Arborist Safety Program

Health and Safety for Arborists in North Carolina

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How to Use This Booklet

Keep this booklet on the job site at all times.

Booklets should be used for a one-year period. Request another copy prior to the twelfth month.

In the upper right hand corner of each page is a box with the words **daily, weekly, monthly, annually** or **continuously** in it. This tells you how often to review, discuss or post information discussed on that page.

Blank lines (_____) require written information such as company name or signatures and dates, etc. Record entries in ink.

You may photocopy materials in this book and keep this book as a master.

This booklet contains sample forms, sample policies and guidelines for maintaining safety records. Formats are suggested and can be modified by each operation. Use of this booklet and completion of suggested forms will assist with OSHA (Occupation Safety and Health Act) requirements as related to arborist operations. A list of agencies and contact information is included for additional information and consultation.

This booklet is not a safety manual with everything you will need. It is intended to be a record of activities and a source of useful information. Each company is encouraged to begin its own manual with detailed information to support information in this booklet. It may also be downloaded from the N.C. Department of Labor's website.

Comments on booklet use and suggested improvements should be directed to the N.C. Department of Labor, Education, Training and Technical Assistance Bureau, 1101 Mail Service Center, Raleigh, NC 27699-1101.

Special thanks to the N.C. Department of Labor, Occupational Safety and Health Division, for guidance in the technical review of this publication.

Potentially Dangerous Situations

Be alert for these situations AT ALL TIMES:

- Are workers wearing hard hats when exposed to overhead hazards?
- Are lodged or hung trees flagged and pulled down as soon as possible?
- Are workers a safe distance from trees being felled?
- Are workers a safe distance from moving equipment?
- Are workers wearing tight-fitting clothing while operating chippers?
- Are overhead power lines in the immediate work area?

Safety Checklist

General Operations

	YES	NO
Are all employees properly trained in the safest way to perform their jobs?	_____	_____
Are all employees in visual or audible contact with another employee?	_____	_____
Are all employees who are exposed to overhead hazards wearing hard hats?	_____	_____
Are all chain saw operators wearing all required personal protective equipment?	_____	_____
Is all equipment located a safe distance from other equipment and employees?	_____	_____
Are there adequate handholds and footing surfaces on equipment?	_____	_____

Felling Operations

Is a minimum safe distance being maintained between felling and closest employee?	_____	_____
Are all lodged and hung trees pulled down as soon as possible?	_____	_____
Are all chain saw safety devices present and operational?	_____	_____
Are overhead hazards checked before felling?	_____	_____
When manually felling, are high wind conditions being avoided?	_____	_____
Is a clear path of retreat for manual fellers being provided?	_____	_____
Are chain saws being used properly to prevent saw kickback?	_____	_____
Are manual felling cuts resulting in directional felling?	_____	_____
Is domino tree felling prohibited and are pusher trees being used?	_____	_____
Are the protective cab structure and guards on mechanical cutters in place?	_____	_____

Manual Limbing and Bucking

Is the work area clearly identified and is it free from random equipment movements?	_____	_____
Are limbers/buckers determining direction of limbing or log movement before cutting?	_____	_____
Are employees cutting and removing spring poles safely?	_____	_____
Are chain saws being controlled during cuts and travel between cuts?	_____	_____

Pre-Climbing Inspections

Are the ropes, safety lanyards, and climbing saddles being inspected for any defects?	_____	_____
Are only double-locking snap hooks being used?	_____	_____

Company Training Policy

How and when employees are trained:

How existing employees receive refresher training:

How training is documented (equipment, first aid, hazcom, hearing conservation, minimum safety rules, safety meetings, personal protective gear, emergency response, etc.):

Safety workshops or training courses (locations, personnel expected to attend):

What training materials are used (videos, handouts, checklists, etc.):

Time schedule for training new and existing employees:

Company Safety Policy

It is our policy to provide as safe a workplace as possible for all employees. Safety is the number one priority. Accidents and injuries are preventable.

Our policy includes the following:

1. A responsible employee in a position of authority will be appointed Safety Coordinator. _____ **(employee name)** has been appointed to fill this position.

2. Owners, supervisors, foremen and employees are responsible for implementing this policy by working in a safe manner.

3. Regularly scheduled safety meetings will be held with all employees.

4. All accidents will be reported and investigated, and actions will be taken to prevent reoccurrence.

5. All new employees will be trained in safe working practices for their particular jobs and closely supervised until they are fully capable of safe performance.

6. All employees are required to use personal protective equipment provided by this company or the employee and to keep the equipment in good condition.

7. Employees will report any and all accidents to their immediate supervisor.

8. All employees are expected to cooperate in keeping work areas clean and free of hazards. Employees will report any observed hazard to their immediate supervisor.

9. Each employee is required to keep a safe distance from other employees while moving equipment or other hazards.

10. Employees will operate equipment as instructed in a safe and reasonable manner.

Minimum Safety Requirements

1. **Immediately** report all accidents, no matter how slight, to your supervisor.

2. Any employee injured on the job or requiring medical attention must report the injury to his/her supervisor before seeking medical treatment. A medical emergency is defined as an open wound requiring stitches, loss of consciousness, or any injury involving broken bones. If you go to an Emergency Room or to a physician on your own, you may have to pay your own bill. The company has the right to refuse payment when you elect to use the services of a physician other than the company medical provider without first obtaining consent from the company.

3. Personal protective equipment such as hard hats, chaps, eye protection, ear protection, gloves, etc., will be provided and must be worn in designated areas at all times.

Designated areas where personal protective equipment is required are as follows:

_____

_____

_____

4. All workers must wear adequate footwear, preferably steel-toed shoes or high-top boots. Tennis shoes, platform shoes, sandals, etc., are not acceptable.

5. Use of alcohol and/or illegal drugs on the job, or the debilitating effects of their prior use, shall not be permitted and shall be grounds for immediate termination of employment.

6. Machine guards and/or protective shields, barricades, safety devices, etc., shall not be removed except by authorized personnel, such as mechanics, maintenance personnel, etc., and shall be reinstalled as soon as maintenance activities are completed.

7. Machine and equipment operators must ensure that all guards and shields are in place and in proper working conditions prior to beginning and during operations.

8. When attempting to “jump start” mobile equipment, employees must ensure that its running gear is in neutral, brakes are locked, head/blades and/or buckets are lowered, and no safety device designed to prevent machine movement is being by-passed.

9. **Horseplay** and running shall not be permitted on the premises, including all work areas inside and outside the buildings and in parking lots.

10. Use of seatbelts is required whenever roadway vehicles are being driven and when woods equipment with rollover cab protection is being operated.

11. If you are unfamiliar with an operation of a machine, do **not** use it. Check with your supervisor prior to proceeding.

12. **Immediately** report any unsafe condition to your supervisor, who is responsible for having the condition corrected prior to proceeding.

13. Before starting a cut, the employee cutting must alert all other employees and ensure that they are at a safe distance from the tree.

14. Workers must keep a minimum distance of at least one-tree length between themselves and mobile equipment and/or felling operations. At least 300 feet should be maintained between high-speed disc cutters on feller bunchers and any equipment or people.

15. Never leave a lodged or hung tree. Flag the area in which the lodged tree is located and get the hazardous tree to the ground immediately.

16. Employees working on the ground shall always be observant for overhead hazards, i.e., lodged trees, hung limbs, etc.

17. Employees cutting down trees shall have a clear path of retreat before beginning a cut to ensure that a line of escape is available.

18. Always plan the direction of fall of any tree being felled. Proper undercut must be made on all trees. Never cut a standing tree completely through. Sufficient wood should be left between the undercut and the felling cut, on which the tree can hinge, to prevent kickback.

19. Chain saw operators must always grip the saw firmly with both hands and never begin cuts with the upper tip of the chain saw blade; this action may create kickback.

20. To prevent being thrown or struck while logs or poles are being moved, employees shall position themselves to avoid standing between logs/wood sticks that may roll while being bucked or positioned themselves.

21. Loader operators shall never load log trucks more than ½ the height of the diameter of the outer logs over stationary standards. The load must be rounded in the middle to stabilize the load.

22. When in the immediate vicinity of a log truck, each employee shall constantly be aware of hazards and position him/herself in a manner, to ensure that he/she will not be struck by material falling from the truck.

23. All truck drivers must comply with all State and Federal laws, statutes, and regulations relating to highway safety such as speed limits, weight limits, driving time, stop signs, etc.

24. Each employee will be trained in, and required to use, proper lifting techniques and body mechanics. When confronted with lifting and/or moving any object for which the employee must exert more force than that required in the normal performance of his routine duties, he is either to seek the assistance of an adequate number of employees to lift and/or move the object in a safe manner, or to lift and/or move it by mechanical means.

NOTE: These safety rules have been developed for the protection of your safety and health. Abiding by these rules will make our operation more efficient and successful. Repeated violations of these safety rules will be grounds for termination of employment. The following actions will be taken for repeated violations:

First Offense: _____

Second Offense: _____

Third Offense: _____

Other disciplinary actions:

_____

_____

_____

I have read and understand the safety policy and minimum rules listed above and agree to comply with the company's safety requirements.

Employee Signature	**Date**

Company Drug and Alcohol Policy

In consideration for employment, I hereby agree to the following rules and regulations pertaining to illegal drugs, alcohol and legally prescribed medical drugs:

1. I agree to notify my employer of the need for me to take any prescription drug(s) that may impair the safe performance of my duties.

