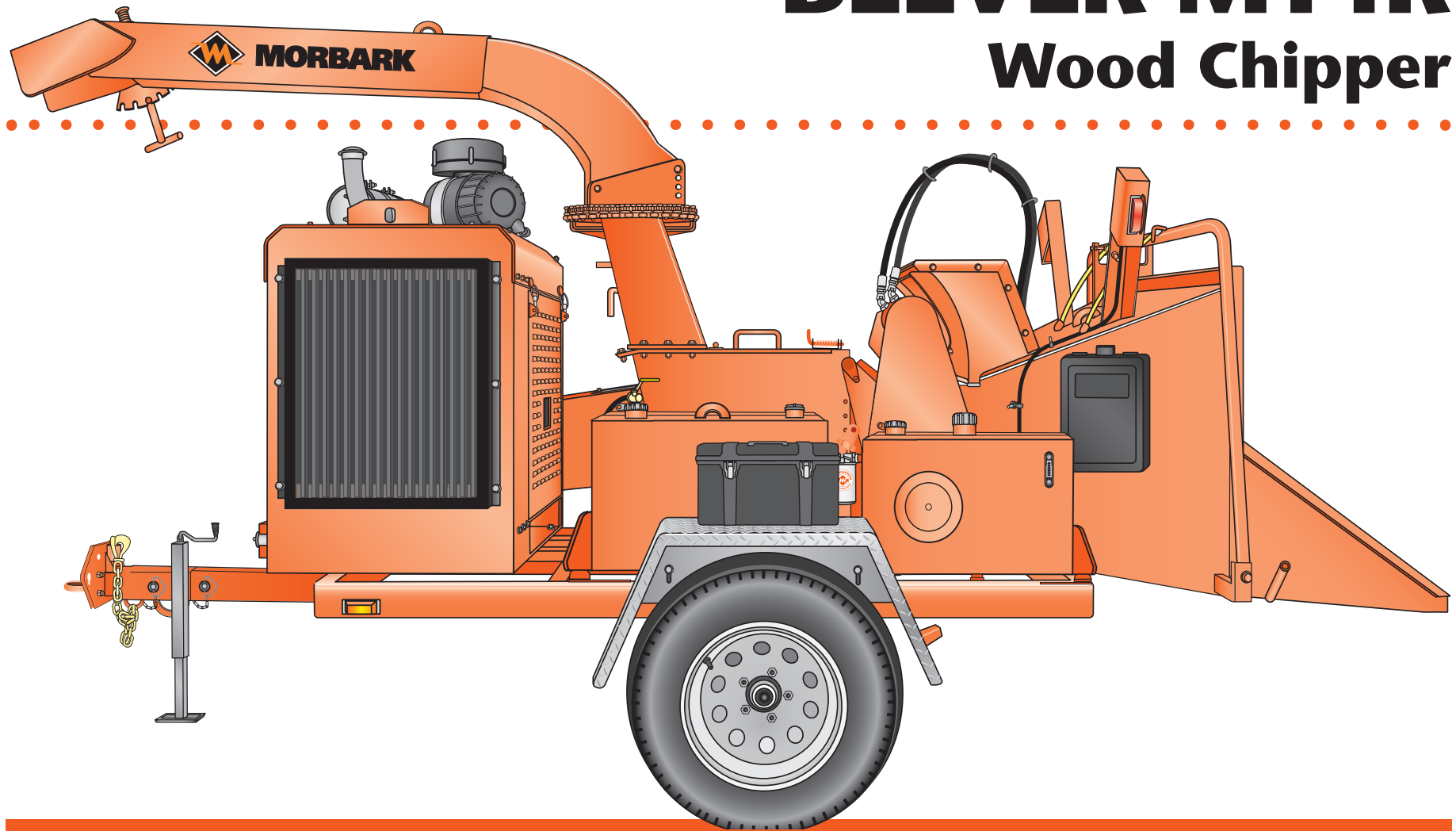


BEEVER M14R

Wood Chipper



MORBARK

S/N 40757

Read this manual before operating the chipper

**PLACE
MORBARK
PARTS
VIDEO
HERE**

**PLACE
MORBARK
SAFETY
VIDEO
HERE**

BEEVER M14R Wood Chipper



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Winn, Michigan 48896

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Printed in the United States of America.



WARNING!

The engine exhaust from this product contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects, and other reproductive harm.

INTRODUCTION



Thank you for purchasing the M14R chipper from Morbark, Inc., the leading manufacturer of wood grinding, recycling, and chipping equipment.

Your heavy-duty M14R chipper is a rugged, reliable machine, built to give you years of productivity. It is a unique machine with features that others in its class do not have. We are proud to offer this machine and appreciate your confidence in our product.

If for any reason you need to correspond with us or any of the Morbark dealers, please have the serial number handy. It is located on the right side of the chipper on the tongue of the M14R chipper.

Your comments and suggestions are welcome and greatly appreciated. They help us develop superior products for demanding professionals like you.

Contact us at:

Address: Morbark, Inc.
P.O. Box 1000
8507 S. Winn Road
Winn, MI 48896

Phone: 1•800•362•9010
1•989•866•2381

Fax: 1•989•866•2280

E-mail: www.morbark.com

About this manual

This manual has been developed to make you familiar with your M14R chipper.

Its unique format presents important information in two ways. Safety, use and maintenance information are combined in the Features section. Additionally, general information is provided in separate, stand-alone sections.

The five distinct sections are Safety, Chipping Cycle, Features, Parts, and Maintenance. If you need specific safety and maintenance information regarding a feature of the machine, look in the Features section. General information about safety and maintenance can be found in their respective sections.

If you need a part, refer to the illustrations and tables in the Parts section. When ordering a part, use the Morbark part number listed next to the part description.

Every person involved with handling, operating, and maintaining the M14R chipper must read this manual and understand the information in it.



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Section 2 • The Chipping Cycle

Section 3 • Features and Function

Section 4 • Parts

Section 5 • General Maintenance

Safety



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Symbols, Signs, and Terms

Think Safety

Safety is a combination of common sense and alertness at all times when handling, operating or servicing the machine.

The following symbols indicate a safety alert. It is used to alert you to potential personal injury hazards.

Obey all messages that follow the symbol to avoid possible injury or death.

Danger

Indicates a hazard or unsafe practice that will result in severe injury or death. This sign is red and white.



Warning

Indicates a hazard or unsafe practice that could result in severe injury or death. This sign is orange and black.



Caution

Indicates a hazard or unsafe practice that could result in minor injury. This sign is yellow and black.



Note Messages

Without the alert symbol indicate that a failure to follow instructions could result in damage to the machine.



Throughout this manual, and on the decals of your machine, you will find many types of safety symbols. It is essential to understand the meaning of each type of symbol and to follow their directives.

Safety symbols are important safety graphics to convey in picture form what the hazard or message is. Any symbol in a yellow triangle is meant to communicate a hazard, such as “fire hazard”. A symbol in a blue circle is meant to communicate a mandatory safety action such as “read this manual”. A symbol in a circle with a red border and a line through it is meant to communicate an action not to take, such as “no smoking”.

Examples of Hazard symbols



Examples of Mandatory Action Symbols



Examples of Action NOT to take Symbols



Warning Symbol Graphics

General

Safety is No Accident

Accidents don't just happen; they are usually caused when people make mistakes, are not properly trained, or do not have full understanding of how the machine operates.

It is mandatory that employers/owners have safety and operating procedures related to the handling, operation, and maintenance of this machine. Before a person works with this machine they must be successfully trained on these procedures.

As part of the training program all personnel must read and understand the information in this, and other, manuals related to this machine. They must also understand all safety labels and know where they are located.

This machine is designed for safe operation and handling. It is the responsibility of the owner and personnel in contact with the machine to ensure there is minimal risk and potential harm during operation, maintenance, and handling.

General safety information is presented in this section. Specific safety information regarding a feature of the machine can be found in the Features and Function section. Failure to heed these safety actions and warnings may result in fire, explosion, serious injury or death.

Operator Training

- All personnel must be successfully trained on the handling, operation, maintenance, and safety requirements before working with the machine. Safety training should include first aid and how to respond to an emergency.
- Familiarity with the machine can lead to complacency with handling and operation. Conduct regular reviews of all procedures associated with this machine.

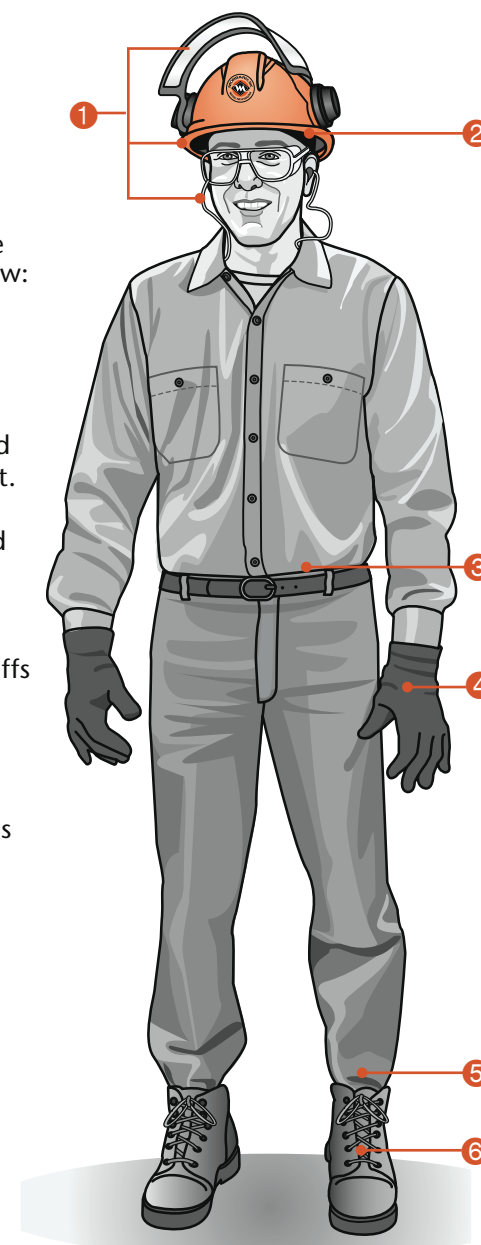
Personal Protection

Clothing and Gear

Wear proper protective equipment and clothing at all times. Follow the personal protection gear listed below:

1. Hard hat, ear muffs or ear plugs, and a shield or safety glasses
2. Long hair should be contained in a hair net or under hard hat.
3. Shirt must be close fitting and tucked in.
4. Gloves without cuffs. Never wear gauntlet-style gloves (cuffs at the wrists).
5. Pants without cuffs
6. Hard-toe, non-skid work boots

• • • Figure 1.1



Operation



General Operation Standards

Before operating the machine:

- Check that all personnel are wearing proper clothing and protective gear to prevent injury from sharp or jagged edges.
- At least two trained operators must be on the work site at all times. The work site is an area where the operators can see, hear, and react to an emergency in a few seconds.
- Never operate the machine while under the influence of alcohol or other mind altering substances.
- Conduct all maintenance (daily and periodically) before operating the machine.
- Inspect the machine for damaged or excessive wear.
- Inspect and prepare the work site. Designate a brush area and a chipped wood area.
- Set up the machine for operation.

Emergency Preparation

Have the following emergency equipment on the work site:

- An approved, charged, fire extinguisher.
- Water tanks and halon gas extinguishers are recommended.
- Communication device (e.g., cell phone, walkie talkie).
- Fully stocked first aid kit. (Can be ordered from Morbark P/N 59135-245).

Maintenance

- Clean dirt, oil, wood chips, and bark from engine area. Remove debris and accumulated oil, grease, and other flammable material from around the power unit and bearings daily.
- Hydraulic pressure is stored in the machine after shutdown. Always test hydraulic controls and relieve pressure before conducting maintenance.

* Refer to the Safety Checklist to conduct safety and maintenance checks before operating the machine.

Spectators, Children, and Untrained Individuals

- Do not allow children or spectators to operate the machine or play near the machine during operation.
- All spectators must wear protective clothing and gear.
- Before operating the machine ensure all untrained personnel are clear of the machine and standing at a safe distance. Alert all persons close to the machine before initiating operation.

Refueling

- Turn the engine OFF and allow the machine to cool down before adding fuel.
- Fuel and its vapors are highly flammable and explosive. Do not add fuel around an open flame, while smoking or where sparks may occur.
- Do not store the machine with fuel in the tank. Only use approved fuel containers for storage.
- Never transport flammable liquids on the machine.

Machine Set Up

- Maintain a safe distance from exposed utility (e.g., gas, water, phone, and power) lines.
- Always set the machine up on flat and stable ground or surface and ensure the machine is level. Do not operate the machine on unstable or sloped ground.
- Do not let the engine idle with the clutch disengaged for 2 to 3 minutes or more. Damage to the clutch pilot bearing will occur.
- Place wheel chocks under the tires to prevent unexpected movement during operation and set axle brake if equipped when unattached to the tow vehicle.
- Only operate the machine in a well lit and ventilated area.

Handling

- Do not climb, sit, stand or lay on the machine during operation.
- Use caution when working and moving around the machine. Walk and maintain balance at all times.

Moving Parts

- Keep away from all moving parts during operation.
- Objects or body parts can become cut or crushed if caught in moving parts. Never attempt to touch a part that is moving until the power to the machine is shutdown and the part is completely stopped. Follow the lockout procedure when performing maintenance on the machine.

Shutdown

- Always remove the ignition key and lock the engine control panel when there is a pause in operation (see Lockout Procedure).
- Parts of the machine remain hot after shutdown. Allow the machine to cool down for 15 to 20 minutes before performing maintenance.
- If the machine is attached to a vehicle make sure the hitch is secure and the safety chains are properly attached.
- Unattended or parked machines must have wheel chocks placed under the tires.
- To minimize the risk of fire spreading, park the machine a minimum of 50 ft. from other equipment.
- Clean debris from the machine after every use.

Safety Checklist

Be sure to check that you have the following items at the beginning of each session or when changing operators:

- ☐ Emergency equipment on work site:
 - communication device
 - stocked first aid kit
 - approved, charged fire extinguisher.
- ☐ Personal clothing and protective gear
 - hard hat
 - safety goggles
 - ear protection
 - hard toe work boots with non-skid soles
 - gloves without cuffs (note: Never wear gauntlet style gloves due to the possibility of snagging).
 - shirt is close fitting and tucked in.
 - pants without cuffs.
 - long hair is contained in a hair net or wrapped underneath the hard hat.

Daily Maintenance

- ☐ All recommended grease points are greased (see Maintenance section).
- ☐ Hydraulic oil, engine oil, and fuel and radiator coolant is at their proper levels and clean.

Machine Inspection

- ☐ Machine is clean and debris is removed from around the engine, muffler, chipper housing, infeed, and discharge chutes.
- ☐ All safety devices and controls (e.g.: safety cables) are in good condition and operating properly.
- ☐ Shields and guards are in place and in good condition.
- ☐ Battery cables, electrical wiring, and connections are in good shape and do not have cracks.

- ☐ Fuel and oil line connections are securely attached to the fittings and there is no sign of fluid leakage. Tubes and hoses are in good condition.
- ☐ Filler caps and drain plugs are securely attached to the machine.
- ☐ Hood latches and pins are in place.
- ☐ Components, parts, and hinges are not broken or cracked.
- ☐ Hardware (e.g., bolts, nuts, pins) are in place and tightened.
- ☐ All tires are properly inflated according to the manufacturer's specifications.
- ☐ All safety decals are clean and legible. If not, replace all missing or damaged decals.
- ☐ The product manuals are in good shape and in the manual holder.

Work Site

- ☐ At least two trained operators are at the work site. Never leave one person at the work site alone.
- ☐ Foreign objects are removed from the work area.
- ☐ The machine is set up in a safe environment (e.g.: no power lines) and in an area that is well lit and ventilated.
- ☐ All spectators are at a safe distance from the machine.

Set Up

- ☐ The machine is set up on a flat and stable ground or surface.
- ☐ If the chipper is attached to a truck or van, the hitch is secure, the safety chains are properly attached, the brake is on, and no one is in the vehicle.
- ☐ If the chipper is not attached to a vehicle, ensure chocks are placed under the wheels.

Lockout Procedure

 **DANGER!**






Failure to lockout during maintenance (e.g., repair, clean-out) of the equipment or machine will result in serious personal injury or death. Always follow lockout procedures and lock out the machine before conducting maintenance.

Morbark chippers are custom built to customer specifications. Control panels, power configurations, and other features may differ from each machine. It is the responsibility of each employer/owner to develop and implement lockout (energy control) procedures specific to their machine.

Lockout of the machine prevents unexpected start-up or motion, release of stored energy, and operation of the machine. It is mandatory the

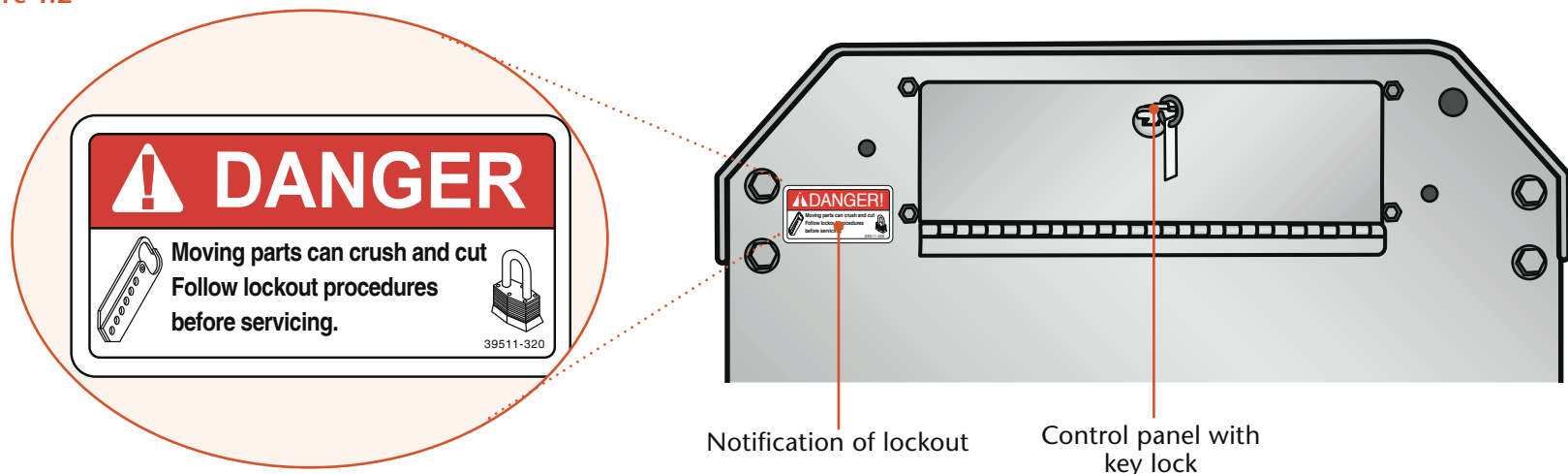
machine is locked out when left unattended, shutdown, or while performing maintenance. As a safety and crime prevention method, the power must be disconnected when the machine is being stored.

Only authorized personnel shall lockout the machine. All employees who handle, operate, and maintain the machine shall be trained on the lockout procedure in accordance with this manual, ANSI Z244.1, and OSHA requirements.

Include the following in your lockout (energy control) procedures:

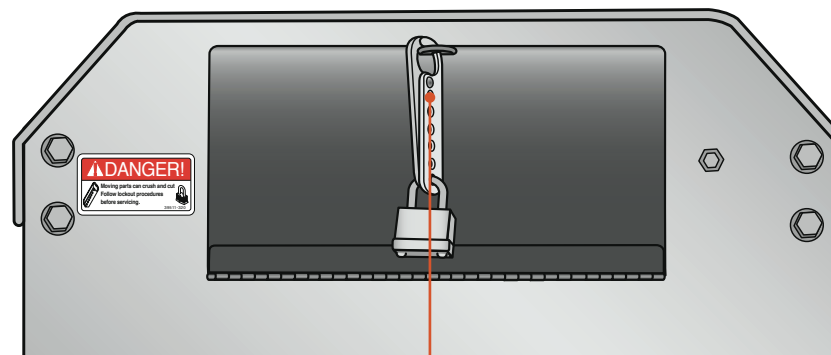
- Each person authorized to lockout the machine must have a safety lock and key dedicated to the machine lockout.
- Authorized personnel must verbally notify affected employees of the machine lockout, and post a sign(s) indicating the power lockout condition near the machine controls.
- The engine, electrical panel or other power source must be locked out before adjustments or repairs are made.

• • • **Figure 1.2**



- Equipment with main disconnect switches shall be turned off and locked in the OFF position only after the source of electrical power is shut off at the point of operational control.
 - After locking out the power source, the employee shall try to start the equipment, machine or operate the controls to ensure no unintended motion will occur or test the equipment and machine by use of appropriate test equipment to determine that the energy isolation has been effective.
 - Attach lockout devices and locks to levers, switches, valves, etc. in the non-operative (OFF) position.
 - When two or more employees work on the same equipment, each person is responsible for attaching his/her own lock. There shall be a separate lock for each person.
 - When shift or personnel changes occur before the maintenance or servicing is finished, it is the responsibility of both authorized personnel from each shift to:
 - A. Ensure that the continuity of the lockout procedure is maintained.
 - B. Decide on whether to use the same lockout device that was originally attached or use a separate device. If a change is made it shall be under the direction of the authorized personnel and should be documented.
 - C. Employers must have specific procedures incorporated into the energy control program to address emergency lock removal. Employees must be trained in these procedures.
- The employee(s) operating, or conducting maintenance on the machine must assure authorized personnel that all guards have been replaced and the equipment, machine or process is ready for operation.
 - Upon verification that the current control of hazardous energy sources has been effective, authorized personnel shall remove the safety lock(s) rendering the machine operational. Appropriate personnel shall be notified that power is being restored to the equipment, machine.

