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Wood Chipper & Stump Grinder Basic Operations & Safety

INTRODUCTION

Bandit Industries, Inc. manufactures and distributes a wide variety of wood chippers and stump grinders.

This information is to be used in conjunction with the Chipper & Stump Grinder manual, manuals supplied from integrated manufacturers, decals that are on the machine and all safety and operational standards published, such as: ANSI [American National Standards Institute], OSHA's [Federal and State Occupational Safety and Health Administration] and Federal & State DOT's [Department of Transportation].

Chippers and Stump Grinders, as with most machinery, can cause severe injury or even death if not operated and serviced correctly.

This document includes BASIC information concerning the safety and operation of your machine. For more complete and detailed instructions, always refer to your manuals.

In the following pages, you will find:

- Basic Safety Information Overview (page 2)
- Basic Chipper Safety Information (page 5)
- Basic Preparation for Chipper Transport (page 7)
- Basic Daily Pre-Startup Procedures (page 9)
- Basic Stump Grinder Safety Information (page 12)

IMPORTANT:

This document contains only *basic* information and is not intended to replace the information found in your operator manuals and operator handbooks.

BASIC SAFETY INFORMATION

Do not take the machine for granted. Always be alert and cautious when operating or servicing the equipment. Before operating or servicing the machine, first read and follow the instructions in the manuals.

This equipment is intended for use by personnel who are trained and experienced in operating similar equipment.

It is required that every operator be properly trained in the safety and operational aspects of the chipper or stump puller involved prior to him/her actually operating it.

This training includes, but is not limited to: information in manuals, videos, decals, ANSI standards, OSHA standards and the equipment owner's company standards.

Operator and bystander safety must be the primary concern at all times.

Wear all required appropriate personal protective equipment such as: safety glasses, hardhat, ear protection, eye protection, face shield, gloves, shoes, etc.

Do not wear ragged, torn or loose clothing, large cuffed [gauntlet style] gloves, jewelry or anything that may get caught in moving machinery.

It is recommended that someone else be present while the chipper is in operation, in case an accident should occur.

Never operate or service the machine while under the influence of alcohol or drugs.

Keep a fully charged, operational fire extinguisher nearby.

Keep children, bystanders and animals clear of the work area and debris field.

Do not allow anyone near the chipping or grinding area while the equipment is running.

Be aware of the flow of wood chips being discharged at all times, and do not allow the material to discharge toward people, animals, vehicles or structures that may cause injury or damage.

Never operate the equipment if it is in need of repair.

Always make sure that all controls, shields, guards and safety devices are securely in place and in proper working condition prior to operation.

The area around the equipment must be free of any objects that could obstruct the operator's movement.

Remove branches, limbs, rocks, and other obstructions that may cause a tripping hazard.

The operator must be located within easy reach of all feed controls and shut-off devices, and be prepared to react if necessary.

Never sit, stand, lay, climb or ride anywhere on the equipment while it is running, operating or in transit.

Do not go near hydraulic oil leaks. High-pressure hydraulic oil can penetrate the skin and could cause severe injury or death.

In cold weather start-ups, let the hydraulic system idle for about 15 minutes to allow the hydraulics to warm up to operating temperature.

Always refuel the machine in a well-ventilated area, preferably outside, and away from sparks or open flames.

Do not smoke while refueling.

Do not refuel while machine is running or engine components are hot.

Clean up any spilled fuel before restarting the machine.

Do not operate the machine indoors.

Do not overfill the fuel tank; there should be room left at the top of the tank to allow for the expansion of the fuel as it warms up without spilling out of the fill neck.

The hydraulic oil tank – maintain an oil level of $\frac{1}{2}$ to $\frac{7}{8}$ full, again do not over fill, allow for expansion.

Only use the type fuel that the engine is manufactured for [consult Engine Manual].

Do not attempt to use jumper cables on a frozen battery. Bring the machine inside to allow it to thaw out before charging the battery, otherwise a battery explosion may occur. Never expose an open flame or spark near a battery. Battery acid fumes are explosive!

There are numerous important decals located on the machine that contain useful information to assist in operating your equipment safely.

It is necessary to have all of your operators and service people familiar with and follow all safety instructions.

It is the equipment owners' responsibility to review these decals with their employees, and keep the decals in good condition so it is easily read.

Your machine can be powered by a variety of different engine makes and models. Consult your engine manuals for proper operation, service and safety.

