



3-in-1 Wood Chipper

Owner's Manual



Scan barcode for video
assembly instructions



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 #63388

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 wood chipper 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**.

Table of Contents

Intended Use.....	4
Technical Specifications	4
Important Safety Information	5
Specific Operation Warnings	7
Safety Labels	9
Main Parts of Wood chipper.....	11
Wood Chipper Identification	11
Site Considerations	14
Assembly Instructions.....	14
Before Each Use.....	17
Operating Instructions.....	18
After Each Use.....	19
Maintenance	19
Troubleshooting	23
Parts Diagram.....	26
Parts List.....	28
Replacement Parts	29
Limited Warranty.....	30

Intended Use

The Powerhorse 3-in-1 Wood Chipper is a gas engine-powered chipper shredder that breaks up leaves and wooded pieces such as tree branches, brush, and limbs into smaller volume via a high-speed rotor containing chipping blades and shredding hammers. It should not be used for any other purpose.

Technical Specifications

Property	Specification
Maximum Chipping Capacity	3"
Shredder Capacity	1/2"
Chipping Knives	2
Shredder Hammer	4 Y-HAMMERS
Reduction Rate	15:1
Chipper Knife Material	CR12MoV
Hopper Dimensions (In.)	16.7X15.2
Limb Chute	YES
Wheel Size (In.)	10x3
Wheel Material	PU
Wheel Type	SOLID
Net Weight (Lb.)	121
Gross Weight (Lb.)	130
Assembled Dimension (In.)	30x24.1x41
Packing Dimension (In.)	31.9x23.8x22.2
Engine Specifications	
Engine Brand	Rato
Engine Type	OHV
Power	6.5HP
Displacement	212cc
Starting	Recoil
RPM	3600
Fuel Capacity	0.7Gal
Oil	SAE 30W
EPA3 Approval	YES
CARB Approval	YES

⚠ CAUTION

HIGH ALTITUDE OPERATION

Operating at an altitude of greater than 6000 feet (1828 meters) may affect your engines performance, fuel consumption, and emissions. To remain emissions compliant and improve engine performance at higher altitudes, a high-altitude kit is required. A high-altitude kit includes a carburetor jet resized to help correct air / fuel mixture at altitude. To order a high-altitude kit or if you have additional questions, go to www.northerntool.com or contact us at 1-866-443-2576. Please note, engines with the high-altitude kit installed operated at lower altitudes could cause severe engine damage and affect emissions compliance. When modified, a tag or decal should be added to the product stating that a high-altitude kit was installed and to remind you to re-service the carburetor (re-jet) when operating in lower altitude environments.

Important Safety Information

⚠WARNING

- Read and understand all instructions. Failure to follow all instructions may result in serious injury or property damage.
- 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.
- 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. This product will be safer and do a better job 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

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 Wood chipper in confined work areas may put you dangerously close to other cutting tools and rotating parts.
- Do not use the wood chipper 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 wood chipper.
- 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.
- 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 immediately. See a doctor. You may have carbon monoxide poisoning.

⚠WARNING

OPERATIONAL SAFETY

- Place the wood chipper on a flat, level, sturdy surface capable of supporting the weight of the Chipper/Shredder and any additional tools and equipment.
- Make sure that the machine is properly adjusted, set up correctly and the hopper and funnel are empty before starting the machine.
- Never place your hands, fingers, feet, or any other part of your body close to the Discharge Opening while the wood chipper is in operation.
- Do not look in the hopper, chipper chute, or discharge opening when the machine is running.
- Always maintain secure footing and solid balance while starting or operating the wood chipper. Never lean directly over the machine.
- 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.
- Never direct discharge material toward anyone. Avoid discharging material against a wall or obstruction. Material may ricochet back toward the operator.

- 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.
- Never leave the machine running unattended. Always turn off the engine, wait for the impeller to come to a complete stop, and disconnect the spark plug before leaving the area. Always move the unit to a safe storage area when not in use.
- Never attempt to reposition or move the debris loader unit while it is running. Doing so could cause the machine to tip over and cause unexpected injury.

⚠CAUTION

WOOD CHIPPER USE AND CARE

- Do not force the wood chipper. 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 wood chipper will operate properly and perform its intended function. Replace damaged or worn parts immediately. Never operate the wood chipper with a damaged part.
- Do not use a product with a malfunctioning switch. Any power tool that cannot be controlled with the power switch is dangerous and must be repaired by an authorized service representative before using.
- Disconnect the power/air supply from the product and place the switch in the locked or off position before making any adjustments, changing accessories, or storing the tool. Such preventive safety measures reduce the risk of starting the tool accidentally.
- Store the wood chipper 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 wood chipper. 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 wood chipper 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 wood chipper. Make sure any bystanders are also wearing safety equipment.
- **ENGINE OPERATION:** Refer to the engine manual for operating instructions and gasoline engine


safety warnings.

- **HAND SAFETY:** DO NOT put hands or other body parts into hopper, funnel, or outlet while the blades are turning. The wood chipper 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 wood chipper.
- **OPERATING LOCATION:** Set up the wood chipper on firm, level, grass or dirt. DO NOT set up the wood chipper 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 Wood chipper in a location where sparks or heat from the motor could cause a fire.
- **SECURE FOOTING:** Placing the wood chipper 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 wood chipper 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 wood chipper 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 wood chipper OFF.
- **TURN OFF WOOD CHIPPER:** 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 WOOD CHIPPER:** Make sure the hopper and funnel are empty when starting the machine. The pull start cord may stop suddenly causing the wood chipper to fall over or injure your hand or arm.
- **CLEANING WOOD CHIPPER:** 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

<p style="text-align: center;">⚠ DANGER</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;">  <p>Keep hands away from the funnel.</p> <p>DO NOT feed metal, rocks, bottles, cans or any other non-botanical objects into the machine. Inspect wood for nails or other foreign objects.</p> <p>DO NOT insert branches thicker than 3 inches (75mm) or longer than 4 feet.</p> </div> <div style="width: 30%;">  </div> </div>	<p style="text-align: center;">⚠ WARNING</p> <div style="display: flex; justify-content: space-around;">   </div>
<p>NO HANDS BELOW THIS LINE</p>	

⚠ DANGER



Amputation Hazard

High-speed rotation cutting blade!

To avoid serious injury, keep hands out of discharge chute while machine is running.

⚠ WARNING



Discharge Objects Hazard

To prevent serious injury from discharge debris, wear ANSI Z87.1 compliant eye protection and install a discharge bag before operating.

⚠ 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 3 inches or longer than 4 feet.

⚠ 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

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.

