Oklahoma Baptist Disaster Relief

Chain Saw Training Manual

7/31/14

Mission Statement:

Southern Baptist Disaster Relief is a Christ-centered partnership of national, state and associational ministries serving through the local church to bring **help**, **healing** and **hope** to individuals affected

Vision Statement:

Southern Baptist Disaster Relief will be a well-defined, unified disaster response organization, demonstrating the love of Christ by providing physical and spiritual

INTRODUCTION

The purpose of Oklahoma Baptist Chain Saw training is to teach Disaster Relief personnel a consistent and safe method of chain saw operation. We realize that many of you have used chain saws most of your adult lives and feel that there is not much to be learned. At the completion of this course we hope you will also feel that this was time well spent.

Southern Baptist Disaster Relief (SBDR) is a Christ-centered partnership of national, state and associational ministries serving through the local church to bring **help**, **healing** and **hope** to individuals affected by disasters. SBDR began in Texas in 1967 and has grown to be one of the largest and most respected disaster organizations in the U.S. and around the world.

This Chain Saw manual provides a brief overview of the safe operation of a chain saw team. As with any equipment, the operator should seek to gain as much knowledge and skill as possible about operating a chain saw. In addition, a chain saw volunteer should spend time in hands-on training, practicing the procedures and skills taught in this manual.

This training is mandatory for every OKSBDR volunteer serving on a chain saw team.

A chain saw has been identified as the most dangerous tool that a person can use. So we want to be faithful stewards of the people the Lord send us by talking, training, and observing safety in every aspect of Disaster Relief.

> *When hurricane Hugo hit the east coast, the storm killed 14 people. During the clean-up and recovery, 15 individuals died as a result of chain saws and tree removal.*

We also feel it is necessary to complete this class because, during ministry, all eyes are on these “Christians” and what they are doing. The Lord deserves only our best.

Once again, we thank you for your time and dedication. Thank you for your help in this ministry.

In Christ,

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Unit and Team Structure

Chapter 1: Unit and Structure

Chain Saw Unit

It is recommended that the chain saw unit be a trailer. This will allow different vehicles to pull the unit. It also reduces the insurance requirements for the unit and increases the number of drivers available.

Unit Leader

The Unit Leader should wear the Blue Cap and is responsible to the Incident Management Team (IMT) for the actions of the unit.

All other team members should wear a yellow hat, no matter his/her training or qualifications.

General

- Be flexible in the assignment and ready to make adjustments. There is no way to adequately list all tasks. Teams should be prepared to meet existing needs. Remember, “It is not about production, it is about your testimony.”
- Review “Chainsaw Property Damage Assessment” (see Appendix) and “House Located on Lot Supplement” (see Appendix).
- Confirm address and have owner sign the “Property Owner Request for Assistance Form” (see Appendix) if it has not been signed.
- Be informed. Deal with information in a positive way. Never be part of misinformation.
- Be responsive in an intelligent, careful, supportive and effective manner. Misinformation by volunteers can make matters worse.

Daily Debrief and Devotion

Teams will meet for devotion and debrief each day. This leads to better team effectiveness and communication.

- Morning devotion
- Informal evening debrief

BASIC EQUIPMENT

Listed below you will find the basic equipment that should be found in a typical Southern Baptist Disaster Relief chain saw trailer.

This is based upon the results of the Chain saw Task Force group that met during the 2002 National Disaster Roundtable.

Chain saws
Extra chains – have on hand at least two chains per saw
Safety equipment:
    Helmets

- Chaps
- Gloves
- Eye goggles
- Ear protection
- First Aid Kit
- Fire extinguisher
- Water cooler with cups

Gas cans with mixture oil
Funnel
Bar oil
Saw cleaning materials
Files
Ropes
Wedges
Sledgehammer
Axe
Tool Box with basic tools
Come-alongs
Pruning pole
Pry bar
Extension ladder
Duct tape
Equipment Owner's Manual
Bolt Cutters
Hand Saw
18 Inch Traffic Safety Cones
Gas Powered Leaf Blower
Air Compressor with Hose
Electric Voltage Meter
Hope in Crisis tracts

CHAIN SAW SAFETY

Safety

Chapter 2: Chain Saw Safety

Safety is:

- **Being careful**
- **A set of rules**
- **An attitude**

This document is intended to give the reader an overview of safety as it relates to chain saw operation and maintenance.