This machine, like any piece of equipment, requires periodic scheduled maintenance and upkeep. The manuals contain detailed, itemized lists and time schedules for this maintenance. Use the manuals for detailed information on daily, weekly, monthly, quarterly and yearly schedules. If the equipment is not correctly maintained, it will cause early and possibly unnecessary wear or failure of components.

To obtain the most from your machine for the least amount of cost, it is recommended to set up and follow a scheduled preventative maintenance program [consult the equipment manual]. Following the schedule will eliminate many possible problems and down time.

As part of the scheduled maintenance, check for fuel and oil leaks – repair as needed.

Use only our factory approved replacement parts, and do not make any modifications to the machine unless it is factory approved.

Do not do any welding on the machine unless the battery is disconnected, engine electronics are disconnected and safety instructions are followed.

BASIC CHIPPER SAFETY

When feeding the chipper it is recommended to feed the material while standing on the right side of the infeed hopper [curb side in the USA].

When feeding wood into the chipper, feed the butt end of the branch or limb first. It will start better in the feed wheels, and it will help to fold the side limbs and branches inward as the wood progresses through the infeed system.

As you insert the wood to be chipped, continue your travel motion by walking up the right side of the machine so that you turn away from the feeding material.

When feeding wood into chippers the wood has a tendency to move to the left, and/or up in the infeed hopper as it is being chipped. Positioning yourself in this manner helps to avoid entanglement. After the wood has started through the feed wheels, do not linger around the infeed area.

Do not perform any type of service or maintenance on this machine unless the engine is shut off, the ignition key is in your pocket and all moving parts, including the cutterwheel/cutterdrum and feed wheels, have come to a complete stop.

Always install the cutterwheel/cutterdrum lock pin completely and securely through the cutterwheel/cutterdrum lock tube before starting any service or maintenance work. Do not attempt to do any work on the machine with the engine running and the clutch system disengaged. It could inadvertently engage and cause severe personal injury.

Never attempt to chip material that may contain wires, stones, nails or any other metal or non-wooden objects which might damage the knives or become dangerous projectiles.

Any left-over debris that is remaining on the ground or under the chipper infeed hopper should be discarded, or shoveled into the chip box. Do not run it through the chipper.

Do not allow anyone to put their hand, arm, foot, leg or any body part past the rim of the infeed hopper or inside of it while the engine is running or the cutterwheel/cutterdrum or feed wheels are turning or coasting to a stop.

Under no circumstances should anyone attempt to open or close the hoods or doors on the chipper wheel/chipper drum while they are turning, coasting to a stop or the engine is running.

This negligent action can cause severe injury or death.

Chippers are equipped with a strong lock pin design with a keyed padlock to secure the hoods/doors in the closed position.

Never use a make-shift pin system.

The housings for the cutter wheels/cutter drums are also built with an engine disable [shut-off] plug-in; attached to the hood/door locking pin.

This safety device helps to ensure that the locking pin is in the proper position or the engine will shut off or not start.

Bandit hand-fed chippers are equipped with several special safety features, which include the following:

- The “Wooden Pusher Paddle” is used by the feeding operator to push the material on the infeed into the feed wheels.
- The “Last Chance Cables” that are located about halfway inside the infeed hopper are connected to the feed control bar at the inlet rim of the infeed hopper. If the cables are pulled by a negligent operator that finds him/her inside the infeed hopper and being pulled into the feed wheels, it will stop or reverse the feed direction. In essence it may be their “Last Chance” to avoid personal injury or death because he/she did not follow correct safety instructions.
- The hand-fed chippers are also equipped with a folding infeed pan or tray that must be folded open and lock pinned into place whenever the chipper is being operated.

All these special features must be in proper operational order at all times.

On disc-style chippers, Bandit also installs another safety feature that is called the “Hood Spring-Lock Pin”. This item is positioned so that it stops the retracting movement of the hood lock pin if the chipper disc is still turning.

(There is a cam extension spot on the chipper shaft that will not let the spring lock pin go down if the chipper shaft is turning. The spring lock pin must be held down against a non-moving chipper shaft to allow the hood lock pin to be retracted from its hood closed position.)

All these devices must be maintained in proper working condition at all times.

After the first hour of running your machine, shut it down. Recheck all nuts and bolts for correct torques [see equipment manual].

After a nut/bolt has been removed five times, the nut/bolt should be replaced, especially the chipper knife bolts and nuts.

Most responsible companies that operate chippers in their equipment fleet, hold weekly, if not daily “tailgate” meetings with their employees where they discuss and remind their people about the “Do’s & Do Not’s” of safety, operation & maintenance.

