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OUTLOOK

This is certainly the biggest and definitely one of the best Tree Care Industry magazines we have ever published. Our sales manager, Chris Brown, our editor, Peter Gerstenberger, and all the TCI staff have done a great job putting it all together and I’m proud of them. They have done a big job with this November issue.

In every industry, some who are the biggest may think they are the best but not everyone might agree. While that negative opinion is frequently just sour grapes, it may also be true in some cases. On the other hand, the biggest companies in our industry grew to their size because they focus on being the best they can be. There are also many companies no longer with us because they emphasized growth not quality.

Biggest is easiest to measure in most cases. It jumps right out at you; most trucks, most people in the field, biggest Yellow Page ad, biggest insurance premiums, biggest price discounts, in the case of TCI, most pages and, for others, who knows what else.

Do you have dreams about being the biggest? Biggest at what? Does biggest include biggest profits?

How about best? In my opinion, biggest isn’t necessarily best, but there is a very interesting phenomenon that brings the two together. It’s not luck that makes you biggest or best. Jack Joy, a vintage Davey Tree executive, once told me that luck is when opportunity meets preparedness. I agree. If you are good, you grow.

The best, most professional performance brings the best of everything with it. The road to being the best is the greatest challenge we all face. It’s painful and expensive, but the fringe benefits are phenomenal.

When you focus on being the best, all kinds of good things happen. Your company grows. Your profits improve. The competition is no longer a serious factor in your business because your clients have confidence in you. They aren’t interested in someone else’s low ball price. When they contract with you, they know that they will get the best results for their money.

Personnel problems seem to decrease when a company goes all out to be the best it can be. People want to work for a successful company. Employee retention and productivity improve. Your people work more safely. There are fewer accidents and damage claims. Your insurance premiums go down. Your company grows even more.

With quality performance, you can charge a fair price, enjoy a reasonable profit and your company still grows. You may never be the biggest, but so what. If being the best you can be provides you with sufficient rewards, then you don’t have to focus on biggest. It will happen by itself.

Robert Felix, Publisher

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Making The Right Connections

By Donald F. Blair

‘Do I hold the grenade and throw the pin, or do I hold the pin and throw ... ?
Rule Number One: If you’re not sure, don’t play with grenades.

-Anon
In both OPE (read climbing gear) and rigging systems, the "C" component of the Anchor-Belt-Connection system is the vital link that holds everything together. Common primary connecting links in arboriculture are: carabiners, rope snaps, screw links, and shackles (aka clevis).

Think of snaps and carabiners as you would of hand grenades - carefully - and get it right, every time!

Back in the "old days," climbers didn't use rope snaps and they sure didn't use carabiners! Remember the bowline on a bight tree harness? Once the saddles were cut loose from the climbing line, the two components were commonly joined with a knot instead of a snap, eliminating a link.

Post World War II climbers, however, discovered the ease and convenience of using a rope snap and the practice became routine. I once heard of an Aerial Rescue Event that took place in the summer of 1993. The judge observed as many as six links involved in the climbing system of some of the contestants on the way to rescue a victim tied in and secured with more links.

The judge noticed that several of the competitors seemed unsure which snaps to secure and which to release.

I know of climbers who, in an attempt to increase their safety in the tree, adopted the practice of carrying two lanyards (two-snap type). I know of at least one climber who fell out of the tree because he wasn't secured by anything, even though he had two lanyards and a climbing line.

History

Carabiners were originally developed as a link to join equipment and rope into a system. Rock climbers use carabiners to link their safety harnesses to their rope and to link their climbing rope to belay points. Carabiners are also used in rigging gear hauling systems as well as search and rescue work.

The invention of the carabiner is attributed to a Bavarian fireman from Munich in 1910. Early carabiners were hand-forged of low-carbon steel.

During World War II, new aluminum alloys were developed that combined high strength with light weight. Virtually all climbing carabiners available in the U.S. before 1967 were made in Europe.

Modern carabiners are available in a virtual plethora of shapes, alloys and locking mechanisms. Carabiners undergo more research, engineering and testing than any other product used in high-angle environments. All this attention is warranted because few products are subjected to the stress and abuse carabiners endure. An understanding of the design, use and limitations of carabiners is crucial to reducing the risks associated with their use in climbing and rigging situations.

All arborist safety, rigging and climbing equipment is designed for a specific function. This is particularly true of carabiners. Using equipment such as carabiners in any way contrary to the specific manner of function may result in failure of the equipment. Failure of the equipment may cause property damage, serious bodily injury or death.

Basic anatomy

The primary parts of a carabiner are body, gate, hinge and latch.

Body - The body is an open-sided frame which is the major element in a carabiner. The spine is the main part of the body, opposite the gate. The spine is the strongest part of the carabiner, while the gate is the weakest.

Body shapes - The first carabiners were oval. Although that style is still popular after more than 80 years, carabiners have evolved through trial, error and need into the following basic body shapes.

Oval - As mentioned, these were the first in a non-locking configuration. Because they are symmetrical when loaded, the stress is equal on the weak "gate" side and the strong "spine" side. In my opinion, non-locking aluminum carabiners are best used on tool lanyards and key rings; do not use them in overhead rigging systems and never for climbing except in an emergency and only then when two are used with reversed and opposed gate orientation.

Bent gate - Also called "dogleg" carabiners, these feature a curved gate which helps a rock climber to quickly guide the carabiner into position. They are non-locking, and I've found a great use for them. I've got one on my saddle that I use to "catch" the ring on my chainsaw lanyard. It's fast, strong and secure. With the bent gate, I can link-up one-handed by feel.
Connecting links: 1 - oval aluminum, non-locking; 2 - offset D aluminum safety locking; 3 - HMS-shaped aluminum safety locking; 4 - offset D aluminum safety locking; 5 - aluminum offset D Petzel with new latch; 6 - offset D aluminum screw lock; 7 - offset D aluminum twist lock; 8 - HMS-shaped steel screw lock; 9 - dogleg-shaped aluminum non-locking; 10 - offset aluminum twist-locking; 11 - offset D aluminum screw locking; 12 - offset D steel screw-locking; 13 - double locking rope snap; 14, 15 - accessory carabiners. Numbers 16-24 are steel. 16 - pear-shaped 10,000# MR link; 17 - screw pin anchor shackle; 18 - delta link; 19 - oval screw link; 20 - twist-lock snap with captive eye; 21 - screw lock offset D; 22 - extra large screw-lock offset D; 23 - D-shaped screw-lock; 24 - 10mm screw-locking oval; 25 - 12mm screw-locing D-shape; 26 - extra large pear-shaped screw lock.

Symmetrical “D” - If you compare the shape of an oval to a symmetrical D carabiner, you can see that the oval would theoretically distort into the shape of the D if placed under enough load. I don’t know if that’s how they came to be invented, but the D is inherently stronger than the oval because the majority of the load is directed towards the strong spine and away from the weak gate.

Asymmetrical “D” - Also referred to as modified “D,” these carabiners are smaller at the hinge end than they are at the latch end of the body. These carabiners weigh a little less than a symmetrical D because they use a little less material. Their broader bearing surface at one end also makes them excellent for rope-to-webbing connections.

Pear - Also known as HMS. As I understand it, H.M.S. stands for H. Münter System. Pear-shaped carabiners are basically asymmetrical D carabiners with a curved radius in the wide part of the body instead of the more flattened profile of the asymmetrical D. The HMS type was originally developed to be used for belaying with a Münter Hitch.

Extra-large - I know this is sort of a no-brainer, but most carabiners fall into a sort of average size, with a gate opening between 5/8 and 1 inch. Extra-large carabiners are steel, usually screw-locking, high-strength, large-capacity brutes with gate openings ranging from 1-1/2 to 2-5/8-inches. It must be noted that the larger the carabiner is, the easier it becomes to incur minor axis loading. In keeping a sense of proportion, I use the large carabiners when I need to clip into large shackles, lowering lines and slings, thus keeping the relationship between carabiner and rope, fitting, etc., more or less the same as it is with smaller rope and standard carabiners.

Industrial snap hook - Conventional carabiners regardless of shape, material or latch, share an open frame design. When used with rope or webbing, under certain circumstances it is possible for the carabiner to rotate from major to minor axis loading, creating problems. Some knots, hitches and bends can be cinched
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Note: To prevent distortion, opening or closing difficulties or failure, the gate must be fully closed (and locked) before applying a load.

Warning: Never select a carabiner for a job that subjects it to sideloading against the gate. Re-rig to change the angle of approach or replace the carabiner with a more suitable connecting link such as a shackle.

Gate - The gate is a spring-loaded, pivoting mechanism attached to one end of the body of a carabiner. Its function is similar to that of the gate in a fence - to permit or deny access to the interior body of the carabiner. Most, if not all, carabiners develop their highest rated strength when the gate is closed and locked, if so equipped.

Hinge - The hinge on nearly all carabiners is of similar design. The gate is slotted and straddles the body of the carabiner where it has been milled for a precise fit. A pin, not much larger than a fat lead pencil, and a spring going up into the gate complete the assembly.

Latch - The latch refers to the interface between the gate and where it meshes with the body opposite the hinge. Allowing for proprietary differences, until recently there have been two common latch designs. One type consists of a pin in the top of the gate which slips into a slot in the body. The other uses a wedge-shaped claw that dovetails into a matching slot machined into the body.

The newest latch was invented and patented by Jean-Paul Frechin. Its smooth contours eliminate the risk of snagging found in sharp-edged latches. Both Kong and Petzl manufacture this latch under license from Monsieur Frechin.

Note: Many accessory links do not have a proper latch, e.g., a cross-pin in the gate and a notch in the carabiner body. They work fine for carrying keys and water bottles. Never use a carabiner without an approved latch/locking mechanism for life support systems and load management rigging.

