The Appropriate Way to Use a Top-Handled Chain Saw in a Tree

(This piece was originally the second part of a letter to the editor written in response to Paul Elcoat's article, "The Appropriate Way to Use a Top-Handled Chain Saw in the UK: One-Handed Use of a Chain Saw is Not Acceptable," in the November 2007 issue of TCI magazine. The first portion of the letter appeared in the January 2008 issue of TCI. Because of its length, this portion is being printed here separately.)

Neither TCI magazine nor its publisher, Tree Care Industry Association, condone the one-handed operation of chain saws under any circumstance. It is not allowed under the ANSI Z133-1 2006 standard, Safety Requirements for Arboricultural Operations. However, we also recognize that professional opinion is sharply divided on the issue. We wish to provide a forum for all relevant points of view to allow our reader to make an informed decision about his/her own practices and behaviors.

By Robert Tews

Any chain saw in any tree is dangerous and each situation has to be judged independently of the advice given here. This advice is given to use in a general sense; specific circumstances should be considered independently.

All activities in trees are characterized by the mobility and functionality of the climber. Whatever the climber is doing sets the pace and the safety environment of the job. If the climber is confident and experienced, then the crew is relaxed and attentive, and the customer is cheerful and relieved that the job is in good hands. The safety environment is very positive and expectations are high. The job has a good character.

If the climber drives up and nobody knows him and he walks over to the tree and put his spikes on backwards while starting an argument with the homeowner, this establishes a bad character to a job. This is not a good safety environment because the climber sets the character of the activity. The education and skill level of the climber is critical to the safety and profitability of the activities. Does the climber know how to position himself in a tree in such a way that he will not cut himself? The answer is going to characterize the job.

In order to attain safe cutting positions, the climber will have to first establish an appropriate climbing position. The first step of which is to tie in high enough that he will be able to use the safety line as a point of contact to the top of the tree as he works his way out to the extremities of the limbs. This positioning is always primary to long limb walks.

One side of the argument is that two hands on the saw will help prevent this type of injury from a kicking or flailing chain saw.

Let's talk about top-handled chain saws and their appropriate use.

I want you to visualize the climber and his climbing system as a pendulum. He or she is tied in at the top of a typical crown in a typical tree in a typical back yard. The further down the tree he belays himself, the wider his swing will be. As the climber moves out onto the lower branches, he is working in tangent to the arc of the pendulum swing. In other words the high tie-in will give him a better angle for his rope to be used as a stabilizing contact point.

There are a number of issues that begin to come into play at this point in the climb. All climbing is manipulation of contact points between the climber and the thing being climbed. Most standards require at least three contact points at all times in any kind of climbing activity. When an arborist is advancing outward from the bole of the tree toward the extremities of the limb, with a chain saw these contact points come into stark contrast.

If the climber were to hang straight down from his top tie-in he would hang in a vertical, straight up and down, angle of repose. The climber is resting upon the single point of contact – the safety line. The angle of repose for any single point of contact is always vertical. When the climber begins to advance outward on the limb, he is moving away from this point of rest that the rope always wants to return to. With a single point of contact the climber would not fall to the ground as much as he would fall to the contact point's angle of repose.

The famous tree climber "George of the Jungle" comes to mind. If he adds the second point of contact, then the angle of repose changes accordingly. The climber is tied in well over head and he is advancing out on the limb. As he does, he is now working against his natural angle of rest or repose. He is broadening his swing potential as he moves out on the limb. In order for the climber to maintain his position, he has to incorporate additional points of con-

tact. The lanyard comes in very handy to accomplish this. Once the second contact point is set or established, then the climber can rest in that position.

From this vantage point, his working area is divided into two main classifications: the area inside his swing potential and the area outside his swing potential. If and when the climber decides to set a load-line position, then he will have to consider these same elements with that line. Your safety hazards are greater working toward your angle of repose versus working away from your angle of repose. This is true with all the equipment that the climber may incorporate. For instance the load line: when a climber is working with a load line, he should always maintain a working position outside the swing of the load. In the field, this is called common sense. In the office, it is rocket science. The same is true of cutting with a pole saw. The pole saw is a dangerous tool and should be used outside of the swing area away from the angle of repose. The reason is that if the climber accidentally loses his position in the process of making a cut inside his swing area, and toward his angle of repose, then gravity pulls him into proximity of the cutting tool.

We are talking about the appropriate use of a top-handled chain saw. With the top-handled saw in use, there is no reason that a climber would have to make a cut inside of this swing area with one hand. If he chooses to do so, he is risking a cut to his free hand, his legs, or his top tie-in safety line. When the climber is cutting outside of the swing area and away from his angle of repose, then the risk of accidentally cutting himself or his rope is greatly reduced. It is in this position that a climber can safely use a top-handled chain saw with one hand. (This practice still does not comply with ANSI Z133)

Ideally, the climber is positioned out on the limb with a top tie-in with three addition points of contact – his two feet and his lanyard. His free hand is on the safety line in the proximity of the climbing knot, leaning away from the tree and the angle of natural repose, cutting the extremities of the branch with the saw in his working hand. If he loses balance he will be pulled away from the cut by gravity instead of into it. The limb being cut will fall away from the climber, saw and lines. The free hand is on the safety line acting as a slack absorber when the branch flexes from the weight change as the branch is cut. With the free hand on the climbing line, it has a task to accomplish and two vulnerable items are further and safer from the chain saw. The climber is holding the saw away and outside of his swing area with his working hand extended away from the free hand and rope.

