



## 4" Chipper Shredder

Owner's Manual



**!** **WARNING:** Read carefully and understand all ASSEMBLY AND OPERATION INSTRUCTIONS before operating. Failure to follow the safety rules and other basic safety precautions may result in serious personal injury.

Item #53135

**SAVE THESE INSTRUCTIONS**

Thank you very much for choosing a Powerhorse™ product!

For future reference, please complete the owner's record below:

Serial Number/Lot Date Code: \_\_\_\_\_

Purchase Date: \_\_\_\_\_

Save the receipt, warranty, and this manual. It is important that you read the entire manual to become familiar with this product before you begin using it.

This Chipper Shredder is designed for certain applications only. Northern Tool & Equipment is not responsible for issues arising from modification or improper use of this product such as an application for which it was not designed. We strongly recommend that this product not be modified and/or used for any application other than that for which it was designed.

For technical questions, please call **1-800-222-5381**.

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## Intended Use

This Chipper Shredder is a great way to quickly turn yard waste into ground covering for gardens or trees. The highly effective cutting mechanism uses two hardened chipping knives, 10 hammers, and ten shredding blades. The dual feed enables you to use the drop-in shredding hopper for brush and leaves and the dedicated chipper chute for sticks and branches.

## Technical Specifications

Property	Specification
Max. Cutting Thickness (in.)	4
Displacement (cc)	420
Maximum RPM	3600
HP	15
Battery Type	DC Sealed Lead Acid
Battery Dimensions	7.17" (L) x 3.07" (W) x 6.69" (H)
Voltage	12V
Amperage	20Ah

## Important Safety Information

### **⚠️WARNING**

- Read and understand all instructions. Failure to follow all instructions may result in serious injury or property damage. Replace worn labels or missing manuals.
- The warnings, cautions, and instructions in this manual cannot cover all possible conditions or situations that could occur. Exercise common sense and caution when using this tool. Always be aware of the environment and ensure that the tool is used in a safe and responsible manner.
- Do not allow persons to operate or assemble the product until they have read this manual and have developed a thorough understanding of how it works.
- Do not modify this product in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the product. There are specific applications for which the product was designed.
- Keep all guards in place at all times.
- Use the right tool for the job. DO NOT attempt to force small equipment to do the work of larger industrial equipment. There are certain applications for which this equipment was designed. It will do the job better and more safely at the capacity for which it was intended. DO NOT use this equipment for a purpose for which it was not intended.
- Industrial or commercial applications must follow OSHA requirements.

### **⚠️WARNING**

This Chipper Shredder may contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

## **⚠️WARNING**

### **WORK AREA SAFETY**

- Inspect the work area before each use. Keep work area clean, dry, free of clutter, and well lit. Cluttered, wet, or dark work areas can result in injury. Using the Chipper Shredder in confined work areas may put you dangerously close to other cutting tools and rotating parts.
- Do not use the Chipper Shredder where there is a risk of causing a fire or an explosion; e.g., in the presence of flammable liquids, gases, or dust. The product can create sparks, which may ignite the flammable liquids, gases, or dust.
- Make sure no children or bystanders are within 50 ft. of chipping operation.
- Protect cars, windows and other objects within 50 ft. from flying debris.
- This machine is to be operated by one person only. When operating the machine, only stand in the operator feed area.
- Keep children and bystanders away from the work area while operating the tool. Do not allow children to handle the Chipper Shredder.
- Be aware of all power lines, electrical circuits, water pipes, and other mechanical hazards in your work area. Some of these hazards may be hidden from your view and may cause personal injury and/or property damage if contacted.
- Do not tilt or transport the machine while it is operating. Only operate this machine in open space (e.g. not close to a wall or other fixed object) on a flat, level surface away from.

## **⚠️WARNING**

### **PERSONAL SAFETY**

- Stay alert, watch what you are doing, and use common sense when operating the tool. Do not use the tool while you are tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating the tool may result in serious personal injury.
- Dress properly. Do not wear loose clothing, dangling objects, or jewelry. Keep your hair, clothing and gloves secure. Loose clothes, jewelry, or long hair can be caught in branches and pulled into the shredder.
- Keep hands and feet away from inlet and discharge openings.
- Avoid burns from engine by not touching hot exhaust.
- Check that the split housing is fastened shut.
- Wear the proper personal protective equipment when necessary. Use ANSI Z87.1 compliant safety goggles (not safety glasses) with side shields, or when needed, a face shield. Use a dust mask in dusty work conditions. Also use non-skid safety shoes, hardhat, gloves, dust collection systems, and hearing protection when appropriate. This applies to all persons in the work area.
- Do not overreach. Keep proper footing and balance at all times. Never stand at a higher level than the base of the machine when feeding material into it. Ensure that there are no tripping hazards in the feed area.
- Be aware of potential for carbon monoxide (CO) poisoning.

## **⚠WARNING**

### **OPERATIONAL SAFETY**

- Make sure that the machine is properly adjusted, set up correctly and the hopper and funnel are empty before starting the machine.
- Do not leave unattended while machine is running. Shut off the machine and disconnect the spark plug wire whenever you leave the work area.
- Do not feed metal, rocks, bottles, cans or any other non-botanical objects into the machine. Inspect wood for nails or other foreign objects.
- Do not feed excessively long materials. Cut wood to at most 4 ft. before feeding into machine.
- Make sure the machine has come to a complete stop and disconnect the spark plug wire before freeing a jam or clog, emptying the bag, filling the gas tank, or performing any maintenance or repairs.

## **⚠CAUTION**

### **CHIPPER SHREDDER USE AND CARE**

- Do not force the Chipper Shredder. Products do a better and safer job when used in the manner for which they are designed. Plan your work, and use the correct product for the job.
- Check for damaged parts before each use. Carefully check that the Chipper Shredder will operate properly and perform its intended function. Replace damaged or worn parts immediately. Never operate the Chipper Shredder with a damaged part.
- Store the Chipper Shredder when it is not in use. Store it in a dry, secure place out of the reach of children. Inspect the tool for good working condition prior to storage and before re-use.
- Use only accessories that are recommended by the manufacturer for use with your Chipper Shredder. Accessories that may be suitable for one product may create a risk of injury when used with another tool. Never use an accessory that has a lower operating speed or operating pressure than the tool itself.
- Keep guards in place and in working order. Never operate the product without the guards in place.
- Do not leave the Chipper Shredder running unattended.

## Specific Operation Warnings

### **⚠WARNING**

- **READ THIS ENTIRE MANUAL AND MOTOR MANUAL:** These manuals contain proper operating and safety instructions for this chipper/ shredder.
- **SAFETY EQUIPMENT:** Wear safety glasses, hearing protection, and gloves when operating a Chipper Shredder. Make sure any bystanders are also wearing safety equipment.
- **MOTOR OPERATION:** Refer to the motor manual for operating instructions and gasoline motor safety warnings.
- **HAND SAFETY:** DO NOT put hands or other body parts into hopper, funnel, or outlet while the blades are turning. The Chipper Shredder can drag you into the blade, causing amputation of fingers, hands or other body parts. DO NOT touch the exhaust during or immediately after operation to prevent burns.
- **CLOTHING:** DO NOT wear loose clothing, neckties, scarves, or jewelry which may get caught in moving parts. DO NOT wear clothing or gloves with pull ties or straps. This type of clothing could get tangled with material that is being shredded, pulling you into the Chipper Shredder.
- **OPERATING LOCATION:** Set up the Chipper Shredder on firm, level, grass or dirt. DO NOT set up the Chipper Shredder on gravel, asphalt, concrete, or stone. The chips are expelled from the machine with enough force to ricochet off of hard surfaces and cause serious injury. DO NOT set up the Chipper Shredder in a location where sparks or heat from the motor could cause a fire.
- **SECURE FOOTING:** Placing the Chipper Shredder on a slope or slippery surface may cause the operator to fall into the machine, causing burns from the motor, or an amputation if an arm accidentally goes into the hopper. Wear non-slip, closed toed shoes or boots to maintain secure footing.
- **JAMS AND CLOGGING:** Turn the Chipper Shredder OFF, allow all moving parts to come to a complete stop, and disconnect the spark plug wire before attempting to free a jam or clog.
- **FEEDING MATERIAL:** Hold branches and brush loosely, and allow the Chipper Shredder to draw the material in. The machine sometimes will draw material in very quickly and your hand may be drawn in if you are holding tightly. If the blades hit a hard object, or if the machine begins to make an unusual noise or vibration, immediately shut the Chipper Shredder OFF.
- **TURN OFF THE CHIPPER SHREDDER:** Turn OFF the machine, allow all moving parts to come to a complete stop, and disconnect the spark plug wire before moving the machine, emptying the bag, unclogging the inlets or outlets, filling the gas tank, or performing maintenance and repairs.
- **STARTING THE CHIPPER SHREDDER:** Make sure the hopper and funnel are empty when starting the machine. The pull start cord may stop suddenly causing the Chipper Shredder to fall over or injure your hand or arm.
- **CLEANING THE CHIPPER SHREDDER:** Allow the motor to cool off, then brush dust and chip build-up off of the motor to prevent fire or motor overheating.