Symmetry

A word about symmetry: So far, reference to symmetry has been to the overall shape of the carabiner. Older carabiners always used round stock to form the body of the carabiner, regardless of the configuration, e.g., oval, D, asymmetrical D, etc. Carabiner science has advanced to the point that the stock itself may no longer be round. In an effort to decrease weight while maintaining strength, modern ultra high-tech carabiners use asymmetrical stock, concentrating material where it's needed and reducing it where it's not.

While they look "cool," their narrow, tri-
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angular rod stock can act as an edge to fray ropes. Remember that rope strength is reduced by tight bend ratios. Super light carabiners are designed for expert use under specific applications only. They are not to be used for general use or rescue use.

Locking mechanisms

Back in the “old days,” when all carabiners were oval, non-locking, standard practice called for using two carabiners with reversed and opposed gates whenever security was required. Locking mechanisms were developed in an effort to reduce the number of carabiners required on big wall climbs, while maintaining security. Common locking devices are:

Screw-lock - With the gate closed, a threaded collar is usually screwed down over the latch, locking the gate closed. A few carabiners lock at the hinge end, but this isn’t nearly as common. Petzl carabiners use a red band on the gate to indicate when the lock is off. The band disappears from view when the collar is fully tightened.

Twist-lock - The problem with screw-lock carabiners is that the user has to remember to screw the collar closed. In an attempt to make carabiners think for themselves, a spring-loaded sleeve was developed into an auto-locking mechanism. More accurately referred to as a “twist-unlock” or “twist-open” carabiner, the collar has to be manually twisted and held in the open position as the gate is tripped open. The thimble automatically returns to the locked position when released.

At first, these carabiners seemed to solve the problem of forgetting to shut the gate. The problem is that because these carabiners are easy to open with a quarter-twist, they open easily with a quarter-twist! The point is, under some conditions of use, they may open when you don’t want them to.

That was the case when a tree worker in Virginia who had used a twist-lock carabiner instead of a rope snap on his climbing line for years, managed to roll open his twist-lock carabiner while tied in. He fell about 30 feet, breaking his back.

Exactly because of this experience, twist-lock carabiners are not widely used in rescue work. The worker is all right now, but his experience nearly killed the use of carabiners with the ANSI Z-133 Committee. In order to keep the standard looking forward instead of over its shoulder, I fought for carabiners that haven’t been invented yet. Z-133 finally approved the use of carabiners as part of the climbing system only if they are steel, have a minimum strength of 5000 pounds and cannot be opened accidentally. Safety-lock carabiners will satisfy most of the requirements, but are currently only available in aluminum.

Safety-Lock - Building upon the desire for an auto-locking mechanism and the absolute need for security, several twist-lock carabiners have been further improved by the addition of a secondary locking mechanism that prevents the collar from twisting open inadvertently.

Contat’s Powerlock carabiner requires the collar to be pulled down before it can be twisted open. It returns automatically to the security position.

Black Diamond has a “safety” that the...
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-Soren Eriksson, International logging expert.

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thimble can be rotated into, allowing for either conventional twist-lock operation or security on demand. In the next few years, I look for the greatest amount of progress to be made in this style of carabiner.

DMM has recently developed a line of steel and aluminum carabiners with its “Locksafe system.”

Note: Many locking carabiners only achieve their ultimate strength when fully locked. Some carabiner designs only develop their ultimate strength when the locking collar is in place to hold the latch in place, supporting the body. For example, the steel Stubal 5000 has an ultimate strength rating of 11,000 pounds when locked. Unlocked, only 800 pounds loading will cause failure!

Warning: It doesn’t take a safecracker to open a locking carabiner. They can and do come open after being locked. Carabiners can open accidentally when the gate unlocks by rubbing against the tree or the gate is opened by rope or webbing running across it. Also, vibration can cause some locking sleeves to loosen, and there’s always human error - thinking you locked it when you didn’t.

They can also become frozen closed if overtightened while under a load. When the tension is released, the body jams against the treads. If this happens, you should first try putting the carabiner back under load to see if that helps. If all else fails, trot out the pliers, but subject that carabiner to a rigorous inspection before putting it back into service. If the latch won’t index perfectly, it’s been permanently distorted and must be discarded. Carabiners are designed to be tightened with firm finger pressure and no more.

GURCs and PURCs

When all carabiners were oval, classification was pretty simple. Now that carabiners have become so highly specialized, it has become important to create some major classifications regarding the manner of function so that uniform performance standards can be adopted. It appears that by consensus, carabiners will be divided into the following rating classifications:

Carabiner - A self-closing, gated, load-bearing connective device, usually made from metal in an oval or “D” shaped configuration. Lower rated than rescue carabiners, these are intended for purposes not involving systems that will support human life in any manner. An oval, aluminum, non-locking carabiner, for example, would be suitable for use on tool lanyards, but not on primary support of a rescue litter.

GURC - The General Use Rescue Carabiner (GURC) has been approved for use in rigging rescue systems that will, in one way or another, support human life, either in the form of the victim(s) or the rescue personnel. These carabiners, for good reasons, have to be the strongest.

PURC - Personal Use Rescue Carabiners (PURC) are rescue carabiners designated for use by a single person, usually for connecting to a rescue support system.

UIAA has already adopted this 3-way test procedure and indicates the results on each approved carabiner.

Note: Carabiner test strengths are based on laboratory test conditions which simulate the best possible loading of the carabiner. In the field, this sort of ideal loading cannot be achieved without deliberate care to ensure proper orientation of the carabiner. As I have urged with each component of any A-B-C system, due
Changing handles takes one tool and one minute.

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The blade is a separate component. Changing it takes one tool and one minute.

The forged hook is designed to draw the material being cut closer to the pivot. This maximizes leverage and minimizes the effort required to make a cut. The hook’s curvature is shallow enough to easily slip between dense, tangled branches and support wires. Yet it is deep enough to hold the branch securely as the cut is being made. The sap groove is deep and wide for improved self-cleaning.

The square-shouldered, right-threaded pivot bolt that enables quick blade change is positioned so that the hook and blade open wide with a minimum of handle movement — in other words, with less effort. And the same coating that makes cutting so easy also self-lubricates the pivot action.

The Santoprene® bumpers, which provide a cushy rebound at the end of each cut, are located low on the tang and well clear of the action. Replacing a worn bumper takes only seconds. Tools needed? Your thumb and forefinger.

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26-inch AL 6640 and 32-inch AL 6660 cut limbs up to 2 1/2 inches thick.

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If you try these loppers, we think you’ll agree that they’re perfect, or close to it. So we’re making you this money-back offer. Buy a pair. Prune with them for two weeks. Use ‘em and abuse ‘em. If you agree they’re the best, buy more. If you don’t, return them to us along with a note telling us what you think would make them better. We’ll refund your purchase price. Fair enough?

For further information, contact your Corona dealer or call us at 1-800-234-2547.
Aluminum or steel?
Rock climbers favor aluminum carabiners because they are lightweight and less expensive. Renowned caver and SAR expert Kyle Isenhart recommends steel carabiners for the same reasons that I endorse their use in tree maintenance. They are more wear-resistant than aluminum carabiners and they hold up better than aluminum carabiners under severe shock loading. Because they are more ductile, they allow a greater amount of energy to be absorbed by the carabiner prior to failure. This is true even though the ultimate tensile strength may be no higher than an aluminum carabiner.

The ductility also helps the carabiner be more resistant to misuse such as non-straight line loading.

Also, steel carabiners are inherently more resistant to corrosion in alkaline environments, and the locking mechanism on some steel-locking carabiners may hold up better than the locking mechanism on aluminum carabiners.

Yes, steel carabiners are heavier and more expensive, but make mine steel. At least most of them.

Carabiner care
For all of steel's advantages over aluminum, rust and dirt are still the enemy. The following steps should be taken to ensure good working order.

1. Use an air hose to blow sawdust and grit out of the mechanism as needed.
2. Remove light, surface rust with steel wool and light oil or solvent. After cleaning, boil the carabiner in water for 30 seconds or so to remove oily residue. Spray a lubricant like WD-40 into the spring mechanism to displace water.

Heavily rusted carabiners must be discarded or permanently attached to a display board as a warning to the others — sort of like nailing a coyote to a fence post. Keep clean or this might happen to you!

3. Use graphite, WD40 or LPS1 on the hinge and locking mechanism. Do not use oil or grease because they will attract more dirt and grit. An oily carabiner is also slippery to hold and manipulate and may contaminate a rope.
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Proposed minimum breaking strengths for GURCs and PURCs

<table>
<thead>
<tr>
<th>Carabiner Type</th>
<th>Major Axis Load</th>
<th>Minor Axis Load</th>
<th>Gate Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>GURC</td>
<td>8000 lbf</td>
<td>2400 lbf</td>
<td>2400 lbf</td>
</tr>
<tr>
<td></td>
<td>35.59 Kn</td>
<td>10.68 Kn</td>
<td>10.68 Kn</td>
</tr>
<tr>
<td>PURC</td>
<td>5500 lbf</td>
<td>1500 lbf</td>
<td>1650 lbf</td>
</tr>
<tr>
<td></td>
<td>24.47 Kn</td>
<td>6.67 Kn</td>
<td>7.34 Kn</td>
</tr>
</tbody>
</table>

4. Never throw carabiners out of a tree. Sharp edges or burns can easily be raised on the surface. Hairline fractures, impossible to detect during routine visual inspection, may also develop in your skull if hit by a flying carabiner.

In my experience, unless you’re throwing them out of the General Sherman tree onto a hardened concrete surface, you’re more likely to damage the locking mechanism than you are to crack the body of the carabiner. Since the possibility exists, I have to mention it, but as I wrote somewhere else, I’ve been called by people worried after they dropped their snap 30-feet onto a lawn. Remember, the dose makes the poison!

**Carabiner inspection**

As you should with all your equipment, adopt an Initial, Frequent and Periodic inspection protocol for all your connecting links.

**Initial** - When purchased, inspect to ensure that it is in perfect condition and what you ordered in the first place.

**Frequent** - Check it out before, during and after each use.

**Periodic** - In accordance with an established company or agency policy, a competent person will inspect and approve for continued service or remove from service. This inspection should be recorded.

