

OWNER'S & OPERATOR'S MANUAL



PRO-SERIES
CSV'S WITH GAS ENGINES

PATRIOT
PRO-SERIES 10
CRIPPER-SHREDDER-VAC

HEAVY DUTY ROTOR

PATRIOT

**THIS AIN'T
EXACTLY A NEW YORK
TIMES BESTSELLER,
BUT...**

Rest assured. This Patriot Chipper-Shredder-Vac™ is the most versatile leaf clean-up machine around. And, it is more efficient and aggressive than products twice its weight costing much more.

However, before you get started, read all the instructions in this manual to work efficiently and safely.

For your own satisfaction and well-being, take time now to study this publication and make it available for anyone else who might use this machine. Then, drop your warranty card in the mail so we can send you news and updates.

Work safely and enjoy!

—PATRIOT PRODUCTS, INC.

THE PATRIOT WARRANTY

NORTH AMERICA ONLY • HOMEOWNERS ONLY



For three years from the date of purchase, Patriot Products, Inc. will repair or replace at its option, free of charge to the original owner, any parts found to be defective due to materials or workmanship.

This warranty applies to products sold and kept in North America, that are operated and maintained as described in this Owner's & Operator's Manual. Please note that the engine is warranted separately by the engine manufacturer. Patriot does not warranty the engine.

The misuse, abuse, commercial use beyond 90 days from the date of purchase, neglect, accident, or improper maintenance of this machine voids this warranty. The warranty does not cover parts that need to be replaced due to normal wear and tear.

Patriot Products, Inc. shall not be liable for any damages or injuries arising from our products, defective or otherwise. The Patriot Warranty gives you specific legal rights. You may have other rights which vary from state to state.

THIS WARRANTY IS NOT TRANSFERABLE.



**PATRIOT
PRO-SERIES**

9.0 HONDA
10 XL/C

ATTENTION LANDSCAPERS, PRO'S AND RENTAL OUTFITTERS!

You've got complete 180 day coverage of all Patriot components! Patriot will provide replacement parts free should your Patriot fail on the job. (Engines warranty covered separately by the manufacturers.)

To register your Patriot or make a claim under "Complete 180 PRO-Series," you must comply with the following:

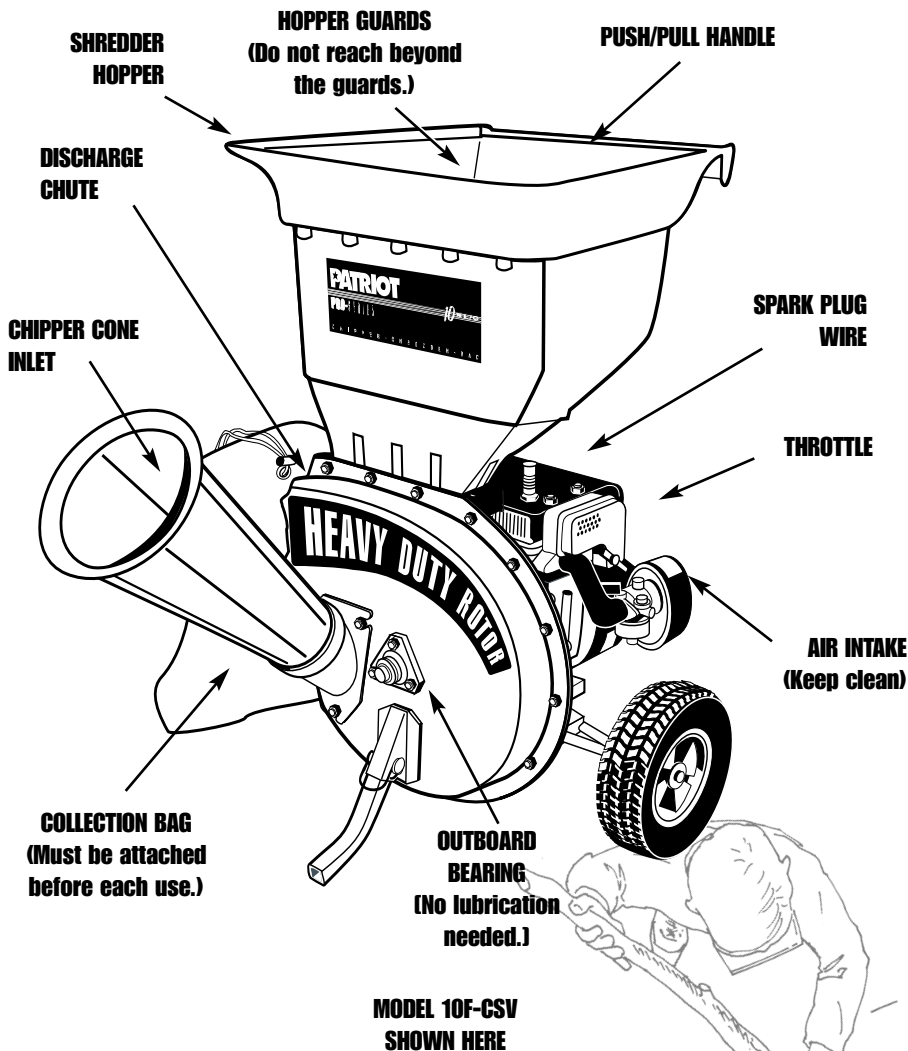
1. Bring the product back to your place of purchase or contact Patriot for the nearest authorized service center.
2. Bring along your DATED SALES RECEIPT as proof of the date of purchase and your company's ownership. This receipt must be faxed or mailed to Patriot Customer Service before coverage can be honored by the factory.



**THESE BLACK TRIANGLES
CALL YOUR ATTENTION TO
IMPORTANT SAFETY AND
OPERATING INSTRUCTIONS.
PROPERTY DAMAGE AND/
OR PERSONAL INJURY MAY RESULT
IF THESE INSTRUCTIONS ARE NOT
HEEDED BY ALL OPERATORS.**

KEY FEATURES

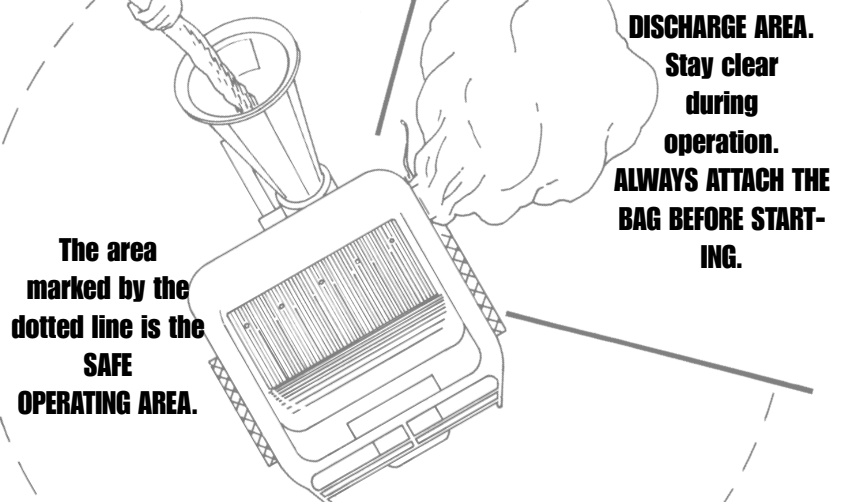
Patriot Chipper-Shredder-Vac™



CAUTION: OPERATE YOUR GAS ENGINE OUTDOORS, IN A WELL-VENTILATED AREA. KEEP CHILDREN AND PETS AWAY FROM THIS POWER EQUIPMENT. SERIOUS INJURY OR DEATH CAN RESULT.

WARNING: DO NOT OPERATE THIS EQUIPMENT UNTIL IT IS COMPLETELY ASSEMBLED AND SERVICED AND YOU HAVE READ AND UNDERSTAND THIS MANUAL. FILL OUT, SIGN AND RETURN YOUR WARRANTY CARD AND SATISFACTION SURVEY AFTER YOUR INITIAL USE OF THE PRODUCT.

WARNING: NEVER PUT YOUR HANDS, FACE OR CLOTHING INTO ANY HOPPER, CONE OR CHUTE WHEN THE ROTOR IS TURNING. NEVER PUT YOUR FINGERS OR FACE INTO THE CHUTE OR BEYOND THE HOPPER GUARDS WHEN THE ROTOR IS TURNING. ALWAYS HAVE THE BAG ATTACHED BEFORE STARTING. SERIOUS PERSONAL INJURY MAY RESULT.





WARNING: NEVER PUT YOUR HANDS, FACE OR CLOTHING INTO THE CHIPPER CONE OR OTHER INLETS WHEN THE ROTOR INSIDE IS STILL TURNING. KEEP YOUR FINGERS AND FACE OUT OF THE INLETS, OUTLETS AND EXHAUSTS WHEN THE ROTOR IS TURNING OR ENGINE IS RUNNING. SERIOUS PERSONAL INJURY MAY RESULT.

CUSTOMER SERVICE HOTLINE

1-800-798-CHIP

OUTSIDE THE U.S. CALL 1-262-523-4580

8:00 AM - 4:00 PM Central Standard Time

MONDAY - FRIDAY (EXCEPT MAJOR HOLIDAYS)

FAX 1-262-523-1011

What About Engine or Starting Problems?

The engine manufacturer warranties the engine separately. If you experience difficulties with your engine, see your telephone book for the engine manufacturer's nearest service center.

How Do I File a Claim?

If you believe any Patriot product or part is defective within a three (3) year period from the date of purchase, contact your place of purchase. They will file your claim or they will direct you to a qualified Patriot Authorized Service Center. You will be asked to produce a dated receipt for the product if it was not registered with the factory.

If the product or part is determined to be defective by a Patriot Authorized Service Center, we will repair or replace it at our discretion, at no expense to you or the service center.

