



## 3 INCH CHIPPER/SHREDDER

**SC3306** – 306cc Briggs & Stratton®

**SC3306E** – 306cc Briggs & Stratton® (Electric)

**OWNER'S MANUAL**

ENGLISH



PN: 70352-00  
Rev. 012218  
Companion to 70509-00  
Range: J00760 - Current

[bearcatproducts.com](http://bearcatproducts.com)

# Before You Begin

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## DEAR ECHO Bear Cat® CUSTOMER

Thank you for purchasing an ECHO Bear Cat product. The ECHO 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 ECHO Bear Cat dealer.

This document is based on information available at the time of its publication. ECHO 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.

## PLEASE SEND US YOUR WARRANTY CARD

A warranty card is included in your owner's kit packaged with your machine. Please take the time to fill in the information requested on the card. When you send your completed card to us, we will register your machine and start your coverage under our limited warranty or go to [bearcatproducts.com/Product-Support/Product-Registration](http://bearcatproducts.com/Product-Support/Product-Registration).

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## FOR MACHINE SERVICE OR PARTS

For service assistance, contact your nearest authorized ECHO 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 identification number of your machine to provide the most efficient service. See below for information on how to identify and record the identification number for your machine.

## FOR ENGINE SERVICE OR PARTS

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

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## 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.

## ORDERING PARTS

Only genuine ECHO 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 ECHO 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.

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## SERIAL NUMBER

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

## HOW TO CONTACT ECHO 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	<a href="mailto:sales@bearcatproducts.com">sales@bearcatproducts.com</a> <a href="mailto:service@bearcatproducts.com">service@bearcatproducts.com</a>	Monday - Friday 8 a.m. to 5 p.m. Central Time

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## LIMITED WARRANTY

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

Crary Industries, Inc. warrants to the original owner each new ECHO 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, 3 years (U.S. and Canada only (2 years outside U.S. and Canada)) for Consumer use of the product, 1 year for Commercial applications and 6 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 ninety (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.

\*Models SC2163, SC2170, SC3206 & SC3208 are classified as Consumer grade products and will not qualify for warranty coverage if used for Commercial or Rental purposes.

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) or the paper card completed and returned to Crary Industries, Inc.

In the event of a failure, return the product, at your cost, along with proof of purchase to the selling ECHO 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 ECHO 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 flails or 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.

ECHO Bear Cat's Demo Fleet Warranty Program includes the following distributor guidelines. On the first day the machine is used for demonstration, all demo units must be registered to the distributor. A demo unit is under warranty to the distributor as long as it is in the demo fleet, a term which cannot exceed two years. If delivery date to the distributor is more than one year prior to the date unit enters the demo fleet, the warranty is expired. All units sold to customers within the demo period will be granted a six month commercial warranty or one year consumer warranty. In order for these warranties to be effective, all registrations must be changed to new owner once units are sold. Should unit be sold to customer outside of the demo period, no warranty is offered by the manufacturer.

Crary Industries, Inc. is not liable for any property damage, personal injury or death resulting from the unauthorized modification or alteration of an ECHO 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.

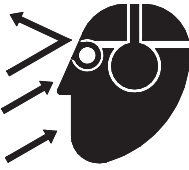
Failure of the owner/operator of the equipment to comply with federal, state, and local laws may subject him or her to fines and/or other penalties. Contact your local fire marshal or forest service for specific information about which regulations apply in your area.

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.

## 1.3 BEFORE OPERATING



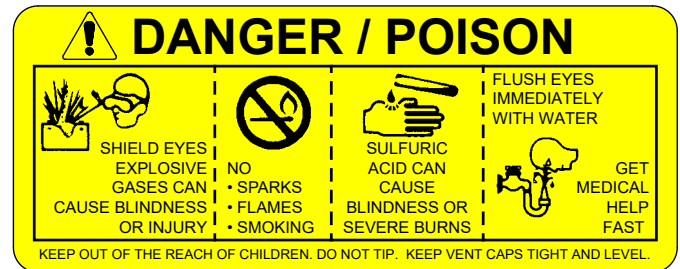
1. Read and understand this owner's manual. Be completely familiar with the controls and the proper use of this equipment.
2. Familiarize yourself with all of the safety and operating decals on this equipment and on any of its attachments or accessories.
3. Keep safety decals clean and legible. Replace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



## 1.5 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.

## 1.6 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.

**1.7 SAFETY DECALS**

See Section 1.8 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 12174**



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

**2 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.

**3 PN 12176**



Do not insert branches larger than 3/4 inch into shredder or machine damage may occur.

**4 PN 31989-00**

Do not insert branches larger than 3 inches in diameter into chipper. Machine damage may occur. Refer to owners manual for operating instructions and recommendations.

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 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.

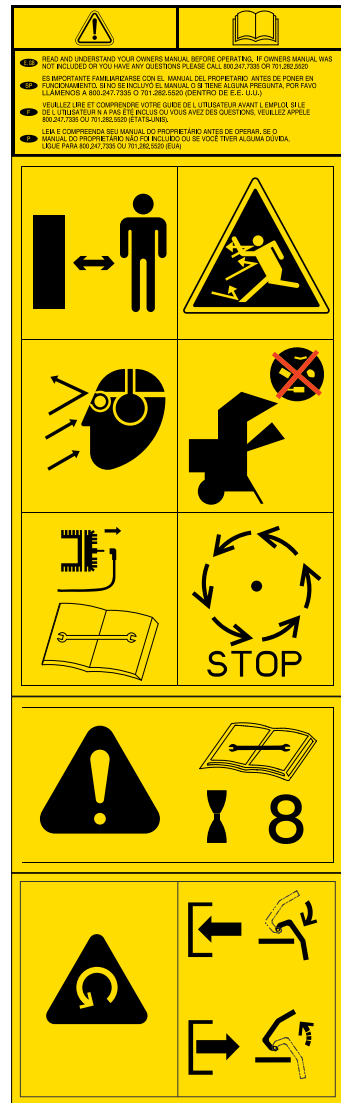
**5 PN 31990-00**

Read and understand you 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.).

Do not operate this equipment in the vicinity of bystanders. Do not allow children to operate 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, disconnect spark plug wire from spark plug and make sure all moving parts have come to a complete stop. Always stand clear of discharge area when operating this machine. Keep face and body away from feed and discharge openings. When feeding shreddable material into chipper, do not allow metal, rocks, bottles, cans or any other foreign material to be fed into chipper or shredder. 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.

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. Refer to owners manual for instructions. Failure to do so may cause poor performance, damage or personal injury and will void the machine warranty.

