internal:** Drink a large amount of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call a physician immediately.
- **ANTIDOTE – Eye Contact:** Flush with water for 15 minutes. Get prompt medical attention.

1. The battery produces explosive gases. Keep sparks, flame or cigarettes away. Ventilate area when charging battery. Always wear safety goggles when working near battery.
2. The battery contains toxic materials. Do not damage battery case. If case is broken or damaged, avoid contact with battery contents.
3. Neutralize acid spills with a baking soda and water solution. Properly dispose of a damaged or worn-out battery. Check with local authorities for proper disposal methods.
4. Do not short circuit battery. Severe fumes and fire can result.
5. Before working with electrical wires or components, disconnect battery ground (negative) cable first. Disconnect positive cable second. Reverse this order when reconnecting battery cables.

1.7 MAINTENANCE/STORAGE SAFETY

1. Before inspecting, servicing, storing, or changing an accessory, shut off the machine and make sure all moving parts have come to a complete stop. Disconnect the battery and remove the ignition key where applicable.
2. Replace any missing or unreadable safety decals. Refer to the safety decal section for part numbers.
3. Allow machine to cool before storing in an enclosure.
4. Store the machine out of reach of children and where fuel vapors will not reach an open flame or spark.
5. Never store this machine with fuel in the fuel tank inside a building where fumes may be ignited by an open flame or spark. Ignition sources can be hot water and space heaters, furnaces, clothes dryers, stoves, electric motors, etc.
6. Drain the fuel and dispose of it in a safe manner for storage periods of three months or more.

1.8 TOWING SAFETY

1. Position and lock the discharge tube to face the opposite direction of the towing vehicle prior to towing.
2. Connect hitch safety chains. Tighten trailer hitch bolts. Do not attempt to tow the trailer if the vehicle is not equipped with a 2" (50 mm) ball.
3. Do not exceed the maximum towing speed indicated on tire sidewall. Inflate tires to manufacturer's specifications as stated on the tire sidewall.
4. Optimum towing performance can be achieved by maintaining a horizontal trailer hitch.
5. Check wheel lug bolts periodically to ensure they are tight and secure.
6. Make sure the jack stand and the rear stabilizer (where applicable) on the trailer are in the UP position during towing. Place the jack stand on a level surface and secure it in the DOWN position before using.
7. Never allow passengers to ride on the machine.
8. If applicable, shut off fuel supply when towing.
9. Towing laws may vary in different countries/regions/states. It is recommended that you contact your local motor vehicle department for any special regulations that pertain to towing and know the laws of any country/region/state you travel through.

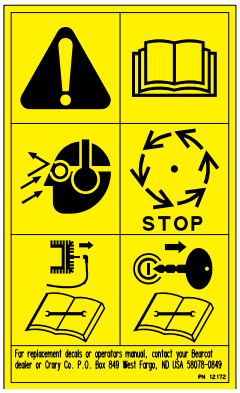
1.9 SAFETY DECALS

See Section 1.10 for decal locations. Familiarize yourself with all of the safety and operating decals on the machine and the associated hazards. See the engine owner's manual or contact the engine manufacturer for engine safety instructions and decals.

1 PN 12169

Keep hands and feet out of inlet and discharge openings while machine is operating to avoid serious personal injury. Stop and allow machine to come to a complete stop before clearing obstructions.

2 PN 12172

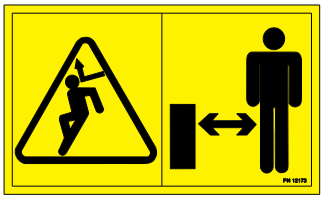


Read and understand this owner/operators manual. Be completely familiar with the controls and the proper use of this equipment

Obtain and wear safety glasses and use hearing protection at all times when operating this machine.

Before inspecting or servicing any part of this machine, shut off power source, remove the key, disconnect spark plug wire from spark plug and make sure all moving parts have come to a complete stop.

3 PN 12173

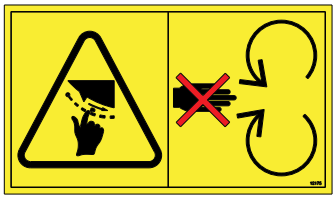


Do not operate this equipment in the vicinity of bystanders. Do not allow children to operate this equipment. Always stand clear of discharge area when operating this machine. Keep face and body away from discharge areas.

4 PN 12174

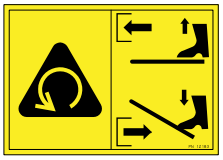
Do not operate machine without shields in place. Failure to do so may cause serious injury or death.

5 PN 12175



Keep hands and feet out of inlet and discharge openings while machine is operating to avoid serious personal injury. Stop and allow machine to come to a complete stop before clearing obstructions.

6 PN 12183

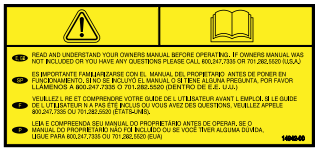


Press clutch pedal down with foot to disengage belt while starting engine. Slowly release foot to engage chipper belt after chipper is running.

7 PN 12250

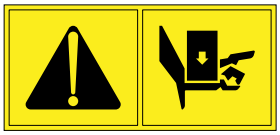
Check blade bolts for proper torque after every 8 hours of operation. Check blades and rotate or resharpen daily or as required to keep blades sharp. Refer to owners manual for instructions. Failure to do so may cause poor performance, damage or personal injury and will void the machine warranty.

8 PN 14942-00



Read and understand your owners manual before operating. If owners manual was not included or you have any questions, please call 800.247.7335 or 701.282.5520 (U.S.A.).

9 PN 18983-00

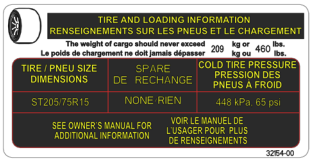


Feed roller support must be secured in the up position prior to servicing chipper feed area. Feed roller can fall and cause severe bodily harm. Consult owner's manual for proper method of securing feed roller support. Lower feed roller before operating chipper.

10 PN 32109-00

Do not operate this equipment in the vicinity of bystanders. Do not allow children to operate this equipment. Always stand clear of discharge area when operating this machine. Keep face and body away from discharge areas. Rotate the discharge tube over the hitch before towing and lock securely in place.

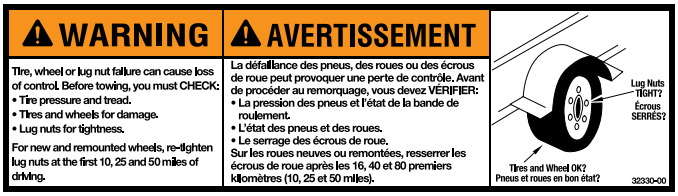
11 PN 32154-00



12 PN 32327-00 ENG. & FR. (32339-00 ESP. & PORT.)

13 PN 32328-00 ENG. & FR. (32340-00 ESP. & PORT.)

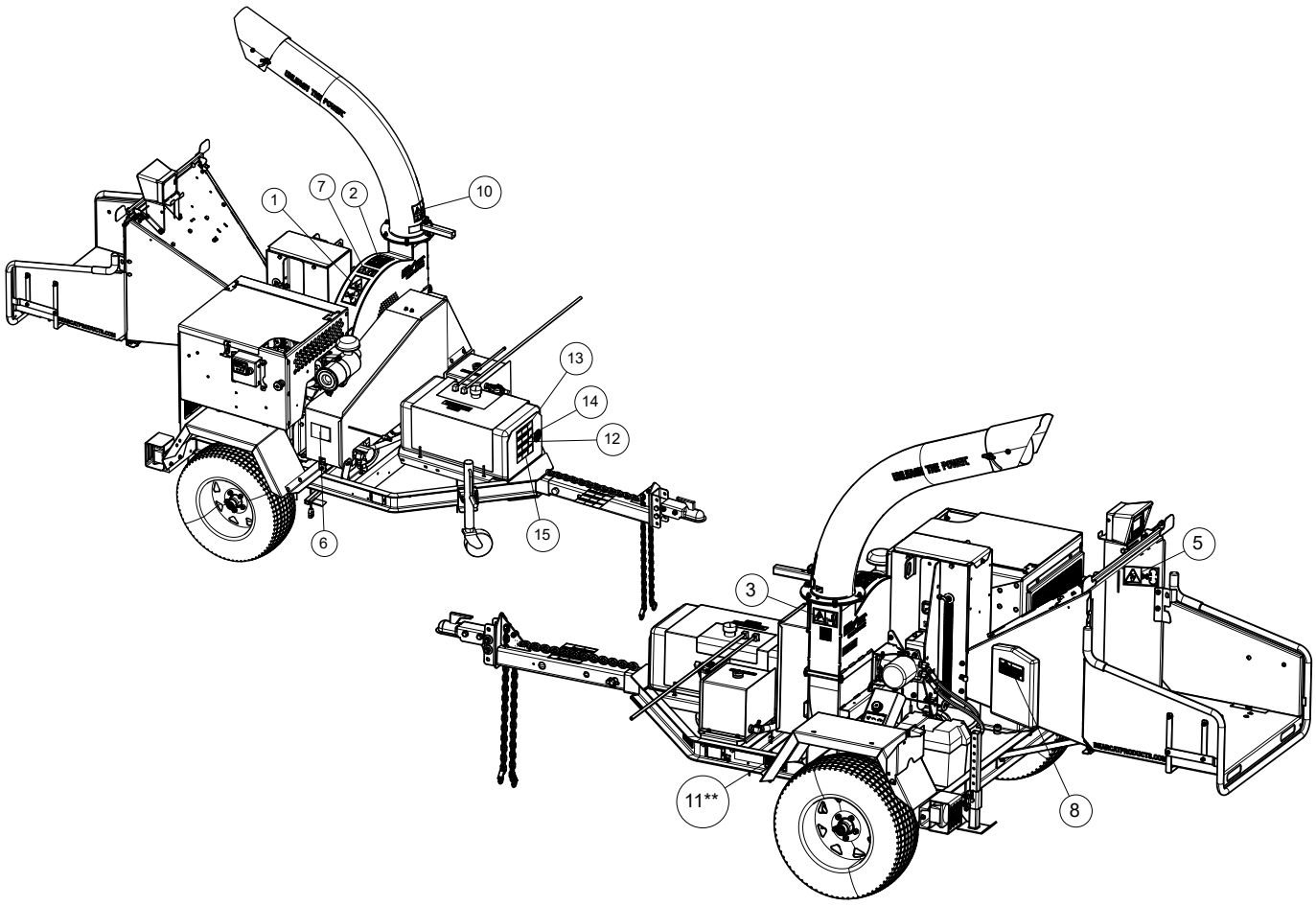
14 PN 32330-00 ENG. & FR. (32342-00 ESP. & PORT.)



15 PN 32332-00 ENG. & FR. (32341-00 ESP. & PORT.)

1.10 SAFETY DECAL LOCATIONS

The numbers below correspond to the decals in Section 1.9. Make certain that all safety and operating decals on this machine are kept clean and in good condition. Decals that need replacement must be applied to their original locations.



*Decal located under shield

**Decal located on trailer

2 ASSEMBLY
Section

WARNING

If any bolts or nuts are dropped in the machine, be sure to remove them before starting the machine.

2.1 ATTACH TRAILER WHEELS

1. Remove the chipper from its shipping crate. Place the unit on a level surface before attempting to assemble.
2. Raise the trailer several inches from the ground with a hoist or jack. Support the chipper securely.
3. Lift one wheel to a hub and align the wheel lug holes with the hub lug bolts. Thread the lug nuts onto the bolts and tighten them to 75 ft-lbs. Follow a star pattern when tightening the lug bolts. Repeat this step for the remaining wheel.

2.2 ATTACH HITCH ASSEMBLY

1. Insert the adjustable hitch assembly into the hitch opening in the chipper trailer frame as shown in Figure 2.1.
2. Adjust the hitch pole to desired length and secure to frame by inserting the 1" × 6” hitch pole pin through the appropriate hole in hitch pole and hole in frame.
3. Secure the hitch pole pin with lynch pin.
4. Attach safety chain from front of trailer frame to bottom hole of gusset at the front of the hitch pole with one 3/8" × 1-1/2” hex bolt, washers and nut.

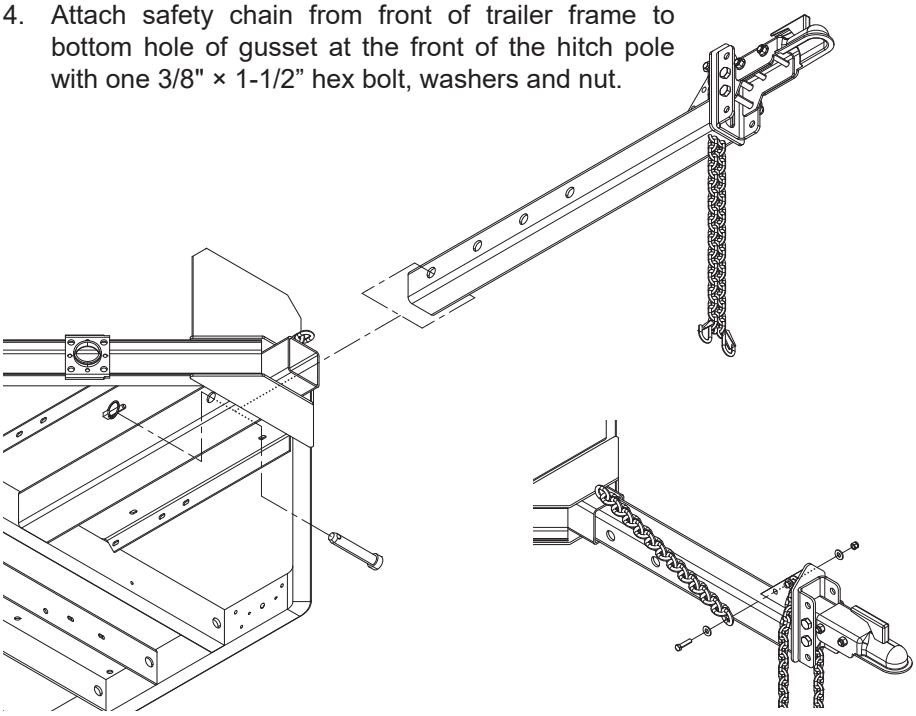


Figure 2.1, Trailer Hitch Pole Assembly Installation

2.3 INSTALL REAR STABILIZER

The rear stabilizer is installed by sliding the stabilizer into the trailer support guide on the rear of the chipper frame. The stabilizer is secured and adjusted with the provided snap pin.