• • • Figure 1.3



Control panel with
lockout device and safety lock

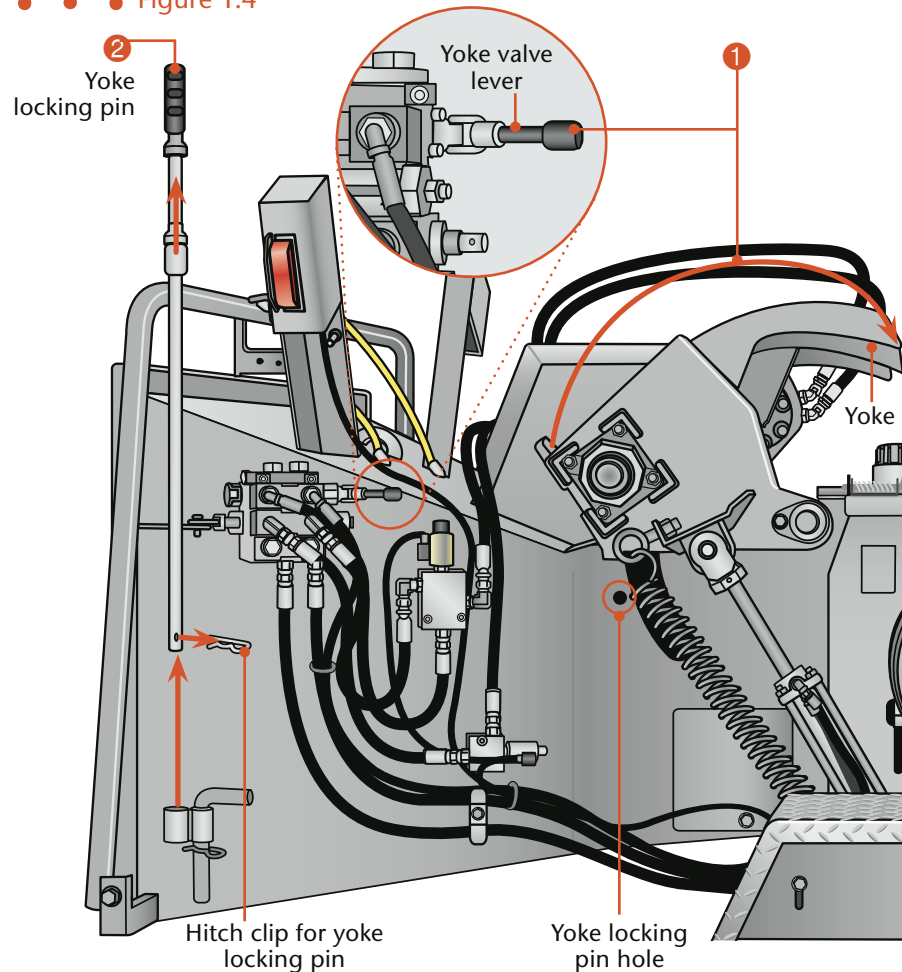
Control panel locks and locations vary depending on the model and engine type.

Safety Lockout Instructions:

To Lockout the Yoke:

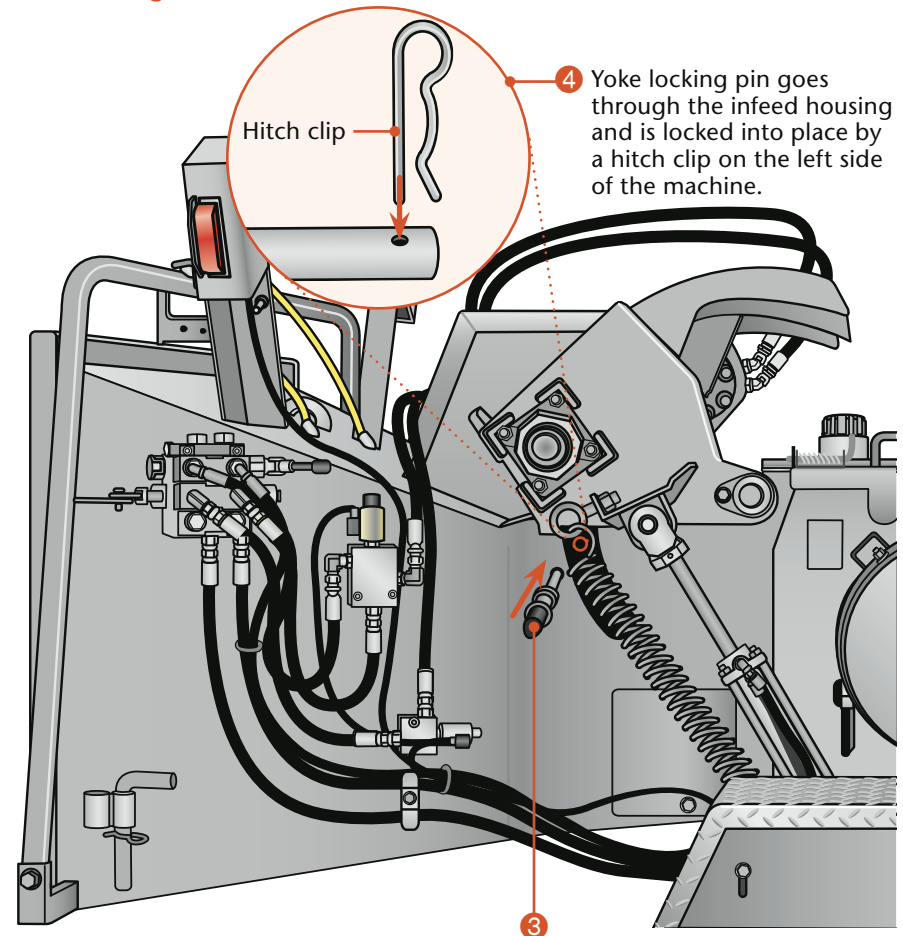
1. Remove the yoke locking pin from its holder.
2. Raise the yoke past the hole for the locking pin by moving the yoke valve lever in the direction indicated by the decal next to your valve bank.
3. Insert it all the way through the yoke locking pin holes on both sides of the machines infeed housing, then release the yoke valve lever.

• • • Figure 1.4



4. Insert the hitch clip into the hole at the end of the yoke locking pin.
5. Check that the hitch clip is securely in place by pulling on the handle of the yoke locking pin, and attempt to remove it. Maintenance on the feed wheel area may begin after the machine is locked out and the yoke locking pin is securely in place.

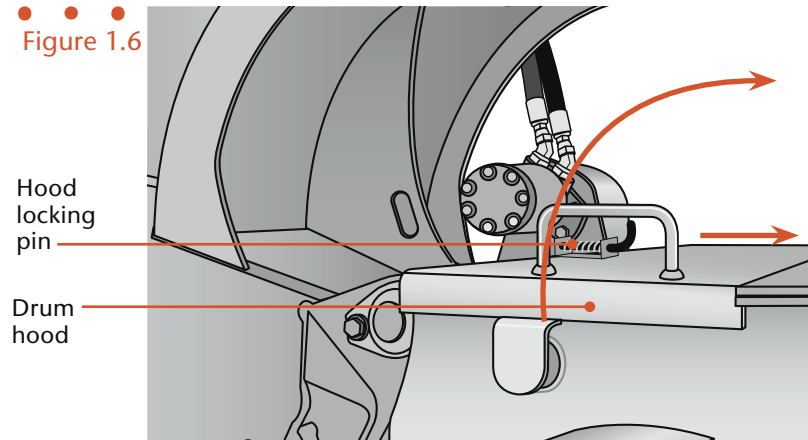
• • • Figure 1.5



To Lockout the drum:

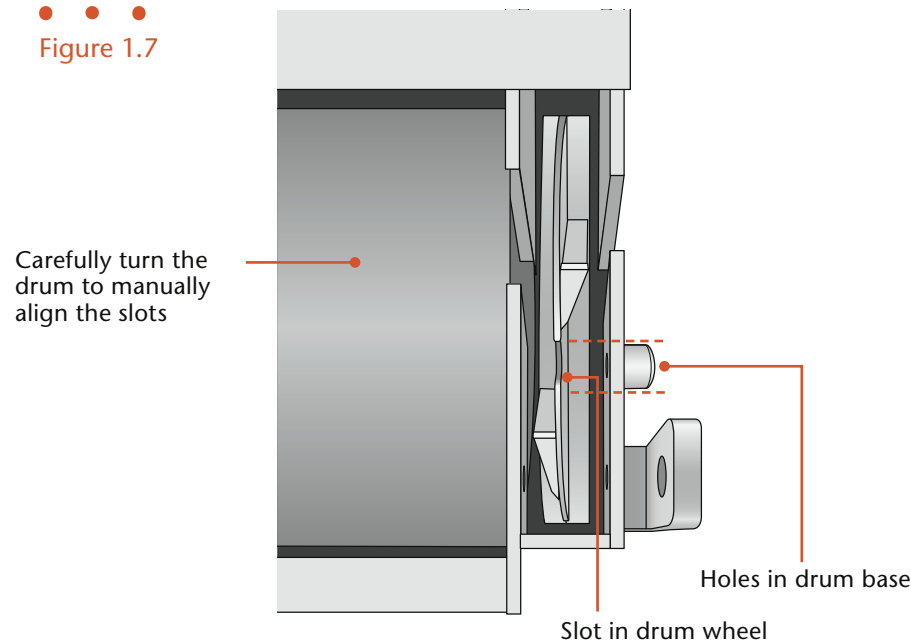
1. Slide out the hood locking pin that holds the drum hood down. Lift the drum hood open.

• • •
Figure 1.6



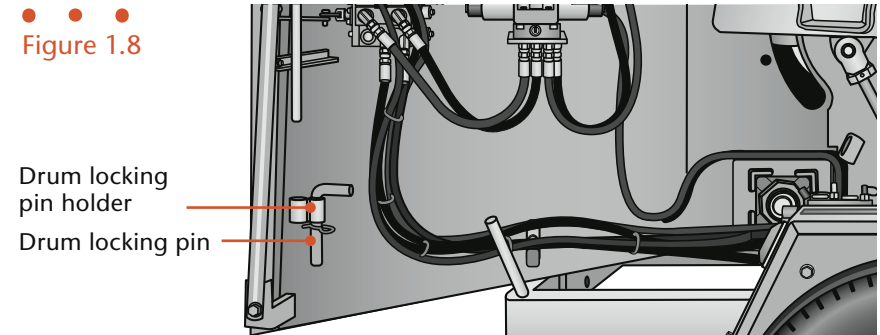
2. Turn the drum manually until the slot in the wheel is aligned with the holes on the side of the drum base.

• • •
Figure 1.7



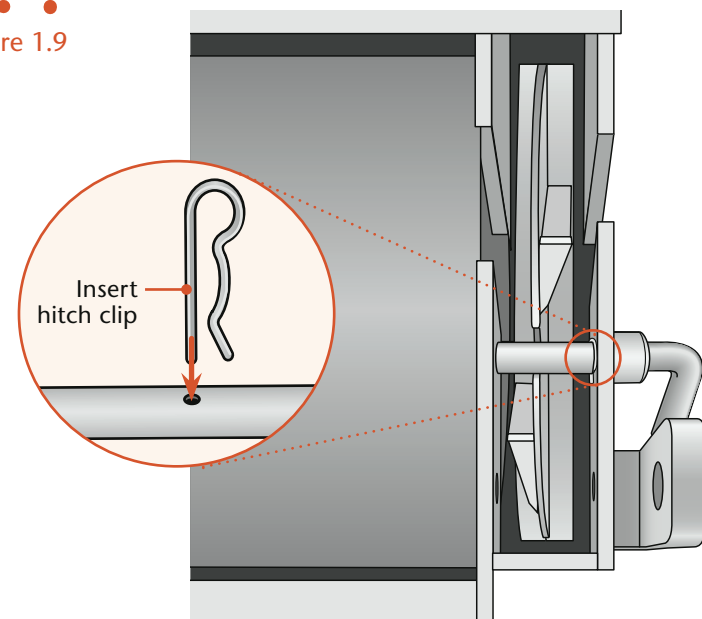
3. Remove the drum locking pin from it's holder located near the bottom right corner of the infeed.

• • •
Figure 1.8



4. Insert the drum locking pin through the holes in the drum base and slot on the wheel.
5. Insert the hitch clip through the drum locking pin.
6. Check that the drum locking pin is securely in place by pulling on the handle of the drum locking pin and attempt to remove it. Maintenance on the drum may begin after the machine is locked out and the locking pin is securely in place.

• • •
Figure 1.9



Crime Prevention



It has been proven that thieves are hesitant to take items that can be readily identified. Placing signs, decals, and other visible information warning potential thieves that this equipment has been marked and registered with the local law enforcement officials may help prevent a possible theft. By following the advice on this page, you can reduce vandalism, discourage theft, and help recover the machine if it is stolen.

Record Identification Numbers

- Record the serial number (S/N) of the machine and the identification numbers of the engine, clutch, hydraulic components etc.
- Check that all serial numbers are complete, correct, and recorded in all relevant documentation (insurance, financial, warranty etc.).
- Inscribe a unique identification mark.
- Participate in a government Owner Applied Numbering (OAN) program.
- A key element in marking equipment is uniformity.

Here are some standard guidelines:

- Locate the mark on the right side of the equipment as you are standing behind it.
- On all equipment with non-removable tongues place the ID number on right side on top of tongue, 12" to rear of hitch pin.
- On 3 point equipment with a tool bar, place the ID number on top of the tool bar, adjacent to the right hitch pin.
- Mark your equipment in a second location known only to you. Record what the mark is and where it is located (photograph).

Maintain Documented Proof of Ownership

- Keep all documents and records (e.g., identification numbers, invoices, warranty) that accompany the machine in a safe location.
- Take color photographs of the machine from all sides and angles.
- Update all documents and photographs when a major change is made to the machine.

- Maintain an inventory record of all equipment and machines. Regularly check to make sure that no machines have been stolen.

Parking Indoors

- Remove the ignition key and place hard-to-move equipment in front of exits.
- Remove the battery or any essential component in the electrical system when the machine is being stored.
- Secure all openings to the storage building.

Parking Outdoors

- Park the machine out of sight.
- Remove the ignition key and lock the control panel and battery box.
- Alert law enforcement personnel of your presence in the area and provide them with a contact person to call when there is suspicious activity.
- Ask for assistance in watching the machine from neighbors and merchants who reside near the parking area.

Reduce Vandalism

- Check the identification plates on all machines regularly and report any missing or destroyed plates.
- Install a protection device(s) on the machine when parking the machine in high-risk areas.
- Take written notes and report to law enforcement all suspicious vehicles or people.

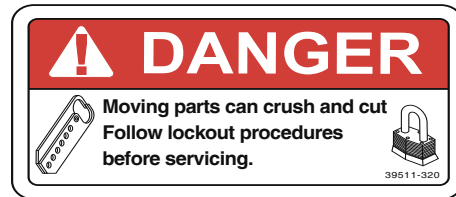
Report Theft

- Notify a law enforcement agency with jurisdiction, and your insurance carrier, when a theft occurs.
- Provide a full description and complete set of serial and identification numbers (found on the tongue of the machine) to the investigating officer and insurance carrier.
- Provide the investigating officer with photographs of the actual machine, manufacturer's literature, and knowledge of any identifiable marks that would help in identifying the machine.
- Verify the stolen machine has been entered into the National Crime Information Center (NCIC) operated by the FBI in Washington, D.C.

Safety Decals and Locations

Control Panel

• • • • • Figure 1.10



39511-320 Danger - Moving Parts



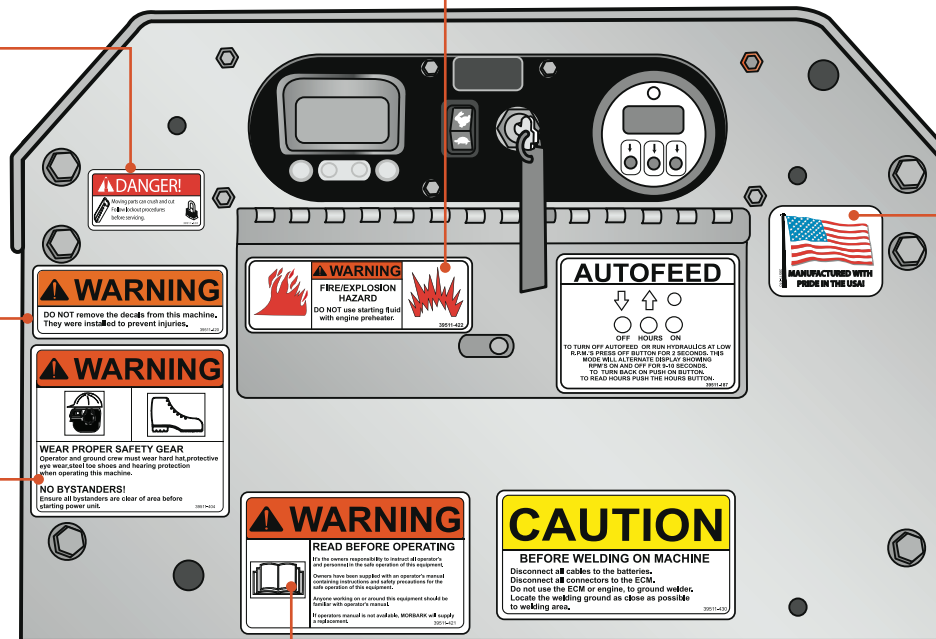
39511-420 Warning - Do Not Remove



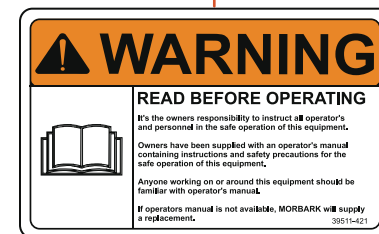
39511-404 Warning - Safety Gear



39511-422 Warning - Fire Hazard



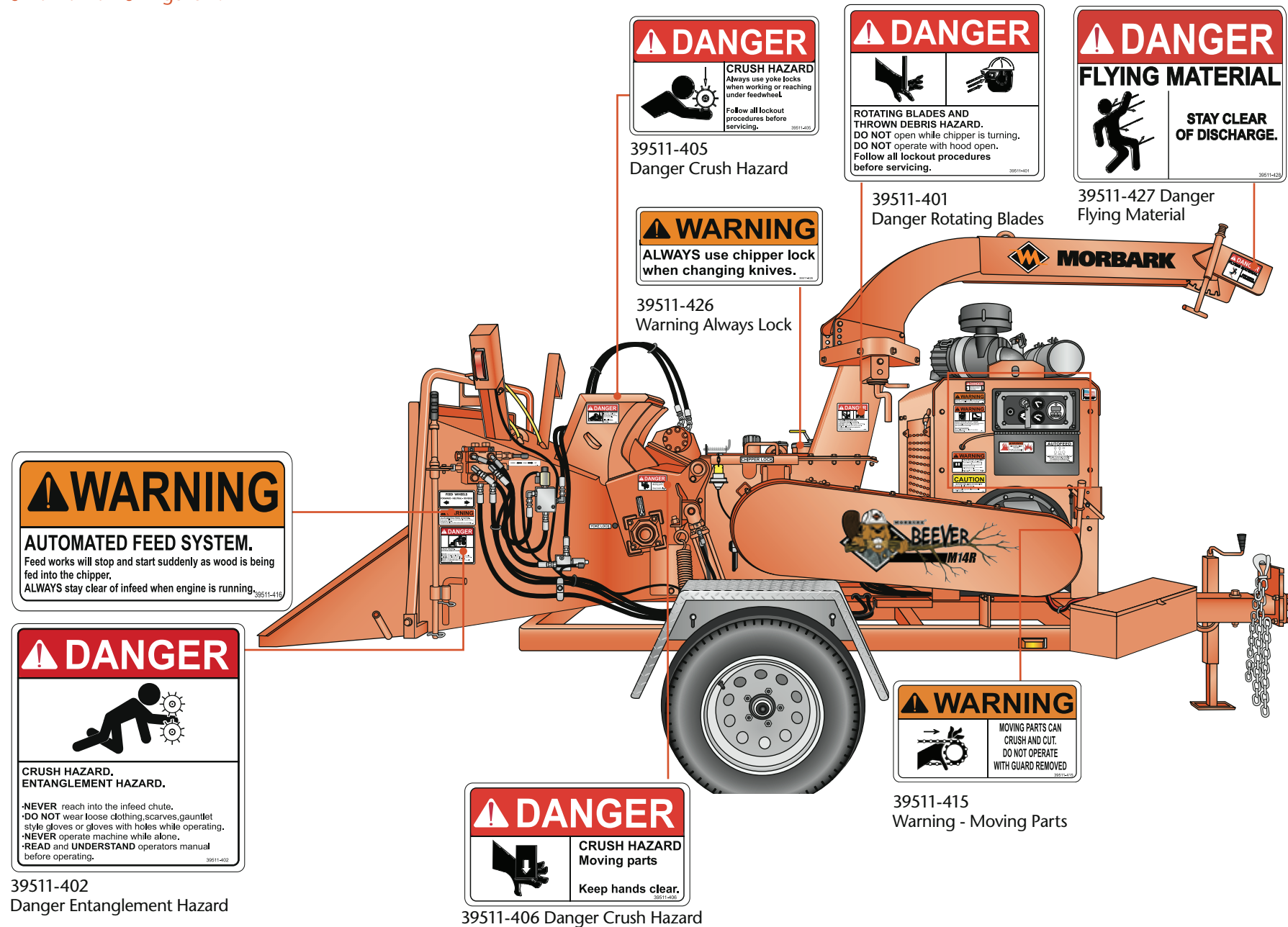
39511-010 Made in USA



39511-421 Warning - Read

Right View

• • • • • Figure 1.11



Left View

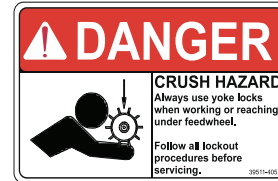
• • • • Figure 1.12



39511-428
Danger Flying Material



39511-320 Danger - Lockout



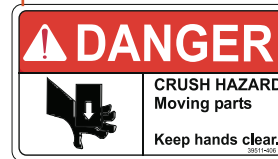
39511-405
Danger - Crush Hazard



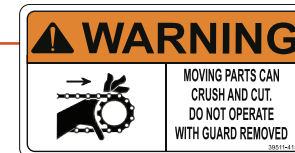
39511-416 Warning - Feed System



39511-403
Danger Entanglement Hazard



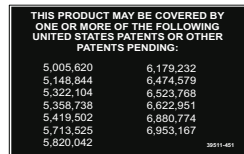
39511-406
Danger - Crush Hands



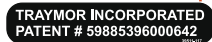
39511-415
Warning - Moving Parts



39511-399 Warning - Manual



39511-799 Patents Pending



39511-117
Traymore Inc.