## Safety Labels

# ! DANGER

1. Do not operate or set up machine until you fully read the owner's manual and are properly trained on its use. Replace worn labels or missing manuals.
2. Always wear ANSI compliant goggles, ear protection, tight fitting gloves and nonslip, steel toed footwear.
3. Do not wear loose clothing or jewelry. Secure long hair and tuck in any long sleeve shirts. Do not wear clothing with loose cuffs or buttons.
4. When operating the machine, only stand in the operator feed area. Keep all people and property at least 50 feet from the discharge zone.
5. This machine is to be operated by one person only. Keep pets, children or bystanders away from the machine.
6. Do not operate under influence of drugs or alcohol.
7. Keep proper balance and footing at all times. Never stand at a higher level than the base of the machine when feeding material into it. Ensure that there are no tripping hazards in the feed area.
8. Keep all guards in place at all times.
9. Do not feed metal, rocks, bottles, cans or any other non-botanical objects into the machine. Inspect wood for nails or other foreign objects.
10. Do not feed excessively long materials. Cut wood to at most 4 ft. before feeding into machine.
11. Do not tilt or transport the machine while it is operating. Only operate on a flat, level surface.
12. Make sure that the machine is properly adjusted, set up correctly and the hopper and funnel are empty before starting the machine.
13. Do not leave unattended while machine is running. Shut off the machine and disconnect the spark plug wire whenever you leave the work area.
14. Make sure the machine has come to a complete stop and disconnect the spark plug wire before freeing a jam or clog, emptying the bag, filling the gas tank, or performing any maintenance or repairs.





## **! DANGER**



Keep hands away from the funnel.  
Keep funnel cover in place at all times.  
DO NOT feed metal, rocks, bottles, cans or any other non-botanical objects into the machine. Inspect wood for nails or other foreign objects.  
DO NOT insert branches thicker than 4 inches or longer than 4 feet.

## **! DANGER**



Keep hands away from the hopper  
DO NOT feed metal, rocks, bottles, cans or any other non-botanical objects into the machine. Inspect wood for nails or other foreign objects.  
DO NOT insert branches thicker than 3/8 inches (10mm) or longer than 4 feet.

## **! WARNING**



DO NOT remove guard while the machine is in operation. Ensure the machine has come to a complete stop and disconnect the spark plug wire before servicing.



## **⚠ WARNING**



**DO NOT stand in front of the  
outlet chute while the machine  
is in operation.**

# **! DANGER**



**DO NOT** open unless the machine has come to a complete stop and the spark plug wire has been disconnected.

**Make sure** this cover is in place before starting the machine.

# **! DANGER**



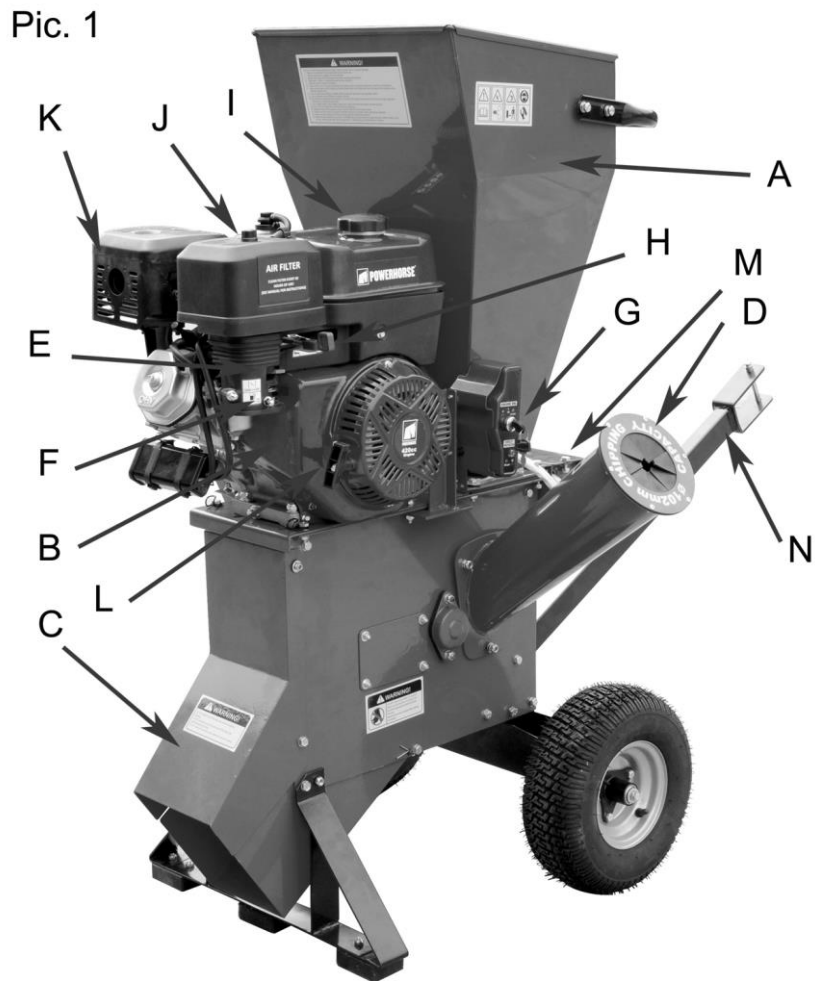
**BLADES CUT  
1/4 INCH FROM  
DISCHARGE  
SCREEN.  
KEEP AWAY.**

# **! DANGER**

## **ROTATING CUTTING BLADES.**

**To avoid serious personal injury keep hands and feet out of inlet and discharge openings while machine is running.**

## Main Parts of Chipper Shredder



**Pic.1 Chipper Shredder Identification**

Reference	Subassembly
A	Hopper
B	Motor
C	Chip Outlet
D	Chipper Funnel
E	Choke
F	Fuel Cock
G	ON/OFF Switch
H	Throttle
I	Fuel Tank Cap
J	Air Cleaner
K	Exhaust
L	Pull Start Handle
M	Battery Assembly
N	Tow Bar

## Site Considerations

### Location

The Chipper Shredder must be placed on a firm, flat, grass or dirt surface to prevent the machine from tipping. DO NOT place the machine on concrete, asphalt, or other hard surfaces. The chips could bounce up from the hard surface and cause injury.

### Working Clearances

Consider the length of the material to be processed through the machine and make sure that there is enough height above the Chipper Shredder to accommodate the material.

Make sure the unit is located close to the area where the chips are going to be used to reduce carrying.

Stay clear of the discharge area. Make sure all bystanders, children, pets, or objects that you do not want damaged or covered in chips, are clear of the discharge area.

## Assembly Instructions

### **⚠️ WARNING**

This machine presents serious injury hazards to untrained users. Read through this entire manual to become familiar with the controls and operations before starting the machine!

