

# FORAGE CHOPPER OWNER'S MANUAL

## FC400

420cc Briggs & Stratton® XR Professional Series

P/N: 78983-00

Revision: 20231108

Serial Range: M01414 - Current

Companion to P/N: 78984-00



BEARCATPRODUCTS.COM// 888.625.4520

ENGLISH



WARNING: Cancer and Reproductive Harm  
[www.P65Warnings.ca.gov](http://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/](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 serial number. Serial numbers are located on the machine body. They are 6-digit numbers. For the exact location of the serial number, see the parts manual available at [bearcatproducts.com/Product-Support/Find-A-Product-Manual](http://bearcatproducts.com/Product-Support/Find-A-Product-Manual).

Record your identification number in the space provided and on the warranty registration card.

MANUFACTURED BY CRARY INDUSTRIES  
WEST FARGO, NORTH DAKOTA 58078 U.S.A.  
SERIAL NUMBER   
MANUFACTURED IN U.S.A.

## HOW TO CONTACT Crary Bear Cat

| ADDRESS                                                    | PHONE                                             | E-MAIL                                                                                                                                                   | HOURS                                               |
|------------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| 237 NW 12th Street<br>P.O. Box 849<br>West Fargo, ND 58078 | 888-625-4520<br>701-282-5520<br>Fax: 701-282-9522 | <a href="mailto:sales@bearcatproducts.com">sales@bearcatproducts.com</a><br><a href="mailto:service@bearcatproducts.com">service@bearcatproducts.com</a> | Monday - Friday<br>8 a.m. to 5 p.m.<br>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](http://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.**

# TABLE OF CONTENTS

|                                          |           |
|------------------------------------------|-----------|
| <b>SAFETY.....</b>                       | <b>1</b>  |
| 1.1 SAFETY ALERT SYMBOL .....            | 1         |
| 1.2 FIRE HAZARD INFORMATION .....        | 1         |
| 1.2 FIRE HAZARD INFORMATION .....        | 1         |
| 1.4 OPERATION SAFETY.....                | 2         |
| 1.5 MAINTENANCE/STORAGE SAFETY.....      | 2         |
| 1.6 SAFETY DECALS .....                  | 3         |
| 1.6 SAFETY DECALS .....                  | 4         |
| <b>ASSEMBLY .....</b>                    | <b>5</b>  |
| 2.1 LEG AND WHEEL ASSEMBLY .....         | 5         |
| 2.2 DISCHARGE ASSEMBLY .....             | 6         |
| 2.3 ADD OIL TO ENGINE.....               | 6         |
| <b>FEATURES &amp; CONTROLS.....</b>      | <b>7</b>  |
| <b>OPERATION .....</b>                   | <b>8</b>  |
| 4.1 STARTING THE ENGINE .....            | 8         |
| 4.2 STOPPING THE MACHINE .....           | 8         |
| 4.3 OPERATION GUIDELINES .....           | 9         |
| <b>SERVICE &amp; MAINTENANCE .....</b>   | <b>10</b> |
| 5.1 SERVICE & MAINTENANCE SCHEDULE ..... | 10        |
| 5.2 ROTOR LOCK .....                     | 11        |
| 5.3 MAINTENANCE.....                     | 11        |
| 5.4 REMOVING THE BLADES .....            | 12        |
| 5.5 SHARPENING THE BLADES .....          | 12        |
| 5.6 INSTALLING THE BLADES .....          | 12        |
| 5.7 SETTING BLADE CLEARANCE .....        | 13        |
| 5.8 CLEARING A PLUGGED ROTOR.....        | 13        |
| 5.9 CHANGE OIL .....                     | 13        |
| 5.10 BELT GUIDE ADJUSTMENTS .....        | 14        |
| 5.11 DRIVE BELTS .....                   | 15        |
| 5.12 REMOVING THE ROTOR.....             | 15        |
| 5.13 LUBRICATION .....                   | 16        |
| <b>TROUBLESHOOTING .....</b>             | <b>17</b> |
| <b>SPECIFICATIONS .....</b>              | <b>19</b> |
| 7.1 BOLT TORQUE.....                     | 20        |
| <b>PARTS &amp; OPTIONS .....</b>         | <b>21</b> |
| 8.1 REPLACEMENT PARTS.....               | 21        |
| 8.2 OPTIONS .....                        | 21        |

# 1 Section SAFETY

## 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.

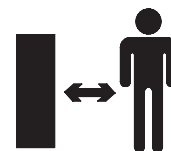
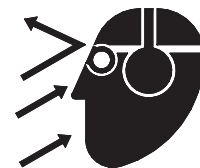
The standard muffler installed on the engine is spark arrestor capable. Spark arrestors require regular maintenance. See the Service & Maintenance section of this manual for more information.

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

## 1.2 FIRE HAZARD INFORMATION



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.
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.
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. 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. Check blade bolts for proper torque after every 8 hours of operation. Check blades and rotate or sharpen 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.

#### **1.4 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.
7. Do not insert branches with a diameter larger than the maximum 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.



#### **1.5 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.
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.

## 1.6 SAFETY DECALS

See Section 1.7 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.



### 6 NP 34839-00

Read and understand your owner's manual before operating. If owner's manual was not included or you have any questions, please call 800-247-7335 or 701-282-5520 (U.S.A.).