If the product or part is damaged due to negligence, abuse of the product's purpose, or improper maintenance, the warranty is void.

How Long Will It Take?

Warranty repairs may take a few minutes...or a few days. It depends on the nature of the problem. We believe it is in everyone's best interest to provide service as quickly and efficiently as possible. However, during peak seasons, a service center may need a week or more to schedule and perform repairs.

What About Professional or Commercial Use?

A Patriot employed in any commercial endeavor (rental stores, landscaping businesses, farming, etc.) is warranted for 90 days from the date of purchase under the terms and conditions described above.

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Common (and Expensive) Mistakes

Sure-fire ways to *shorten* the life of your chipper-shredder-vac while incurring costly repairs along the way:

- Neglecting the engine's need for fresh, clean oil.
- Not cleaning the engine recoil of debris or changing the air filter from time to time. Over-heating results, burning out the engine.
- Chipping dead wood or lumber and not sharpening the knives more often.
- Forcing branches down the chipper when the knives are dull and not self-feeding.
- The occasional, if accidental, railroad spike, brick, 2 x 4, barbed wire, and/or gardening tool "down the hatch" routine.



ATTENTION: WEAR GOGGLES AND STURDY SHOES WHEN USING THIS MACHINE. HEARING PROTECTION IS ALSO ADVISED.

Message to Parents

Poor judgement when using this equipment may result in damage and serious personal injuries. Help prevent accidents by making thoughtful decisions about *if, when, and how* older children will operate this equipment.

Age is not the only factor.

1. Size, strength, and coordination. Each is required to start, push, pull, and turn the equipment safely.

2. Maturity and responsibility. Does the young person think through problems and use good judgement?

3. Supervision. Make time to talk through the manual and walk through the operation of the machine. Supervise the operation of the machine the first few times. Do all re-fueling and maintenance yourself.

Put safety first. Take time to instruct the young person. Even as they gain confidence and a sense of accomplishment with the machine, continue to monitor their work.

Long-Term Storage

Store the chipper-shredder-vac out of reach of children and where gasoline vapors will not find an open flame or spark. For extended storage periods (such as over the winter months), add a fuel stabilizer and let the engine run briefly to allow the stabilizer to mix with the fuel and get into the carburetor and fuel lines. Let the engine to cool before storing.

Change the oil and add fresh fuel to return the unit to "active duty."



WARNING: DO NOT OPERATE THIS EQUIPMENT UNTIL (1) IT IS COMPLETELY ASSEMBLED AND SERVICED, AND (2) YOU READ AND UNDERSTAND THIS MANUAL.

1 SAFETY

The Shut Down Procedure

Before assembling, using, servicing, or otherwise operating your chipper-shredder-vac, protect everyone's safety by knowing how and when to use the Shut Down Procedure.

HOW TO SHUT DOWN

1. Turn off the engine. Do not touch hot engine parts or exhaust.
2. Wait until the rotor has stopped turning.
3. Disconnect the spark plug wire from the spark plug.

WHEN TO SHUT DOWN

- ⇨ Before attaching, unzipping, or detaching the collection bag.
- ⇨ Before clearing debris from any inlet or outlet in the event of a clog.
- ⇨ Before removing debris from inside the chipper cone or shredder hopper.
- ⇨ Before refueling the gas tank or adding oil.
- ⇨ Before putting hands, face, fingers, probes, etc., near moving parts.
- ⇨ Before children, pets or bystanders come near.

Your Responsibilities

Know how to stop the engine quickly.

- ▲ Show others who will use this product how to use it safely. Allowing anyone—especially children—to use this equipment without instruction may cause serious injury. Please remember that this is a tool, not a toy.
- ▲ Wear long pants, protective footwear, and safety goggles. Hearing protection is advised. You may suffer injury if you work barefooted or wear only sandals.
- ▲ Keep alert while operating this equipment.

Operator and Property Hazards

Check all fasteners for tightness before each use. Keep the engine's air intake on top clear of debris and leaves. Do not move the machine while the engine is running or the rotor is turning.

- ▲ Keep all guards, deflectors and warning labels in place. Replace them should they become cracked, broken or unreadable.
- ▲ Keep your face, hands, body, and clothing out of the hoppers, bag, and discharge areas. Stay clear of moving parts and hot mufflers.
- ▲ Do not wear loose-fitting clothing or hanging jewelry.

Thrown Object Hazards

Clear the chipper and shredder hoppers before trying to start the engine.

- ▲ The collection bag must be installed by the operator before each use. Do not start the engine until the bag is attached over the discharge chute.
- ▲ Do not use near pets, parked cars or bystanders.
- ▲ Inspect yard waste before processing. Make sure it is free of rocks, glass, metal, and other non-organic objects.
- ▲ Work in daylight, so you can see objects, hazards, and bystanders.

Fire and Burn Hazards

Gasoline is very flammable. The vapor can explode. Use extreme care when handling gasoline. **KEEP FUEL AWAY FROM CHILDREN.**

Use a proper fuel container for your gasoline. Do not remove the gas cap until you have shut down the chipper-shredder-vac. Re-fuel the engine out of doors and only after the engine has cooled down. Use a gasoline funnel.

Do not operate or store the chipper-shredder-vac, or the gasoline, near open flames or other heat sources.

- ▲ Avoid touching a hot engine and exhaust system. Allow the engine to cool before refueling, transporting, or storing the chipper-shredder-vac.
- ▲ Refuel in a well-ventilated area with the engine shut off and the rotor fully stopped. Keep flames, sparks, and smoking materials away!
- ▲ Avoid spilling or over-filling the tank. Tighten the gas cap after re-fueling. Allow spilled fuel to dry before re-starting the engine.
- ▲ Store the chipper-shredder-vac on a level surface in a well-ventilated area, away from appliances like water heaters and clothes drier.

Grass and dry leaves are also flammable. Empty the bag when you are finished, even if it is not full. Stored shreds and clippings are a fire hazard.

- ▲ Grass and dry leaves are flammable. Empty the bag before storage, even if it is not full. Stored shreds and clippings are a fire hazard.

Carbon Monoxide Hazards

Exhaust from the engine contains poisonous carbon monoxide. It is colorless, odorless, and can be lethal. Breathing the exhaust can cause loss of consciousness, possibly leading to death.

- ▲ Do not operate any gas engine in an enclosed area. Use outdoors only!
- ▲ Carbon monoxide is a poison known to cause cancer and birth defects.

Mechanical Hazards

If unusual vibration or noise occurs, shut down the chipper-shredder-vac. Continuing to run the machine when it may be damaged may cause serious property damage and personal injury. Replace or repair parts as needed and check fasteners for tightness before resuming work. If there are still problems, take it to a service shop.

- ▲ Don't tamper with the engine speed governors. They prevent rotating parts from over-speeding and causing damage or injury. Seek an authorized service mechanic should engine problems arise.
- ▲ Do not put your hands or any other part of your body or clothing inside the cone, shredder hopper, or into any inlet or outlet to moving parts!
- ▲ Do not attempt even a minor clean-out of the cone, hopper, bag, or engine service while the rotor is turning!
- ▲ Empty the collection bag when it is almost full to prevent clogging and poor performance.



Safety & Maintenance

This chipper-shredder-vac is built to meet or beat the very latest safety standards established by the Outdoor Power Equipment Institute and the American National Standards Institute.

Part of this certification requires that safety labels meet certain standards. They must be replaced when they become worn out. It is your responsibility to replace the labels if they become hard to read.

Safety certification also requires that all guards and deflectors be kept in place and in good condition. Again, it is the operator's job to repair or replace guards and deflectors when necessary.

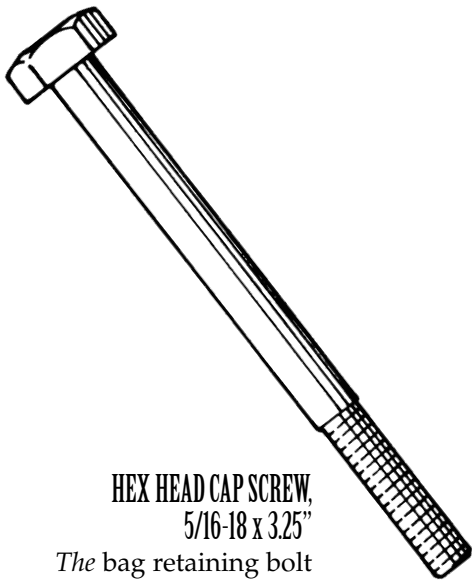
Other Maintenance

Regular maintenance must also include the engine. Add oil as it is needed and change the oil regularly. Your engine manual has information about the kind of oil to use, how much to use, and how to add or drain the oil.

It's hard to say exactly when you should sharpen the knives or replace the shredding hammers.

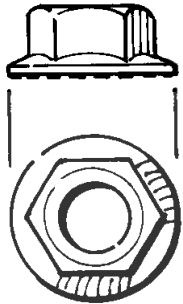
Chipping branches and prunings while they are green and fresh keeps the knives wet and cool. They stay sharp longer. Dead, dry wood—and dirty, gravelly garden waste, for that matter—dulls chipping knives.

Generally speaking, when the knives do not pull branches down the chipper with relative ease, it is time to sharpen them. The hammers can be checked after you have shut down. If the edges are smooth, weathered or bent, reverse or replace them.