39511-408 Warning - Flammable



39511-234
Warning - Stay Clear

The Chipping Cycle



Preparation
Preparation and Set-up 2.2

Start-up
Fluid Levels 2.6
Engine Start-up.....2.6

Chipping the Wood
Feeding Brush into the Chipper 2.8

Shut-down
Machine Shut-down.....2.9
Lock-up.....2.9
Clean-up.....2.9

Checklist
Start-up 2.10
Shut-down 2.10

Preparation



This section is an overview of the chipping process. It is mandatory that all personnel handling, operating, and maintaining this machine read the manual completely and be properly trained on its use. Operators should also review the manual on a regular basis. Specific information on safety, function, use, and maintenance of a machine feature is also located in the Features and Function section.

Preparation and Set-up

Preparation is the cornerstone for safe, efficient, operation of the chipper.

The operator must conduct all safety measures, wear proper protective gear, prepare the machine for operation, and understand the process of chipping wood as described in this manual.

However, before any chipping can begin, there are three important areas to inspect, set-up, and prepare each time you use the chipper. They are; the work site, the brush and the chipper.

Work Site Preparation

- Clear objects containing metal, stones, etc. that may damage the machine.
- Clear any objects that may trip or entangle the operator.
- Check that the area is clear of utility and power lines.
- Be sure the area is well lit with good ventilation (when indoors).
- Set-up a sufficient space to work in.
- Designate an area for the brush pile and chipped wood.
- Create a clear walking path for loading the brush.
- Ensure emergency equipment is available on the work site.
- Always have two trained personnel dressed in safety gear on the work site at all times.

Brush Preparation

! DANGER!

Foreign material (metal, stones, glass) in the chipper will cause damage and potentially shatter the cutting blades resulting in property damage, serious injury or death.



Vines left on the wood will cause entanglement of operating personnel, or hide foreign material resulting in equipment damage, serious injury or death. Always remove vines from the material to be chipped. Do not leave vines in the work area or place vines in the chipper.

! CAUTION

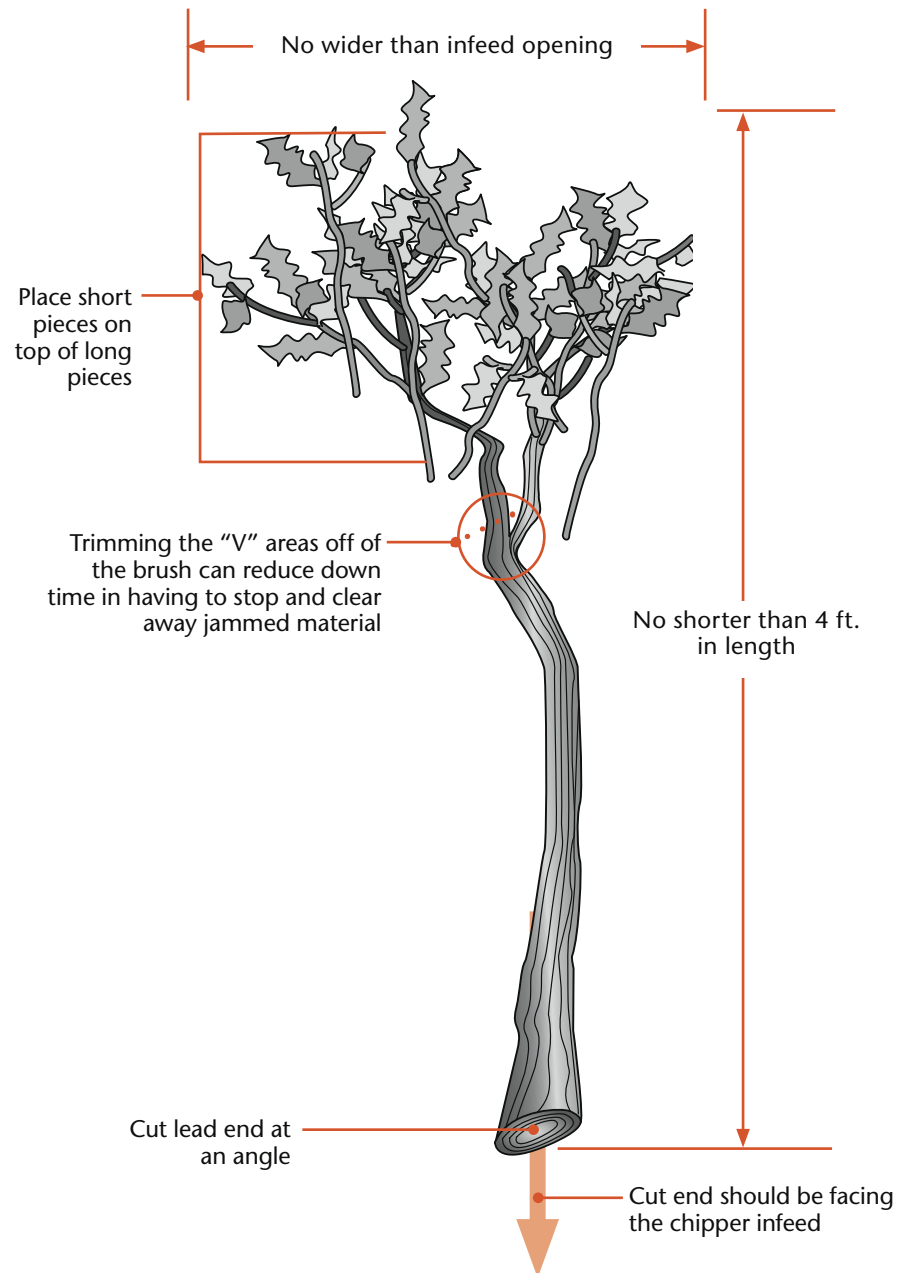
Lifting heavy objects may cause serious back injury. Always use proper lifting technique or the winch (optional feature) designed for the machine.

Proper preparation and organization of the brush and branches will provide an efficient chipping process, as well as creating safe working conditions and reducing the possibility of unexpected maintenance expenses.

To prepare the wood and brush:

- Cut the lead end of the brush at an angle. This will help ease the feed wheel open and facilitate feeding.
- Cut the brush into lengths long enough to be safely fed into the chipper without the operator hands entering the infeed. The average length should be no shorter than 4 feet. **Note:** Place short pieces on top of longer pieces.
- Cut the wood into a weight that can be easily lifted without injury to the operator.

• • • Figure 2.1



Machine Preparation

 **DANGER!**



Before operating always block the wheel, and ensure the chipper is on stable level ground when not attached to a vehicle. Failure to do so will result in unexpected movement, serious injury or death.

Before starting operation the chipper must first be placed on a stable surface and secured so that it does not move. The chipper can be mounted on a surface by using two methods; hitched to a tow vehicle or in a stand alone position with the jack supporting it.

When the chipper is hitched to a tow vehicle:

- The towing vehicle must be capable of handling your machine.
- Park the vehicle and the chipper on a level surface.
- The vehicle must be completely stopped, with the parking brake on.
- There must NOT be a driver in the vehicle.
- The hitch must be properly secured to the vehicle with locking pins installed.
- Connect safety chains and cables to the vehicle. Two lengths of chain must be used. The lengths of chains should be equal in length and properly affixed to the towing vehicles the chain shall be hooked through the hitch plate in such a way as to allow the operator to turn the vehicle and not drag the chains on the ground.
- Hook up electrical connections and check that tail lights and turn signals are in working order.
- The chipper must be level, with the machine parallel to the ground.

When the chipper is used as a stand-alone with jack support:

- The chipper must be placed on a level surface with the machine frame parallel with the ground.
- Wheel chocks must be placed under both wheels and axle brake if equipped is applied to keep the chipper from moving.

Adjust discharge chute

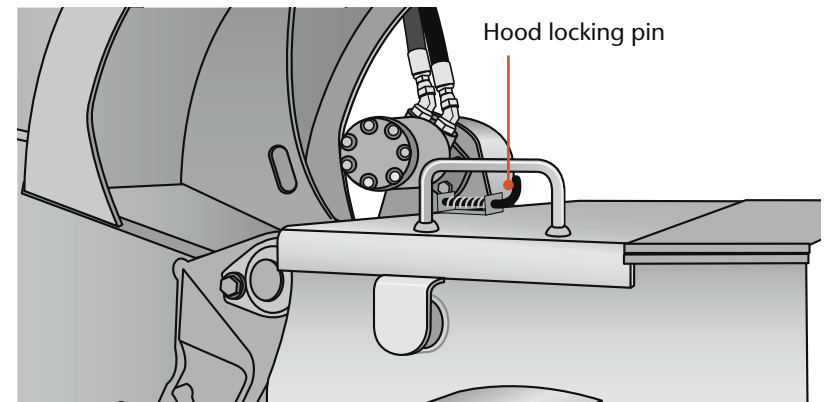
Once you have the machine secured and level, the next step in machine preparation is setting up the discharge chute. See discharge chute in the Features and Function section for more detail.

- Ensure the infeed spout is clear of any debris.
- Rotate the discharge chute in the direction you want the wood chips projected. The discharge chute can rotate 360°. Adjust the height of the discharge chute if necessary.
- Adjust the deflector for the desired angle of projection. Direct chips away from the work area and bystanders.

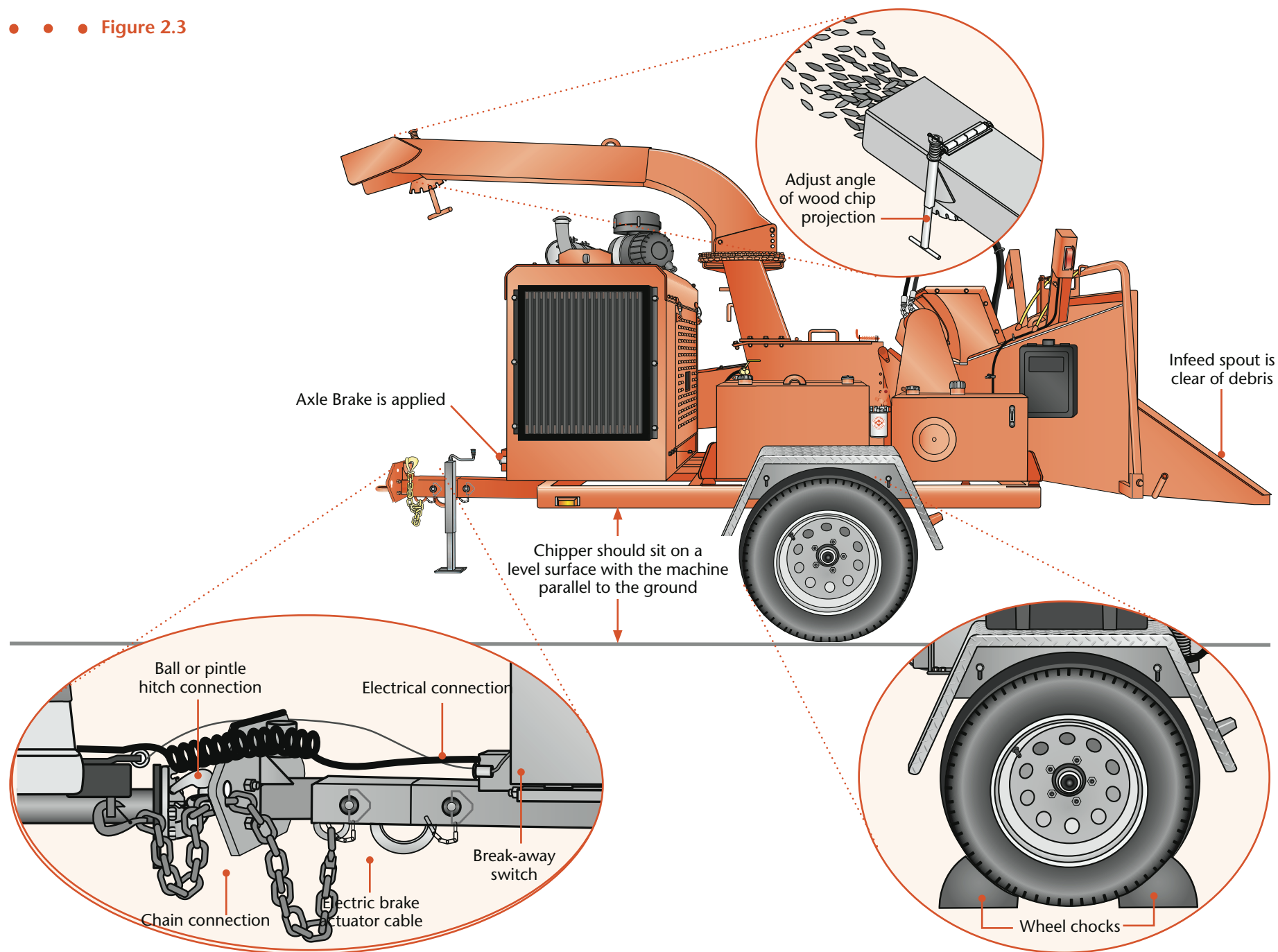
Chipper Hood

Note! Be sure the chipper hood is closed and secured with the locking pin. (See hood locking procedure in safety section for more detail.)

● ● ● **Figure 2.2**



• • • Figure 2.3



Start-up



DANGER!



Exposing fuel to an ignition source such as a flame or spark will result in explosion, fire, serious injury or death. Never smoke, light a flame or create a spark around the fuel tank. Store the machine and extra fuel away from any ignition sources.



After use of the machine hydraulic oil becomes extremely hot and under pressure, which will burn or puncture the skin if not handled properly. Allow the hydraulic oil to cool down and relieve built up pressure before performing maintenance.

NOTE

Do not allow the engine to idle with the clutch disengaged for longer than 2-3 minutes. Failure to the pilot bearing will occur.

Shut the engine down immediately if you hear a noise that might indicate loose or broken parts. Have the engine checked by qualified personnel.

In cooler weather let your hydraulic system run for approximately 15 minutes prior to operation. Extremely cold oil will cavitate causing noise, loss of capacity and damaging the motors and pumps.

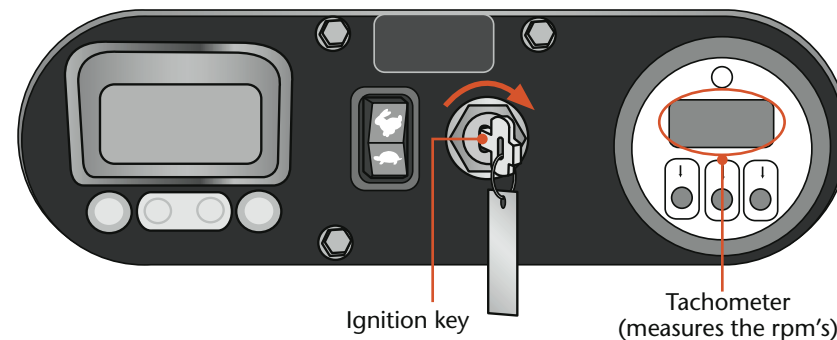
Fluid Levels

Before you start the machine it is important to check the fuel, hydraulic oil, and radiator coolant levels. Allow the machine to cool down before adding oil, fuel or radiator coolant. Remove the cap slowly to relieve pressure.

Engine Start-up:

1. Place the safety control bar into the neutral position.
2. Place all hydraulic valves in the neutral position.
3. Because the M14R has many engine options, consult your engine operators manual for specific directions on starting your engine.
Note: Refer to the electric motor/starter manual for start-up procedure.
Note: "Panel will vary with engine make and model and is shown for illustrative puposes only."

• • • Figure 2.4 Typical control panel

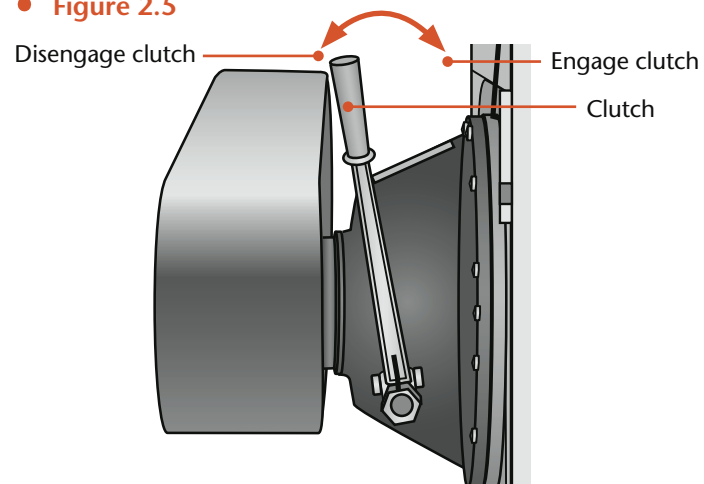


4. Start engine, wait 1 minute, and engage the clutch by moving the clutch handle toward the engine for 2 to 3 seconds, then move the clutch handle away from the engine disengaging the clutch, wait until the engine regains rpm's then repeat 2 more times until drum is spinning at full rpm's. Then fully engage the clutch handle. Let the engine warm up according to your engine operators manual until the engine stabilizes.
5. Place the safety control bar into the feed position. This position pulls the material into the feed wheel.

After Engine Warm-up:

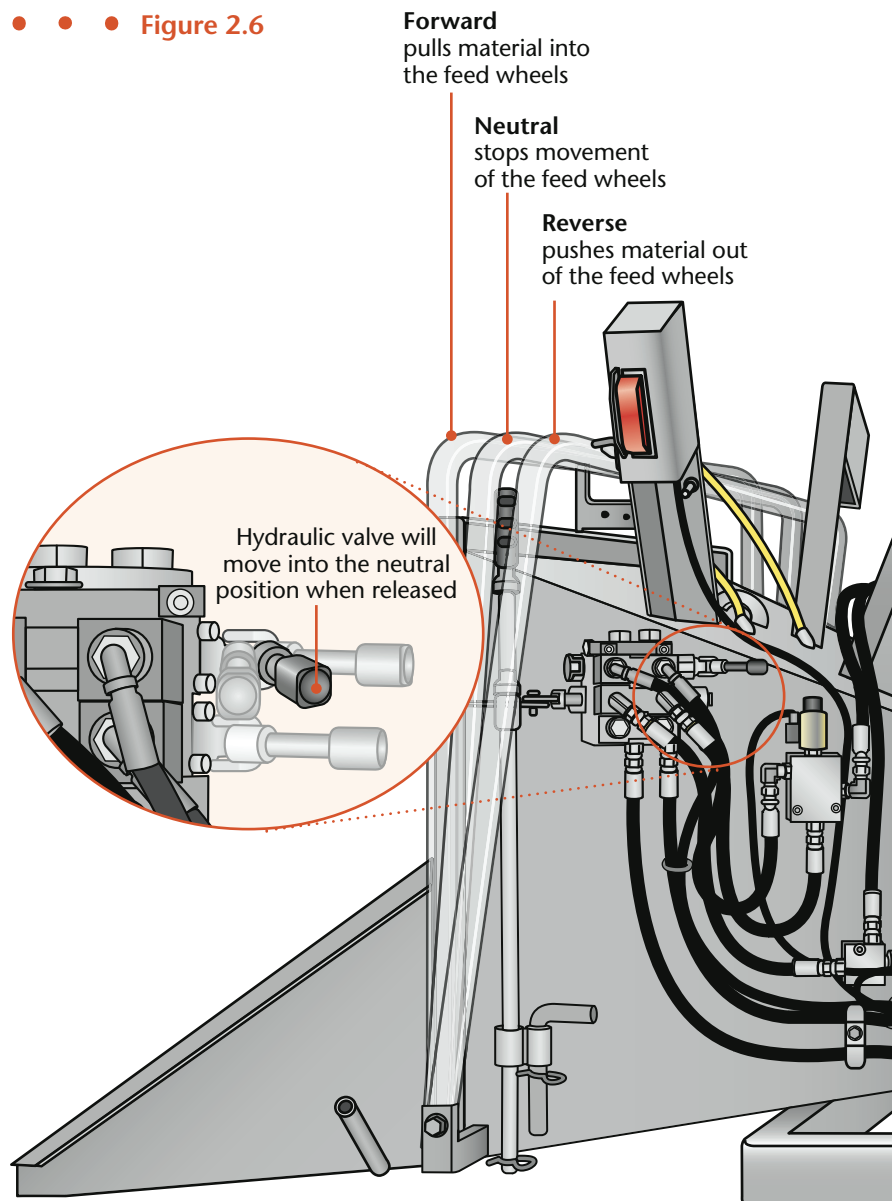
1. Go to full throttle. Keep it at this speed during the chipping process.

• • • Figure 2.5



2. Begin loading the brush. (see next page.)

• • • Figure 2.6



Chipping Wood

Feeding Brush into the Chipper

When you are about to feed brush into the chipper, position the throttle at full RPM's with the safety control bar in the **feed** position, as discussed on the previous page.

Note: At least two trained operators must be on the work site at all times. The work site is an area where the operators can see, hear, and react to an emergency in a few seconds.