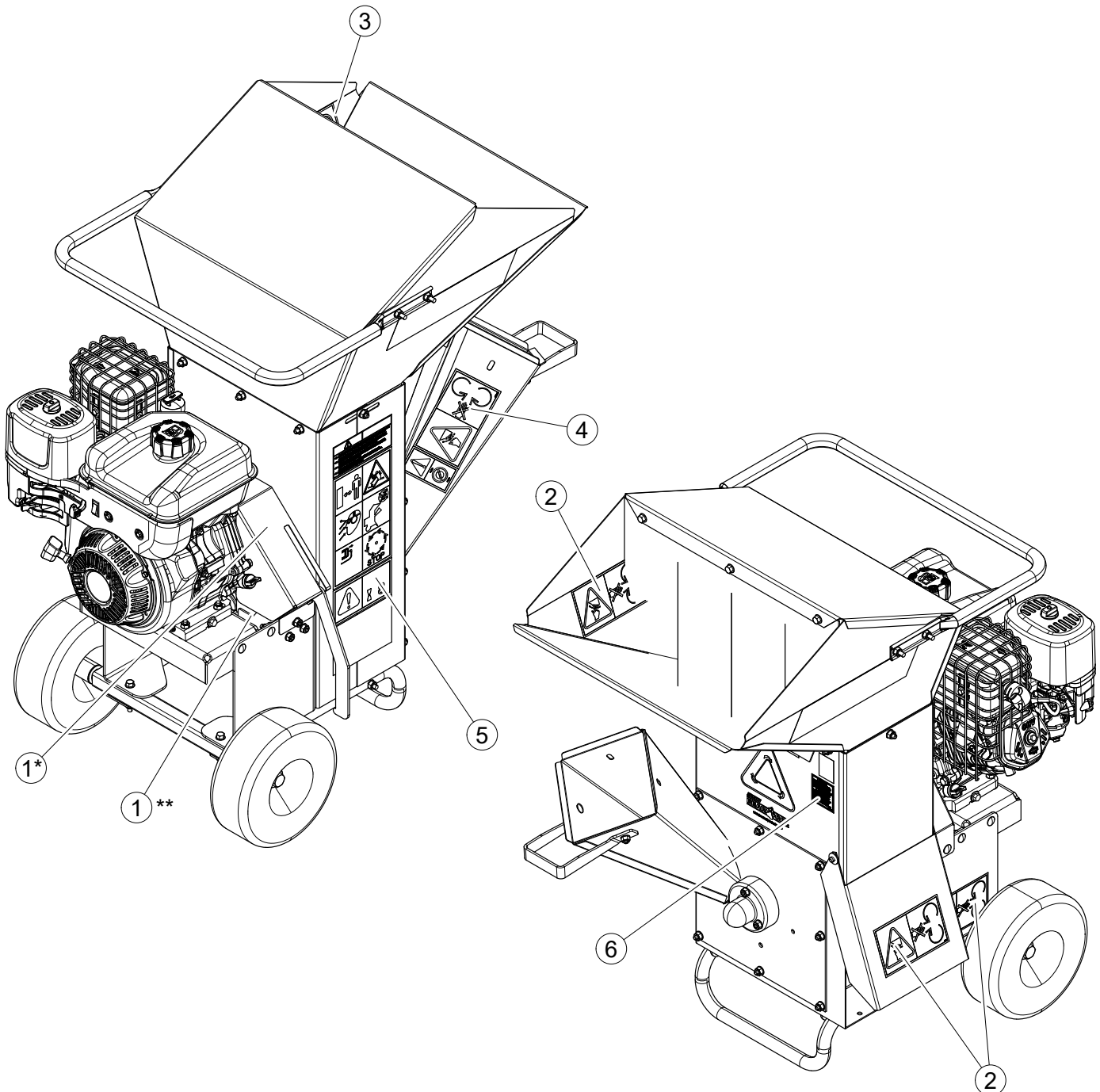
Lower lever slowly to engage chipper. Pull lever up to disengage chipper. Chipper/shredder rotor will continue to rotate when clutch is disengaged. Stop engine and remove spark plug wire before cleaning debris from discharge area or servicing this machine. Do not operate without discharge screen, inlet flaps and all shields in place.





## 1.8 SAFETY DECAL LOCATIONS

The numbers below correspond to the decals in Section 1.7. 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 on housing

\*\*Decal located on base

# 2 ASSEMBLY

## Section



### WARNING



Do not tip machine onto its side or turn machine upside down during assembly. Machine must be assembled in an upright position.



### WARNING



If any bolts or nuts are dropped in the machine, be sure to remove them before starting the machine. Remove items from the shredder area by removing the discharge screen.

## 2.1 NON-CE COMPLIANT ASSEMBLY

### 2.1.1 INSTALL LEG STAND, AXLE AND WHEELS

1. Align holes in chipper base (1) with the holes in axle weldment (2) and the support leg (3). Secure assembly to chipper base with two 5/16-18 x 2-1/4" hex head bolts (4) and flange nuts.
2. Secure support leg to the base of the housing body (5) with two 5/16-18 x 1-3/4" hex head bolts (6), and flange nuts.
3. Complete by bolting wheels (7) to axle weldment using two 5/8 x 3" hex head bolts (8).
4. The axle bolts turn into centerlock nuts in the ends of the axle bar and consequently turn fairly hard. Care must be taken not to over tighten the bolts or bearing damage will occur. A properly tightened bolt will allow minimal side to side movement of the wheel while allowing the wheel to spin freely.

### 2.1.2 ATTACH CHIPPER CHUTE HANDLE (NON-CE MODELS ONLY)

Attach handle (9) to chipper chute (10) using two 5/16 x 3/4" carriage bolts (11) so the head of the bolt is located on the inside of the chute. Install both bolts through handle before fastening with 5/16" flange nuts. This handle is to be attached only to the bottom of part 10.