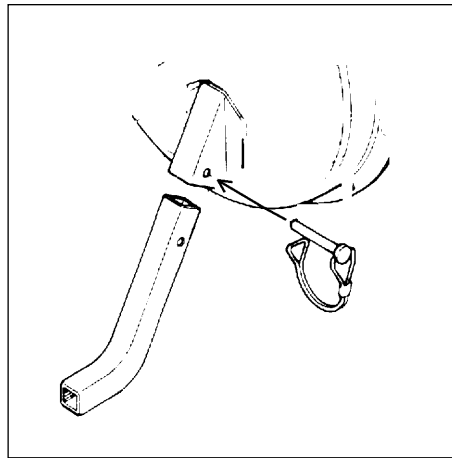
**HEX HEAD CAP SCREW,
5/16-18 x 3.25"**

The bag retaining bolt
used in Step 3.



**SERRATED
FLANGE NUT**

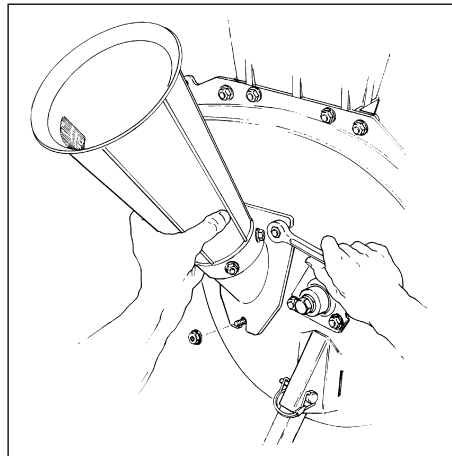
Side and top views.
The serrations on
the bottom bite into
the steel for better
staying power.



2 ASSEMBLY

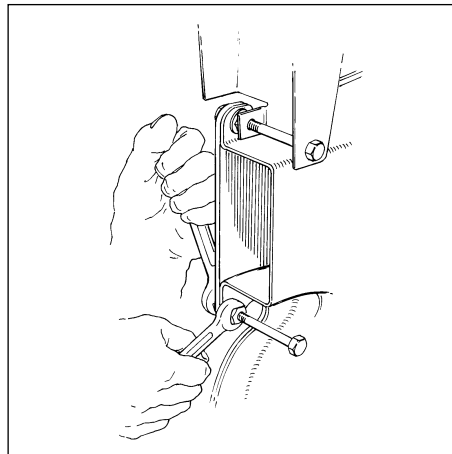
STEP 1

Put the leg into its holder. Insert the lynch pin and clip the U-shaped clasp over the front of the leg, onto the end of the pin.



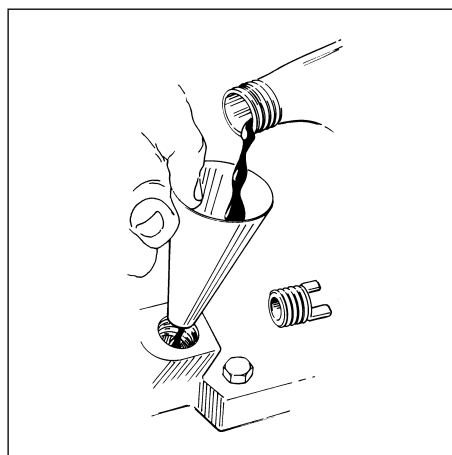
STEP 2

Insert the base of the chipper casting, bottom first, into the oval hole. Use your 1/2" wrench to tighten three serrated flange nuts (5/16-18) on the exposed studs. *Do not over-tighten these nuts. Do not file or grind any part of the chipper cone base.*



STEP 3

Thread one flange nut onto the 3-1/4" long bolt with the serrated side facing *away* from the head of the bolt. Insert the end of the screw through the hole under the discharge chute. Screw on the remaining nut, serrated side facing *in* this time. Tighten with one 1/2" wrenches. (Use two wrenches if the bolt won't go in easily.)

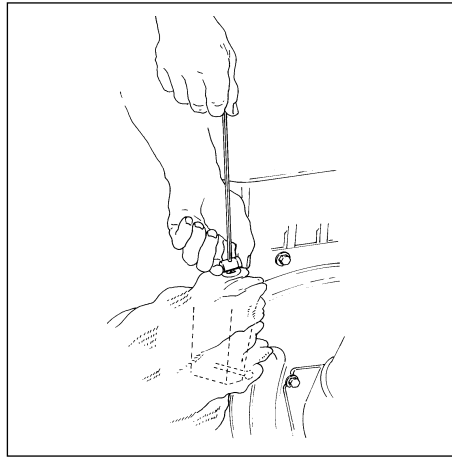


STEP 4

SEE YOUR ENGINE MANUAL FOR PROPER OIL LEVELS. Oil and gas are poured into different parts of the engine. *Do not mix the oil and the gas! Engines are shipped with a reddish lubricant in them. Please refer to owners manual for proper oil type.*

STEP 5

Attach the bag over the entire deflector shield assembly and the retaining bolt you installed in STEP 3. Pinch the plastic barrel clamp and pull down sharply until the bag is tightly attached. The bag must be put on before each use of your chipper-shredder-vac.



Now check all the fasteners. They may have loosened during shipping. Tighten anything that's loose. It's a good idea to check the fasteners for tightness before every use.

Don't Have a Seizure

Bolt it together, add some gas and start chippin'...and the engine will seize and jerk to a dead-stop in minutes.

Call the engine manufacturer and the first question will be, *Was there oil in the engine before you ran it?* Because unless you put it there, there wasn't.

Failure to fully prep the engine is the single most common mistake you can make with power equipment. Young, old, weekend warrior, or seasoned power jockey, it can happen to anyone. Slipping in a quart after the damage is done doesn't cover the tell-tale tracks, either.

So, read the engine manual, follow the instructions and hope you never join the Seizure Club.

The good news is, people rarely join twice!

Also, it is important to keep the recoil area (where the pull cord is located) clean of leaves and debris. Change the air filter regularly, too. If either of these two intakes become too dusty and dirty, the engine overheats and may seize up.

Engine Controls

Be careful before touching the muffler or other metal engine parts. Even if the machine has been running just a few moments, the engine and exhaust can get hot enough to cause a serious burn.

THE RABBIT

Low or Idle: When you are not shredding or chipping, move the throttle to a lower speed.

Fast: When chipping, shredding or using the vac hose option, move the throttle to its highest speed.

THE STOP SIGN

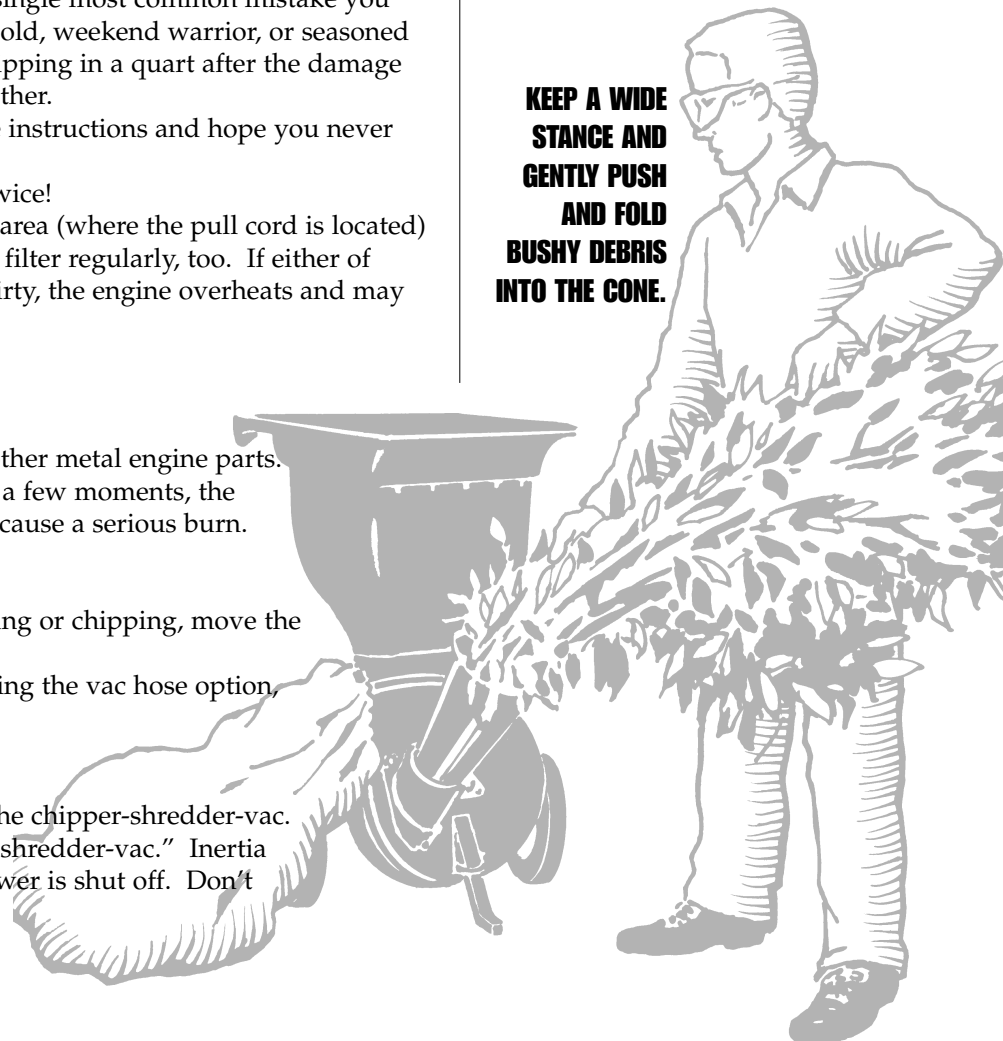
Move the throttle to OFF to cut power to the chipper-shredder-vac. Notice, we do not say "to stop the chipper-shredder-vac." Inertia causes the rotor to coast, even after the power is shut off. Don't mess with a moving rotor!