### 2 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.



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

### 3 PN 12174

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



### 4 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.



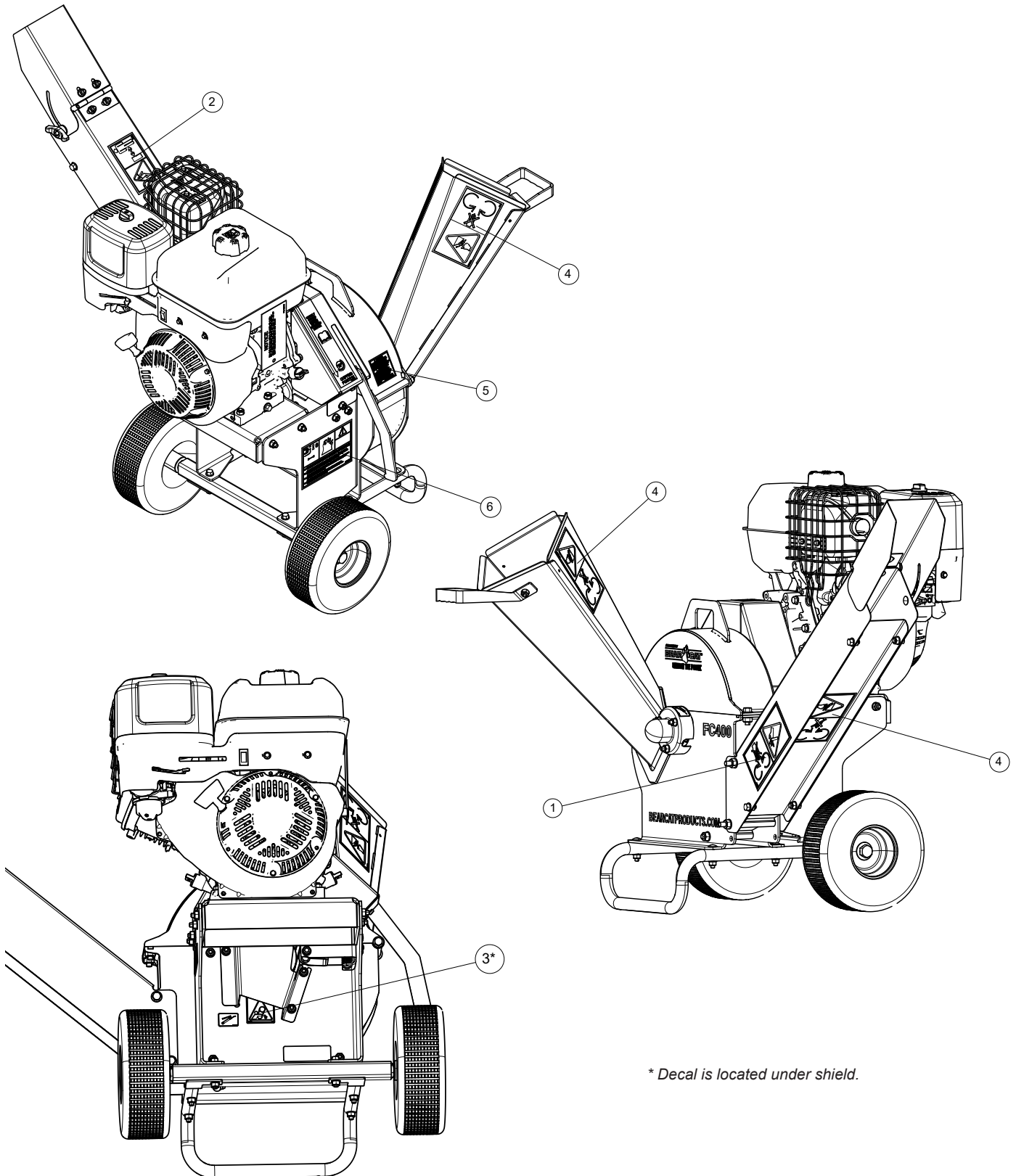
### 5 PN 33883-00

Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrestor may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.



## 1.6 SAFETY DECALS

The numbers below correspond to the decals in Section 1.6. 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.



# 2

## Section ASSEMBLY

### 2.1 LEG AND WHEEL ASSEMBLY

1. Attach wheels (1) to the axle weldment (2) using 5/8 bolts (3). Tighten bolts enough to allow free spinning. Do not over tighten as bearing damage could occur.
2. Attach axle weldment (2) and leg weldment (4) to base of assembly. Use 5/16 bolts (5) and nylock nuts (6) to attach axle weldment (2). Use 5/16 carriage bolts (7) and nuts (6) to attach leg weldment (4).