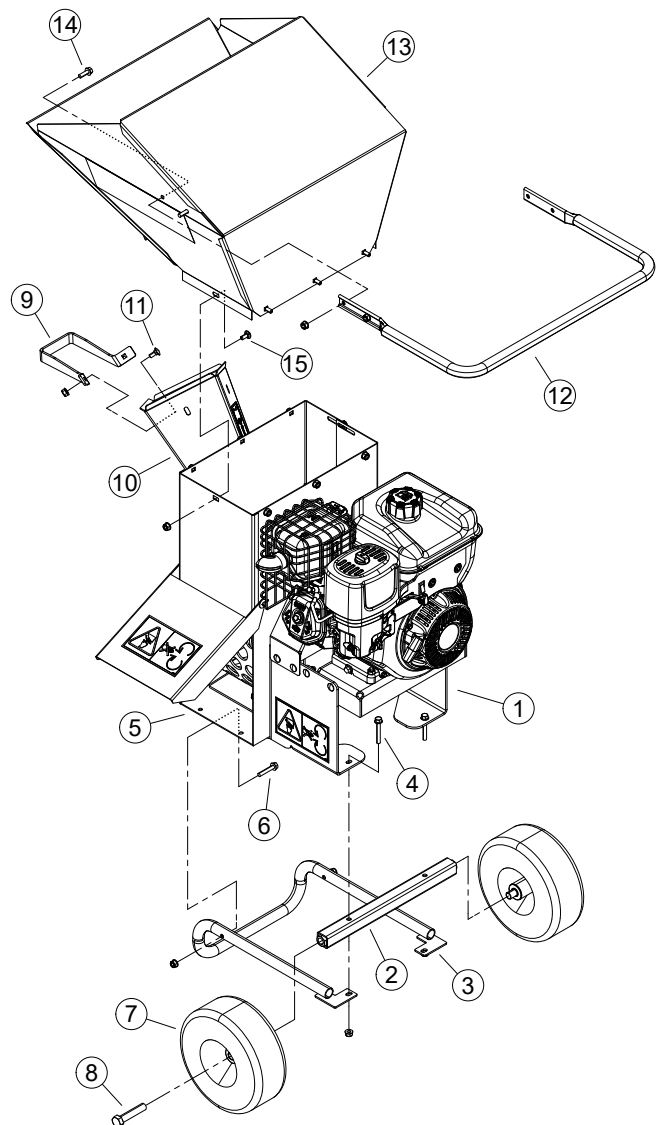
### 2.1.3 ATTACH SHREDDER HOPPER HANDLE

To attach handle (12) to shredder hopper (13), install four 5/16 X 1" hex bolts (14) so the head of the bolt is located on the inside of the hopper. Secure bolts with 5/16" flange nuts.

### 2.1.4 ATTACH SHREDDER HOPPER

1. Install the shredder hopper (13) to the housing body so the handle is located above the engine and the opening is toward the chipper chute.

2. Install eight 5/16-18 x 3/4" carriage bolts (15) so the head of the bolt is located on the inside of the hopper. Fasten bolts with 5/16" flange nuts.



## 2.2 CE COMPLIANT ASSEMBLY

### 2.2.1 INSTALL LEG STAND, AXLE AND WHEELS

1. Align holes in chipper base (1) with the holes in axle weldment (2) and the support leg (3). Secure assembly to chipper base with two 5/16-18 x 2-1/4" hex head bolts (4) and flange nuts.
2. Secure support leg to the base of the housing body (5) with two 5/16-18 x 1-3/4" hex head bolts (6), and flange nuts.
3. Complete by bolting wheels (7) to axle weldment using two 5/8 x 3" hex head bolts (8).
4. The axle bolts turn into centerlock nuts in the ends of the axle bar and consequently turn fairly hard. Care must be taken not to over tighten the bolts or bearing damage will occur. A properly tightened bolt will allow minimal side to side movement of the wheel while allowing the wheel to spin freely.

### 2.2.2 ATTACH SHREDDER HOPPER HANDLE

To attach handle (9) to shredder hopper (10) install four 5/16 x 1" hex bolts (11) so the head of the bolt is located on the inside of the hopper. Secure bolts with 5/16" flange nuts.

### 2.2.3 ATTACH SHREDDER HOPPER

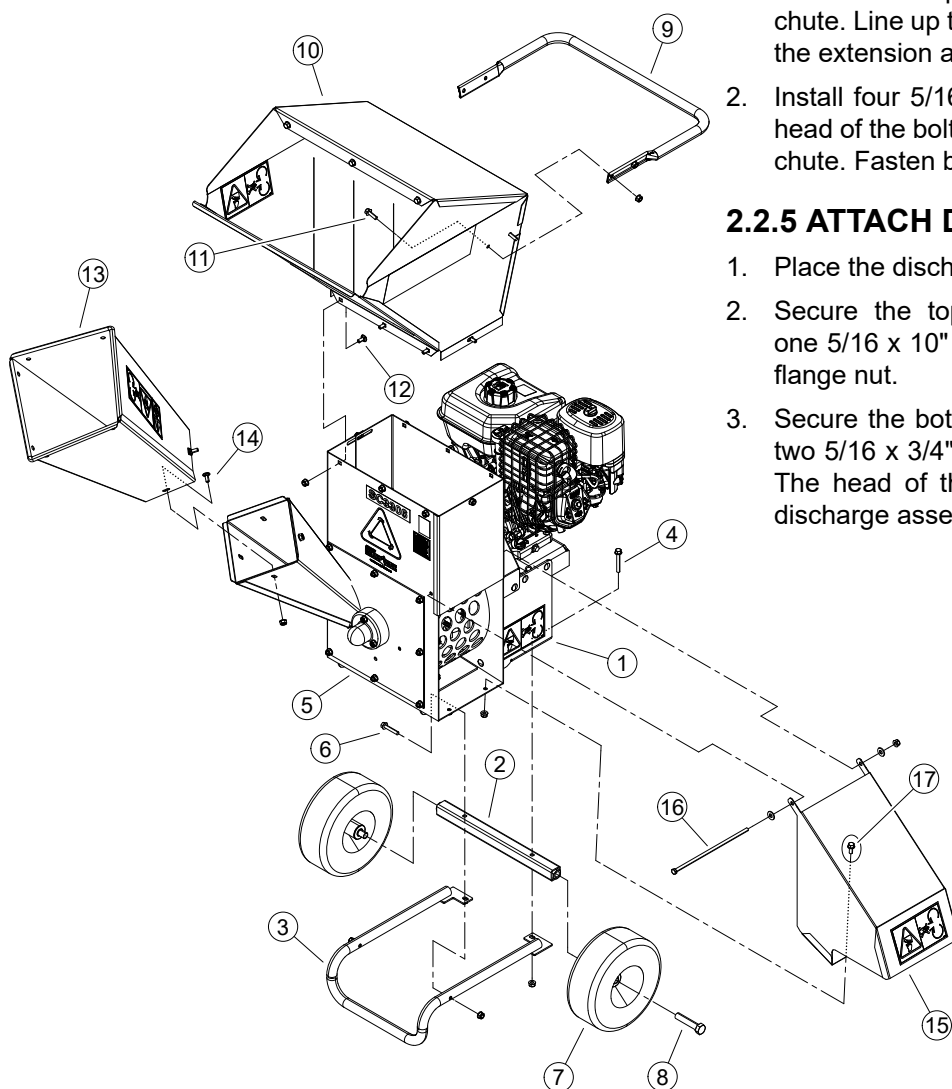
1. Install the shredder hopper (10) to the housing body so the handle is located above the engine and the opening is toward the chipper chute.
2. Install eight 5/16-18 x 3/4" carriage bolts (12) so the head of the bolt is located on the inside of the hopper. Fasten bolts with 5/16" flange nuts.

### 2.2.4 ATTACH CHIPPER CHUTE EXTENSION (CE COMPLIANT MODELS ONLY)

1. Place the chipper chute extension (13) onto the chute. Line up the four holes located on the bottom of the extension and the top of the chute.
2. Install four 5/16-18 x 3/4" carriage bolts (14) so the head of the bolt is located on the inside of the chipper chute. Fasten bolts with 5/16" flange nuts.

### 2.2.5 ATTACH DISCHARGE WELDMENT

1. Place the discharge weldment (15) onto the chipper.
2. Secure the top of the discharge weldment using one 5/16 x 10" bolt (16), two washers and one 5/16" flange nut.
3. Secure the bottom of the discharge weldment using two 5/16 x 3/4" hex head bolts (17) and flange nuts. The head of the bolt should be located inside the discharge assembly.