Figure 2.2, Rear Stabilizer

2.4 ATTACH CHUTE AND SUPPORT

WARNING

Do not operate this unit without the chipper chute correctly installed. Rotating cutting blades can cause serious personal injury.

NOTE

In tropical regions, areas of high humidity or rainfall amounts, dielectric grease may be added to wire harness connectors to provide corrosion resistance.

1. Use a support or hoist to hold the chipper chute in place on the hydraulic feed.
2. Attach the chute support (1) to the rear end of the trailer using one 3/8" × 1-1/4” bolt (2) and nylock nut (3). Torque to 35 ft-lbs. Refer to Figure 2.3 for proper positioning of the weldment. Attach the other end of the chute support (1) to the chute (4) using existing hardware.
3. Attach the chipper chute (4) to the hydraulic feed using eight 3/8" × 1-1/4” carriage bolts (5) and nylock nuts (6). Use three bolts on each side and two on the bottom. Install clamp (7) for wire harness as shown in Figure 2.3. If feed roller is obstructing the top bolt holes, it may be necessary to use the hydraulic jack to raise the feed roller in order to insert the top bolts. Before inserting the top side bolts to mount the chute, it is important to raise the feed roller high enough to engage the locking mechanism. See Section 5.10 for instructions on how to use the hydraulic jack to lift and secure the feed roller.
4. Connect the wire harness coming from the feed chute (4) to the connector that is located underneath the feed roller housing (8).

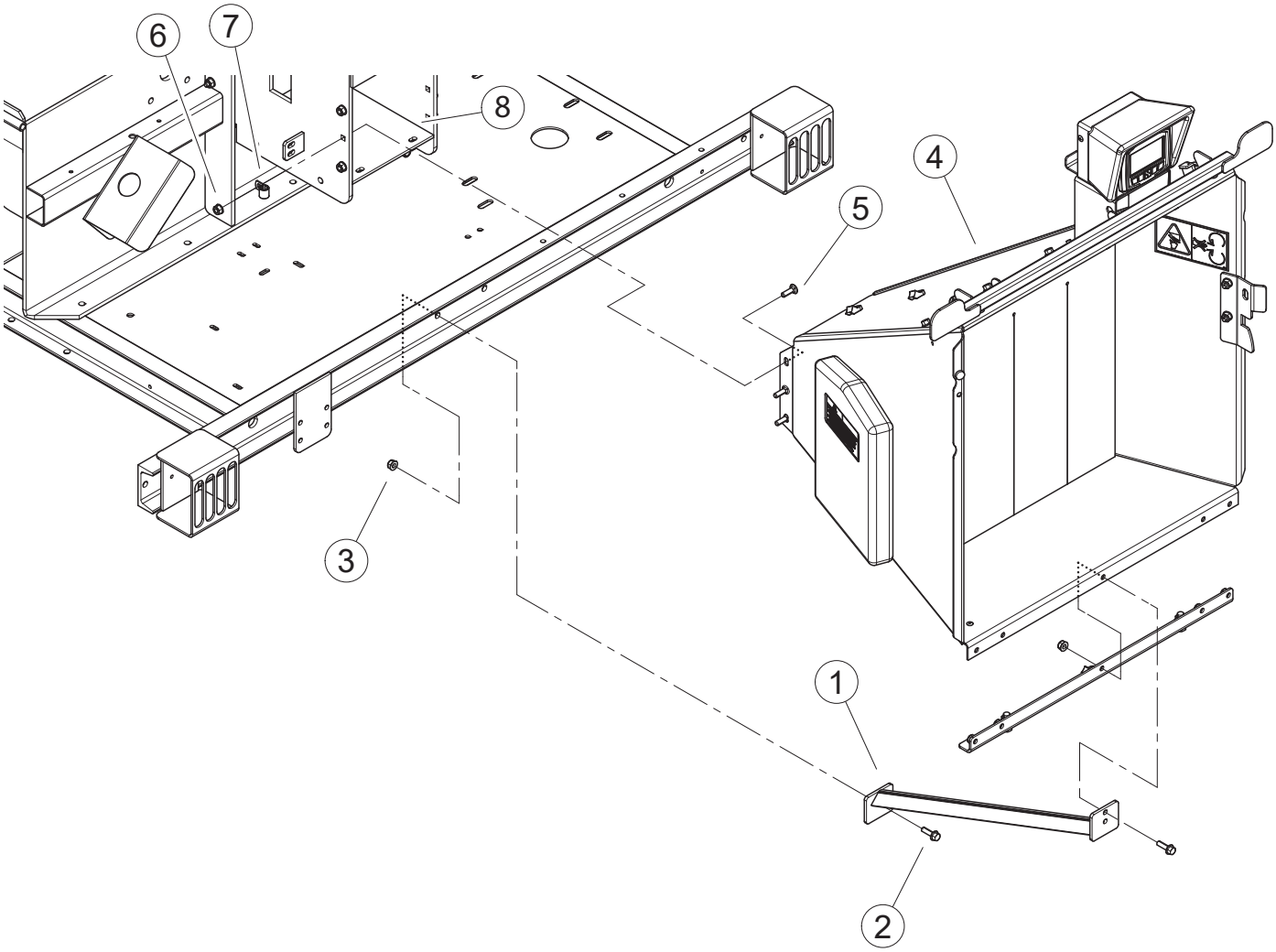


Figure 2.3, Attaching the Chute Support

2.5 ATTACH DIGITAL DISPLAY CONTROLLER MOUNT ASSEMBLY

1. Remove the bolts (1) and nuts (2) attaching the digital display controller mount assembly (3) to the inside of the chute.
2. Attach mount assembly to the outside of the chute as shown.
3. Route harness using the zip ties and two holders (4) shown in Figure 2.4. Leave excess harness at the controller to allow rotation of the enclosure from side to side.

NOTE

The controller mount assembly can be attached to the chute in either set of mounting holes.

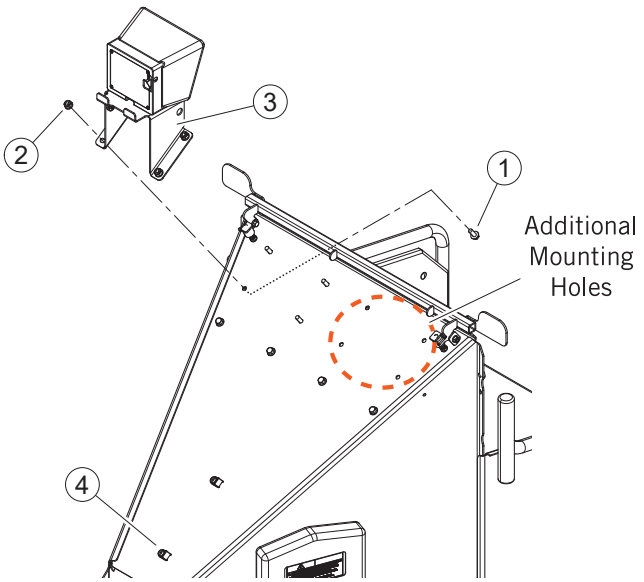


Figure 2.4, Digital Display Controller Enclosure

2.6 ATTACH EXTENSION TRAY

1. Tilt the extension tray (1) up, so the bottom of the tray is facing outward. Slide the extension tray between the extension hinge and chipper chute lips (2).
2. Tilt the extension tray down until the tray rests on the extension hinge, and the extension tray lips contact the back of the chipper chute lips.
3. Insert four 3/8" × 1" carriage bolts (3) and one 3/8" × 1-1/2" carriage bolt (4) (included in owner's kit) through the extension tray and hinge. Secure the bolts with nylock nuts (5) from the bottom (Figure 2.5).
4. Install knee bar sensor mount (7) on the exterior of the extension tray using two 5/16" × 3/4" bolts (6) and one nylock nut (5) as shown in Figure 2.6.

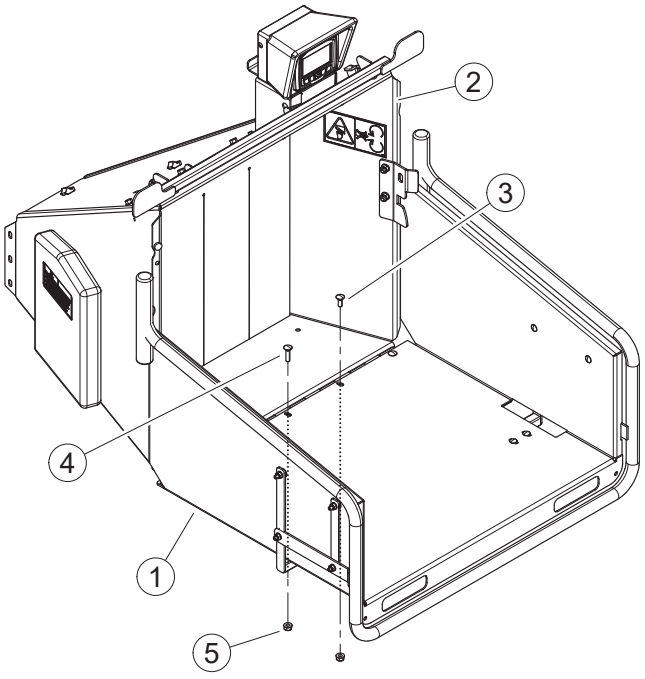


Figure 2.5, Attaching the Extension Tray

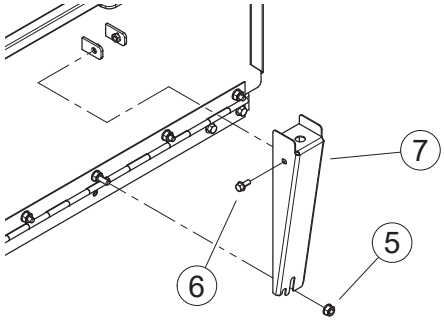


Figure 2.6, Knee Bar Sensor Mount

2.7 ATTACH DISCHARGE TUBE

1. Attach one clamping ring (1) and one spacer ring (2) to discharge tube base (3) using three 3/8" × 1-1/4" bolts (4) and nylock nuts (5). Tighten leaving 1/16" gap to assist in mounting to flange. See Figure 2.7.
2. Slide the tube onto the mounting flange on the chipper frame. The discharge clamp (1) should slide underneath the lip of the flange. Tighten the bolts to secure it.

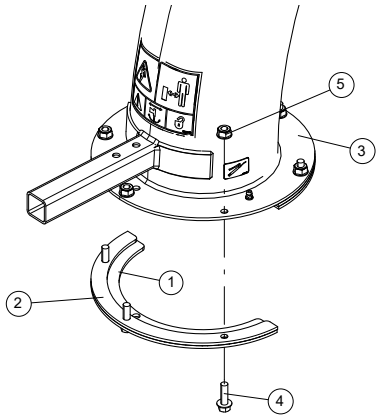


Figure 2.7, Attach Clamp Ring and Spacer

3. Install the second half of the spacer (2) and clamp ring (1) on the discharge tube with 3/8" × 1-1/4" bolts (4) and nylock nuts (5).
4. Attach lanyard with discharge pin (6) as shown in Figure 2.8. Loop on lanyard installed below nut located under discharge handle.

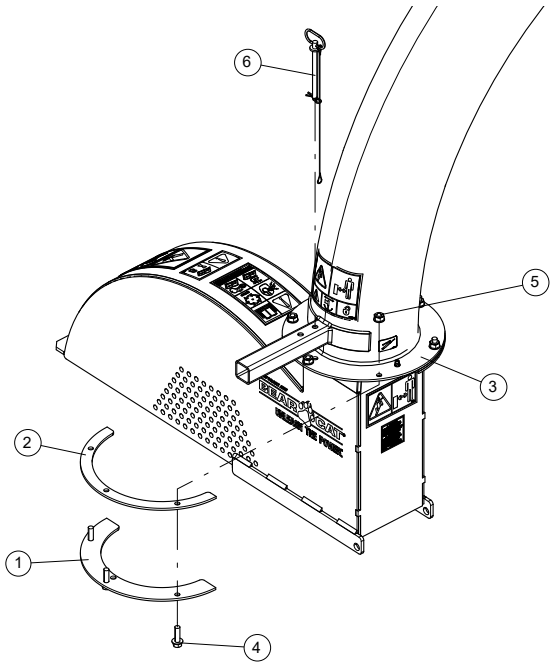


Figure 2.8, Attach Discharge Tube

NOTE

Keep nuts as tight as possible while allowing the discharge tube to freely turn.

5. Lubricate the tube by applying grease to the grease zerk at the base of the tube. Rotate the tube and apply grease until the tube rotates freely.
6. Rotate the tube 360 degrees and lock it in place with the lock pin to make sure it is mounted correctly.
7. Attach the discharge deflector (7) to the discharge tube. Connect the deflector with two 3/8" × 1-1/2" carriage bolts (8) through the lower hole in the discharge tube. Run these bolts through the inside of the tube, 1/2" washer (12), deflector, 3/8" washer (13), and then knob (9).
8. Finish bolting the deflector to the tube with two 3/8" × 1" carriage bolts (10) through the end hole in the discharge tube and secure with washers and nylock nuts (11).