To Feed the brush:

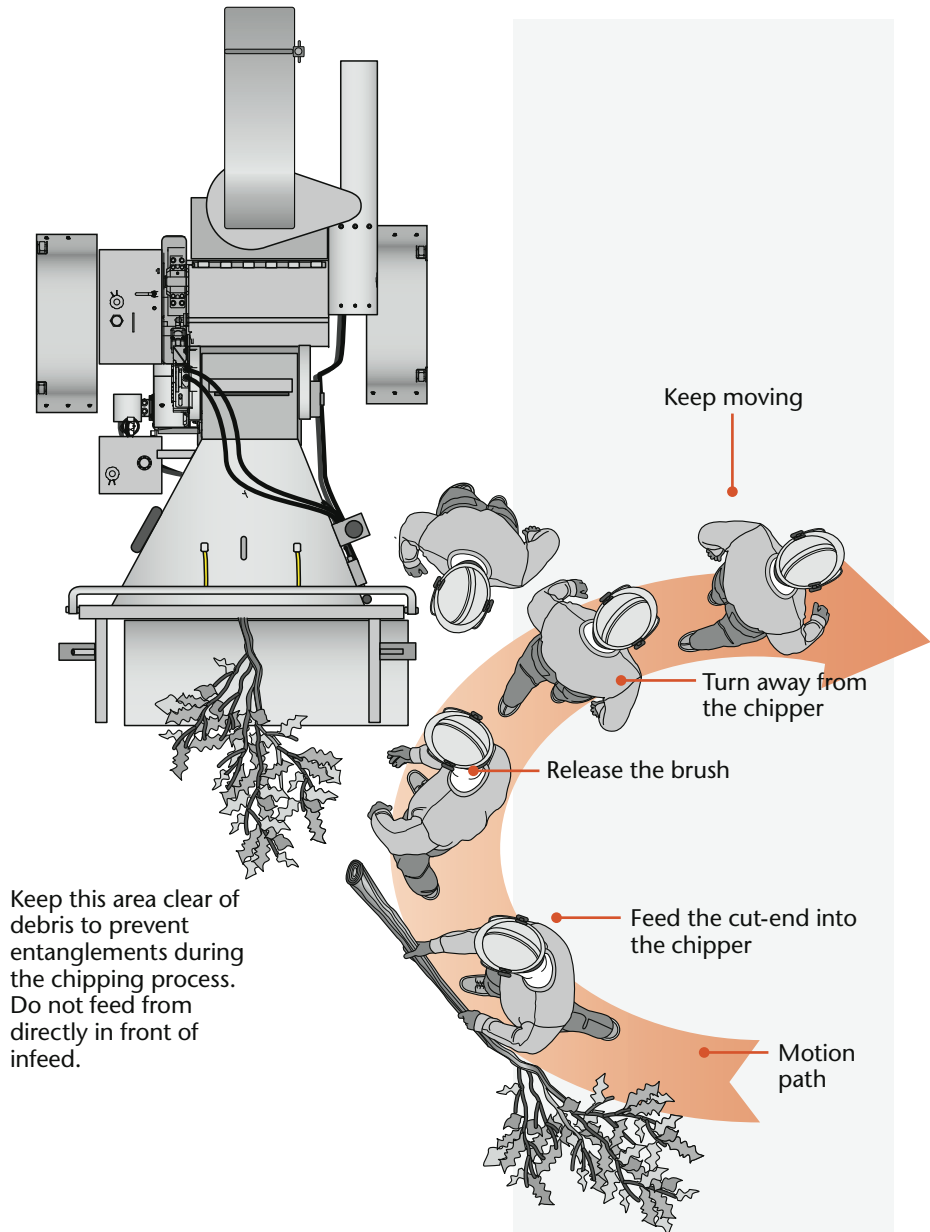
1. Pick up a limb from the brush pile that is light enough to easily maneuver. Keep your back straight and lift with your legs. The cut-end should be facing towards the infeed.
- Note:** When breaking in a machine, it is recommended that you begin by feeding 6" - 7" diameter pieces into the chipper, gradually working up to the larger diameter pieces during the first 4-8 hours of work.
2. Insert the brush into the infeed making sure your hands do not enter the infeed area. When you feel the material pull away, release the material and let it pull through the feed wheels.

Note: To safely feed shorter pieces; as the longer material enters the feed wheels place the safety control bar into the neutral position. Lay the shorter material on top of the longer material, (without entering the infeed!) then place the safety control bar back into the forward position and begin the chipping process again.

3. Quickly turn, and face away from the infeed. Keep moving along your motion path.
4. During the feeding process, monitor the gauges, standing at the side of the machine.
5. Check the discharge chute and make sure the wood chips are projecting at the correct angle. If necessary adjust the discharge chute.

Note: It is the operators responsibility to keep all bystanders away from the work site.

• • • Figure 2.7



Shut-down

 **DANGER!**



A rotating chipper drum may cause entanglement, crush or mutilation of body parts resulting in serious injury or death. Always wait for the chipper drum to completely stop after shutting the machine OFF and before opening the chipper hood.



Foreign material such as stones, wire or metal will cause blade failure causing serious injury. Do not sweep or rake the work site and try to put this material into your chipper.

 **CAUTION**



To keep the machine free of vandalism, always lock and secure the machine using the lockout procedure.

Machine Shut-down

1. Place the safety control bar into the neutral position.
2. Place the throttle switch to the throttle down mode.
3. When the engine has reached an idle, disengage the clutch.
4. Turn the ignition off.
5. Fires can start after engine shut-down therefore, the operator should watch and check the equipment for 15-20 minutes after shut-down to ensure the machine is completely cooled.

Lock-up

After the machine is shut-down it is important for safety and security reasons to follow the lock-out procedure in the Safety section, page 1.7. The following components must be locked at the end of each work period:

- Engine control panel
- Battery box
- Tool box

If you are towing the machine, be sure the hitch is properly secured to the towing vehicle and that the taillights are working. If you are **not** towing the machine, it's best to remove the battery and any other essential electrical components and store them off site.

Clean-up

When cleaning the work site, never attempt to feed handfuls of twigs, leaves and other material that have been raked up. It is impossible to feed it into the chipper without violating all safety rules or damaging the machine. Place all small brush in the chipper pile after the chipping process is complete.

Be sure the infeed is clear of all debris before transporting the machine. Loose debris, especially large pieces, in the infeed can dislodge and cause damage to vehicles behind the towed chipper..

Now that you've become familiar with the entire chipping process, use the checklists below at the beginning and end of each cycle.

Checklist



Start-up

- ☐ Emergency equipment is on the work site.
- ☐ At least two trained personnel are on the work site.
- ☐ All personnel are outfitted with proper protective clothing and gear.
- ☐ Work site is inspected.
- ☐ Work site is prepared.
- ☐ Chipper is inspected for worn, damaged, missing or loose parts.
- ☐ Chipper set-up for operation.
- ☐ Infeed is clear of debris.
- ☐ All shields and hoods are secured with locking pins.
- ☐ Tire pressure (if applicable) is checked for proper inflation.
- ☐ Daily maintenance is conducted.
(see maintenance schedule)

Shut-down

- ☐ Safety control bar is in the neutral position.
- ☐ The ignition key is out of the machine and control panel is locked.
- ☐ The chipper drum has completely stopped rotating.
- ☐ The machine has cooled down for 15-20 minutes.
- ☐ All storage areas and covers are locked and secured.
- ☐ The work site is cleared of all debris.
- ☐ Infeed is clear of debris.
- ☐ If towing, the tongue is properly hitched to the towing vehicle, the discharge is turned and centered with the front of the machine and if equipped with an optional discharge chute support, it is properly fastened.
- ☐ Chipper set-up for operation.

Features and Function

The Basics

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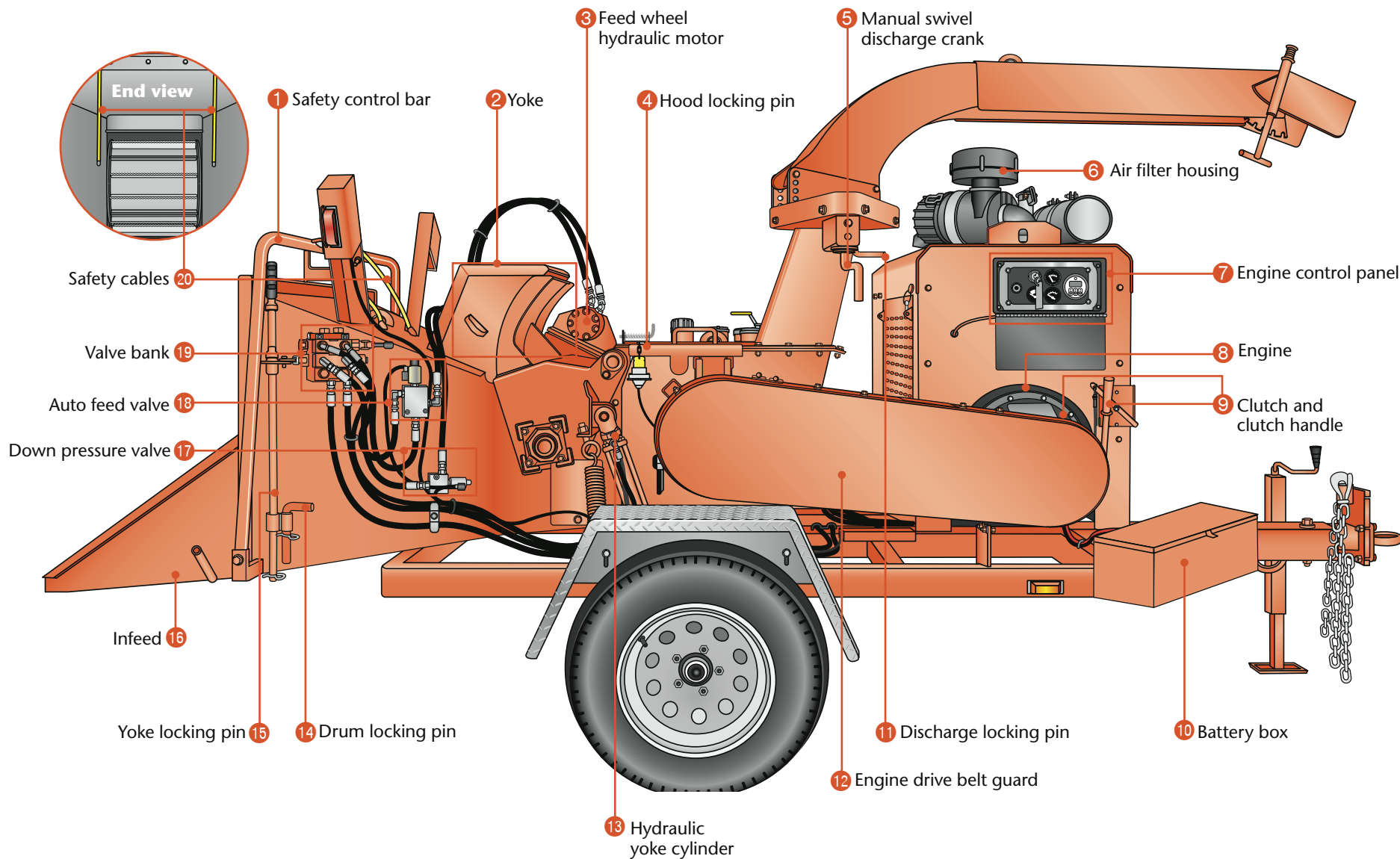
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See the option tabs along the side of the page for more information on each optional feature.

The Basics

..... Figure 3.1

Right View

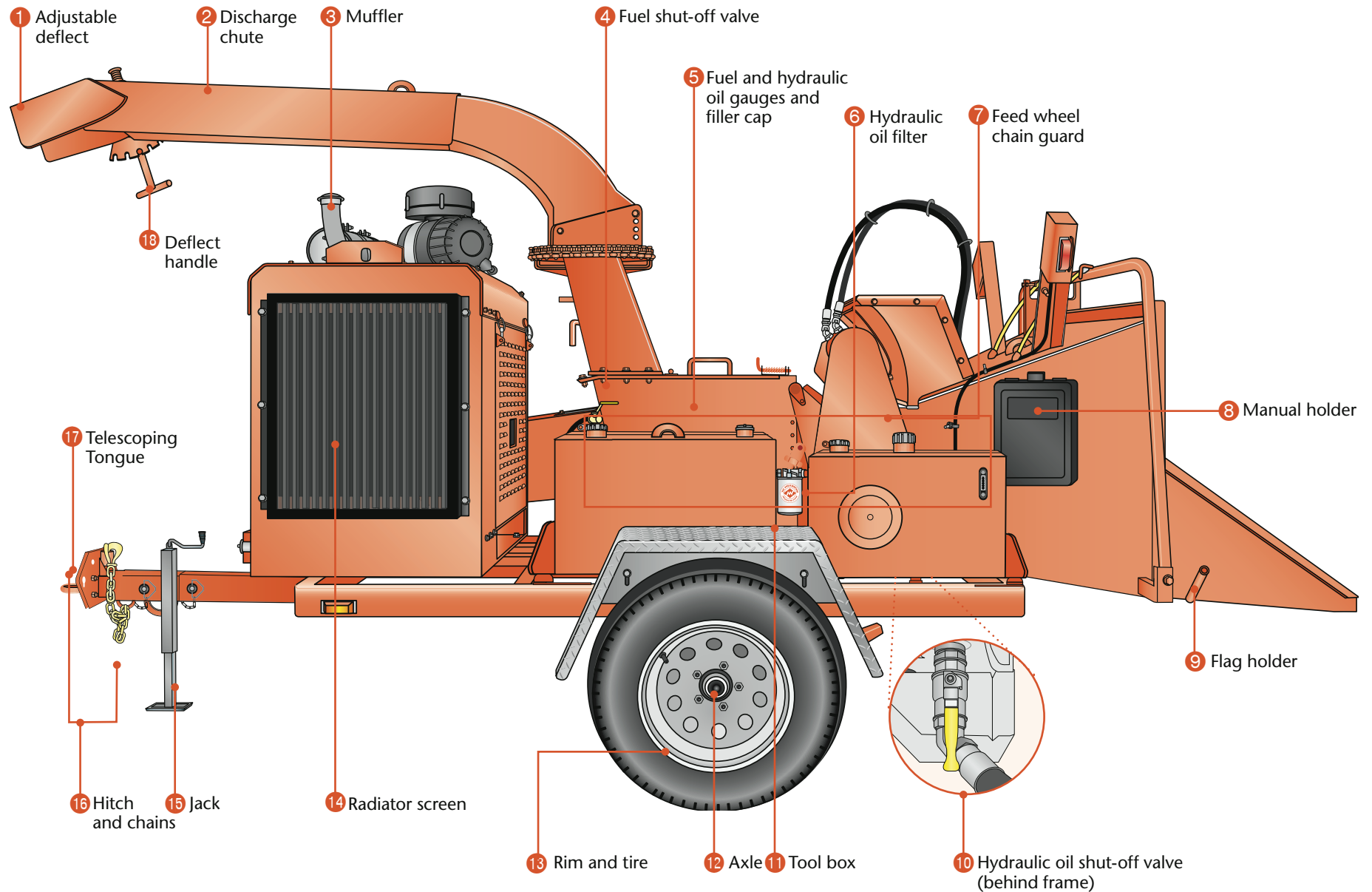


- 1. Safety control bar**
Controls forward, neutral and reverse action of the feed wheel.*
- 2. Yoke**
Housing for the feed wheel.
- 3. Feed wheel hydraulic motor**
Provides power to the feed wheel.
- 4. Hood locking pin**
Secures hood and engages hood safety switch. Important safety feature.
- 5. Manual swivel discharge crank**
Used to manually rotate the discharge chute 360°.
- 6. Air filter housing**
The air filter is located inside this housing. It protects the engine from air-borne contaminants.
- 7. Engine control panel**
Primary controls for the power unit.*
- 8. Engine**
Provides power to the chipper. Available in a variety of manufacturers and models.*
- 9. Clutch and clutch handle**
Used to engage and disengage power to the chipper.*
- 10. Battery box**
Container where the battery is stored.
- 11. Discharge locking pin**
Locks discharge chute in position.
- 12. Engine drive belt guard**
Protects the operator during operation of the machine. The guard must be attached during operation. *
- 13. Hydraulic yoke cylinder**
Hydraulically moves the yoke up and down to access the drum.
- 14. Drum locking pin**
Prevents chipper drum from turning when performing knife maintenance. This is a critical safety lockout feature.
- 15. Yoke locking pin**
Prevents accidental lowering of the feed wheel when performing maintenance. This is a critical safety lockout feature.
- 16. Infeed**
Allows unrestricted flow of material and keeps operator away from feed system.
- 17. Down pressure valve**
Controls the amount of downward pressure the feed wheel applies to the wood.
- 18. Auto feed valve**
Senses low engine rpm and stops the feed wheel from functioning until the engine rpm can increase to an acceptable level.
- 19. Valve bank**
Main controls needed to operate the chipper. These include; yoke- up and down, discharge hydraulic swivel, winch package.*
- 20. Safety cables**
Reverses the feed when the cables are pulled. Important safety feature.

*Feature varies depending on the model you have ordered, see the options tabs for details on your model.

Left View

• • • • • • • • • • Figure 3.2



- 1. Adjustable deflect**
Easily adjustable discharge deflect with 4 locking positions.
- 2. Discharge chute**
Used to change the direction of the discharge. Capable of 360° rotation.*
- 3. Muffler**
Reduces engine noise.*
- 4. Fuel shut-off valve**
Shuts off the flow of fuel to the engine.
- 5. Fuel and hydraulic oil gauges and filler cap**
The oil and fuel gauges indicate the level of each fluid. The filler caps are where the fuel and hydraulic oil are added.*
- 6. Hydraulic oil filter**
Helps keep oil clean.
- 7. Feed wheel chain guard**
Safely guards against entanglements with the feed wheel chain. The guard must be attached during operation.
- 8. Manual holder**
Storage compartment for product manuals. Keep all the manuals with the machine at all times. Use the manuals to refer to safety, features and functions, parts and maintenance.
- 9. Flag holder**
Holds safety clearance flags.
- 10. Hydraulic oil shut-off valve**
Shuts off the flow of hydraulic oil when performing maintenance.
Note: Damage to hydraulic components will occur if this valve is not turned back on before operating machine.
- 11. Tool box**
Lockable container for electrical pin connector and other tools.*
- 12. Axle**
Provides suspension and braking for the chipper.*
- 13. Rim and tire**
- 14. Radiator screen**
The screen keeps debris from plugging the engine radiator.*
- 15. Jack**
Lifts and levels the chipper during the towing/hook-up process.
- 16. Hitch and chains**
Fastens the chipper to a towing vehicle.*
- 17. Telescoping tongue**
Adjusts to match tongue length with towing vehicle.*
- 18. Deflect handle**
Changes the angle of the adjustable deflect.

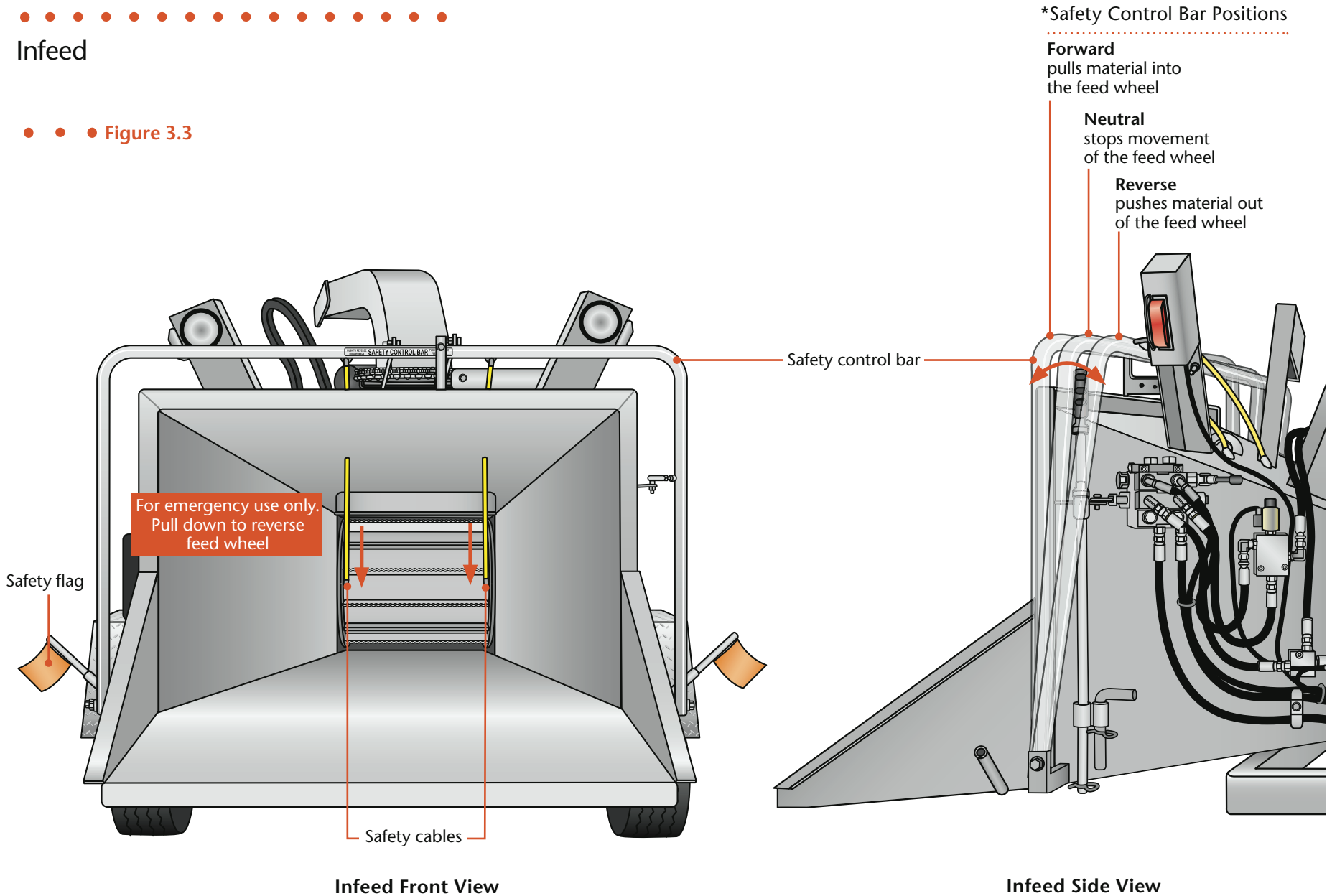
*Feature varies depending on the model you have ordered, see the options tabs for details on your model.