## 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.



## 2.4 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, wait for all parts to stop moving and disconnect spark plug wire. 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.

## 2.5 INSTALL BATTERY (SC3306E)

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.

To install the battery:

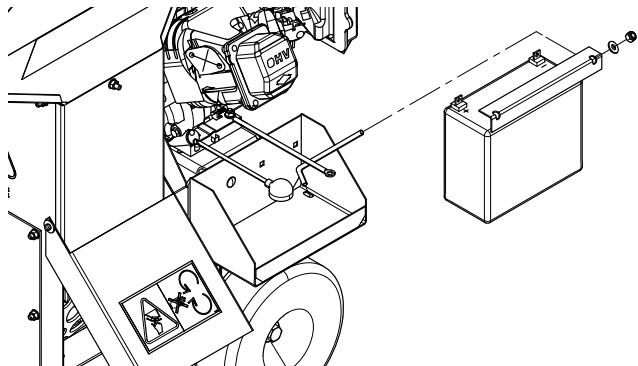
1. Insert battery into the battery tray.
2. Attach the positive (red) battery cable from the engine to the positive (+) battery terminal.
3. Attach the negative (black) battery cable from the engine to the negative (-) battery terminal.
4. Secure battery as shown with two nylock flange nuts.



### 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.



# 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. SHREDDER CHUTE

Materials no larger than 3/4" (1.9 cm) in diameter are fed through the shredder chute to the shredder knives.

### 2. CHIPPER CHUTE

Materials no larger than 3" (7.6 cm) to be chipped are fed through the chipper chute to the chipper blades.

### 3. 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.

### 4. ENGAGEMENT HANDLE

During engine start-up, the engagement handle must be in the disengaged (UP) position. With the engine at 1/4 throttle, carefully engage the rotor by slowly pushing the engagement handle down, allowing the rotor to speed up gradually. Engaging the chipper 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.

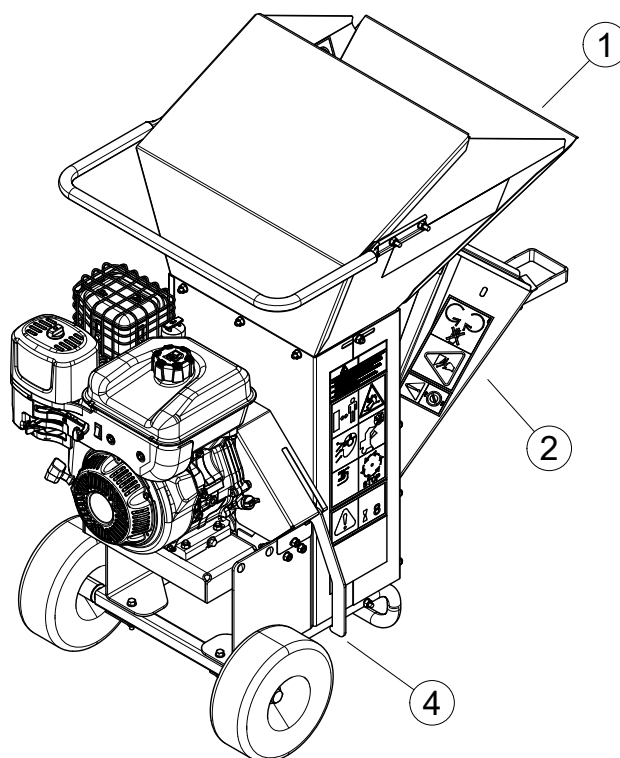


Figure 3.1, Start Position Belt Disengaged



Figure 3.2, Operating Position Belt Engaged

**5. ENGINE CHOKE**

Use when starting a cold engine. Move lever to the choke position when starting. Move lever to the run position when engine is running. Refer to engine manual for further engine operating instructions.

**6. STARTER SWITCH**

Electric start model only. The starter switch is used to start or stop the engine on model SC3306E. See Figure 3.4 for switch location. Refer to the engine manual for further operating instructions.

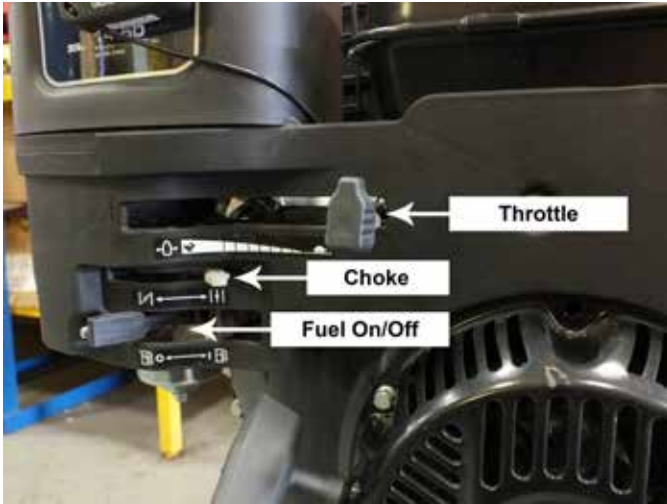


Figure 3.3

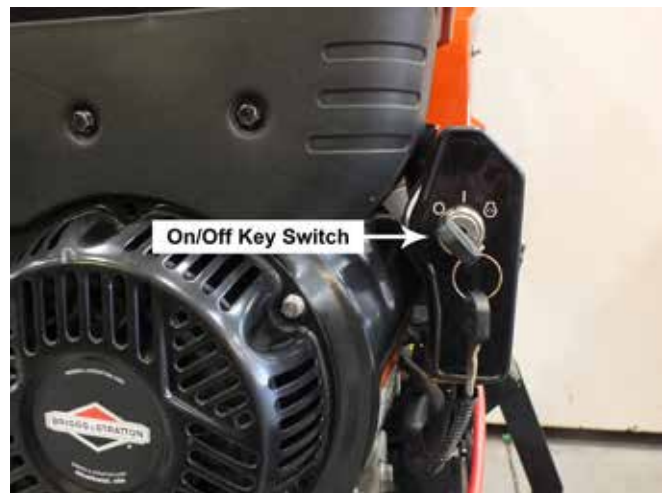


Figure 3.4

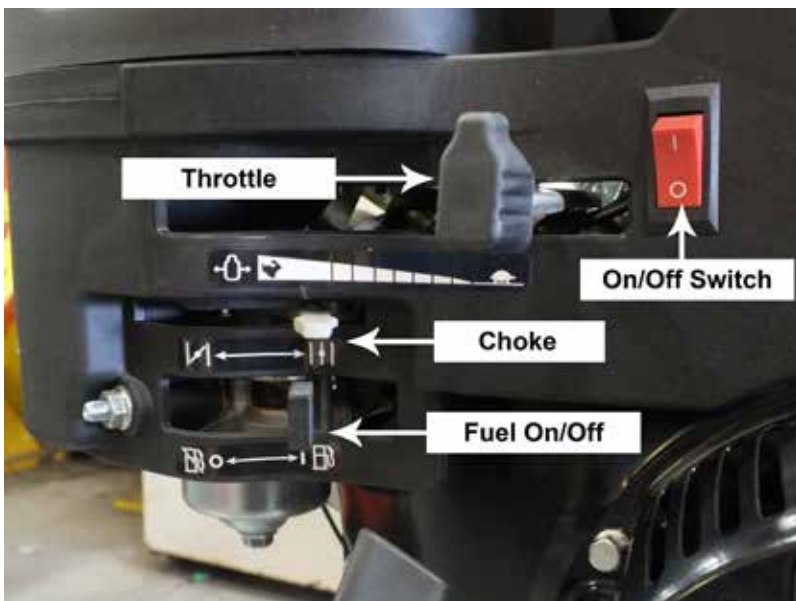


Figure 3.5

# 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 on the front 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.