Vacuum Connection Inlet

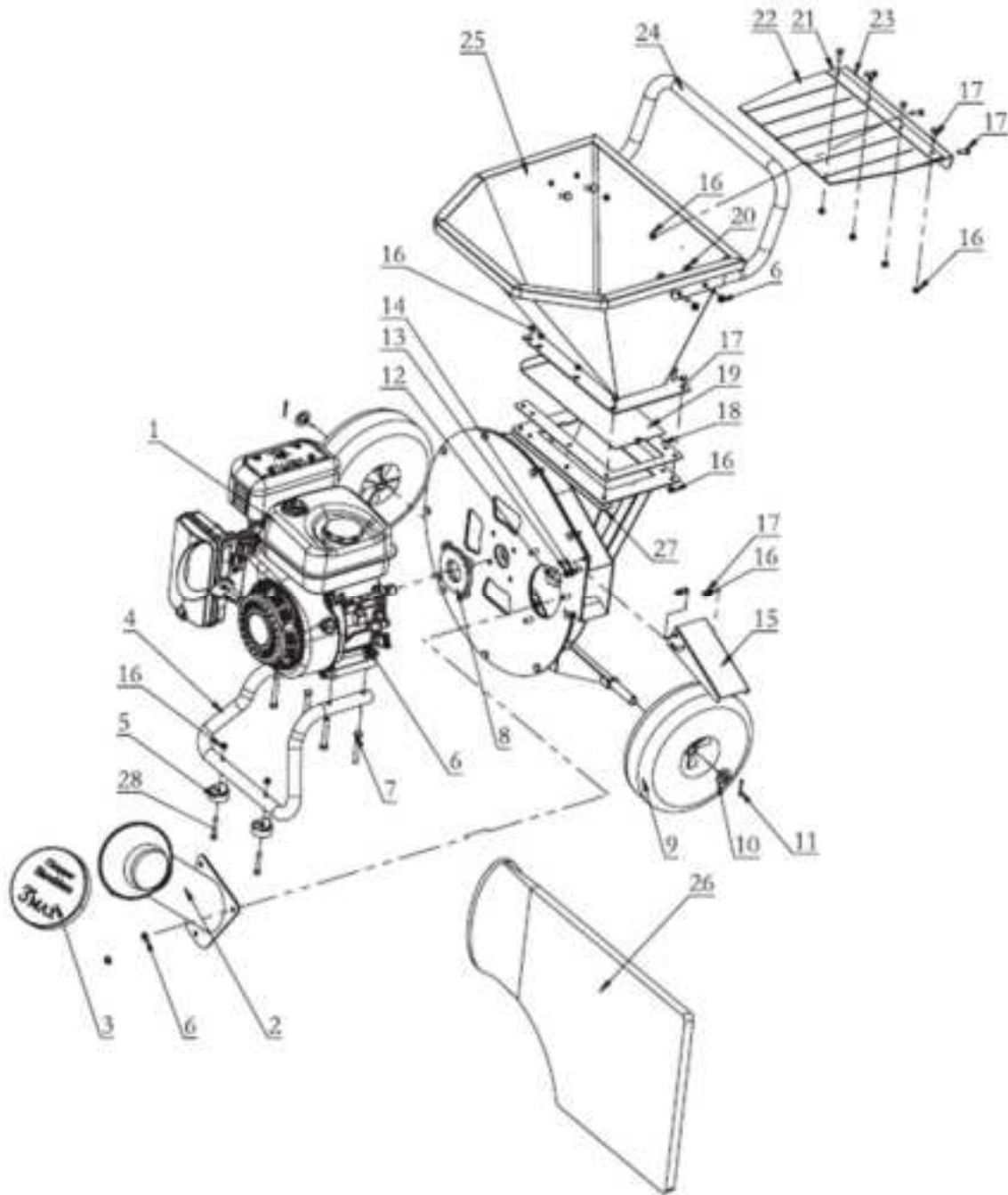
⚠ WARNING



Amputation Hazard

Do not open while machine is running. Wait for blade to come to a complete stop and disconnect spark plugs before removing cover.

Main Parts of Wood chipper



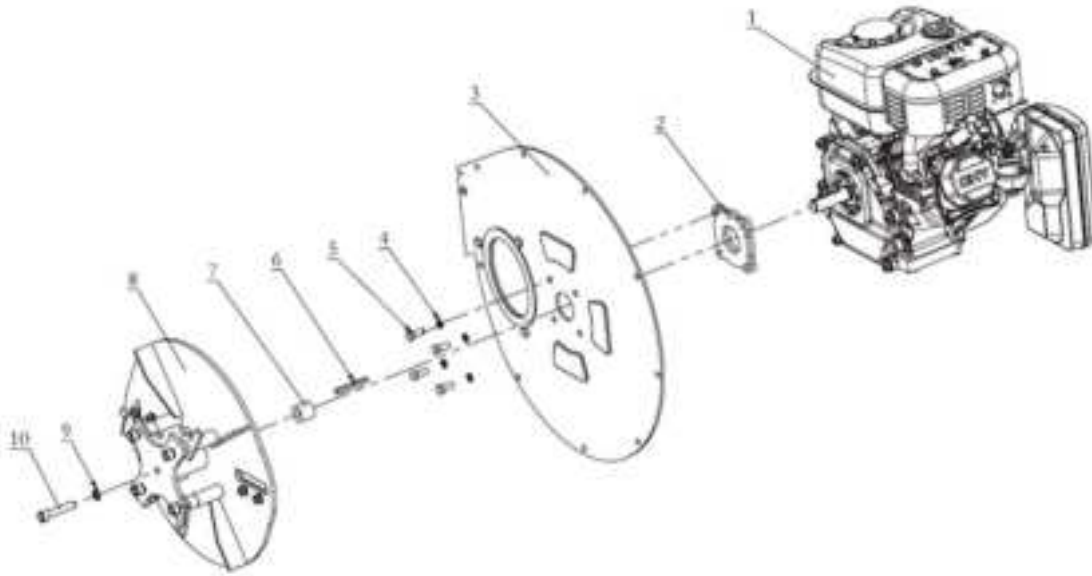
Wood Chipper Identification

Part No.	Description	Quantity	Part No.	Description	Quantity
1	Engine	1	15	Discharge guard	1
2	Chipper cone	1	16	Flange nut M6	17
3	Cone cap	1	17	Flange bolt M6x20	17
4	Support stand	1	18	Damper attachment	1
5	Stand pad	2	19	Damper	1
6	Flange nut M8	11	20	Flange bolt M8x20	4
7	Flange bolt M8x60	4	21	Retainer hopper guard	1
8	Flange	2	22	Hopper guard	11

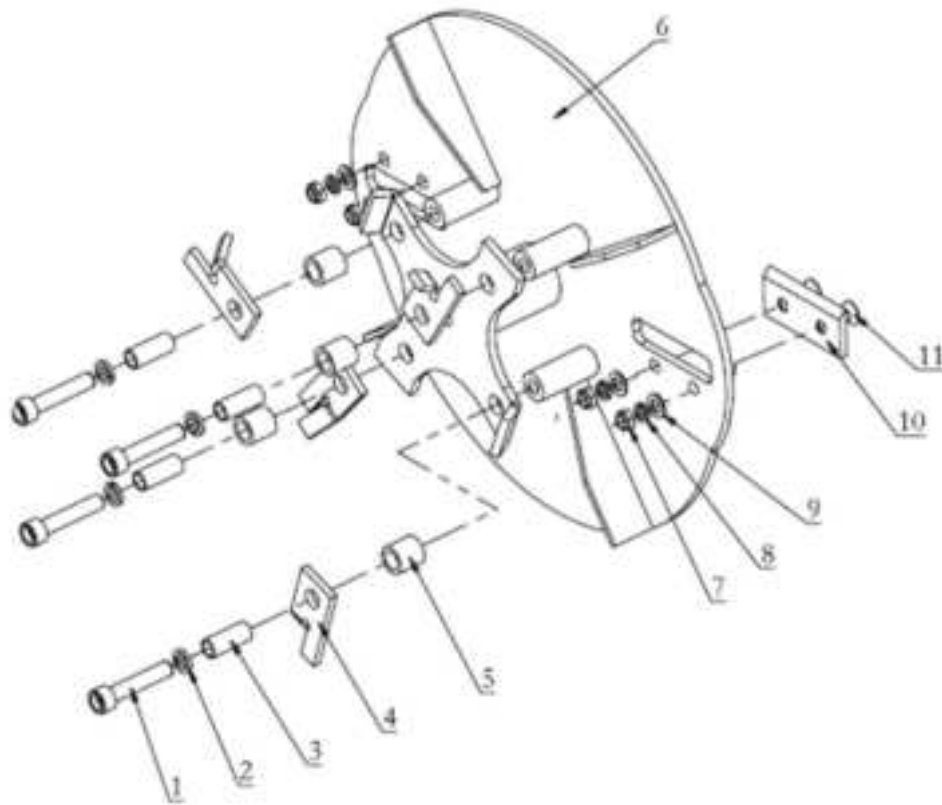
Part No.	Description	Quantity	Part No.	Description	Quantity
9	Wheel	2	23	Flange hopper guard	1
10	Washer	2	24	Handle	1
11	Cotter pin	2	25	Hopper	1
12	Handwheel	1	26	Bag	1
13	Spring washer	1	27	Screw plate	1
14	Washer	1	28	Socket cap screw M6x40	2