2. I agree not to operate any equipment or motor vehicle while taking a prescribed drug that may impair the safe performance of my duties.

3. I agree never to drink alcohol when operating employer owned or leased vehicles or equipment.

4. I agree never to use any illegal or controlled substance while employed.

5. I agree never to report for work under the influence of alcohol or illegal drugs. I will advise my supervisor upon reporting to work if I am taking medication prescribed by a doctor that may impair the safe performance of my duties.

6. I agree that if I am asked to take a test for illegal or controlled substance and refuse, it will constitute my immediate voluntary resignation.

7. I agree that if I violate any of the above rules and regulations, my employment will be terminated immediately.

Employee: _____ **Date:** _____

Witness: _____ **Date:** _____

This form may be used as a master; photocopies maybe made.
Signed forms should be kept with employee's personnel file.

Free On-Site Safety Consultation

Upon request, a consultant from NCDOL's Consultative Services Bureau can visit your work site to offer advice on reducing hazards and eliminating injuries. The consultant will evaluate your equipment and procedures and help you establish a work site safety program. The consultant will contact you directly to arrange a meeting after receiving your request. You are protected from a general compliance inspection while the consultant is working with you. The protection begins after the consultant arrives and begins working with you. Keep a copy of the request form on the job site until the consultative session begins. You may read more details about the process at the following website: www.nclabor.com/osha/consult/consult_steps.htm

Request for On-Site Safety Consultation for Arborist Operations (Please Print)

Company Name: _____

Contact Person: _____

Title: _____

Mailing Address: _____

Number of Employees _____

E-Mail Address: _____

Office Phone: _____ Cell Phone: _____

Mail to:

N.C. Department of Labor
Occupational Safety and Health Division
Consultative Services Bureau
1101 Mail Service Center
Raleigh, NC 27699-1101

Or fax: (919) 807-2902
Consultative Services Bureau

Or call: (919) 807-2899
Consultative Services Bureau
Give information requested above.

KEEP A COPY OF YOUR REQUEST ON THE JOB SITE.

What to Expect from an OSH Inspection

AN OSH INSPECTOR'S CREDENTIALS

When an OSH compliance officer arrives at the establishment or inspection site, he or she will display official credentials. The compliance officer will ask to meet with the employer or an appropriate employer representative. Employers should always ask to see the compliance officer's credentials.

OPENING CONFERENCE

In the opening conference, the compliance officer will explain how and why the establishment or site was selected for an inspection. The officer will instruct whether the inspection will be comprehensive or partial. The compliance officer will also request the following kind of information from the management representative:

- Company mailing address
- Contact names and telephone numbers
- Number of employees
- Accident and injury records (OSHA Form 300)
- Written safety and health programs
- Whether there are any trade secrets at the establishment or site

Trade secrets are treated confidentially. The employer will be asked to select an employer representative to accompany the compliance officer during the inspection. This selection process may include a bargaining agency representative, safety committee selection or employee selection.

THE INSPECTION PROCESS

The inspection tour will start at the beginning of the work process to the finished product. The compliance officer will observe safety and health conditions and practices, interview employees privately and make every effort to minimize any work interruptions. The compliance officer will take photographs and monitor employee exposures if necessary.

CLOSING CONFERENCE

At the conclusion of inspection, the compliance officer will conduct a closing conference with the employer and the employee representatives. A free discussion will take place of the alleged violations that were observed during the inspection. Additional safety and health problems and needs may be discussed.

The compliance officer will not indicate any specific proposed monetary penalties. Many factors influence that amount and will only be calculated after all of the facts of the case are established. The employer rights and responsibilities will be explained. The discussion will include the time line of what happens after the site visit. Good communication and contact with the compliance officer is encouraged until the case is closed.

Safety Meeting Topics

Frequent safety meetings are very useful. A short weekly meeting is recommended to keep safety topics in the minds of staff; however, a more lengthy and detailed meeting will be necessary for some areas. In the sample list below, topics with an asterisk (*) are included in the following pages. Other suggested topics are also listed and you should add additional topics specific for your company in the lines following the suggested list. Use the Safety Meeting Record form (on the next page) to document your meetings.

* * Personal Protective Equipment
* * Equipment Manuals and Operation
* * Lockout /Tagout Procedures (zero energy state)
* * Hazard Communication
* * Emergency Response Plan
* * First Aid
* * Bloodborne Pathogens
* * Hearing Conservation Program
* Driver Training/DOT Review (Class C)
* Bucket Truck Annual Certification
* Company Safety Policies
* Heat Stroke (Exhaustion)
* Fire Extinguisher Training

_____

_____

_____

_____

_____

_____

_____

_____

Safety Meeting Record

(Make copies of this page for use at every meeting and for good recordkeeping.)

Date: _____

Location: _____

Topic (s): _____

_____

Presented by: _____

_____

Brief outline of discussion**:**

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Signatures of employees:

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Personal Protective Equipment Requirements

The employer must document the hazard assessment and certify a written copy of that assessment in accordance with 1910.132(d). This short checklist is to assist the employer in beginning that process.

Check (✓) what is required:

Equipment	Chipper Operator	Bucket Truck Operator	Groundman	Climber
Hard Hat				
Eye Protection				
Climbing Gear				
Body Belt/Harness				
Hearing Protection				
Safety Shoes				
Saw Chaps				

I understand the above company requirements for proper use of personal protective equipment.

Employee Signature: **Date:**

Equipment Operation Manuals

Equipment operation manuals must be with each machine on the job site. Use them as training materials with each new employee before the new job begins. Review the manuals each year with all employees who will operate that specific piece of equipment.

Equipment	Operator(s)	Date of Review / Initial Training

Lockout/Tagout Policy

1. All arborist equipment, transport vehicles, and implements will have a lockout or tagout procedure to protect employees who are conducting service or maintenance. Actions will be based on procedures in the equipment operator's manual.

2. Equipment will be shut down and placed in a zero energy state (ZES) for areas on the equipment where work will be performed. Examples of energy include gravity (rolling down a hill, broken floor jack), hydraulic pressure (falling boom, falling blade), electrical (equipment switch-on, shock), chemical (ignited fuel can), and air pressure (changing tires).

3. Persons authorized to service and repair equipment must eliminate energy from the affected equipment and lockout or tagout the equipment to be sure that another person does not energize the equipment. Tags and locks should be readily available and all employees trained in their use. Locks are prevention tools and tags are warning tools.

4. No person is to remove or by-pass a tag or lock. Only the employee who placed the tag or lock may remove it.

I have read and understand the above policy on lockout and tagout and agree to follow the stated procedures.

Employee Signature:	**Date:**

Hazard Communication (HAZCOM) Program

This HAZCOM Program was developed to make employees aware of chemical hazards. Information is provided to employees about chemicals used on the job through the following a master list of chemical names, Material Safety Data Sheets (MSDS) kept on the job site in a booklet, proper labeling of containers, training for new employees, and annual reviews for all employees.

The HAZCOM Program Coordinator for this company is_____.
The Coordinator is responsible for overseeing the program.

Master Chemical List
A list of any hazardous materials used on our job sites is available at this location: _____. This list is updated as needed.

Job Site Chemical List
A list of common and frequently used hazardous materials is available at this location: _____. This list is kept with the MSDS file on the job site and has an MSDS for each chemical listed.

Material Safety Data Sheets (MSDS)
Information on hazardous materials found on the job site is available to any and all employees. The MSDS file is found on the job site at _____.

Container Labeling
Hazardous material containers will be clearly labeled as to: *contents, correct hazard warning* or *symbol, name and address of manufacturer.* Labeling is not required for portable containers intended for immediate use.

Training
New employees must attend a training session before working with hazardous materials. This training will cover:

- Information contained in MSDS
- Physical and health hazards for job site chemicals
- How presence or release of materials is detected
- How to protect against hazards by personal protective equipment, special handling, and other controls
- Emergency procedures in case of leaks, spills or reactions
- First aid procedures to follow if employees are exposed
- All employees must receive annual refresher training in above and immediate training if a new material is added or new hazard is determined.

- Supervisors must receive training adequate to answer employee questions and monitor job site hazards.

- Any outside contractor will be advised of any hazards existing on the job site, location of MSDS's and must provide proper labeling and MSDS for any chemical brought on the job site.

Additional information
Any employee can obtain additional information by contacting the designated HAZCOM Program Coordinator indicated above.

The HAZCOM Program above has been reviewed with me and I understand my rights and responsibilities:

Employee Signature: **Date:**

HAZCOM Materials Master List

An MSDS for each of the materials listed below is available at: _____

Chemical:	**Location**

This master list was prepared by and will be updated by:

Name: _____ **Title:** _____

Emergency Response Plan for Hazardous Materials

Most spills will involve fuel oil, motor oil or hydraulic oil. Only fuel oil is a "hazardous substance" by definition. The following actions will be used to handle leaks and spills and to prevent any environmental damage not related to employees handling hazardous substances:

PREPARING FOR A SPILL

Designated persons will be trained as a first response team. The training will include: how to contain spills, how to clean up spills, recognizing hazards in clean up, limits on ability to clean up.

REPORTING A SPILL

You must report any leak or spill to an immediate supervisor. The reporting sequence is as follows: **Employee → Supervisor → Company Owner → NC Emergency Management, 1-800-858-0368.**

Spills that threaten lives or have significant environmental threat must be reported immediately. If you cannot reach someone in the chain of command, then report directly to NC Emergency Management.