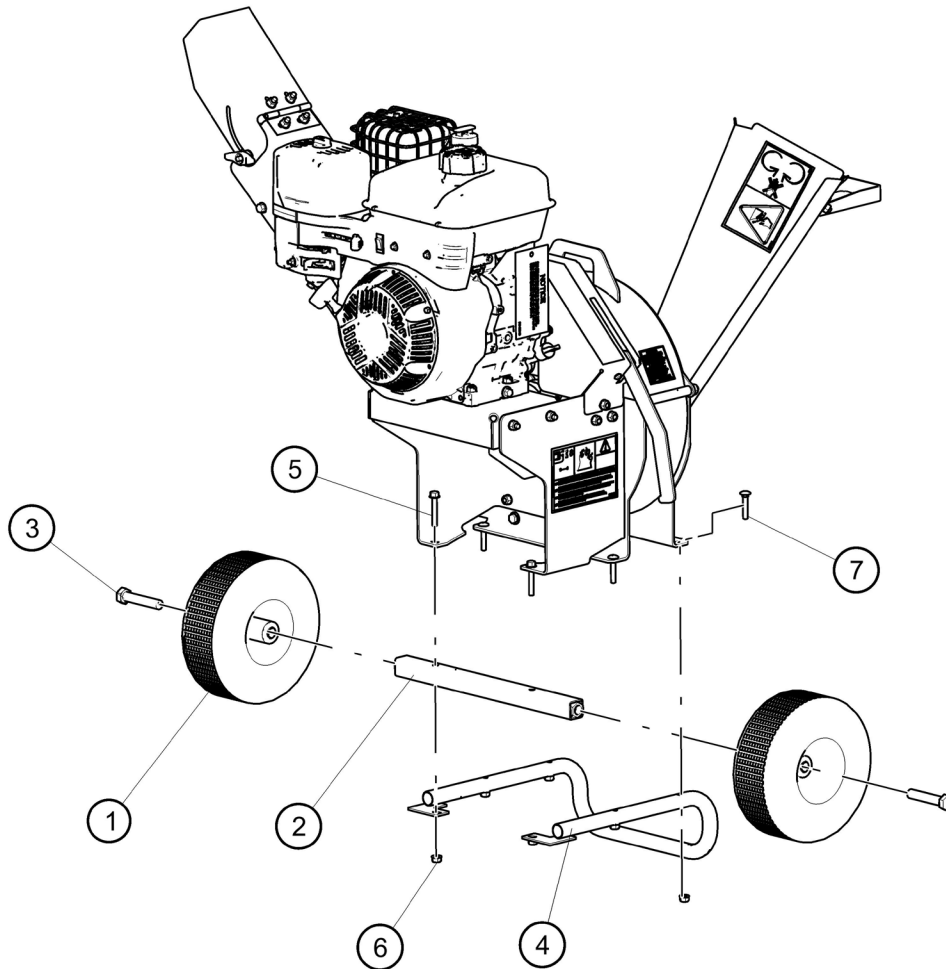


Figure 2.1, Attach Leg and Wheels



#### WARNING



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

## 2.2 DISCHARGE ASSEMBLY

1. Position the deflector weldment to align with the holes for the Up position.(see Figure 2.2).

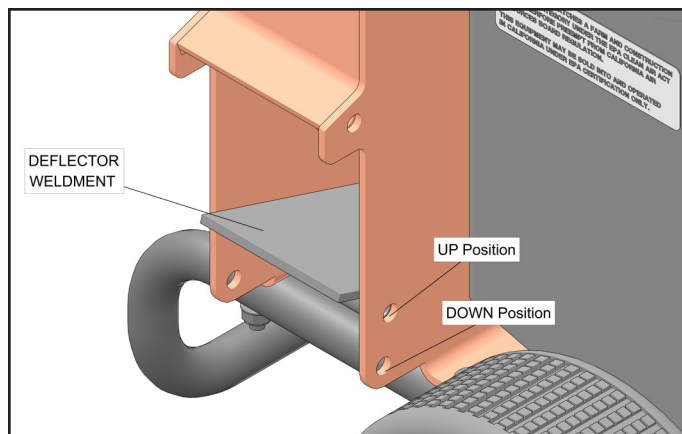


Figure 2.2, Deflector Weldment

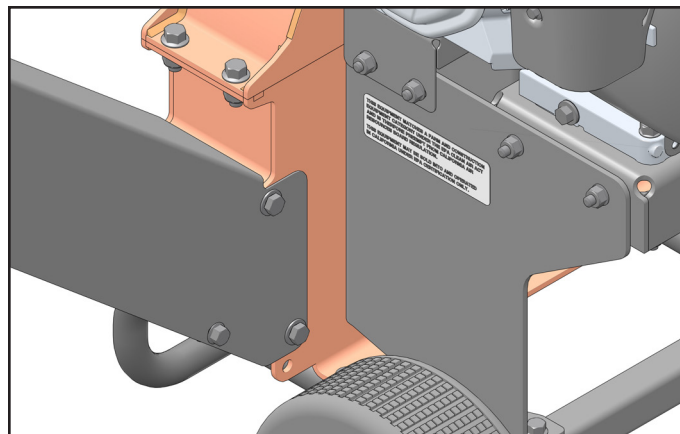


Figure 2.2.1, Discharge chute installed

2. Position the discharge chute (1) and attach using two 3/8 x 5 1/2 bolts (2), washer (3) and nylock flange nuts (4). (see Figure 2.2.3).

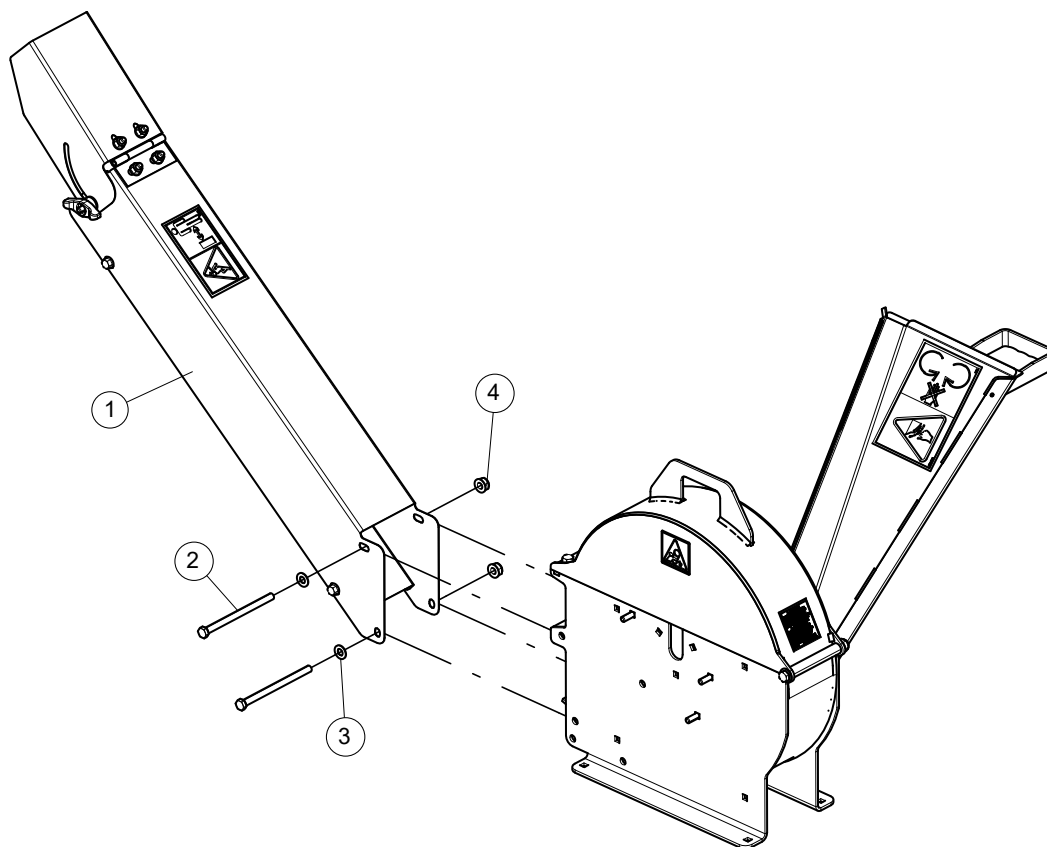


Figure 2.2.3, Attach Discharge Chute

## 2.3 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.

# 3 Section FEATURES & CONTROLS

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

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

**1. DISCHARGE CHUTE**

Processed material exits out the chute.

**2. ROTOR LOCK**

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

**3. INFEEED CHUTE**

Materials to be processed are fed into the chute.

**4. ENGINE THROTTLE**

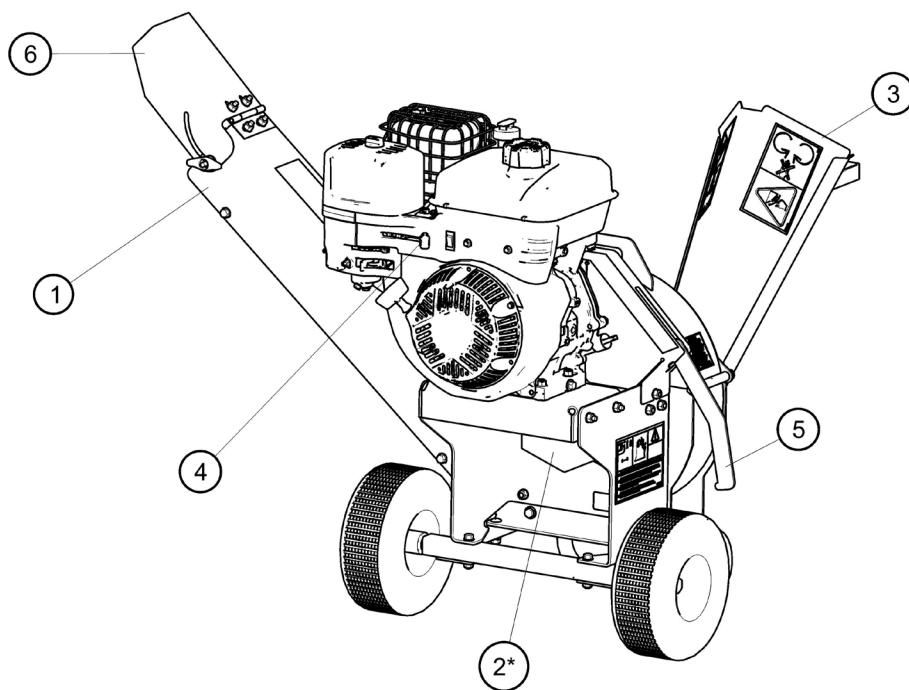
This controls the speed of the engine. Increase the throttle by moving the lever to the FAST position. To decrease the throttle, move the lever to the SLOW position.