Parts Breakdown – Engine and Rotor Group

Part No.	Description	Quantity
1	Engine	1
2	Flange	2
3	Engine plate	1
4	Spring washer 8	4
5	Hex bolt	4
6	Key parallel pin	1
7	Bearing spacer	1
8	Rotor assembly kit	1
9	Spring washer 10	1
10	Socket head cap screw	1

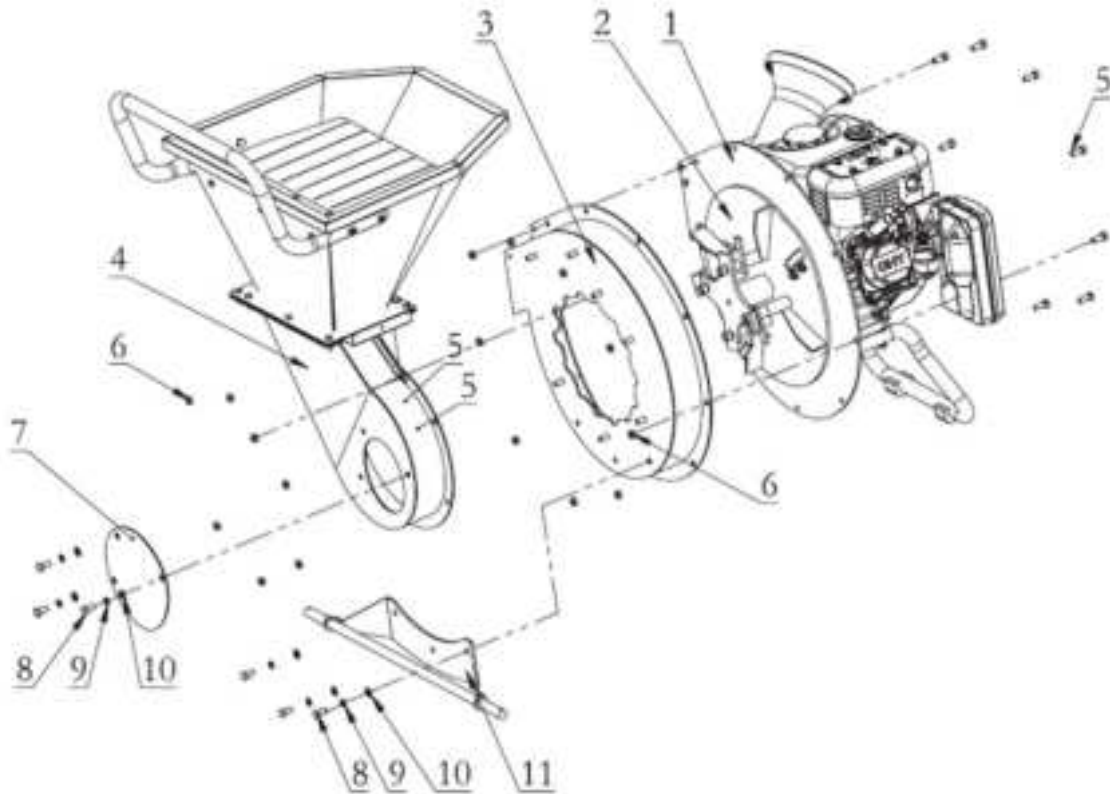


Part No.	Description	Quantity
1	Socket head cap screw M10x50	4
2	Spring washer 10	4
3	Spacer	4
4	Y hammer	4
5	Bearing sleeve	4
6	Knives plate	1
7	Locknut M8	4
8	Spring washer 8	4
9	Washer 8	4
10	Knife	2
11	Screw	4



Parts Breakdown – Wood Chipper Housing Group

Part No.	Description	Quantity
1	Engine plate	1
2	Rotor assembly kit	1
3	Rotor house	1
4	Chipper back cover	1
5	Flange bolt M8x20	11
6	Flange nut M8	18
7	Vacuum inlet cover	1
8	Hex bolt M8x15	6
9	Spring washer	6
10	Washer	6
11	Wheel rack	1



Site Considerations

Location

The wood chipper 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 wood chipper 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

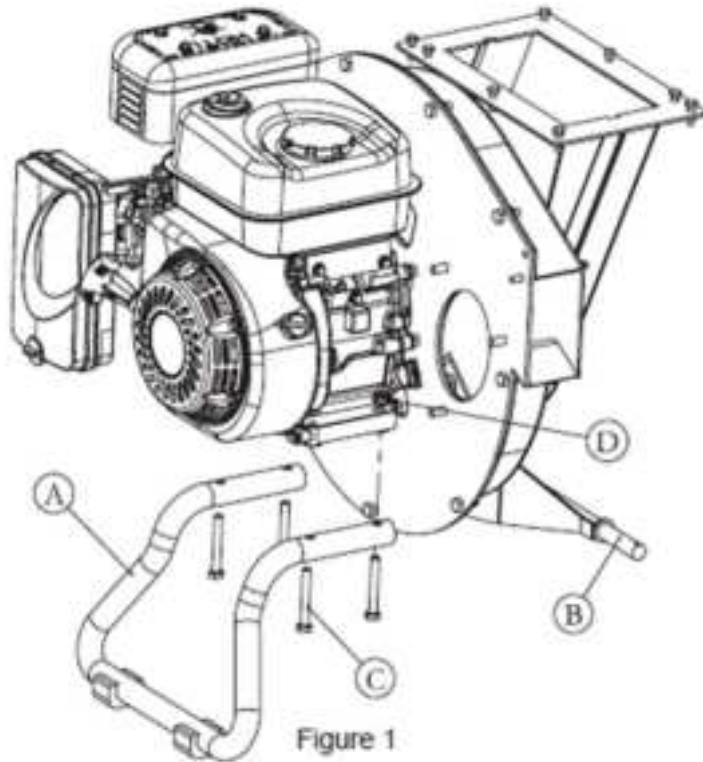
This machine presents serious injury hazards to untrained users. Read through this entire manual to become familiar with the controls and operations before starting the machine!

The major components of the wood chipper 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.

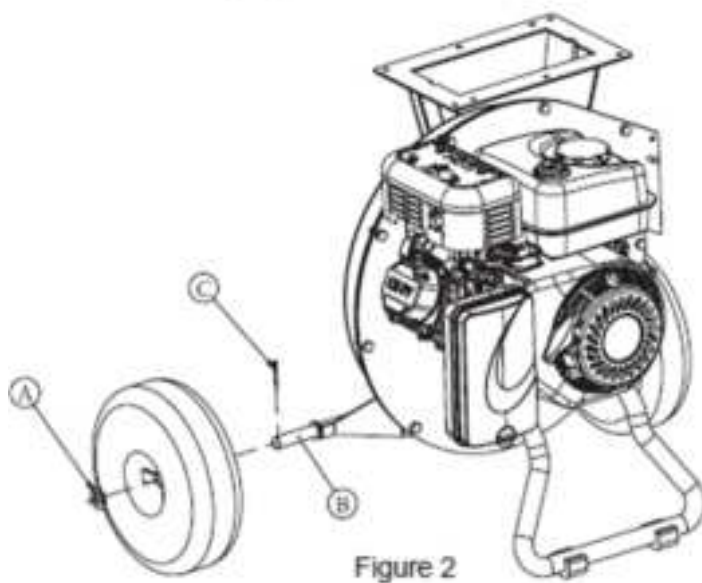
Install Stand (See Figure 1)

1. Position the stand (A) underneath the engine base.
2. Using the four M8x60 bolts (C) and four nuts (D), tighten the stand with the engine base plate.