When talking to NC Emergency Management be sure to:

- provide good direction to the spill
- do not hang up until directed to do so
- record the name of the person to whom you spoke to and the time you talked with him/her
- write a brief report including calls made, public agency answers and responses, actions taken by you and other company employees

HANDLING A SPILL

If the material is listed as hazardous or you do not *know what* it is:

- do not attempt containment or clean up
- maintain a safe distance
- allow no one to enter the area, use flagging *if* necessary
- avoid large volumes of gasoline or other volatile substances
- call and wait for first response team

If the material is *known and not* hazardous:

- stop the release *if you* have been trained on operating/opening/closing the container, and
- fire and other dangers do not exist

The "First Response Team" of trained employees is:

_____
_____
_____
_____
_____
_____
_____

Spill cleanup tools and supplies consist of:

_____
_____

_____
_____
_____
_____
_____

and are located:

_____
_____
_____
_____

The following employees have reviewed this emergency response plan and understand their duties.

Employee Signature:	**Date:**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

First Aid Training Record

The following employees have completed the indicated training. Photocopies of signed certification cards are on file at this location: _____.

COMPLETION DATES

Employee Signature	First Aid	CPR	Bloodborne Pathogens

First Aid Kit Contents

First aid kits must be available on each job site and in transport vehicles.

Large Kits - Located on job site at _____

The first aid kit contents listed below should be adequate for small work sites, consisting of approximately two or three employees. When larger operations or multiple operations are being conducted at the same location, additional first aid kits should be provided at the work site or additional quantities of supplies should be included in the first aid kits. The contents include the following:

- Gauze pads (at least 4x4 inches)
- Two large gauze pads (at least 8x10 inches)
- Box of adhesive bandages (“Band-Aids”)
- One package gauze roller bandage at least 2 inches wide
- Two triangular bandages
- Wound cleaning agent such as sealed moistened towelettes
- Scissors
- At least one blanket
- Tweezers
- Adhesive Tape
- Latex gloves
- Resuscitation equipment such as resuscitation bag, airway or pocket mask
- Two elastic wraps
- Splint
- Directions for requesting emergency assistance

Compact Kits - carried by each chain saw operator working away from the primary work site.

Compact kits, at a minimum, should contain:

- Wound compress
- Latex gloves
- Assorted of adhesive bandages (“Band-Aids”)
- Antiseptic swipes
- Items should be packaged to remain clean and dry.

Bloodborne Pathogen Exposure Control Plan

This plan has been developed to minimize and prevent exposure of employees to disease-causing microorganisms in human blood. All employees who could be exposed to blood or infectious materials are involved in this program. The OSHA Bloodborne Pathogens Standard applies to those persons who are first aid trained and those who would be exposed while not in a first aid capacity. If any arboriculture employees are designated first aid providers, they would be covered by the bloodborne standard.

BLOODBORNE PATHOGENS

The standard covers those agents, primarily viruses, present in human blood, semen, vaginal secretions, internal body fluids, and any body fluid contaminated with blood. Urine, feces, and vomit are not considered infectious unless contaminated with blood. HIV (Human Immunodeficiency Virus) and HBV (Hepatitis B Virus) are the two pathogens that come to mind for many people when discussing this standard; however, any bloodborne pathogen is covered by this standard. Other examples include, but are not limited to, the following: syphilis, malaria, babesiosis, brucellosis, leptospirosis, arboviral infections (especially Colorado tick fever), relapsing fever, Creutzfeldt-Jakob disease, human T-lymphotropic virus type I, and viral hemorrhagic fever.

HAZARDS

The covered pathogens can be spread in the workplace by any contact with blood such as an open wound (scratch or cut), contact with mucous membranes (mouth, eyes, and nose), being stuck with a used hypodermic needle (diabetic use), etc.

Clothing and other materials can become contaminated and can be sites for infection. An employee can be exposed by using improperly cleaned equipment where blood and body fluids are present. Touching and removing blood soaked clothing or bandages can also lead to infection. Someone away from the job can also be affected such as a spouse or garbage collector who comes in contact with the contaminated material.

PREVENTION

Protective Equipment: protective items must be used during administration of first aid or CPR (disposal rubber gloves, eye protection, and mouthpiece or airway device). These must be readily available on the job site.

Handling: once used, rubber gloves must be disposed of. Employees must wash their hands immediately after removal of disposable gloves. Equipment in contact with blood or body fluids must be washed immediately with soap and water.

Clothing and Articles: personal clothing and equipment must be cleaned, laundered, disposed of or replaced if contaminated. The employer supervises the disposal. Consider calling the local Health Board or other medical authorities. Sharp objects must be placed in puncture-proof bags.

Housekeeping: All equipment and work areas exposed to blood or other body fluids must be cleaned with a disinfectant. All tarps and protective covers should be cleaned or replaced if contaminated. Eating, drinking, smoking, and applying contact lens are prohibited in work areas where there is a possibility of contact with human blood or body fluids.

Hepatitis B Vaccinations: Any person who has had an occupational exposure has the right to request a series of three injections. The arborist may arrange for the three injections over a six-month period prior to exposure or offer this series within 24 hours of a first time exposure. The employee, normally a first-aider, is not required to take the vaccination. If he/she declines, then sign a form stating the decision.

After Exposure and the Follow-up: The employee reports the exposure immediately to his supervisor. The supervisor writes down the method of exposure and details of the incident. Personal data such as identification can be included in the medical file. Blood from the victim and exposed person must be collected and tested. Medically indicated treatment to prevent disease will be given to the employee. Counseling of the employee regarding results of the finding and documentation from the health care provider will be given to the employee. A record of illnesses of the employee after the incident shall be documented for one (1) year by the employer.

BBP Training

Annual training is required for employees covered by the Bloodborne Pathogens Standard. Names of attendees and the names of certified individuals will be documented. 1910.1030(g)(2) contains detailed requirements for the training and trainer. It is recommended that this be done in conjunction with first aid/CPR training.

Employee Signature:	**Date:**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
trainer: _____	_____

RECORDKEEPING

- Employee illnesses for one (1) year after exposure
- Training records for three (3) years
- Employee medical records for thirty (30) years after leaving employment

Hearing Conservation Program

Protecting the hearing of employees is a priority. This operation will take the following steps to help prevent hearing loss:

1. All employees will wear hearing protection in areas where noise levels are above 85 decibels.

2. Noise levels can be expected to be in the following ranges at full power:
   - Chain saws (105-110 decibels)
   - Chipper (100-105 decibels)
   - Stump grinder (100-105 decibels)

An annual noise level check, listed previously, should be made to identify high noise areas.

3. Employee training will be conducted for those exposed to noise above 85 decibels. This will include:
   - A safety meeting on hearing conservation
   - A discussion on proper types of protection
   - Being told to wear hearing protection
   - Documentation on a safety meeting record form

4. Employees exposed to noise over 85 decibels will wear one of the following approved types of protection:
   - Moldable inserts
   - Earmuffs attached to hardhats
   - Earmuffs attached to headband

Hearing Conservation Overview

Hearing loss can happen slowly over a period of time, or it can happen instantly with exposure to a loud, sudden noise. Either way, it can affect you as an employer.

If your employees work in conditions where they have to shout to be heard, your company probably falls where OSHA guidelines governing to hearing conservation. The allowable noise exposure for employees has been 85 decibels per eight-hour period since 1983. The noise levels associated with most machinery used in arboriculture activities ranges from 85-110 decibels. If you have such noise levels, you must have a hearing conservation program in place. You might say. “I provide hearing protection, isn't that enough?” Not according to OSHA. A complete hearing conservation program consists of five areas: (1) Sound level measurements, (2) Audiometric testing and evaluation, (3) Hearing protection, (4) Education, (5) Recordkeeping.

Sound Level Measurements: You have to know how loud your equipment is to know if you should have a program. These measurements determine what type of hearing protection your employees should use. They also help determine who should be included in the program. Many insurance companies will measure your sound levels free of charge. The N.C. Department of Labor’s Consultative Services Bureau may also be able to measure noise levels for small businesses (see page 11). You can also take your own sound level measurements if you have a calibrated sound level meter. Most industrial audiometric companies can explain how to do this. Some companies may allow you to borrow a sound level meter. These options can save your company money; however, certain criteria must be met.

Audiometric Testing: Hearing tests are conducted at least once each year. The first test is called the baseline test. This determines the employees' hearing thresholds (the level at which they can just hear a tone presented at each frequency). Each year thereafter, an annual test is conducted. The results are compared to the baseline to measure any changes in hearing. An audiologist or medical professional makes appropriate recommendations such as a change in hearing protection, ensuring employees are wearing their protection correctly, and medical referral. If there is a significant change at certain frequencies, known as a Standard Threshold Shift (STS), the employee and STS are recorded on the OSHA-300 and 301 forms.

Hearing Protection: Employees should be provided with adequate hearing protection. This can be formable, disposable earplugs, hard rubber plugs, earmuffs, customized hearing protection, etc. There are a variety of different options. It is not enough, however, just to provide hearing protection. As an employer, it's also your responsibility to make sure that the hearing protection is worn and that it's worn correctly. Hearing protection should be treated just like any other protective devices. How do you handle an employee who does not wear safety glasses or an employee who does not wear safety boots?

Education: Education is one of the most important aspects of the hearing conservation program. OSHA requires that specific topics be covered in safety sessions, which must be conducted each year. Employees are much more likely to wear their hearing protection if they see how it can protect them.