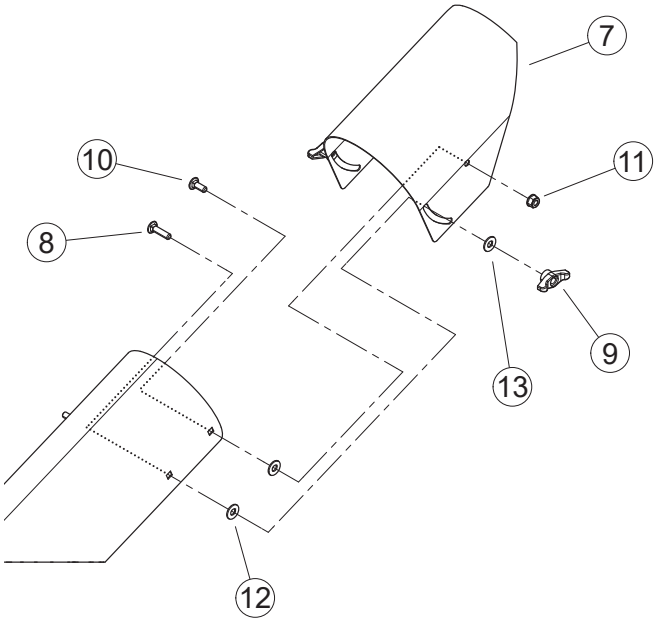


Figure 2.9, Attach Discharge Deflector

2.8 ADD OIL TO ENGINE

Check the oil level and, if needed, fill the engine crankcase with the type and amount of oil specified in the engine owner's manual.

2.9 CHECK/ADD HYDRAULIC FLUID

Hydraulic fluid drives the feed roller. The machine was shipped with fluid, as it was tested at the factory. However, check the fluid levels before initial operation and add if necessary.

The hydraulic pump requires premium hydraulic fluids containing high quality rust, oxidation, and foam inhibitors. These include premium turbine oils, API CD engine oils per SAE J183, M2C33F or G automatic transmission fluids meeting Allison C-3 or Caterpillar TO-2, and certain specialty agricultural tractor fluids.

IMPORTANT

For additional information, please see the chart under Temperature Operating Window (Section 7).

2.10 ADD COOLANT

Check the level of coolant before you start the diesel engine. While operating, make sure the fluid is between the full and the low marks. Add if necessary. Refer to the engine owner's manual for further coolant information.

2.11 INSTALL BATTERY

You will need to purchase a battery. Choose a battery that meets or exceeds the engine manufacturer's specifications. Consult your engine owner's manual or authorized dealer for specification details.

WARNING

To avoid sparks and a possible explosion or fire due to a short circuit, do not touch the positive (+) battery terminal and any surrounding metal with tools, jewelry or other metal objects. When installing battery cables, connect the positive (+) cable first and the negative (-) cable last.

To install the battery:

1. Open the battery box (11-1/8" × 7-3/4" × 10-1/8") and insert battery into the battery box.
2. Attach the positive (red) battery cable from the engine to the positive (+) battery terminal.
3. Attach the negative (black) battery cable from the engine to the negative (-) battery terminal.
4. Secure the cover on the battery box with the strap.

2.12 FILL THE FUEL TANK

WARNING

Gasoline and diesel fuels are highly flammable and their vapors are explosive. To prevent personal injury or property damage:
Store fuel only in approved containers, in well ventilated, unoccupied buildings, away from sparks or flames. A container with a capacity of 2 gallons or less with a pouring spout is recommended. Do not fill the fuel tank while the engine is hot or running, since spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Do not start the engine near spilled fuel. Never use fuel as a cleaning agent.
DO NOT MIX OIL WITH FUEL.

Use only those types of fuels that are recommended in your engine owner's manual.

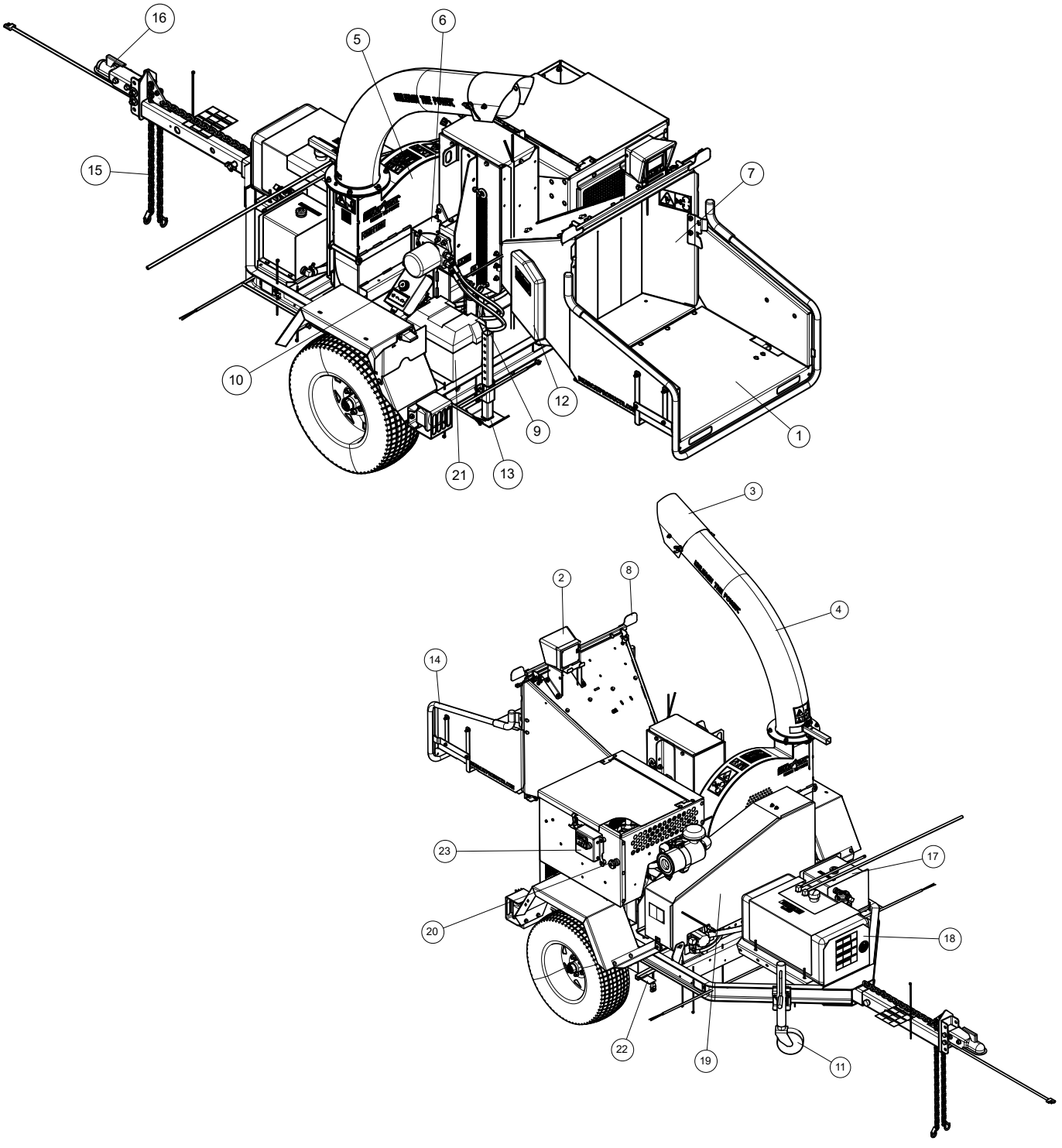
To add fuel:

1. Stop engine and wait for all parts to stop moving. Remove key from key switch. Allow the engine and muffler to cool for at least three minutes.
2. Clean area around fuel fill cap and remove cap.
3. Using a clean funnel, fill fuel tank to 1/2" below bottom of filler neck to provide space for any fuel expansion. Install fuel fill cap securely and wipe up any spilled gasoline.

3 FEATURES & CONTROLS
Section

Understanding how your machine works will help you achieve the best results when using your chipper. The following descriptions define the features and controls of your machine.

REFER TO ENGINE OWNER'S MANUAL FOR FURTHER ENGINE OPERATING INSTRUCTIONS.



1. CHUTE EXTENSION TRAY

The feed chute has an extension tray that folds down. Raise the extension tray to an upright position and secure with latch before towing the machine.

2. DIGITAL DISPLAY CONTROLLER

Used to control the chipper. See Sections 4 and 6 for more information.

3. DISCHARGE CAP

Directs the discharge of material vertically. Adjust the discharge cap by turning the knobs located on the side. Turn knob counterclockwise to loosen discharge cap. Adjust to desired position. Turn knob clockwise to secure discharge cap.

4. DISCHARGE TUBE

Directs the discharge of chipped material horizontally. The discharge tube can be rotated 360° horizontally by removing the pin and rotating the discharge tube until the discharge faces the desired position. Replace the pin in one of the holes on the base of the discharge.

5. ROTOR ACCESS COVER

Tilts up to expose rotor.

6. ROTOR LOCK

Use the rotor lock to hold the rotor in place when doing any maintenance work. See Section 5.2.

7. FEED CHUTE

Materials to be chipped are fed into the feed chute, through the feed roller, to the chipper blades.

8. TOP SAFETY BAR

In the event of an emergency, push the top safety bar and feed roller will reverse.

9. FEED ROLLER LIFT JACK

Used to lift the feed roller. The feed roller can be raised to inspect and service the machine and to clear a plugged rotor. Secure the feed roller in the raised position using the provided snap pin.

10. FEED ROLLER SPEED CONTROL

Controls the speed of the feed roller. Allows the operator to have better control over the material being fed into the chipper. Turning the knob clockwise will decrease the speed of the feed roller. Turning the knob counterclockwise will increase the speed of the feed roller.

11. HITCH JACK

Always have in UP position and clear from ground when towing. When in use, place in DOWN position on a level surface. Turn handle to raise or lower wheel.

12. MANUAL CONTAINER

Conveniently holds your manuals.

13. REAR STABILIZER

Prevents the chipper from tipping when disconnected from tow vehicle. Always have in UP position and clear from ground when transporting the chipper. When disconnected from tow vehicle, place in DOWN position on a level surface.

14. KNEE BAR

In the event of an emergency, push the bar in and forward feed will stop. Hold the knee bar reset button on controller to resume operation.

15. SAFETY CHAINS

Safety chains are used, during towing, to prevent the chipper from completely separating from the tow vehicle in the event the chipper detaches from the tow vehicle. Cross the safety chains under the hitch and connect to tow vehicle.

16. COUPLER

2" coupler. Always use safety chains when towing.

17. HYDRAULIC FLUID TANK

Check level of hydraulic fluid before each use.

18. FUEL TANK

Fuel level indicator is located on top.

19. DRIVE BELT SHIELD

Never remove shields when in use.

20. ENGINE THROTTLE

Turn counterclockwise to increase throttle. Turn clockwise to decrease throttle.

21. BATTERY BOX

Use group 24 600 CCA min.

22. BELT ENGAGEMENT PEDAL

During engine start-up, the engagement foot pedal must be depressed. With the engine at 1/4 throttle, carefully engage the rotor by slowly releasing the engagement foot pedal, allowing the rotor to speed up gradually. Engaging the rotor too quickly with the engine at full or half throttle will bog down the engine and will shorten the life of the belt. See Sections 4.2 and 4.4.

23. CONTROL PANEL

Contains engine controller with hour meter and on/off key.

3.1 ENGINE CONTROLLER

A - STOP BUTTON
Pressing the button will shut down the engine or stop auto-start.

B - AUTO BUTTON
Typical function is not used for this application. Pressing the button will shut down the engine or stop auto-start.

C - START BUTTON
Pressing the button will begin the auto-start process.

D - MENU NAVIGATION BUTTON
Pressing the button will toggle between Engine RPM's, Battery Voltage, and Engine Hours shown in the display.

E - MODE ICON
Icons indicating the engine state or the engine controller operating mode are shown in the display.

F - FAULT LED
The indicator flashes when an Electrical Trip or Shutdown Fault occurs.

ENGLISH

Mode Icons	
	Appears when the engine is at rest and the unit is in stop mode with no alarms active.
	Appears when the engine is at rest and the unit is in auto mode with no alarms active.
	Appears when the engine is at rest and the unit is waiting for a manual start with no alarms active.
	Appears when a timer is active, for example cranking time, with no alarms active.
	Appears when the engine is running, and all timers have expired with no alarms active. The animation speed is reduced when running in idle mode.
	Appears when the unit is in the front panel editor.

Warning Alarm Icons:

Warnings are non-critical alarm conditions and serve to draw the operator's attention to an undesirable condition. Warning alarms are self-resetting when the fault condition is removed.

Warning Alarm Icons		
	Fail to Stop	**Note: Fail to Stop could indicate a faulty oil pressure sensor. If the engine is at rest, check oil sensor wiring and configuration.** The controller has detected a condition that indicates the engine is running when it has been instructed to stop.
	Charge Failure	The auxiliary charge alternator voltage is low as measured from the W/L terminal.

Shutdown Alarm Icons:

Shutdown alarms are latching and immediately stop the engine. The alarm condition must be rectified before a resetting. The alarm must be accepted and cleared, and the fault removed to reset the module. If the alarm condition remains, it is not possible to reset the unit (The exception to this is the Low Oil Pressure alarm, as the oil pressure is low with the engine at rest).

Shutdown Alarm Icons		
	**Fail to Start**	The engine has failed to start after the configured number of start attempts.
	**Low Oil Pressure**	The controller detects the engine oil pressure is low after the Safety On Timer expired.
	**High Coolant Temperature**	The controller detects the engine collant temperature is high after the Safety On Timer expired.
	**Over Speed**	The engine speed has risen above the over speed alarm setting.
	**Charge Failure**	The auxiliary charge alternator voltage is low as measured from the W/L terminal.
	**Emergency Stop**	The emergency stop button has been depressed. This failsafe (normally closed to emergency stop) input and immediately stops the set when the signal is removed.
	**Magnetic Pick-Up Failure**	Pulses are no longer being detected from the magnetic pickup probe.