Install the Wheels (See Figure 2)

1. Place the wheel onto the axle (B). Make sure the wheel disc flat side faces the machine.
2. Slide the washer (A) onto the axle against the wheel.
3. Insert the cotter pin (C) into the hole to secure the wheel on the axle.



Install Chipper Cone (See Figure 3)

1. Position the chipper cone (B) over the three M8 thread studs protruding from the engine plate.
2. Attach the three M8 flange nuts (C) and tighten to secure the cone.
3. The rubber cone cover (A) can be used when using the vacuum function.

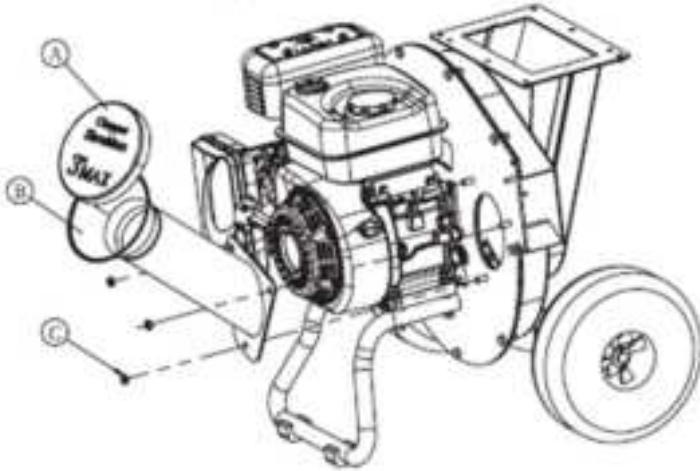


Figure 3

Install the Handle (See Figure 4)

1. Position the handle (A) by aligning the handle holes with the hopper holes on the two sides.
2. Using four flange bolts (C) and nuts (D), secure the handle on the hopper.

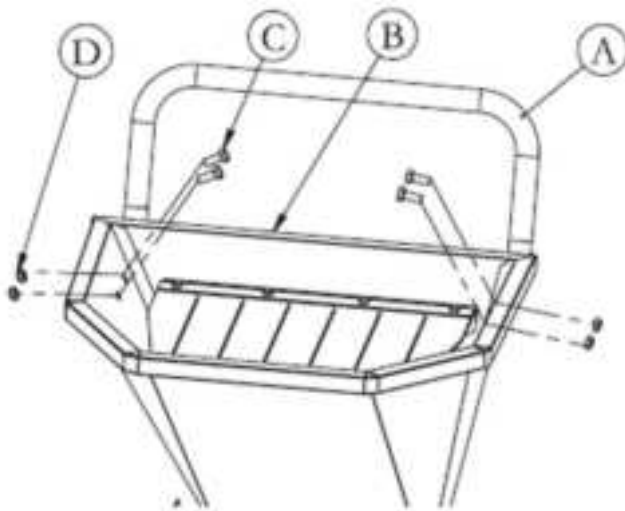


Figure 4

Install the Hopper Guard (See Figure 6)

1. Position the hopper guard assembly (C) by aligning the assembly holes with the holes in the hopper.
2. Use the three M6 flange bolts (A) and nuts (D) to secure the guard assembly (C) to the hopper.

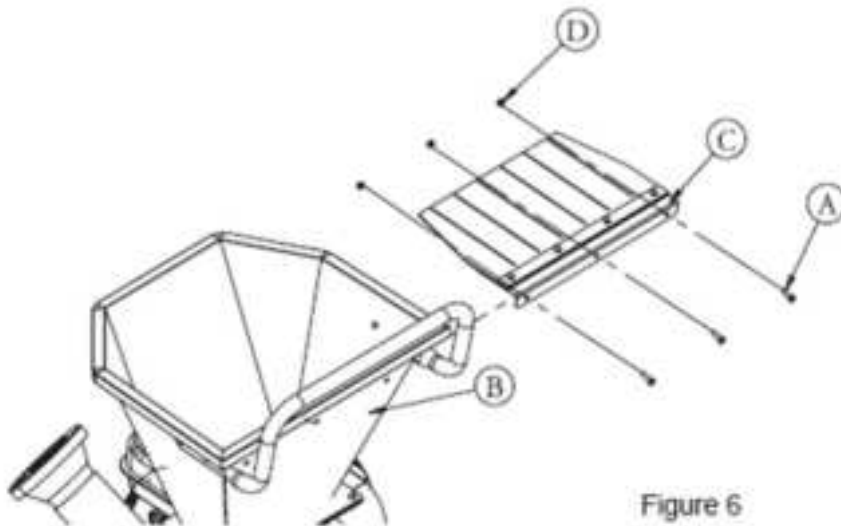


Figure 6

Before Each Use

⚠WARNING

- Inspect the unit for any signs of damage or foreign material in the machine. Remove any solid material that may be preventing the unit from operating properly.
- Be familiar with the controls, how each functions, and what each operates.
- Check engine oil level. Add oil if necessary, following the engine manufacturer's recommendations. Refer to engine manual included with literature packet.
- Check the air cleaner for dirty, loose, or damaged parts. Clean or replace if necessary.
- Check the air intake and cooling area for dirt or debris and clean as necessary.
- Gasoline is extremely flammable and highly explosive under certain conditions. BE SURE to install fuel cap after refueling.
- Fill fuel tank with good quality, clean, unleaded regular gasoline to the level recommended by the engine manufacturer.

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

⚠WARNING

- Never open the oil fill port while engine is running. Hot oil can spray over face and body.
- The exhaust from this product contains carbon monoxide gas. Carbon monoxide is a colorless, odorless and tasteless gas that can cause dizziness, nausea, unconsciousness or even brain damage and death if inhaled for prolonged periods.
- Operate the unit outdoors in a well-ventilated location only. Keep children, pets and bystanders away.
- Failure to follow these instructions may result in serious injury or death.

Operating Instructions

⚠WARNING

- Never place your hands, fingers, feet, or any other part of your body close to the Discharge Opening while the Chipper/Shredder is in operation.
- Do not look in the hopper, chipper chute, or discharge opening when the machine is running.
- Always maintain secure footing and solid balance while starting or operating the wood chipper. Never lean directly over the machine.
- 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.
- Never direct discharge material toward anyone. Avoid discharging material against a wall or obstruction. Material may ricochet back toward the operator.
- 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.
- Never leave the machine running unattended. Always turn off the engine, wait for the impeller to come to a complete stop, and disconnect the spark plug before leaving the area. Always move the unit to a safe storage area when not in use.
- Never attempt to reposition or move the debris loader unit while it is running. Doing so could cause the machine to tip over and cause unexpected injury.

Chipper Operation

The wood chipper is designed to handle tree limbs and branches up to approximately 3" inches in diameter. The chipping knives also permit the processing of coarse, organic matter, like corn stalks. Tree branches must be inserted large-end first into the chipper cone. Since occasional kick-backs may occur, always stand off to the side of the unit. Allow the self-feeding action of the unit to draw the sticks in.