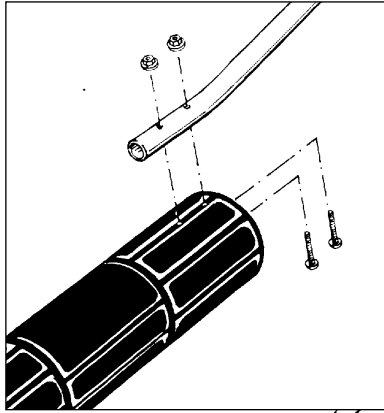
FIRE AND EMISSIONS WARNINGS (ESPECIALLY FOR CALIFORNIA OWNERS AND OPERATORS)

CAUTION: This engine may not be equipped with a spark arrester. If it is to be used on any forest-covered, brush-covered or grass-covered unimproved land, a spark arrester would have to be added to the muffler before using the engine on such land. The arrester must be maintained in effective working order by the operator. This is required by law in certain states. Federal laws apply on federal lands. Contact your authorized engine service center in your telephone book for spark arrester muffler options.

KEEP A WIDE STANCE AND GENTLY PUSH AND FOLD BUSHY DEBRIS INTO THE CONE.



ACCESSORY KIT



15-ft. Vac Kit Assembly (Optional)

The optional vacuum kit, 15 feet long and 4" in diameter, is used to vacuum and grind leaves, pine straw and other loose organic waste. The kit is sold separately; instructions are provided here and with the kit for your convenience.

FIRST

Insert two 1.25"-20 carriage bolts from inside the nozzle and through the holes in the handle. Fasten with the two 1/4"-20 serrated flange nuts provided using a 7/16" wrench.

SECOND

Push one end of the hose firmly into the nozzle. The nozzle has what is called a "regressive" fit. Turn the nozzle a few times to adjust the angle of the nozzle.

THIRD*

Thread the other end of the hose into the adaptor about three inches. You may need to tug it through from the other side.

FOURTH*

When you want to use the vac, snap the adaptor into the hopper *before you turn on the engine*. The adaptor only fits with the DANGER decal on your right as you stand behind the machine.

FIFTH & LAST*

Snap the cone cover over the chipper cone. This seals off all air flow for maximum vacuuming power.

**Patented design featured in this step.*

3 OPERATION

Safe Operating Conditions

Avoid wet, slippery terrains or areas congested with people and traffic. Avoid using the machine on driveways, sidewalks, gravel, and other hard areas. The force of the air might make debris bounce up and hit cars, you, or bystanders. Wear goggles and other protective clothing.

Chipping

CHIPPER	HP	CAPACITY	TYPE OF DISCHARGE
Hard or soft branches, prunings, corn stalks, drier viney materials, palm fronds.	9 & 10	3" dia.	Coin-sized chips

CHIPPING TIPS

- Rotate, insert, and retract thicker branches so that the engine runs at a steady rate. Allow the rotor to recover and discharge the chips.
- Skinny prunings may be bundled and inserted together.
- Green materials chip easier and the knives keep their edges longer.
- Resharpen or replace the chipper knives when you notice that they do not self-feed very well. Forcing debris into dull knives causes vibration and will eventually damage or destroy the rotor.
- Shut down and empty the bag before it fills up and stalls the rotor.

Shredding

SHREDDER	HP	CAPACITY	TYPE OF DISCHARGE
Leaves, pine straw, small plants, flowers, bulbs, light prunings.	9 & 10	1" dia. x 36"	Fine mulch (greens) to longer fingerling shreds. Same as above.

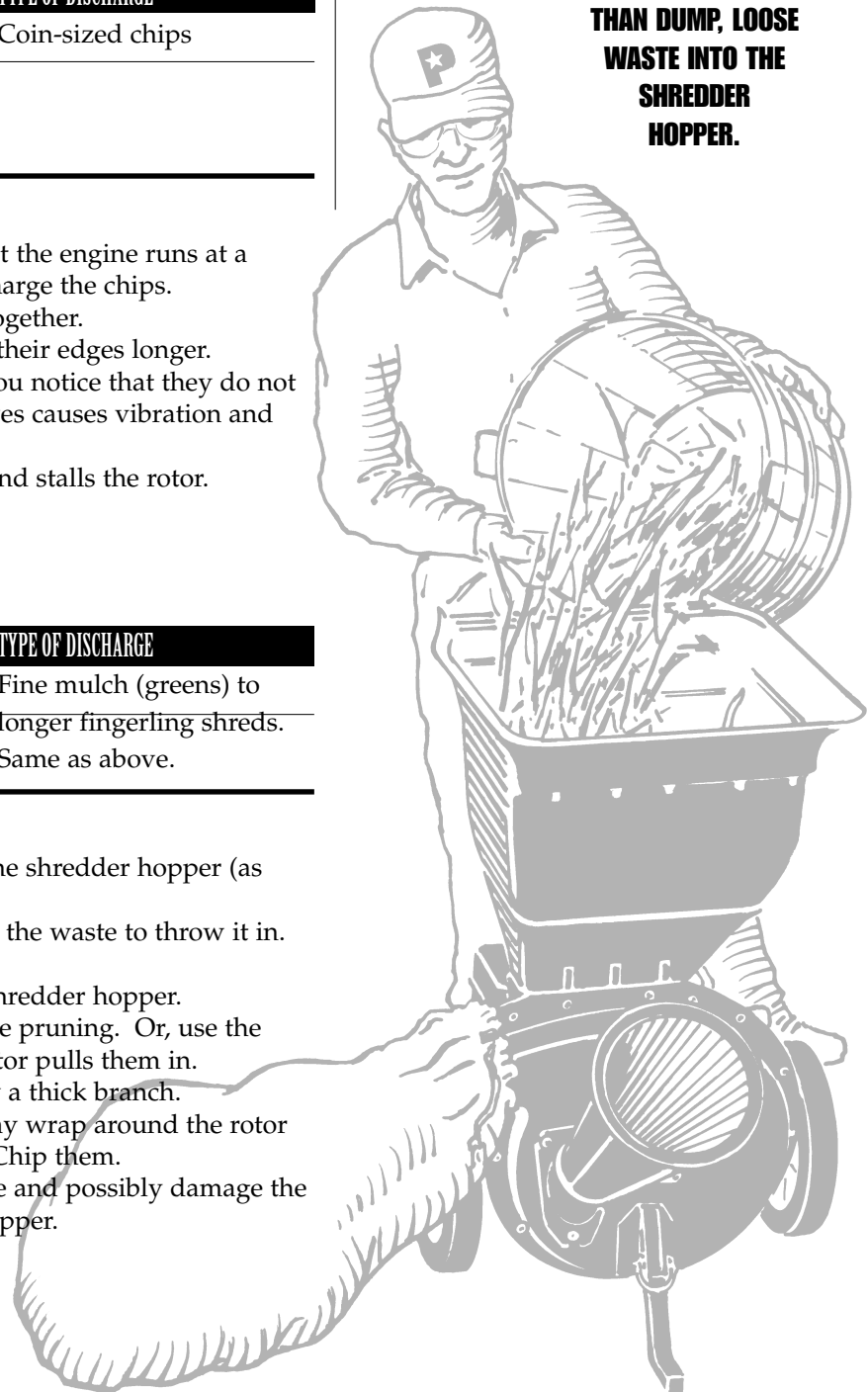
SHREDDING TIPS

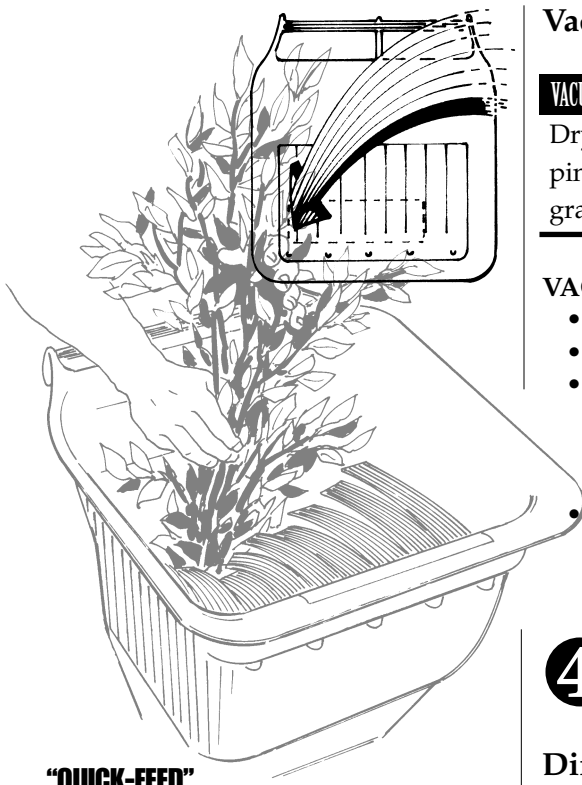
- Aim the waste butt-first down the right side of the shredder hopper (as you stand behind it).
- Use an open-handed technique, loosely grasping the waste to throw it in. Do not hold onto it.
- Pour—rather than dump—leafy waste into the shredder hopper.
- Chase waste stuck in the throat with a shreddable pruning. Or, use the end of 3" thick branch to stir clumps until the rotor pulls them in.
- Vines are best fed down the chipper, followed by a thick branch.
- Green debris exceeding the length limitations may wrap around the rotor and seriously plug up or damage the machine! Chip them.
- Materials that are too thick may stall the machine and possibly damage the hammers, rotor, housings or hopper. Use the chipper.



CAUTION: OPERATE YOUR GAS ENGINE OUTDOORS, IN A WELL-VENTILATED AREA. KEEP CHILDREN AND PETS AWAY FROM ANY OPERATING POWER EQUIPMENT.

POUR, RATHER THAN DUMP, LOOSE WASTE INTO THE SHREDDER HOPPER.