*Note: I have recommended using an engraver to etch the “enlistment date.” Never apply an engraver to the load-bearing body of the carabiner. Etch your data on the gate where it won’t compromise strength. Don’t engrave across the threads of a locking mechanism.*
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What to look for:

Body
1. Cracks, burrs, nicks, rust and flaws.
2. A carabiner that is bent or deformed must be discarded.
3. Discard if grooved. A reduction in diameter means a reduction in strength. Also, a groove can cut a rope or webbing.
4. Peened or mushroomed areas may be an indication that it has been thrown from a tree onto a hard surface or run over by a vehicle. Be wary.

Gate
1. When open, there should be little or no lateral movement (side play).
2. Gate must stay open only as long as it is held open. If it lags or doesn’t snap shut automatically when released, get rid of it!

Hinge
Ensure that hinge pin is tight and straddling the gate. Discard carabiners with loose, worn or corroded hinge pins.

Latch
1. Seats fully when closed, indexing in body with appreciable gap.
2. Cross pin is tight and showing no signs of wear or corrosion.

Corrosion on aluminum carabiners starts when moisture penetrates between the cross-pins and the gate or between the cross-pin and body of the carabiner at the pivoting end of the gate. Also, moisture left between the inner surfaces of the gate tabs and the adjoining surfaces of the body will start the corrosion process.

With aluminum carabiners in particular, corrosion can do extensive damage. Salt, either from the ocean or from sweat, can begin the process. Corrosion damage is virtually invisible when it occurs in the holes occupied by carabiner cross-pins. As I have said in this text, the cross-pins and hinge pins are not much larger than fat lead pencils.

Don’t be cheap! When in doubt, throw them out!

Thoughts about carabiners
As soon as carabiners began to gain acceptance among climbers, many of us became concerned about establishing the correct applications for carabiners in tree work.

Through many hard lessons over the years, we’ve shared horror stories, close calls and accident reports to develop a pretty clear picture as to the limitations and hazards of carabiners to the tree climber.

As far as I’m concerned, carabiners are certainly appropriate for rigging that presumes to be longitudinal, along the strong spine of the carabiner. I use them for hanging rescue pulleys and rigging with Figure 8s and speedlines.

They may be necessary in certain ascender systems or a valuable aid in aerial rescue, but I cannot endorse their use as a replacement for the standard, drop-forged locking rope snap. Carabiners were not designed nor intended for use with the large support D rings standard on most American-made tree saddles. Even locking carabiners can be accidentally disengaged from a saddle with heart-stopping ease. You only have to forget to turn that collar down once. Your climbing line only has to roll against the twist-lock mechanism when you least expect it.

Although it’s not worth the one-in-a-thousand chance, ANSI Z-133 has taken the guesswork out of the decision. Don’t tie in with any carabiner that doesn’t meet

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minimum performance standards for that application. Use a locking rope snap. Compared to carabiners, rope snaps may seem dated and a little boring, but there's nothing boring about personal safety and matched OPE systems. Until my dream safety-locking-steel-industrial-snap-hook-with-captive-rope-eye comes along, I'm going to have to make do with an approved snap hook.

In May 1993, as head judge of the first ISA European Jamboree, I had the opportunity to visit with many of my continental colleagues. Nearly all of the 58 climbers that competed in the Work Climb (my aching neck!), used carabiners of virtually every description, shape, size and color. What they don't use are standard American rope snaps.

Over apres d'tree schnaps, I asked the international contingent huddled around my table if any of them had experienced "roll-outs" or other carabiner catastrophes.

"Jawol, mein baumflegger!"

"Mais oui!"

"But of course!"

"Zdanov tzku kecskemel hodmezovasarhely!"

"Icke nay oulle, icke nay arbeit!" (I think this one was "no beer, no work" in Finnish, but I'm not sure.)

These guys just figured it was all in a day's work.

**Rope snaps**

Snap hooks, also called rope snaps by arborists, are drop-forged, plated to resist rust and corrosion and have a minimum proof load of 5000 pounds. A proof load means that the device can be loaded to that weight without distortion. As opposed to carabiners, rope snaps were designed to be compatible with the D rings used on tree saddles. A very real advantage the snap hooks have over carabiners is their weight. In the hands of an expert, when incorporated into a throwing loop, they can help carry a climbing line to impressive heights.

Although locking snap hooks were available, the self-closing, non-locking type was by far the most popular with climbers until the great snap scare. In early 1991, OSHA handed down a directive, probably written by someone who had never seen a tree climber, so strongly in support of locking snaps that nearly all of the domestic producers discontinued their line of popular non-locking snaps. Although non-locking snaps are not illegal, OSHA and expensive litigation settlements over questionable product liability suits have conspired to make it economically stupid for anyone to risk the exposure of using or selling wonderfully efficient, self-closing, non-locking rope snaps.

Numerous locking snap mechanisms have been tried. They all have problems. Look for one that permits one-handed use from as many positions as possible. If you work in the snow belt, good luck with gloves. Although far from ideal, the snap with the fewest negative features appears to be the design that FORGECRAFT uses on the 3155L snap hook. With certain snaps, I've either damaged cambium when unavoidably dragging a protruding locking stud over a limb on descent. I've also wedged bark up under flanged-type mechanisms, making it impossible to open the snap without first prying all that bark loose. That's hard to do when you're being swarmed by wasps.

**Snap hook specifications**

1. Snap hooks shall be drop-forged and capable of supporting without failure a load of 5000 pounds.

2. The spring tension for the keeper shall be such that the keeper will open with a force not less than 2.5 pounds and no greater than 4 pounds. The keeper shall be capable of withstanding 750 pounds of applied side pressure.
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The alphabet soup that covers these changes are OSHA 1910.269, OSHA 1910.331 and ANSI Z133.1-1994.

OSHA 1910.269. Effective January 31, 1995, you must certify that all employees who come closer than 10 feet to energized wires have received electrical hazard training.

OSHA 1910.331. Effective in August, 1991, all employees who may come within 10 feet must be trained in electrical hazard awareness, and that training must be documented.

ANSI Z133.1-1994 outlines the required training subjects. Remember, an ANSI violation is an OSHA violation.

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3. Snap hooks attached to D-rings should have less than 5/8-inch throat opening. (From ASTM F 887 - 91a)

Safe use procedures for snap hooks
1. Always attach the snap hook to the proper anchor point for the intended use of the belt, saddle or harness.
   A. For positioning with a lanyard, use designated side D-rings.
   B. For suspension, use designated D-ring(s) on seat assembly.
2. Do not rely on the feel or sound of snap hook engaging the D-ring. Always check visually for proper engagement of the snap hook before committing yourself to the climbing line or lanyard.
3. Never disable the locking keeper on the hook.
4. Never use a ladder or rebar snap for suspension. Some climbers use a ladder snap to carry their chainsaw, but that’s a different application.

Routine inspection procedure
Before each use, ensure that:
1. Hook keepers are free of burrs, are functioning properly, clean and not bent.
2. There are no cracks, nicks, distortion, rust or corrosion.
   (Author's note: I recommend that snap hooks be indelibly engraved with the date they are put into service. That way, in addition to daily inspection and the manufacturer’s forging date, you can track the length of service before forced retirement.)

Shackles
For our use, the shackle, also known as the clevis, looks sort of like a horseshoe with a bolt running across the open end. I’m not positive, but I suspect that shackles go back as far as forged-link anchor chain.

Most general service industrial clevis bodies are drop-forged from C-1035 carbon steel. Pins are usually alloy steel. Maritime shackles are available in corrosion-resistant brass and stainless steel, but we’ll stick with steel. Chain shackles are "U" shaped with parallel sides. The body of a chain shackle is longer than that of an anchor-type in the same size, thus allowing more "reach" onto a fitting.

Anchor shackles flare outward from the pin, giving the body of the clevis less reach.
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but more interior room. I've found the anchor shackle suitable for a Münter hitch belay when an HMS carabiner was not available.

**Pins** - The closing pin is usually available in the following styles:

- **Screw pin** - This is the more or less "standard" pin. They seem to be the most common in average industrial supply houses. The inside of the pin threads into the body of the shackle like a bolt. The outside of the pin is generally flattened to provide a more secure grip. A hole drilled through this section enables the use of a drift pin to coax frozen shackle pins open. A safety wire can also be passed through the pin hole if desired to prevent accidental opening.

- **Round pin** - A round pin looks just like a hitch pin. It's got an oversized head at one end to keep it from passing through the shackle and is drilled for a cotter pin or hitch pin at the other. When used with a cotter pin, it is generally intended for use that will not require frequent opening and closing. When used with a hitch pin, it may be too easy to open to be safe for much of the rigging work we use them for.

- **Safety pin** - The pin looks like a bolt. The pin is inserted through the body of the shackle and secured with a nut. For additional security, a cotter pin is inserted through the threads to keep the nut from backing off. You cannot get much safer than that. You also can't get much slower in taking one apart - but that's no reason not to use one if it's the best choice for safety.

**Shackle care**

1. Inspect body of clevis for cracks, burrs and sharp edges. The forging process sometimes leaves a raised edge. Smooth with a file as needed.
2. Inspect holes for sharp edges. I've been cut pretty badly by sharp edges left in the threading process.
3. Ensure that pin and body index perfectly. Discard if distortion makes pin installation difficult or impossible.

4. Keep pin and shackle threads clean. Lubricate with a dry lubricant like graphite.

**Setting the record straight** - Years ago, Sam Noonan and I would use a 1-inch shackle to create a larger bend radius than what we'd get if rigging through a ring or steel carabiner. Arborist blocks simply did not exist then as they do now in a range of sizes (and weights). Our design factors were more than high enough to compensate for the strength loss factor involved in the tight bend ratio offered by a 1-inch shackle. With a safe working load of 8-1/2 tons, shackle strength was never an issue, but rope strength is. We never had a problem, accident or failure, but I want to go on record here and now as no longer being in favor of the practice. With lightweight arborist blocks actually weighing less than a 1-inch shackle, there is no reason to "put the hurt" on your ropes like we felt we had to. We were pioneering new techniques in those days with only a few visionaries to light the way.
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Shackle talk

Shackles have a lot of use in tree work. You’ll find them on the heavy equipment, cranes, skidders, loaders, etc. They are heavy-duty applications, consult your cables. For advice on these and other for use with wire rope slings and winch generally the connecting link of choice. You’ll find them on the heavy equipment, sales rep for the hardware or the equipment you want to use it with.