### SHREDDING OPERATION

In this operation, hardened steel shredder knives grind up material fed into the shredder chute. The shredded material then leaves the shredder area by traveling through the discharge screen. The shredded material can be diverted into a container or onto the ground.



### 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.



### 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.

### NOTE

FOR THE SPECIFIC STARTING, OPERATING AND SERVICE INFORMATION PERTAINING TO YOUR EXACT ENGINE MODEL, ALWAYS CONSULT THE ENGINE OWNER'S MANUAL FIRST.

### 4.1 STARTING 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. Check engine oil level before starting.
2. Place the throttle control midway between the SLOW and FAST positions. Place the choke control into the CHOKE position.
3. Place the chipper engagement lever in the START position.
4. Use key switch/recoil to start the engine.
5. Move the clutch to the RUN position.
  - **For a cold engine:** gradually return the choke to the OFF position after the engine starts and warms up.
  - **For a warm engine:** use of choke may not be necessary for restart of a warm engine. If it is needed, return choke to the OFF position once the engine starts.

### 4.2 OPERATING THE CHIPPER

After the engine has been started and properly allowed to warm to an operating temperature, you can begin operating the chipper. To properly start and operate the chipper, follow the steps below:

1. **AFTER** engine is warmed and ready for use, move the throttle control back to approximately 25% of full throttle.
2. When engine is running at approximately 25% of full throttle, **SLOWLY** engage belt by using the belt engagement lever.

**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, return the engagement handle back to the START position, restart engine, **SLIGHTLY** increase throttle and attempt engagement again.
4. Once the belt is engaged, **SLOWLY** increase throttle to 100% or full throttle.
5. **ALWAYS** run the chipper at 100% or full throttle when chipping material.

**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!**

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.**
2. **ALWAYS** run engine at full operating speed before starting to chip material.
3. **If the chipper rotor slows**, stop feeding material. Allow the rotor to process backed up material. Feed material more evenly.
4. **If the chipper jams**, remove the branch and 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.
5. **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.
6. **Limbs fed in to the chipper chute must be 3 inches (7.6 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.
7. **Material fed into the shredder chute must be 3/4 inches (2 cm) in diameter or less.** Common shredding materials include grass, leaves, garden refuse, sticks, and small branches.



**WARNING**



**DO NOT INSERT BRANCHES LARGER THAN 3/4 INCH INTO SHREDDER OR MACHINE DAMAGE MAY OCCUR.**

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 and remove the spark plug wire 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.



**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.



## 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, slowly move the throttle to the SLOW position.
2. Allow the engine to run at slow idle for 30-60 seconds.
3. Stop the engine by moving the throttle to the STOP position or turning off the ignition switch.
4. Allow rotor to come to a complete stop.
5. Once the engine is off and the rotor has completely stopped, the belt can be disengaged by moving the belt engagement handle back to the START position.

### 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.

# 5 SERVICE & MAINTENANCE

## Section

### 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.**



### WARNING



To prevent personal injury or property damage: shut off engine and make sure that all moving parts have come to a complete stop before, servicing, adjusting or repairing. Disconnect the battery and remove ignition key where applicable.

SERVICE AND MAINTENANCE SCHEDULE							
COMPONENT	MAINTENANCE REQUIRED	REFER TO ENGINE OPERATOR'S MANUAL	FREQUENCY				
			BEFORE EACH USE	EVERY 8 HOURS	EVERY 25 HOURS	EVERY 50 HOURS	EVERY YEAR
Engine oil	Change (1)	•					
Fuel filter	Replace	•					
Spark plug	Check condition and gap	•					
Engine oil	Check/fill		•				
Fuel tank	Check/fill		•				
All internal and external nuts and bolts	Check tightness		•				
Battery connections	Check		•				
Chipper blades	Check sharpness and re-torque to 25 ft-lbs. (2)			•			
Shredder knives	Check condition			•			
Spark arrestor*	Clean			•			
Entire machine	Clean			•			
Drive belt	Check				•		
Belt tension	Check				•		
Belt/pulley alignment	Check				•		
Grease zerks	Lube					•	
Wheel bearings	Check						•
(1) Perform more frequently under extremely dusty conditions.							
(2) Perform more frequently when chipping 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 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.</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

There are holes on 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. Insert bolt into hole on the chute side housing panel and through holes on rotor to prevent the rotor from turning.
2. Remove bolt when service and/or maintenance is completed.

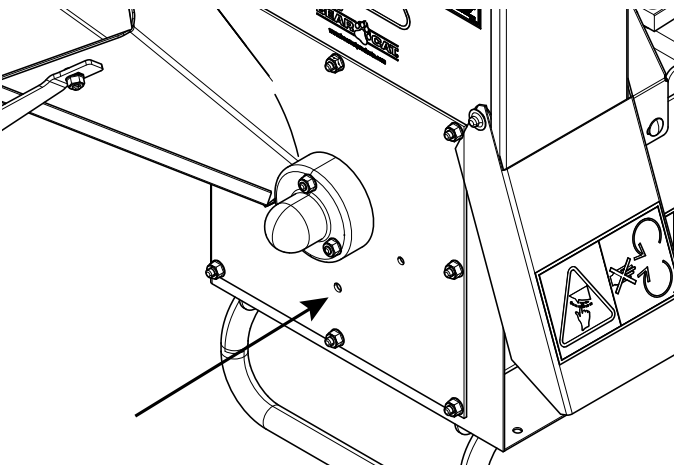


Figure 5.1, Rotor Lock Hole

### 5.3 CHIPPER BLADES MAINTENANCE

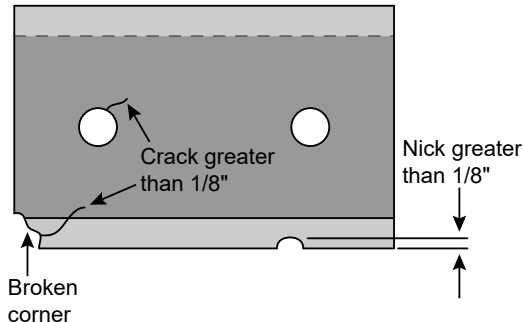
The chipper blades will eventually become dull, making chipping difficult and adding extra strain on the machine. **CHECK THE SHARPNESS OF THE BLADES EVERY 5-15 HOURS OF OPERATION AND SHARPEN AS NEEDED.**