It is a good time to do “Hands-On” instruction with the machinery and the equipment.

BASIC PREPARATION FOR CHIPPER TRANSPORT

Prior to transporting the pull-behind chipper there are several required checks and precautions that must be completed. Consult the specific equipment models manual for more complete and detailed instructions.

- 1] Engine and all moving parts must be completely stopped.
- 2] Make sure Wooden Push Paddle is secured in its mounting bracket.
- 3] Store all tools in the tool box, and make sure all boxes, covers, doors and infeed trays are closed and secured in place.
- 4] Remove all debris that may have collected on or in the machine.
- 5] Raise the tongue/hitch of the machine to accept the hitch height of the towing vehicle using the tongue jack secured in the jack lifting position.
- 6] Make sure that the chipper hitch coupler size, style and capacity matches the hitch receiver on the towing vehicle.
- 7] Make sure that the towing vehicle has the hitch and towing capacity to safely pull the trailered chipper.
- 8] Securely couple the machine to the towing vehicle hitch receiver and then lock and pin it. The chipper must be towed with the chipper frame parallel or level with the ground to obtain the best tire wear, braking capabilities and towing characteristics.
- 9] Raise and secure the tongue jack in the transport position.
- 10] Attach the safety chains to the towing vehicle securely in a cross pattern under the chipper hitch. Inspect the chains and the chain hooks for wear or damage, replace as needed. The chains must be long enough to allow for vehicle turning, but short enough that the chains do not drag during transport.
- 11] Connect the Brake Break-Away cable from the chipper to a secure position on the towing vehicle. Allow for length for vehicle turning. Note: the chipper battery must be connected and charged to power the Brake Break-Away Actuator on electric brake systems.
- 12] Make sure that the electrical plug-in on the chipper matches in style, size and wiring to the electrical plug-in receiver on the towing vehicle. Securely couple the plug-in connections together.
- 13] Check the chipper tail lights, marker lights, turn signals and stop lights to confirm that they function correctly off the towing vehicles controls.
- 14] Check that the brakes on the chipper activate properly off the towing vehicles control.

- 15] Rotate the chipper discharge to point over the chipper tongue for correct towing balance of the chipper. Secure the discharge spout in that position by clamping, pinning and installing the transport bolt in the discharge swivel. Make sure that the end of the discharge will not hit the towing vehicle while going up and down grades or vehicle turning during transport.
- 16] Check tires for proper air pressure and for cuts or damage to the tires or rims. Check the lug nuts for correct torque. Make sure tires, rims and suspension are in good working condition.
- 17] Check that axle dust caps are not leaking, damaged or missing. Ensure that the suspension is properly adjusted and lubricated per the axle manufacturer's manual recommendations.
- 18] Take a walk around the machine to ensure that everything is secure and that there is nothing loose that could fall off during transport. Look under the machine to be sure that nothing is dragging. Look down both sides of the machine to be sure that nothing is hanging out that could be dangerous or fall off.
- 19] Make sure that you follow all local regulations and laws regarding the transportation of this type of machine. Do not drive too fast for the road conditions or exceed speed regulations for towing this machine. Make sure you are properly licensed to tow this type and size of machine.

BASIC DAILY PRE-STARTUP PROCEDURES

Before starting the engine, make sure that it is located on a level surface, securely positioned and stable. Make sure the engine is shut off, ignition key is in your pocket and all moving parts have completely stopped. Consult the specific equipment models manual for more complete and detailed instructions:

- 1] Confirm that all the all the safety decals are in place and legible. All potential operators must understand and follow the instructions on the decals.
- 2] Confirm that all controls, guards, shields and safety devises are in place and properly operate.
- 3] Confirm that all nuts, bolts and parts are securely fastened and in place.
- 4] Confirm that the hinge on the chipper hood cover/door is lubricated, undamaged and works properly.
- 5] Confirm that there is not any debris, equipment or foreign objects in the infeed hopper or in the cutterwheel/cutterdrum housing.
- 6] Check the chipper cutterwheel/cutterdrum for secure welds, excessive wear, impact cracks, damaged or dull knives, correct torque on knife mounting bolts and nuts, condition of chipper bearings and condition of chipper housing and covers.
- 7] With a pry bar or wooden stick, carefully turn the cutterwheel/cutterdrum at least a full revolution to confirm that it will turn freely. This will help you be sure that there is not any binding, scraping or frozen material within the chipper housing.
- 8] Check the condition of the chipper fan blades, feed plate anvil, knives and attaching nuts and bolts. Components must have proper clearance, fit and tightness without excessive wear or dullness.
- 9] Re-close the chipper hood/door securely. Confirm that the covers fit and are pinned and locked correctly in the closed position. Reinstall the engine disable plug-in securely.
- 10] Grease feed wheel bearings and chipper bearings per instructions in the chipper manuals.
- 11] Check and adjust the belt drive condition and tension on the chipper drive, the pump drives, etc.
- 12] Check, adjust and lubricate any chain drives on the machine such as the chipper discharge swivel, feed wheels, etc.
- 13] Check for any looseness of fit of the hydraulic motors on the feed wheels, on the discharge swivel, etc. Repair as needed.