The uses I want to write about are more in keeping with rigging equipment. Having started my career with shackles, I’ve spent plenty of time with carabiners and now I’m back to advocate a balanced use of shackles, screw links and carabiners as appropriate connecting links.

Rock climbers would find it burdensome or impossible to climb if they were weighted down with shackles in the quantity that they carry carabiners. We don’t have to worry about such a limitation. We drive to work in 2-ton trucks!

Screw pin anchor shackles, in my opinion, are a much better choice as a connecting link for much of our work than carabiners. As I see it, the major advantages of shackles over carabiners are:

1. Safety - You can’t “forget” to lock a screw pin anchor shackle. It’s either on or off. Shackles are not likely to vibrate open accidentally. You cannot inadvertently “trip” the pin open like you can the gate of a carabiner. There is one thing, however: Never allow a rope to run across the pin. If you calculate odds, you’ve got a 50-50 chance of losing the pin. Those aren’t good odds. If such an occurrence is possible, even remotely, use a safety shackle.

2. Strength - The average rescue carabiner has a proof rating of about 10,000 pounds. Our 1/2-inch example has a minimum tensile strength of 20,000 pounds.

3. Durability - What is there to wear out on a shackle? With a carabiner, you’ve got major and minor axis loading, a weak gate, hinge, latch and locking mechanism to worry about. You’ll probably lose a shackle before you wear it out. By the way, replacement pins are available from the best supply houses.

4. Variety - In addition to there being chain and anchor shackles with a choice of pin, they come in a range of sizes from 3/16 to 1-1/2 inch with safe working loads (5:1) from 1/3 ton to 17 tons, respectively. When rigging with rescue pulleys, carabiners, screw links and mountaineering lowering devices, I’ve found that 1/2-inch, 5/8-inch and 3/4-inch shackles are the most useful sizes.

5. Cost - Shackles need fewer shackles. The average rescue-grade steel carabiner is going to cost about $20. A 1/2-inch domestic shackle costs about $5!

The disadvantages are arguable. Compared to carabiners, shackles are heavier, bulkier and slower to open and close.

Rigging with shackles

I use them wherever I can and whenever the link doesn’t have to be taken on and off, over and over. I find they work great for such rigging duties as:

1. Linking rescue pulleys to slings.
2. Linking come-alongs and other devices to slings.
3. An interface between a sling and a carabiner. Let’s say you’re using a Figure 8 to anchor a speedline. The Figure 8 needs to be taken off the sling each time you want to reposition the rope. A carabiner or a screw link works best for that. I’ll put a shackle on the sling so I’ve got metal-to-
metal contact. This reduces wear and tear on the sling material and eliminates the possibility of snagging the carabiner on the sling.

(Note: The ISA book on Arborist Rigging will go into detail on actual applications. The main purpose of this article is to serve as a reference on the selection, care and maintenance of the equipment.)

Screw links

The original screw link was invented on the outskirts of Geneva, Switzerland, in the French town of Annemasse by the Peguet Company in the late 1940s. Called Maillon-Rapide (rapid-link) by the inventors, they are marketed in the United States as M-R links.

With the inevitable expiration of patent rights, devices resembling M-R links from other places, Taiwan, in particular, are on the shelf of nearly any hardware store, but they aren’t the same and this is one place where I’m going to make a biased pitch for the real McCoy. More about that later, but first...

Screw links are a vital step between a shackle and a carabiner. They are available in oval, extra-long oval, pear, delta (read triangle), square and semi-circular shapes. For most of our work, the ovals, pear and delta in carbon steel have the most practical uses. Links are also made in stainless steel and the same aluminum alloy that carabiners are made from.

As I did with shackles, it is helpful to compare carabiners to screw links on the basis of safety, strength, variety, durability and cost.

1. Safety - Although it’s easier to forget to lock a screw link than a shackle, the process is deliberate enough to become second-nature. The problem with a carabiner is the gate is closed whether the collar is locked or not, making visual inspection a little obscure. An open screw link is obviously open. Obvious hazards are easier to manage than obscure ones. You cannot say that an unlocked link "looked" closed.

Once locked, a screw link, in my opinion, is much more secure against unintentional, accidental or inadvertent opening. A properly tightened screw-lock carabiner should fully open when given a good spin with the thumb. An unwelcome stand-in for that thumb can be rope or webbing moving across the hand, but the length and pitch of the threads greatly reduce the risk of accidental opening.
2. Strength - Because there is no gate, hinge or latch, screw links have great inherent strength. A Stubai 10mm steel oval carabiner has a tensile rating of 3300-pounds. A 10mm M-R pear link has a tensile rating of 7950 pounds. A standard M-R oval weighs in at 14,600 pounds. The largest M-R link has a tensile strength of 44,090 pounds! Man, that’s some strong stuff!

Durability - Without a gate, hinge or latch, there’s not much to wear out on a steel screw link.

Variety - As described, screw links come in a wide variety of shapes, sizes, ratings and materials.

Cost - Like the shackle, the price and cost of a screw link is lower than that of a carabiner. My standard $20 carabiner replacement, the 10mm pear link, costs about $5.

Rigging with screw links
Like shackles, I use screw links whenever the convenience of speed isn’t the first requirement of the fitting to be selected. Like shackles, screw links are so strong, durable and inexpensive, I’ve tried to incorporate them to reduce my dependence upon carabiners to a minimum. A few uses for my favorite shapes are:

Oval - When using a cam-type rope adjuster like the Microjuster or Gibbs with a flipline, I use an oval screw link instead of a carabiner. Once it’s installed on my D ring, I don’t have to worry about it coming loose, as I have experienced with many types of carabiners in the same location. Only the extra-long ovals have enough clearance to permit installation.

Pear - Pear links are my standard carabiner replacement. I use them for specific purposes in rigging speedlines and mountaineering lowering devices.

Delta - The delta link is the only link designed to maintain strength in 3-way loading situations. I use a delta link on my Bry-Dan saddle instead of a carabiner at the tie-in. With a 5:1 safe working load rating of almost 2000 pounds, I like to use a 10mm delta link and rope that ensures that the rope is the weakest link.

Ratings
M-R links are given a Working Load Limit (WLL) that is 20% (read 5:1) of the breaking strength. It is up to the user to decide if the design factor needs to be increased for safe use. Working Load Limits as given are only good if the nut is fully tightened. Screw links are not designed for overhead lifting.

Another thing about ratings. The American Heritage Desk Dictionary defines tensile strength as “the resistance of a material to a force that tends to pull it apart, usually expressed as a measure of the largest force that can be applied in this way before the material ruptures.”

In my mind, that’s what it takes to break the test object. There are proof loads, tensile strengths, and safe working loads as defined below:

1. Safe Working Loads or Working Load Limits are calculated as a percentage of the known tensile strength that provides an adequate margin of safety.

2. Design Factor - Usually expressed as 5:1, 10:1, whatever, it is the percentage of tensile strength that permits safe loading. Traditional industrial Design Factors have been 5:1. My personal Design Factors begin at 10:1 and range to 20:1 and beyond.
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Before you start your next job, contact your local distributor to take advantage of the Wisconsin "benefit package".
3. Proof Load - A proof load is a test that requires an object to accept loading to a given level without malfunction. Many UIAA-approved hardware is individually proof loaded and tested before being sent to the consumer.

The Magnificent Seven
With the above information serving as my data base, it is easy to get confused by the spin that each manufacturer puts on labeling their test results.

Some manufacturers provide a tensile strength that gives you the point of departure to select a Design Factor suitable for your requirements.

Some manufacturers state the Working Load Limit, but you may have to look a little deeper to determine the Design Factor. Your need may require reducing the given Working Load to increase the margin of safety.

Some manufacturers list a tensile strength indicating the average load that caused a failure. Average means that a few products going out the door may fall below that number.

Use what information you can get, be conservative and add a couple of factors to compensate for the unknown. If you start with the standard 5:1 and add a couple, you’ll end up with the “Magnificent Seven” as your starting point.

Screw link care
There’s not much to do. Keep them clean and dry in storage and away from corrosive fumes and agents. Clean and lubricate the threads with a dry lubricant like graphite. Discard them if the thread-lock portion. I do not know if that is true of other brands. For what it’s worth, all other high angle practitioners use M-R links exclusively, when their need calls for links.

Accessory links
This class of connecting link is not a primary link like the carabiners, shackles and screw links are, but, for no other reason than to make you aware of the difference, they bear notice and mention.

Looking for all the world like baby carabiners, these small links are extremely handy for such duties as carrying keys and hanging tools, but they are neither rated nor designed for OPE and rigging applications. The fact that many are not much larger than a safety pin should be a clue.

We have to be careful about taking equipment from other high-angle environments without thoroughly understanding, questioning and adapting someone else’s accepted practice to our specific needs.

Carabiners are a popular connecting link for rock and rescue because they offer a reasonable compromise between speed, strength, weight and security. We don’t need to compromise. Exchanging a carabiner for a shackle or a screw link is one of the simplest steps that can be taken in the process of adapting high-angle techniques and equipment to the greater abuse and shock-loading of tree maintenance.
The Information Superhighway:

Basics of the Internet

By Richard G. Ensman Jr.

Pick up any national newsmagazine these days and you'll read all about the up-and-coming "information superhighway." From discussions of sophisticated fiber optic communication networks to the anticipated proliferation of cable television stations to vast electronic libraries, the superhighway seems to be on everyone's lips.