Recordkeeping: When OSHA inspectors come into the workplace, one of the first things they ask for is documentation. Written documentation proves that testing and training were conducted. You should keep all employee test results, sound level measurements and records of educational sessions (who attended, topics covered). It is not only important to have a hearing conservation program to avoid OSHA citations, but also to protect the health and well-being of your employees. Hearing loss is painless, progressive, permanent and preventable!

Job Safety, Health and Associated Posters

POSTER	ID NUMBER	CONTACT
OSHA 300	NONE	http://www.nclabor.com/pubs.htm#Forms
State OSH Poster Requirements: - Safety and Health on the Job - Wage and Hour Act - Workers' Compensation Notice - Unemployment Insurance	NONE	ETTA N.C. Department of Labor 1101 Mail Service Center Raleigh, NC 27699-1101 Phone: (919) 807-2875
Equal Employment Opportunity (Federal)	O-383-798	EEOC 1309 Annapolis Drive Raleigh, NC 27608-2129 1-800-669-3362
Minimum Wage Standards Polygraph Protection Act Family and Medical Leave Act	WH-1462	U.S. Department of Labor Wage and Hour Division 4407 Bland Rd, Suite 260 Raleigh, NC 27609 (919) 790-2741
Noise Exposure	1910.95	www.osha.gov/SLTC/noisehearingconservation

These posters are to be displayed in prominent locations for all employees to see.

Safe Behavior Observations

Safe behavior observations are simple notes on how an employee is observed working. Work behavior is the key to eliminating accidents because it involves all aspects of equipment, job site terrain, weather, and human behavior and decisions. Potential hazards should be identified for major job activities using supervisor and crew input. Write in how to avoid these hazards on the forms. Later, observations should be made by a supervisor or another employee and the results shared with the employee observed. Points of interest should also be shared at crew safety meetings.

The following Safe Behavior Observation form is suggested for the following jobs or work sites:

- Chain saw operation
- Shop area
- Chipper operation
- Stump grinder operation
- Bucket truck operation

An example behavior observation has been provided on chain saw operation. That is followed by a blank form for you to copy and use on your job site.

Safe Behavior Observations (Example)

Job: Chain Saw Operation

Behavior: Inspect chain saw before use for proper chain tension, good repair, loose bolts and screws, levels of fuel and chain lubricant, filter condition and that all safety features work. Wear necessary personal protective gear. Start saw from a stable surface clear of debris and combustible material. Position body properly and pull starter rope after setting chain brake, turning on switch, and positioning choke. Once started, release trigger and be sure chain does not move in idle with brake off. Never carry saw unless chain brake is on or engine off. Keep blade pointed to the rear when transporting. Inspect work area for hazards and plan an escape route before cutting. Keep chain teeth sharp. Control saw at all times. Proper open-faced cuts and back cuts practiced to directionally fell trees. Limbing and topping done to prevent turning or rolling of logs. Take rest breaks when necessary. Allow saw time to cool before refueling or adding lubricant.

Observations (check)	Safe	Unsafe	Comment
1. Chain saw inspection	✓		
2. Saw started properly	✓		
3. Inspection of starting site and cutting area	✓		
4. Proper carrying technique		✓	
5. Inspection of work area	✓		
6. Escape route planned	✓		
7. Saw in control at all times	✓		
8. Proper open-faced cuts and back cuts	✓		
9. Logs stable when limbing and topping	✓		
10. Adequate work breaks taken	✓		
11. Saw secured when climbing/blocking	✓		

Total Observations Safe: **10**

Total Observations Unsafe: **1**

% Safe Observations: **91**

By: supervisor Date: _____

Safe Behavior Observations

Job: _____

Behavior

_____

_____

_____

_____

_____

_____

Observations (check)	**Safe**	**Unsafe**	**Comment**

Total Observations Safe: _____

Total Observations Unsafe: _____

% Safe Observations: _____

By: _____ Date: _____

Contact Information and Telephone Numbers

ISA Technical Resources Champaign, IL	(217) 355-9411
Southern Chapter of ISA Fax:	(336) 789-4747 (336) 789-0202
Sherrill Inc Arborist Supply	(800) 525-8873
N.C. Division of Forest Resources Raleigh, NC	(919) 733-2162
N.C. Department of Labor (General Information) Raleigh, NC	1-800-625-2267 or (919) 807-2796
N.C. Cooperative Extensions Raleigh, NC	(919) 515-5581 or (919) 515-5637
N.C. Emergency Management	1-800-858-0368 or (919) 733-3300
TCIA (Tree Care Industry Association) Londonderry, NH 03053	(800)733-2622
Your Company's Insurance Agent	
_____	_____

Other Important Numbers:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Directions to and Phone Numbers for Local Hospitals

Rescue squad phone number(s):

Area _____ Phone _____

Area _____ Phone _____

Area _____ Phone _____

Hospital(s):

City/County _____ Phone _____

City/County _____ Phone _____

City/County _____ Phone _____

City/County _____ Phone _____

If rescue squad/emergency responders are not in the immediate area, sketch of nearby roads leading to nearest hospital (new for each work site):

If in remote area, nearest helicopter landing area, (including latitude/longitude if available) in case an injured worker has to be removed from work site:

APPENDIXES

Each piece of equipment will have an owner's manual. The manual will contain important detail on the operation and maintenance. Safe work practices will also be included and must be followed. The manual will have part identification and inspection suggestions or requirement. The following appendixes are extracts from operator's manuals and are not complete. The extracts are examples only and are not intended to replace any operator's manuals or regulatory requirements.

Appendix A **Chain Saws and Tree Felling**

Appendix B **Chippers**

Appendix C **Line Clearance Checklist**

Appendix A

Chain Saw Operation

Safely starting the chain saw requires two points of contact. Any method that uses the chain brake and ensures that the saw is secured by TWO POINTS OF CONTACT is acceptable. We (ISA and OSH) recommend either of the methods illustrated below. "Two points of contact" means that the saw is securely held at two points while one hand is used to pull the starting cord.

For example, in the photo on the left, the operator's left hand holds the saw for one point of contact, while the saw is held between the operator's legs for the second point of contact. In the photo on the right, the operator's left hand holds the saw for one point of contact, while his right foot securely holds the saw on the ground for the second point of contact.

Chain Filing

Smooth and efficient cutting of the saw requires a properly sharpened chain. Many chain saw operators tend to reduce the height of the rakers in an attempt to “take a bigger bite”.

Dull chains reduce cutting speed and increase the chance of injury to the operator. To properly file a saw, it is important to understand the function of each of the elements of the chain.

The following is a brief description of the functions of the saw chain teeth:

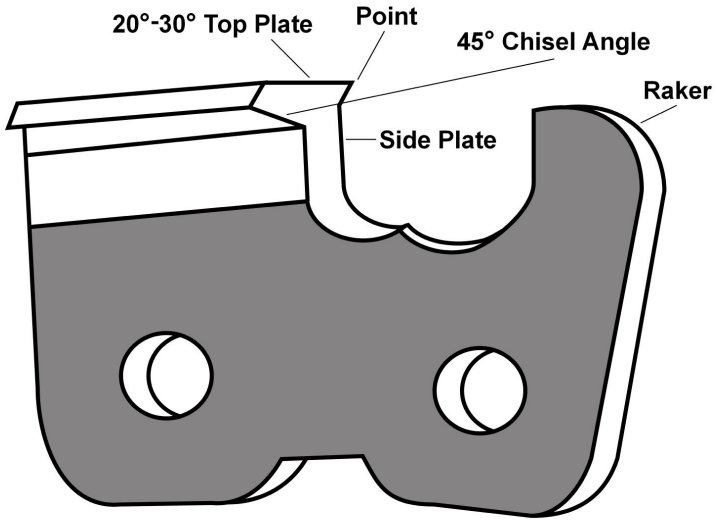
1. **Raker (sometimes referred to as a Depth Gage)** – The raker determines the thickness of the chip, which should be 20 to 30/1000 of an inch depending on whether you are cutting hard wood or soft wood. A raker depth gage is the best tool to use to get the proper height of the raker and can be purchased at local chain saw stores.

2. **Working Corner or Point** – This is the point formed by the intersection of the side and top plates. This is where the cut begins.

3. **Side Plate** – The side plate cuts off the fiber. The side plate should lean forward approximately 5-degrees. Making this angle too great will cause the tooth to be sucked into the wood, creating a kickback danger. Many chain saw operators have a tendency to create a hook on the side plate. This is very dangerous and inefficient.

4. **Top Plate** – The top plate angle establishes the width of the saw Kerf. The angle causes the tooth to be pushed to the side. The greater the angle the more wood needs to be cut. Current models of saws need a top plate angle of 20 to 30 degrees.

5. **Chisel Angle** – The chisel angle is beneath the top plate, and allows chips to slide underneath the tooth. This angle should be 45 to 55 degrees.