Your blades need to be sharpened if:

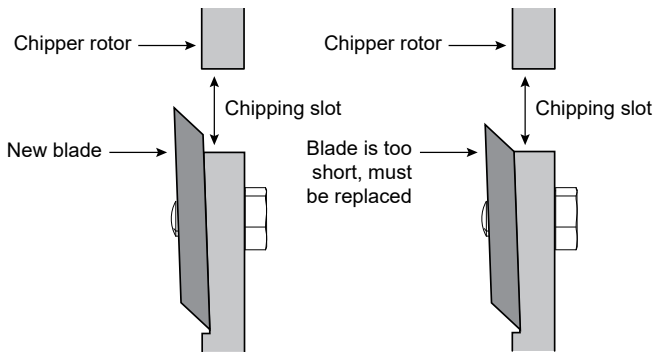
- Machine vibrates severely when material is fed into the chipper.
- Chips discharge unevenly or have stringy tails, especially when chipping green branches.

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).



### 5.4 REMOVING THE BLADES

**⚠ WARNING ⚠**

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

1. Install the rotor lock (see Section 5.2).
2. Flip the discharge door/shield (1) up. For CE compliant models, remove the discharge assembly.
3. Remove the 5/16 x 1" bolt (2) and flange nut (3) holding the shredder screen (4) to the bottom of the frame. Pull discharge screen out from the bottom and rotate the top downward to remove.
4. Remove the two bolts that hold the blade to the rotor. The hardware can be reused. Repeat for the remaining blade.
5. The blades have two edges and can be reversed one time before sharpening.



**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.

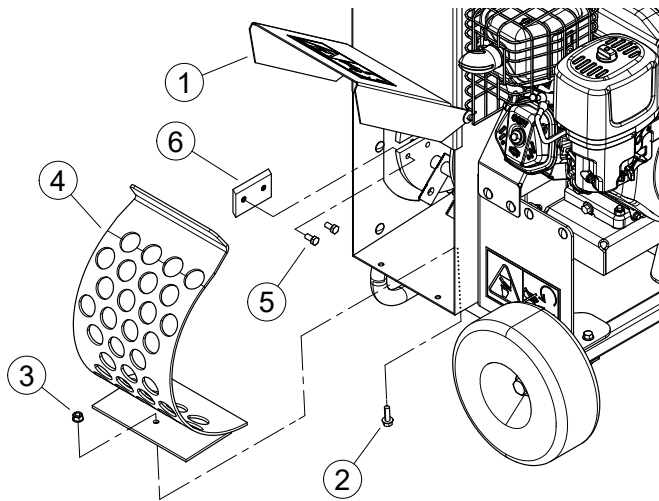


Figure 5.2, Blade Removal and Installation

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 5.3).

**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 chipping performance.
2. Regrind the angled edge of the chopping blades to 45 degrees (Figure 5.3). Use the blade angle gauge plate when sharpening the blades to achieve the proper angle (see Figure 5.4).

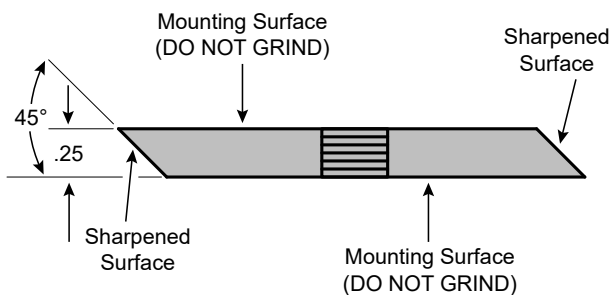


Figure 5.3, Chipper Blade Surfaces

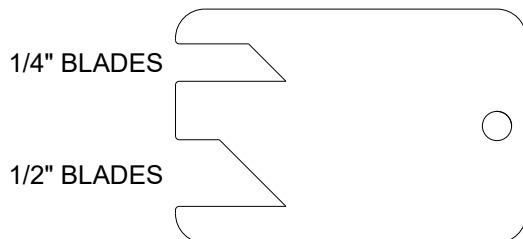


Figure 5.4, Blade Angle Gauge Plate

**5.6 INSTALLING THE BLADES**

See Figure 5.2 for illustration.

1. Clean away any material that may be between the blade and mounting surface on the rotor.
2. Place a blade (6) on the rotor and attach with two 5/16-18 x 5/8" bolts (5). Torque to 25 ft-lb. Repeat for the second blade.
3. Reinstall the shredder screen (4) in the machine with 5/16 x 1" bolt (2) and flange nut (3).

**NOTE**

Make sure the top flange of the discharge screen is properly and completely installed into upper slot of the housing. Failing to do so may cause knives to make contact with discharge screen during operation.

4. Lower the discharge door/shield (1) into the normal operating position. For CE compliant models, reinstall the discharge assembly.
5. Remove rotor lock.

**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 SHREDDER KNIVES MAINTENANCE**

Do not attempt to sharpen shredder knives. Inspect the knives often for signs of damage.

If a knife has any sign of cracking or is broken in any way, it should be replaced immediately.

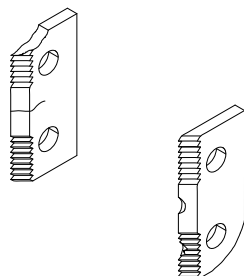


Figure 5.5, Examples of Damage to Knives

**5.8 REMOVING THE SHREDDER KNIVES****WARNING**

The serrated edge of the shredder knives should face the same direction as the cutting edge of the chipper blades. Never reuse the #10-24 nut and bolt. Never reuse shafts or spacers if they show signs of wear or abuse. Always install new parts when repairing.

1. Remove the lower belt guard from under engine frame, remove discharge door/shield and discharge screen.
2. Remove the 10-24 x 1-3/8" bolts and nuts from knife shafts.
3. Align shaft with the 5/8" hole in rear of frame and the small hole in front of frame by the chipper chute.
4. Using a small punch or rod, push the shaft out the 5/8" hole in rear of frame.
5. To assemble, insert shaft through the 5/8" hole in rear of frame and slide knives and spacers in their proper order onto the shaft. **Install a new 10-24 x 1-3/8" bolt and nut.**
6. Repeat steps 3 through 6 to assemble the other three shafts.
7. When completed, install the discharge screen, discharge door shield and torque all 3/8" bolts to 33 ft-lbs. Test run machine.

**5.9 ADJUSTING THE CHIPPER ANVIL**

The chipping 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 the anvil:

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 (Figure 5.6) and engine side (Figure 5.7) bearings.
3. Use a punch and hammer in punch hole (3) to tap the lock collars in the opposite direction of normal rotation.