In conceptual terms, the superhighway - at least as presented by many of the world's communications conglomerates and the media - will be a massive electronic network, offering an array of entertainment, shopping, information and communication services to homes and businesses via computer or some futuristic version of the television set. When will this superhighway be built? It's coming soon, say the communication experts - 1998, 1999, or early in the next century, they insist.

But hold on. The information superhighway - at least an information superhighway - already exists. It's called the internet, a huge network of computer-based information and communication resources accessible to almost anyone with a computer. Whether the internet will be the precursor to the superhighway of tomorrow or remain an electronic road in its own right, the internet of today helps us understand what the information superhighway of the future will be like.

Where it all began
The internet wasn't formed as a highly accessible superhighway. It was originally established by the U.S. Defense Department in the late 1960s as a defense research network and a fail-safe communication system that could be fully activated in the event of war or public emergency. The internet was, and is, nothing more than a collection of huge supercomputers, telephone cable and satellite transmission systems that relay data to and from thousands of points across the globe.

It's important to remember from the outset that the internet isn't a "network" in the conventional sense. Rather, it's a "network of networks"; the internet consists of some 8,000 to 10,000 different computer services and networks, operated by government, industrial and not-for-profit organizations. Just as traditional highways can be accessed by a variety of secondary roads and access ramps, the internet can be accessed through any of these networks by anyone with a computer, modem and telephone line. As a consequence, its use has broadened considerably since the late 1960s. Today, educational institutions, business firms, researchers, computer buffs and people from just about every walk of life use the internet as a communications and information retrieval tool.

Once you're connected
Once you're connected to the internet, you're part of an electronic community consisting of well over 15 million users. You have access to an estimated 10,000 information sources and data bases covering every field of human endeavor. You can, at least in theory, gain access to libraries and experts in more than 50 nations around the globe.

Connect to the internet and you'll gain the ability to communicate with other users through electronic mail. You'll have the ability to transfer computer files to other internet users around the world. You'll be able to search information sources for articles, graphic and even original research material - and, frequently, pull the full text of the material into your own computer system with the touch of a few keystrokes. In short, you'll travel today's information superhighway - the most powerful information resource known to mankind in the 1990s.

Planning an internet trip
Because no one "owns" the internet, you can't obtain an internet "account" or "subscription." You can't even obtain an official "road map" to this vast superhighway.

For starters, though, all you need for a cruise on the internet is a computer, a
telephone, a modem and internet access. “Access” simply means that a network operator - a business, an educational institution, or an online information service such as CompuServe, America Online or Delphi, for instance - has assigned you an internet “address,” or code, that enables you to send and receive information via the network.

Access is much easier to obtain than you think. If you’re affiliated with an educational institution or major corporation, ask if you can obtain an internet address; you’ll probably be able to do so at no charge. Some colleges and universities offer “guest accounts” on their computer systems to community residents for a small fee; these guest accounts can usually be used to access the internet. Some metropolitan communities offer full or limited internet access via not-for-profit communication or computing organizations, or library systems. Search, of course, for a long access source; this will ultimately save you costly long-distance telephone charges.

If you can’t find a local organization that will provide you with access, you can easily subscribe to an online service, usually for under $15 a month. While online services may require you to pay some surcharges for internet access, the costs are usually quite modest. If you’re interested in this option, the names and telephone numbers of the larger online services are noted at the end of the article. Online services, incidentally, usually provide you with a local access number.

Your internet address will consist of “domains” - a series of numbers and letters that identify you, your host computer, the organization providing you access and the national affiliation of the organization. You’ll use this address to enter and navigate through the internet.

Maps and road signs
The internet, remember, is an amalgamation of thousands of different computers, organizations and networks. It’s not a menu-driven service that provides quick and easy access to every destination in the network, and there’s no one to call for advice when you get lost on your internet trip.

No one, you see, “governs” the internet. While the volunteer-driven Internet Society attempts to establish guidelines and protocols for internet use, it doesn’t have the authority or resources to make hard-and-fast rules, approve or disapprove of the content offered by the networks comprising the internet, or even build up-to-the-minute “road signs,” directing casual users to the breathtaking variety of destinations on the superhighway.

So let’s say you’ve got access to the internet. How do you find your way around? Here are a few suggestions.
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First, you can use one or more of the commercially published "internet guidebooks." These books list many of the popular internet destinations and provide the appropriate addresses. But these books can quickly become out of date since internet offerings and addresses change constantly and no one routinely reports these changes to any central authority.

Next come the internet discussion groups. These discussion groups, or "listservs," consist of 100, 200 or even several thousand people who are interested in a particular topic and systematically exchange ideas, data and chatter with each other through an elaborate computer bulletin board and e-mail system. If you belong to a group on international marketing, for instance, you'll almost certainly hear about a wide variety of internet destinations that deal with this topic from other members of the group.

Then come gophers. These electronic gateways provide simple menus to sections of the internet, directing you to your destination quickly and efficiently. Usually set up at specific internet locations or "nodes," like government offices, universities or business libraries, they allow you to navigate through topical collections of resources without a lot of guesswork or internet knowledge. A number of businesses and universities are developing other forms of menu-driven access tools; these will undoubtedly become more common in the years ahead.

As you become more proficient in navigating the internet, you'll accumulate a collection of addresses of special interest to you. Besides locating addresses as the result of your own internet travel, you'll find them in computer publications, professional meetings and even

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**Internet Access: The Superhighway On-Ramp**

If you want to cruise the internet, you'll first need access, preferably local access. Check with area colleges, libraries and not-for-profit agencies offering telecommunications services. They may be able to provide you with inexpensive (or even free) access to the internet.

Commercial online services also offer limited and full access to the internet, although some cost is involved. To gain access to the internet through an online service, you must be a service subscriber. If you want to learn more about these online services, here are the largest. Give them a call:

- America Online (800-827-6364)
- CompuServe (800-848-8199)
- Delphi (800-695-4005)
- Genie (800-638-9636)
- Prodigy (800-776-3449)
routine business correspondence. Friends or acquaintances may pass internet addresses along to you. All of these addresses could - and should - become part of your personal internet address book. They'll allow you to get to your destination of choice within a matter of seconds.

The internet is a vast network of electronic roads, boulevards, dead ends and circles that seemingly take you everywhere - and nowhere. The more addresses you collect, the easier your internet trips will be.

Where all roads lead

No one knows whether the internet will gradually evolve into the much-touted information superhighway envisioned by elected representatives and industrial leaders, or whether other superhighways will be sponsored and constructed by public and private sources.

But some trends are readily apparent. First, the traditional differentiation among media will soon be a thing of the past. Whatever form the superhighway eventually takes, users will almost certainly be able to make telephone calls, watch videos, search data bases, read electronic magazines, shop and exchange written messages from a single electronic receptacle - a cross, perhaps, among the traditional computer, telephone and television set.

Second, tomorrow's superhighway will be much easier to navigate than today's internet. While the sheer size of the superhighway will make a "master menu" all but impossible, new navigational software will be available to help both serious and casual users locate - and reach - destinations quickly.

Third, the superhighway will give people from all walks of life access to an incredible array of communication and information resources. Business leaders will obtain data on market trends and conditions through the network each day. Employees will use the network to communicate to each other. Sales reps will use it to market products and services. Children will use it to complete homework assignments. Tomorrow's superhighway will offer thousands of electronic newspapers and magazines, continuing education to people in their own homes and offices, huge electronic shopping malls, online conferences, and much more.

Finally, and most important, tomorrow's information superhighway will touch everyone. Business people, government leaders, educators, children and consumers will all be traveling on the superhighway, obtaining and exchanging information, buying and selling products, meeting new people, living life.

The internet is already here, and the technology already exists for a dramatic expansion - or realignment - of this vast roadway. Already you can take trips to thousands of destinations with a few strokes of your fingertips. As the years progress, your fingertips will hold even more power, as they access the huge band of fiber optic cable, satellites and computers that will comprise the superhighway of the 21st century. Then, your fingertips will take you wherever you want to go, anywhere in the world.

Richard G. Ensman Jr. is a freelance author based in Rochester, New York. He specializes in business and management topics.

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Cash Flow & A New Truck

A re-visit to Nimble Tree, Inertia Tree, and their new trucks

By Susan B. Haupt

Before you buy, you need to determine whether purchasing a new truck is feasible. Last month we reviewed the effect of buying a truck on the profit of two companies.

Nimble Tree is an active company that uses its equipment on a regular basis. Inertia Tree has equipment that is too often parked in the yard, not out on a job. A 5-year analysis of the projected income and expenses and resulting profit, or lack thereof, was done for both companies.

October’s Profit Analysis showed that the truck used on a regular basis by Nimble Tree would be a good investment. Inertia Tree’s truck, used infrequently, would not earn enough to justify its purchase and would be an ill-advised investment.

In addition to the analysis done last month, it is also important to determine how spending a large sum of money will affect your available cash over the long term. A cash flow analysis will give you this information.

A month-by-month review of the flow of income and expenses for your business for at least the past year should help you to find answers and should give you an understanding of your cash flow. Knowing the seasonal peaks and valleys of available dollars allows you to plan how to pay your major expenses: taxes, insurance and loans, as well as your company’s routine expenses.

We all recognize that fuel is essential every day to operate equipment. Think of cash as the fuel that is essential every day to operate your company. Analyzing and understanding the flow of cash into and out of your business will enhance your ability to manage money.

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There are several main differences between a cash flow analysis and last month’s profit analysis. Generally, profit deals with taxable income for a given period. Depreciation, a major expense, is part of a profit analysis.

A cash flow analysis deals only with actual dollars received and actual dollars spent. Depreciation, an accounting function, does not affect the dollars you receive or spend. You do spend cash for the total amount you pay for the original purchase of equipment. (Nimble Tree and Inertia each paid $5000 cash for their trucks.)

The total amount of your loan payment - principal plus interest - is also included in cash flow. The profit analysis included only the interest portion. Principal is not a deductible expense and so does not affect profit, but does affect cash.