Components



Infeed

• • • Figure 3.3



Safety



DANGER!



Movement or placement of any part of the body inside the infeed will result in dismemberment, mutilation, serious injury or death. Keep all parts of the body (hands, feet, head) outside the infeed.



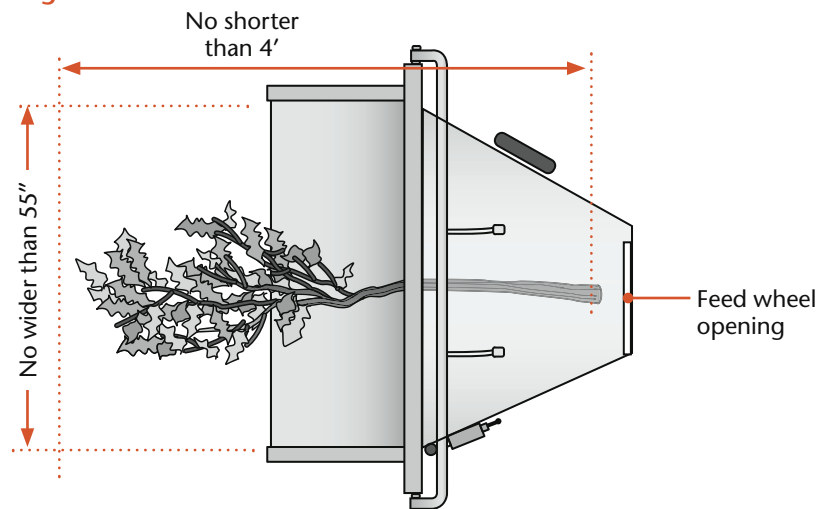
CAUTION

Be sure the infeed is clear of all debris before transporting the machine. Loose debris, especially debris in the infeed can dislodge and cause damage to vehicles behind the towed chipper.

Function

The infeed acts as a safety barrier between the operator and the feed wheel during the chipping process. The tray of the infeed can also be used to rest the end of a limb prior to feeding it into the wood chipper. The safety control bar controls the direction of the feed wheel.

• • • Figure 3.4



Use

When feeding material into the infeed, keep all body parts outside of the infeed chute. To safely accomplish this the material being fed should be no shorter than 4' long.

The brush being fed into the infeed should be no shorter than 4 ft. and no wider than 55".

The bar running around the outside of the infeed is the safety control bar. The safety control bar has three positions. The first position is **Forward**, this pulls material into the feed wheel. The second is **Neutral**, this stops movement of the feed wheel. The third is **Reverse**, this position reverses the feed wheel and pushes material out of the feed wheel.

The infeed is equipped with two bright yellow emergency safety cables, which are located inside the infeed. The safety cables are there in case the operator is accidentally pulled into the infeed. When the safety cable is pulled, it will move the safety control bar to reverse the feed wheel.

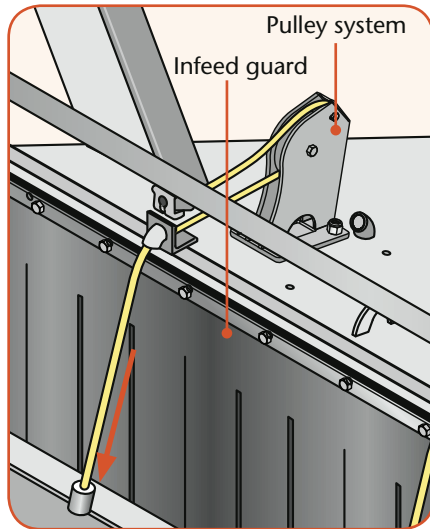
Maintenance

- Keep the infeed clear of any debris (stones, glass, metal, etc.) that may damage the machine.
- Clean the infeed only when the ignition key is out, all covers are locked, and the machine is stable.
- Clear the infeed of all debris before towing.

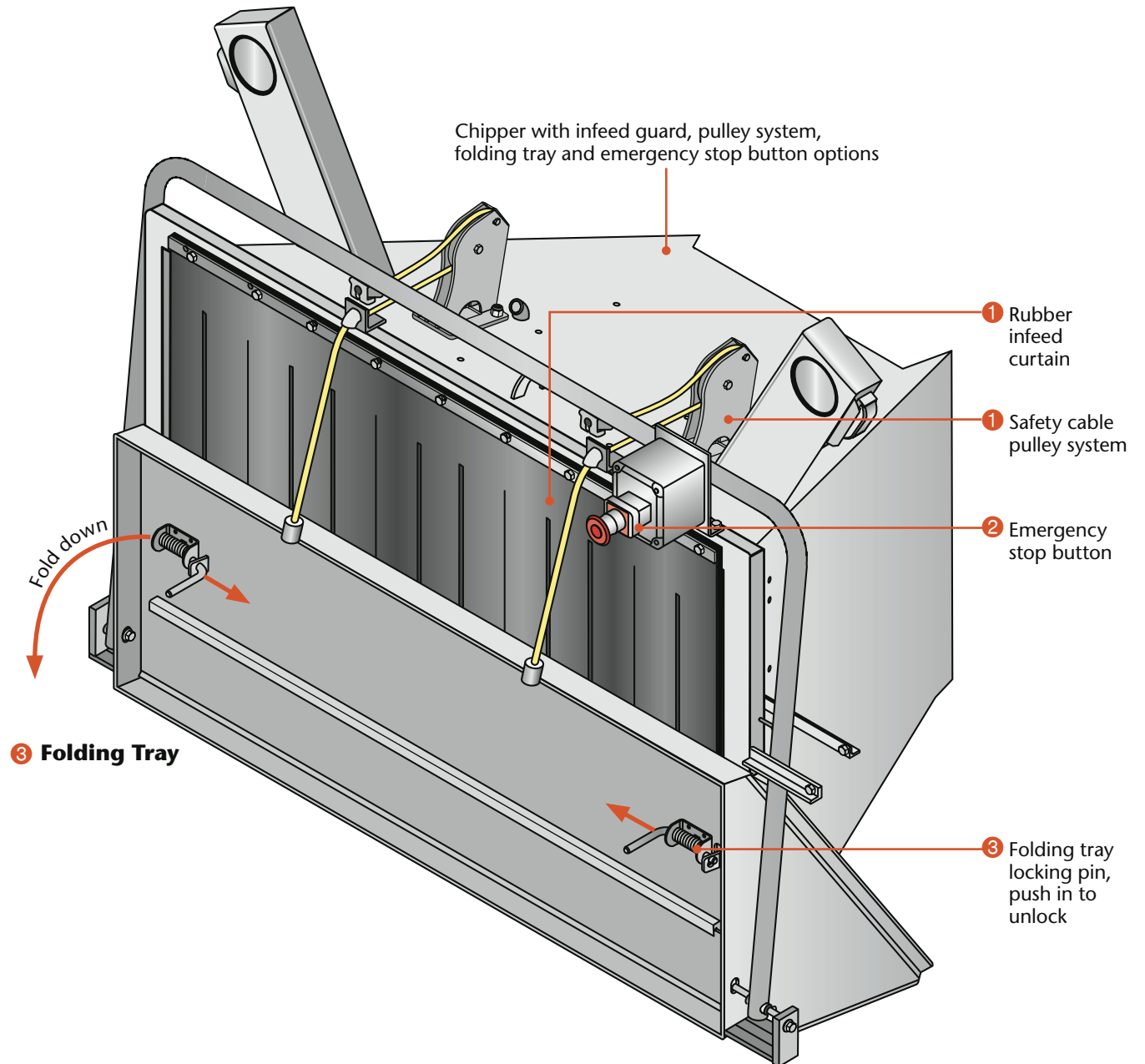
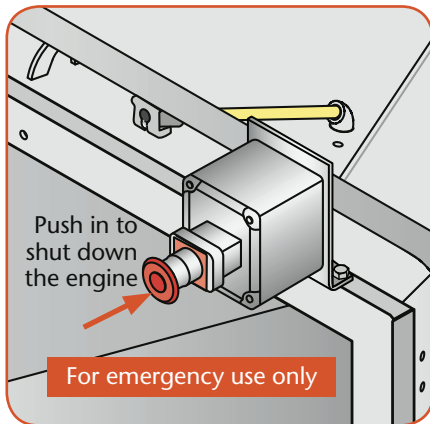
Infeed Options

• • • • • Figure 3.5

1 Rubber infeed curtain with Pulley Safety Cables



2 Emergency Stop Button



Safety


DANGER!



Running the engine while a person is performing maintenance will result in serious injury, dismemberment or mutilation. Always follow proper lockout procedures before performing maintenance. In an emergency, press the emergency stop button, if equipped, or immediately shift the safety control bar into the neutral position.

Function

There are three options available for the infeed they are; rubber curtain with pulley safety cables, emergency stop button and the folding tray. Your chipper may have a combination of these options.

1. **Rubber Infeed Curtain With Pulley Safety Cables:** The rubber infeed curtain keeps debris from flying back towards the operator. When your chipper is equipped with a rubber infeed curtain you must use the pulley safety cable system. This system routes the safety cables to the outside of the rubber guard.
2. **Emergency Stop Button:** Allows the operator to shut down the engine in an *emergency situation only!*
3. **Folding Tray:** Shortens length of infeed for transport. Keeps debris from flying out and harming bystanders and other vehicles when towing the chipper.

Use

Rubber infeed curtain and Pulley Safety Cables: Pull the safety cables straight down to reverse the feed wheel.

Emergency Stop Button: Push the red emergency stop button in until the engine stops. Pull the stop button back out after the engine has completely shut down. If the button is not pulled out the engine will not restart. **Note:** The feed wheel and chipper will continue to turn after engine has been shut off.

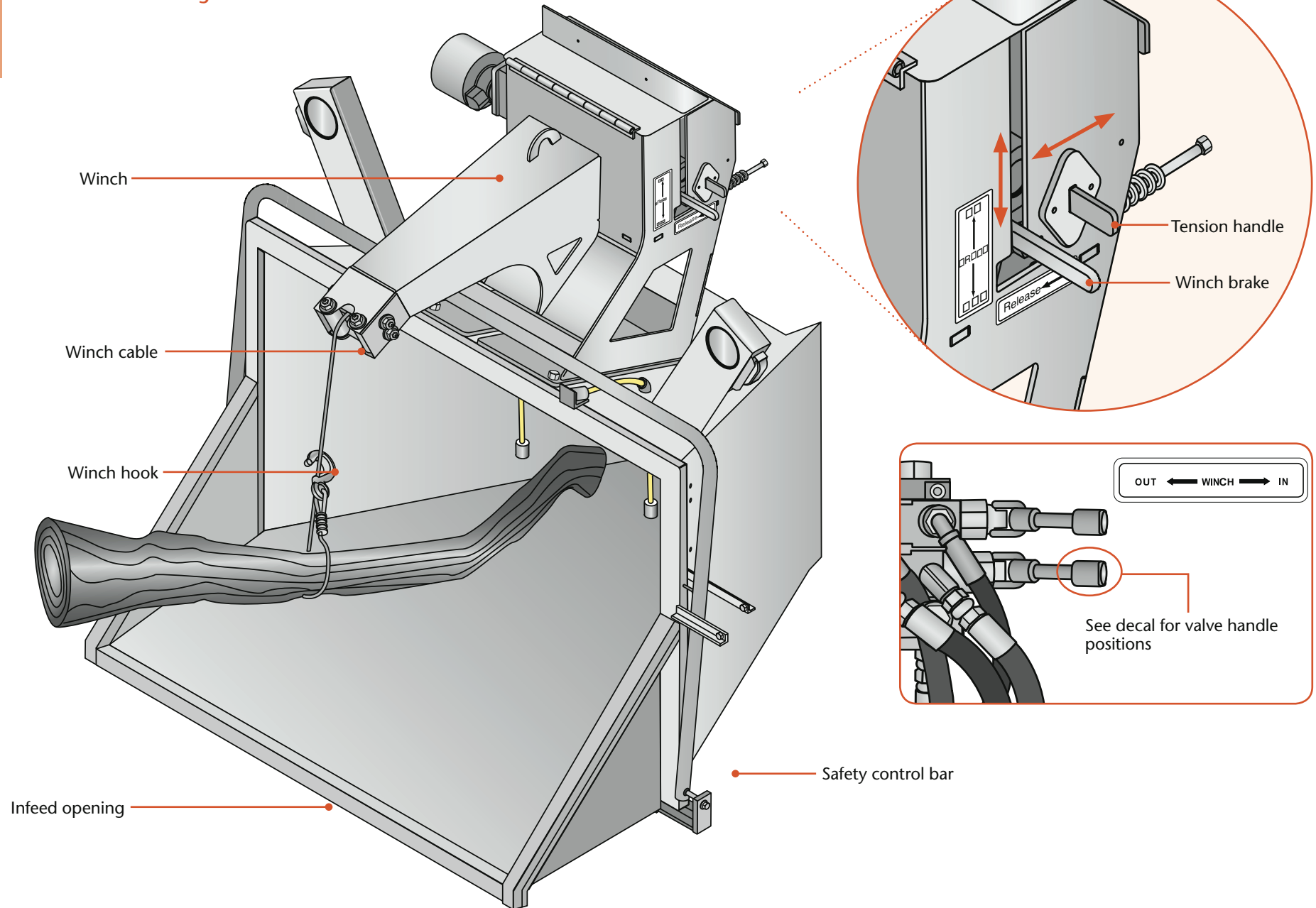
Folding Tray: To unlock the folding tray, pull the locking pins towards the center of the tray, and fold the tray down. Lift the tray up and lock into place when not in use.

Maintenance

- Keep the infeed clear of any debris (stones, glass, metal, etc.) that may damage the machine.
- Clean the infeed only when the ignition key is out, engine control panel is locked, and the machine is stable.
- Clear the infeed of all debris before towing.

Winch Option

• • • • • Figure 3.6



Safety



DANGER!



Movement or placement of any part of the body inside the infeed chute will result in dismemberment, mutilation, serious injury or death. Keep all parts of the body (hands, feet, head) outside the infeed chute.



WARNING!



Failure to properly fasten the winch cable to a load could result in the cable unraveling and flying back causing serious injury to the operator and/or damage to the machine. Do not allow anyone to stand between the winch load and the winch during operation.



Unstable loads resting on the infeed opening may fall off and cause serious injury. Be sure the load is stable when resting on the infeed opening before making any further movements.



The load may move the chipper. Never operate the winch when the chipper is not chocked and attached to a towing vehicle in park.



The safety control bar must be in the neutral position before operating winch. Failure to do so may result in the cable being caught and pulled into the feed wheel. Failure to detach chain and hook from load while engaging feed wheels could result in serious injury to operator and/or equipment damage.

Operators should review ANSI Z133.1 for worksite instructions.

Function

The winch assists in moving heavy limbs or logs (Loads) to the infeed opening.

Use

To operate the winch:

1. Position the chipper in an area that can easily lift and move the load and place into the infeed opening.
2. Place chocks on each side of the chipper wheels and be sure the towing vehicle is in park to prevent any rolling of the chipper or towing vehicle.
3. Be sure safety control bar is in neutral position. Push the tension handle in towards the infeed until you are able to pull the winch brake down into the OFF position.
4. Pull as much cable out as you need to comfortably reach and securely fasten cable around load to be chipped. For larger loads, fasten chain near large end of load. Inspect winch cable before every pull. Repeated side loadings will shorten cable life.
5. Push the winch brake up to lock the cable into place.
6. Move the winch control handle on the valve bank to retract the winch cable and bring the load towards the infeed. Be sure to keep tension in the cable while retracting to create smooth wrapping onto winch drum.
7. Continue to move the load towards the infeed until the load rests on the infeed opening. Ensure the load is stable and not in danger of falling off the infeed opening or it may cause injury.
8. Extend the cable by pushing the tension handle towards the infeed until you are able to pull the winch brake down.
9. Place the cable further down on the load.
10. Retract the cable to move the load towards the feed wheels by activating the winch manifold handle as in step 6.

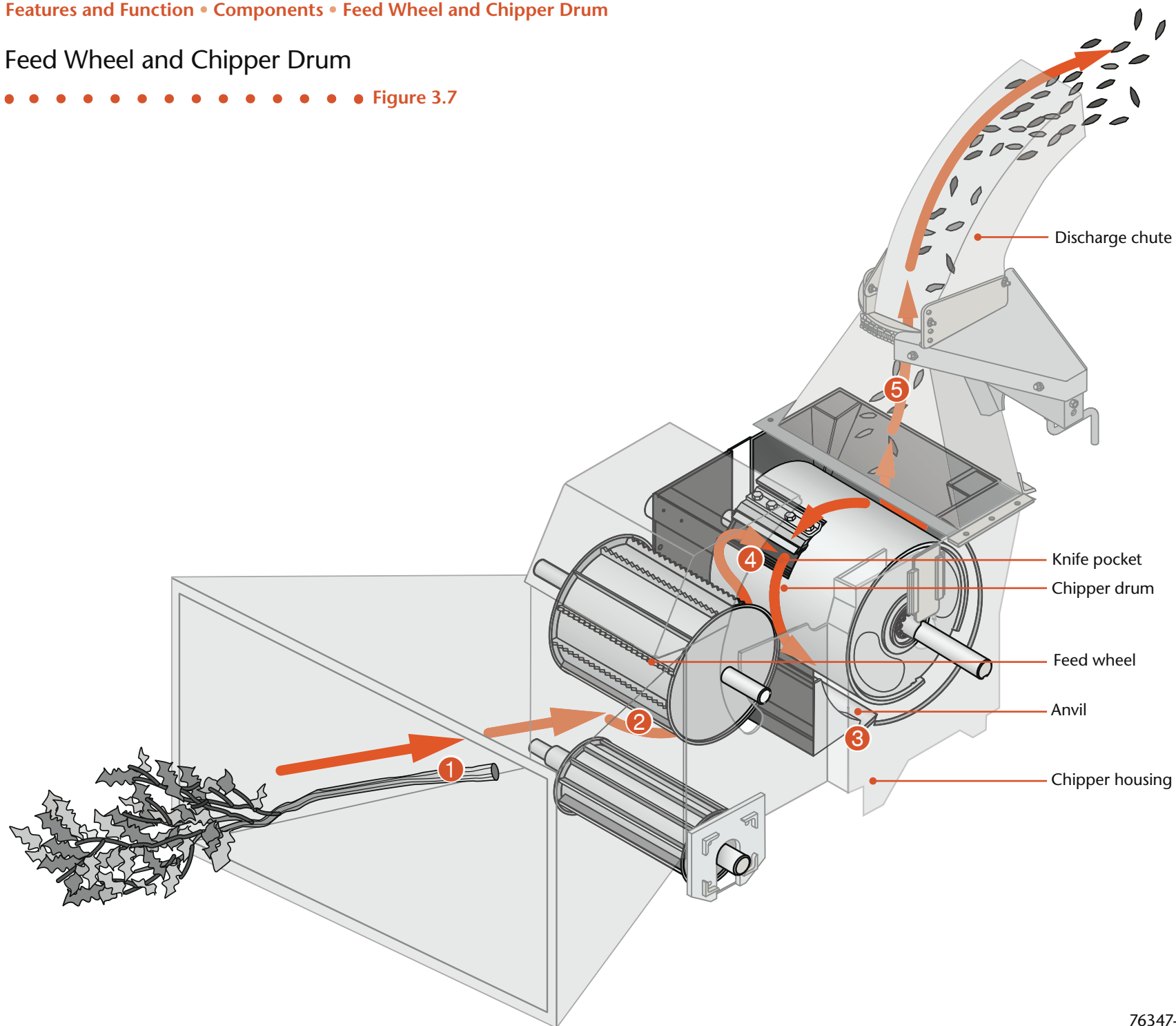


Danger: When engaging feed wheels ensure that you stop the feed wheels before any part of the winch cable or hook breaks the plane of the infeed opening.

11. Place the safety control bar in the neutral position and unfasten the winch hook from the load.
12. Fully retract the cable making sure to keep hands clear.
13. Place the safety control bar in the forward position and continue to feed the load into the machine.

Feed Wheel and Chipper Drum

..... Figure 3.7



Safety

**DANGER!**



Movement or placement of any part of the body inside the feed wheel and chipper drum will result in mutilation, serious injury or death. Keep all parts of the body (hands, feet, head) outside of the yoke.



Opening the chipper hood while the chipper drum is moving will result serious injury or death. Do not open the chipper hood when the chipper drum is moving. Turn off the engine and lock the hood before servicing.

**CAUTION**



Always wear leather gloves and protective clothing when changing or servicing the chipper knife and anvil. Serious injury could occur.

Function

Feed wheel: Feeds brush at a steady rate into the chipper drum.

Chipper Drum: Reduces brush, limbs and logs into chip size material.

Chipping Flow Path:

1. Brush enters the infeed.
2. The teeth of the feed wheel grab the brush and pull the brush into the chipper drum at a steady rate.
3. The chipper drum cuts against the anvil.
4. The two knife pockets accumulate the chips.
5. The rotation of the drum and the air impeller system (this system helps blow chips up into the discharge chute) provides steady air flow to carry the chips up into the discharge chute.

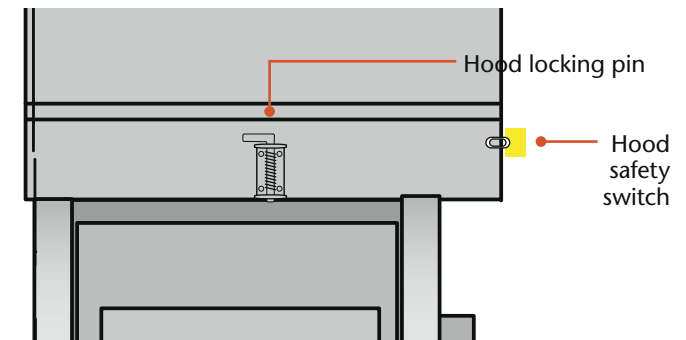
Features and Function • Components • Feed Wheel and Chipper Drum

Use

The feed wheel operates in two directions, forward and reverse. The safety control bar and the emergency cables located on the infeed control the direction of the feed wheel.