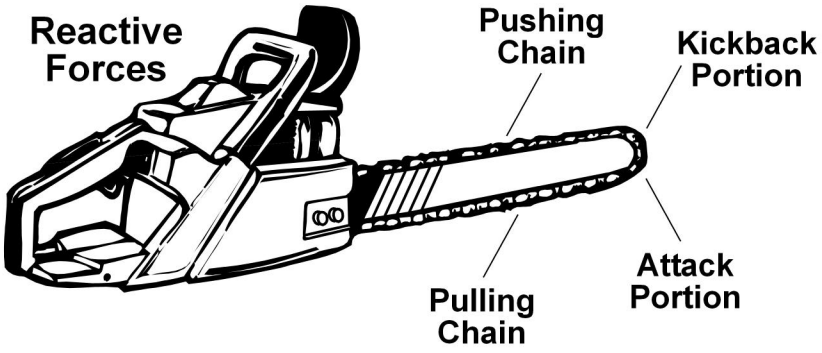


Reactive Forces and Stance

It is very important that a chain saw operator understands the reactive forces upon the saw and know the proper stances to counteract these reactive forces. The illustration below shows the areas of the bar and the associated reactive forces. When cutting with the *top of the bar*, the saw will **push back** toward the operator. When cutting with the *bottom of the bar,* the saw will **pull away** from the operator. The *top quarter of the bar tip* is the **kickback area** and should never be allowed to make the initial contact with the wood or any other object in the cutting area. The *bottom quarter of the bar tip,* called the **attack portion,** will be used to make the initial contact when making a bore cut.

Knowing the reactive forces upon a saw allows the operator to use a stance that will counteract the forces and maintain good balance. A proper stance consists of standing with the feet slightly apart, one foot ahead of the other, and the knees bent. Whenever possible, brace the right arm or elbow against your leg for extra support. See the photograph below.

Operators who use a saw only occasionally will likely tire quicker than an operator who uses a saw every day. If your arms and legs begin to tire and weaken, stop and rest. ***Remember, fatigue is the primary cause of chain saw accidents.***



Felling Hazards

When a tree falls, it often brushes against other trees and leaves broken live or dead limbs hanging in surrounding trees. Sometimes falling trees will shoot off a stump and roll sideways or ahead creating pressures on tree limbs. Chain saw operators should **never limb a tree immediately after felling.** Consider dropping several trees and refueling the saw prior to limbing. This will provide ample time for overhead hazards to fall or stabilize.

Prior to limbing, chain saw operators should evaluate the following five potential hazards:

1. Overhead hazards.
2. Spring poles.
3. Butt movement forward (creates back pressure on limbs).
4. Butt twist (creates sideways pressure on limbs).
5. Butt off the ground (creates tension on the tree stem).

Limb Lock: Back and sideways pressure on limbs can be handled using a limb lock.

If limbs have backpressure on them, they can severely injure an operator when they are severed from the tree. In these circumstances, use a limb lock as a precaution. A limb lock will prevent a limb under pressure from kicking back and striking the leg or pinching the saw. The first cut is made on either the top side or bottom side of the limb (top and bottom refer to top and bottom of the limb as if the tree were standing up). It is preferable to make the first cut on the side with compression pressure, and then make a second cut on the side with stress.

The cut on the top of the limb is made closer to the trunk of the tree; the cut on the bottom is made further out on the limb. It is important that the two cuts by-pass so that all fiber is severed. This will create a step in the limb which will prevent the limb from kicking back and hitting the operator. This is similar to the way in which a raised back cut prevents the butt of a tree from kicking back over the stump.

Top Lock: Twisting of trees and butts off the ground creates pressure on the stem that can be handled with a top lock.

If the tree stem is under stress, a top lock can be used to prevent the top from kicking up and striking the operator. The first cut of a top lock is made on the side of the tree that is under compression, in the top or bottom of the stem. The second cut is made on the side of the tree, which is under tension. This prevents pinching the saw. The top cut is always made closer to the top of the tree and the bottom cut is made closer to the bottom of the tree (the reverse order of the limb lock). Both cuts must by-pass so that all fiber is severed.

Tongue and Groove: Dangers of a tree or portion of a tree rolling on the operator can be handled with a tongue and groove. To make a tongue and groove, bore the stem of the tree in the center, then make the up and down cuts closer to the top or butt of the tree, so that each of them bypasses the bore cut, but do not meet. With all fibers severed, the tongue and groove will prevent the tree from rolling.

Small Tree Felling

Chain saw operators may assume that small trees are not worth the extra effort of direction felling. However, a small tree that falls the wrong way, or hangs up, can be very costly to pull down.

If felled in the wrong way, even small brushy trees that are cleared as part of housekeeping chores around the base of the tree, or for an escape route, can create additional production problems. For example, a small sapling that is being removed from the base of one tree can fall into the next tree requiring the operator to cut the tree a second time when doing housekeeping around the second tree. Therefore, the extra seconds taken to directionally fell a small sapling can save time later.

Directionally felling saplings: It is difficult to put a regular notch in a small sapling, since it is easy to cut right through the tree. Creating a tab by making a downward cut through the last few years of growth will make an acceptable notch. A back cut, leaving a hinge, will cause this tree to fall in the direction of the initial undercut. It is important for the operator to use the Sight Line on the saw to make sure this sapling falls in the intended direction.

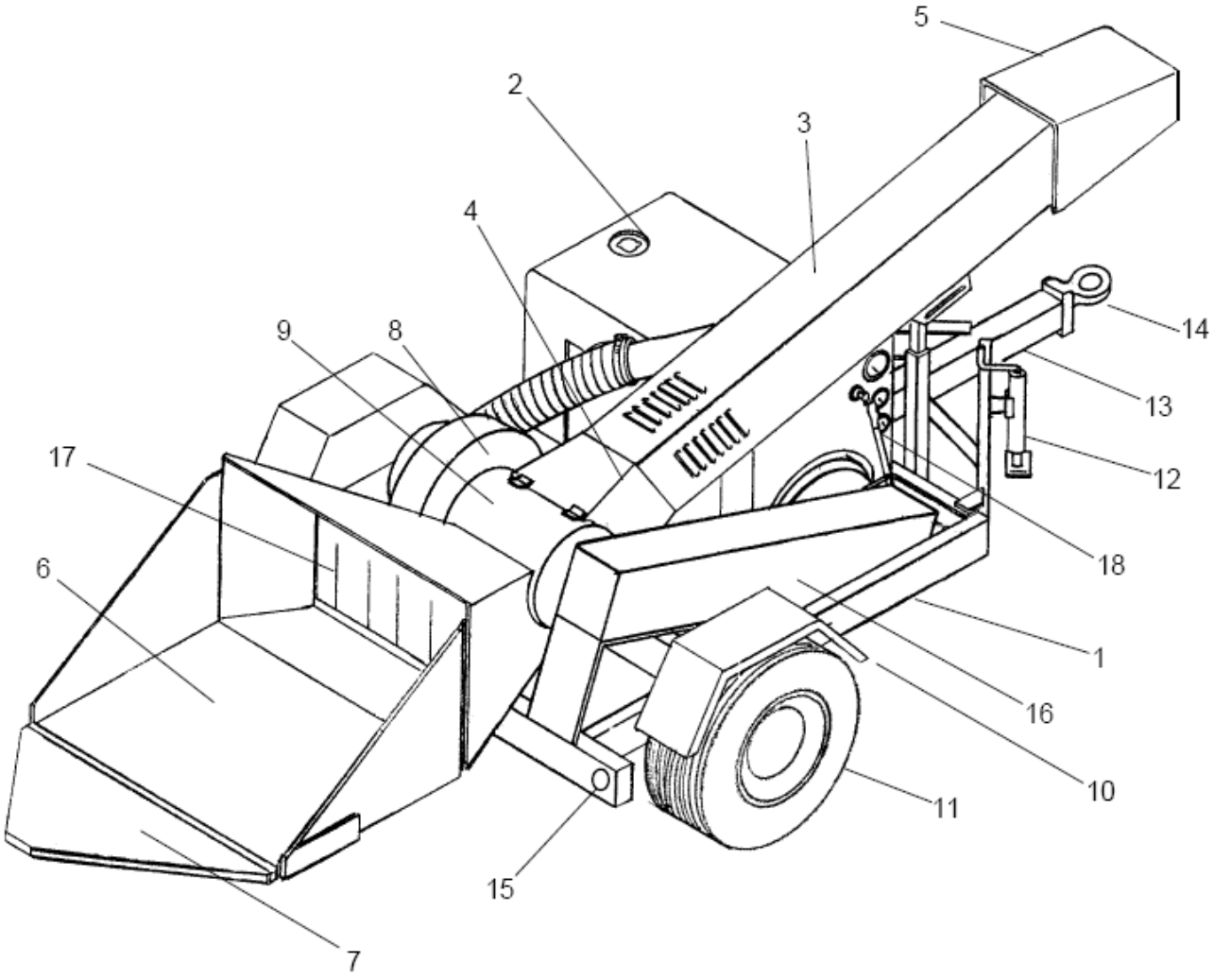
Spring Poles

Spring poles may also be released from underneath. To do this the operator should stand at 45 degrees to the rear of the spring pole and use the chain saw to shave wood off the underside of the spring pole at the maximum point of tension. Do not cut into the spring pole because the compression of the wood will pinch the saw. After enough wood is shaved the fibers will begin to break by themselves and the operator can stand aside and let the spring pole release its tension naturally.

If the point of maximum tension on the spring pole is higher than the shoulders of the chain saw operator, then the spring pole should be released from the top. The operator can stand under the spring pole. Trim any branches that may be in the way and then release the spring pole by cutting off the top. The spring pole should fly harmlessly above the operator and not cause injury.