The two truck cash flow analyses, Schedule A for Nimble Tree and Schedule B for Inertia Tree, are based on the same data used in last month’s article and deal only with the income and expenses that are attributed to each company’s

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**Reviewing cash flow year by year gives you a general understanding of how a truck purchase affects cash.**

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truck. Line I for 1994 includes the $5000 cash each company paid for its truck. It is entered as $-5000 because it reduced the amount of each company’s cash. No other company expenses, such as overhead costs and taxes, are included in this analysis.

For ease of presentation, the two cash flow analyses have been done on a yearly basis. Reviewing cash flow year by year gives you a general understanding of how a truck purchase affects cash.

What the analyses show

These two analyses demonstrate in a different way the same thing as last month's profit analyses. Nimble’s truck earnings exceed its expenses. Its positive cash flow is available for other company expenses such as overhead for sales, clerical and administrative expenses. Investing in this truck will benefit this company.

Inertia’s truck does not even generate enough income to pay its costs. If it can’t earn enough to support itself, it obviously can’t support company overhead. Each month Inertia has to find other dollars to cover this deficit. Where would this money come from in your company? Probably out of your own salary. Why would you want to buy a truck if it is going to be a constant drain on your cash?

Cash affects your ability to pay your company expenses. Profit affects your taxes. Both profit and cash affect your ability to stay in business, to grow and to prosper.

At the end of five years, both companies will have paid off their loans, thus reducing their outflow of cash by $600 per month. This would eventually put Inertia’s truck in a positive cash position. Better yet, it would make Nimble Tree’s operation even more profitable.

Many companies are able to survive many years of poor cash flow and still become successful, profitable, respected firms.

The purpose of doing an analysis of proposed equipment investments is to help you understand what you are doing ahead of time. If you know when you buy that your investment may not support itself, you won’t have to wonder why you are so low on cash, or why you fail to show a profit. If you know what you are doing, you won’t have unwelcome surprises.

What’s ahead

Next month we will look at another way of analyzing the consequences, positive or negative, of purchasing new equipment: the cash pay back period.

Susan Haupt is senior vice president of the Haupt Tree Company, Sheffield, Massachusetts, as well as a management consultant. She is vice president of the National Arborist Association.
Alcohol Testing To Take Effect

Employers must implement program for employees with CDL

By Brian Barnard

Starting January 1, employers will be required to implement an alcohol testing program if they had 50 or more employees who carried a Commercial Driver's License (CDL) as of this past March. All other CDL holders will be covered as of January 1, 1996. This new testing will be in addition to the drug testing requirements already in place for drivers holding a CDL.

Drivers must hold a CDL if the vehicle they are driving is in excess of 26,000 Gross Vehicle Weight Rating (GVWR) or combination of truck and 10,000-plus-pound trailer exceeds 26,000 GVWR. Drivers must also carry a CDL if they operate vehicles designed to carry 16 or more passengers or those carrying hazardous materials requiring placards.

The legal blood alcohol limit for driving a commercial vehicle is .04% or greater. This threshold is half the limit in most states for illegal driving of a passenger vehicle.

Employers must either send employees to a medical facility that offers alcohol testing, or have an employee on staff trained to administer the alcohol test.

The new rule requires alcohol testing in the following circumstances: pre-employment; post accident; random; reasonable suspicion; return to duty; and follow-up after a positive test.

To comply, employers must either send employees to a medical facility that offers alcohol testing, or have an employee on staff trained to administer the alcohol test. Firms with less than 50 employees will have a much easier time complying with the alcohol testing rule when it affects their operations in 1996. They can simply send employees to the medical facility where their drug testing is now performed.

For the larger firms that are affected January 1, the challenge of compliance is greater. It is not always feasible for these firms to send their employees to a single facility because crews are often spread across a large geographic area.

These firms have three options to comply. The first is to contact medical facilities where employees may work to coordinate alcohol testing. Many medical facilities are gearing up to help clients comply with the alcohol testing requirements. Again, because of revolving worksites, this option may not work.

The second option is to have an employee trained to administer the testing in-house. This entails purchasing a DOT-approved breath analyzer (prices start at approximately $1500), and having an employee trained in a course that follows National Highway Traffic Safety Administration curriculum. Such training will consist of classroom instruction, hands-on testing, calibration of breath analyzing machines and an overview of regulations.

Another alternative is to hire a private firm to do all of the coordination of testing and record-keeping. This will also pose certain challenges. To get a random drug test, a sample is drawn and sent overnight to the private testing firm for analysis. Alcohol testing must be done with a breath analyzer, so mailing the test is not possible. The CDL holder must either be tested on site or travel to a facility with an approved breath analyzing machine. Many private firms are working with local facilities to coordinate the alcohol testing.

For additional information on compliance requirements and training options, contact one of the sources noted here:

1. Your local medical facility
3. National Safety Council, Central Region, 800-621-7615; Northeastern Region, 800-432-5251; Southeastern Region, 800-441-5103; Western Region, 800-848-5588.

Brian Barnard is Government Affairs specialist for the National Arborist Association.
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Custom Truck Gives Right Lift

Lars Anderson has owned and managed a tree service in Lyme, Connecticut, for 12 years. He performs all types of tree work except line clearance. He was searching for an aerial lift that was customized to his needs, but not finding what he wanted, decided to build his own.

He started with a used 1983 International 1900 truck chassis and a rear-mounted Hi-Ranger 52-foot working height boom. The aerial lift was completely rebuilt three years ago.

Anderson chose a truck with a short wheelbase for maneuverability. He designed the protruding rear deck as protection for the aerial basket when backing up. The unit’s cab guard, front and aft decks and large tool box were fabricated in his shop. The rear deck corners were boat-tailed so that workers wouldn’t run into them in tight quarters.

Rope bollards were added at waist height on each side on the rear deck to anchor lowering lines. The ladder to the aerial lift bucket is pinned so that it can be removed. Flag-holders were added to the outriggers. Even the truck lights were recessed into the deck to create a tangle-free work area.

The lift is powered by a 12.5-horsepower Kubota diesel pony motor linked to the bucket hydraulics via a shop-built direct drive transmission. The engine is rubber-mounted to the deck, and its control panel is mounted under the deck at waist height. The truck engine and pony motor operate from the same fuel tank, a convenience that Anderson appreciates. He claims the pony motor saves $80 to $100 a week in fuel.

Anderson figures that his total cash outlay for his custom lift was between $15,000 and $20,000. “Of course,” he admits, “that doesn’t include all my hours in the shop.”

Share your innovation with TCI and we will pay you $100. Submissions become the property of TCI and are subject to editing for grammar, style and length. Color or black-and-white photos are welcome. Entries must include the name of a company and a contact person or they will not be considered for publication.
Managing Your Finances

Following these procedures can help you stay on track to profitability

By Howard L. Eckel

A manager would never send a crew to a job site without a work order containing complete instructions, equipment, and all the tools necessary to complete the job satisfactorily. Yet, due to the lack of financial tools or inadequate financial data, many managers/owners in our industry feel, and rightly so, that they are not able to manage their business effectively.

Business is not a spectator sport, yet many managers find themselves almost sitting on the sidelines, frustrated, while their businesses fail to achieve the sales or profits they anticipated. Individual jobs appear to make money but there doesn't seem to be any money left at the end of the month. Perhaps a specific course of action or goal is chosen, but then it is difficult to track progress. Existing financial data does not indicate specifically what is wrong, and certainly not why. Or, results are received too late to take corrective action. Sometimes the goal is missed completely.

I am not an accountant. My experience has been primarily in sales and operations management. However, as an operations manager, particularly of diverse services in scattered locations, I learned some basic concepts. One is that anything we do or don't do - action or lack of action - can be quantified by some type of numerical system. For instance, if we price a job incorrectly or the crew has a production problem, the result will eventually show up in some sort of numerical data.

I learned that to be an effective manager, I had to go where the bad news was. In order to be successful, I had to key in on the problem areas first before getting involved in the fun things. I also learned that I did not like unpleasant surprises. I wanted some type of indicator to warn me that things might not be going as they should.

Asking the right questions

A manager plans, executes, and then monitors progress. If things start to go astray, the manager should ask some questions. It is difficult to ask the right questions if the financial data that supposedly quantifies actions is in a form that is not easily understood. Bookkeepers or accountants, not operations managers, accumulate the quantifying numbers representing our actions. I learned that I needed to explain to them what I wanted, in a format that I could use.

The accountants were cooperative, but I had to say: "I want the numbers, the financial information necessary to manage, in this, my format. You, the accounting function, may ultimately need the financial data in a different format from mine to satisfy professional or government standards. But, my financial management information needs come first or the business won't survive."

Without adequate financial data in a form I can use to manage, I will likely spend a lot of energy hoping things will turn out right. My ultimate destiny will be a result of hitting the target occasionally, if I'm lucky. Random shots fired frequently will usually hit something, but I have learned not to be put in the position of "ready, fire, aim."

The basic tools

It is essential to take control of your destiny by taking control of the format of the financial data you receive. That's the easy part. The hard part is determining what specific type of financial information you should receive and the form it takes. Understand that no amount of financial data will solve problems unless organized systems and procedures are in place first.

Therefore, before any numbers or data, I want everyone to have a job description and a list of specific responsibilities. I want them to have a copy of job descriptions for every other position in the organization. When you are in the business of selling and managing people, things go easier if the production organization is organized. As a manager, I find time is scarce. I do not want to have to repeat who does what, every day or week. Chaos is no friend of management.

I want a work order form that allows for a sufficiently detailed and itemized outline of work to be accomplished on the job site. (The National Arborist Association has compiled a complete collection of these forms which are available to its members.)

Next, I want someone to telephone the client within 24 hours of job completion. The purpose of the call is to determine if the work was accomplished to the client's satisfaction. If it wasn't, I want to be notified immediately. Corrective actions should be undertaken to avoid simmering dissatisfaction that leads to a receivables problem. When clients respond favorably and are satisfied with the work, they have, whether they realize it at the time of the call, agreed to pay the bill! Then mail the invoice.

Once all the arrows are going in the same direction and the clients are satisfied, you can concentrate on a few financial management tools.