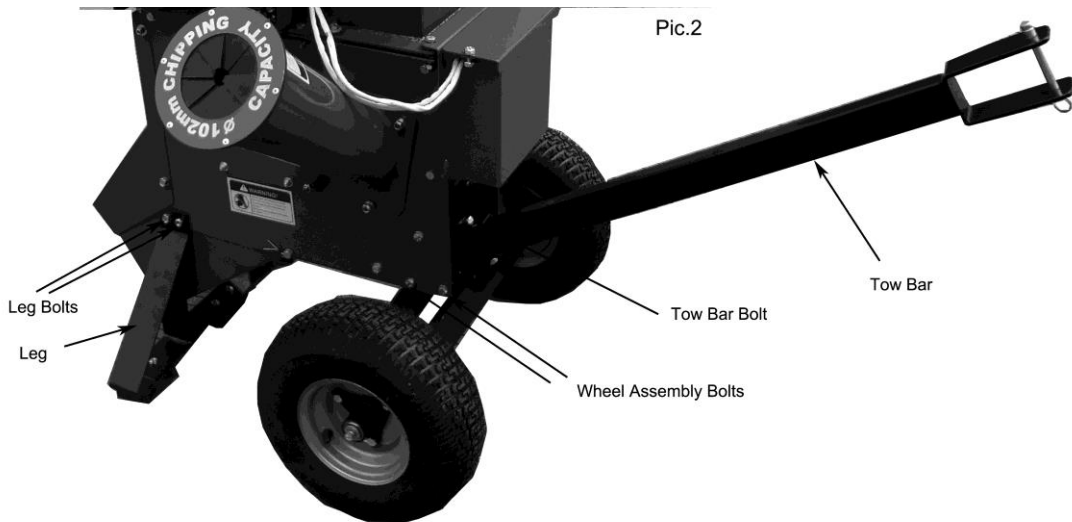
The major components of this Chipper Shredder have been assembled at the factory. Some minor assembly is required. The assembly process will use all the parts and hardware listed in the inventory.

DO NOT attempt to start this machine until all assembly has been completed. Serious personal injury and damage to the machine could occur.

1. Tip the Chipper Shredder over and remove the bolts shown in Pic.2. DO NOT turn the Chipper Shredder over once it is full of oil and gas. The oil and gas will spill out.

For assembling the leg you'll need: 2pcs Bolt M8x20, 1pc Bolt M8x200, 1pc Support Tube, 4pcs Washer Ø8, and 3pcs Lock nut M8.

For assembling the wheel you'll need: four-piece Bolt M8x200, 2-piece Support Tube, 4-piece Washer Ø8, and 2-piece Lock nut M8.



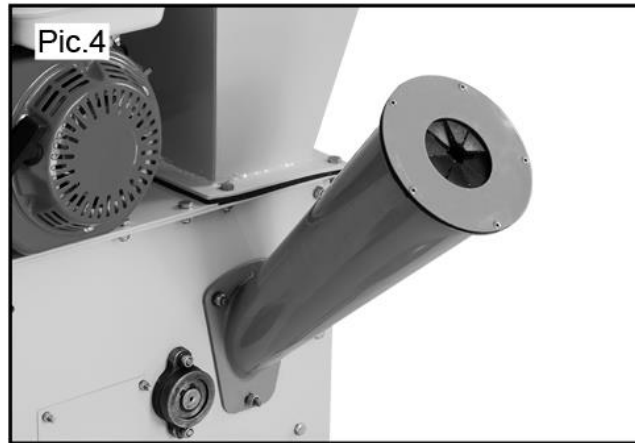
### Attaching the Leg (Pic. 2)

2. Attach the wheel assembly and the leg with the bolts that were removed in **Step 1**.
3. Attach the tow bar to the wheel assembly with the tow bar bolt that is attached.
4. Place the handle on the hopper and line up all of the holes. Secure it with a flat washer (Ø8, 4 pieces), a spring washer (Ø8, 4 pieces) and a bolt (M8x20, 4 pieces). See Pic.3.



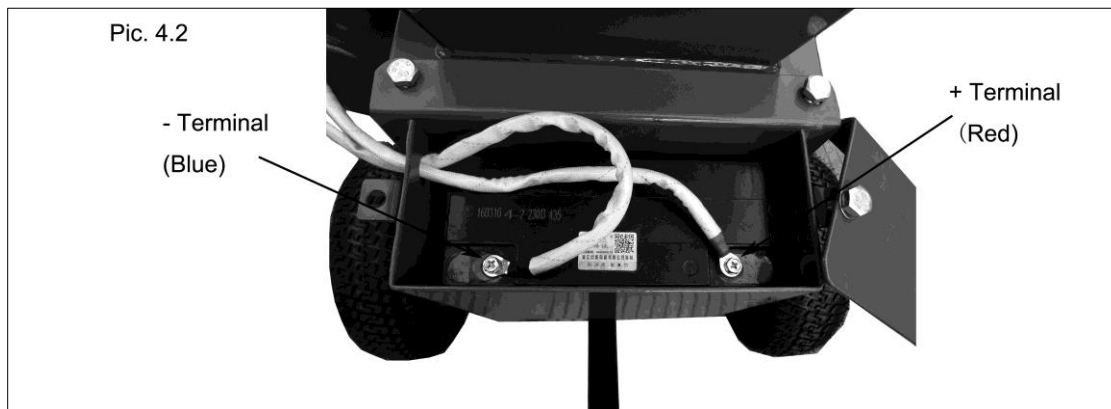
### Installing the Handle (Pic. 3)

5. Place the funnel over the studs in the side of the Chipper Shredder and secure it with a flat washer (Ø8, 3 pieces), a spring washer (Ø8, 3 pieces), and a locknut (M8, 3 pieces). See Pic.4.



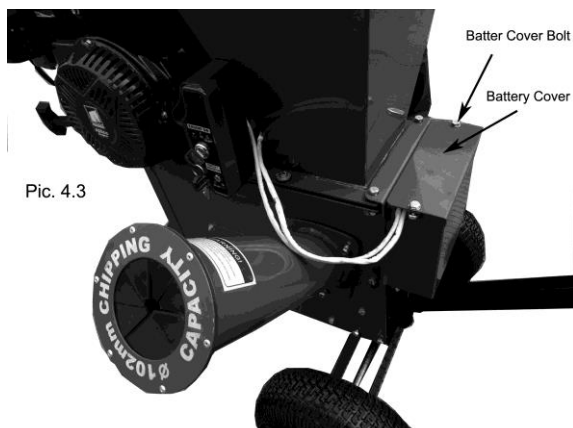
**Pic.4** Funnel installation

6. Install the battery assembly to the front part of the machine using the bolts (M8 x 20, 2 pieces) and a locknut (M8, 2 pieces). See Pic.4.2. Take off the battery cover and carefully connect the cables to the battery's #2 terminal ('+' in red and '-' in blue) firmly. **NOTE: battery manual is not included.**



**Pic.4.2** Battery Assembly Installation

7. Place the battery cover and attach it with bolts (M8x20, 2 pieces), a flat washer (Ø8, 2 pieces), and a spring washer (Ø8, 2 pieces). See Pic.4.3.



## Battery Cover Installation (Pic. 4)

### Before Each Use

#### ⚠WARNING

This Chipper Shredder does not have oil in the motor when shipped. Add oil before operating the Chipper Shredder, or the motor will seize.

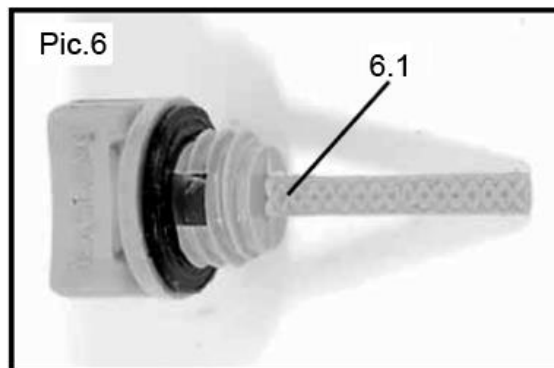
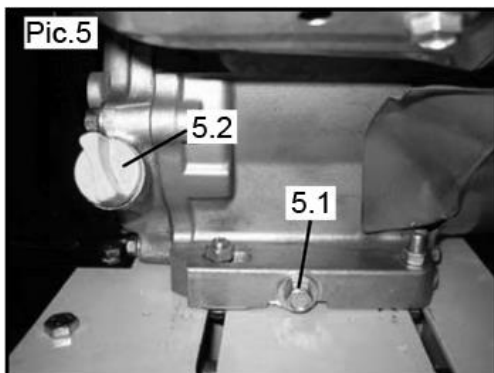
Before operating, fill the motor with oil and gas according to the instructions.