4 OPERATION

Section

As with any other piece of outdoor equipment, getting the feel for how your machine operates and getting to know the best techniques for particular jobs are important to overall good performance.

CHIPPING OPERATION

The chipping operation takes place in the middle of the machine, where hardened steel chipper blades are mounted on a rotating rotor assembly. Material fed into the chipper chute is sliced into small chips and propelled out through a discharge tube.

WARNING

Before operating your machine, be sure you read and understand all safety, controls and operating instructions in this owner's manual and on your machine. Failure to follow these instructions can result in serious injury or property damage.

WARNING

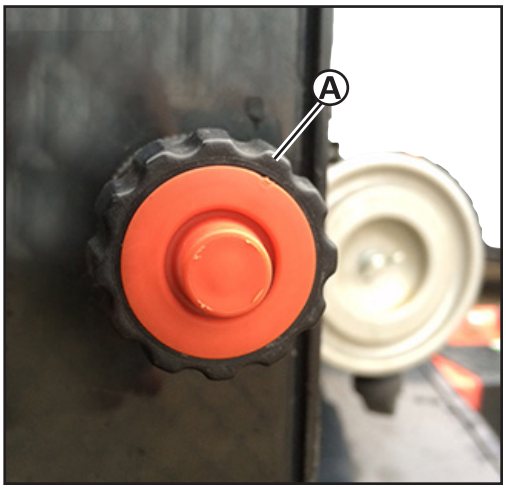
Move machine to a clear, level area outdoors before starting. Do not operate in the vicinity of bystanders. Make sure cutting chamber is empty before starting.

4.1 STARTING THE ENGINE

BEFORE ATTEMPTING TO START THIS MACHINE, MAKE SURE THE BELT IS DISENGAGED AND THE HANDLE IS IN THE "START" POSITION.

NEVER ATTEMPT TO START MACHINE WITH THE DRIVE BELT ENGAGED.

1. Please refer to engine owner's manual for priming procedure for first time starting, or if the unit has been sitting for prolonged period.
2. Check levels of fuel, oil, and hydraulic fluid and fill if necessary.
3. Place chipper engagement handle in the START position.



4. Open the throttle slightly by turning throttle knob (A) counterclockwise a 1/4 turn.
5. Turn key to the right or "On" position.
6. Press the start button on the engine controller. Engine will begin autostart immediately and alarm will sound. After 5-10 seconds of warming, the starter on the engine will engage. The length of cranking will vary depending on conditions. To interrupt the start-up process, press the stop button.

4.2 OPERATING THE CHIPPER

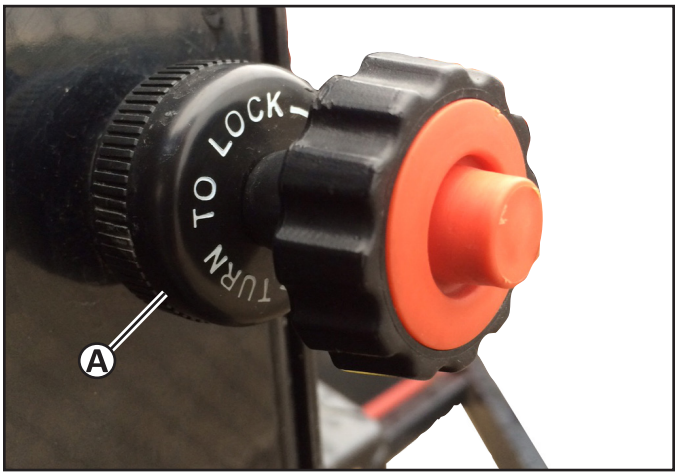
To begin operating the chipper, follow the steps below:

1. **AFTER** engine is warmed for 2-3 minutes and is ready for use, move the throttle control to approximately 25% of full throttle.
2. Engage the belt by slowly lowering the belt engagement handle.

   DO NOT engage the belt with engine running at high RPM.

   Engaging belt while engine is running at high RPM will result in significant belt squealing and damage.

   Engaging belt while engine is running at high RPM can also damage vital drive components of the chipper.
3. If the chipper engine stalls while engaging the belt, move engagement handle back to the START position, restart engine, **SLIGHTLY** increase throttle and attempt engagement again.
4. Once the belt is engaged, continue to **SLOWLY** turn the throttle knob counterclockwise to increase throttle to 100% or full throttle. **ALWAYS** run the chipper at 100% or full throttle when chipping material.



Turn Throttle Lock Clockwise to Lock Throttle at 100%

5. Turn Throttle Lock (A) clockwise to prevent losing RPM while operating the machine.

4.3 CHIPPER OPERATION GUIDELINES

WARNING

Read and follow all safety instructions in this manual. Failure to operate the machine in accordance with the safety instructions **MAY RESULT IN PERSONAL INJURY!**

CAUTION

- Obtain and wear safety glasses at all times when operating the machine.
- Do not wear loose fitting clothing.
- The operator should always wear heavy boots, gloves, pants and a long-sleeved shirt.
- Use common sense and practice safety to protect yourself from branches, sharp objects, and other harmful objects.

The machine chips a variety of materials into a more readily decomposed or handled condition. The following guidelines will help you get started.

1. **Gradually increase engine speed until full throttle is achieved.** When the controller light is steady green the engine speed is high enough to begin to chip.
2. **ALWAYS** run engine at full operating speed before starting to chip material.
3. **Engage the hydraulic feed** by pushing the forward button from the Chipping Screen (see Section 4.7 for more details on utilizing the Digital Display Controller).
4. **If the chipper rotor slows,** the feed roller will stop automatically to process backed up material. Feed material more evenly.
5. **If the chipper jams,** the feed roller will reverse momentarily to remove the branch. Once the branch is removed, rotate it before reinserting into the chute. Alternately insert and retract the limb or insert continuously at a rate that will not kill the engine.
6. **Sharpen the chipping blades periodically.** Check the sharpness of the blades every 5-15 hours. Refer to the Service and Maintenance section for sharpening instructions.
7. **Limbs fed in to the chipper chute must be 9" (22.9 cm) in diameter or less.** Trim side branches that cannot be bent enough to feed into the chipper chute. Hold small diameter branches together in a bundle and feed in simultaneously.
8. **Alternate green or fresh cut material with dry material to lubricate the chipping blades for longer life and better performance.** Chipping dead, dry material will create heat and dull the chipping blades quicker.
9. **ALWAYS feed brush from the side of the chipper chute,** rather than from the front. Step aside to avoid being hit by the brush moving into the chipper.
10. **ALWAYS place limb, butt end first, into the chipper chute until it contacts the chipper blades.** The actual feed rate of the limb into the chipper will depend on the type of material fed and sharpness of the cutting blades.
11. **NEVER use the belt engagement to clear a plugged rotor.** This may cause belt damage. Refer to the instructions for clearing a plugged rotor in the Service and Maintenance section.
12. **NEVER** attempt to clear a plugged rotor or discharge with the engine running. **ALWAYS** shut engine OFF before servicing any part of this machine.
13. **NEVER** attempt to chip pieces of metal, rock, bottles, cans or other foreign objects.

CAUTION

- **Never** lean over the chipper chute to push objects into the cutting device. Use a push stick or brush paddle.
- **Never** use shovels or forks to feed brush. They can cause extensive damage if they contact the blades. In addition, metal pieces can be ejected from the chipper chute and cause serious injury or death.
- **Never** feed brush into the chute with your feet.
- **Never** use hands or feet to clear materials that build up in the chute.

4.4 SLOWING AND STOPPING THE CHIPPER ROTOR AND ENGINE

NEVER disengage the belt as part of the stopping or shut down process. The belt should remain engaged during the entire shutdown process.

Leaving the belt engaged is a vital part of proper shutdown and ensures the rotor stops spinning in conjunction with the engine shutting off.

TO PROPERLY SLOW DOWN AND STOP THE ROTOR AND ENGINE

1. With the belt still engaged, unlock the throttle and **SLOWLY** turn clockwise until engine reaches slow idle speed.
2. Allow the engine to run at slow idle for 30-60 seconds.
3. Press the stop button on the engine controller.
4. Turn the key to the OFF position.
5. Allow rotor to come to a complete stop.

NOTE

The rotor will continue to turn for some time after the engine has been shut off. Make sure rotor has stopped completely before inspecting or servicing machine.

4.5 FEED ROLLER SPEED CONTROL

This machine is equipped with a flow control to vary the speed of the feed roller. This allows the operator to increase the feed speed when processing smaller material and lower the speed when handling material close to the maximum capacity of the machine. It is recommended that operators start using the machine at the lower limits of the speed control and slowly increase the speed, according to the size and hardness of the material being chipped.

While occasional stopping and starting of the feed roller is normal, frequent stopping and starting of the feed roller and/or rapid decreases in chipper rotor rpms is an indication that the feed speed is too high. Continued operation under such conditions can result in plugging of the discharge, belt damage, and inefficient operation.

Recommended Procedure: Turn the flow control knob fully clockwise to bring the feed roller to a stop. Turn the flow control knob counter clockwise two full turns and begin feeding material into the chipper. Adjust as needed.

4.6 CHIPPER FEED CONTROLLER

This machine is equipped with a Digital Display Controller (DDC). The DDC monitors the chipper rotor RPM and regulates the feed roller.

When chipper rotor RPM drops too low, the feed roller is stopped automatically to allow the chipper rotor to process material.

When the chipper rotor returns to chipping RPM, the feed roller will automatically reengage.

Try Again Feature: If the feed roller becomes obstructed, the controller will reverse the feed roller momentarily to clear the obstruction. The controller will then engage the feed roller and feed the material again.

This cycle will continue if the piece is not pulled in by the feed roller. Remove or reposition the material manually and activate the forward position.

Remember to sharpen blades when necessary so material will feed smoothly.

NOTE

The rotor sensor and safety bar sensors must be set to the correct clearance or the chipper will not operate. Set the clearance to 1/32" (the width of a credit card). The rotor sensor will flash with every rotation of the chipper rotor when the clearance is set correctly.

4.7 USING THE DIGITAL DISPLAY CONTROLLER

The feed roller FORWARD and REVERSE functions are controlled by the controller. In addition to the feed roller control functions, the controller also provides service reminders, onboard diagnostics, operating instructions, troubleshooting help and language selection.

4.7.1 MAIN MENU

After turning the key to the ON position, the Crary® Bear Cat® logo will be displayed followed by the screen shown in Figure 4.4.

The model number of the chipper is displayed in the upper right hand corner. The model number shown should match the model of the chipper. If it does not, contact Crary Bear Cat Service at 888-625-4520 for help.

A scannable QR code is located in the lower left corner. It will lead you to the Crary Bear Cat website where owner's and parts manuals can be viewed and downloaded.

Battery Voltage is displayed in the upper left hand corner.

The Main Menu is at the center of the screen. The menu is navigated by using the up and down keys on the Navigation Button, located directly below the menu.

Figure 4.4, DDC Main Menu

After selecting the menu option of your choice, use the Enter key on the far right to move to the selected screen.

The Main Menu has six selections:

- **Chipping Screen –** The chippers' feed roller system is controlled from this screen. The Chipping Screen can also be selected by the button to the right of the Navigation Button.

NOTE

The Chipping Screen is accessible from any screen by pressing the Chipping Screen button.

- **Hours/Service Reminders –** Shows the total hours on the chipper as well as hours remaining until the next service on the blades/anvil, belts, bearing lubrication, engine or hydraulic system is required.

  If the chipper needs service, a service reminder will flash just above the Enter key. The user should navigate to the Hours/Service Reminders screen for more information on the service required. The Hours/Service Reminders are described in Section 4.7.3.

- **Diagnostics –** Faults in the chipper control system, which can be detected by the controller, are shown here.

NOTE

Consult the Controller Manual (P/N 78561-00) for more information on using the Diagnostics screen to help troubleshoot the chipper control system.

- **Operation –** Contains basic information on the operation of the chipper. Navigate the three screens of this section with the Navigation Button.
- **Troubleshooting –** Basic troubleshooting information to help diagnose problems with the engine, belt drive or other problems that may occur during chipping. Navigate the screens of this section with the Navigation Button.
- **Language –** Allows the selection of the language displayed on the controller. Choices are English, Spanish, Portuguese, French, Norwegian, Russian, and Chinese.

4.7.2 CHIPPING SCREEN

To begin chipping, the user needs to enter the Chipping Screen (see Figure 4.5). This can be done in one of two ways:

1. Selecting Chipping Screen from the Main Menu and pressing Enter, or
2. Pressing the Chipping Screen button to the right of the Navigation Button.

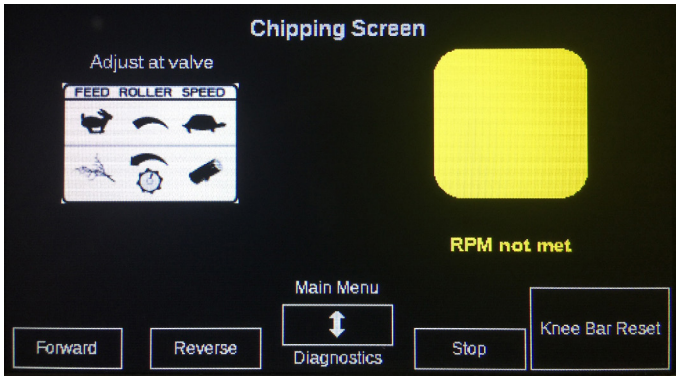


Figure 4.5, Chipping Screen

In the upper left hand corner of the screen is a reminder that the feed roller speed can be adjusted. The adjustment occurs at the control valve, the location of which varies by model. In general, the speed of the feed roller should be slower for large diameter material and faster for smaller diameter material. See chipper owner's manual for detailed instructions.