Appendix B

CHIPPERS



1. Trailer
2. Engine
3. Discharge Chute
4. Discharge Transition
5. Discharge Bonnet
6. Folding Feed Table
7. Operator Guide
8. Blower and Flywheel Housing
9. Rotor and Blades Housing
10. Fender
11. Tires
12. Jack
13. Drawbar
14. Towing Eye
15. Lights
16. Belt Guard
17. Rubber Shroud
18. Clutch Lever
19. Engine Controls

CHIPPER REQUIREMENTS

ALL personnel using a chipper ***MUST*** be trained and qualified in all aspects of the operations, maintenance, repair and safety procedures defined in this manual prior to conducting any operations or procedures. Improper or careless use of this chipper ***CAN*** result I serious injury, and even death. All procedures in this section must be completed in a timely fashion to ensure safe operation. See Section 1.0 **GENERAL** for additional information.

Operations shall be restricted to:

1. Properly trained, qualified and experienced operators and/or qualified and experienced maintenance and test personnel.

2. Trainees under the direct supervision of qualified and experience3d personnel.

3. Qualified and experienced maintenance and test personnel only in the performance of their duties.

Personnel who qualify to operate this equipment under the above restrictions shall also comply with the following physical requirements:

1. Have a good vision and the ability to read and understand this manual as well as all safety and operational decals and placards on equipment.

2. Be capable of hearing, with or without a hearing aid, at a level adequate for the assigned operation.

3. A record of mental stability with no history of epileptic seizures, dizziness, or any other disability that may result in injury to him/herself or others.

4. If any of these requirements are not satisfied at any time, the personal failing to meet these requirements ***MUST NOT OPERATE THIS EQUIPMENT.***

ADDITIONAL REQUIREMENTS

1. Each operator must demonstrate competence to understand all placards, operator's manuals, safety codes, applicable government regulations, and all other information applicable to the safe and proper operation of this chipper.

2. Each operator must demonstrate the ability to recognize an emergency condition that may arise during chipper operations and knowledge and procedures to implement corrective action.

3. Each operator must demonstrate or provide evidence of qualification and experience prior to operating this chipper.

4. Each operator must be able to recognize existing or potential problems regarding the mechanical integrity of the chipper and report any maintenance requirements to the supervisor in charge.

5. Each operator must wear the proper personal clothing and safety gear.

6. Operators must not be mentally or physically fatigued.

7. Operators must not be under the direct or indirect influence of alcohol and/or drugs. This includes prescription drugs that could cause drowsiness, dizziness or any other conditions that would impair their ability to operator or use this equipment in a safe manner.

PREPARATION FOR OPERATION

Before your chipper is put into operation it is very important to read and follow procedures outlined in the engine manufacturer's **ENGINE OWNER'S MANUAL.** (EOM)

To assist the reader in determining when to refer to the **ENGINE OWNER'S MANUAL**, look for this symbol. **(EOM)** You will find this symbol used throughout the rest of this manual.

For specific information regarding the following checks please refer to the **"MAINTENANCE"** section of this manual and the **(EOM).**

DISENGAGE clutch and the hydraulic feed system**.** ***REMOVE*** keys from the ignition switch.

DO NOT remove disc pin until you have read and understand section 6.2.1. Disc and drive system continue to move after the clutch has been disengaged and the engine has been cut off. ***ENSURE*** that the disc and drive system have come to a ***COMPLETE STOP BEFORE ATTEMPTING ANY MAINTENANCE IN THIS AREA!***

Blades are extremely sharp. Care must be taken to avoid contact with the blades and blade pinch points. Failure to do *WILL* result in severe injury.

ALWAYS secure cutter disc to prevent rotation before tightening fasteners or performing maintenance in the disc housing areas.

Never place any part of the body under or behind guards or any other visually obscured area.

IMPORTANT CHECKS

Note: The following checks contained in sections 5.2, 5.3 and 5.4 should be preformed prior to leaving the storage area for several reasons:

a. Tools and spare parts may not be available at the job site.

b. Safety gear and procedures cannot be followed if they are not available at the work site

c. Unscheduled delays at the work site cost you lost time and money

d. You may leave a bad impression on your customers if you are not ready to go to work once arriving on the job site.

1. Check engine fuel, coolant and oil levels. **(EOM)**

2. Check the engine air filter. **(EOM)**

3. Check all bolts and nuts to ensure they are tight.

4. Check cutting knives to ensure all attachments bolts are tight and knives are in good condition.

5. Inspect anvil to ensure all attachments and adjust bolts are secure.

6. Check all controls for free and proper operation.

7. Check chipper disk main drive belt for proper adjustment.

8. Inspect the fan blades and paddles to ensure that they are bolted securely, welds intact, not bent or deformed and free of any cracks, fatigue, or separation from the disc.

9. Inspect discharge chute to determine if it is clear, positioned and secure.

10. Inspect the chipper frame and structure for any bent, broken, cracked, missing or loose parts.

11. Check all guards to ensure they are undamaged, in place and properly secured.

12. All decals must be in place and legible prior to operating the chipper.

13. Check hydraulic fluid level, fluid must be within 1" of top of the tank when the fluid is cold.

14. Factory supplied Disc Hold Pin in place and secure with a padlock before operation.

15. Check feed rollers for debris.

FAILURE to properly hitch chipper to tow vehicle, verify the toad-worthiness of the chipper and tow vehicle and verify all equipment is properly stowed, may cause serious injury or death to you or to others.

TOW VEHICLE MUST have proper towing capacity for the chipper being towed. Check the tow vehicles operating manual for rating capacity.

DO NOT tow the chipper unless all the important checks listed below are satisfactorily complete.

ADDITIONAL CHECKS

1. Hitch secured to tow vehicle and safety pin/latch secured.

2. Frame must be level or the tongue slightly lower than the rear of the chipper while towing to ensure proper weight distribution. The hitch may have to be adjusted when towing with vehicles of varying tow hitch height.

3. Safety chains installed correctly.

SAMPLE MAINTENANCE INTERVALS

Sample for a particular model. Use the list specific to your model.

OPERATION	DAILY	WEEKLY	MONTHLY	BIMONTHLY	YEARLY
Visual Examination	X				
Rotor blades and cutting bar	X				
Draw bar for damage, cracks, wear, etc			X		
All fasteners are tight			X		
Cutter bar and blade bolts tight	X				
Fuel, oil and coolant leaks	X				
Engine oil level	X				
Radiator coolant level	X				
Drive belt tension		X			
Lubrication					
Engine		See Engine Manual	X	X	
Check engine oil level	X				
Change oil and filter				X	
Grease pilot bearings				X	
Trailer wheel bearings					X
Grease jackstand				X	
Grease spring shackle bushings (if unit is so equipped)				X	
Grease rotor pillow block bearings				X	
Clutch	See Clutch Manual				
Maintenance					X
Tighten all fasteners					
Blade change		As required			
Cutting bar rotation		As required			
Sharpen cutting edges		As required			
Engine	See Engine Manual				
Radiator coolant/antifreeze					X
Tune engine					X
Replace filter					X
Air cleaner			X		
Crankcase breather			X		
Governor oil level			X		
Engine oil and filter				X	
Battery water level			X		
Drive belts				X	
Tire pressure				X	
Torque of wheel lug bolts (90-95 ft. lbs.)				X	

Warning: Shutdown the engine and remove the ignition key before performing any maintenance. Except for engine check out, after tune-up, there is no need to incur the risk of working close to operating equipment, while performing maintenance operations.

WARNING

Operational personnel must be familiar with the contents of this manual and trained in the operation of the chipper before attempting operation. Serious injury, or even death, can result from the improper or careless use of this equipment.

Operation must be limited to:

1. Designated, competent, and experienced persons.

2. Trainees or untrained persons under the direct supervision of qualified persons.

3. Maintenance and test personnel, only in so far as it necessary for the performance of their duties.

Operators and trainees shall meet the following qualifications:

1. Have good vision in both eyes.

2. Hearing, with or without hearing aid, must be adequate for the specific operation.

3. A history of mental stability and not subject to epileptic seizures, dizziness, or any other disability which may cause injury to himself or other persons on the job site.

4. If an operator becomes physically or mentally unfit he shall disqualify himself.

In addition to the above listed requirements, the operator shall:

1. Demonstrate the ability to comprehend and interpret all placards, operator's manuals, safety codes, appropriate governmental regulations, and other information pertinent to safe chipper operation.

2. Possess knowledge of emergency procedures and implementation of the same.

3. Demonstrate to the employer the ability to operate the specific type of equipment or provide satisfactory evidence of qualifications and experience to do the same.

4. Recognize any potential problem and alert the Shop for any maintenance requirement of the lift operated by him or trainees under his supervision.

5. Fully comprehend the operating procedures as outlined in this manual.

6. Not operate this machine while under the influence of drugs or alcohol.

Preparation for Operation

CLOTHING AND PERSONAL EQUIPMENT

Persons working close to the chipper shall wear appropriate clothing and personal protective equipment to guard against possible injury caused by whipping branches, flying debris and excessive noise levels.

1. **Clothing** shall be free of all decorations and loose parts which could become entangled in the brush before being fed. Clothing should be close fitting, but not so tight as to hamper movement. Gauntlet type gloves, loose scarves, neckties, and jackets with straps at the wrists or shoulders should not be used. Hooded sweat shirts may be worn if the hoods are pulled tightly around the face and the drawstrings are carefully tucked inside the collar. If it becomes desirable to remove the hood, it should be tucked into the back of the collar to prevent entanglement in whipping brush.