The following procedures are **mandatory** when operating a chain saw with Oklahoma Baptist Cleanup and Recovery teams. Hopefully, these procedures will become second nature any time you are operating or maintaining a chain saw.

Remember, the saw blade is traveling in excess of 80 feet per second. Just a touch can result in serious injury in as little as a split second.

SAFETY GEAR

The first part of the procedure is intended to explain the importance and use of the required safety gear or Personal Protective Equipment (PPE). PPE includes hand, head, ear, and eye protection as well as the proper clothing with chaps.

- Clothing must not be loose fitting. Loose fitting clothing could become tangled in brush and limbs as well as the saw.
- Anything that could become entangled must be secured before operating a saw.
- Proper footwear is also important. High top boots with lug soles offer superior traction. Chain saw boots are preferred.
- Necessary safety equipment is located on the unit. This includes helmet with eye and ear protection, gloves, and chaps. These must be worn any time you are operating a chain saw.
- Chaps are a key part of the safety gear. They are constructed of material that resists cuts from the saw teeth. The internal material will also choke the saw to a stop when entangled.
- Chain saw gloves or mitts are constructed of material that resists saw cuts to the hands in the event of a kickback. These gloves provide a better grip while reducing fatigue resulting from extended operation.
- Chain saw helmets are also provided. The helmet not only provides protection to the head, but it includes a pull-down eye shield and ear covers to reduce noise.
- Each cleanup/recovery unit must have the required PPE for each person operating a chainsaw. These items must include helmets with eye and ear protection, gloves, and chaps. **PPE must be worn whenever you are operating a chainsaw.**

OPERATION

General

- Read and understand the owner's manual
- Watch what you are doing. Use common sense!

STARTING TECHNIQUE
When starting the saw, always use a method that utilizes the chain brake and insures that the saw is secure. We recommend the "on-the-ground" starting method.

1. Examine the work area. Make sure that the area is free of obstructions such as limbs, vines, and other people.

2. Apply the chain brake.

3. Hold down the trigger in the full throttle position.

4. Push the choke lever down into the full choke position.

5. Put the saw on the ground and put your right foot in the handle, pinning it to the ground.

6. Put your left hand on top of the saw handle to brace for the kickback when pulling the starting cord.

7. Several quick pulls should make the saw sound like it is ready to start. At that time move the choke lever up one notch and pull the cord again. This should start the saw.

8. After the saw has started, release the chain brake with the right hand, and rev the saw for about five seconds (cold start).

9. Re-apply the chain brake and verify the saw idles properly in all positions as demonstrated by the instructor. Make any needed adjustment.

REACTIVE FORCES

When in use the chain saw creates four reactive forces – pull, push, attack, and kickback. Following is an explanation of each.

PULL: When used for cutting, the bottom of the bar will pull away from the operator. Have a firm grip on the saw and insure that feet are firmly planted.

PUSH: When used for cutting, the top of the bar will push the saw back toward the operator. Position the body to brace the saw as demonstrated.

ATTACK: Attack refers to the bottom half of the bar tip. This point is used when starting a bore or plunge cut.

KICKBACK: When used for cutting, the upper half of the bar tip will cause the saw to kickback toward the operator. **DO NOT USE THE UPPER HALF OF THE BAR TIP.** Serious injury may result.

BORE CUT

Trees with backward or forward lean pose some difficulty and generally require the operator to make a hinge prior to completing the back cut.

When performing a bore cut, it is very important that the saw teeth be as sharp as possible and the saw is running at maximum RPM. Use the attack corner of the bar as demonstrated. Never use the kickback portion of the bar.

TREE FELLING PLAN

There are five steps to consider before attempting to cut a tree. A few moments spent evaluating the situation prior to the cut could save serious injuries later.

1. Consider the possible hazards. Hazards may include wind velocity and direction, obstacles in the path of the tree, dead limbs, hollow or rotten tree trunks, and spring poles.

2. Determine the lean of the tree and how it will be handled. If the lean is in the direction of objects that cannot be relocated, it will have to be compensated for.

3. Plan your escape route. The safest route is at a 45-degree angle to the rear, away from the direction of the fall. The path should not only be clear but also allow room on either side for a change in plans. As the tree begins to fall, you should begin to walk away, keeping alert as to whether the tree is indeed falling in the planned direction. To avoid falling limbs and debris, get at least twenty feet away from the trunk of the tree.