### Filling the Engine Oil

#### ⚠WARNING

Never open oil fill port while engine is running. Hot oil can spray over face and body.

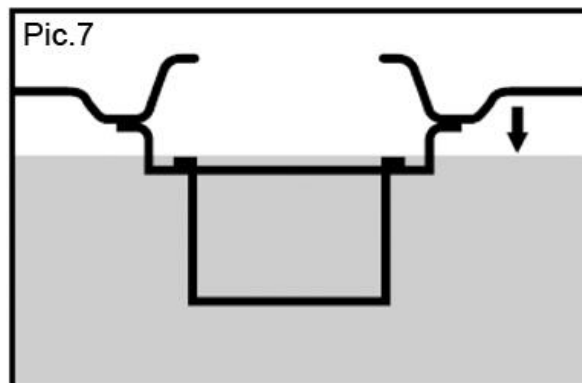
Place the machine on a level surface and remove the oil filler cap (Pic.5, 5.1).



Add engine oil to the upper level of the dipstick (Pic.6, 6.1).

### Filling the Fuel Tank

The Chipper Shredder is powered by a four-stroke engine, which uses unleaded gasoline fuel. Use a suitable funnel to transfer the fuel to the engines fuel tank, taking care not to spill any fuel or over fill the fuel tank. The fuel tank should not be filled above the top of the fuel filter as shown in Pic.7





## Operating Instructions

### ⚠WARNING

- Damage to your eyes, hands, and ears could result from using this machine without proper protective gear. Always wear safety glasses, hearing protection, and leather gloves when operating this machine.
- Loose hair and clothing could get caught in machinery and cause serious personal injury. Keep loose clothing and long hair away from moving machinery.
- If you have never used this type of machine or equipment before, WE STRONGLY RECOMMEND that you read books, trade magazines, or get formal training before beginning any projects.
- This Chipper Shredder does not have oil in the motor when shipped. Add oil before operating the Chipper Shredder, or the motor will seize.

### Chipping/Shredding

Understand and follow all of the safety precautions listed in warning and caution areas before operation.

This Chipper Shredder is intended for mulching garden and pruning waste such as green branches, twigs, brush, vines, and long grasses. DO NOT use this Chipper Shredder for chipping construction debris, plastic, paper products, rope or twine, or any material that may contain metal.

**Note:** Remove any nails, rope, twine, or rocks that may be imbedded in roots, before inserting material into the Chipper Shredder.

### To Operate the Chipper Shredder

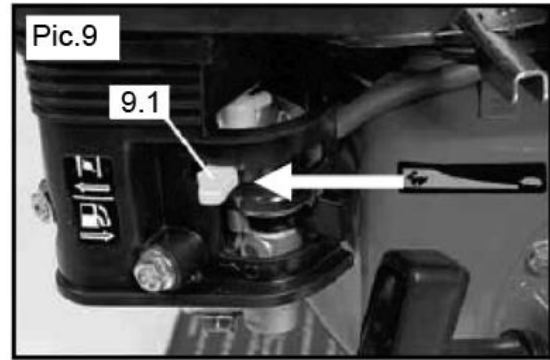
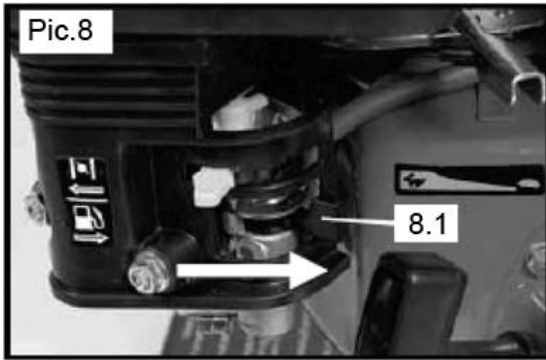
### ⚠WARNING

Carbon Monoxide Warning. The running engine gives off carbon monoxide, a poisonous gas that can kill you. You CANNOT smell it, see it, or taste it. If you start to feel sick, dizzy, or weak while using the chipper, shut off the engine and get to fresh air RIGHT AWAY. See a doctor. You may have carbon monoxide poisoning.

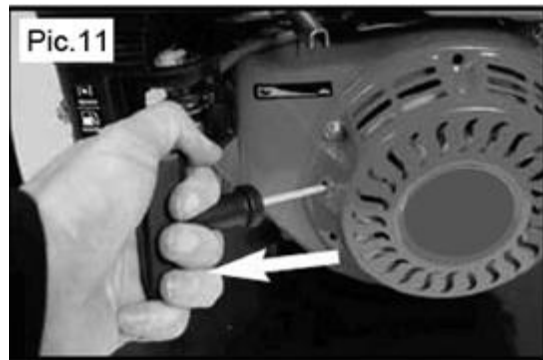
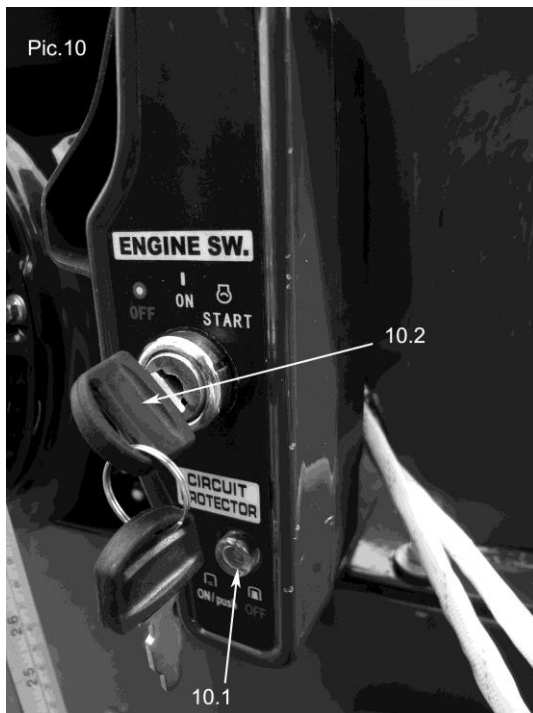
1. Place the Chipper Shredder on a flat, firm, dirt or grass surface and point the outlet in a safe direction.
2. Check the oil and gas levels before starting the motor.
3. Place the bag over the chute and tie it securely in place.
4. Make sure the hopper and funnel are empty before starting the engine. If there is material in the hopper or funnel, the pull start cord may stop suddenly causing the Chipper Shredder to fall over, or causing injury to your hand or arm.
5. Put on eye and ear protection and gloves, start the Chipper Shredder as instructed in the manual, then set the throttle to FAST.
6. Stand to the side of the hopper and make sure you have a stable stance and firm footing.

### To Start the Chipper Shredder

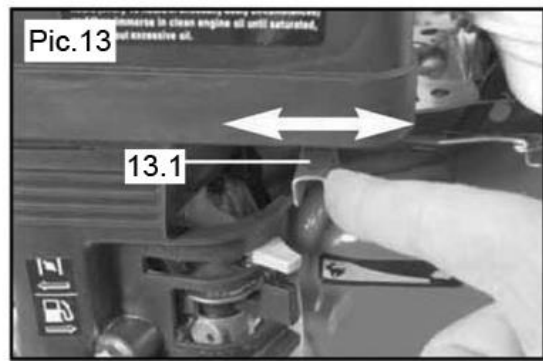
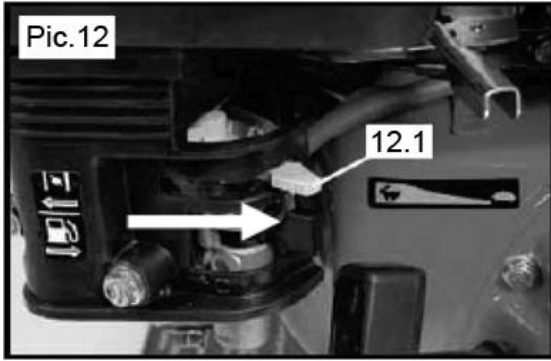
1. Turn the fuel lever to the ON position (Pic.8, 8.1).
2. Set the choke lever to the ON position (Pic.9, 9.1).