2. **Protective Equipment** Hard hats, safety goggles and ear protectors are a must when operating a chipper. Hard hats should be worn without any under-chin strapping. Eye protectors should be the wraparound goggle type which are held in position by an elastic band around the head. Hard hat mounted shields offer a greater area of facial protection. Avoid the use of glasses which hook over the ears. Plug type ear protectors are prefer-able to muff types. The plug type cannot be entangled by whipping branches.

SAFETY CHECK

Before start up of the engine or chipper, perform the following walk around safety check.

1. Ensure the feed table and chipper housing are free of all foreign objects.

2. Confirm the discharge chute is clear and directed away from people.

3. Look under the chipper for any evidence of an oil leak.

4. Ensure all fasteners are in place and secure.

BRUSH PREPARATION

To minimize the dangers from flying debris and to extend the life of the chipper's cutting edges, all foreign materials should be removed from the brush before it is fed to the chipper. Properly delimbing the brush will permit easy passage through the feed opening, eliminating hangups and the need to assist feeding by pushing with a limb.

Warning - Stones trapped in crotches, cans caught in leaves, nails driven into branches and wire wrapped limbs are all examples of foreign materials that can cause damage to the chipper. Such materials will not only damage the cutting edges, they may also cause the cutting blades to shatter, with resultant fragments being discharged. Fragment ejection can cause personal injury or damage to nearby property.

Pre-trim the brush to a size and shape that will allow it to be drawn easily through the opening to the cutting edges. The size and growth direction of most branches will allow the self-feeding action of the chipping mechanism to bend them toward the main stem, permitting passage through the feed opening.

Many evergreens, however, have side branches that grow toward the butt end of the main stem rather than toward the tip. When brush of this shape is pulled into the cutting mechanism, the side branches will spread apart, rather than being pushed inward toward the main stem, and the branch will not pass

through the opening. A similar “no feed” situation can develop if the branch has crotches which are too wide or too stiff to be bent by the chipper’s self-feeding action. Where side branches grow toward the butt end, or where crotches are too wide or too stiff to permit easy passage through the feed opening, the brush should be pre-trimmed with an appropriate cutting tool before it is fed to the chipper.

SET-UP OF EQUIPMENT

Work site preparation and organization is a major factor in the safety of chipper operation. The following guidelines should be observed by operating personnel.

1. Select a work site out of the mainstream of highway traffic, but not too close to houses or other inhabitable buildings.

2. Establish adequate warning and diversion systems for both automotive and pedestrian traffic. Signs, cones, and flagmen may be required, depending on circumstances.

3. Do not set up the chipper directly beneath a tree being trimmed.

4. Provide enough room on the curbside of the chipper to maneuver while feeding brush.

5. Clear the ground directly beneath and around the chipper of flammable materials. Hot sparks from the chipper’s engine exhaust are capable of starting fires.

6. Confirm that no one is working overhead.

7. Unlatch and lower the feedtable. Ensure the feedtable is clear of all tools and foreign objects.

8. Ensure that all persons who are working in the area are wearing required personal protective equipment.

9. Exclude all personnel not feeding the chipper from the feed and discharge area of the chipper.

10. Position the exhaust deflector assembly in the desired direction for chip discharge.

11. If the chipper is unhitched from the towing vehicle for operation, always chock the wheels and lower the jackstand.

12. If the chipper is equipped with an optional flywheel brake the rear dropleg must be down before operation begins.

Danger - Failure to lower the rear drop leg may cause the trailer to upset when the flywheel brake is applied.

Warning - Do not attempt to hitch or unhitch the chipper from a towing vehicle without sufficient help. Ensure the dropstand is lowered and both trailer wheels are chocked.

The chipper is heavy and could roll out of control on a grade. Serious injury to personnel or property damage could result. The chipper tongue is too heavy to be lifted safely by one man. Lower the dropstand to support the tongue weight. Serious muscle strains could occur by lifting the tongue.

OPERATION ENGINE START

1. Refer to Figure 2-1. Pull the choke knob out slightly.

2. Depress the rubber capped button in the center of the throttle knob and pull the throttle rod out all the way, to establish its full length, then push it in to about one third of its length.

3. Ensure the clutch lever is in its disengaged, horizontal position, refer to Figure 2-1.

4. Turn the ignition key/starter switch fully clockwise to energize the starter. Press the override button until the engine starts. This button overrides the low oil pressure, high temperature of engine water shut down system. Pull the choke knob if the engine is hesitant about starting. (No choking required on EFI engines).

5. When the engine starts, allow it to run for several minutes at approximately 1000 RPM. Check the oil pressure gauge to confirm pressure is developed, and listen to the engine sound to make sure that the clicking noise associated with dry valves disappears in a few seconds.

CHIPPER START

Warning before starting the chipper, check the feed table to ensure it is clear of foreign objects such as wrenches etc. and the exhaust chute and discharge bonnet are directed away from personnel. Be sure the rubber shroud is in place. Do not operate the chipper without a rubber shroud. Kick back from the feed hopper and/or violent discharge through the exhaust chute can occur, with resultant blade damage and/or injury to personnel. The chipper should not be operated when the aerial device is being utilized. An electrical shock hazard exists when the lift comes into contact with energized electrical lines.

1. When the engine is running smoothly at approximately 1000 RPM, push the clutch lever to the vertical position to engage the clutch, Refer to Figure 2-1. Do not push the lever too fast or too slow as either extreme can cause excessive clutch wear. The cutter head should begin to rotate without causing the engine to lose speed or stall. If the engine begins to stall, it indicates the clutch is being engaged too quickly or the engine is running too slowly.

2. Listen to the sound of the engine and cutter head. Any strange sounds should be investigated promptly.

3. When the cutter head is running smoothly, move the RPM switch to “Run”. The engine should now be running at its factory set speed.

FEEDING BRUSH TO THE CHIPPER

Proper brush feeding technique involves placing the brush on the feed table, pushing it toward the cutter opening, and moving quickly to the curbside of the chipper - all in one continuous motion, See Figure 2-2. The following procedures should be followed

1. Ensure the brush has been properly prepared (See Brush Preparation), and does not exceed six inches in diameter.

Warning - Chipping limbs larger than six inches in diameter can result in equipment damage and/or personal injury resulting from brush kickback.

2. Carry the brush butt end first toward the feed hopper, approaching the chipper on an angle to the line of cutting action from the curbside, to avoid traffic hazards. (See Figure 2-2).

Warning - Never approach the chipper directly from behind. At any time and without warning, a piece of brush can be kicked back with sufficient velocity to cause bodily injury.

3. Lay the brush on the feed table, butt end toward the cutter opening, and feed it toward the opening, being careful to release it before the cutting mechanism actually grabs it. Small pieces of brush may be thrown toward the opening.

4. When the brush has been fed into the cutter opening move immediately forward and to the

curbside of the feed table. Do not wait to see if the cutters have grabbed the brush. The sound of the chipper will confirm chipper operation. Even with ear protection in place, the sound of a chipper chipping is unmistakable.

5. Do not refeed small pieces of brush which remain on the feed table. Feed a large branch last, which will carry small brush into the chipper.

6. If the blades do not grab a branch, use another branch to push the first one toward the opening, being careful to stand at the side of the feed table, not in a direct line with the cutting action.

Warning - Do not operate or feed brush into the chipper without the rubber shroud in place. The rubber shroud is provided to stop or slow down material which is kicked back. Without the rubber shroud, kickback is more violent. Serious injury can result.

7. Do not feed limbs exceeding six inches in diameter into the chipper. Large limbs may stall the chipper or not self feed.

Warning - Do not use any tool with metal components such as a rake or pruning tool to push the brush. Metal components fed into the chipper can damage the blades. Violent discharge through the chute or kick back from the feed hopper can result.

Do not feed the brush by standing in one spot and throwing it toward the cutter opening; operator movement with the brush minimizes the impact of moving brush.

Keeps hands and arms out of the feed hopper. Loss of limb can result.

Do not lean or permit others to lean or stand on the feed table. Loss of balance can result in serious injury or death.

Keep the working area clear of limbs on the ground which could trip or entangle the operator. An entangled operator could be dragged into the feed hopper by brush being fed, serious injury or death could result.

Do not throw clean up sweepings which contain foreign materials e.g. wires, stones, nails, etc. into the chipper. Blade damage and violent discharge can result.

SHUT-DOWN PROCEDURES

1. To shut-down the chipper, move the engine speed switch to idle.

2. When the engine has slowed to idle speed, disengage the clutch by moving the clutch lever to the horizontal position, Refer to Figure 2-1.

3. Turn off the ignition switch, and remove the ignition key.

4. Place the feed table in its closed, stowed position and latch, to prevent feeding by unauthorized personnel.

Caution - The rotor will continue to rotate after the engine has stopped and the clutch has been disengaged.

5. Do not leave the chipper unattended until the rotor has stopped revolving.

TOWING THE CHIPPER

Before the chipper is towed ensure the following items have been properly taken care of. In addition close and latch the feed table.

1. Ensure the vehicle being used to pull the chipper is adequate for the job.

2. Hitch is secured to tow vehicle and safety pin/latch is secured.

3. Safety chains are installed correctly.

    a. Chains are routed under the trailer tongue in an “X” pattern between tow vehicle and trailer.

    b. Slack in chain should be adjusted to permit turning but not dragging on the ground.