When a climber is advancing out on a limb and he is tied in high up in the canopy, his weight is transferring to the branch that he walking out on from the safety line that is providing support. It is necessary for the climber to compensate by adjusting the safety line, reestablishing support and stability. The further away and/or higher the climber gets from his natural angle of repose, the tighter he will have to get his safety line for it to be of any use as a point of contact with the tree. At the same time, his position is losing the ability to absorb the shock that will result from the rigging and cutting of the limb. The chance of swinging under the branch and working area are increased by reason of the second tie in to the branch. There is a point when the climber will have to reach out with one hand to ward the extremities of the branch and hold on to the safety line with the other in order to keep his balance on the branch. If the climber puts both hands together and leans away from the angle of repose toward the branch extremities he will become top heavy and the safety line will lift on the feet. This is not a comfortable or safe position to work in. In order to maintain a safe working position, the climber should keep both feet on the branch with the knees bent to absorb shock. His lanyard should be around a lateral limb that is not part of the limb that is being cut off, and his free hand extended back toward his top tie-in point gripping the safety line in the proximity of his climbing knot. From this position the climber can make a comfortable and safe cut with his working hand. In this position everything is inside the swing area except the saw and the limb being cut (a good climber gets to tend the tail of the safety line to keep it out of the working area as much as possible).

Technical trim jobs and removals will have this kind of limb walking involved in their accomplishment. The physical demands and risks are considerable with each climb and not all climbers will want or should try these described techniques. I am presenting this as information only and do not advise anyone to climb trees and cut with a chain saw; it is not safe. Once in a while I run into the person who is willing

to do this work and is determined to do it regardless of the risks. This is the person that I am writing to, as helpful suggestions as they relate to being safe.

There are at least three ways for a climber to advance out on a limb with an overhead, top tie-in safety line.

Advancing out on a limb can be accomplished any way that a climber can walk out and maintain controlling tension on the safety line. When a climber is close to the tree and his natural angle of repose, it is fairly easy to walk out on the limb, most of his weight is supported by the rope and he can use his safety line as a balancing support. As he advances out on the limb, more of his weight is committed to the limb from the safety line. As he moves away from his natural angle of repose, his position becomes more dependent upon balance rather than the safety line. When the climber feels his sense of balance being threatened, it helps to have tension to lean against. The climber can lean on his safety line in a backward fashion. He turns and faces the bole of the tree that he is tied off to and pushes himself backward toward the extremities of the branch, butt first as he leans backward away from the supporting safety line. This method makes for easier limb walking, but it puts the climber in an awkward position to work in once he has reached his destination. Almost always he will have to change positions in order to cut securely.

The climber has the option to advance out on the limb using a sideways approach to the limb. He can turn sideways to the bole of the tree and the extremities of the branch, reaching forward with one hand and reaching back with the other on the safety line, maintaining tension on the safety line and feeding slack as needed. This is a very practical technique that will leave the climber in a good cutting position when he arrives at his destination at the extreme tip of the branch. Advancing out on the limb in a sideways fashion allows the climber to use his lanyard in such a way as to rest between the lanyard contact point with the branch and the safety line contact point in the top of the tree. The two contact points can "cradle" the climber's weight between them. This technique lends itself to one handed-cutting with the chain saw.

Another approach to limb walking is to advance forward with the safety line against the shoulder. In this position the climber leans toward the extremities of the branch against the safety line. When advancing in this fashion, the safety line comes up from the saddle across the chest and up over one of the shoulders, positioning the climbing knot just above the shoulder and back with the rest of the safety line behind the climber. He can control the slack and tension with a free hand over the shoulder at the climbing knot. If the climber can advance in this position to the area of the cut, then he can use this position to cut with both hands on the chain saw, once he has established a point of contact with the limb by use of the lanyard. This position has its drawbacks, one of which was mentioned earlier. If the safety line slips off the shoulder and the climber has both hands on the chain saw, reaching out toward the end of the branch away from the tree, then the safety line can lift him off his feet with a capsizing action. This would put his head and shoulders in the direction of the cutting area. If the climber has to reach around his safety line to get into position to cut, then he will move to a sideways stance.

It is important to understand this dynamic in order to understand the appropriateness of using a top-handled chain saw with one hand. When a climber is extended away from his top tie-in point, he is holding himself up with the hand that is back on the safety line. He is taking up the top weight with his stabilizing hand, maintaining stability with the three other contact points of his feet and lanyard. Without the stabilizing action of the non-cutting hand, he would lose the directional pull holding him into the other three points of contact. If he were to suddenly gain slack in the safety line, he would fall onto or off the branch, neither of which are good for working with a chain saw. For the sake of argument I consider hanging off the end of a branch by your lanyard as having fallen off the branch. He has to maintain tension on the climbing line as he is working, in order to keep his balance and stance.

We are talking about working at the extremities of branches, cutting with one hand, using a top-handled chain saw. This is a scary place, it is a dangerous place, but with the right equipment and the right techniques, the climber can minimize the risks to a safe working level.

Robert Tews is owner/operator of 2's Tree Service, LLC in Jacksonville, Fla., and TreeVentures, a recreational and professional climbing training school in Jacksonville. He has been training climbers since 1999 to climb professionally and for recreation.