Below the Feed Roller Speed image is an empty area of the screen that will flash Check blades/anvil when the chipper blades or anvil require service.

After servicing the blades and anvil, the service indicator will need to be reset. See Section 4.7.3 for information on resetting the service indicators.

The large indicator in the upper right hand corner and the text box below it will give one of four indications:

- **Flashing Green –** The chipping rotor has not achieved enough RPM to begin chipping. It is not possible to engage the feed roller in the forward direction when the indicator is flashing green. The text box below the indicator will display "RPM Not Met."
- **Solid Green –** The chipping rotor has achieved sufficient RPM to begin chipping. The feed roller can now be engaged in the forward direction. The text box below the indicator will display "FORWARD," "REVERSE," or "STOP."
- **Solid Red –** The knee bar has been activated and the feed roller is now stopped. The text block below the indicator will display "Hold Knee Bar Reset."

  The Knee Bar functions as an emergency stop system for the feed roller to immediately stop the feed roller system. Occasionally, branches or limbs may contact the Knee Bar with enough force to activate the Knee Bar safety circuit. When this occurs the operator will need to reset the Knee Bar safety system with the "Knee Bar Reset" button to continue chipping. The "Knee Bar Reset" button will need to be held for two seconds to reset the system.

  Carefully check to be certain the infeed chute and feed roller are clear and that it is safe to continue chipping before resetting the Knee Bar Reset.
- **Solid Yellow –** There is a fault in the chipper control system. The text box below the indicator will display "Go to Diagnostic Screen."

The buttons to the left and to the right of the Navigation Button are used to control the feed roller.

The Forward button starts the feed roller turning forward and feeds material into the chipper.

The Reverse button reverses the direction of the feed roller and will push the material back toward the operator.

The Stop button stops the feed roller.

The Knee Bar Reset button resets the controller so Forward and Reverse can be re-engaged after the Knee Bar safety system has been activated. **To re-engage the feed roller safety system after the Knee Bar safety system has been activated, the operator must press and hold the Knee bar Reset button for two seconds.**

Any time the Knee Bar safety system is activated, carefully check that the infeed chute and feed roller are clear and it is safe to continue chipping before resetting the Knee Bar safety system.

NOTE

Anytime the user leaves the Chipping Screen, the feed roller will automatically stop. The user will have to re-enter the Chipping Screen and press the Forward button again to resume chipping.

4.7.3 HOURS/SERVICE REMINDERS

The Hours/Service Reminders screen is shown in Figure 4.6.

The Total hours on the chipper are shown in the upper left corner of the screen. The total hours are based on "Key On" time and cannot be reset.

The service reminders on the right hand side of the screen are all count down timers. They all show the time until the next service is required in each category. Additional information for each category can be found by moving the cursor next to a category with the Navigation Button and pressing Enter.

- **Blades/Anvil –** Hours are based on the time the feed roller is in Forward since that is the only time the blades can actually chip wood.
- **Belts –** Hours are based on "Key On" time.
- **Lubrication –** Hours are based on "Key On" time.
- **Engine –** Hours are based on "Key On" time. The service interval is dependent on the model selected. (Does not apply to PTO driven models.)
- **Hydraulic System –** Hours are based on "Key On" time. First service interval is at 50 hours; subsequent service intervals are at 200 hours.

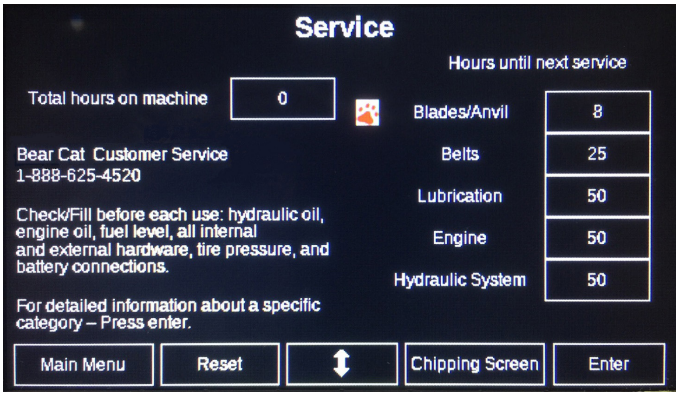


Figure 4.6, Hours/Service Reminders

After a service operation has been performed, that Service Indicator Reminder will need to be reset.

Using the Navigation Button, move the cursor to the appropriate service reminder, then press and hold the Reset button for three seconds.

4.7.4 LANGUAGE

The language used to display messages on the controller can be changed to one of four options on the Language selection screen.

1. From the Main Menu select the Language option at the bottom of the menu and press Enter.
2. Use the Navigation Button to move the cursor to the desired language.
3. Press the Enter button on the far right of the display to select that language.

4.7.5 PROXIMITY SENSORS

There are three proximity sensors. The first sensor monitors the rotor RPMs, which determines if the feed roller can be engaged to begin chipping. The second sensor is mounted on the top of the infeed chute, below the digital display controller. This sensor is for the top safety bar. When the bar is pressed the feed roller is put into reverse. The third sensor is located on the infeed tray and is for the knee bar. When the knee bar is pressed the feed roller is stopped. All three sensors are critical to machine function and operator safety.

4.7.6 TO REPLACE OR ADJUST A SENSOR

1. Locate the sensor and trace the wire back to the connector.
2. Unplug the connector.
3. Remove the top nut to remove the sensor.
4. Install the new sensor.
5. The face of the sensor should be 1/32" (width of a credit card) from the target. When the target passes in front of the sensor, the back of the sensor will illuminate.
6. Connect the new sensor to the wire harness.

4.8 TOWING

4.8.1 ATTACHING

1. Rotate the discharge tube to face the opposite direction of the towing vehicle before towing.
2. Raise rear stabilizer.
3. Raise the extension tray to an upright position before towing the machine. Secure with the spring-loaded latch located near the top of the tray.
4. Open the coupler latch.
5. Raise the trailer hitch until the coupler is above the height of the hitch ball on the towing vehicle.
6. Align the coupler over the hitch ball and lower the trailer hitch until the coupler fully engages the hitch ball.
7. Close the coupler latch securing the coupler to the hitch ball.
8. Install the hitch pin through the coupler latch.
9. Cross the safety chains under the hitch and connect to towing vehicle.
10. Connect the wire harness to the tow vehicle.
11. Raise the jack stand and rotate 90 degrees.

4.8.2 DETACHING

1. Unhook the safety chains from the towing vehicle. Latch safety chains to the hitch to prevent them from interfering with chipping.
2. Disconnect the wire harness from tow vehicle.
3. Remove the hitch pin from the coupler latch.
4. Unlatch the coupler. Disconnect the hitch coupler from the hitch ball. Rotate jack stand 90 degrees. Raise chipper to clear hitch ball.
5. Move the hitch of the chipper away from the hitch ball. Raise or lower jack stand to level the chipper for operation.
6. Lower rear stabilizer.

NOTE

Optimum towing performance can be achieved by maintaining a horizontal trailer hitch.

5 Section SERVICE & MAINTENANCE

5.1 MAINTENANCE SCHEDULE

The items listed in this service and maintenance schedule are to be checked, and if necessary, corrective action taken. This schedule is designed for units operating under normal conditions. If the unit is operating in adverse or severe conditions, it may be necessary for the items to be checked and serviced more frequently.

SEE ENGINE OWNER'S MANUAL FOR FURTHER ENGINE MAINTENANCE AND TROUBLESHOOTING INFORMATION.

SERVICE AND MAINTENANCE SCHEDULE								
		FREQUENCY						
COMPONENT	MAINTENANCE REQUIRED	REFER TO ENGINE OPERATOR'S MANUAL	BEFORE EACH USE	EVERY 8 HOURS	EVERY 25 HOURS	EVERY 50 HOURS	EVERY 200 HOURS	EVERY YEAR
Air cleaner	Check and clean (1)	●						
Air intake	Clean (1)	●						
Engine oil	Change (1)	●						
Fuel filter	Replace	●						
Hydraulic oil	Check/fill		●					
Engine oil	Check/fill		●					
Fuel tank	Check/fill		●					
All internal and external nuts and bolts	Check tightness		●					
Tire pressure	Check		●					
Battery connections	Check		●					
Chipper anvil	Check clearance and re-torque to 75 ft-lbs. (2)			●				
Chipper blades	Check sharpness and re-torque to 120 ft-lbs. (2)			●				
Entire machine	Clean			●				
Drive belt	Check				●			
Hydraulic drive belt	Check				●			
Belt tension	Check				●			
Belt/pulley alignment	Check				●			
Hydraulic oil filter	Replace						●	
Wheel bearings	Check and repack							●
(1) Perform more frequently under extremely dusty conditions.								
(2) Perform more frequently when chipping dry or dirty wood.								
As the Limited Warranty states, failure by the Owner to perform normal maintenance will void the machine's warranty. The aggressive, high-speed nature of chipping REQUIRES THE OWNER TO PERFORM THE ABOVE LISTED NORMAL MAINTENANCE. Special consideration to maintain and re-torque the CHIPPER ANVIL, CHIPPER BLADES, and ALL INTERNAL AND EXTERNAL NUTS AND BOLTS is the sole responsibility of the Owner. Failure by the Owner to do so shall be cause for denial of warranty.								

WARNING

BEFORE INSPECTING OR SERVICING ANY PART OF THIS MACHINE, SHUT OFF POWER SOURCE, DISENGAGE THE HYDRAULICS, OPEN SHIELD AND MAKE SURE ALL MOVING PARTS HAVE COME TO A COMPLETE STOP.

5.2 OPEN/CLOSE ACCESS COVER

Follow the steps below to open or close the access cover:

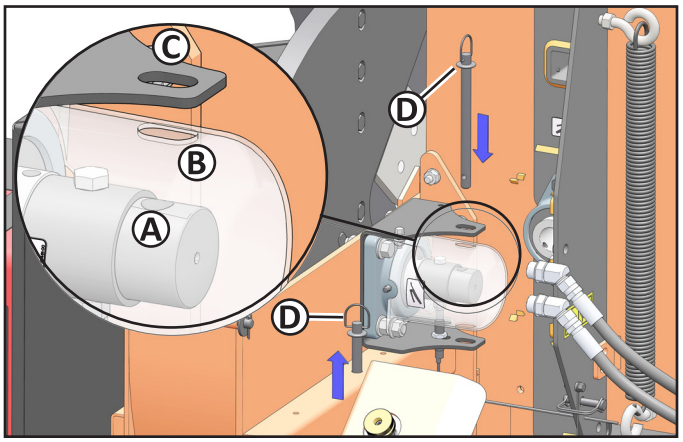
1. Rotate the discharge tube so it is parallel to the access cover.
2. To open the access cover, remove the chipper housing access weldment and nylock nuts that secure the cover to the chipper housing.
3. Close the cover and secure to the chipper housing using the chipper housing access weldment and nylock nuts.

5.3 USING THE ROTOR LOCK

WARNING

The rotor assembly has a lock mechanism. When working on the rotor assembly, use the lock mechanism at all times.

1. Open the access cover.



2. Rotate the rotor assembly until the hole (A) in the rotor shaft lines up with the holes in the shaft cap (B) and bracket (C).
3. Remove the hitch pin (D) from the hole in the chipper bottom and install the hitch pin into the bracket, cap and shaft.
4. When service and/or maintenance is completed, remove the hitch pin and store it in the hole in the chipper bottom.
5. Close the access cover.

5.4 CHIPPER BLADES MAINTENANCE

The chipper blades will eventually become dull, making chipping difficult and adding extra strain on the machine. **CHECK THE SHARPNESS OF THE BLADES EVERY 5-15 HOURS OF OPERATION AND SHARPEN AS NEEDED.**

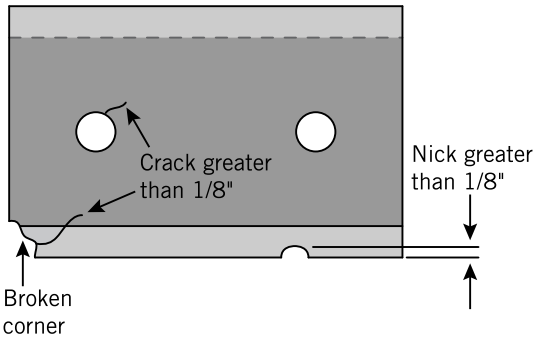
The controller will indicate a blade/anvil service reminder every eight hours as a reminder to check the chipper blades. To reset the service reminder, see Section 4.7.3.

Your blades need to be sharpened if:

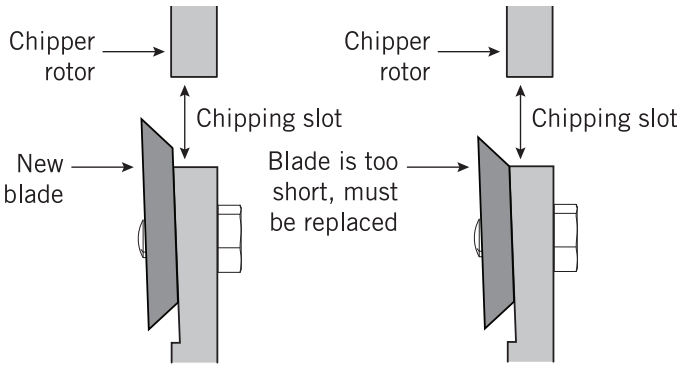
- Machine vibrates severely when material is fed into the chipper.
- Chips discharge unevenly or have stringy tails, especially when chipping green branches.

Before you sharpen the chipping blades, check for permanent damage. Replace the blade if:

- There are cracks, broken corners or nicks greater than 1/8" (see below).



- The base of the cutting edge is worn or has been re-sharpened so that it no longer extends past the chipping slot (see below).