When the chipper drum is moving the chipper hood **MUST** be closed and locked in place using the hood locking pin. To insure that the chipper hood is locked, the machine is equipped with a hood safety switch. The switch will not allow the machine to start with the hood open.

• • • Figure 3.8



Maintenance

To achieve good quality chips, eliminate stress on the chipper as well as reducing down time due to clogged components, follow these steps for top chipper performance:

- Knives must be made of the correct steel composition and hardness
- Always maintain proper cutting angle and sharpening techniques
- Change the knives frequently.
- Maintain correct anvil/knife clearances
- Keep the anvil square
- Use matched sets of knives on the chipper drum.
- Do not use knives that are too narrow
- Keep anvil and chipper knife bolts tight.
- Clean holder pocket and clamps when changing knives
- Protect blades when not in chipper

See the Maintenance section for detailed information on maintaining all feed wheel and chipper drum components.

Feed Wheel Chain Drive



Safety

**DANGER!**



Moving chains will cause serious injury or death. Do not operate without the guards in place. Do not attempt to touch, check, clean, or adjust the chain during operation.

Function

The feed wheel chain provides power to the feed wheel. The chain drive consists of the chain, two sprockets, two bushings, hydraulic motor and the chain guard.

Use

The feed wheel chain drive is housed inside the chain guard. Never remove the chain guard unless you are changing, servicing or cleaning the components inside the guard. To remove the chain guard, loosen and remove the bolts on the sides of the guard. Lift the guard off the machine. Always replace the belt guard and secure with the bolts after the work is completed.

To get top performance from the chain drive, it is important that the chain has the proper tension. When adjusting the tension, you need to increase the distance between the two sprockets by manually pulling on the hydraulic motor.

Maintenance

- Inspect sprockets for wear or damage when replacing the chain.

Yoke



Safety

**DANGER!**



Movement or placement of any part of the body inside the yoke will result in mutilation, serious injury or death. Keep all parts of the body (hands, feet, head) outside of the yoke.

Function

The Yoke houses the feed wheel, its primary function is to aid in feeding material into the chipper. When maintenance or repairs are needed on the feed wheel and chipper drum, the yoke raises and lowers, allowing easy access to the interior of the chipper base.

Use

To raise and lower the yoke, use the hydraulic handles on the valve bank.

Note: The direction of movement (left-right, up-down) depends on the specific machine configuration that was ordered with your chipper. Refer to the decal next to the yoke control valve for exact handle direction.

When the yoke is raised, it **MUST** be locked in place with the yoke locking pin. The locking pin is located at the curb side of the machine next to the valve bank. To lock the yoke, raise the yoke. Then insert the locking pin in the yoke locking hole, making sure it goes all of the way through both sides of the infeed. Secure with the hitch clip at end of the locking pin.

Maintenance

Grease the yoke cylinder pin and the yoke pivot pin every 40 hours. See the Maintenance section for more detail.

Valve Banks



Safety

**WARNING!**



Relieve stored hydraulic pressure before performing service to the hydraulic system. Components could be hot to the touch.

Function

The hydraulic valve bank controls operate the machine. They control the yoke and aide in machine maintenance. The auto feed valve is the component that stops the feed wheel when low rpm's are detected from the motor. It allows for smooth shifts in direction (forward or reverse) of the feed wheel.

The chipper comes with several options, depending on what type of options you have will dictate how many hydraulic handles your chipper is equipped with. Check the front of the parts section for the options on your chipper.

Use

Operating the machine is managed by moving the hydraulic handles. The handles are located on the valve bank. All handles, except the Safety Control Bar, have a spring mechanism that will return the handle to the Neutral position when not in use.

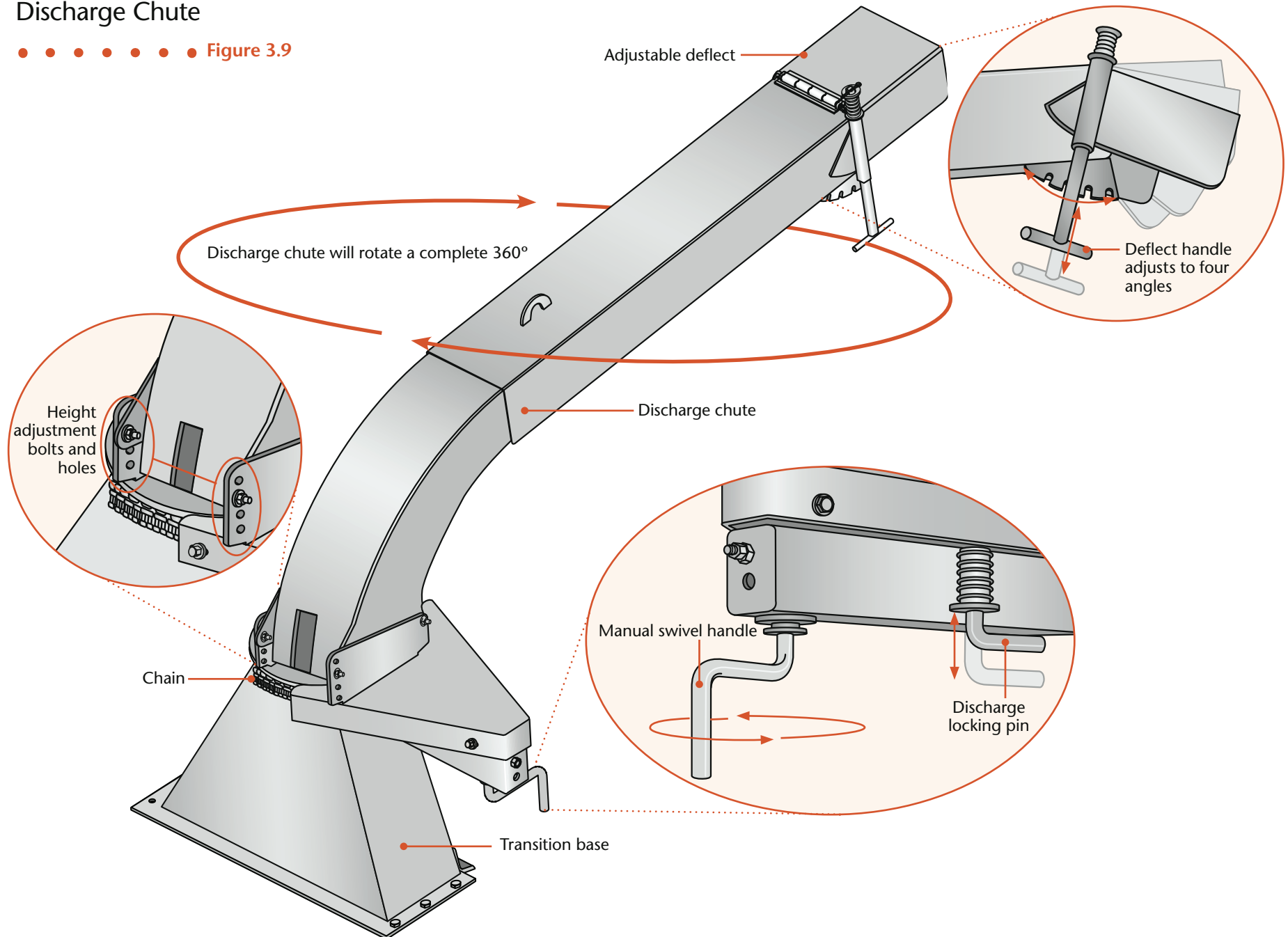
Maintenance

- Check fittings and hoses for leaks
- Check coils for tightness
- Check for wear on wiring

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Discharge Chute

• • • • • • • • **Figure 3.9**



Safety


DANGER!



Contact with the discharge chute while it's in motion will cause serious injury or death. Do not stand or position yourself near the discharge chute during operation. Move spectators or bystanders away from the discharge chute.



Transporting the chipper when the discharge chute is not centered with the width of the front of the machine will cause serious injury. Always center the discharge chute before transporting.



Flying debris will cause serious injury or death. Never stand in front of the discharge chute. Direct discharge away from people and animals.



Conducting maintenance with the engine on will cause serious injury or death. Turn off the engine and lockout the machine before servicing.


CAUTION



Machine components may be hot or have sharp edges which could cause serious injury. Always wear protective gear during operation and maintenance.

Function

The purpose of the discharge chute is to project chipped wood away from the machine and into a designated chipped wood area.

Use

The discharge chute has three adjustments to help in discharging the chipped wood. The first is the rotation of the entire discharge chute. The second adjustment is setting the discharge deflect and the third is adjusting the height of the discharge chute.

To rotate the chute:

1. Pull down on the discharge locking pin.
2. Manually position the discharge chute to point in the desired direction by rotating the manual swivel handle. The discharge chute will rotate a full 360°.
3. Push the discharge locking pin back up into place.

To adjust the discharge deflect:

1. Pull the handle towards you, far enough for the pin on the handle to clear the adjustment bracket.
2. Move the deflect handle to the desired position. The deflect has four angles of projection.

To adjust the height of the chute:

1. Remove the washers and bolts located at the rear of the transition base and loosen the bolts in the front.
2. Position the entire chute into the desired height slot. There are four positions available.
3. Insert the washer and bolts through the new holes on each side, and tighten the bolts.

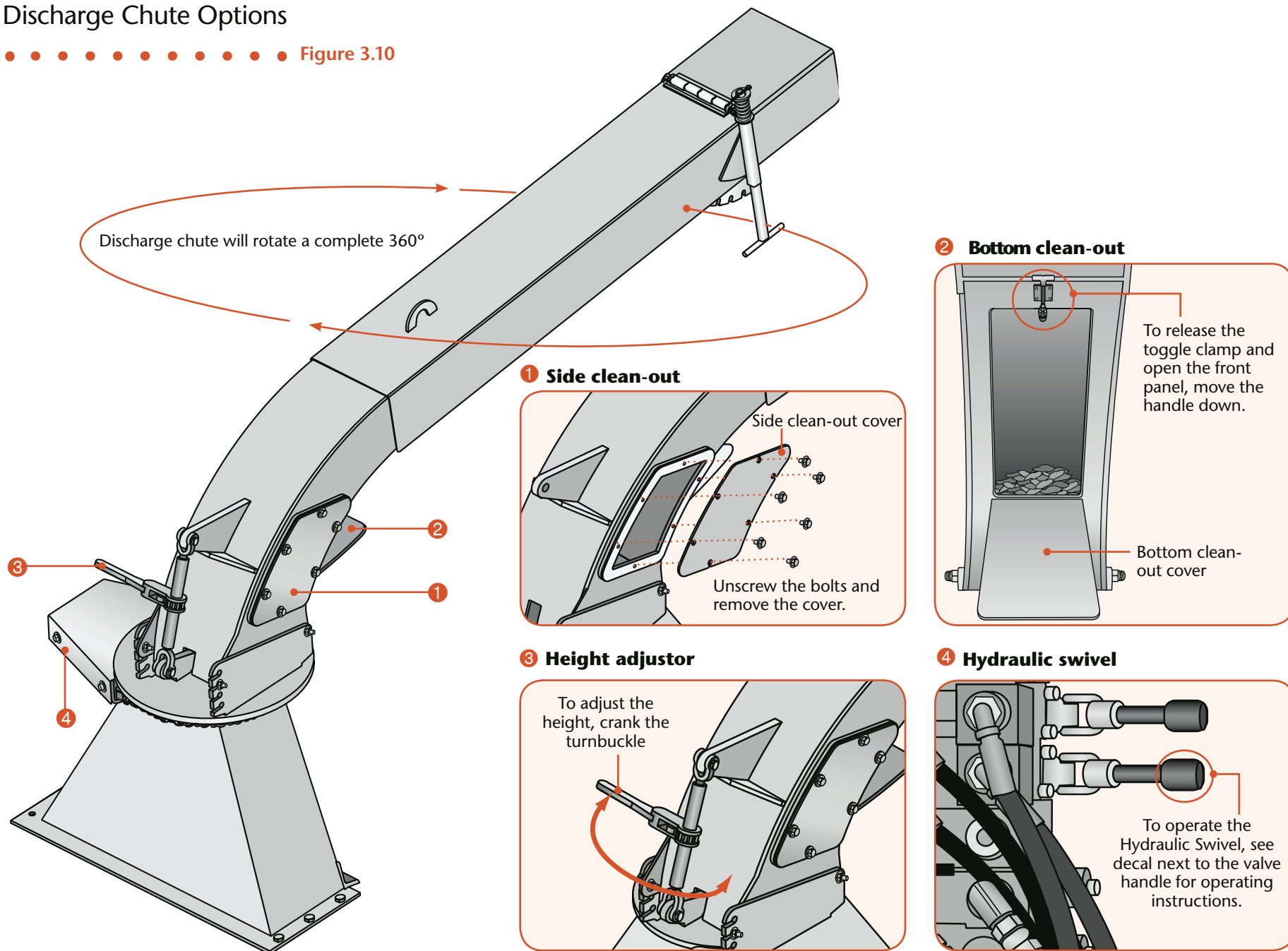
Ideally, the chipped wood should be piled either in the back of the tow truck that is hitched to the chipper, or a designated area removed far enough away so that it does not effect safe operation of the chipper.

Maintenance

- Lubricate grease points every 40 hours of operation (see lubrication points in maintenance section for more detail).
- Check tension, alignment and lubrication of chain drive at start up and after every 8 hours of operation.
- Check that the discharge chute is free of debris that may cause blockages before start-up.

Discharge Chute Options

Figure 3.10



Safety

 WARNING!	
	Hydraulic fluid is under pressure. Spraying fluid from a leak can burn or penetrate the skin and cause serious injury. If fluid penetrates the skin, immediately seek medical attention to have it surgically removed.
	Pressure may be stored in the hydraulic system even after the power unit is turned off. Slightly open a line to relieve pressure.

Function

There are four options for the discharge chute. They include; a bottom clean-out, side clean-out, height adjuster and hydraulic swivel. You can order one or all options.

1. **Side Clean-out:** An opening on the side of the discharge that enables the operator access to the base of the chute for clean-out.
2. **Bottom Clean-out:** An opening on the front/bottom of the discharge chute that enables the operator access to the base of the chute for clean-out.
3. **Height Adjuster:** Changes the flow angle of the discharge.
4. **Hydraulic Swivel:** Provides fluid power to the discharge swivel.

Use

Side Clean-out: Remove the screws and cover. Clear out debris from chute. Place cover back on window and securely fasten with screws.

Bottom Clean-out: Release the toggle clamp and open the bottom clean-out cover. Clean out debris from the chute. Close cover and tighten toggle clamp.

Height Adjuster: To change the discharge angle height, first loosen and remove the rear bolts and loosen the front bolts. Then, move the turnbuckle to the left to raise or to the right to lower the discharge chute.

Hydraulic Swivel: To change the direction the discharge is flowing or pointing, see decal next to the valve handle for operating instructions. The swivel is capable of rotating 360°.

NOTE: Before transporting the chipper center the hydraulic discharge chute with the width of the machine facing the front of the machine. If equipped with a optional Discharge Chute Support, ensure that it is properly mounted and secure.

Maintenance

- Lubricate grease points every 40 hours of operation (see lubrication points in maintenance section for more detail).
- Lubricate grease points every 40 hours of operation (see lubrication points in maintenance section for more detail).
- Check tension, alignment and lubrication of chain drive before start up and after every 8 hours of operation.

Discharge Chute Cleaning

Safety



! DANGER!



Never attempt to remove material by starting the machine and engaging the chipper to blow material out. This is a very dangerous and unsafe practice?



Two (2) people shall be involved when attempting to lower the discharge chute. The chute must be securely supported while removing rear support bolts. Never stand directly under the chute as it can fall, causing injury.



! CAUTION



Machine components may be hot or have sharp edges which could cause serious injury. Always wear protective gear during operation and maintenance.

Plugging is mainly caused by the engine RPM's dropping too low. This drop can be caused by running the unit at less than full RPM's, by dull knives that do not chip the wood efficiently or by trying to overfeed material that is either too large or too soft, which prevents chipping. If the unit has autofeed it should be set high enough to prevent a low RPM situation.

To clean out the chute:

1. Complete lockout/tagout.
2. Inspect to make sure drum/disc has stopped turning.
3. Pull material out from the open end of the discharge.
4. If unit has a clean out door, open and remove any material that is accessible.
5. For units without a clean out door or that still have material that is unreachable through the clean out door, the chute should be lowered to gain access to the clogged area.

Note: Two (2) People shall be involved when attempting to lower the discharge chute. The chute must be securely supported while removing rear support bolts. Never stand directly under the chute as it can fall, causing serious injury or death.

6. Once the chute is lowered any remaining clogged material may then be removed from the discharge area and chipper housing.

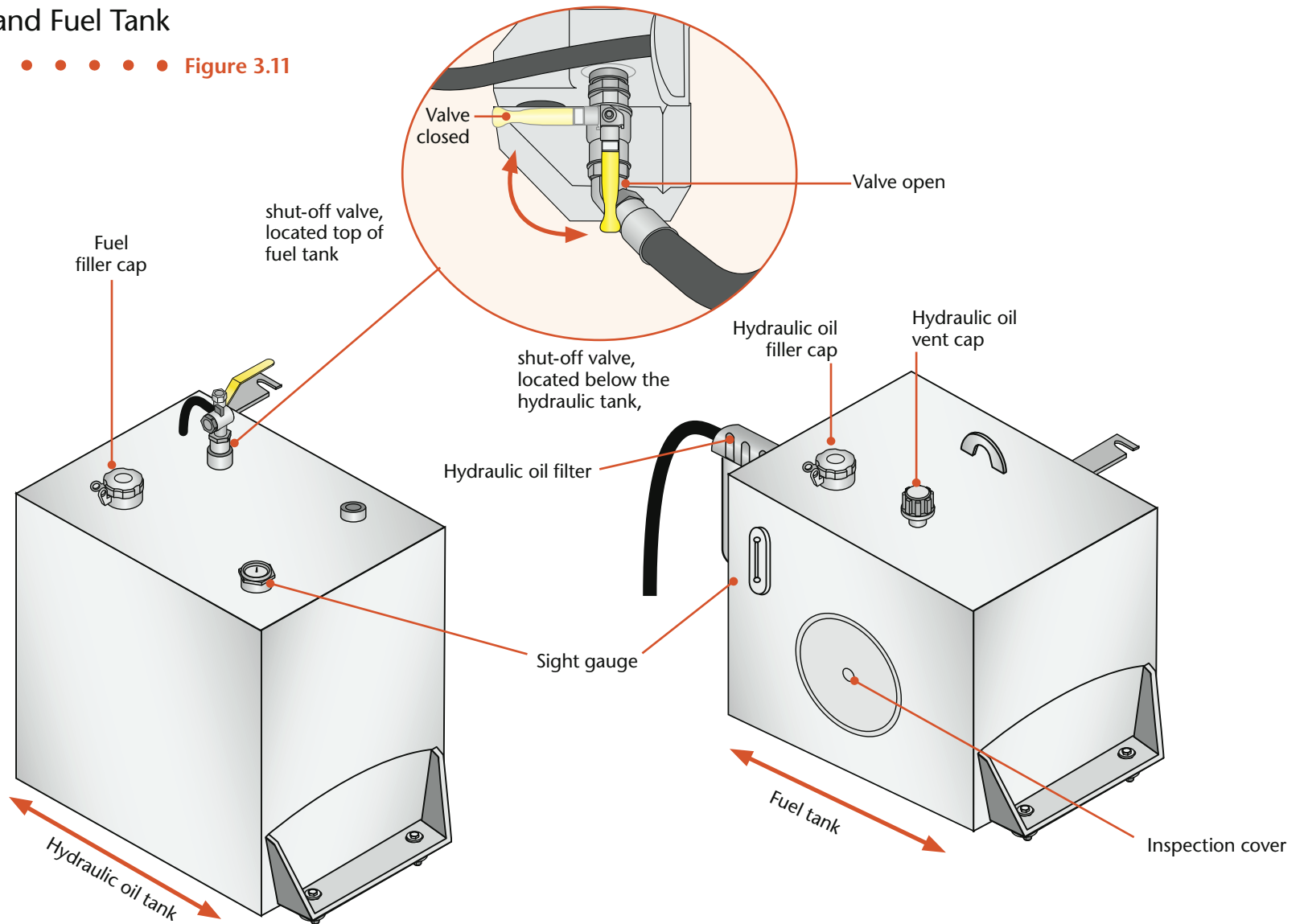
Note: Never attempt to remove material by starting the machine and engaging the chipper to blow material out. This is a very dangerous and unsafe practice.

7. Reinstall components and attempt chipping again using small material to determine if chipper discharges properly.

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Hydraulic Oil and Fuel Tank

● ● ● ● ● ● ● ● ● ● Figure 3.11



*Feature varies depending on the model you have ordered, see the options tabs for details on your model.

Safety


DANGER!



Exposing fuel to an ignition source such as a flame or spark will result in explosion, fire, serious injury or death. Never smoke, light a flame or create a spark around the fuel tank. Store the machine and extra fuel away from ignition sources.



After use of the machine hydraulic oil becomes extremely hot and is pressurized which will burn or puncture the skin if not handled properly. Allow the hydraulic oil to cool down and relieve built up pressure before conducting maintenance, such as adding oil.



Function

The large, 22 gallon tank, is used for storing and monitoring fuel. The smaller, 14 gallon tank, is used for storing and monitoring the hydraulic oil.

Use

On the top and side of the tanks is a sight gauge and filler cap. The gauges show you the amount of oil, or fuel, that is in the tank. Allow the machine to cool down before adding hydraulic oil or fuel. Remove the filler cap slowly to relieve any pressure that may be built up.

NOTE: The optional hydraulic California tank has a combination filler/breather cap which provides a vent for oil to go to if forced out of the tank due to heat or over pressurization.