**“QUICK-FEED”
PRUNINGS DOWN
THE LEFT SIDE OF
THE SHREDDER
WITH A LOOSE,
OPEN GRIP.**

Vacuumping

VACUUM (15-ft. kit optional)	HP	CAPACITY	TYPE OF DISCHARGE
Dry to wet leaves, pine straw, sawdust, grass clippings.	9 & 10	Loose waste	Fine mulch (leaves), some fingerling shreds.

VACUUMPING TIPS

- Keep the hose straight or slightly curved along the ground.
- Allow nozzle to hover over the waste, rather than sticking it into the pile.
- If the vacuum loses power, there may be a clog in the nozzle or in the throat of the shredder hopper. Lift the hose over your head and shake it. You may need to shut down, unplug the adaptor and unclog the shredder’s throat.
- Don’t let the hose come in contact with the muffler. The muffler can get hot enough to melt it.

4 HOW IT WORKS

Direct-Bagging

The chipper-shredder-vac must be operated with the bag in place. The bag holds over two bushels, but emptying it often is a good habit. If it overfills, debris may back up into the discharge chute and stall the engine—just like a lawn mower does when it’s bag gets too full.

*Great will be the temptation...*but do not begin to remove the bag until the engine is shut off and the rotor has stopped.

Chipping

Waste fed down the chipper cone produces uniform, coin-sized chips. Two sharp knives, mounted on the rotor, pass by the cone’s solid base at more than 3750 RPM, slicing the end of the branch into little chips.

The angle of the knives draws branches in as they are cut. Eventually, the knives become dull. They must be removed and re-sharpened. Replace the knives when their cutting surface nears one-eighth inch from the knives’ mounting holes.

Shredding

The shredder uses six Y-shaped hammers and the built-in vacuum to pull waste into the grinder housing. The shredding hammers attached to the rotor grab onto thicker debris. Material is ground and shredded until it is small enough to be pulled into the fan chamber and discharged into the bag.

The rotor spins clockwise (as you stand behind the machine). The hammers swing freely on shafts a full 360°. If material is too heavy to shred on the first strike, they swing out of the way. The Y-forks do the shredding and pulling. (Technically speaking, green debris is said to be “shredded”; drier, leafier debris is “ground”.) Hammers eventually wear down and can be replaced or simply reversed.

Vacuumping

The four blade vacuum draws air into the housings through the shredder hopper and chipper cone. To take full advantage of this air flow system, the optional vacuum kit snaps into the hopper for a 15-ft. reach around the machine.



CAUTION: DO NOT LET GO OF BULKY WASTE AND LET IT BOUNCE AROUND IN THE HOPPERS. IT MAY DAMAGE THE MACHINE OR BE EJECTED TOWARD THE OPERATOR OR BYSTANDERS AND CAUSE INJURY.

Fixing Clogs, Stalls & Jams

Stalls, jams, and plug-ups most often occur when the machine is overloaded. When vacuuming, walk slowly over heavy leaf coverage. When chipping, insert and retract thick branches so that the rotor maintains a constant speed. Do not put prunings down the shredder that exceed the diameter or length capacities of the model you own (see page 11).

If the chipper-shredder-vac clogs and stops, try the following:

1. Set throttle to STOP. Pull off the spark plug wire.
2. Check fuel supply. Did it run out of gas?
3. Put on some gloves to avoid sharp edges when digging out the inlets.
4. Remove collection bag, clean out discharge inlet.
4. Clear out chipper cone and shredder hopper.
5. Gently pull the starter cord. If the rotor inside is turning freely, re-attach the spark plug wire, bag, and re-start the engine.
6. If the jam is more serious, remove the chipper cone. Then, use a heavy stick or probe to insert into discharge inlet, and push back against the fan blades on the rotor. This will force clogged debris out the front oval opening and the discharge inlet. Repeat until clear.

Ready to Go?

- Check oil and gas levels, attach spark plug wire.
- Attach bagger-blower chute, T-bolts, hook bag on handle, close zipper.
- Remove any objects from chipper cone.

5 MAINTENANCE

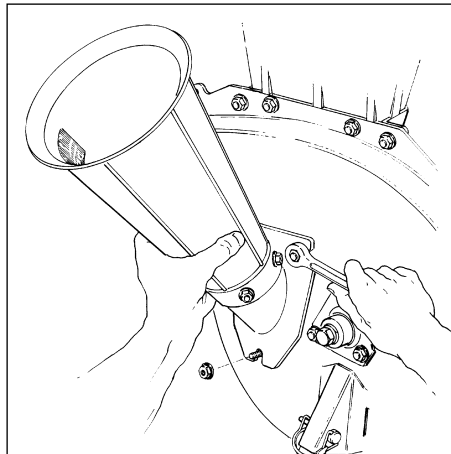
Servicing the Hammers & Sharpening the Knives

1

Shut off the engine, let the rotor stop, disconnect the spark plug wire.

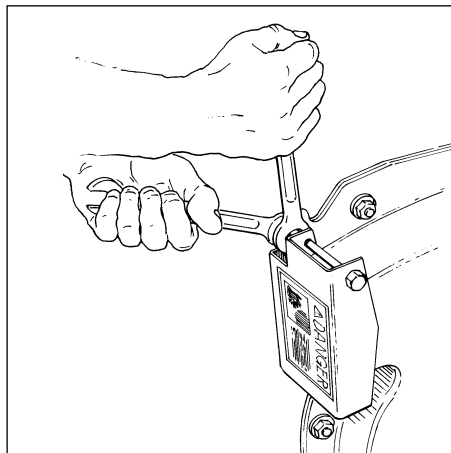
Remove the chipping cone assembly at its base with a 1/2" wrench.

(To service the knives, go directly to Step 8 on page 15.)



2

Disassemble the discharge deflector and the bag retaining bolt underneath the discharge chute using two 1/2" wrenches.



WARNING: THE POWER MUST BE OFF, THE ROTOR FULLY STOPPED AND THE SPARK PLUG WIRE DISCONNECTED FROM THE SPARK PLUG BEFORE ANY SERVICE OR MAINTENANCE IS PERFORMED. OTHERWISE, PERSONAL INJURY MAY RESULT!

Batten Down the Hardware

All the serrated fasteners, roll pins and lockwashers have special locking qualities when they're new.

Whenever removing one for any reason, use a new one in its place.

Inspect and tighten loose fasteners before each use.

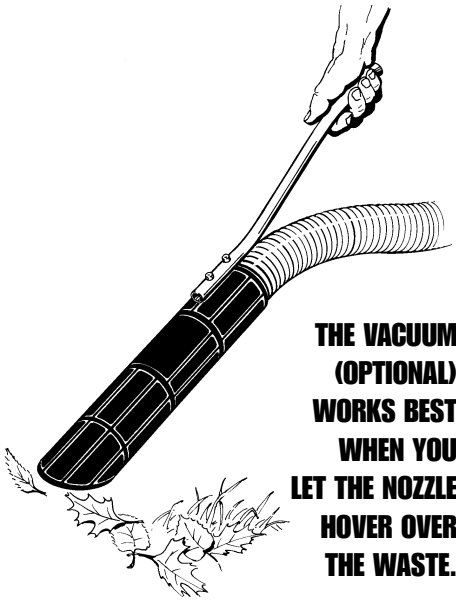
Deflector Shields, Hopper Guards & You

The deflector shield covering the discharge chute and the flexible hopper guard inside the shredder hopper are designed to last a long, long time.

However, should either the guard or the deflector somehow become damaged, you must shut down the unit and fix or replace them before continuing any further.



CAUTION: TURN OFF THE ENGINE, WAIT FOR THE ROTOR TO STOP TURNING AND DISCONNECT THE SPARK PLUG WIRE BEFORE ATTEMPTING TO SERVICE THE HAMMERS OR KNIVES. FAILURE TO SHUT DOWN PROPERLY CONSTITUTES NEGLIGENT BEHAVIOR AND MAY RESULT IN PERSONAL INJURY.



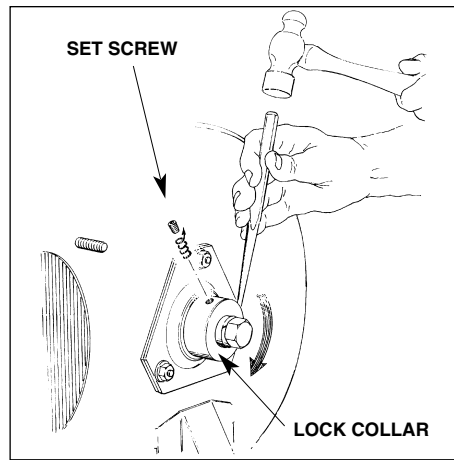
**THE VACUUM
(OPTIONAL)
WORKS BEST
WHEN YOU
LET THE NOZZLE
HOVER OVER
THE WASTE.**



CAUTION: FOR YOUR SAFETY AND TO MEET NATIONAL SAFETY STANDARDS, THE DISCHARGE DEFLECTOR AND HOPPER GUARD MUST BE MAINTAINED IN GOOD CONDITION. SERIOUS PERSONAL INJURY MAY OCCUR IF THE SHIELD OR DEFLECTOR ARE NOT INTACT. IT IS THE OPERATOR'S RESPONSIBILITY TO MAINTAIN THESE SAFETY DEVICES.