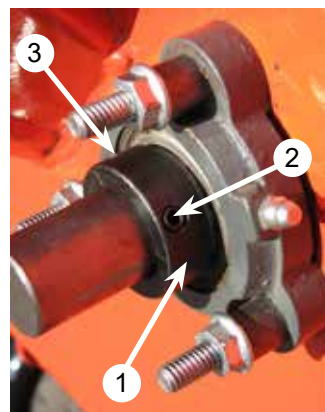


Figure 5.6, Chute Side Bearing

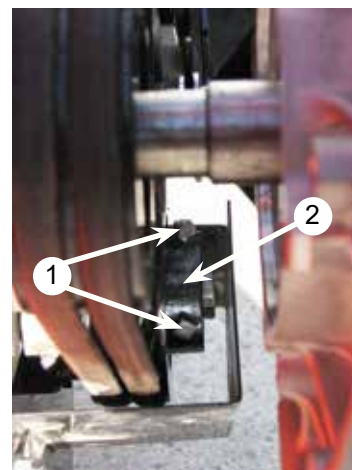


Figure 5.7, Engine Side Bearing

**NOTE**

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



**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.

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 chipping blades.
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. 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. Insure 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.

**5.10 CLEARING A PLUGGED ROTOR**

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

1. Shut off engine and allow all moving parts to come to a complete stop.
2. Remove the 5/16 x 1" bolt and flange nut securing the discharge screen to the frame and remove the shredder screen.
3. 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.
4. Install discharge screen and retaining hardware.

**5.11 CHANGING THE DISCHARGE SCREEN**

There are several optional discharge screens available in different sizes (see Section 8). Optional discharge screens produce different sized chips. To change the discharge screen, proceed as follows:

1. Shut machine off, make sure all moving parts have completely stopped and disconnect spark plug wire.
2. Lift discharge door/shield to gain access to the discharge screen.
3. Remove the 5/16 x 1" bolt (1) and flange nut (2) securing the discharge screen to the frame (Figure 5.8). Pull discharge screen out from the bottom and rotate the top downward to remove.

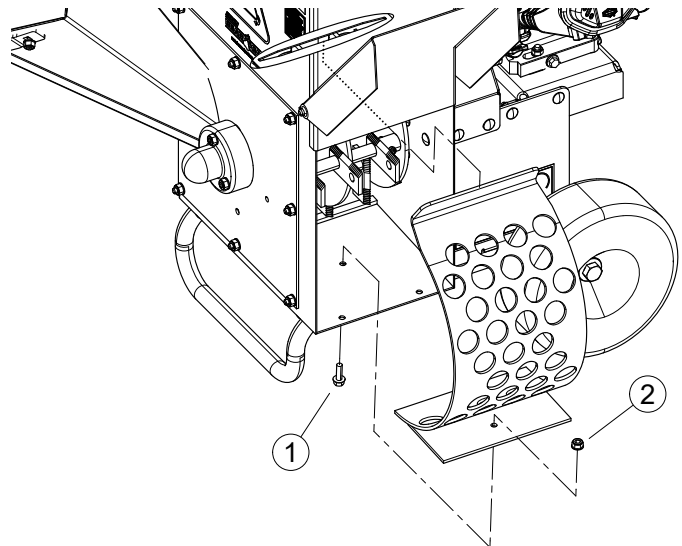


Figure 5.8, Changing the Discharge Screen

4. Clean any trash or debris out from the screen area.
5. Insert the top of the replacement screen into the slot in the chipper body and push the bottom of the screen inward so bolt holes align.

**NOTE**

Make sure the top flange of the discharge screen is properly and completely installed into upper slot of the housing. Failing to do so may cause knives to make contact with discharge screen during operation.

6. Install the bolt from the underside upward through the frame and screen, attach flange nut and tighten securely.

**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.

**5.12 BELT GUIDE ADJUSTMENTS**

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

1. Remove belt shield to expose the belt and pulleys.



Figure 5.9, Belt Shield Removal

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.



Figure 5.10, Engine Side Bearing Set Screws

3. Engage the clutch 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 clutch 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 clutch 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 clutch disengaged, the card should not be able to slide. Adjust if necessary.



**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 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 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.

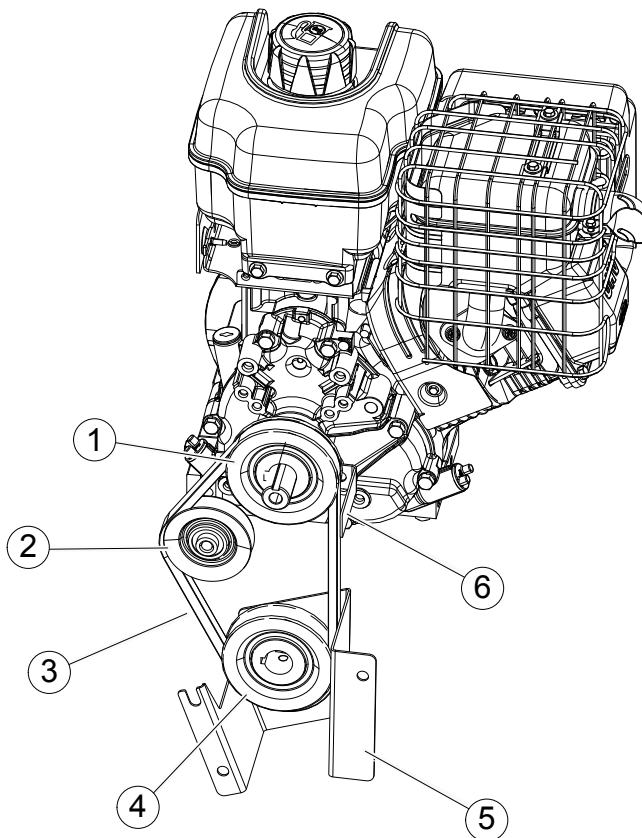


Figure 5.11

**5.14 REMOVING THE ROTOR**

1. Remove discharge door/shield, discharge screen and 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.
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.
7. Repeat steps 2 and 3 on the engine side rotor bearing.
8. Remove the bolts securing the chipper chute cover to the frame and remove chipper chute cover.
9. 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.