Shredder Operation

The wood chipper is designed to shred light brush, leaves, and other soft but bulky organic waste. As material (no larger than 1/2 inch in diameter) is loaded into the shredder hopper, it is pulled into the path of the hammers by air flow.

Vacuum Attachment (Optional)

In addition to the chipper cone and hopper, loose debris may be processed by the vacuum hose adapter kit. Leaves may be raked directly into the leaf tray where vacuum action will draw them into the shredder. Forward-to-reach areas, the nozzle and hose assembly may be used. The strength of the vacuum may be changed using the rotating sleeve on the nozzle.

Operating Location

1. Select an area with firm, level ground, covered by dirt or grass.
2. Do not operate on wet or slick surfaces, or near bystanders.
3. Locate and organize the materials to be processed so that you don't have to walk in front of the inlet or discharge openings, and so you have adequate room to work safely.

Install the Hopper Guard (See Figure 6)

1. Position the hopper guard assembly (C) by aligning the assembly holes with the holes in the hopper.
2. Use the three M6 flange bolts (A) and nuts (D) to secure the guard assembly (C) to the hopper.

Adding Oil

Refer to the engine's manual for information on adding oil.

Adding Fuel

1. Remove the fuel cap.
2. Fill the tank. Do not overfill. Leave room in the tank for fuel expansion. Refer to the engine's manual for specific fuel recommendations.
3. Install and hand tighten the fuel cap.

Starting the Engine

1. See engine's manual for starting up instructions.
2. Ensure the engine is running full throttle before beginning chipping operation. On some engines, the throttle may not be adjustable.

⚠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.

Stopping the Engine

1. See the engine's manual for the shut-down procedure.
 2. Stopping the engine is the only way to stop the rotor from turning. With engines equipped with an adjustable throttle, move the throttle to the SLOW position and wait for the engine to be running a slow RPM. Then switch to STOP ENGINE as shown in the engine manual.
1. Place the wood chipper 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 wood chipper to fall over, or causing injury to your hand or arm.
 5. Put on eye, ear, and hand protection. Start the wood chipper as instructed in the manual and set the throttle to FAST.
 6. Stand to the side of the hopper and make sure you have a stable stance and firm footing.

After Each Use

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.

Schedule & Procedures

The following schedule should be followed for normal care of your unit.

SAFETY ITEMS	BEFORE EACH USE	EVERY 5 HOURS	EVERY 25 HOURS	EVERY 100 HOURS	EVERY 250 HOURS	SPRING & FALL
Check for loose hardware		X				X
Check all safety labels						X
Inspect cone, hopper, and guards	X					X
Clean debris from engine and chipper	X					
Inspect/rotate shredding hammers			X			
Inspect/rotate chipping knives			X			

Engine Maintenance

Refer to the engine's manual for information on engine maintenance. Your engine manual provides information and a maintenance schedule for performing the following tasks:

1. Always check the oil level before starting the engine. Refer to the engine manual for capacity and type of oil to use.
2. Change the oil after first 5-8 hours of operation. Change the oil while the engine is warm. Refill with new oil of recommended grade.
4. Check the spark plug yearly or every 50 hours of operation.
5. Service the air cleaner.
6. Keep engine and parts clean.
7. Check engine and equipment often for loose nuts and bolts, keep these items tightened.

Check for Loose Hardware

1. Service Interval: Every 5 hours; every spring and fall.
2. Inspect the unit, checking for loose hardware or components.
3. Pay special attention to the hardware attaching the chipper cone, hopper, axle, and front leg.

Check Safety Labels

1. Service Interval: Every Spring and Fall.
2. Check that the safety labels are in place and undamaged.
3. Sample illustrations and part numbers of the decals can be found on page 6. Replace any damaged or missing decals.

Inspect Cone, Hopper, and Guards

1. Service Interval: Every spring and fall.
2. Check that the chipper cone, shredder hopper, and discharge guards are in place, undamaged, and secure. Replace any damaged or missing parts.

Clean Debris from Engine and Chipper

1. Service Interval: Before each use and every 100 hours.
2. The engine requires air flow to cool itself and for combustion.
3. Before each use, clean any debris from the unit especially from around the air shroud intake, air filter, and muffler. Every 100 hours, remove the engine air shroud and clean out any debris from the

engine cooling fins.

We recommend having this service performed by an authorized dealer.

Inspect / Rotate Shredding Hammers (See Figure 7)

Service Interval: Every 25 Hours, or As Necessary

The shredding hammers of this unit can be rotated to provide a new cutting surface as required. The Y hammers can be flipped over once. To inspect the shredding hammers:

1. Disconnect the spark plug wire and secure it away from the spark plug.
2. Remove the small circular access panel (B) from the back of the shredder housing. See Figure 7.
3. Inspect the cutting edges of the Y-hammers (A).

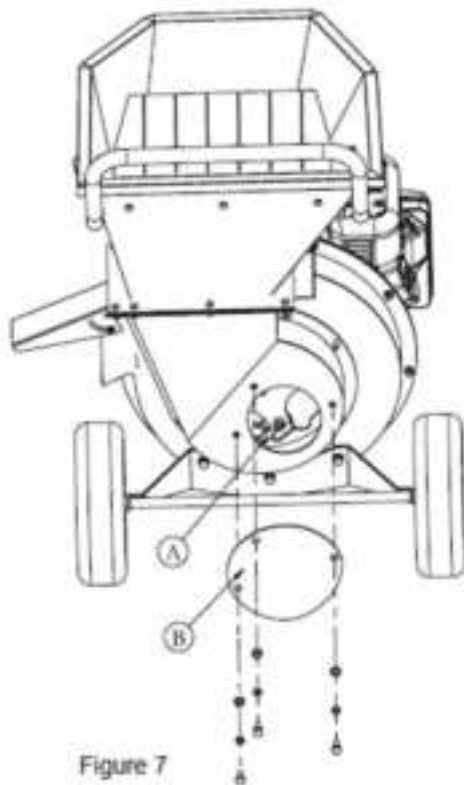


Figure 7

TRANSPORTING AND STORAGE

1. Always observe safe refueling and fuel handling practices when refueling the unit after transportation or storage.
2. Never store the unit (with fuel) in an enclosed poorly ventilated structure. Fuel vapors can travel to an ignition source (such as a furnace, water heater, etc.) and cause an explosion. Fuel vapor is also toxic to humans and animals.
3. Always use the hopper handle and built-in wheels to move the wood chipper. Never lift the unit using the fuel tank for support. If the unit must be lifted, always use at least two people, and always grip the unit securely using the front leg and hopper handle.
4. Always follow the engine manual instructions for storage preparations before storing the unit for both short and long term periods.
5. Always follow the engine manual instructions for proper start-up procedures when returning the unit to service.
6. Never store the unit or fuel container inside where there is an open flame or pilot light, such as in a water heater. Allow unit to cool before storing.

Storage

Perform engine maintenance and storage measures listed in the engine's owner's manual. This includes draining the fuel system, or adding stabilizer to the fuel. **NOTE: Do not store a fueled unit in an enclosed structure. (SEE GASOLINE FIRES AND HANDLING FUEL SAFETY)**

Before starting the unit after it has been stored:

1. Check all fluid levels. Check all maintenance items.
2. Perform all recommended checks and procedures found in the engine's owner's manual.
3. Allow the engine to warm up for several minutes before use.