3. Use the electric starter to start: Turn the key (Pic.10, 10.2) from "OFF" to "ON" and then to "START".
4. If the electric starter doesn't work, you can also use the recoil starter to start: Turn the engine ON/OFF switch to the ON position (Pic.10, 10.1).



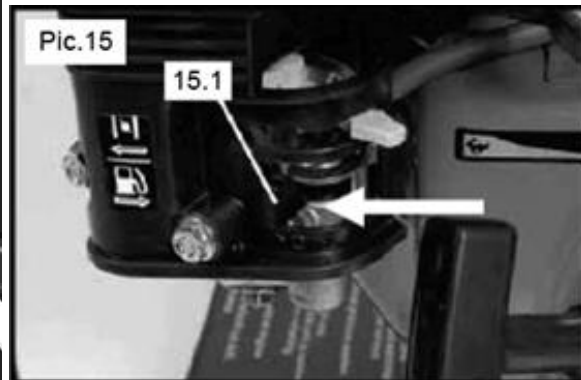
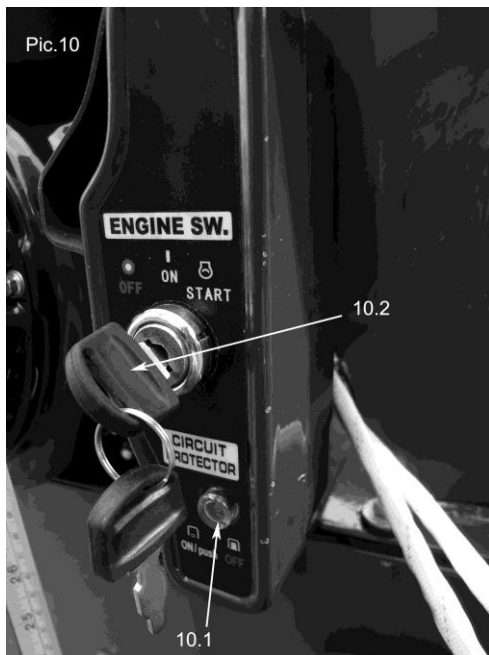
5. Hold down the engine firmly with one hand on the frame. With the other hand, grip the recoil starter cord handle and pull slowly until resistance is felt indicating that the recoil starter is engaged. When resistance is felt pull the cord sharply (Pic.11). Continue this procedure until the engine starts.
6. When the engine has been successfully started and is running smoothly return the choke lever to the OFF position (Pic.12, 12.1).



When the engine is running, the speed can be adjusted by moving the throttle control lever (Pic.13, 13.1) to the high (indicated by a hare), medium or low position (indicated by a tortoise).

### To Stop the Chipper Shredder

To stop the engine, turn the key (Pic .10, 10.2) to the OFF position or you can stop the engine by turning the engine ON/OFF switch to the OFF position (Pic.14, 14.1).



When the engine has stopped and before storing, turn the fuel lever to the OFF position (Pic.15, 15.1).

### To Shred Twigs, Leaves, and Brush

1. Slowly pour the material into the hopper. DO NOT try to stuff too much material in at one time or the machine will jam.
2. Use a 1" diameter branch to push the material into the hopper if necessary (Pic.16). DO NOT use your hands!



**Pic.16** Shredding leaves

**Note:** Move the throttle to the idle position, or turn the Chipper Shredder **OFF** when not actively shredding or chipping.

3. Turn **OFF** the machine, allow all moving parts to completely stop, and disconnect the spark plug wire before moving the machine, emptying the bag, unclogging the inlets or outlets, filling the gas tank, or performing maintenance and repairs.

### Shredding Tips

- Feed material into the Chipper Shredder slowly. If the motor begins to bog down, you are feeding too fast.
- Roots and soiled material will dull or damage the blades.
- Remove the chips often. Allowing the chips to pile up to the outlet will cause the outlet to clog.
- Do not shred wet material such as leaves, brush, paper, or vines in the mulcher.
- Be sure the material to be shredded is dried or seasoned before mulching. This will allow your machine to perform at peak performance and maximize its shredding capability.
- Do not mulch palm fronds (or similar tree material) since this type of fibrous material will often wrap around the axle or flywheel causing the chipper to stop operating or operate improperly.

### To Chip Branches

1. Stand to the side of the hopper and make sure you have a stable stance and firm footing.
2. Remove twigs and smaller branches from the branch if they might catch on the edges of the funnel and prevent the branch from going in.
3. Place branches into the funnel, thick end first, and allow the blades to draw the branch into the funnel (Pic.17).



Pic.17

Pic.17 Chipping branches

### Chipping Tips

- DO NOT feed material in excess of the diameter indicated on the funnel cover into the funnel. Large branches will cause the motor to stall.
- Chipping wood when it is green is easier on the machine. The blades will stay sharper longer.
- The Chipper Shredder will work best if the blades are sharp. Rotate, sharpen, or replace the blades as soon as Chipper Shredder performance begins to deteriorate.

### After Each Use

#### ⚠WARNING

Never forget to turn OFF the machine!

When finished chipping, turn OFF the machine, allow all moving parts to come to a complete stop, and disconnect the spark plug wire before moving the machine, emptying the bag, unclogging the inlets or outlets, filling the gas tank, or performing maintenance and repairs.

### Maintenance

#### ⚠WARNING

Turn OFF the machine, allow all moving parts to come to a complete stop, and disconnect the spark plug wire before moving the machine, emptying the bag, unclogging the inlets or outlets, filling the gas tank, or performing maintenance and repairs.

### Visual Inspection

Before and after using the Chipper Shredder, closely inspect the machine for loose parts and damage.

- Check the hopper, hopper guard, and funnel for cracks, holes, and loose bolts.
- Check the box frame for cracks or damage.
- Check the entire machine for loose bolts or screws.
- Check the blades and hammers for cracks and dings.
- Check the engine oil level.

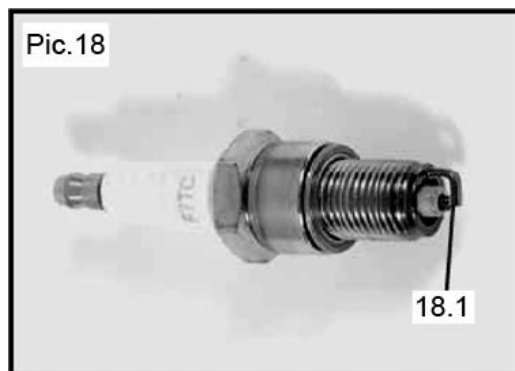
## Cleaning

Clean the machine after each use. Allow the motor to cool and remove the spark plug wire. Brush off or vacuum wood chips and wipe off the remaining dust from the exterior of the machine with a dry cloth. DO NOT rinse off the chipper/ shredder with water. Remove any chips or debris from the hopper and the discharge chute.

It is much harder to clean the machine if you allow it to sit for a while after use. You may need to use an engine cleaner to remove the resin build-up from the motor. Engine cleaners are available at most auto parts stores.

## Spark Plug

After every 50 hours of running the spark plug should be removed. Check the color of the deposits on the end of the spark plug it should be a tan color. Remove all deposits using a stiff brush or brass wire brush. Check the spark plug gap (Pic.18, 18.1) and adjust if required. The correct gap should be 0.7 to 0.8mm.