**5.15 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 the following points every 50-100 hours of operating time:

- Engine side bearing
- Chute side bearing

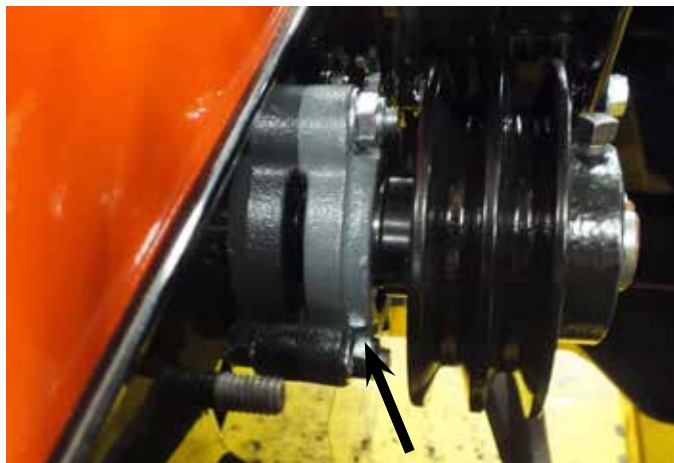


Figure 5.12, Engine Side Bearing Zerk (Bottom of Bearing)



Figure 5.13, Chute Side Bearing Zerk

# 6 TROUBLESHOOTING

## Section

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 ECHO 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	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.
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 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

\*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 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
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

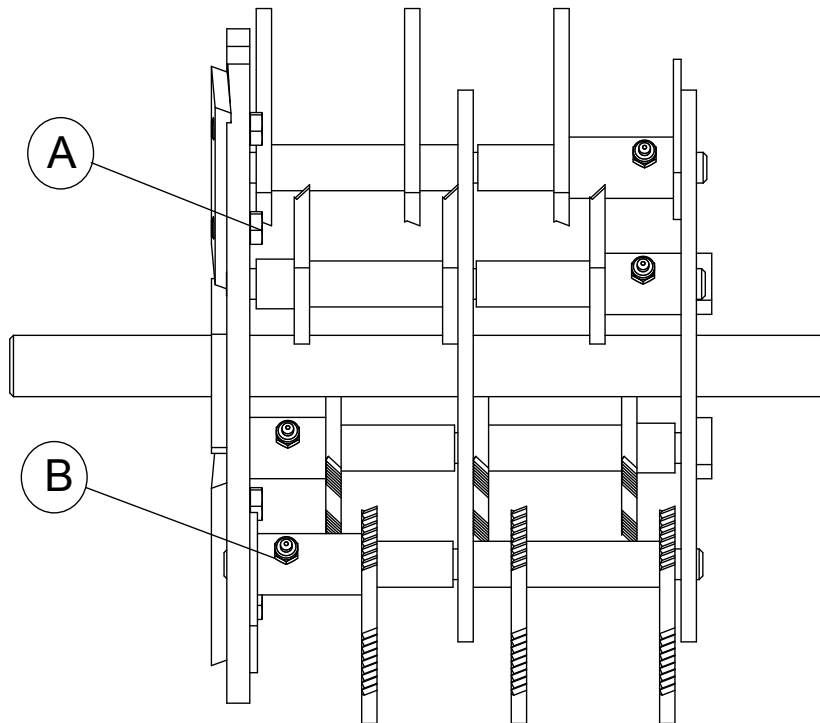
# 7 SPECIFICATIONS

## Section

SC3306		
DESCRIPTION	ENGLISH	METRIC
Overall weight	228 lbs.	103.4 kg
Max chipper capacity	3"	7.6 cm
Chipper blades	3.125 x 2 x .25"	7.94 x 5.08 x 0.64 cm
Max shredder capacity	3/4"	2 cm
Shredder knives	12	
Rotor speed	3,600 RPM	
Rotor weight	27 lbs.	12.3 kg
Drive type	Single belt	
Belt size	29"	73.7 cm
Engine	306cc Briggs & Stratton®	




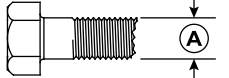
SC3306E		
DESCRIPTION	ENGLISH	METRIC
Overall weight	240 lbs.	108.9 kg
Max chipper capacity	3"	7.6 cm
Chipper blades	3.125 x 2 x .25"	7.94 x 5.08 x 0.64 cm
Max shredder capacity	3/4"	2 cm
Shredder knives	12	
Rotor speed	3,600 RPM	
Rotor weight	27 lbs.	12.3 kg
Drive type	Single belt	
Belt size	29"	73.7 cm
Engine	306cc Briggs & Stratton	

SPECIAL TORQUE REQUIREMENTS			
LOCATION	HARDWARE DESCRIPTION	TORQUE (UNIFIED INCH)	TORQUE (METRIC)
A – On rotor plate, blade mounting bolts	5/16 x 1" hex HD, grade 8 bolts	25 ft-lbs.	34 Nm
B – On rotor knife shafts	10-24 x 1-1/8" screw	36 in-lbs.	4 Nm





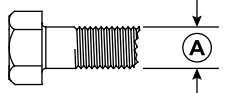


## 7.1 BOLT TORQUE

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%.

# 8 OPTIONS

## Section

PART NUMBER	DESCRIPTION
31605-00	METER, TACH/HOUR
70089	LEAF TAMPER
70093	ALL WEATHER COVER
70251	BLOWER WITH 2-BLADE RADIAL FAN
70355-00	KIT, 3" DISCHARGE DEBRIS BAG
70738	KIT, CHIPPER BLADE
70973	KIT, SHREDDER KNIVES
77000-00	KIT, TWO WHEEL TOW
77353-00	TRAILER, 3" CHIPPER/SHREDDER
77386-12	SCREEN, FINE DISCHARGE (3/8" DIAMETER HOLES)
77387-12	SCREEN, MEDIUM DISCHARGE (3/4" DIAMETER HOLES)
77388-12	SCREEN, COARSE DISCHARGE (1-3/8" DIAMETER SLOTS)
77389-12	SCREEN, WET DEBRIS



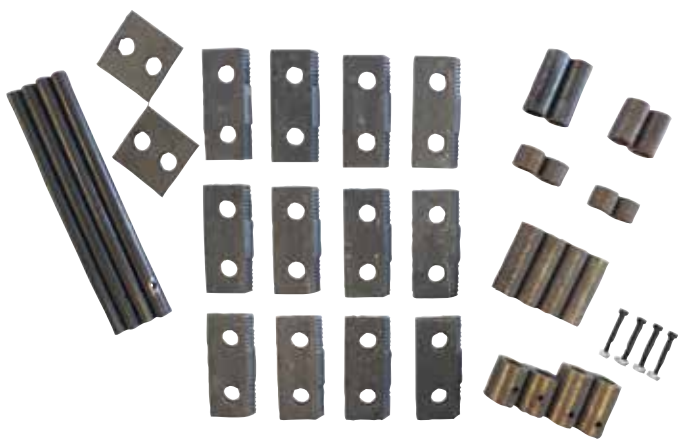
Trailer, 77353-00



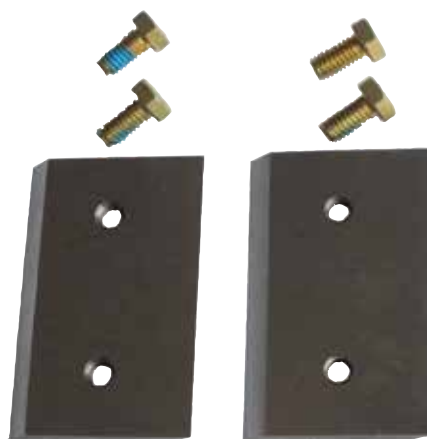
Leaf Tamper, 70089



Discharge Screens  
(See Chart For Part Number Details)



Shredder Knife Kit, 70973



Chipping Blade Kit, 70738



Optional Blower, 70251



Discharge Debris Bag, 70355-00



Two Wheel Tow Kit, 77000-00



All Weather Cover, 70093



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