When adding fuel, leave space in the tank for vapor to expand. A completely full tank could overflow if exposed to a rise in air temperature. Screw the filler cap back on and tighten until it seals.

On the top of the fuel tank is a fuel shut-off valve. Below the hydraulic tank, and behind the machine frame is the hydraulic oil shut-off valve. Close these valves to avoid spilling fuel or oil during maintenance.

Each tank has a filter. The hydraulic oil filter is located on the side of the hydraulic oil tank. The fuel filter is located in the engine enclosure. See your engine operator manual for more detail.

Over time hydraulic oil will create a sludge. This is a fluid transformation where the oil will become thick and sticky, contaminating good oil if left in the tank too long. The inspection cover allows access to the inside of the hydraulic oil tank for cleaning out the sludge deposits. To remove the inspection cover, drain the tank, remove the bolts and washers, and remove the cover from the tank.

Maintenance

- Replace the fuel and oil filters every six months or as recommended by your engine manufacturer.
- Use only original manufacturer parts when replacing filters.
- Inspect and clean the inside of the hydraulic tank when sludge deposits accumulate.

*Feature varies depending on the model you have ordered, see the options tabs for details on your model.

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Engine Belt Drive



Safety

WARNING!

Moving belts can cause serious injury or death. Do not operate without the guards in place. Do not attempt to touch, check, clean, or adjust the belts during operation. Turn off the engine and lock-out the machine before servicing.

Never use flammable cleaning solvents on the belt, friction may cause a fire. Use non-flammable cleaners.

Function

The engine belt drive provides power to the chipper drum. The belt drive consists of the belt, two sheaves, two bushings and the belt guard.

Use

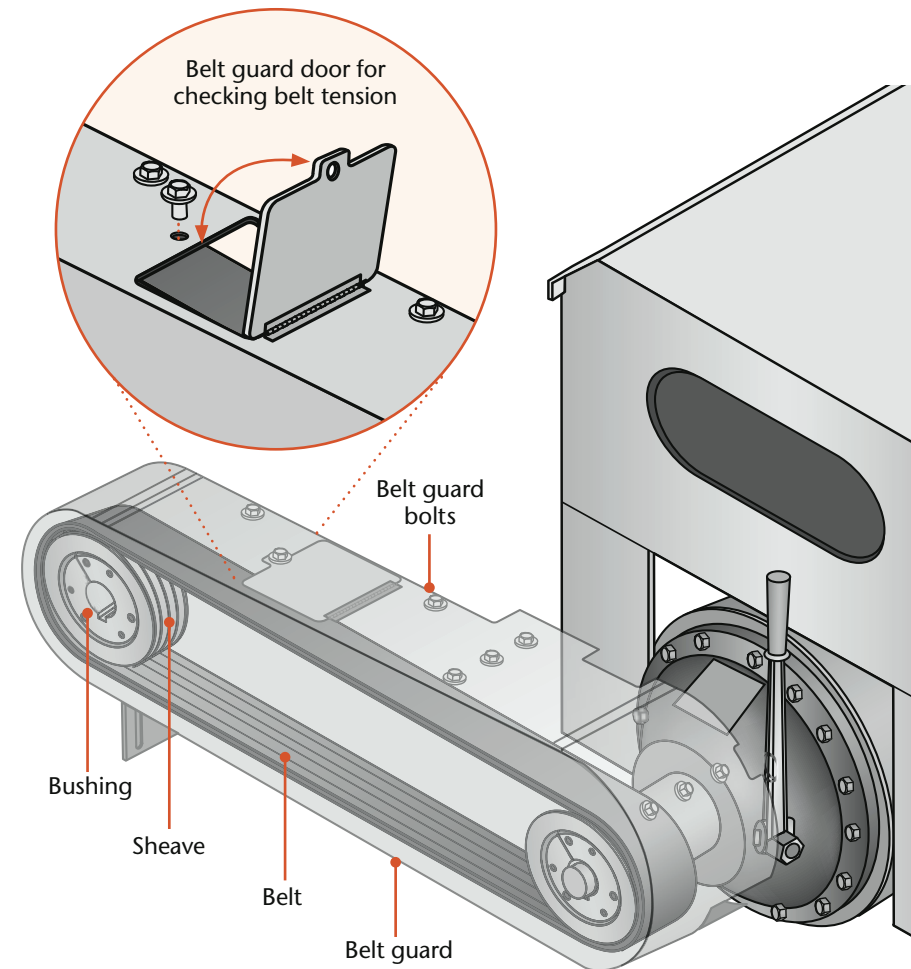
The engine drive belt is housed inside the belt guard. Never remove the belt guard unless you are changing or servicing the belt. To remove the belt guard, loosen the bolts and washers on the top and sides of the guard, lift the top of the guard off the guard base. Always replace the belt guard and secure with the bolts and washers after the work is completed.

To get top performance from the drive belt, it is important that the belt tension is adjusted properly. At the top of the belt guard, is a door for checking belt tension. To open the door, remove the bolt and lift open. See Maintenance section for checking and tightening the belt tension and replacing belts.

Maintenance

- Grease and oil can penetrate the belt, remove grease and oil from belt as soon as possible.
- Clean the belt with a clean cloth and non-flammable cleaning solution. Soap and a mild detergent will work, but a non-flammable cleaner is best.
- Inspect sheaves for wear or damage when replacing the belt.

• • • Figure 3.14

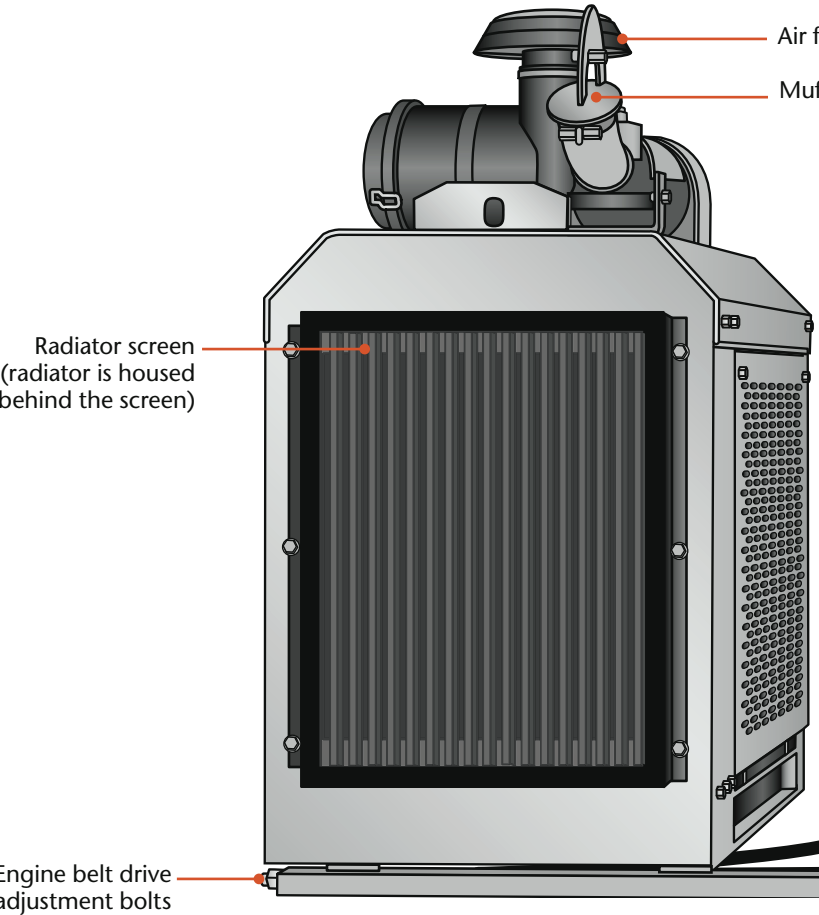


Engine

• • • Figure 3.15

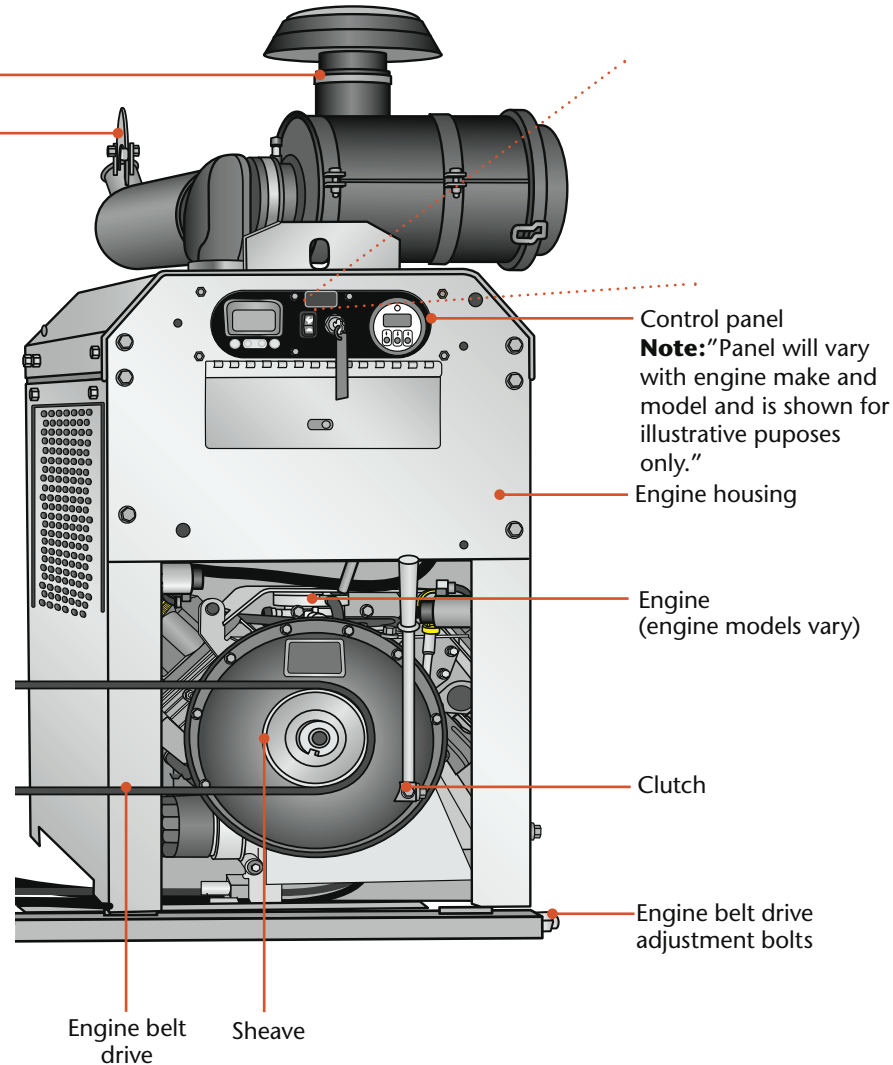
Left View

.....



Right View

.....



Typical Engine Configuration

Safety



WARNING!



Loose clothing, long hair, dangling jewelry may get entangled in moving parts and cause serious injury. Do not get near or wear loose items near moving parts.



The muffler becomes hot during operation. Contact with the muffler may cause burns.



Removing the radiator cap while the engine is hot can cause the coolant to spray out, seriously scalding you. Always let the engine cool down before removing the radiator cap.

NOTE

Follow the manufacturers recommended procedure when using starting aids in cold temperatures.

Use of plain water alone as a coolant will result in liner pitting and corrosion. Always have the proper mix of coolant. Artificially softened water should not be used in the radiator.

Moisture in the fuel system has an impact on engine performance and results in corrosion.

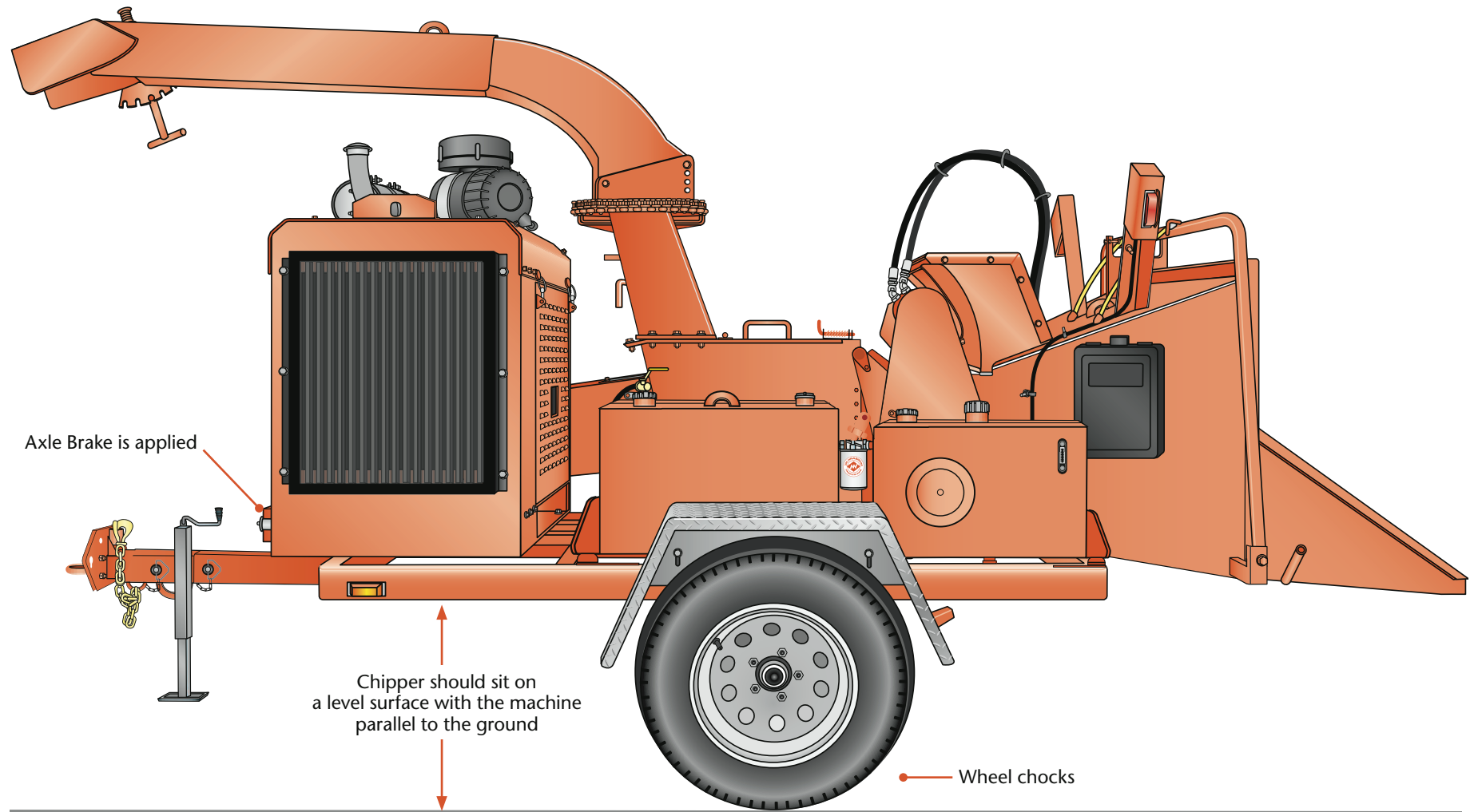
Function

The engine is the source of power for the machine.

The M14R chipper has many options for its engine. Consult the engine manufacturers manual for the safety, use and maintenance of your specific engine. The engine drive belt, sheaves, air filter and muffler will vary with each model. See the Parts section page for part numbers on the engines and their components.

Hitch, Chains and Jack

• • • Figure 3.16



Safety



DANGER!



Before operating always block the wheels, support the tongue and secure the chipper when not attached to a vehicle. Failure to do so will result in unexpected movement, serious injury or death.

Check your break-away system periodically to insure that wiring and connections are secure. A short or an open circuit will result in your brakes not working causing serious injury or death.

NOTE

To avoid frame damage; always tow machine with frame level, check axles, tires, hitch, tongue, rims, and safety chains for loose bolts, cracks, and damaged equipment before towing. Make the necessary adjustments to the hitch.

You must re-insert the pin on the break-away switch after use. Failure to do so may drain battery source potentially damaging the battery.

Function

The hitch and chains are used to secure the chipper to a towing vehicle during operation and towing. The tongue, located at the front of the frame, can be extended when being used with a towing vehicle to provide clearance. The jack is used to level and stabilize the chipper.

Use

The chipper can stand by itself with the support of the jack or it can be attached to a towing vehicle with the use of the hitch and chains. There are two styles of hitch: pintle or ball.

When the chipper is standing alone with jack support:

- The chipper must be placed on a level surface.
- Wheel chocks must be placed under both wheels to keep the chipper from moving and axle brake if equipped is applied.
- The chipper must be level or parallel with the ground.

When the chipper is attached to a towing vehicle:

- The towing vehicle must be capable of handling a minimum of 600 lb. tongue weight.
- Park the vehicle and the chipper on a level surface.
- During the chipping process the towing vehicle must have the parking brake on.
- There must NOT be a driver in the vehicle.
- Adjustments to the tongue should be made before attaching the chipper to the towing vehicle.
- The hitch must be properly secured to the vehicle with locking pins installed.
- Connect the safety chains and breakaway cables to the vehicle. The chains should be equal in length and shall be hooked through the hitch plate in such a way as to allow the operator to turn the vehicle and not drag the chains on the ground.
- Hook up electrical connections and check that tail lights and turn signals are in working order.
- The chipper must be level or parallel with the ground.
- Secure loose end of the actuator cable to the towing vehicle making sure the cable does not drag, has no strain or restriction, and the line is unobstructed of pull in the event of vehicle separation.

Maintenance

- Check tire pressure for proper inflation. You can find this information on the side of your tires.
- Before moving the chipper, check wheel rims for loose lugnuts.
- Clear the infeed of all debris before towing.
- Inspect the adjustable tongue for cracks around the bolt holes. If cracks or stress marks are present, replace immediately.

Hitch and Jack Options

Safety



WARNING!

A faulty hydraulic line or leak can result in your brakes not working. Check your breakaway system periodically to insure your brakes are in proper working order.

Function

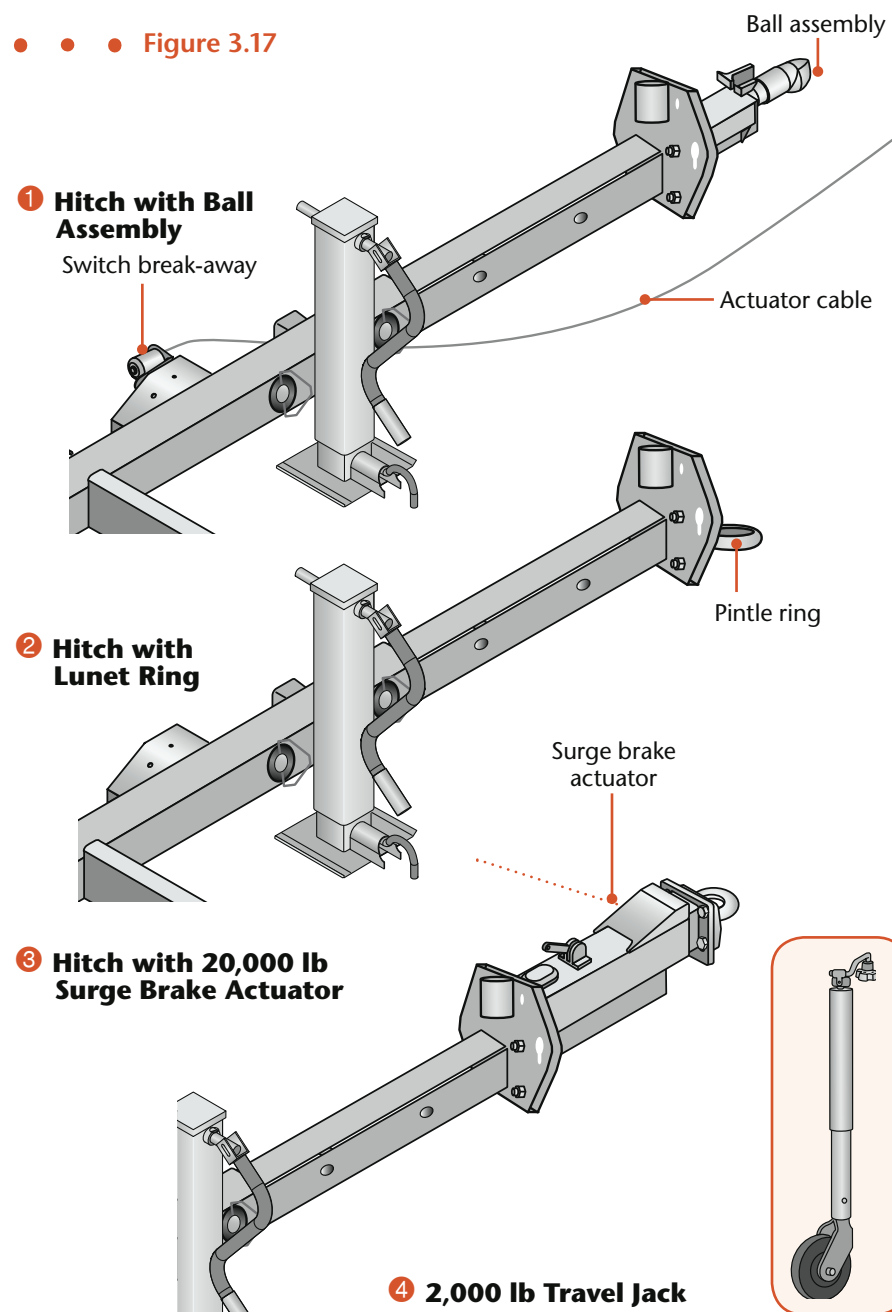
The hitch is used to couple the towing vehicle to the chipper. There are three options available:

1. **Hitch with Ball Assembly:** is used when the towing vehicle is equipped with a 2" diameter ball. It has a 7,000 lb load capacity.
2. **Hitch with Pintle Ring:** used for heavier loads, and when the towing vehicle is equipped with a pintle hitch.
3. **Hitch with 10,000 or 20,000 lb Surge Brake Actuator:** In the event that the towing vehicle becomes separated with the chipper, the chain on the hydraulic brake actuator will be pulled. This will pull the lever forward locking the hydraulic brakes on the axle.
4. **2,000 lb Travel Jack:** The jack is used to level the tongue. It has 13 1/2" of travel and has a 2,000 lb load capacity.