WARNING

BEFORE INSPECTING OR SERVICING ANY PART OF THIS MACHINE, SHUT OFF POWER SOURCE, DISENGAGE THE HYDRAULICS, OPEN SHIELD AND MAKE SURE ALL MOVING PARTS HAVE COME TO A COMPLETE STOP.

5.5 REMOVING THE BLADES

WARNING

Chipping blades are sharp! Use caution when working on machine to avoid injury.

1. Open access cover to allow access to rotor (see Section 5.3). Rotate the rotor so that the bolts holding the chipper blades are accessible.
2. Install the rotor lock (Section 5.2). The rotor is now restrained for removing the blades. To access the remaining blades, remove pin and reposition rotor. Return pin to the rotor lock hole.
3. Remove the two bolts that hold the blade to the rotor. The hardware can be reused. Repeat for the remaining blade.
4. The blades have two edges and can be reversed one time before sharpening.

5.6 SHARPENING THE BLADES

The blades can be ground on a bench grinder or by a professional.

1. Never sharpen or grind the mounting surfaces of the blades. This will cause the edge to roll and the blade will be damaged, resulting in poor chipping performance.
2. Regrind the angled edge of the chopping blades to 30 degrees (Figure 5.2). Use the blade angles on the anvil spacing gauge when sharpening the blades to achieve the proper angle (see Figure 5.3).

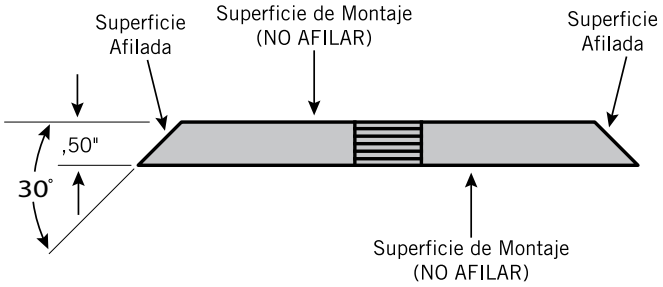


Figure 5.2, Chipper Blade Surfaces

3. Be careful when grinding so that the blade does not become overheated and change color. This will remove the heat-treated properties.
4. Use short grinding times and cool with water or some type of liquid coolant.
5. Remove an equal amount off each blade to maintain rotor balance.
6. Small imperfections such as nicks and burrs on the flat side of the blade will not affect the chipping performance of the machine.
7. For blades that have been repeatedly sharpened, ensure that the sharpened surface extends past the chipping slot opening. If it does not extend past the opening, the blades should be replaced (see Section 5.4).

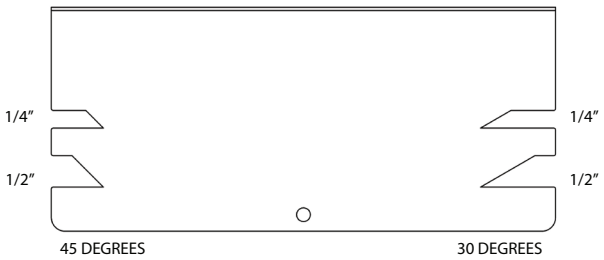


Figure 5.3, Anvil Spacing Gauge

5.7 INSTALLING THE BLADES

1. Install the rotor lock (Section 5.2). The rotor is now restrained for installing the blades.
2. Place a blade on the rotor and attach using original hardware. Torque the bolts to 120 ft-lbs. (162 Nm). Repeat for the remaining blade.
3. Lower the access cover and secure to the chipper housing (see Section 5.3).
4. Remove rotor lock.

⚠ WARNING ⚠

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5.8 SETTING CHIPPER BLADE CLEARANCE

The chipping blades should clear the chipper block located directly under the chipper chute by 1/16 to 1/8". To adjust the blade clearance, proceed as follows:

1. Open access cover (see Section 5.3) to allow access to anvil. See Figure 5.4 for anvil location.

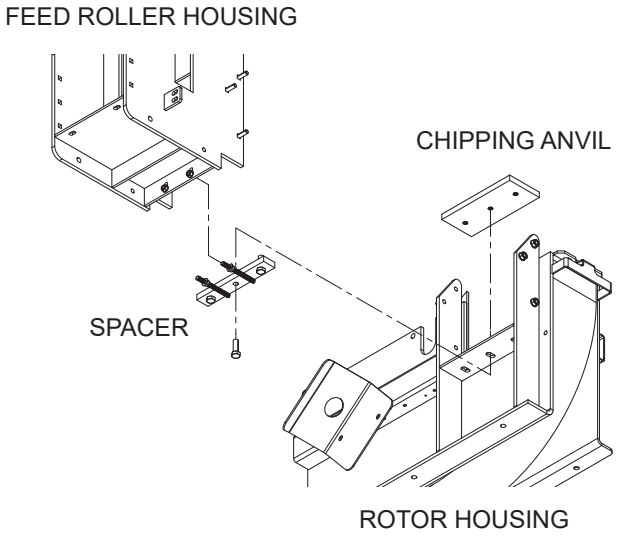

Figure 5.4, Chipping Anvil Location

2. Loosen the three 1/2" bolts that hold the chipper anvil to the frame.
3. Measure the amount of clearance between chipping blades and chipping anvil from inside of housing. Adjust both rods of the anvil spacer to achieve a uniform gap.
4. Raise the feed roller (see Figure 5.6). Install anvil spacing gauge (see Figure 5.5).
5. Check clearance on all the blades. Remove anvil spacing gauge.
6. Tighten bolts on chipping anvil to 75 ft-lbs. and resume operation.
7. If chipping anvil edge is damaged or worn unevenly, remove the three bolts holding the anvil and use one of the other three edges. Adjust for correct measurement. When all four edges have been used, replace anvil.

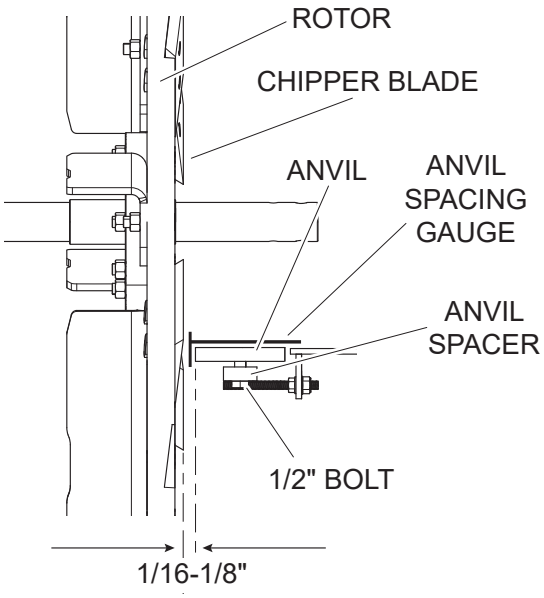

Figure 5.5, Chipper Blade/Anvil Clearance

5.9 TRAILER MAINTENANCE TIPS

1. Check wheel bolt torque monthly.
2. Check air pressure in tires monthly.
3. Check and repack wheel bearings with grease every 12 months.
4. When towing, always connect the safety chains. Make sure trailer hitch bolts are tight.
5. Check trailer lights periodically.

5.10 CLEARING A PLUGGED ROTOR

⚠ WARNING ⚠

If the machine becomes plugged, lift the engagement handle, shut off the engine, and allow the machine to come to a complete stop before clearing debris. Do not operate the machine without proper guards and shields in place.

Feeding too large or too much material at once may plug the chipper. To clear a plugged rotor, proceed as follows:

1. Turn off engine key switch. Allow all moving parts to come to a complete stop. Lift the engagement handle.

⚠ WARNING ⚠

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2. Open access cover (see Section 5.3).
3. Remove the lock pin from storage position (see Figure 5.6).

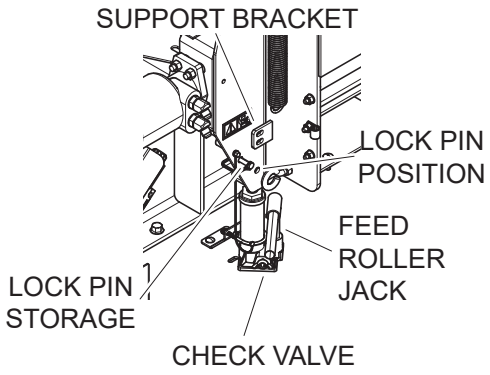


Figure 5.6, Feed Roller Jack

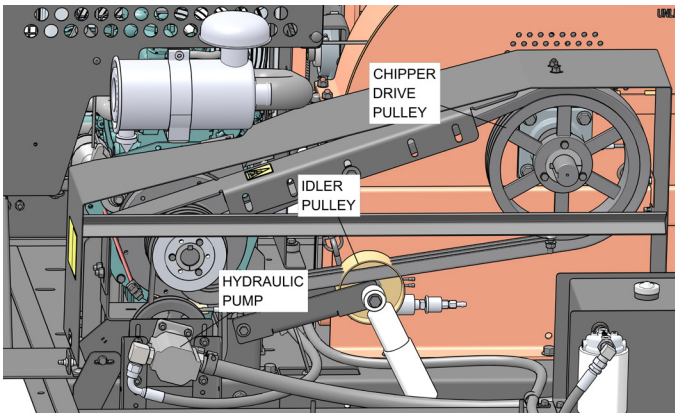
4. Turn check valve clockwise to engage the jack pump.
5. Pump the handle to raise the feed roller until the lock pin position aligns with one of the support bracket holes.
6. Secure the position by putting the lock pin through the support bracket and lock pin position.
7. Clean the debris away from the chipper rotor. Turn the rotor by hand to be sure it is free to rotate. Be careful to avoid the chipper blades when cleaning out the debris.
8. Remove the lock pin and put it back in storage position. **LEAVING THE LOCK PIN IN ANY OTHER POSITION MAY INTERFERE WITH FEED ROLLER OPERATION.**
9. Turn the check valve counterclockwise to disengage the pump and lower the jack.
10. Close access cover and secure (see Section 5.3).
11. Start the engine. Follow start up procedures in Section 4.1.

5.11 DRIVE BELTS

Check the condition of the drive belt annually or after every 25 hours of operation, whichever comes first. If the belt is cracked, worn, frayed, or stretched, replace it. Replace belt with original banded belt type only. Do not use single type belts.

To replace the belt:

1. Shut off engine.
2. Remove drive belt shield.
3. Remove the hydraulic pump belt by loosening the bolts on the hydraulic pump.
4. Take the tension off the drive belt by depressing the belt engagement pedal. Remove the drive belt from pulleys.
5. Install the new drive belt on pulleys.
6. Check pulley alignment with a straight edge and adjust engine if needed.
7. Check belt tension and adjust if needed. The belt deflection at the center of the belt should be 7/16" when a 20 lb. load is placed against the belt. See Figure 5.7.



8. Reinstall hydraulic pump belt. Readjust hydraulic pump belt tension by sliding the hydraulic pump in the mounting slots. Tighten bolts.
9. Replace belt guard.
10. Depress belt engagement pedal, start engine, engage drive belt, and test unit. Readjust pulleys and belt tension if needed.

5.12 ROTOR BEARINGS

5.12.1 REMOVING BELT SIDE BEARING

1. Open access cover (see Section 5.3). Tilt access cover over to allow rotor access.
2. Remove large belt guard.
3. Remove belt guide spacer.
4. Remove the belt guide by removing the 3/8" bolts on the engine side and the 5/16" nuts on the housing side.
5. Loosen bolts on hydraulic pump and remove hydraulic pump belt.

⚠ WARNING ⚠

BEFORE INSPECTING OR SERVICING ANY PART OF THIS MACHINE, SHUT OFF POWER SOURCE, DISENGAGE THE HYDRAULICS, OPEN SHIELD AND MAKE SURE ALL MOVING PARTS HAVE COME TO A COMPLETE STOP.

6. Take the tension off the drive belt by depressing the belt engagement pedal. Then, remove the drive belt from pulleys. Using the push bolts from the bushing, remove the bushing and pulley from the rotor shaft by removing the three bolts in the sheave and putting them in the threaded holes. Tighten the bolts equally until the sheave loosens and can be removed.
7. Remove the set screw securing the rotor spacer on the rotor side. Remove spacer from shaft.
8. Remove the four 1/2" bolts on belt side bearing and take off the sensor bracket. Remove bearing and discard.

5.12.2 REMOVING FEED ROLLER SIDE BEARING

1. Lift the feed roller to the highest position and secure.
2. Remove the two 1/2" nuts securing the plastic bearing cover.
3. Remove the 3/8" bolt holding the rotor shaft spacer. Remove the spacer.
4. Remove the two 1/2" lock nuts, and the 1/2" bolts in the opposite holes.
5. Remove bearing and discard.
6. Attach the belt side bearing and feed roller side bearing to the frame with four 1/2" bolts for each bearing. Re-attach sensor bracket to belt side bearing using a top left bearing bolt. Tighten bolts to 75 ft-lbs.
7. Slide the feed roller side spacer onto the shaft. Making sure the spacer is fully tight up against the bearing collar, insert and tighten the 3/8" bolt.
8. Tighten and torque two set screws on each bearing to 160 in-lbs.
9. Slide belt side collar on shaft against belt side bearing. Make sure the collar set screw lines up with the sensor. Slide bushing onto shaft with flange against collar and lock bushing to shaft. Attach large pulley to bushing by inserting the bolts back into the non-threaded holes. Tighten equally until snug. Torque bolts to 180 in-lbs.
10. Replace drive belts on pulleys.
11. Check pulley alignment with a straight edge and adjust engine if needed. Check belt tension. Belt deflection at the center of the belt should be 7/16" when a 20 lb. load is placed against the belt. See Section 5.11 for more information on adjusting belt tension.
12. Replace hydraulic pump belt. Readjust hydraulic pump belt tension by sliding the hydraulic pump in the mounting slots. Tighten bolts.
13. Check to make sure you knife to anvil gap is a 1/16" to your closest blade and torque the anvil bolts to 75 ft-lbs.
14. Replace belt guides and belt guard and resume operation.
15. Depress belt engagement pedal, start engine, engage drive belt, and test unit. Readjust pulleys and belt tension if needed.