## Engine Oil Replacement

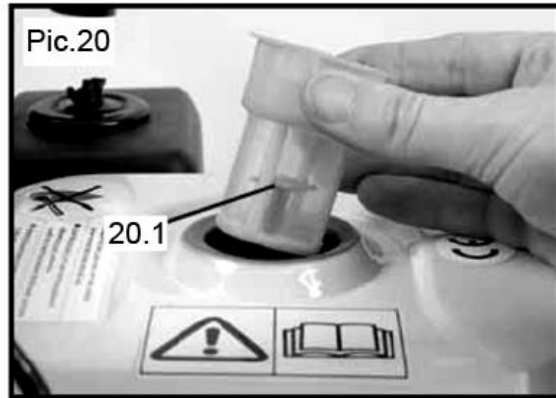
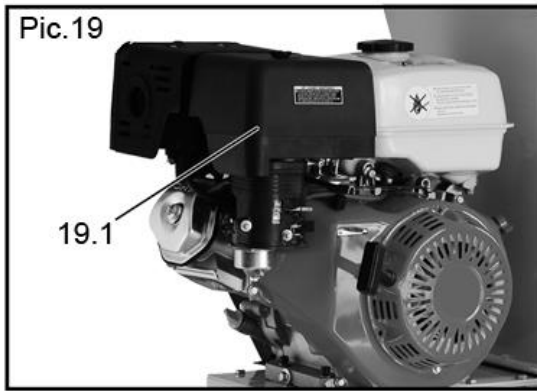
1. Place the machine on a level surface and warm up the engine for several minutes. Stop the engine.
2. Remove the oil filler cap (Pic.5, 5.1).
3. Place an oil pan under the engine. Remove the oil drain plug (Pic.5, 5.2) so that the oil can be completely drained. You will need to use a tube or other similar device to prevent the oil leaking onto the frame of the Chipper Shredder.
4. Check the oil drain plug, gasket, oil filler cap, and O-ring. If any of these are damaged, replace the part.
5. Reinstall the oil drain plug.
6. Add engine oil to the upper level of the dipstick (Pic.6, 6.1).

## Air Filter

After every 100 hours of running, or every month, the air filter (Pic.19, 19.1) should be removed, examined for deterioration, and cleaned. Clean it thoroughly using an environmentally friendly, water-based, degreasing agent. Allow it to dry fully, and then replace it.

### **⚠WARNING**

Never run the engine without the air filter fitted.



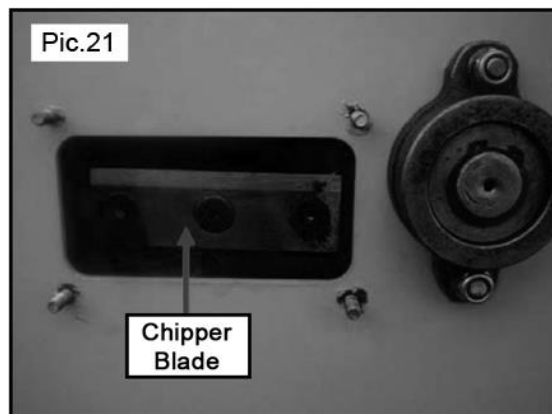
### Fuel Tank Filter

After every 150 hours of running or every three months the fuel tank filter (Pic.20, 20.1) should be removed and cleaned. Remove the fuel tank filler cap and the filter, clean the filter thoroughly using environmentally friendly water based degreasing agent and re-fit.

### Replacing Blades

Sharpen or replace the blades as soon as the chipping performance begins to deteriorate, or if you notice dings, chips, or cracks.

1. TURN **OFF** THE MACHINE, ALLOW ALL MOVING PARTS TO COME TO A COMPLETE STOP, AND DISCONNECT THE SPARK PLUG WIRE!
2. Remove the side cover plate to expose the blades (Pic.21).
3. Remove one blade, rotate the impeller, and remove the second blade.
4. Have the original blades professionally sharpened, or order a replacement set, then re-install the blades.
5. Replace the side cover plate and re-attach the spark plug wire.

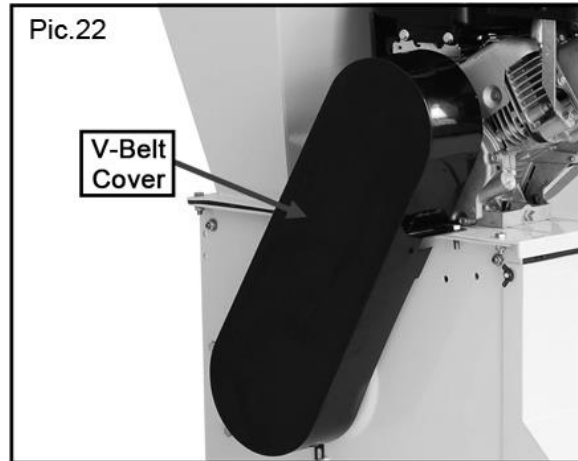


**Pic.21** Chipper blade

### Replacing the V-Belt

Replace or tighten the V-belt if you notice the motor running and the chipper blades are not spinning.

1. TURN **OFF** THE MACHINE, ALLOW ALL MOVING PARTS TO COME TO A COMPLETE STOP, AND DISCONNECT THE SPARK PLUG WIRE!
2. Remove the V-belt cover as shown in Pic.22.



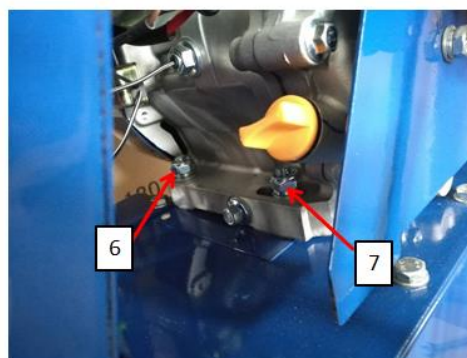
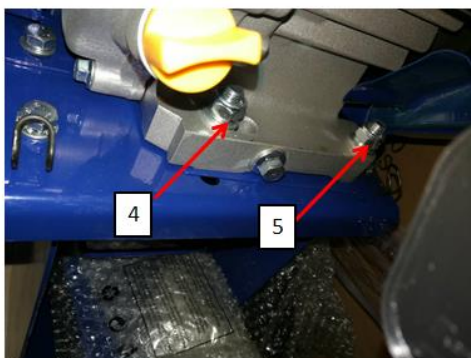
3. Roll the belt off the pulleys and install the new belt.
4. Replace the V-belt cover and re-attach the spark plug wire.

### Adjusting the V-Belt

1. Remove the belt cover by disassembling bolts #1, 2, and #3 (M8\*25) and the nut (M8). See the photos below for references.

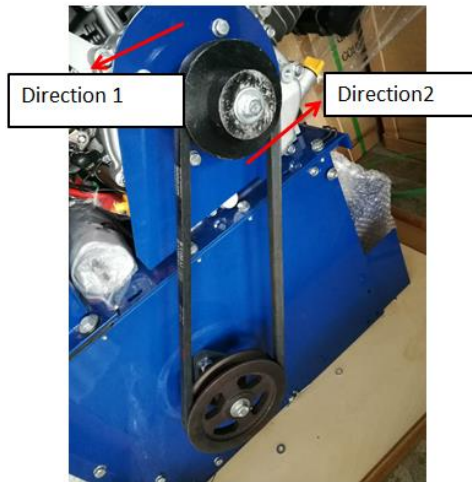


2. Loosen the nuts #4, #5, #6, and #7 (M10) enough so the engine can move. You can leave the remaining in place.





3. Pull the engine toward direction 1 and the belt will loosen. Pull the engine toward direction 2 and the belt will tighten.



4. After adjusting, tighten the nuts (#4, #5, #6, and #7) to guarantee the engine will not move.
5. Assemble the belt cover by tightening the bolts and nuts (#1, #2, and #3).

## Storage

Follow these guidelines when storing your Chipper Shredder.

- Remove the spark plug wire to prevent unauthorized starting.
- Empty the bag before storing to keep the mulch from rotting in the bag.
- Place the Chipper Shredder in a dry, level area. If the Chipper Shredder is tipped it may leak oil and gas.
- DO NOT store the Chipper Shredder near an ignition source, such as a wood stove, gas or electric heater, or an appliance or heater with a pilot light.
- Store the Chipper Shredder in a well-ventilated area. DO NOT store the Chipper Shredder in an area that will allow toxic gas fumes into areas inhabited by humans or animals.
- Close the discharge chute deflector and place the covers over the hopper and the funnel to prevent objects or critters from getting into the machine.