- 14] Check and correct all fluid levels on the machine such as the hydraulic tank, fuel tank, engine oil, engine coolant, etc. You must use the fluid specifications as described in the manuals.
- 15] Confirm that the radiator, radiator debris screen and the engine air filtration system are clean.
- 16] Check the engine PTO clutch to make sure that it is properly adjusted and lubricated.
- 17] Block the tires and the tongue for stability.
- 18] Confirm that the chipper discharge spout is pointed in a safe direction and locked in place.
- 19] Open the folding infeed pan on the infeed hopper and pin lock it in the open position.
- 20] Make sure all Personal Safety Equipment is being worn, such as hard hat, gloves, eye protection, face protection, ear protection, clothing, etc. as previously discussed.
- 21] Follow all the standards and codes for safety and operation of this type of equipment as published by Bandit Industries, component manufacturers, ANSI and OSHA.
- 22] Do not operate or service the machine unless you have been properly trained, are familiar with and follow all the safety and operational instructions involved and all controls, safety devices, guards, shields, doors, drives and components are functioning and fitting properly.

Additional Information

If the chipper is going to be positioned on a street side or road side, there are extra provisions that must be made, especially because of possible vehicle and pedestrian traffic. Following are some of those provisions:

- 1] Along with the normal personal safety equipment that the chipper operator people must wear, they should also have on safety reflective vests or jackets.
- 2] Follow the Federal, State and Local Requirements to correctly redirect vehicle and pedestrian traffic around the work site, workers and the chipper.
- 3] Locate the chipper as far out of the path of traffic and pedestrians as possible and as far off the road or street as possible. Avoid crossing traffic to collect the wood to be chipped up.
- 4] Do not locate the chipper in a position that it interferes with or makes the machine an obstacle for the falling limbs, tree cutters, climbers or their ropes, tools and equipment.

- 5] Make sure that the chipper and the chip truck are securely parked, braked and the tires are chocked.
- 6] Do not allow anyone to use the chipper as a platform to work from.
- 7] Feed the wood into the chipper from the curb side of the chipper to avoid being located in the vehicle traffic.
- 8] All pedestrian traffic must be rerouted around the chipping and wood cutting work area, and kept at a safe distance.

BASIC STUMP GRINDER SAFETY & OPERATIONS

As an owner of a Stump Grinder, your safety and the safety of your employees is dependent on your ability to train employees to properly operate and maintain your Stump Grinder.

Failure to exercise caution and follow proper safety practices may result in injury or even death. We cannot overstate the need for proper and continual training of all those who operate the Stump Grinder.

DO NOT allow untrained people around the unit.

It is extremely important to wear the proper safety clothing when operating a stump grinder. All operators should be equipped with a hard hat, eye protection, work boots, gloves and ear protection. Loose clothing is dangerous and likely to get caught in moving machinery parts. Keep long hair, shirt sleeves and shirt tails properly contained. Avoid wearing items such as; necklaces, rings, watches, neckties and gauntlet style gloves.

It is also important to keep a First-Aid kit handy in case of an accident. Always keep a fire extinguisher at the job site.

When transporting your stump grinder, remember to raise the jack to the proper height and attach securely to the towing vehicle. With the hitch properly attached to the towing vehicle, rotate the jack and secure it in the transport position.

Always hook safety chains to the vehicle by crossing the chains under the tongue, allowing enough slack to avoid binding when making turns.

If your stump grinder has a pintle hitch, make sure the ring has a good coating of grease to slow down wear.

Check brakes and highway lights to make sure they are functioning properly. Before towing a stump grinder, check tire inflation levels. Always drive safely and observe all towing ordinances.