⚠ WARNING ⚠

Failure to maintain proper fastening torque on bolts may result in damage to the chipper and/or personal injury!

5.13 HYDRAULIC FEED MAINTENANCE

Hydraulic fluid drives the feed roller. Check the fluid level daily and fill as needed. The fluid and filter should be changed and system cleaned if the fluid becomes contaminated with foreign matter (water, dirt, grease, etc.) or if the fluid has been subjected to temperatures greater than the maximum recommended.

The hydraulic pump requires premium hydraulic fluids containing high quality rust, oxidation, and foam inhibitors. These include premium turbine oils, API CD engine oils per SAE J183, M2C33F or G automatic transmission fluids meeting Allison C-3 or Caterpillar TO-2, and certain specialty agricultural tractor fluids.

In the unlikely event that the oil is completely drained from the hydraulic system, oil must be added and any air bubbles must be purged from the system. To do this:

1. Clean all system components (reservoir, fittings, etc.).
2. Fill the hydraulic reservoir.
3. Start the engine and run at the lowest possible RPM.
4. As you purge air from the unit, the oil level in the reservoir will drop and bubbles may appear in the fluid. Refill the reservoir as necessary.

WARNING

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5. Run the feed roller in both directions for several minutes until any remaining air purges from the unit. Refill the reservoir as necessary.
6. Shut down the engine, check for and correct any fluid leaks, and check the reservoir level. Add fluid if necessary. The hydraulic pump is now ready for operation.

WARNING

Handle pressurized hydraulic fluid carefully. Escaping pressurized hydraulic fluid may penetrate your skin causing serious injury. This fluid may also be hot enough to burn. Serious infection or reactions can develop if immediate proper medical treatment is not administered.

NOTE

Hydraulic pressure controlled by the relief valve is factory set at 2500 psi.

5.14 CHANGE HYDRAULIC FLUID FILTER

Change the hydraulic oil filter after the first 50 hours of operation and every 200 hours thereafter.

To change the hydraulic oil filter:

1. Using an oil filter wrench, turn the filter counterclockwise.
2. Once the filter becomes loose, turn it out the rest of the way with your hand.
3. Properly discard old filter.
4. Lube the rubber seal on the new filter with clean hydraulic oil.
5. Install the filter onto the threaded pipe. Turn with your hand until the filter is finger tight.
6. Using an oil filter wrench, tighten the filter another 1/2 turn.
7. Check hydraulic oil level and fill if necessary

5.15 CHANGE OIL

Check the oil level before each use. Change oil as directed in the engine owner's manual.

5.16 CHECK COOLANT LEVEL

The diesel engine is tested before shipping. In order to test the equipment the fluid levels are filled. However, before starting the machine, and every time the engine is started thereafter, be sure to check the coolant level. If the level is low, add fluid.

Refer to the engine owner's manual for coolant information and maintenance.

SERVICE & MAINTENANCE

⚠ WARNING ⚠

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5.17 LUBRICATION

⚠ WARNING ⚠

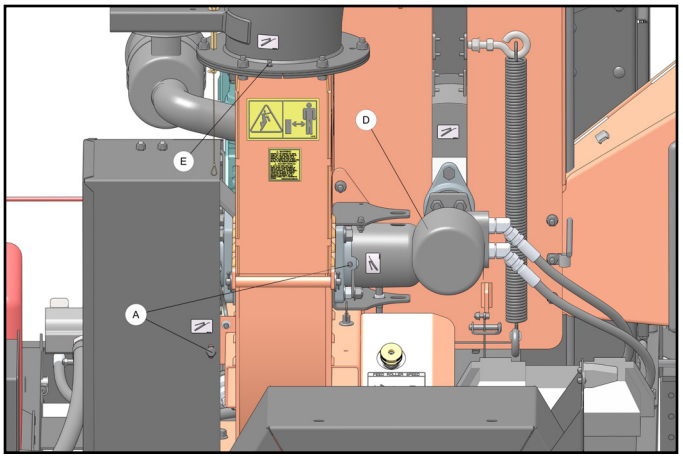
Polyurea and lithium-based greases are not compatible. Mixing the two grease types may lead to premature failure.

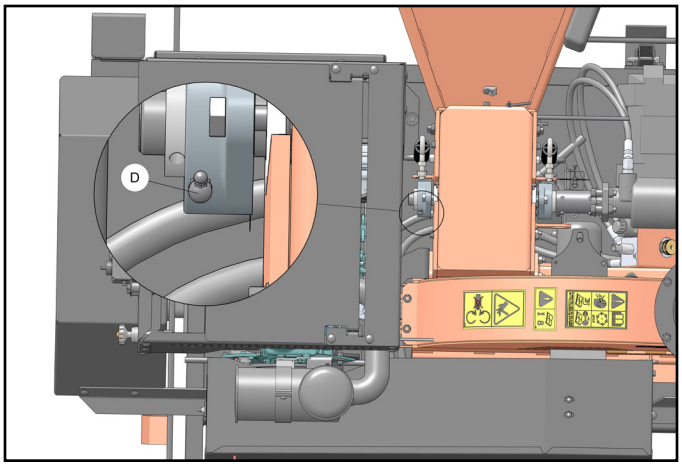
NOTE

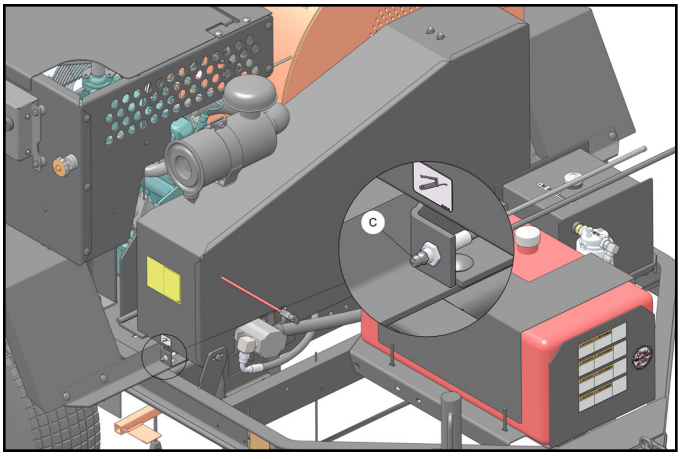
Do not over grease bearings. Overfilling can lead to excessive heat and/or unseating of the seals. Add grease slowly and under light pressure. Whenever possible, rotate bearing slowly while lubricating.

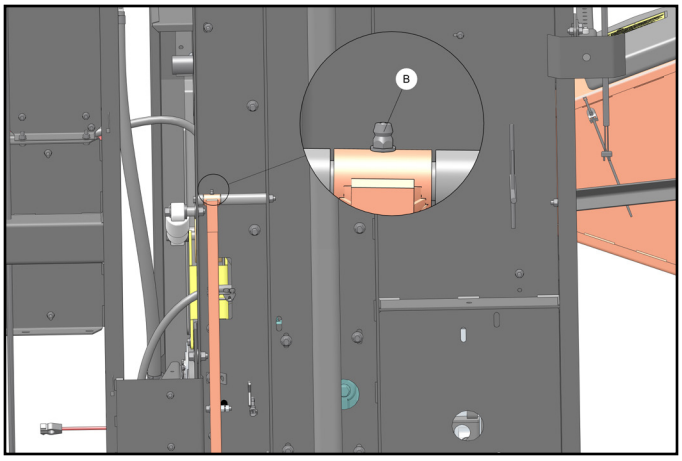
Lubricate the machine periodically with a lithium-based grease. Extreme working conditions will require more frequent greasing.

Grease Interval				
	8 Hours	50 Hours	100 Hours	As Needed
Number of Zerks		2 Rotor Assy Bearings (A) 1 Clutch Pedal (B) 1 Idler Pivot (C)	2 Feed Roller Assy Bearings (D)	1 Discharge Chute (E)









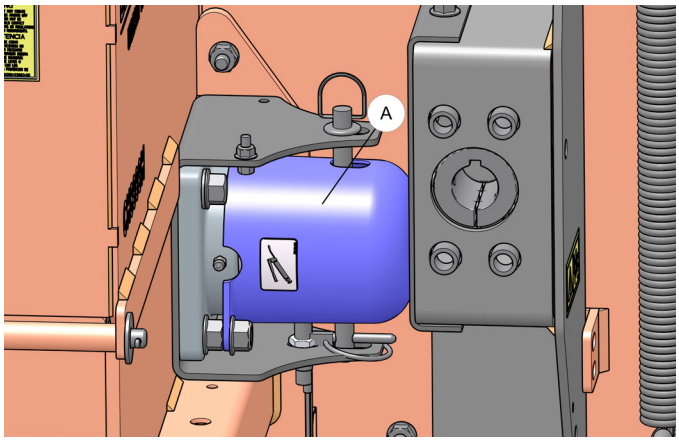
Visit https://qrco.de/CBCGreaseZerks to learn how to properly locate grease points and grease your Crary Bear Cat machine for maintenance.

ENGLISH

WARNING

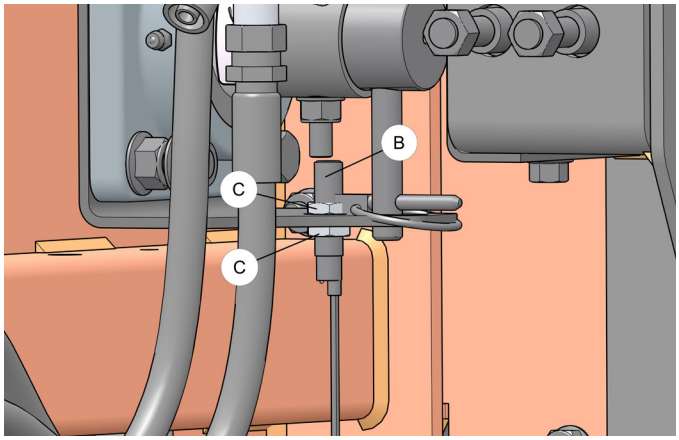
BEFORE INSPECTING OR SERVICING ANY PART OF THIS MACHINE, SHUT OFF POWER SOURCE, DISENGAGE THE HYDRAULICS, OPEN SHIELD AND MAKE SURE ALL MOVING PARTS HAVE COME TO A COMPLETE STOP.

5.18 SERVICING THE RPM SENSOR



1. Remove the rotor shaft cap (A).

5.18.1 CHECKING SENSOR GAP



1. Check the gap distance between the tip of the sensor (B) and the bolt. The gap should be 1/32" (about the thickness of a credit card).
   - If the gap is correct, clean the sensor if needed.
   - If the gap is not correct, loosen the nuts (C) and adjust the gap. Tighten the nuts and clean the sensor if needed.
2. Install the rotor shaft cap.

5.18.2 CLEANING SENSOR

1. Loosen the nuts (C) to remove the sensor.
2. Clean the tip of the sensor with a soft cloth.
3. Install the sensor and check the sensor gap.
4. Install the rotor shaft cap.

5.18.3 REPLACING SENSOR

1. Loosen the nuts (C) to remove the sensor.
2. Disconnect the sensor from the harness.
3. Connect and install the new sensor with the nuts.
4. Check the sensor gap.
5. Install the rotor shaft cap.

6 Section TROUBLESHOOTING

6.1 FLASH CODES FOR THE DIGITAL DISPLAY CONTROLLER

FREQUENCY	CAUSE	ACTION TO TAKE
GREEN		
Solid	Chipper has reached required RPM and forward feed is available	Machine ready for chipping
1/2 second on, 1/2 second off	Chipper has not reached chipping RPM upon initial startup	Slowly increase RPM
1/2 second on, 1/2 second off	Chipper RPM dropped while chipping	Feed roller will automatically pause to bring RPM back up
RED		
Solid	Knee bar was activated	Hold Knee Bar Reset
Solid	Battery voltage is low	Charge battery. Check charging system.
YELLOW		
Solid	Controller has detected an electrical system fault	Use diagnostics screen information on controller or see troubleshooting section in manual

6.2 TROUBLESHOOTING GUIDE

Before performing any of the corrections in this troubleshooting chart, refer to the appropriate information contained in this manual for the correct safety precautions and operating or maintenance procedures. Contact your dealer or Crary Bear Cat® for service problems with the machine.

PROBLEM	POSSIBLE CAUSES	REMEDY
Controller light is not on	No power to controller	Check the resettable fuse breaker and/or condition of battery
Engine will not start	Lack of fuel or oil	Fill fuel tank and check oil level
	Kill switch on access cover is damaged	Test kill switch. Replace if it is not working
	Dirty, stale, or contaminated fuel	Drain and refill fuel tank with fresh, clean unleaded regular gasoline or diesel. Replace fuel filter.
	Internal engine problems	See your engine dealer
Engine or rotor stalls or stops	Chipper rotor housing or discharge tube is plugged	Shut off engine and disengage belt engagement. Refer to manual for information on clearing a plugged rotor. Never use the belt engagement to clear a plugged rotor.
	Feeding material that is too large	Limit branch size to rated capacity
Engine overheats	Cooling system plugged	Clean cooling fan and cooling fins on the radiator or engine block
	Improper coolant level	Fill engine to correct coolant level. Refer to the engine owner's manual
Engine stalls or belt squeals when engaging belt	Engaging belt too fast	Reduce engagement speed
	Belt tension too loose	Adjust tensioner. Replace belt if needed.
Machine chips poorly	Dull chipper blades	Flip, sharpen, or replace
	Drive belts loose or worn	Inspect drive belts, adjust or replace if needed
	Feeding material that is too large	Limit branch size to rated capacity
Cannot engage belt	Improper belt installation, belt not under belt guide	Install belt properly, install belt under belt guide
	Improper belt tension	Adjust belt tension, Replace belt or belt tension spring if needed
Excessive belt wear	Not using correct belt	Contact your nearest authorized dealer to order the correct belt for your chipper
	Pulley(s) damaged or worn	Replace pulley(s)
	Pulley(s) not in alignment	Align pulley(s) to within 1/16" with straight edge
	Belt(s) tension too loose	Replace belt or belt tension spring
During chipping the sensor gives a solid green light, but the feed roller runs intermittently	Rotor RPM sensor is set too far away	Open the shield and check rotor sensor, Gap should be 1/32" (thickness of a credit card). Clean face of sensor. Replace if necessary.