4. Connect trailer wiring to the tow vehicle and insure that all trailer lighting is operating properly.

5. Check tire pressure and insure that all lug nuts are securely fastened.

6. Visually examine the chipper frame to determine if all components are correctly positioned and secured for travel.

7. Check discharge chute to confirm it is positioned and secured for travel.

8. Insure that the safety breakaway switch is functioning properly and attached securely to the tow vehicle. Allow enough slack to insure that vehicle turns will not activate the safety breakaway switch.

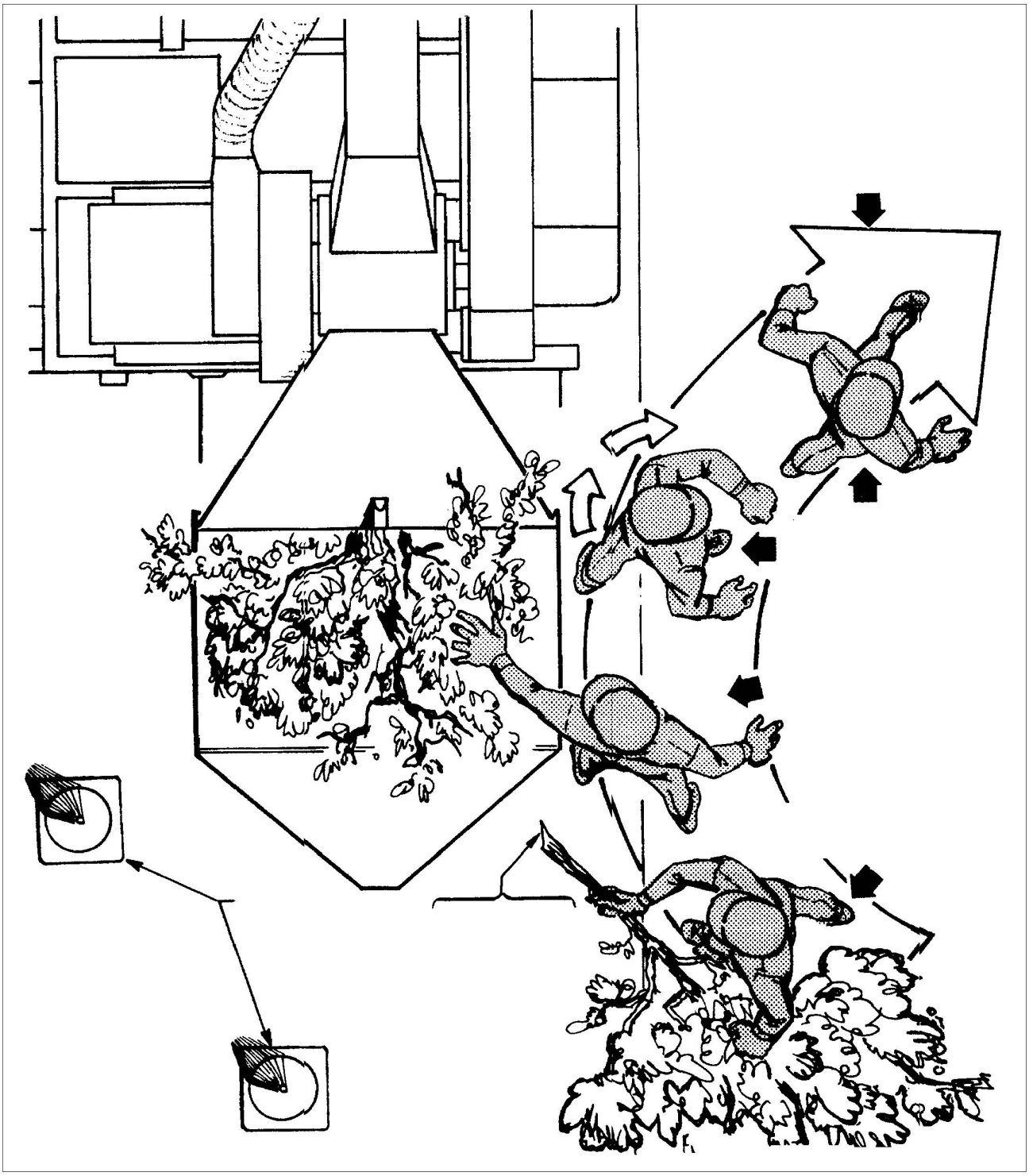


Figure 2-2 - Feeding Brush to the Chipper

Appendix C

Line Clearance Checklist

To answer the following questions, observe the employees at work, or ask employees directly to determine the understanding of individual employees. Check appropriate answer Yes, No or N/A (Not Applicable, or type of work not being done when observation made). If "No", cross-reference items and comments.

	Yes	No	N/A
General Training – 1910.269(a)			
Have employees been trained to perform the jobs they are doing? (Determine by observing or asking employees.)	____	____	____
Medical Service and First Aid – 1910.269(b)			
When employees are performing work on or associated with exposed lines or equipment energized at 50 volts or more, are employees trained in first aid and CPR, available, as follows:			
1. If two people or more people are working, are at least two of them certified in CPR and First Aid? (New hires have 90 days to become trained.	____	____	____
2. Is each first aid and CPR kit maintained and readily available for use?	____	____	____
Job Briefing – 1910.269(c)			
1. Did the employee in charge conduct a job briefing with the employees involved before they started this job?	____	____	____
2. Did the job briefing include, at least, the following:	____	____	____
a. Hazards associated with the job?	____	____	____
b. Work procedures involved?	____	____	____
c. Special precautions?	____	____	____
d. Energy source control?	____	____	____
e. Personal protective equipment?	____	____	____
Personal Protective Equipment – 1910.269(g)			
1. Eye and Face Protection – 1910.133			
a. When there is a hazard of flying objects, is each employee wearing eye protection that includes side protection?	____	____	____
2. Head Protection – 1910.135			
a. Are all employees working in areas where there is possibility of head injury wearing hard hats?	____	____	____
3. Leg Protection – 1910.132			
a. Are all employees using chaps when operating a power saw on the ground	____	____	____
4. Hearing Protection – 1910.95			
a. Are all employees using hearing protection when operating power saws or chippers?	____	____	____
5. Foot Protection – 1910.137			
a. Are employees using foot protection when operation power saws or chippers?	____	____	____

Mechanical Equipment – 1910.269(p)

1. Were the safety components of mechanical elevating and rotating equipment (components that would result in free fall or rotation) visually inspected before this shift? ____ ____ ____

2. Are outriggers extended and firmly set for the stability of the specific equipment? ____ ____ ____

3. Is equipment being operated so that minimum approach distances are maintained? If answer here is NO, stop work immediately! ____ ____ ____

4. Is there a designated employee (other than the equipment operator) observing the approach distance to exposed lines and equipment and warning before the minimum approach distance (MAD) is reached? ____ ____ ____

Line-clearance Tree Trimming – 1910.269(r)

1. Before any employee climbs, enters, or works around any tree, is a determination made of the normal voltage of electric power lines that pose a hazard? ____ ____ ____

2. Is there a second line-clearance tree trimmer within normal (unassisted) voice communication present under the following conditions: ____ ____ ____

    - If a line-clearance tree trimmer is to approach more closely than 10 feet of any conductor energized at more than 750 volts? ____ ____ ____

    - If branches or limbs being removed are closer to lines energized at more than 750 volts than the minimum approach distance allowed? ____ ____ ____

    - If roping is necessary to remove branches or limbs from conductors energized at more than 750 volts? ____ ____ ____

3. Do line-clearance tree trimmers themselves (not equipment) maintain minimum approach distances? ____ ____ ____

4. Are branches that are contacting exposed energized conductors or that are within the minimum approach distances removed through the use of insulating equipment? ____ ____ ____

5. Are conductive ladders brought no closer to an energized part than the minimum approach distance? ____ ____ ____

6. Are brush chippers equipped with a locking device (key) in the ignition system? ____ ____ ____

7. Are brush chippers, not equipped with a mechanical infeed system, equipped with an infeed hopper of sufficient length to prevent employees from contacting the blades or knives of the machine during operation? ____ ____ ____

8. Are trailer chippers detached from trucks chocked or otherwise secured? ____ ____ ____

9. Is each chain saw equipped with a chain brake? ____ ____ ____

10. Is the chain saw started at least 20 feet away from the fueling area? ____ ____ ____

11. Is the chain saw started on the ground or where otherwise firmly supported? (Drop starting of saws over 15 pounds is permitted outside the bucket of an aerial lift only if the area below the lift is clear of personnel.) ____ ____ ____

12. Is the chain saw held with both hands during operation? ____ ____ ____

13. Does each employee operating a chain saw, always use it below head level? ____ ____ ____

14. Are saws not running when carried into trees by employees? ____ ____ ____

15. When the bucket is in the air, is an insulated tool (off the truck) available for lowering control operation during emergency situations? ____ ____ ____

16. Is rope inspected before each use and discarded if unsafe? ____ ____ ____

17. Are wet ropes, or ropes contaminated to the extent that their insulating capacity is impaired, not used near exposed, energized lines? ____ ____ ____

18. Is each employee tied in with a climbing rope and safety saddle when working in a tree (except when ascending into a tree)? ____ ____ ____

19. If work is done in the facility of traffic, are warning signs or flags and other traffic control devices used to alert and channel traffic? ____ ____ ____

Incident Investigation Form

Conveyed to Contractor	Date	By
Contractor Supervisor		Date
Description of Incident		
Contractor Follow-up Action Planned		

Follow-up Action Implemented	Date	By

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