If the engine is not to be used or is to be stored for more than one month the following storage procedure should be carried out. Drain all the fuel from the fuel tank and the carburetor ensure that all the fuel has been removed. Remove the spark plug and pour approximately one tablespoon full of clean engine oil into the spark plug hole. With the ignition turned OFF gently pull on the recoil starter cord several times. Re-fit the spark plug continue to pull the recoil starter cord until the piston is on the compression stroke (when resistance is felt) then stop pulling.

## Troubleshooting

### ⚠ WARNING

Turn OFF the machine, allow all moving parts to come to a complete stop, and disconnect the spark plug wire before moving the machine, emptying the bag, unclogging the inlets or outlets, filling the gas tank, or performing maintenance and repairs.

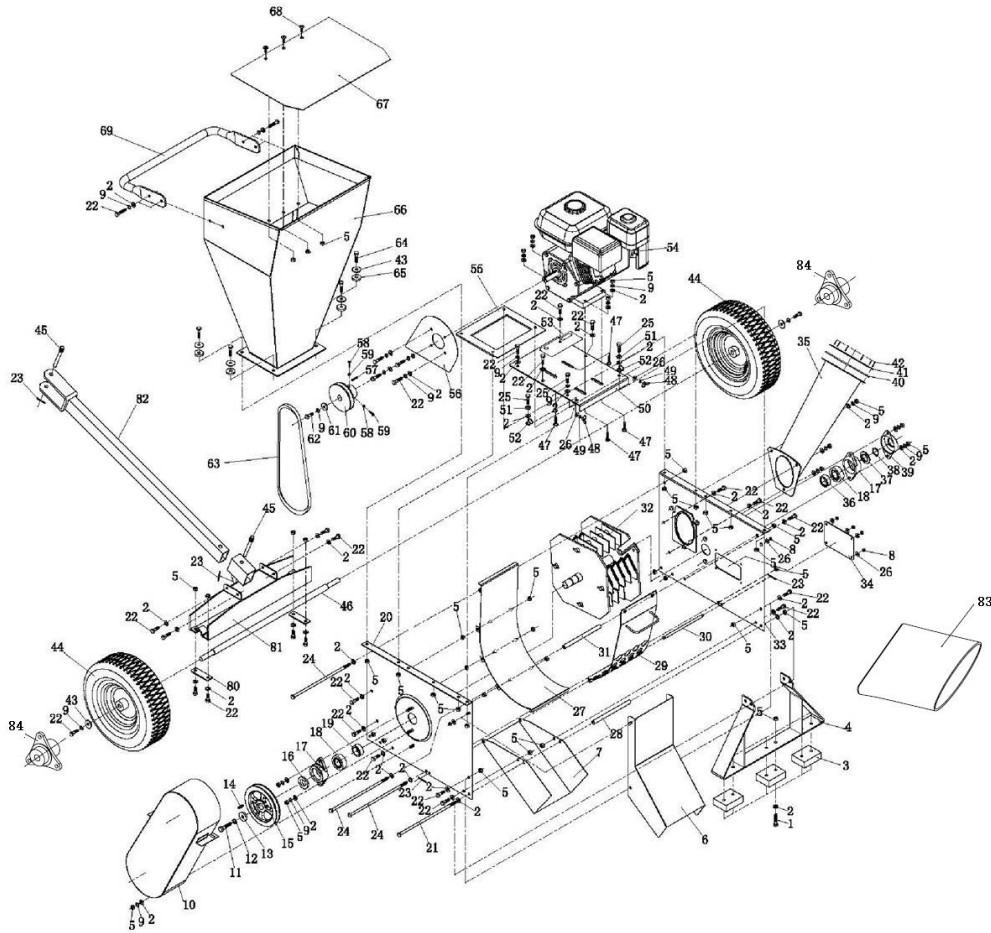
Review the troubleshooting and procedures in this section to fix your machine if a problem develops.

Failure	Possible Cause	Corrective Action
Engine will not start.	<ol style="list-style-type: none"> <li>1. Control levers are not in correct positions for starting.</li> <li>2. Spark plug wire is not connected to the spark plug, or the spark plug is bad.</li> <li>3. No gas or gas is old and stale.</li> <li>4. Air filter is dirty.</li> <li>5. Engine oil is low.</li> <li>6. Blocked fuel line.</li> </ol>	<ol style="list-style-type: none"> <li>1. Make sure the ON/OFF switch is ON, the fuel shut-off valve is open, and the choke and throttle controls are in the start position.</li> <li>2. Connect the spark plug wire or replace the spark plug.</li> <li>3. If empty, fill the tank. If full, drain the gas and fill the tank with fresh gas.</li> <li>4. Clean out the air filter.</li> <li>5. Add oil to the engine.</li> <li>6. Clean out the fuel line.</li> </ol>
Engine does not run smoothly.	<ol style="list-style-type: none"> <li>1. Engine is warm, and the choke is still in the CHOKE position.</li> <li>2. Air filter is dirty.</li> <li>3. Stale fuel, water or dirt in fuel, blocked fuel line.</li> </ol>	<ol style="list-style-type: none"> <li>1. Move the choke to the RUN position.</li> <li>2. Clean the air filter.</li> <li>3. Drain the fuel tank, clean out the fuel line, and fill the tank with fresh gas.</li> </ol>
Engine overheats.	<ol style="list-style-type: none"> <li>1. Chips and sawdust around the motor.</li> <li>2. Dirty air filter.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean off the motor.</li> <li>2. Clean out the air filter.</li> </ol>
Machine vibrates or makes unusual noises.	<ol style="list-style-type: none"> <li>1. Loose or damaged parts.</li> <li>2. Impeller/blades have woody residue or chunks stuck to them.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the blades, hammers, impeller, and all connections. Tighten, repair, or replace any loose or damaged parts.</li> <li>2. Clean the impeller and blades.</li> </ol>
Chipper Shredder no longer chips or shreds well.	<ol style="list-style-type: none"> <li>1. Dull or damaged blades and hammers.</li> <li>2. Loose, worn, or damaged V-belt.</li> </ol>	<ol style="list-style-type: none"> <li>1. Sharpen or replace blades and check the hammers for damage.</li> <li>2. Replace or tighten V-belt.</li> </ol>
Chips do not come out of the discharge	<ol style="list-style-type: none"> <li>1. Discharge chute or hopper is clogged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn <b>OFF</b> the motor, disconnect the spark plug, then clean out the machine</li> </ol>

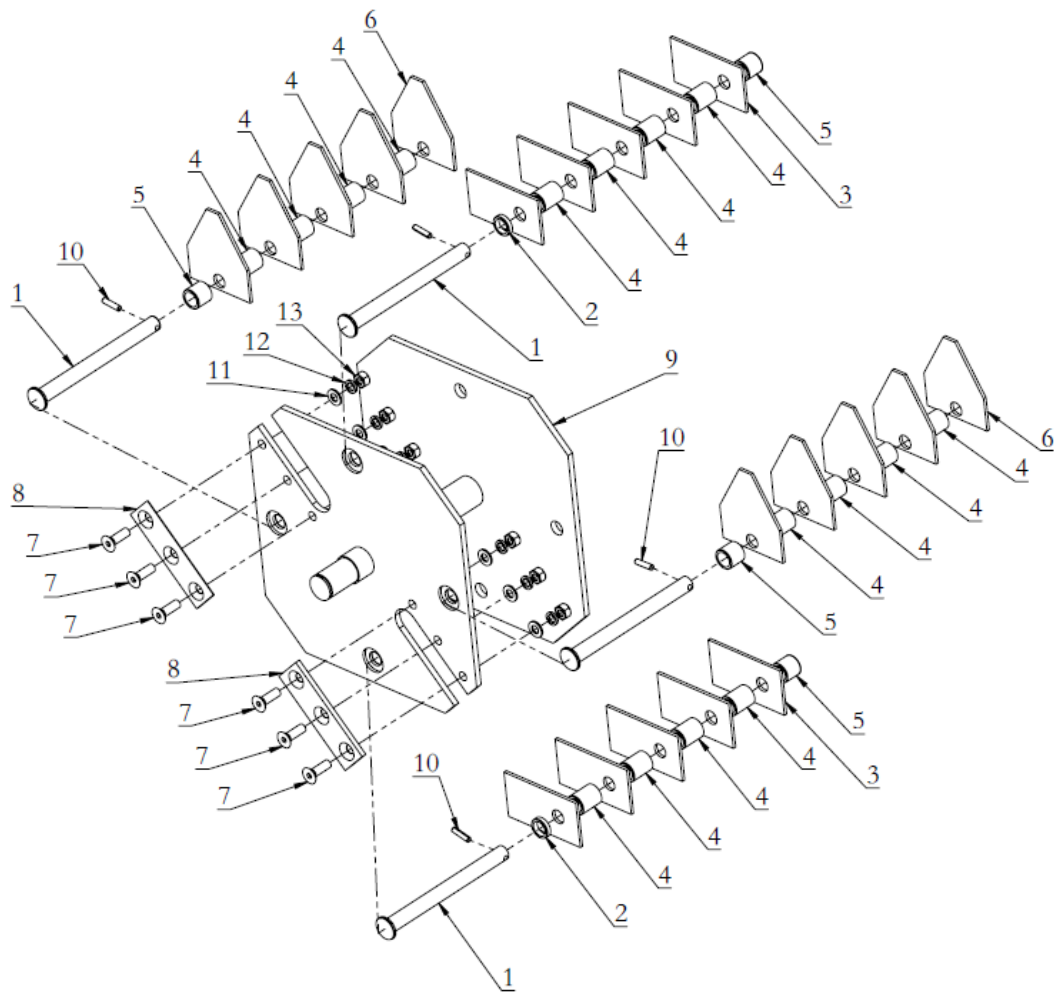
Failure	Possible Cause	Corrective Action
chute or come out slowly.	2. Insufficient motor RPMs.	2. Move the throttle to FAST.