**5. BELT ENGAGEMENT**

Disengage belt to start engine. Once started engage belt and increase engine RPM to full throttle. Do not disengage while running.

**6. DISCHARGE CAP**

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



\* Rotor lock is located behind the lower belt shield.

# 4 Section OPERATION

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.

## OPERATION

The cutting of material takes place on the front of the machine, where hardened steel blades are mounted on a rotating rotor assembly. Material fed into the infeed chute is sliced into small pieces and propelled out through a discharge chute.

### 4.1 STARTING THE ENGINE

1. Check engine oil level before starting.
  2. Turn the fuel shut-off valve to the ON position.
  3. Move the choke control lever to the choke position.
  4. Place the throttle control midway between the SLOW and FAST positions.
  5. Disengage belt.
  6. Pull the recoil starter until the engine starts. Make sure the starting cord retracts.
- **For a cold engine:** Gradually return the choke control to the off position after the engine starts and warms up. The machine may be operated during the warm up period, but it may be necessary to leave the choke partially on until the engine warms up.
  - **For a warm engine:** Return choke to the off position as soon as engine starts.
7. Engage belt at 25% throttle. Once engaged increase engine RPM to full throttle. If engine stalls during belt engagement. Disengage belt, restart the engine, place throttle at 50% and engage belt.



Figure 4.1, Choke Control Lever and Fuel Shut-off Valve



## 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.

### 4.2 STOPPING THE MACHINE

1. Move the throttle control lever to SLOW position.
2. Allow the engine to run at idle for 30-60 seconds.
3. Stop the engine by moving the throttle to the stop position.
4. Turn the fuel shut-off valve to the OFF position.
5. Allow machine to come to a complete stop.
6. Do not disengage the belt while the engine is running.

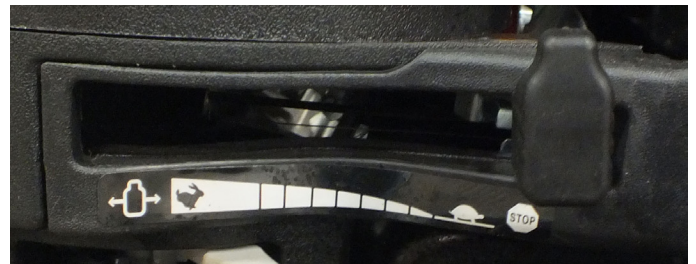


Figure 4.2, Throttle Control Lever

## 4.3 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!**

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

1. **ALWAYS** run engine at full operating speed before starting to process material.
2. **If the engine slows to where it may stall**, stop feeding material and allow the engine to recover. Feed material more evenly.
3. **If the rotor jams**, remove the material and rotate it before reinserting it into the chute. Alternately insert and retract the limb or insert continuously at a rate that will not kill the engine.
4. **Sharpen the blades periodically.** Check the sharpness of the blades every 5-15 hours. Refer to the Service and Maintenance section for sharpening instructions.
5. **Materials fed in to the infeed chute must be 4" (10.2 cm) in diameter or less.** Trim materials that cannot be bent enough to feed into the infeed chute.
6. **Alternate green or fresh cut material with dry material to lubricate the blades for longer life and better performance.** Cutting dead, dry material will create heat and dull the blades quicker.
7. **ALWAYS feed material from the side of the infeed chute**, rather than from the front. Step aside to avoid being hit by the brush moving into the machine.
8. **ALWAYS place limb, butt end first, into the infeed chute until it contacts the blades.** The actual feed rate of the limb into the machine will depend on the type of material fed and sharpness of the cutting blades.
9. **NEVER** attempt to clear a plugged rotor or discharge with the engine running. **ALWAYS** shut engine OFF and remove the spark plug wire before servicing any part of this machine.
10. **NEVER** attempt to cut pieces of metal, rock, bottles, cans or other foreign objects.



### WARNING



- **Never** lean over the infeed 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 infeed 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.



### WARNING



- 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.

# 5 Section SERVICE & MAINTENANCE

## 5.1 SERVICE & 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 YEAR |
| Air cleaner                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Check and clean (1)                             | •                                 |                 |               |                |            |
| Engine oil                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Change (1)                                      | •                                 |                 |               |                |            |
| Fuel filter                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Replace                                         | •                                 |                 |               |                |            |
| Spark plug                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Check condition and gap                         | •                                 |                 |               |                |            |
| Engine oil                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Check/fill                                      |                                   | •               |               |                |            |
| All internal and external nuts and bolts                                                                                                                                                                                                                                                                                                                                                                                                                                    | Check tightness                                 |                                   | •               |               |                |            |
| Fuel tank                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Check/fill                                      |                                   | •               |               |                |            |
| Drive Belt                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Check                                           |                                   |                 |               | •              |            |
| Blades                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Check sharpness and re-torque to 25 ft-lbs. (2) |                                   |                 | •             |                |            |
| Belt Tension                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Check                                           |                                   |                 |               | •              |            |
| Belt / Pulley Alignment                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Check                                           |                                   |                 |               | •              |            |
| Wheel Bearings                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Check                                           |                                   |                 |               |                | •          |
| Spark arrestor*                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Clean                                           |                                   |                 | •             |                |            |
| Entire machine                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Clean                                           |                                   |                 | •             |                |            |
| (1) Perform more frequently under extremely dusty conditions.                                                                                                                                                                                                                                                                                                                                                                                                               |                                                 |                                   |                 |               |                |            |
| (2) Perform more frequently when processing dry or dirty wood.                                                                                                                                                                                                                                                                                                                                                                                                              |                                                 |                                   |                 |               |                |            |
| *If equipped                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                 |                                   |                 |               |                |            |
| <b>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 cutting material REQUIRES THE OWNER TO PERFORM THE ABOVE LISTED NORMAL MAINTENANCE. Special consideration to maintain and re-torque the 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.</b> |                                                 |                                   |                 |               |                |            |

**WARNING**

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

**5.2 ROTOR LOCK****WARNING**

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

There are holes in the rotor that are utilized to lock the rotor in place before performing any kind of service and/or maintenance.