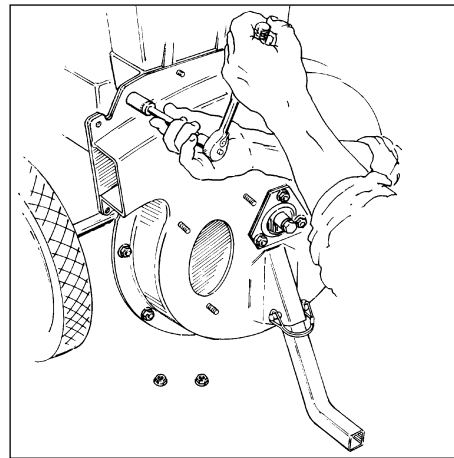


CAUTION: THE ROTOR WILL COAST EVEN AFTER THE ENGINE IS OFF. MAKE SURE THIS ASSEMBLY IS FULLY STOPPED AND DISCONNECT THE SPARK PLUG WIRE BEFORE ANY MAINTENANCE OR SERVICE IS PERFORMED. IF THE ROTOR IS STILL TURNING, IT MAY CAUSE SERIOUS PERSONAL INJURY.



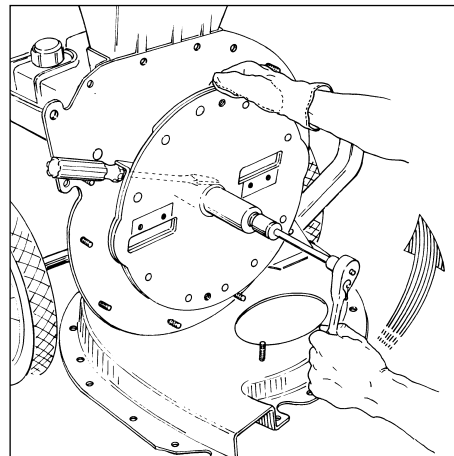
3

Loosen the lock collar by unscrewing and removing the set screw with an 1/8" Allen wrench. Insert a pin punch and tap at an angle with a ball peen hammer, turning the collar clockwise until you can remove it. (Before reassembling the collar, use sand paper to smooth the burr where the set screw enters the hub. Be sure the collar mounts flush with the outside of the rotor bearing shaft.)



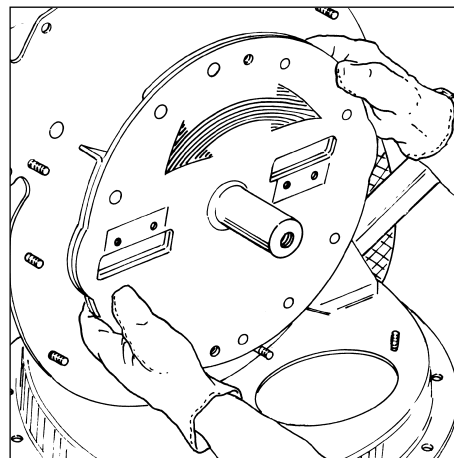
4

Remove the flange nuts from around the perimeter of the fan housing. Next, loosen but do not remove the three flange nuts holding the triangular flangettes over the bearing. Pull apart the housings, then take off the flangettes and remove the entire fan housing. Position it underneath the unit, as seen in the next drawing...



5

Note how the fan housing has been placed underneath. Put a rag there, too, to avoid scratching the housing. Use a 9/16" wrench to remove the 3/8" bolt from the center of the rotor shaft. (When reassembling, use a torque wrench to tighten this bolt to 45 ft.-lbs.)



6

Pull the rotor from the crankshaft by turning the rotor back and forth. There may be some resistance. Pull it off steadily, making sure that the hammers clear the inner wall of the center plate. (When reassembling, coat the exposed engine shaft and key with a liquid graphite or slip plate type compound.)

7

Service one hammer assembly at a time. Use a ball peen hammer and pin punch to remove the roll pins from each spacer and shaft as shown. (Discard the roll pins. Use new pins during reassembly.) Pull the shaft out of the rotor, catching the spacers and hammers with your free hand. Inspect the shafts and spacers for unusual wear. Replace them, if necessary.

Reverse each worn hammer, or replace them as need be. Note how the Y-hammers are positioned in relation to one another. Shafts with two hammers must be reassembled so that the bent prongs face inward and towards one another; the single hammers face their prongs in opposite, outward directions. Secure the spacers with new roll pins using your ball peen hammer and punch pin.

If not servicing the knives, reassemble your unit by following 1 through 6 in reverse order.

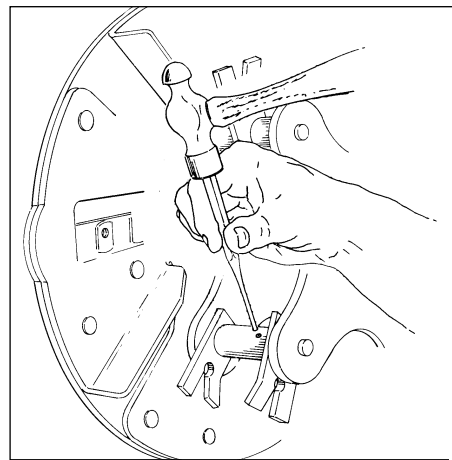
8

With the chipper cone and base removed, slowly turn the rotor clockwise with a probe until a chipper knife appears in the hole. First, scrape out any pulp embedded in the heads of the screws. Loosen the screws using the 3/16" Allen wrench provided with your unit. Unscrew them by hand and remove the knife. Rotate the rotor slowly and remove the second knife in this same way.

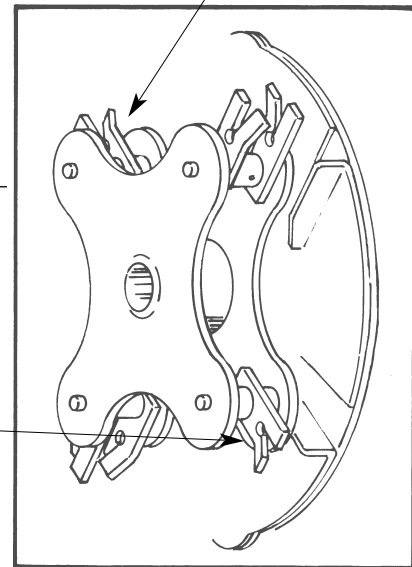
Sharpen the knives evenly at 30° angles. A homeowner's bench grinder with a fine grit stone will do, but because the knives are specially treated, too much heat will make them brittle. Grind only a little bit at a time and allow them to cool. Slow-speed, water-cooled grinding is preferred. For best results, see your local machine shop specialist.

Knives must be replaced once the bases of their cutting edges are ground within 1/8" of the mounting holes.

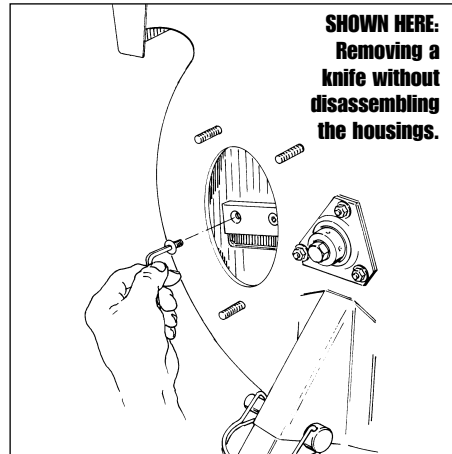
Reassemble your chipper-shredder-vac by following these instructions in reverse.



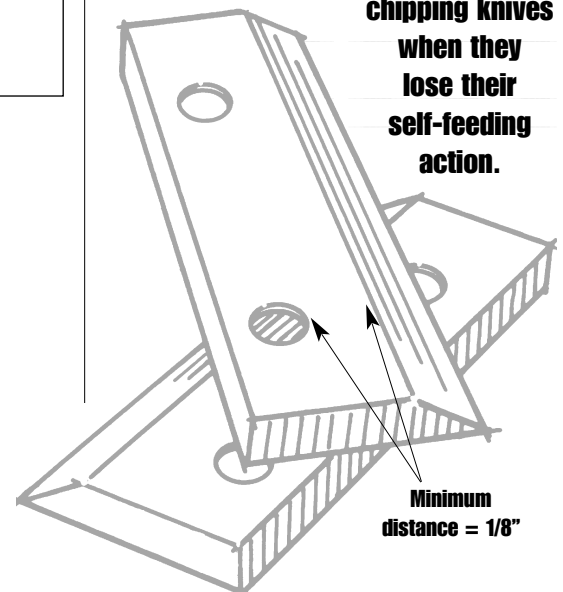
Single hammer, fork facing out.



CORRECT "STAGGERING" OF HAMMERS



Sharpen the chipping knives when they lose their self-feeding action.



Bitten by the Bug?

- "The Rodale Book of Composting," by the editors of Rodale Press.
- "The Mulch Book," by Stu Campbell (Storey Publishing).
- "Worms Eat My Garbage," by Mary Apelhof (Flower).
- "Yardening," by Jeff and Liz Ball (MacMillan).

⑥ WHAT TO DO WITH THE STUFF NOW THAT IT'S ALL CHIPPED & SHREDED

The chips, shreds and mulch you make are valuable organic materials for your lawn and garden. Put them to good and immediate use—even if you are not an avid green thumb-er.

Landscape & Garden

Use the reduced materials to make a garden path and to edge saplings or shrubs. An inch or so holds in moisture, moderates temperatures and erosion, and reduces weed and turf growth. They also protect exposed root systems and tender bulbs from unpredictable elements.

Composting

Whole books have been written on the subject. A good compost pile will not—contrary to popular opinion—smell like a landfill and attract critters. One rule of thumb for a proper pile is, "Equal weights of green and brown help to break the microbes down." (Note well the word *weights*, as opposed to *parts*!)

Your basic compost pile is a three layer salad that is 4' x 4' x 4'. Simply put it in a pile, or dig a pit or a trench. Some fancy containers speed things along and look nicer.

Things you can't use? Animal wastes, bones and meat scraps.

BROWN, 3" - 5"

Some old leaves or twiggy brush on the bottom helps air enter the pile.

GREEN, 3" - 5"

Leafy, non-woody stuff. Include grass clippings and kitchen scraps. But no meat, fat or dairy products.