Inspect Chipping Knives (See Figure 8)

Service Interval: Every 25 hours, or as necessary

The chipping knives of this unit can be rotated or sharpened to provide a new cutting surface as required. When inspecting the knives, be careful to avoid touching the sharpened edges. To inspect the chipping knives:

1. Disconnect the spark plug wire and secure it away from the spark plug.
2. Remove the nuts securing the chipper cone to the front of the chipper. Remove the chipper cone to access the knives. See figure 8.
3. Using the recoil starter, slowly pull the starter rope to rotate the rotor into position so the blades can be seen. To sharpen or replace the chipper knives, see the Troubleshooting.

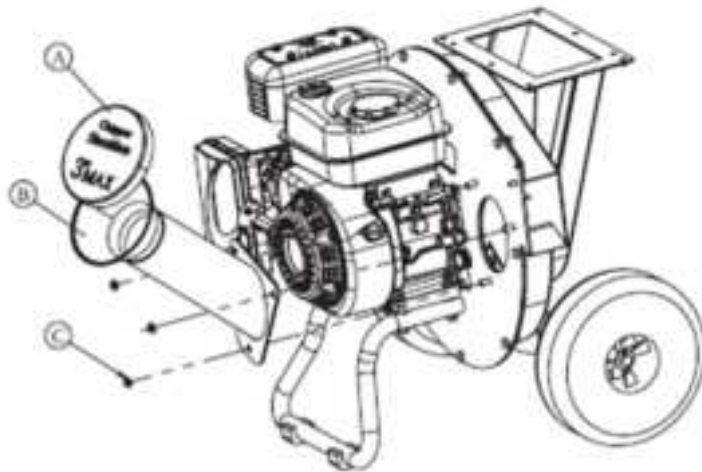


Figure 8

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.
- While normal care and regular maintenance will extend the life of your equipment, prolonged or constant use may eventually require that service be performed to allow it to continue operating properly.
- To avoid serious injury, perform maintenance on the unit only when the engine is stopped.
- Always disconnect the spark plug wire and fasten it away from the plug before beginning the maintenance, to prevent accidental starting of the engine.

Review the troubleshooting and procedures in this section to repair your machine if a problem develops. See the information on the following pages for instructions on how to perform most of these minor adjustments and service repairs yourself. If you prefer, all of these procedures can be performed for you by your local authorized dealer.

Failure	Possible Cause	Corrective Action
Engine will not start.	1. No fuel.	1. Add fuel.
	2. Choke does not in START position.	2. Turn choke to the START position.
	3. Low quality or old gasoline.	3. Use fresh unleaded gasoline.
	4. Dirty fuel passageways.	4. Clean out passageways using fuel additive Heavy deposits may require further cleaning.
	5. Spark plug cap not connected securely.	5. Connect spark plug cap properly.
	6. Spark plug fouled.	6. Remove the spark plug. Clean/replace as recommended in engine manual.
	7. No compressions after long storage periods.	7. Lubricate the cylinder. Pour a tablespoon of oil into spark plug hole. Crank the engine a few times and try to start again.
	8. Low engine oil.	8. Add engine oil to proper level.
Engine exhaust is black	1. Dirty air filter.	1. Replace air filter.
	2. Choke closed.	2. Open choke.
Engine stops suddenly	1. Fuel tank empty or full of impure or low quality gasoline.	1. Add fuel tank with fresh unleaded gasoline.
	2. Low oil shutdown.	2. Fill engine oil to proper level.
	3. Disconnected or improperly connected spark plug cap.	3. Secure spark plug cap.

Failure	Possible Cause	Corrective Action
	4. The limb is too long.	4. If the limb diameter for the side chute is 2"-3" and the length is over 31" long, help the limb feeding by slightly holding to keep the rotate speed.
Engine runs but no material is discharged	1. Discharge chute clogged.	1. Clean out debris.
	2. Engine not running at full speed.	2. Set throttle control to FAST if equipped.
Chipping action slow, or engine stalling	1. Branch diameter is too thick.	1. Do not process branches over 3" diameter.
	2. Throttle set is too slow.	2. Adjust throttle to increase engine speed.
	3. Tree limbs are extremely hard or dried out.	3. Material is not suitable for chipping.
Unusual noise or vibration when chipping material	1. Rotor overloaded with material.	1. Allow unit to clear itself before adding more material to the hopper.
	2. Hammers are broken, bent, or loose.	2. Check assembly. Tighten or replace as necessary.
	3. Hammers frozen in place.	3. Check for obstructions and debris. Repair or replace as necessary
Vacuum not working.	1. Hopper gate not closed.	1. Slide gate to closed position.
	2. Cone cover not installed.	2. Allow material to dry.
	3. Hose not attached properly.	3. Clear blockage or replace.
	4. Engine is not running at full RPM.	4. Set throttle control to FAST if equipped.

REPAIR

Shredding Hammer Rotation and Replacement

The cutting edges of the shredding hammers may eventually wear out requiring rotation of the hammer or replacement if all cutting edges have been dulled.

To rotate the shredding hammers:

1. Turn the engine off and wait for all moving parts to stop.
2. Disconnect the spark plug wire and secure it away from the spark plug.
3. Detach the rotor housing and hopper from the rotor plate. See Figure 9.
4. Note the assembly sequence of the hardware used to secure the hammers. Using an allen wrench, remove the socket head cap screw (A) and related hardware. See Figure 10.
5. Inspect the hammers (D), spacer tubes (C, E), and hardware. If the spacer tube (E) shows signs of wear, replace it. Inspect and flip, or replace the hammers (D).
6. Reassemble the hammers, spacers, washers, and cap screws. Torque the socket head cap screws (A) back tightly.
7. Repeat for all the hammers.

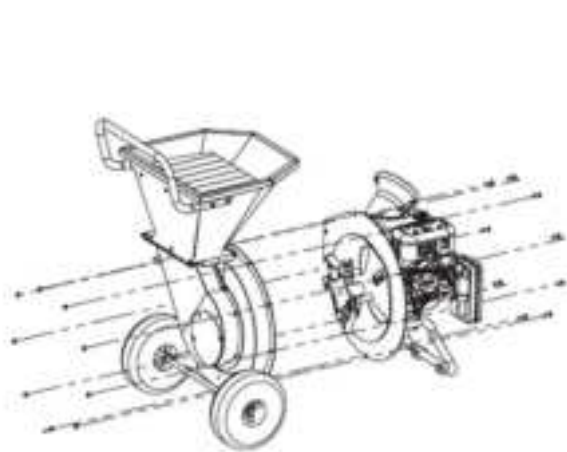


Figure 9

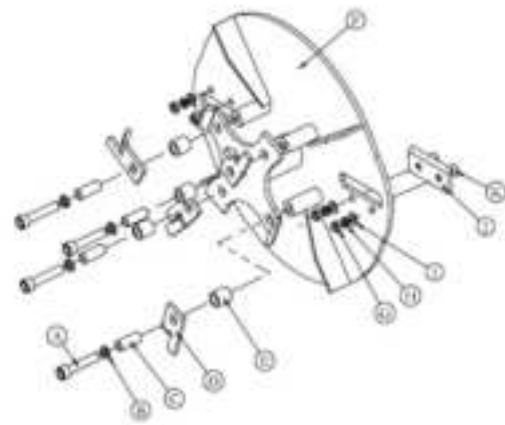


Figure 10

Chipping Knives Sharpening and Replacement

1. The chipping knives should be sharpened or replaced when tree limbs require extra force to feed into the chipper cone.
2. The chipping knives may be sharpened at a 39 degree angle until the distance between the edge of the blade bevel and the mounting hole is less than 1/16" (1.6mm). See Figure 13.