Follow the steps below to lock the rotor:

1. Remove two bolts (1) and nuts (2) and open the rotor housing (3). See Figure 5.2.

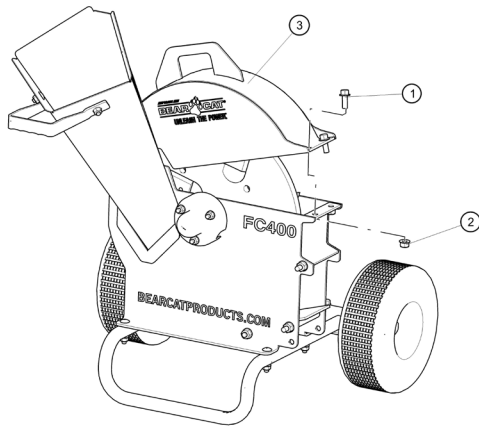


Figure 5.2, Open Rotor Housing

2. Disengage the belt.
3. Remove the lower belt shield to expose the rotor lock hole.

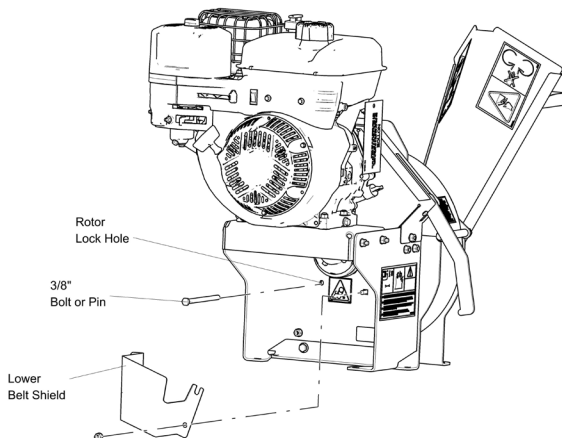


Figure 5.2.1, Rotor Lock

4. Insert 3/8 bolt or pin into hole in rotor housing. Align hole in rotor with the hole in the rotor housing by rotating the rotor. See Figure 5.2.1
5. Remove bolt when service and/or maintenance is completed.
6. Install lower belt shield and close rotor housing. Secure with the two bolts and nuts that were removed in step 1.

**5.3 MAINTENANCE**

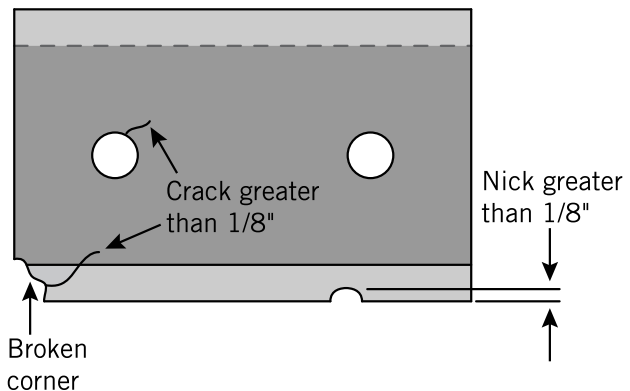
The blades will eventually become dull, making cutting difficult and adding extra strain on the machine. **CHECK THE SHARPNESS OF THE BLADES EVERY 5-15 HOURS OF OPERATION AND SHARPEN AS NEEDED.**

Your blades need to be sharpened if:

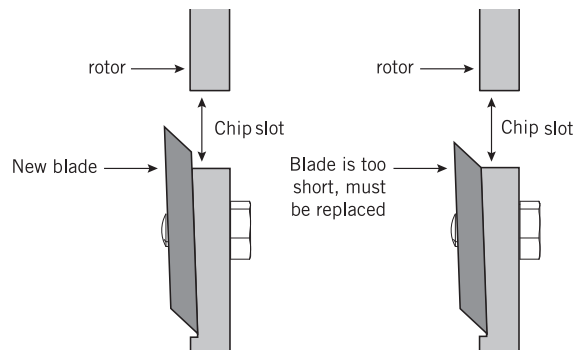
- Machine vibrates severely when material is fed into the infeed chute.
- Chips discharge unevenly or have stringy tails, especially when cutting green material.

Before you sharpen the 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 chip slot (see below).





## WARNING



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

### 5.4 REMOVING THE BLADES



## WARNING



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

1. Remove two bolts and nuts and open the rotor housing.
2. Remove the lower belt shield to expose the rotor lock hole.
3. Rotate the rotor until a blade is accessible and install the rotor lock (Section 5.2).
4. Remove the two hex bolts holding the blade to the rotor.
5. Remove rotor lock.
6. Repeat step 3 -5 for any remaining blades.
7. The blades have two edges and can be reversed one time before sharpening.

### 5.5 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 cutting performance.
2. Regrind the angled edge of the blades to 45 degrees (Figure 5.5). Use the blade angle gauge plate when sharpening the blades to achieve the proper angle (see Figure 5.5.2).
3. Be careful when grinding so that the blade does not become overheated and change color. This will remove the heat-treated properties.

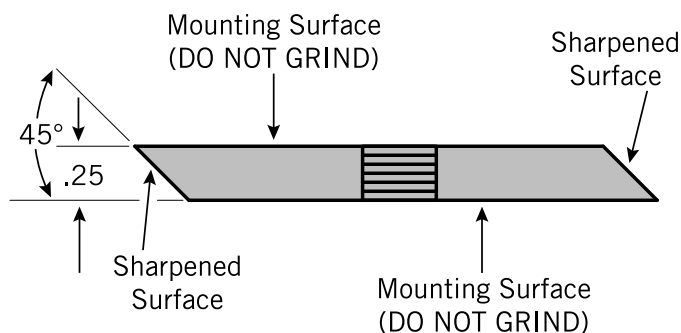


Figure 5.5, Blade Surfaces

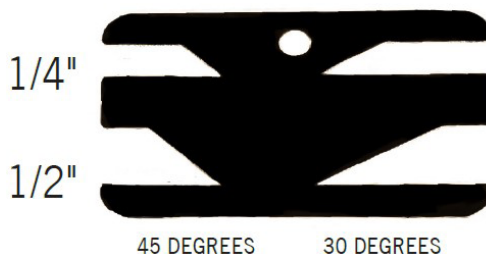


Figure 5.5.2, Blade Angle Gauge Plate

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 performance of the machine.
7. For blades that have been repeatedly sharpened, ensure that the sharpened surface extends past the chip slot opening. If it does not extend past the opening, the blades should be replaced (see Section 5.3).