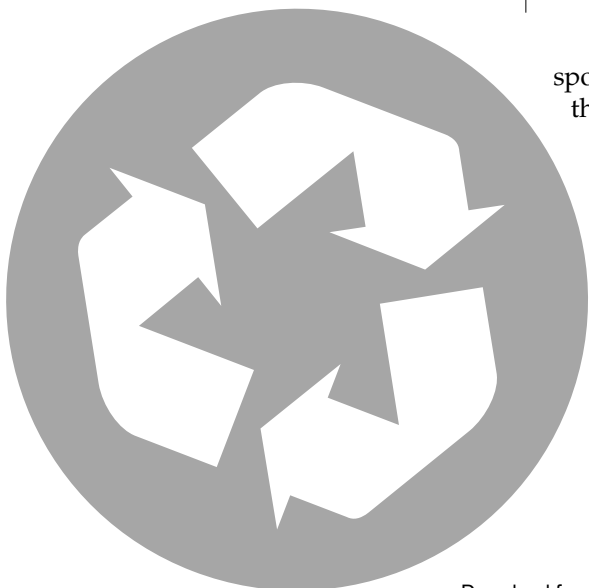
SOIL OR COMPOST STARTER, 1"

This layer of micro-organisms does the dirty work. If you're so inclined, a handful of granular fertilizer jump starts it, feeding the organisms.

Wet the pile as needed to keep the center the consistency of a damp sponge. Continue to add layers until it is up to four feet high and deep. Turn the pile once a week or so with a shovel or pitch fork. Turning and wetting the pile is what the pros call "fast" or "hot" composting, with temperatures inside the pile reaching 160° F.

How Long Until Soup's On?

Depending on how well it is tended, in two to four weeks the compost is ready for use in your garden. Better still, you can't "spoil" the recipe. If offending odors emerge, it may be due to too much moisture, green materials, or critter droppings. Mix in more brown, turn the pile often, or cover it with plastic to keep it dry.

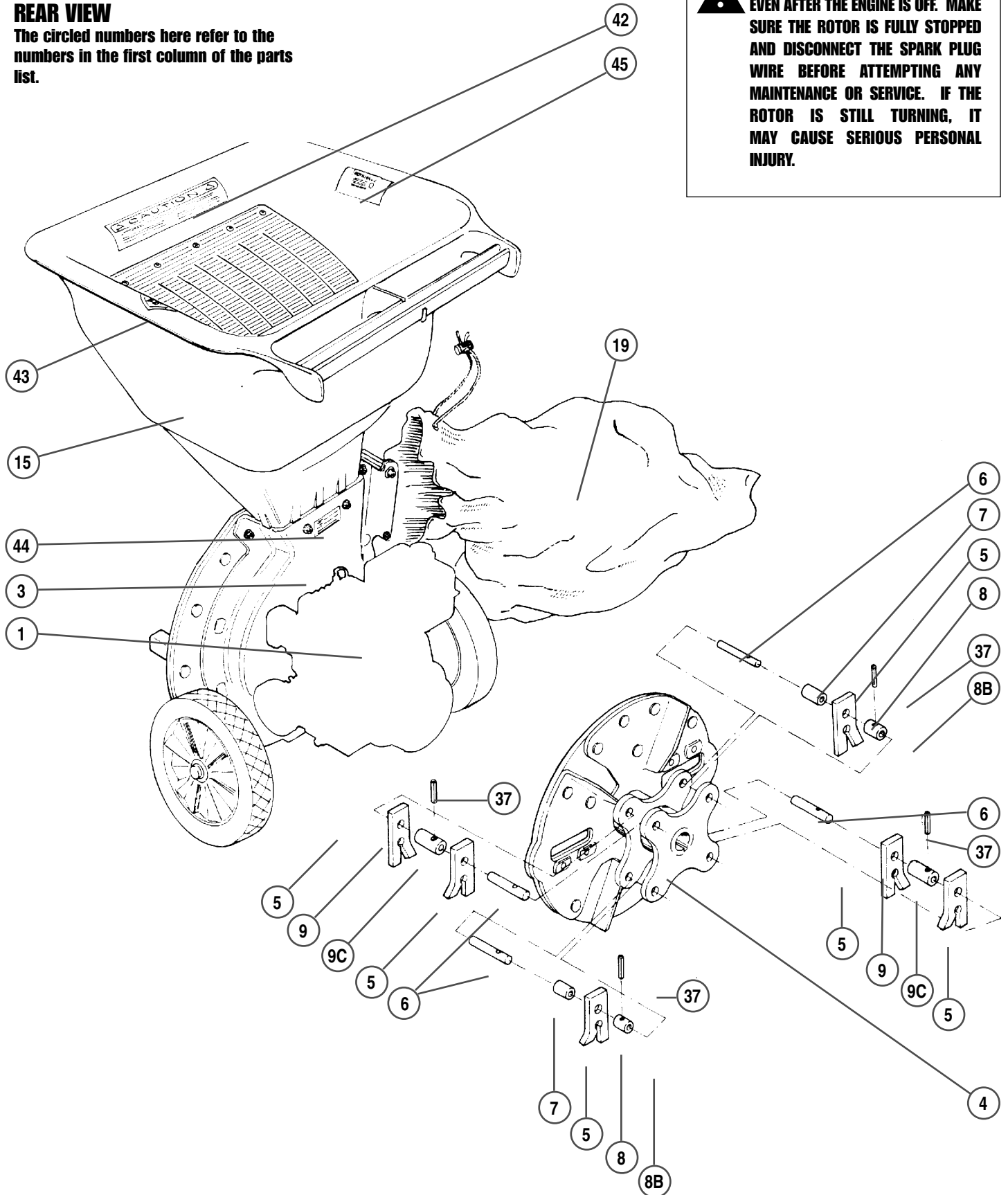


REAR VIEW

The circled numbers here refer to the numbers in the first column of the parts list.



CAUTION: THE ROTOR WILL COAST EVEN AFTER THE ENGINE IS OFF. MAKE SURE THE ROTOR IS FULLY STOPPED AND DISCONNECT THE SPARK PLUG WIRE BEFORE ATTEMPTING ANY MAINTENANCE OR SERVICE. IF THE ROTOR IS STILL TURNING, IT MAY CAUSE SERIOUS PERSONAL INJURY.

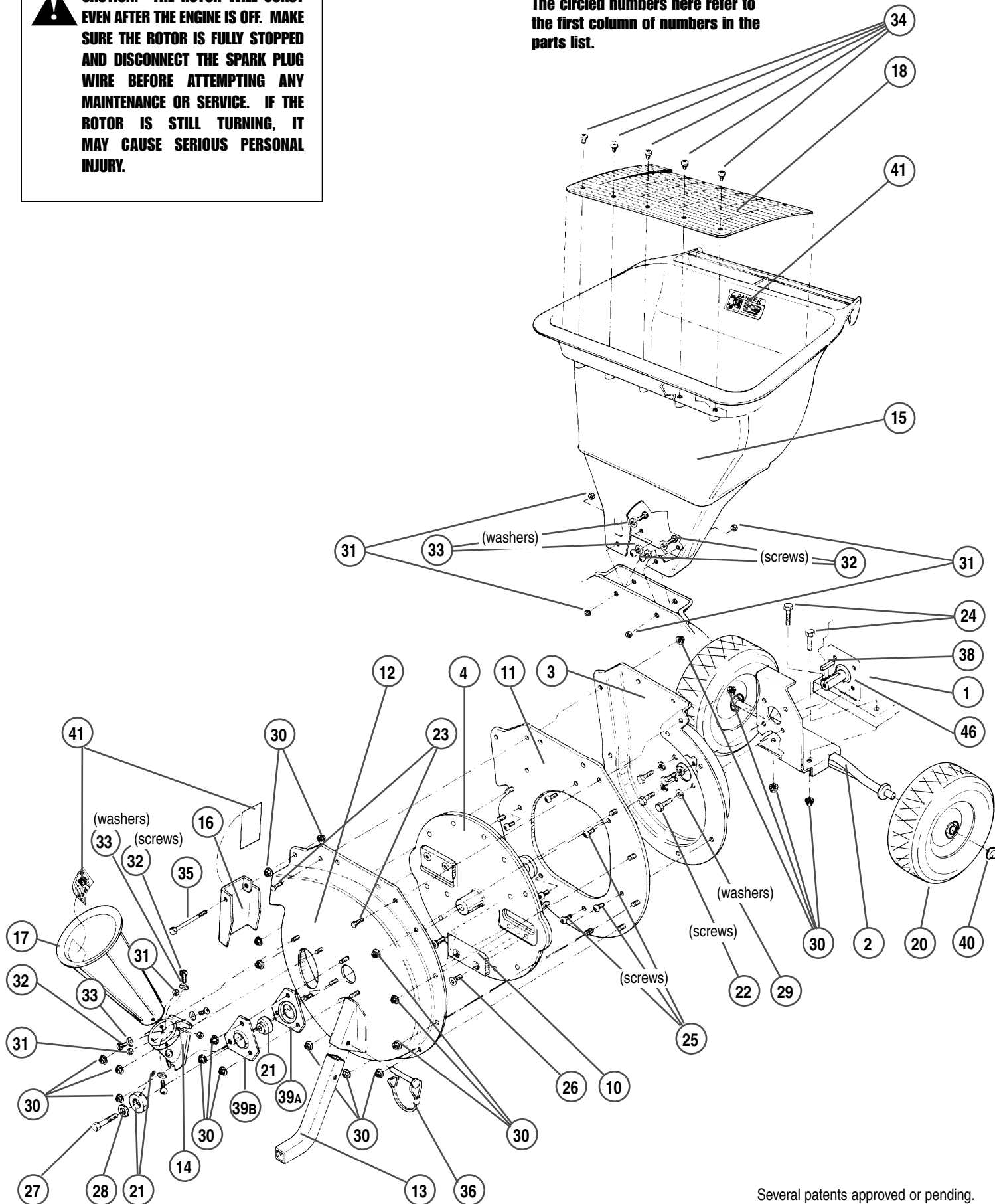




CAUTION: THE ROTOR WILL COAST EVEN AFTER THE ENGINE IS OFF. MAKE SURE THE ROTOR IS FULLY STOPPED AND DISCONNECT THE SPARK PLUG WIRE BEFORE ATTEMPTING ANY MAINTENANCE OR SERVICE. IF THE ROTOR IS STILL TURNING, IT MAY CAUSE SERIOUS PERSONAL INJURY.