The reports you need

You only need a few concise financial reports to manage the operations part of the business profitably. In fact, having too much financial data to analyze rodes time spent on the really important parts of the business: selling, supervising and managing the field operations.
What financial reports do you need? You will first need, on a weekly basis, a total of the previous week's billing and the month-to-date billings. You can then compare these numbers to a previously determined estimate of sales required per month to break even. If sales are way behind and production capacity cannot possibly produce enough billing before the end of the month, the result will be a negative effect on profit. While that is bad news, at least you know it in advance.

The next report you need is a listing of all accounts receivables that are more than 45 days old. You should be receiving this report every two weeks. If another salesperson is involved, the report should include that salesperson's comments as to why the account is overdue and what dialogue has taken place with the client.

The third report you need should indicate the accounts that are more than 60 days old. This report should be developed every 30 days and should include explanations of why these accounts are so far overdue.

Attention to receivables will keep working capital requirements to a minimum. Reduced working capital could mean less interest expense on bank loans during certain times of high cash outlays.

We may be arborists but ours is a service business. We sell knowledge and service. To accomplish our tasks, we employ people and equipment. We sell hours. Our sales or contract price depends on how many people and equipment hours will be used to complete a given contract or assignment. A report on how each contract job went compared to the pre-established hourly billing rate for people and equipment is extremely helpful. It can be a separate report or calculated on a copy of each individual invoice retained in the office. It should list salesperson, the foreperson's name, contract price and a time and material extension. It will only take a few minutes to thumb through invoices or look at a report comparing the contract price billed to the T&M extension. It won't take long to spot underpricing or production problems with a particular crew. (The National Arborist Association has samples of these comparison reports. They are available to its members.)

Once a month, a profit and loss statement should be developed showing the monthly and the year-to-date totals for labor hours billed, sales by services offered, variable production costs including payroll, payroll taxes, workmen's compensation insurance, total equipment costs, other operating costs, production employee benefit costs and general insurance cost. The other section of the statement - the fixed or overhead portion of the statement - should include all other costs. (The National Arborist Association has a chart of accounts and an accounting system format listing these categories for tree care companies, that is available to its members.)

Equipment costs are the second largest cost item on the profit and loss statement after labor. So every month, along with the profit and loss statement, a report should be prepared showing monthly and year-to-date equipment costs and hours billed for all production equipment. Any equipment that is carrying or did carry depreciation should be on the report. The report should list, by individual unit, the following information: costs for fuel/oil, repairs, insurance, depreciation, license
and total hours billed. From this information, you can determine the monthly and year-to-date hourly cost.

If we are selling hours, every unit should be billed to the maximum each month. If it isn't, then we need to determine if the equipment broke down, if it should be replaced or if it is really needed.

If possible, you should have a report comparing the current month, year-to-date sales, variable production and overhead costs with a previously prepared forecast of the current year's goals. This will help you to compare how you are doing to what you had hoped to be doing.

The forecast
The forecast should be in the same configuration as the profit and loss statement. A forecast is one of the best but most overlooked, under-used tools an operations manager can have. A forecast leads to asking all the right questions. Is everything on plan? If not, why? Is the forecast wrong? Sales off? Are actual or assumed costs off? What is out of kilter?

Why? What immediate action needs to be taken? What can be done to change the situation?

Comparing the forecast with the monthly and year-to-date numbers should dispel thoughts that next month will be better. In your dreams! Nothing will happen unless you ask the questions to determine exactly what is wrong and what corrective action should be implemented. A forecast helps you to ask the right questions.

After all of the above, as time allows, compare a previously prepared source and use of funds forecast with actual year-to-date cash generation and expenditures. Did you get carried away and purchase something before you had sufficient cash to cover it? The name of the game is discipline. Whether you end the fiscal year in June or December, there are only two good quarters and two not-so-good. We are a seasonal business. Plan your expenditures accordingly, when you have the cash.

These reports will allow you to be an effective manager, yet won't consume a great deal of time. The reports are not that complex to create. Any off-the-shelf spreadsheet software will accommodate them.

With the reports and procedures I have described, I can almost guarantee you will spend more time figuring out a solution to a problem than you will figuring out where the problem is. As the saying goes: “Once the problem is defined, it is 95% solved.”

Howard L. Eckel retired as executive vice president of The Davey Tree Company. He was general manager of the parent Kent and Eastern Canadian companies. He is the principal of Howard L. Eckel & Associates, consultants to the green industry, and the author of Growing and Staffing Your Business. He is an associate member of the National Arborist Association and a member of the International Society of Arboriculture. His address is P.O. Box 1197, Marathon, FL 33050-1197. Phone: 800-233-8510, ext. 444.

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There are two ways to work smarter...

**THE HARD WAY**

Work harder or work smarter? Some people think that's an easy question to answer. But there are hard ways to work smarter and there are easy ways. You could take accounting, management, government and other related courses, and in, say, five years, you'd be ready to take your tree care business right to the top.

Or, become a National Arborist Association member and tap into a source that has all that information ready for tree care companies. A source that doesn't have to reinvent the wheel every time a question comes up. A source that offers you all the experience of its staff and other members, to help you work smarter.

**THE EASY WAY**

Take a look at what members have in their business arsenal:

- **A Toll-Free Hotline:** Tree care answers to your tree care business and technical questions. When you need them.

- **Business Management Guidelines:** What would you pay for accounting, cost analysis, sales compensation and human resource guidelines that are already set up for tree care companies?

- **Federal Regulation Guidelines:** NAA members get the rules spelled out for them exactly as they relate to tree care companies. No more wading through page after page of government gibberish!

- **Safety and Technical Training Materials:** There is no other source that offers such comprehensive training programs at such a reasonable cost.

- **Networking with Peers:** You could find out how a tree care company similar to yours turned a problem into a profit center. Maybe you can't call another tree care company in your area with a question, but why not a fellow NAA member from across the country?

- **Better Group Rates on Insurance:** NAA searches out the best plans, then negotiates for you and executes "power buys" to keep the cost of insurance under control.

- **Better Advertising and Public Relations:** An ongoing public awareness program including events such as the National Arborist Day at Arlington National Cemetery, means that the NAA logo on your advertising and stationery carries more weight with cautious homeowners and businesses. Plus, the NAA offers an excellent array of professionally developed brochures and marketing materials at a fraction of what they'd cost you to produce.

So if you are determined to make '94 a banner year for your business, you can hit the books... Or, you can hit this toll-free number and become a member today! 1-800-733-2622

National Arborist Association, P.O. Box 1094, Route 101, Amherst, NH 03031  603/673-8952  FAX 603/672-2613

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TREE CLIMBING IS FOR TRAINED PROFESSIONALS

If you can't get to it safely you can't prune it or otherwise work in a tree. NAA's video orientation to ROPES, KNOTS & TREE CLIMBING provides:

- Essential information on the ropes, snaps, carabiners and saddles used.
- Basic instruction in the knots required for tree climbing.
- Various climbing techniques used for ascending into and working in trees.

All of the appropriate elements of the ANSI Z133-1994 are included.

NAA's video training programs make actual on the job training much easier. After viewing an NAA video a trainee can go into the field with basic background information. Repetitive viewing of NAA's video training program re-enforces the training provided in actual work situations.

Attendance sheets provided with this program allow an employer to easily document employee training which meets OSHA requirements. Tests are also provided to measure employee comprehension.

To order the ROPES, KNOTS & TREE CLIMBING video program please fill out the order form on page 68 or call the National Arborist Association Hotline at 1-800-733-2622.
**TEST YOUR KNOWLEDGE**

**CONNECTING LINKS**

1. What type of locking mechanism should a carabiner have to be used in place of a conventional climbing snap?
   a. Screw-lock mechanism.
   b. Twist-lock mechanism.
   c. Safety lock mechanism.
   d. None of the above.

2. What is perhaps the most important benefit of the carabiner with a symmetrical or asymmetrical “D” configuration?

3. Which type of load generally yields the highest minimum breaking strength?
   a. Minor axis load
   b. Major axis load
   c. Gate open load
   d. There is no significant difference.

4. Rope snaps must have a minimum tensile strength of:
   a. 540 pounds
   b. 1,000 pounds
   c. 5,000 pounds
   d. 10,000 pounds

5. For heavy rigging where strength, durability and cost are key considerations, which of the following connecting links is most ideally suited?
   a. 10 mm non-locking aluminum carabiner
   b. twist lock offset D carabiner
   c. one-half inch steel shackle
   d. a large M-R link, or screw link

6. What is the difference between “proof load” and “safe working load” as these terms apply to connecting links?

7. What is the strongest part of the carabiner?
   a. Spine
   b. Gate
   c. Body
   d. Latch

8. To prevent damage, the gate of a locking carabiner must be fully closed and locked before applying a load.
   a. True
   b. False

9. Non-locking aluminum carabiners are best used in overhead rigging systems where making repeated quick connections is important.
   a. True
   b. False

10. Generally, the larger the carabiner is, the easier it becomes to incur minor axis loading.
    a. True
    b. False

**ANSWER KEY**

1. C, according to people working on the 1994 revision of ANSI Z133.

2. The configuration shifts the load away from the weaker gate side and toward the stronger spine of the carabiner.

3. B
4. C

5. C - This was sort of a trick question in that no single connecting link is ideal for all situations, and many applications call for the use of more than one kind of link.

6. A proof load means that the device can be loaded to that weight without distorting or cracking, and safe working load is a percentage of the known tensile strength that provides an adequate margin of safety. Another way of thinking about it is that the proof load is a constant, but the safe working load might vary with the intended application and the margin of safety desired.

7. A
8. A
9. B
10. A

---

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See us at TCI EXPO '94!

Tree Care Industry - November 1994
Perseverance Pays Off

By Peter Moritz

The tree business is a lot like farming - the weather is either "for or agin" you. Last winter in the northwest part of Connecticut it was certainly "agin"!