### 5.6 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 25 ft-lbs. (34 Nm). Remove rotor lock.
3. Repeat steps 1 and 2 for the remaining blades.
4. Reinstall the lower belt shield.
5. Close the rotor housing and secure with two bolts and nuts.

**WARNING**

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

**5.7 SETTING BLADE CLEARANCE**

The blades should clear the anvil by 1/16" to no greater than 1/8". Check the clearance every 8 hours of operation and adjust if needed.

To adjust anvil to blade clearance:

1. Remove the rotor shaft end cap and lower belt shield.
2. Loosen the set screws (1) holding the lock collars (2) on the chute side and engine side bearings.
3. Use a punch and hammer in punch hole (3) to tap the lock collars in the opposite direction of normal rotation (Figure 5.7).
4. Using a rubber mallet tap the end of the rotor shaft to obtain 1/16" to no greater than 1/8" clearance. Rotate the rotor and check the clearance on all blades.

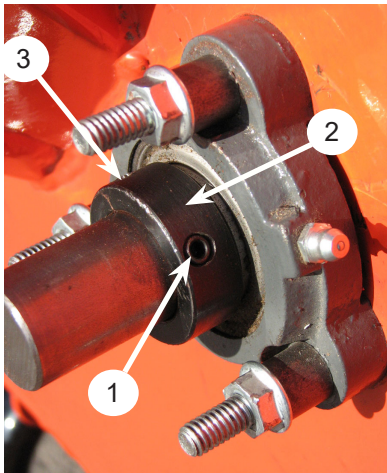


Figure 5.7, Rotor Bearing

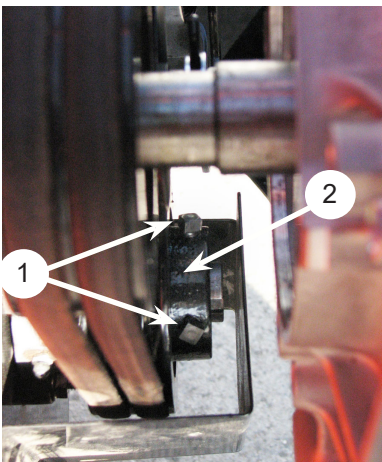


Figure 5.7.1, Rotor Shaft Belt Pulley

5. Once clearance has been set, the lock collars must be replaced and retightened. Using a punch and a hammer, tap the lock collars in the direction of shaft rotation (**clockwise on the engine side bearing and counterclockwise on the chute side bearing**) and set them with a hammer tap. Tighten the lock collar set screws.
6. Loosen the set screws holding the belt pulley on the rotor shaft (Figure 5.7.1). Move the pulley on the shaft so it is aligned with the engine drive pulley. The pulley should be moved the same amount the rotor was moved, only in the opposite direction. Torque pulley set screw to 160 in-lbs.
7. Ensure the pulley drive key is completely seated under the pulley and tighten the set screws.
8. Check pulley alignment by laying a straightedge across the pulley faces. Pulley faces should line up. If not, repeat steps 6 and 7 until the pulley is lined up.

**NOTE**

On the chute side bearing, tap punch in a CW rotation. On the engine side bearing, tap punch in a CCW rotation.

**5.8 CLEARING A PLUGGED ROTOR**

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

1. Shut off engine and allow all moving parts to come to a complete stop.
2. Open the rotor housing.
3. Clean the debris away from the rotor. Turn the rotor by hand to be sure it is free to rotate. Be careful to avoid the blades when cleaning out the debris.
4. If the discharge chute is plugged, remove the lower panel from the discharge chute and remove debris.
5. Reinstall lower panel.
6. Once debris is removed, close rotor housing and secure with hardware.

**5.9 CHANGE OIL**

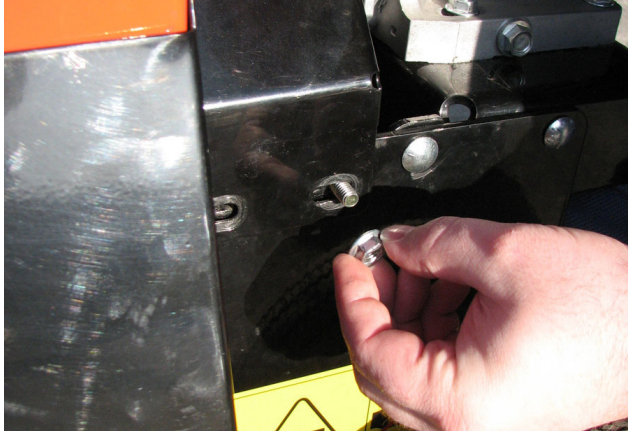
Check the oil level before each use. Change oil as directed in the engine owner's manual.

**WARNING**

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

**5.10 BELT GUIDE ADJUSTMENTS**

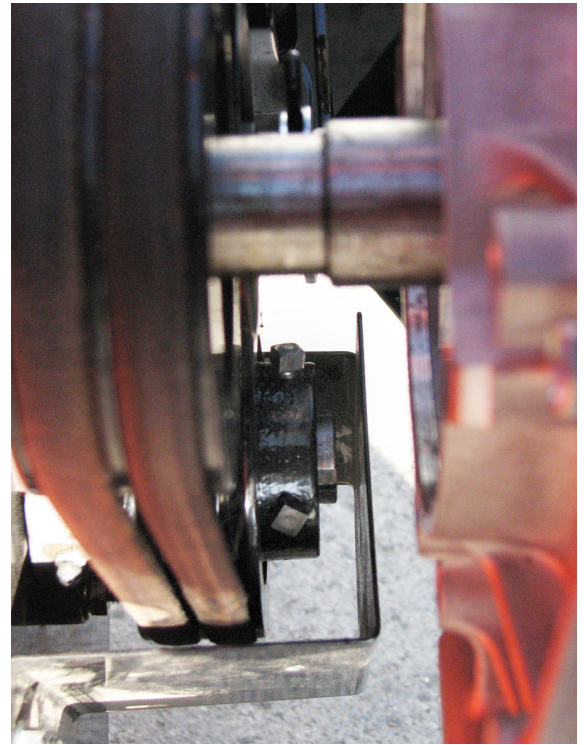
The belt guide aids in disengaging the rotor. If problems arise with engaging and disengaging the unit, follow the instructions below. These instructions also adjust the lower belt guard.