To inspect, sharpen, or replace the chipping knives:

1. Turn the engine off and wait for all moving parts to stop.
2. Disconnect the spark plug wire and secure it away from the spark plug.
3. Detach the rotor housing and hopper from the rotor plate. See Figure 9.
4. Remove the rotor by removing the hardware that secures it to the engine crank shaft. See Figure 11.

Note: Do not lose the spacer during reassembly. Be sure the spacer is installed inside the rotor. Without the spacer, the rotor will interfere with housing components.

5. Using a hex wrench, remove the two socket head cap screws and the chipper knife. See Figure 12.
6. Inspect, rotate, sharpen, or replace the chipper knife. See Figure 13.
7. Reinstall the chipper knife and tighten the socket head cap screws.

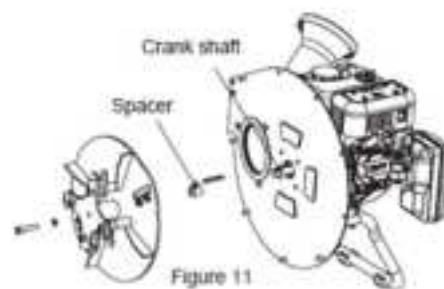


Figure 11

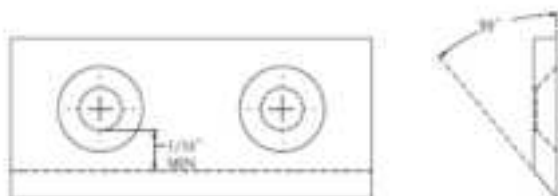


Figure 13- Chipper knife minimum cutting edge

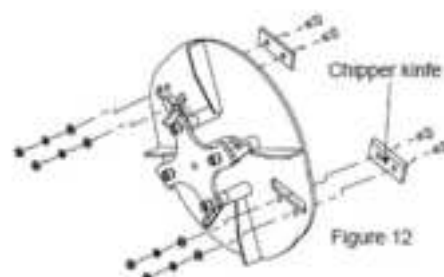
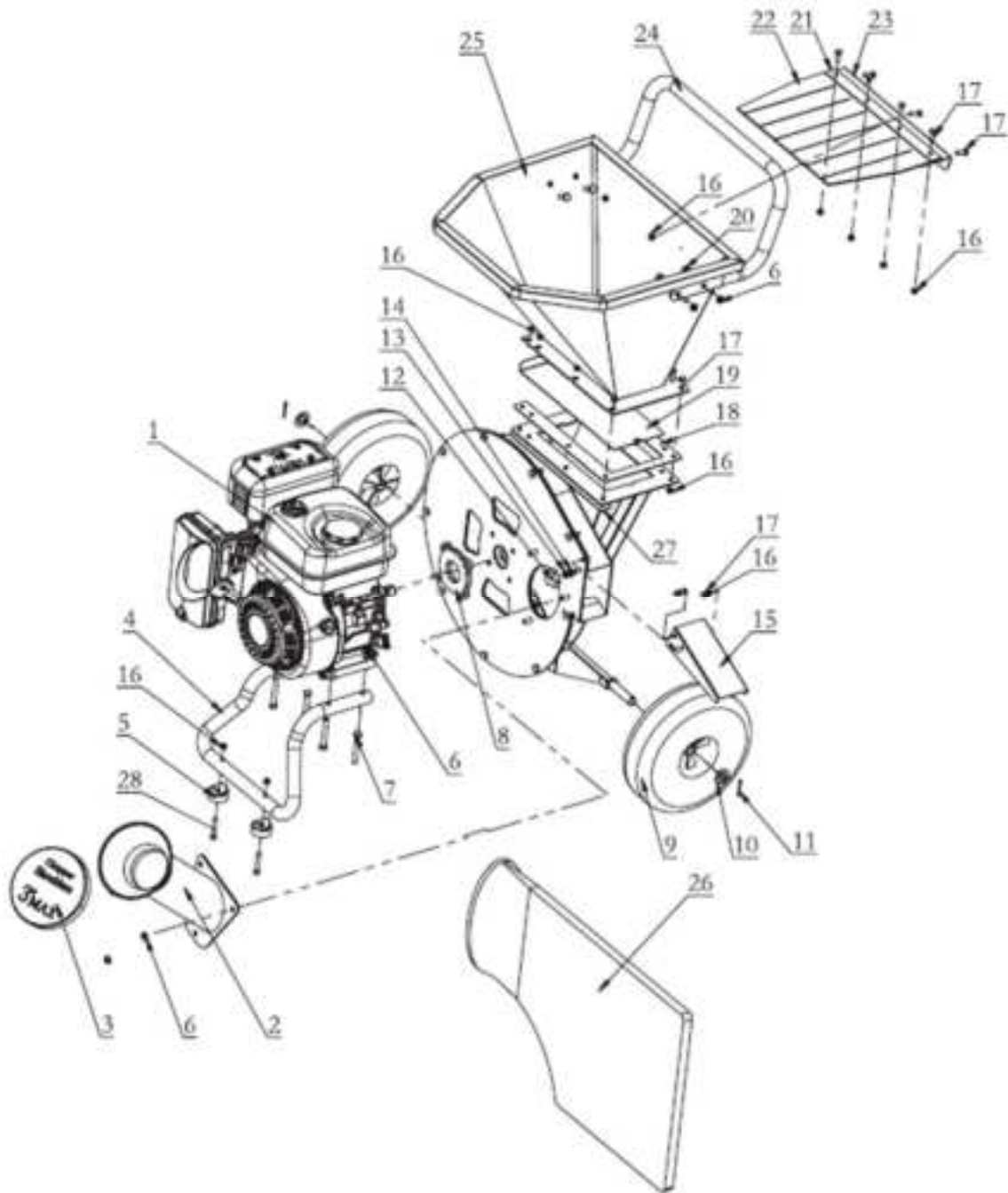
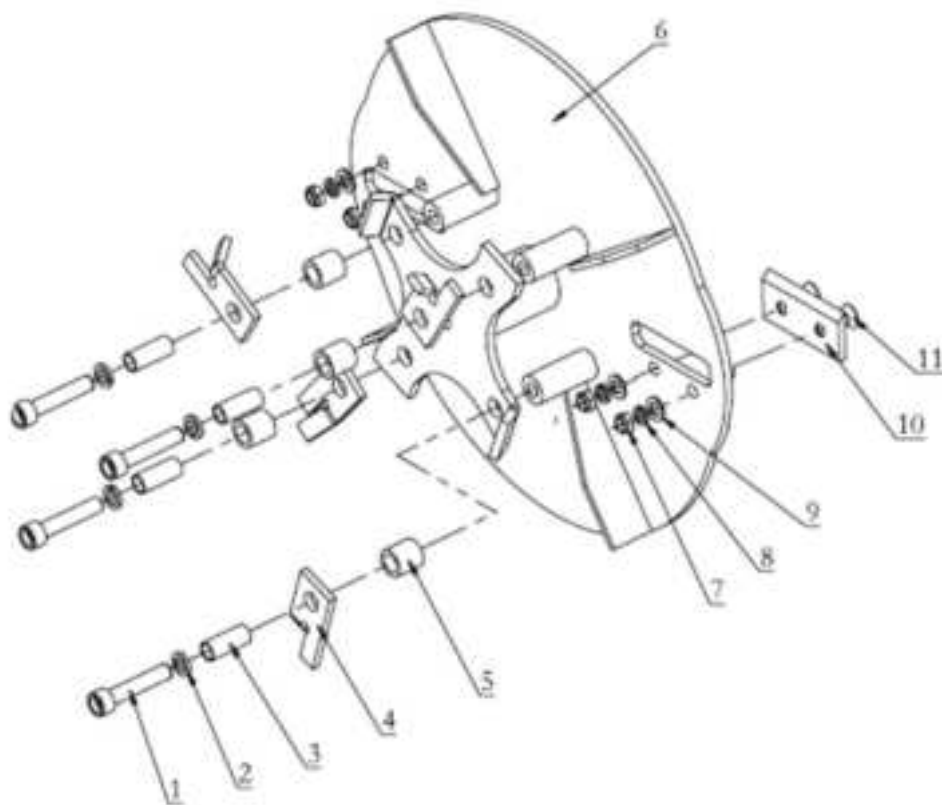
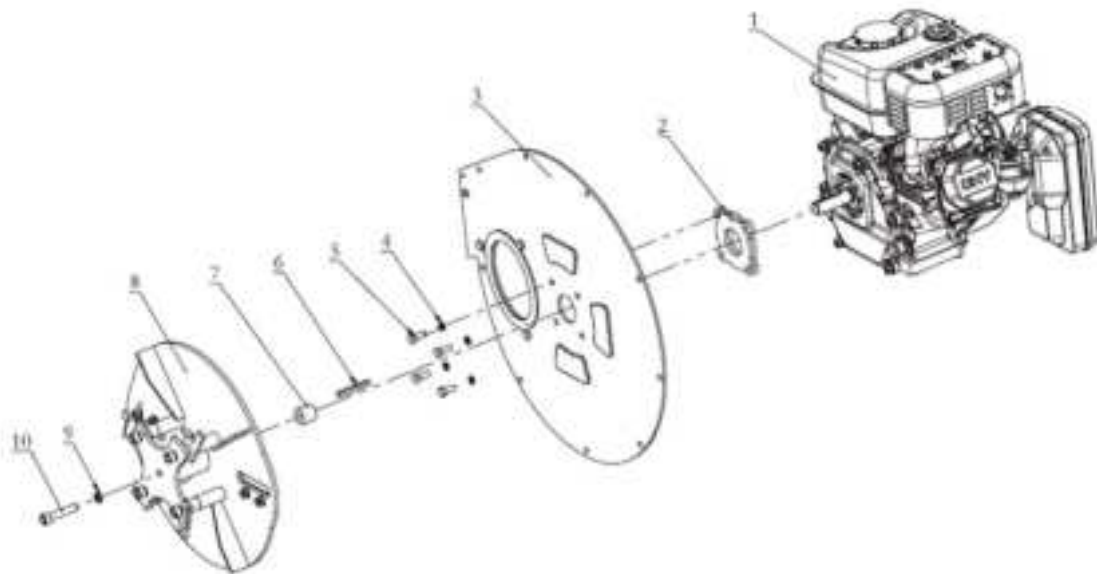
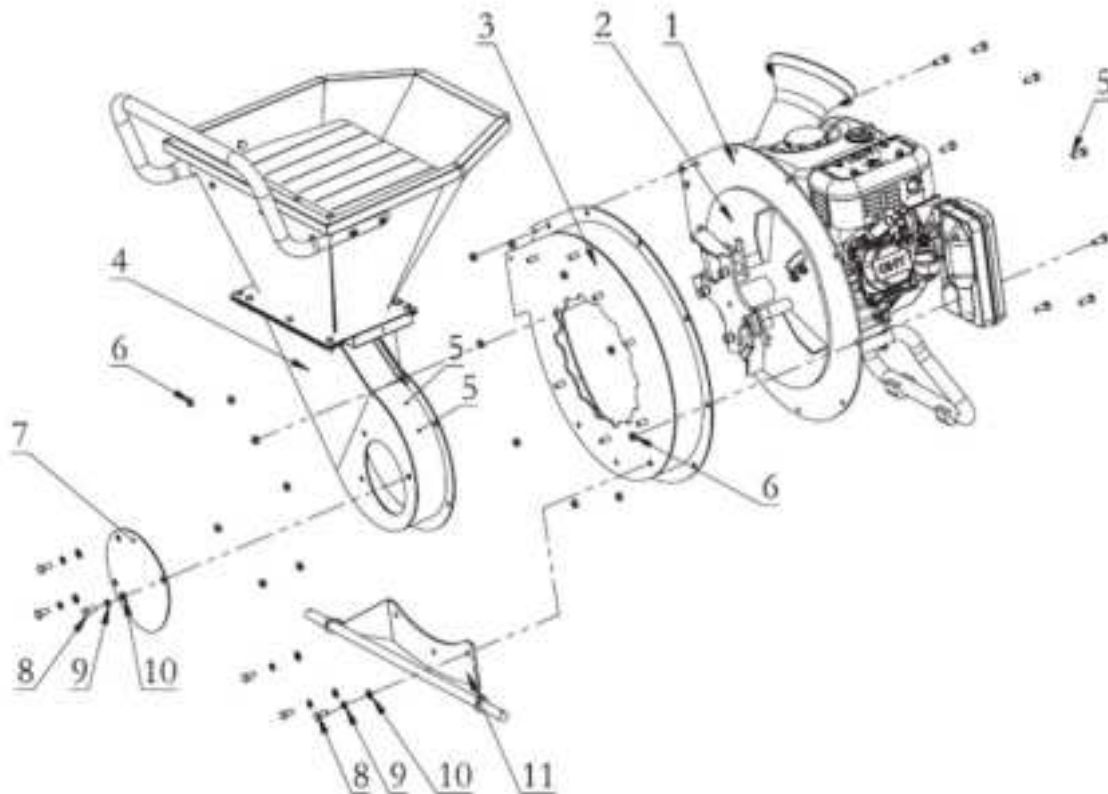