PROBLEM	POSSIBLE CAUSES	REMEDY
Hard to feed chipper, requires excessive power to chip	Dull chipper blades	Flip, sharpen, or replace
	Obstructed discharge	Use branch or similar object to clear discharge tube
	Improper blade clearance	Set blade/anvil clearance to recommended distance
Excessive vibration while running	Dull chipper blades	Flip, sharpen, or replace
	Drive system vibration	Check drive belts, bearings, and pulleys for bad or worn areas. Check for dull chipper blades.
	Rotor out of balance	Inspect rotor for damaged or missing chipper blades, replace if needed
	Chipper blade to anvil clearance is incorrect	Set blade/anvil clearance to recommended distance
Feed roller operation is reversed	Wire harness connection at valve is incorrect	Switch wire harness connection from A to B and B to A. Green and white wire should connect to A on valve. Orange and white wires should connect to B on valve
	Hose connection from valve to motor is incorrect	Ensure that the hoses go from port A on valve to port A on motor and B to B.
Cannot achieve solid green for forward feed	Drive belts loose or worn	Inspect drive belts, adjust or replace if needed
	Engine/Tractor is not achieving full RPM	Confirm that engine is achieving full RPM. Confirm that PTO is 540 RPM.
Knee bar sensor does not stop feed roller	Knee bar linkage is not free to move	Check knee bar linkage for full range of motion
	Harness connection or sensor failure	Check harness connection. Adjust or replace sensor.
Feed roller alternates between forward and reverse	Hydraulic motor is malfunctioning	Hydraulic motor needs to be replaced
	Pressure switch fault	Unhook the pressure switch, test for operation. If the forward feed works or the feed roller stops “ratcheting,” replace the pressure switch.
Feed roller will not achieve Forward or Reverse	Forward or Reverse coil on hydraulic valve is malfunctioning or faulty wiring.	Plug wire from the faulty coil, as indicated on the Diagnostic Screen, into the other coil. Start chipper, engage belt, and achieve solid green indicator. Push the button (Forward or Reverse) for the faulty coil. If the feed roller works opposite of the intended direction, replace coil and reconnect wires: Green and white to A (Forward), Orange and white to B (Reverse). If the feed roller does not operate in the opposite direction, look for a fault in the wiring.
	Faulty wiring	Check harness for: grounded wire, cut wire, etc.
Trailer sways during towing	Discharge tube and/or extension tray not in correct towing position.	Before towing the machine, position and lock the discharge tube to face the opposite direction of the towing vehicle and raise the extension tray.
	Tire air pressure is not correct	Check tire sidewall for inflation limits

7 Section SPECIFICATIONS

DESCRIPTION	ENGLISH	METRIC
Overall size (L × W × H)	145" × 79" × 100"	368 cm × 201 cm × 254 cm
Overall weight	2510 lbs.	1139 kg
Max chipper capacity	9" diameter	22.9 cm diameter
Chipper blades	4 reversible (5" × 4" × 0.5")	4 reversible (12.7 cm × 10.2 cm × 1.3 cm)
Chipping anvil	9" × 4" × 0.625"	22.9 cm × 10.2 cm × 1.6 cm
Rotor speed	1600 RPM	
Rotor size	30" diameter × 1.25"	76 cm diameter × 3.18 cm
Rotor weight	275 lbs.	125 kg
Discharge tube size	8"	20.3 cm
Drive type	Belt	
Drive belt size	3B83 (86")	3B83 (218.4 cm)
Hydraulic belt size	BX30 (33")	BX30 (83.8 cm)
Tire size	ST205/75R15	
Jack	1000 lb. rating	454 kg rating
Engine	1.1 L Diesel Kubota®	
Fuel tank capacity	18 gal.	68 L
Hydraulic feed rate	0-120 fpm	37 m/min
Hydraulic oil tank capacity	3 gal.	11.4 L

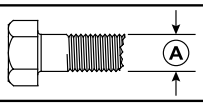
SPECIAL TORQUE REQUIREMENTS			
LOCATION	HARDWARE DESCRIPTION	TORQUE (UNIFIED INCH)	TORQUE (METRIC)
Controller mounting hardware*	8-32 screws	20 in-lbs.	2.26 Nm
Back of controller	USB seal cap**	20 oz-in	0.14 Nm

*Use of medium strength thread locker required.

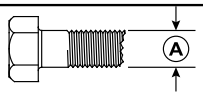
**If removing cap to program, cap and rubber washer must be reinstalled to correct torque to maintain IP67 seal.

7.1 BOLT TORQUE

The tables below are for reference purposes only and their use by anyone is entirely voluntary, unless otherwise noted. Reliance on their content for any purpose is at the sole risk of that person and any loss or damage resulting from the use of this information is the responsibility of that person.

SAE Grade and Head Markings	SAE 2	SAE 5	SAE 8	Bolt Diameter
				

BOLT DIAMETER (A)	BOLT TORQUE*					
	SAE 2		SAE 5		SAE 8	
	NM	FT-LB.	NM	FT-LB.	NM	FT-LB.
1/4"	7.5	5.5	11	8	16	12
5/16"	15	11	23	17	34	25
3/8"	27	20	41	30	61	45
7/16"	41	30	68	50	95	70
1/2"	68	50	102	75	149	110
9/16"	97	70	149	110	203	150
5/8"	122	90	203	150	312	230
3/4"	217	160	353	260	515	380
7/8"	230	170	542	400	814	600
1"	298	220	786	580	1220	900
1-1/8"	407	300	1085	800	1736	1280
1-1/4"	570	420	2631	1940	2468	1820

Metric Grade and Head Markings	4.8	8.8	10.9	12.9	Bolt Diameter
					

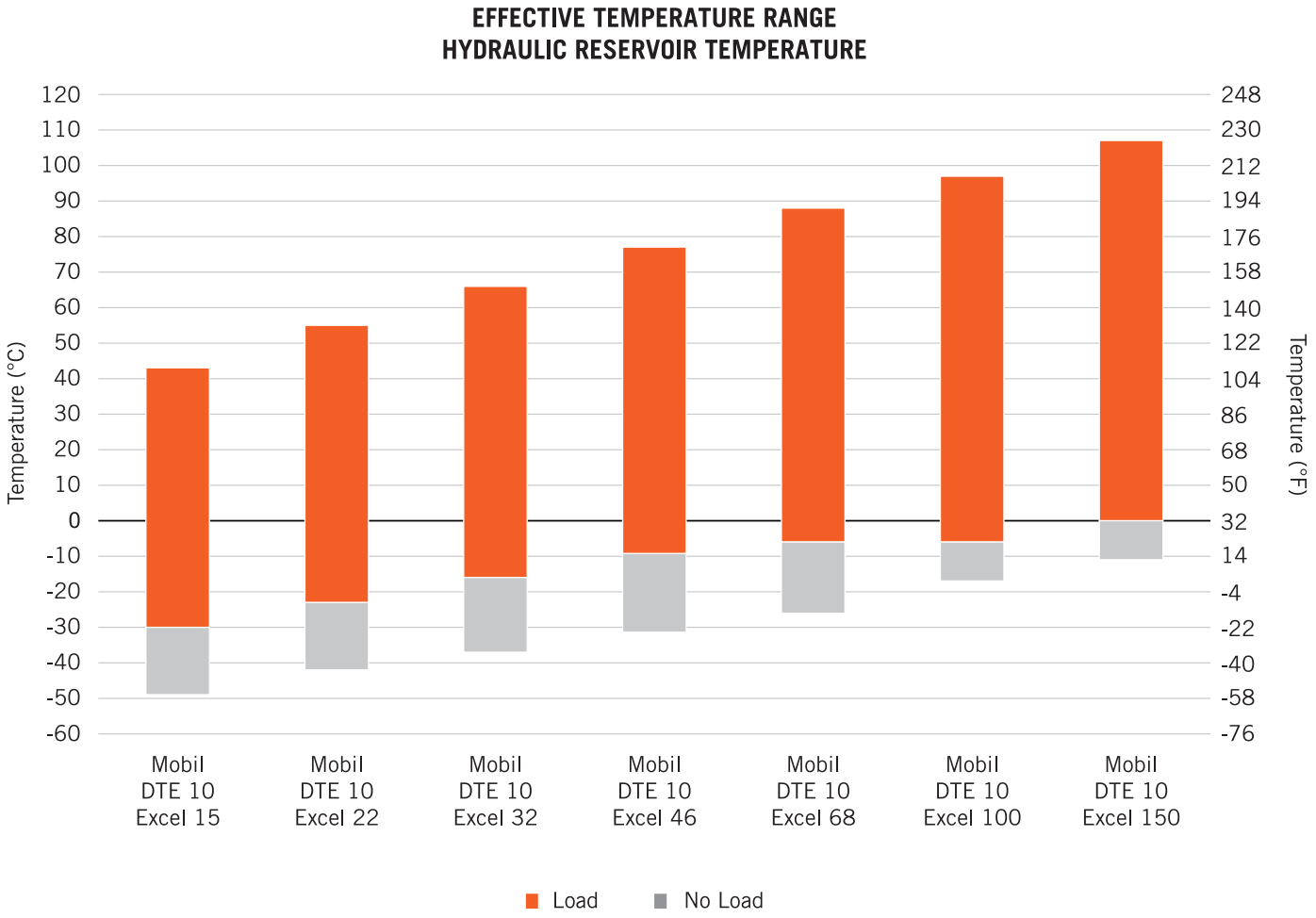
BOLT DIAMETER (A)	BOLT TORQUE*							
	4.8		8.8		10.9		12.9	
	NM	FT-LB.	NM	FT-LB.	NM	FT-LB.	NM	FT-LB.
M3	0.5	0.4	–	–	–	–	–	–
M4	3	2.2	–	–	–	–	–	–
M5	5	4	–	–	–	–	–	–
M6	6	4.5	11	8.5	17	12	19	14.5
M8	15	11	28	20	40	30	47	35
M10	29	21	55	40	80	60	95	70
M12	50	37	95	70	140	105	165	120
M14	80	60	150	110	225	165	260	190
M16	125	92	240	175	350	255	400	300
M18	175	125	330	250	475	350	560	410
M20	240	180	475	350	675	500	800	580
M22	330	250	650	475	925	675	1075	800
M24	425	310	825	600	1150	850	1350	1000
M27	625	450	1200	875	1700	1250	2000	1500

*Torque value for bolts and capscrews are identified by their head markings.

Torque figures indicated above are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or capscrews unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

7.2 TEMPERATURE OPERATING WINDOW

For the nearest Mobil lubricant supplier or technical information, including lubricant information for severe arctic operating conditions, call 800-662-4525.



ENGLISH

8 Section PARTS & OPTIONS

8.1 REPLACEMENT PARTS

FOR MACHINE SERVICE OR PARTS

For service assistance, contact your nearest authorized Crary Bear Cat dealer or the factory. For parts, contact your authorized dealer. The parts manual for your machine is available at bearcatproducts.com/Product-Support/Find-A-Product-Manual. Your dealer will need to know the serial number of your machine to provide the most efficient service. See below for information on how to identify and record the serial number for your machine.

FOR ENGINE SERVICE OR PARTS

For engine service or parts, contact your nearest authorized engine dealer. Crary Bear Cat does not handle any parts, repairs or warranties for engines.

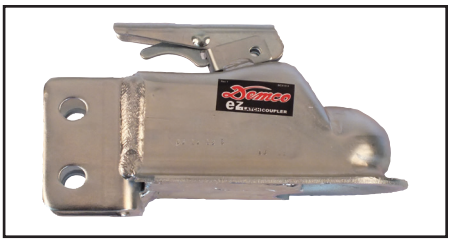
ORDERING PARTS

Only genuine Crary Bear Cat replacement parts should be used to repair the machine. Replacement parts manufactured by others could present safety hazards, even though they may fit on this machine. Replacement parts are available from your Crary Bear Cat dealer.
Provide the following when ordering parts:

- The SERIAL NUMBER of your machine.
- The PART NUMBER of the part.
- The PART DESCRIPTION.
- The QUANTITY needed.

8.2 OPTIONS

PART NUMBER	DESCRIPTION
14519-00	COUPLER, 2-5/16 20,000 LB.
14900-00	HITCH, PINTLE RING 20,000 LB.
33900-00	KEY, DSE
71072-00	KIT, CHIPPER ELECTRIC BRAKES
71725-00	KIT, LOW PROFILE DISCHARGE CHUTE
71731-00	KIT, FINE-CHIP ROTOR
78361-00	KIT, CHIPPER BLADE, 1/2 INCH
76721-00	KIT, BATTERY DISCONNECT
78922-00	KIT, SPARE TIRE HOLDER 9" DIESEL



2-5/16" Coupler Kit, 14519-00

Pintle Hitch, 14900-00

Low Profile Discharge Chute, 71725-00

Chipper Blade Kit, 78361-00

Spare Tire Kit, 78922-00

Crary® Bear Cat® • 237 12th St. NW, West Fargo, ND 58078
For customer service or for your nearest Crary Bear Cat dealer call 888.625.4520 | For International call 701.282.5520
BEARCATPRODUCTS.COM