FRONT VIEW

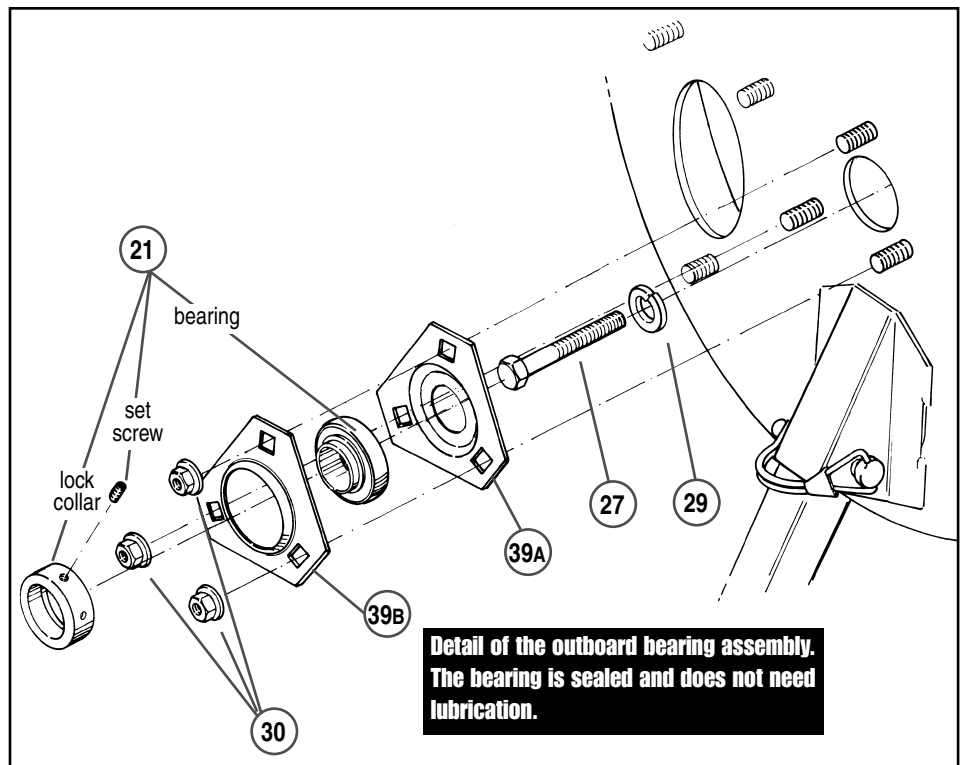
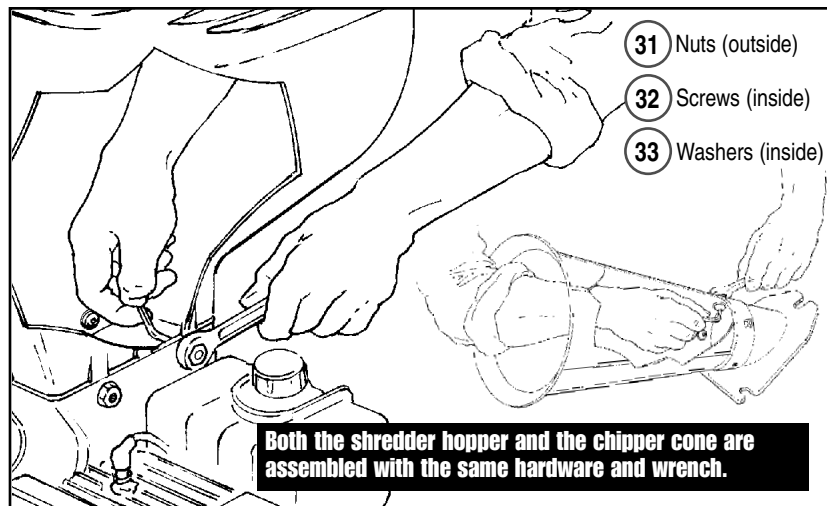
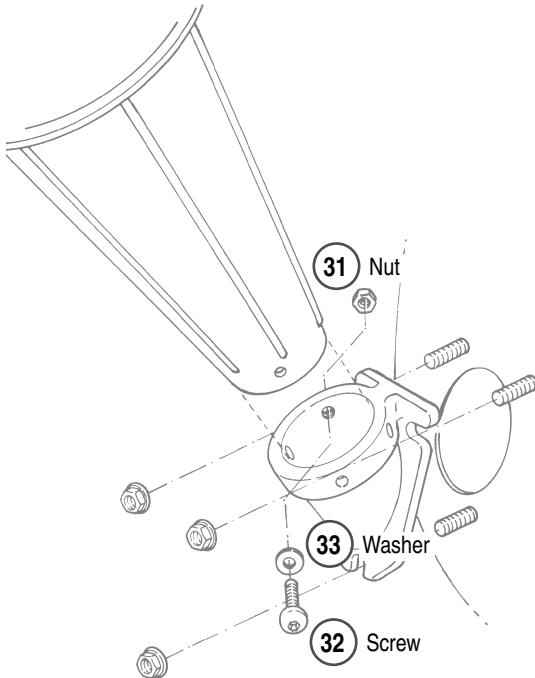
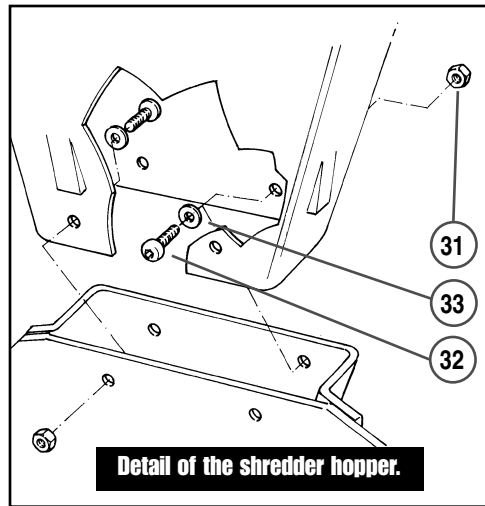
The circled numbers here refer to the first column of numbers in the parts list.



Several patents approved or pending.



CAUTION: THE ROTOR WILL COAST EVEN AFTER THE ENGINE IS OFF. MAKE SURE THE ROTOR STOPS TURNING, THEN DISCONNECT THE PLUG WIRE FROM THE ENGINE BEFORE ATTEMPTING ANY MAINTENANCE OR CLEAN-OUT. IF THE ROTOR IS STILL TURNING, IT MAY CAUSE SERIOUS PERSONAL INJURY.



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8 TROUBLE-SHOOTER



CAUTION: BEFORE ATTEMPTING TO REMEDY PROBLEMS WITH YOUR CHIPPER-SHREDDER-VAC, TURN THE ENGINE OFF, WAIT FOR THE ROTOR TO STOP TURNING, AND DISCONNECT THE SPARK PLUG WIRE. FAILURE TO DO SO CONSTITUTES NEGLIGENT BEHAVIOR AND MAY RESULT IN PROPERTY DAMAGE AND SERIOUS PERSONAL INJURY.

PROBLEM	CAUSE	REMEDY
Engine won't start. Grinds, smokes, stalls.	<ul style="list-style-type: none"> ❶ Check fuel, oil, choke, and spark plug wire. ❷ Old gas, dirty oil or air filter, bad plug. 	<ul style="list-style-type: none"> ❶ That was easy enough! ❷ Drain or run out old gas. Change oil and filter. Replace spark plug.
Unusual vibration, rubbing noises.	<ul style="list-style-type: none"> ❶ Sticky debris lodged on rotor. ❷ Chipper knife is loose. ❸ Damaged knives, hammers, or rotor. 	<ul style="list-style-type: none"> ❶ Clear debris out of discharge area. ❷ Check fasteners and knives for damage. Re-secure and/or repair. ❸ Check the rotor for balance by watching it turn while slowly pulling the cord. If it wobbles, see a Patriot service center <i>immediately</i>.
Debris does not chip easily.	<ul style="list-style-type: none"> ❶ Throttle speed too low. Engine problem. ❷ Dull or damaged knives. ❸ Wood is dead, old, takes more effort. ❹ Feeding rate too fast for discharge rate. 	<ul style="list-style-type: none"> ❶ Run at maximum throttle. ❷ Sharpen or replace <i>immediately!</i> ❸ Alternate with green waste to keep knives cool and sharp. ❹ Feed thicker waste at a slower rate.
Clogs while shredding, not vacuuming well.	<ul style="list-style-type: none"> ❶ Debris may be too bulky or wet. ❷ Hammers worn, broken. ❸ Debris stuck in grinder housing. 	<ul style="list-style-type: none"> ❶ Feed more slowly. Add dry stuff. ❷ Replace the hammers. ❸ Shut down. Unclog or run water down the shredder.
Chronic clogging, vibration, rattling.	<ul style="list-style-type: none"> ❶ Engine not up to par. ❷ Internal damage or failure to rotor. 	<ul style="list-style-type: none"> ❶ Contact an engine service center. ❷ Contact a Patriot service center.

NOTES/SERVICE HISTORY

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