Figure 12

Parts Diagram







Parts List

Part No.	Description	Quantity	Part No.	Description	Quantity
1	Engine	1	15	Discharge guard	1
2	Chipper cone	1	16	Flange nut M6	17
3	Cone cap	1	17	Flange bolt M6x20	17
4	Support stand	1	18	Damper attachment	1
5	Stand pad	2	19	Damper	1
6	Flange nut M8	11	20	Flange bolt M8x20	4
7	Flange bolt M8x60	4	21	Retainer hopper guard	1
8	Flange	2	22	Hopper guard	11
9	Wheel	2	23	Flange hopper guard	1
10	Washer	2	24	Handle	1
11	Cotter pin	2	25	Hopper	1
12	Handwheel	1	26	Bag	1
13	Spring washer	1	27	Screw plate	1
14	Washer	1	28	Socket cap screw M6x40	2

Parts Breakdown – Engine and Rotor Group

Part No.	Description	Quantity
1	Engine	1
2	Flange	2
3	Engine plate	1
4	Spring washer 8	4
5	Hex bolt	4
6	Key parallel pin	1
7	Bearing spacer	1

Part No.	Description	Quantity
8	Rotor assembly kit	1
9	Spring washer 10	1
10	Socket head cap screw	1

Part No.	Description	Quantity
1	Socket head cap screw M10x50	4
2	Spring washer 10	4
3	Spacer	4
4	Y hammer	4
5	Bearing sleeve	4
6	Knives plate	1
7	Locknut M8	4
8	Spring washer 8	4
9	Washer 8	4
10	Knife	2
11	Screw	4

Parts Breakdown – Wood Chipper Housing Group

Part No.	Description	Quantity
1	Engine plate	1
2	Rotor assembly kit	1
3	Rotor house	1
4	Chipper back cover	1
5	Flange bolt M8x20	11
6	Flange nut M8	18
7	Vacuum inlet cover	1
8	Hex bolt M8x15	6
9	Spring washer	6
10	Washer	6
11	Wheel rack	1

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 or 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.

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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.

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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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Northern Tool & Equipment Company, Inc.

Burnsville, Minnesota 55306

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