*Figure 5.10 Belt Shield Removal*

1. Remove belt shield to expose the belt and pulleys.
2. Loosen set screws and using a straightedge align the engine pulley (1) with the idler pulley (2) and the rotor pulley (4) with the engine pulley (1). See Figure 5.11. Tighten all set screws.
3. Engage the rotor with the belt (3) in place and check idler engagement. See Figure 5.11. The idler pulley should impact the belt in the center of the pulley. All pulleys must be in perfect alignment. Torque pulley set screws to 160 in-lbs.
4. If idler pulley will not remain in alignment with engine and rotor pulleys, it may be necessary to replace the idler bracket bushings.

5. There should be 1/8" clearance between the belt and the upper belt guard when the belt is engaged. Adjust by loosening the mounting bolts and repositioning the guide. Retighten mounting bolts.
6. Reinstall upper shield.
7. From underneath, check the alignment of lower belt guard with a post card. With the belt engaged, there should be enough room between the belt and the side of the guard for the card to slide along the belt. With the belt disengaged, the card should not be able to slide. Adjust if necessary. See Figure 5.10.1



*Figure 5.10.1 Lower Belt Shield Adjustment*

## 5.11 DRIVE BELTS

Check the condition of the drive belt annually or after every 25 hours of operating, whichever comes first. If the belt is cracked, frayed, or worn, replace it. To replace or adjust drive belt, proceed as follows:

1. Remove the belt shield, upper belt guide (6) and lower belt guard (5).
2. Remove idler pulley (2).
3. Slip the drive belt (3) off the belt pulleys.
4. Inspect pulleys for wear. Replace the pulleys if they are cracked or worn so that the belt contact area is not smooth and flat.
5. Place the new belt over pulleys. Do not force or pry the belt over pulleys as this may cause cord breakage.
6. Reinstall the idler pulley, ensuring that the belt is on the outside edge of the idler pulley.
7. Check all pulleys to make sure they are properly aligned.
8. Replace all shields, guides and guards.

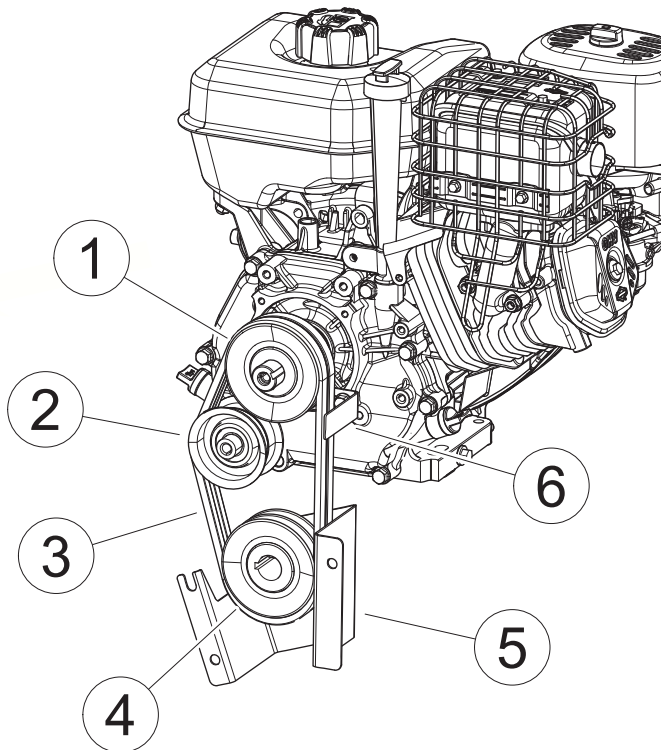


Figure 5.11, Belt Drive

## 5.12 REMOVING THE ROTOR

1. Remove rotor shaft end cap on chute side of the machine.
2. Loosen the set screws on the lock collar securing the chute side bearing on the rotor shaft. See Figure 5.7.
3. Using a punch and hammer, tap the lock collar in the opposite direction of normal rotation until loose; remove lock collar and bearing.
4. Remove the upper shield, upper belt guide and lower belt guard to allow access to the engine side bearing.
5. Remove the drive belt.
6. Loosen the set screws holding the belt pulley on the rotor shaft and remove the pulley. See Figure 5.7.1.
7. Repeat steps 2 and 3 on the engine side rotor bearing.
8. Remove the bolts and nuts securing the rotor housing cover. Open the cover.
9. Remove bolts and nuts that attach the rotor bearings to the rotor housing. Slide bearings off the shaft.
10. Remove rotor.



**WARNING**



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

**5.13 LUBRICATION**



**WARNING**



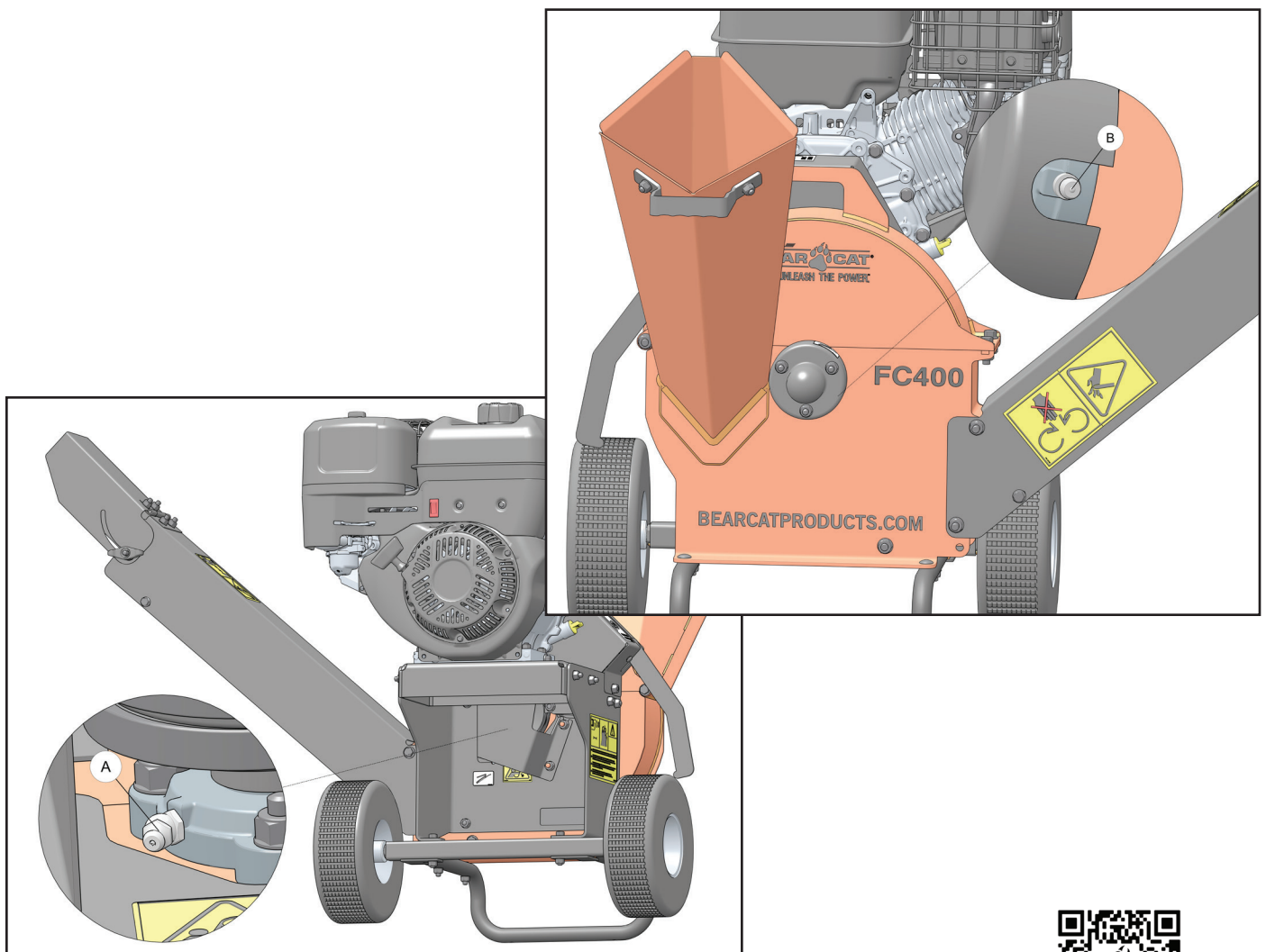
Polyurea and lithium-based greases are not compatible. Mixing the two grease types may lead to premature failure.