## Parts Diagram

Whole Unit Diagram:



**32# Knife Rest Diagram:**



## Parts List

Part No.	Description	Q'ty	Part No.	Description	Q'ty
1	Screw M8x25 SHCS	6	46	Axle	1
2	Flat Washer 8	76	47	Screw M10*45	4
3	Rubber Foot	3	48	Dishing Nut M6	2
4	Front leg	1	49	Gasket 6	4
5	Locknut M8	59	50	Engine Plate	1
6	Discharge Chute	1	51	Taper Gasket 8	2
7	Discharge Cover Board	1	52	Pothook	2
8	M6 Nylon Locknut	6	53	Guard	1
9	Gasket 8	31	54	15HP Engine	1
10	Strap Cover	1	55	Hopper Gasket	1
11	M10*20 Bolt	1	56	Belt Cover Protecting Plate	1
12	Gasket 10	5	57	4.78X5X35 Flat Pin	1
13	Flat Washer 10*32*4	1	58	Screw M6x25	2
14	Flat Pin 8*7*22	1	59	M6 Nut	2
15	Big Pulley	1	60	Small Pulley	1
16	Retainer Ring(Right)	1	61	Positive battery wire	1
17	Bearing Seat	2	62	Negative battery line	1
18	2205 Rolling Ball Bearing	2	63	B1092 V Belt	1
19	Space Ring 18.5mm	1	64	M8*30 Bolt	4
20	Box Frame Side Right	1	65	Rubber Gasket	4
21	M8*200 Bolt	1	66	Hopper D	1
22	M8*20 Bolt	33	67	Striker Plate	1
23	3*30 Cotter Pins	4	68	Screw	3
24	M8*190 Bolt	3	69	Handle	1
25	M8*25 Bolt	5	80	Fixed block under wheel bar	2
26	6*15*1 Flat Washer	8	81	The rear bracket	1
27	Rear Board	1	82	Trailer tube	1
28	Support Tube 2	1	83	M10 Nylon Locknut	4
29	Screen	1	84	10 Flat Washer	4
30	Support Tube	1	85	Small Belt Pulley Cushion Block	2
31	Support Tube 1	3	86	Flat Washer 8x28x3	1
32	Knife Rest	1	87	Gasket 8	1
33	Box Frame Side Left	1	88	Screw 5/16UNF-20	1
34	Blade Cover Plate	1	89	Start switch fixing plate	1
35	Chipper Chute B	1	90	Small sleeve	1
36	Space Ring 17.5mm	1	91	start switch	1
37	Retainer Ring(Left)	1	92	6x12x1.2 Flat	2
38	Circlip A	1	93	M6*12 Bolt	1
39	Bearing Cover	1	94	M6*30 Bolt	1
40	Rubber Grid	1	95	Battery box	1
41	Cover Board 89	1	96	Battery box cover plate	1
42	4*16 Rivet	6	97	12V Battery	1
43	8*24*2 Flat Washer	6	98	Bag	1
44	13" Pneumatic wheel	2	99	flange	2
45	Bayonet lock	2			

<b>Part#</b>	<b>Description</b>	<b>Q'ty</b>
32-1	Hammer Axle	4
32-2	Spacer 1	4
32-3	Shredding Hammer	10
32-4	Spacer 3	16
32-5	Spacer 2	4
32-6	Shredding Knives	10
32-7	Screw M8*25	6
32-8	Chipping Blade	2
32-9	Cutter	1
32-10	Elastic Cylindrical Pin 5*25	4
32-11	Flat Washer 8	6
32-12	Gasket 8	6
32-13	Locknut M8	6

## Replacement Parts

- For replacement parts and technical questions, please call Customer Service at **1-800-222-5381**.
- Not all product components are available for replacement. The illustrations provided are a convenient reference to the location and position of parts in the assembly sequence.
- When ordering parts, the following information will be required: item description, item model number, item serial number/item lot date code, and the replacement part reference number.
- The distributor reserves the rights to make design changes and improvements to product lines and manuals without notice.

## Limited Warranty

Northern Tool and Equipment Company, Inc. ("We" or "Us") warrants to the original purchaser only ("You" or "Your") that the Powerhorse product purchased will be free from material defects in both materials and workmanship, normal wear and tear excepted, for a period of **two years** from date of purchase. The foregoing warranty is valid only if the installation and use of the product is strictly in accordance with product instructions. There are no other warranties, express or implied, including the warranty of merchantability or fitness for a particular purpose. If the product does not comply with this limited warranty, Your sole and exclusive remedy is that We will, at our sole option and within a commercially reasonable time, either replace or repair the product or product component without charge to You or refund the purchase price (less shipping). This limited warranty is not transferable.

### Limitations on the Warranty

This limited warranty does not cover: (a) normal wear and tear; (b) damage through abuse, neglect, misuse, or as a result of any accident or in any other manner; (c) damage from misapplication, overloading, or improper installation; (d) improper maintenance and repair; and (e) product alteration in any manner by anyone other than Us, with the sole exception of alterations made pursuant to product instructions and in a workmanlike manner.

### Obligations of Purchaser

You must retain Your product purchase receipt to verify date of purchase and that You are the original purchaser. To make a warranty claim, contact Us at 1-800-222-5381, identify the product by make and model number, and follow the claim instructions that will be provided. The product and the purchase receipt must be provided to Us in order to process Your warranty claim. Any returned product that is replaced or refunded by Us becomes our property. You will be responsible for return shipping costs or costs related to Your return visit to a retail store.

### Remedy Limits

Product replacement, repair or a refund of the purchase price is Your sole remedy under this limited warranty or any other warranty related to the product. We shall not be liable for: service or labor charges or damage to Your property incurred in removing or replacing the product; any damages, including, without limitation, damages to tangible personal property or personal injury, related to Your improper use, installation, or maintenance of the product or product component; or any indirect, incidental or consequential damages of any kind for any reason.

### Assumption of Risk

You acknowledge and agree that any use of the product for any purpose other than the specified use(s) stated in the product instructions is at Your own risk.

### Governing Law

This limited warranty gives You specific legal rights, and You also may have other rights which vary from state to state. Some states do not allow limitations or exclusions on implied warranties or incidental or consequential damages, so the above limitations may not apply to You. This limited warranty is governed by the laws of the State of Minnesota, without regard to rules pertaining to conflicts of law. The state courts located in Dakota County, Minnesota shall have exclusive jurisdiction for any disputes relating to this warranty.



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