4. Determine the actual cut dimension. The open face method will always be used. This method consists of a notch, hinge, and back cut. The notch cut is made on the side toward the direction of fall. The notch should form at least a 70 to 80 degree opening. The width of the notch is approximately 80% of the diameter of the tree. The hinge cut is then made leaving 10% of the trunk intact to control the direction of fall. As a rule, the hinge width should be 10% of the diameter of the tree.

5 Establish a back-cut plan. This plan will vary with the size of the tree and the direction of lean. If the tree is relatively small and leaning in the direction you want it to fall, there is no problem. However, this is a rare occurrence. If you have a 36” tree trunk and an 18” bar you will have to make at least two cuts. In this case the bad side should always be cut first, then install wedges as needed to finish the cut.

SPRING POLES

A spring pole is a condition that exists when a smaller tree or limb is trapped by a larger falling tree. The trapped tree stores unreleased energy and can pose a serious threat when released.

A small spring pole no more than shoulder height can be cut from the top. To determine the proper cutting position of taller spring poles, the cutter must envision a horizontal level with the top of the arc. A vertical line must be envisioned parallel with the trunk line. From the insertion point formed by these two lines, come down at a 45-degree angle and the cut should be made where the line meets the trunk. The cut should be made with the saw at maximum RPMs. The saw should be lowered slowly into the trunk. The cutter should position himself at a 45-degree angle away from the direction of fall.

Taller spring poles must be released from the underside. After determining the cutting point, carve away a broad section of the trunk until the spring pole is released.

LIMBING

The next objective is to remove the limbs from the tree. A large limb vertical to the trunk can be removed using the open face method. Small limbs can be cut using the bypass cut, so that all fibers running along the limb are severed. A limb that must be removed from the trunk can be removed by making an initial compression side cut and then going to the backside and cutting until the limb moves.

To avoid rolling when removing an entangled limb, use the tongue-and-groove cut. To make a tongue-and-groove cut, make a plunge cut through the limb at the halfway point. Make a second cut on the compression side four to six inches above the plunge cut. The cut should stop parallel with the plunge cut. This severs the lengthwise fibers and allows the limb to be removed while under complete control. This method may also be used when a log is spanning a ditch or other logs.

CHAIN SAW MAINTENANCE

CAUTION: Protective gear must be worn while performing maintenance on the saw.

The performance of your saw can make the different between a good day and a bad day in the field. There is nothing more frustrating than a saw that does not operate properly once you are in the field and ready to go to work. Maintenance is very important.

Maintenance should be performed at the unit or preferably in a shop where a vise and adequate space are available. The field is not the appropriate place to do maintenance unless absolutely necessary. If maintenance must be performed in the field, find a clear area and spread a tarp on the ground so smaller parts will not be lost.

MAINTENANCE PROCEDURE

1. Do a visual inspection of the complete saw.
   A. Look for loose or missing screws.
   B. Check trigger mechanism and throttle lock.
   C. Inspect chain for cracks and wear.
   D. Inspect chain catcher. If missing or torn, replace.

2. Clean air filter.
   A. Use air or vacuum to remove all debris from filter. Never use solvents.
   B. Replace air filter if cracked, torn or completely clogged. If the saw cannot breathe, it will not work properly and may cause engine failure.
   C. Clean the carburetor and area under filter with air or vacuum. Carburetor cleaner may be used if excess cleaner is removed before starting saw.

3. Inspect sparkplug.
   A. Blow all debris from plug socket.
   B. Use a socket with rubber boot designed for sparkplugs.
   C. Slowly remove plug.
   D. Use a toothbrush to clean the sparkplug. Do not use metal or sandpaper. Blow off debris.
   E. Check sparkplug for cracks or eroded electrode.
   F. Check sparkplug gap. Set to manufacturer specification, usually .020.
   G. If plug is worn, cracked or oily, replace it.
   H. Replace plug. Be careful not to over-tighten.

4. Check starter cord.
   A. If worn or frayed, replace. This can be accomplished much easier in the shop.
   B. Check pull handle. If cracked or broken, replace.

5. Check flywheel and pawls.
   A. Remove flywheel housing and clean flywheel with toothbrush.
   B. Clean ignition wiring and check for wear.