Use

Secure the loose end of the actuator cable/chain to the towing vehicle, making sure the cable/chain does not drag, has no strain or restrictions, and the cable/chain is unobstructed of pull in the event of vehicle separation.

• • • Figure 3.17



Battery



Safety

 WARNING!		
	The battery generates explosive gas during normal operation. Keep ignition sources away at all times.	
Battery acid can cause severe burns. Wear protective gear when handling the battery.		

NOTE

Charging the battery with cables connected can damage the machine's electronic system. Disconnect both cables before connecting the battery to a charger.

Function

The battery is the electrical power source for the machine. It is stored inside the metal battery box located on the tongue of the machine.

Use

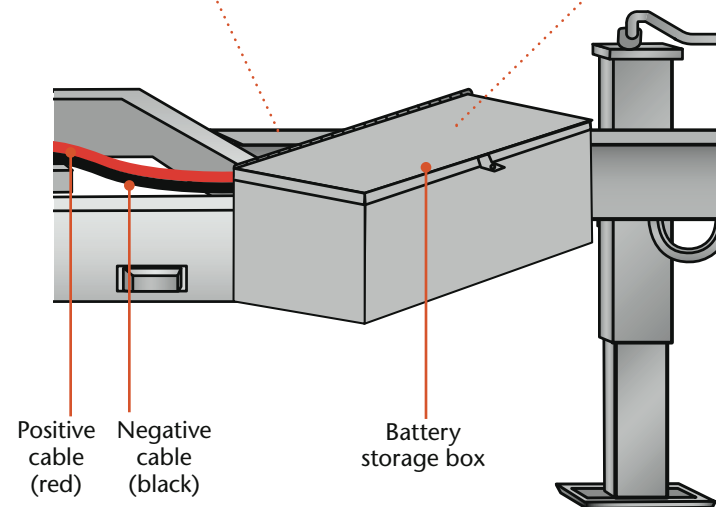
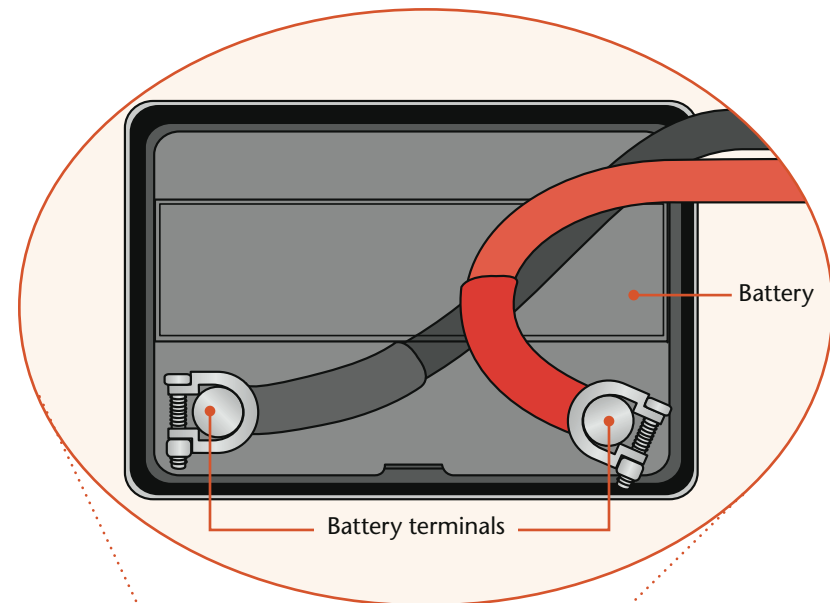
When handling the battery, make sure the engine is OFF. Access the battery by removing the lock at the side of the box, and open the lid. When connecting or disconnecting the cables, always handle the negative (-) terminal first.

After completing the connection, reconnect and tighten the cables to the terminals. Apply grease to the terminals to prevent corrosion. Close the battery box cover and lock.

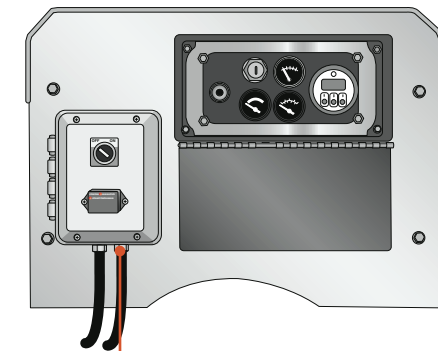
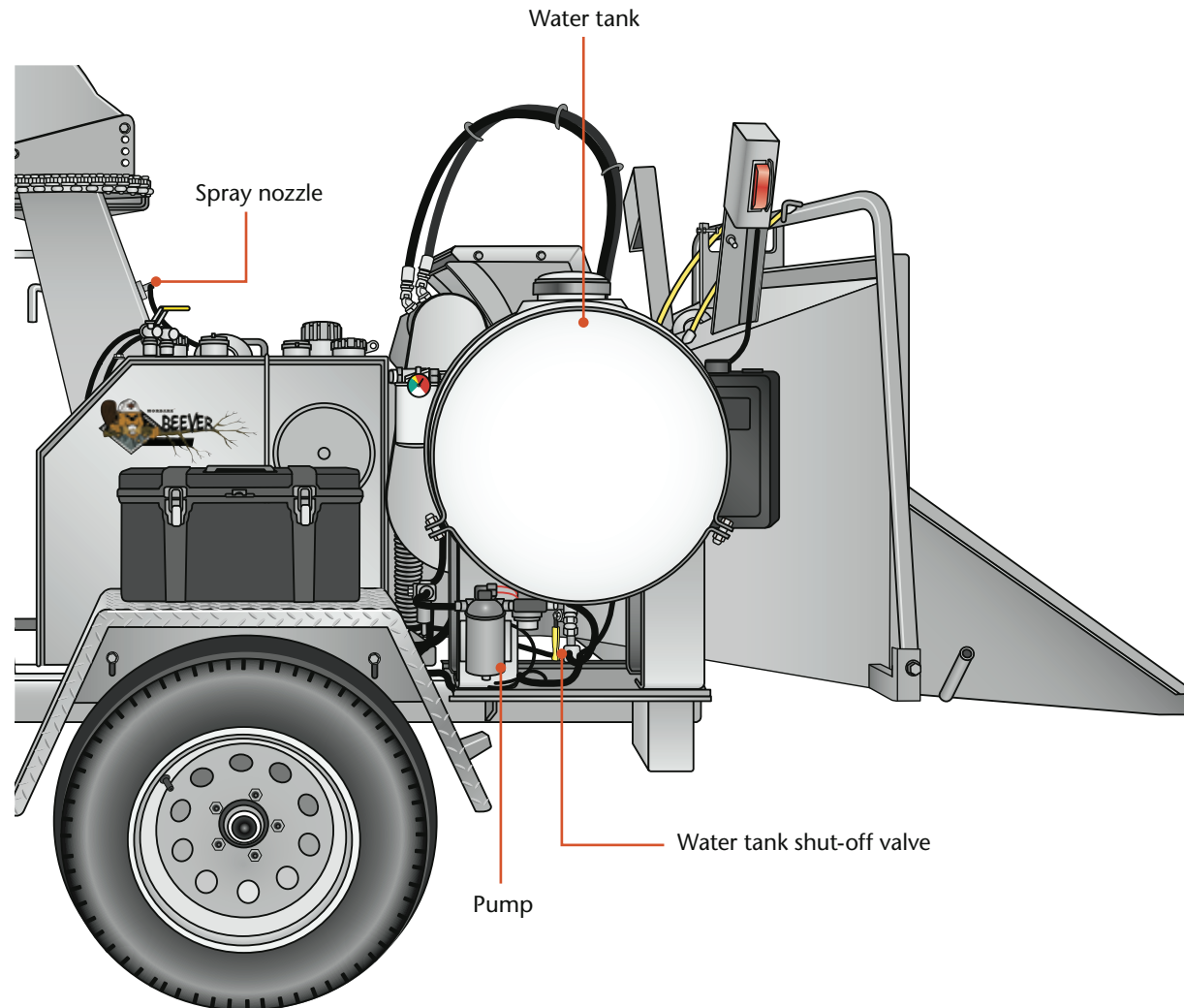
Maintenance

- Check the battery terminals for corrosion (white or yellowish powder).
- Remove corrosion by covering the terminals with a solution of baking soda and water. After the mixture bubbles and turns brown, wash it off with water. If there is severe corrosion, clean with a wire brush, and dry with a paper towel.

• • • Figure 3.18



● ● ● ● ● ● ● ● ● ● Figure 3.19



Dust suppression
control panel

Safety

NOTE

The dust suppression pump may overheat and burn-out. To avoid damage to the pump monitor the coolant level and add coolant when the Low Coolant light is ON.

Function

The dust suppression system applies a mist into the discharge chute and on airborne dust. The dust is then combined with the material stream and discharged.

Use

Follow these steps to use the dust suppression system:

1. Turn the switch located on the dust suppression control panel to ON.
2. Monitor the coolant level.

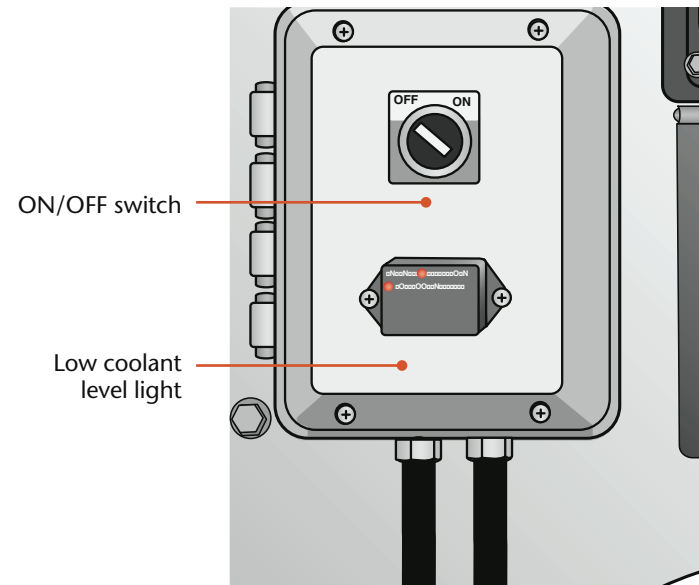
Note: A light on the coolant diagnostic box will indicate when the coolant level is to low. When the light is ON immediately shut the machine down and add coolant.

3. Turn the dust suppression system OFF when chipping is completed.

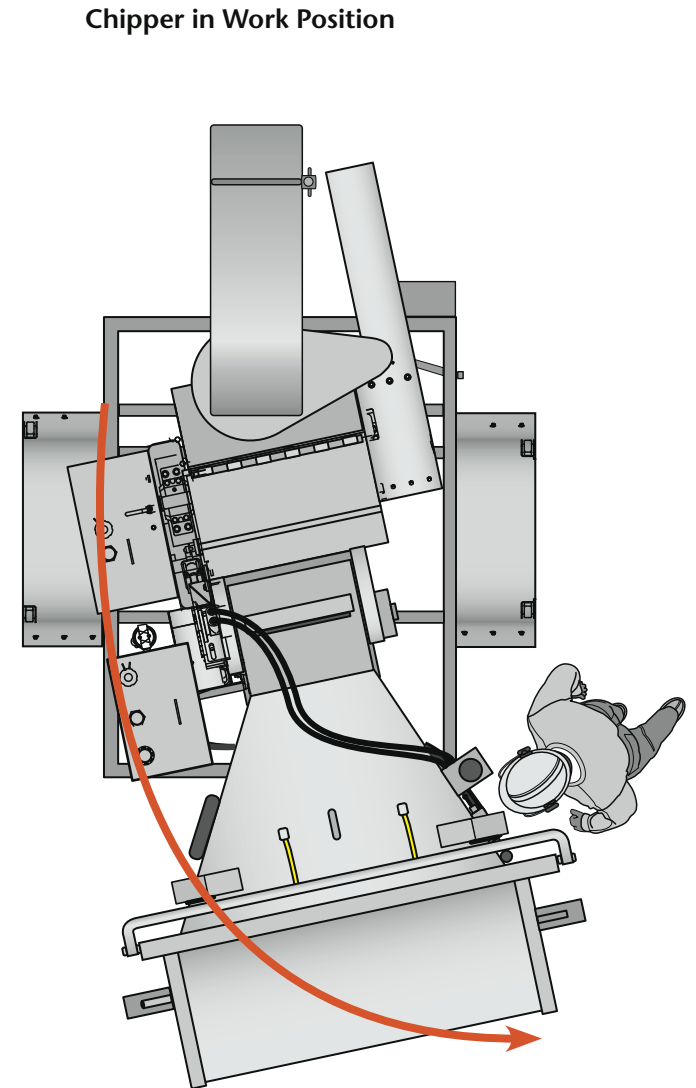
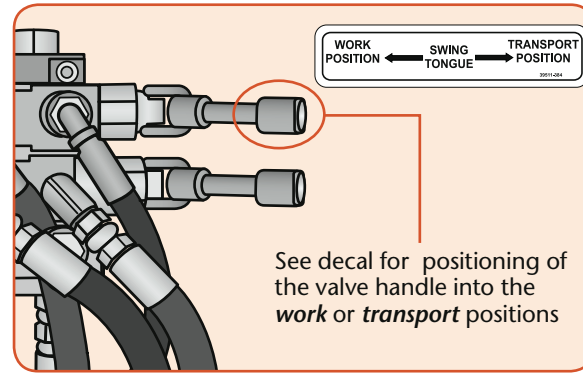
Maintenance

- Keep the water tank full.
- Add an appropriate amount of anti-freeze to the water when operating in cold conditions.

• • • Figure 3.20



● ● ● ● ● ● ● ● ● ● Figure 3.21



Safety



DANGER!



Contact with the swing tongue while it's in motion will cause serious injury or death. Do not stand or position yourself near the discharge chute during operation. Move spectators or bystanders away from the discharge chute.



Transporting the chipper when the discharge chute is not centered with the width of the machine will cause serious injury. Always center the discharge chute with the width of the machine before transporting.



Flying debris will cause serious injury or death. Never stand in front of the discharge chute. Direct discharge away from people and animals.



Conducting maintenance with the engine on will cause serious injury or death. Turn off the engine and lockout the machine before servicing.



CAUTION



Machine components may be hot or have sharp edges which could cause serious injury. Always wear protective gear during operation and maintenance.

Function

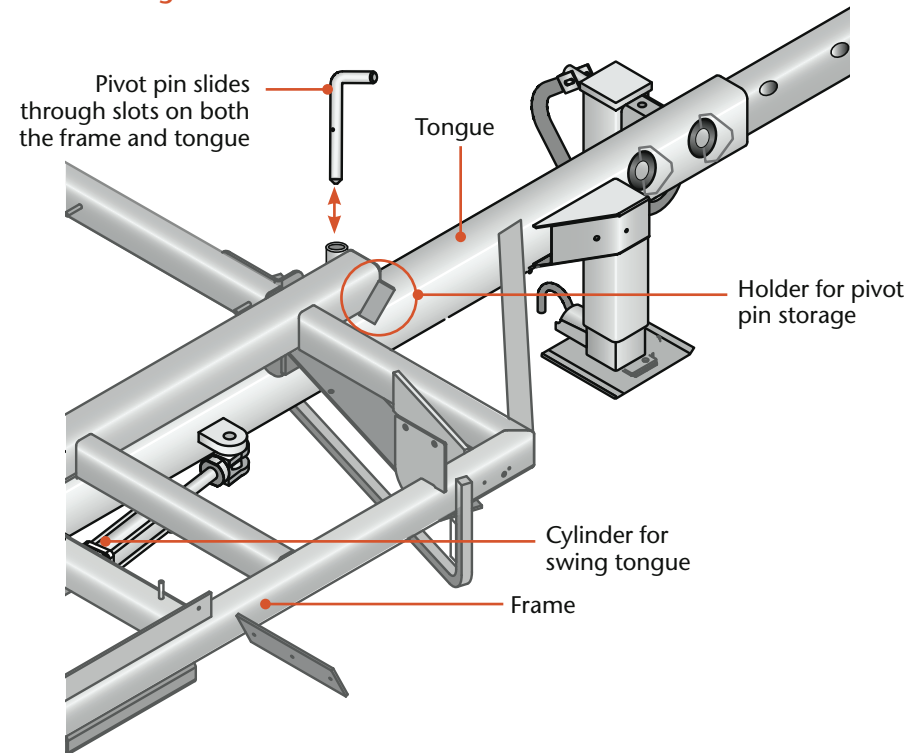
To rotate (or swing) the chipper for ease of use and safety in tight working conditions such as urban areas.

Use

To rotate the chipper:

1. Remove the pivot pin that joins the frame and tongue. This will allow the chipper to rotate from the transport position to the work position. Store the pivot pin in the holder on the tongue when not in use.

• • • Figure 3.22

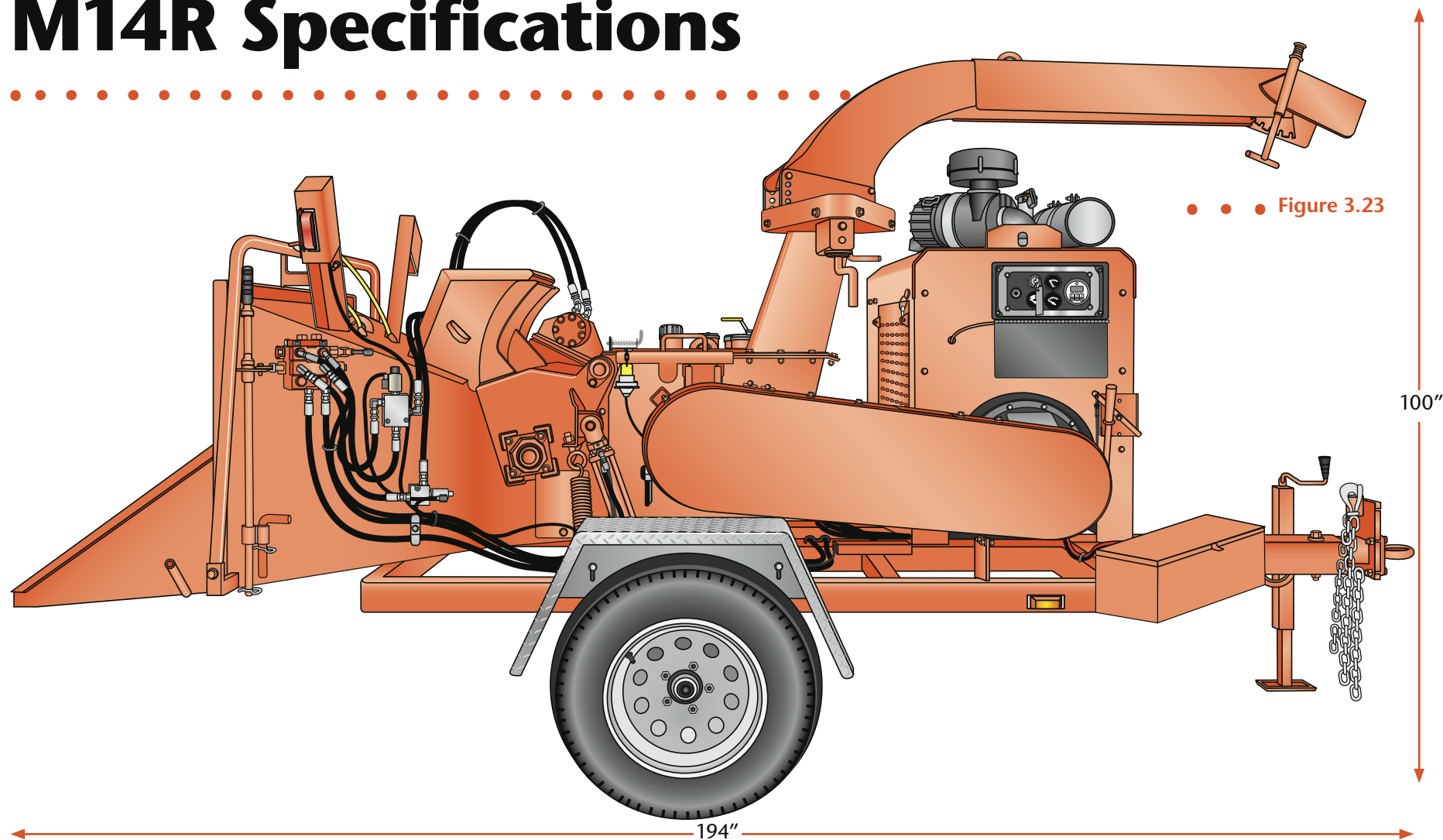


2. Rotate the chipper to the desired position by moving the hydraulic valve into the work position. Depending on your chipper model the positions of the handle may vary. Follow the directions on the decal next to the valve handle for specific handle positions.
3. Using the manual swivel crank (or the optional hydraulic swivel), adjust the direction of the discharge chute. Ideally, the chipped wood should be collected either in the back of the tow truck that is hitched to the chipper or a designated area that does not effect safe operation.

Maintenance

- Check tension and alignment of swing tongue at start-up.
- Ensure the discharge chute is free of any debris that may cause blockage before start-up.

M14R Specifications



General

Length 186 inches
 Transport Width 83 inches
 Transport Height 106 inches
 Gross Weight 6,050 lb.
 Electrical System 12 volt

Chipper

Drum diameter 20 inches
 Drum width 21 inches
 Knife length 10.5 inches
 Knife configuration 2
 Capacity 14 inch round wood

Tank Capacities

Diesel Fuel 31 gallon
 Hydraulic Fluid 14 gallon