Before stump grinding, check the cutter guard lock pin to make sure that it is secure. Opening the cutter guard can be very dangerous while the wheel is turning. Do not operate the stump grinder unless the cutter guard pin is in place.

Before starting the engine, check engine oil, coolant, fuel and hydraulic levels!

Check for loose fittings, leaks etc. prior to stump grinding. Check the entire machine for any loose parts or components. Check for loose nuts or bolts; torque, tighten or replace.

Check around the machine for tools, cans, saws, etc.

Make sure all guards are tight and securely in place. Check the air pre-cleaner; clean as necessary.

Before checking the cutter wheel teeth always remove the ignition key, and install the cutter wheel lock pin into the cutter wheel lock tube. Make sure the teeth and pockets are secure and in good condition. For the complete Daily Start-Up Check List, refer to your manual under Start-Up Procedures.

To start the stump grinder, make sure the throttle control is in the idle position and turn the ignition key switch to the "power on" position.

Wait for the green light to stop flashing; this will indicate the machine is ready to be started. Once the engine has been started, raise the cutter head to remove the travel chock block (the chock block secures the cutter head for transport).

To engage the cutter wheel, make sure the engine RPM is 'idle'. Engage the cutter head drive belts by pushing down on the engagement handle to relieve pressure on the engine slide stop. Lift slide stop and slowly pull handle back to engage belts.

Once the cutter wheel is engaged, increase the engine RPM to 'full'.

Test the controls for proper operation, speed and unobstructed movement.

The cutter head swing speed can be adjusted by turning the Swing Speed Control. Turning the dial counter clockwise will slow the swing and clockwise will increase the swing speed.

The speed should be set to a rate that will allow the cutter wheel to pass through the stump smoothly. If jerking, bouncing or significant drops in engine speed occur, the swing rate is too rapid and must be decreased.

At low engine RPM the cutter wheel swing speed control needs to be closed for the cutter head to swing. Turn the Swing Speed Control knob clockwise to close.

Operators should be located within easy reach of the controls and shut-off devices when the unit is running. They should be positioned away from flying debris and within sight of the cutter head to visually see the stump while grinding.

After grinding, reduce the engine speed to idle and disengage the drive belts. DO NOT TURN OFF THE MOTOR. The engine should be allowed to cool slowly at idle for 2 to 3 minutes to avoid engine damage.

Do not disengage drive belts at a high engine speed. Damage to belts and machine will occur.

Do not run engine if not in white area of level gauge on the boom.

For optimum performance, the stump should be cut with the 3 o'clock to 6 o'clock portion of the cutter wheel.

Never cut the stump from the top. The cutter wheel will throw debris up and toward the operator, instead of down and under the machine.

Hitting rocks or other foreign debris will not only dull teeth but may cause teeth to break and could cause wheel damage, bearing damage or cause projectiles to be thrown.

Keep teeth sharp and refer to your operator's manual for teeth changing procedures.

Do not get near the cutter wheel until it comes to a complete stop, the wheel will continue to spin even after the engine is shut down.

You should completely review all the operational and service information that is contained in the manual that is provided with your stump grinder.

Teeth maintenance is very critical in making a stump grinder perform to its capabilities. Do not run your stump grinder with dull teeth. Running with dull teeth makes it more difficult to cut through the stump, consumes energy and creates much unneeded vibration and wear.

Within the first ten (10) hours of operation the drive belts on the stump grinder will likely stretch, as will the pump belt. It is critical that the drive and pump belts be tightened as they loosen or stretch. Always check the pump belt first! Belts may stretch a second time within the first forty (40) hours of operation. Once tightened a second time, the belts should stay tight, but always check to make sure that they are.

If you hear a squealing sound or smell burning rubber and the stump grinder engine does not slow down, you have likely ruined the belts. Remember, belts that are not tightened and allowed to slip will glaze and need to be replaced.

DISCLAIMER

Your chipper & stump grinder is designed and manufactured in accordance with the latest industry standards.

This alone DOES NOT prevent injury!

It is the responsibility of the operator to use good judgment and follow proper safety procedures. Any unapproved repairs or modifications may not only damage the machine and its performance, but could result in severe personal injury.

As stated in the introduction to this document, this information is to be used in conjunction with the Chipper & Stump Grinder manual, manuals supplied from integrated manufacturers, decals that are on the machine and all safety and operational standards published, such as: ANSI [American National Standards Institute], OSHA's [Federal and State Occupational Safety and Health Administration] and Federal & State DOT's [Department of Transportation].