6. Inspect clutch drum and drive socket.
   A. Remove housing, chain, and bar retaining nuts.
   B. Lay chain and saw aside after marking bar with an arrow on the top side to be reversed when reinstalled.
   C. Clean with toothbrush and/or vacuum
   D. Check sprocket for wear.

E. Check clutch for wear.
F. Remove housing for debris.
G. Clean muffler screen. Check for cracks or other damage.

7. Clean chain and bar.
   A. Clean bar groove with small flathead screwdriver or flat thin piece of metal.
   B. Inspect the bar for wear, using caution. As bar wears, the edges may become sharp. If so, remove the edge with bar or flat file.
   C. Place chain in bar groove and check for excessive side-to-side play. If there is too much play, bar must be re-grooved. This may be done with the proper tool or by the dealer. Do not discard bar.

8. Inspect chain.
   A. Check for wear.
   B. Check for broken, cracked, or loose links or teeth.
   C. Check sharpening mark to make sure chain has not been over-sharpened.
   D. Check links to make sure sharpener is not cutting into links. As you sharpen the tooth, it gets smaller and shorter. A smaller diameter stone or file must be used.
   E. Check chain catcher. The chain catcher is designed to catch the chain if it breaks or comes loose from the bar.
   F. Verify that the brake locks and unlocks properly.

9. Sharpen the chain.
   A. There are five sections to the chain saw tooth.
   B. The raker depth should be 20 to 30/100 less than the point. Do not file the raker below 30/100. This will not increase cutting. It will decrease the speed and overwork the saw.
   C. Working corner (point). This is where the cutting begins.
   D. Side plate. This cuts the fiber. It should have a 5-degree forward lean.
   E. Top plate. The top plate angle should be 20 to 30 degrees. It establishes the width of saw kerf by pushing the tooth to the side as it cuts.
   F. Chisel angle. The chisel angle should be 45 to 55 degrees. This allows the chips to slide underneath the tooth.

10. Filing
   A. The file should be held so that 25% of the file extends above the tooth.
   B. The tooth should be filed at a 20 to 30 degree angle. The raker section of the tooth should be 0.002 to 0.003 inches below the remainder of the tooth.

Websites of Interest:

- www.stihlusa.com
- www.oregonchain.com
- www.namb.net/dr
- www.training.fema.gov/EMIWeb/IS/crslist.asp (for IS-100, 200 and 700 courses)

Baptist Chain Saw Crew
Safety Recommendations

1. Avoid cutting limbs over shoulder high.
2. Watch for spring-loaded or hanging limbs.
3. Never work in an area close to downed power lines. **Check the safety of the area before starting work. Don't cut on trees that are touching lines or could fall into power lines. Let the power company do it.**
4. **Plan your work before you start cutting trees that are entangled so it can be done in a safe manner. Protect the homeowner's property as much as possibly from further damage from trees that are felled. Concentrate on trees that are a safety hazard first and make sure the man with the saw has a cleared escape route behind him.**
5. **Constantly check around you so you know where your coworkers are located (for everyone's protection.) It is recommended that men working with the saws stay 30 feet apart. Men pulling limbs for the man cutting will have to get close enough to clean an escape path for him so they will have to watch out for the swinging of the saw or falling limbs.**
6. Do not get up in a tree with a saw without safety ropes attached to you.
7. Avoid getting up on ladders with a chain saw.
8. Always wear leather gloves, especially when touching the chain for proper tension or sharpening.
9. **When refueling saws, avoid spilling fuel or oil, especially around anyone smoking. If fuel is spilled on the saws, wipe them clean with rags and dispose of the rags properly.**
10. **Every 1 ½-2 hours the man that was using the saw needs to trade jobs with the man dragging limbs to rest his back and arms.**
11. Frequently check the tension on the chain while cutting so that it doesn't come off the saw and cause an injury to the saw operator.
12. **Drink plenty of water and Gatorade to avoid dehydration and muscle cramps.**
13. Wear steel-toed boots, loggers' helmets, long sleeve shirts, and chain saw chaps for protection.

Recommended Items for Volunteers to Bring
on a Chain Saw Trip

1. Leather gloves
2. Steel-toed boots
3. Long-sleeve shirts
4. Sunscreen
5. Prescription medicine, if needed
6. Cell phone
7. Loggers' helmet
8. Chain saw chaps
9. Chain saw and fuel can marked with your fuel mix and bar of oil marked for your saw.
10. Disaster Relief clothing