**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 |         | 1 Engine Side Bearing (A)<br>1 Chute Side Bearing (B) |           |           |



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



# 6 Section TROUBLESHOOTING

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                                                                                                                                                              |
|-------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Engine will not start                                 | Lack of fuel or oil                        | Fill fuel tank and check oil level                                                                                                                                  |
|                                                       | Spark plug disconnected                    | Connect spark plug                                                                                                                                                  |
|                                                       | 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                       | 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.                                                                                                                           |
| Engine runs, but dies or does not accelerate properly | Air filter dirty                           | Clean or replace                                                                                                                                                    |
|                                                       | Fuel filter dirty                          | Replace                                                                                                                                                             |
|                                                       | Fuel vent plugged                          | Clean or replace                                                                                                                                                    |
|                                                       | Spark plug dirty/worn                      | Clean and adjust or replace                                                                                                                                         |
|                                                       | Carburetor vibration                       | Adjust                                                                                                                                                              |
|                                                       | Cooling system dirty/plugged               | Clean                                                                                                                                                               |
|                                                       | Spark arrestor* plugged                    | Clean or replace                                                                                                                                                    |
| Machine cuts poorly                                   | Dull 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                                                                                                                                 |

\*If equipped

| PROBLEM                                        | POSSIBLE CAUSES                                       | REMEDY                                                                                 |
|------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------|
| 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 machine.     |
|                                                | 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.                                                   |
| Hard to feed , requires excessive power to cut | Dull 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 blades                                           | Flip, sharpen, or replace                                                              |
|                                                | Drive system vibration                                | Check drive belts, bearings, and pulleys for bad or worn areas. Check for dull blades. |
|                                                | Rotor out of balance                                  | Inspect rotor for damaged or missing blades, replace if needed.                        |
|                                                | Blade to anvil clearance is incorrect                 | Set blade/anvil clearance to recommended distance.                                     |

# 7

## Section SPECIFICATIONS

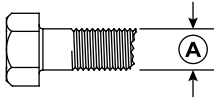
| DESCRIPTION              | ENGLISH                                            | METRIC                                                 |
|--------------------------|----------------------------------------------------|--------------------------------------------------------|
| Overall size (L × W × H) | 42" x 48.5" x 35"                                  | 107 cm × 123 cm × 89 cm                                |
| Overall weight           | 228 lbs.                                           | 104 kg                                                 |
| Max capacity             | 4" hardwood<br>4" soft fibrous material            | 10.2 cm hardwood<br>10.2 cm soft fibrous material      |
| Blades                   | 4 reversible heat treated<br>(3.125" × 2" × 0.25") | 4 reversible heat treated<br>(8 cm × 5.1 cm × 0.64 cm) |
| Rotor speed              | 3600 RPM                                           |                                                        |
| Rotor size               | 15.25" diameter x 5/8"                             | 38.8 cm diameter x 1.58 cm                             |
| Rotor weight             | 37 lbs.                                            | 16.8 kg                                                |
| Engine                   | Briggs & Stratton® XR Professional Series™ 420cc   |                                                        |
| Drive Type               | Belt, HAH 29.1 Matched Set                         |                                                        |
| Drive Belt Size          | 29                                                 | 73.7 cm                                                |
| Tires                    | 410/350 4" (foam-filled)                           | 410/350 10.2 cm (foam-filled)                          |
| Fuel Tank Capacity       | 3.2 quarts (0.8 gallons)                           |                                                        |
| Starter                  | Recoil                                             |                                                        |
| Spark Arrester Equipped* | No                                                 |                                                        |

| SPECIAL TORQUE REQUIREMENTS              |                                 |                       |                 |
|------------------------------------------|---------------------------------|-----------------------|-----------------|
| LOCATION                                 | HARDWARE DESCRIPTION            | TORQUE (UNIFIED INCH) | TORQUE (METRIC) |
| A – On rotor plate, blade mounting bolts | 5/16" × 3/4" hex, grade 8 bolts | 25 ft-lbs.            | 34 Nm           |

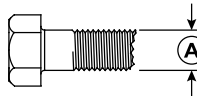
\* If a spark arrester is required it must meet the specifications and performance requirements of local, state, and federal laws and regulations. A spark arrester is available from authorized servicing dealers.

## 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-LBS. | Nm    | FT-LBS. | Nm    | FT-LBS. |
| 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-LBS. | Nm   | FT-LBS. | Nm   | FT-LBS. | Nm   | FT-LBS. |
| 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%.

# 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](http://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 or VIN of your machine.
- The PART NUMBER of the part.
- The PART DESCRIPTION.
- The QUANTITY needed.

### 8.2 OPTIONS

| PART NUMBER | DESCRIPTION           |
|-------------|-----------------------|
| 78999-00    | KIT, GROUND DISCHARGE |
| 78993-00    | KIT, TWO WHEEL TOW    |
| 78995-00    | KIT, BLADE            |
| 31605-00    | KIT, TACH / HOUR      |



Blade Kit, 78995-00



Two Wheel Tow Kit, 78993-00



Tach / Hour Kit, 31605-00



Ground Discharge Kit, 78999-00