In an effort to prepare for another slow winter, I decided to make a push for fall and early winter high-return work. A creative day of ideas resulted in the concept of running an ad campaign on our local radio station. As part of the ads, I decided that a catchy phone number would be brilliant; 567-TREE would be the ticket. Pretty boring, right? Read on.

I then contacted the radio station and put the ball in play. I then called the business office of the phone company and was given a confirmation number of my new number. In order to monitor the response to the ads, I decided to have a new line hooked up with the new number and rented a phone for this purpose. At the end of the campaign I decided that I would take the 567-TREE number and get rid of my existing number. No sense paying for two numbers when I only need one. Pretty simple, right? Read on.

I went and cut the commercials and sat back to wait for the calls - and money - to come in. Wanting to make sure that I touched every base before home plate, I called the phone company on my scheduled day of installation to make sure I was ready to strike.

Strike I did. The professional person at the other end of these magical devices pleasantly informed me that my new line was connected and was ready for use - the ball had made contact with the bat. By the way, she said as I was about to run for first, "We changed the number." The ball had somehow hooked foul. When I picked myself and the phone up from the office floor - which has about as much dirt on it as home plate - I proceeded to explain that a number change could not be done. After all, I had this brilliant ad campaign with my number as a feature and, besides, I had a confirmation number from the telephone company rep.

After a short discussion with this person, she gladly complied with my request to speak with her supervisor (I am appealing the call to the first base umpire), but not before she divulged an important piece of information: The phone company owns all numbers and can giveth as well as taketh as they choose.

Attitude and approach at this point become very important. Remembering my on-the-job training and experience of sales techniques as well as the lessons learned from my Dad - who has his own business - and the manners from my Mother - a minister's daughter - I pondered my next at-bat. Being on hold with soothing classical phone music helped.

Getting interested? Read on.

I decided that I needed an ally in the umpires' camp and worked my best stuff. The professional and pleasant person I dealt with next became a sympathetic and helpful ally. I hoped for the best - that the number was given to a residence and would be easy to change - while thinking the worst - that the number was sought after by a competitor. Of course, it was the latter. Not one to give up easily, I pleaded my case. My second swing had connected again and I was on my way to second. By 5 p.m., after at least 10 calls back and forth, the number was mine.

At 6 p.m., as I was on my way home, my pager interrupted my self-congratulating mood with a number I now knew by heart - The Phone Company, aka Umpire. "Peter, there's another problem." What else!

Apparently the competitor had purchased an existing business and had a letter on file that included 567-TREE as part of the deal. Sliding into second, I was called out. Never accepting defeat easily, I protested my position - professionally but aggressively. Relying again on old lessons, I listened as much as I talked. A number, although owned by the phone company, was given preference to the user if it has been active within 18 months. It was now 8 p.m. - the ump was tired and going home - the game was called because of darkness, but would resume early in the morning.

Before I could rest, I had to do some preparation for my next at-bat. Scouring old telephone directories - which I do whenever I am travelling to check the creativity of fellow arborists - I went as far back as the '90-'91 editions and found no ad with my 567-TREE. I slept pretty well.

The next morning my Ally/aka/Ump/aka/Phone Company Rep were on the line by 8:30. She starts later than I. I offered breakfast - she wanted a beer.

When I told her of my research, she replied that too many coincidences were occurring and that the whole thing was becoming uncommonly complicated. In other words, it was time for some divine intervention - the Legal Department of the Phone Company would sort out this sordid affair. Fair enough.

What about the ad campaign? Read on.

When you're on a roll, don't stop for anything - sell, sell, sell!. Read on.

I had already thought of a winning compromise - and presented it. The phone company could provide, free of charge - 1-800-49-ACORN. The name of my business is Acorn Tree Care, Inc. - first in most phone books, by the way.

My ally thought I was very clever and would try to get it done. I'm up at-bat again, bottom of the eighth - two outs - and nobody on. The score is still 0-0. The call/pitch comes in. What normally takes five days was done in one hour. I had safely hit a triple!

The ad is now running with 1-800-49-ACORN.

The 567-TREE and the results of the campaign will be determined in a later issue.

Read on.

Peter Moritz owns and operates Acorn Tree Care, Inc., in Litchfield, Connecticut.
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Lancaster, Pa.
Contact: Elizabeth Wertz, 215-795-2096

February 14-18
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TREE CARE INDUSTRY - NOVEMBER 1994
Don’t Take Chances; Be Aware of Electrical Hazards

Whether you are an employer or employee, you need to be aware of two safety standards from the Occupational Safety and Health Administration that apply to the line clearing, tree care and urban forestry industries.

The newly revised Electrical Hazards Awareness Program, put out by the National Arborist Association, will help familiarize you with these standards while assisting you with compliance.

Under the new regulations, employers must train their tree workers in electrical hazards awareness and document training as well as self-certify that their employees are trained.

OSHA’s Electrical Safety Related Work Practices, 29 CFR Part 1910.333, regulates residential/commercial tree workers who work within 10 feet of any energized electrical conductor during normal tree care operations. OSHA 1910.333 requires every employer to document that they have provided appropriate electrical hazards training for the field employees. An employee who is so trained then falls under the jurisdiction of the second OSHA standard.

OSHA’s Electric Power Generation, Transmission and Distribution Standard, 29 CFR Part 1910.269, the so-called Vertical Standard, requires anyone who by OSHA’s definition is engaged in utility line clearance to meet additional requirements. Appendix B of ANSI Z133.1-1994 outlines those requirements. Employers have until January 31 to certify that their workforce has been trained to comply with OSHA 1910.269.

While the materials and tests included in EHAP familiarize an employee with the OSHA standards and regulations, completion of EHAP only fulfills the training requirements for employer certification pursuant to 29 CFR, Section 1910.269.

To complete the EHAP and receive a certificate of completion, the student must watch videos (“Electric Hazards & Trees,” “Aerial Rescue”), pass the Home Study tests in the manual that is provided with a minimal grade of 85%, submit proof of aerial rescue performance, and submit current, acceptable proof of CPR and First Aid training.

Participants receive a Certificate of Completion. The certificate may be updated annually by attending a refresher training program. The employee must pass a review test, perform another mock aerial rescue, and review the videos, and keep CPR and First Aid training current.

There are some circumstances under which the training requirements discussed here would not apply. To determine your responsibilities as an employer or form information on EHAP and other programs, contact the NAA at 800-733-2622.

NAF Receives Grant For Study

The National Arborist Foundation has received a 50/50 matching grant to quantify the benefits of large tree maintenance. The results of this project will offer direct assistance to commercial arborists. With worksheets, brochures and informational videos, homeowners will have an improved understanding of the benefits of channelling funds toward maintaining the health of their large trees.

The National Arborist Foundation is the research and educational arm of the National Arborist Association.

ACRT, Inc., a training, consulting and research firm in Kent, Ohio, will carry out the research.

The primary objective of the project is to develop methods that quantify and demonstrate the aesthetic, environmental and economic benefits of large trees relative to maintenance costs to private tree owners.

The study will produce a worksheet that the arborist can fill in to show a client the benefits of proposed tree work. The worksheet will include pre-defined variables so that the arborist can estimate the economic and environmental benefits for an individual tree on a client’s property.
Tree Care Sales Top $2.5 Billion In 1993

Private property owners spent $1.5 billion on residential tree care in 1993, with commercial property owners spending another $1 billion, according to a survey sponsored by the National Arborist Association.

A sample group of tree care companies was surveyed by the American Research Group to determine trends in service on a quarterly basis, as well as to determine the market by region. The sample was taken from the total group of 14,700 tree care companies and 5400 government or municipal departments engaged in tree care. The sample excluded those engaged in timber harvesting.

It is estimated, based on returns, that in 1993: 13.8 million trees were pruned; 3.7 million trees were fertilized; 268,376 trees were cabled; 6 million trees were treated for insects; 1.6 million trees were treated for disease; and 1.6 million trees were removed.

A Gallup poll of the consumer market for lawn and landscape maintenance found that tree care was performed at 5% of the households in the United States (4.8 million, an increase of 33% from 1992).

Tree Pruning Guidelines Now Available

The long-awaited Tree Pruning Guidelines is now available from the International Society of Arboriculture.

Written and reviewed by a committee of top arborists and educators in the profession, the Tree Pruning Guidelines were developed to accompany the new ANSI A-300 Pruning Standards, slated to be released this fall. The Tree Pruning Guidelines promote practices that encourage the natural development and preservation of trees.

The 14-page book is designed to be used in the field as a handy pocket reference or to assist in training. Tree Pruning Guidelines can be purchased for $12 (U.S)/$10 for members. Add $5 shipping and handling in U.S., $15 elsewhere. Order prepaid from ISA. P.O. Box GG, Savoy, IL 61874, or FAX Visa/MasterCard orders to 217-355-9516.

In New England and the Pacific states, 10% of the households are buying tree care services. On average, the amount spent per household was $323.90.

The highest average sale was in the South, at $529, with New England second at $514.

Households with incomes of $50-70,000 per year accounted for 32% of all sales, with the largest average sale - $558 - being made at households with yearly incomes of $75-100,000. Half of all services were sold in urban areas with suburban areas accounting for 29% of the market for residential tree care.
Vermeer's new 1230 brush chipper shares many of the features of the 1250 model but is more compact. Designed for heavy-duty applications, the 1230 is 10.5 inches narrower and approximately 600 pounds lighter and features a Croft hitch for easy transporting. Power is supplied by a 76-hp Ford gas engine, an 81-hp Perkins diesel, or a 102-hp Perkins turbo diesel. The 1230 features Vermeer's patented auto-feed system which controls feed roller speed. The 1230 also has a heavy-duty, fold-up feed table for longer, heavier limbs and branches. Vermeer Manufacturing Co., 800-829-0051 in U.S.; 515-628-3141 outside U.S.

A new brochure, now available through Cummins Engine Co., Inc., features the company's oil products - Premium Blue and Premium Blue 2000. Cummins is the only diesel engine manufacturer that makes its own oil. The 12-page brochure reviews the features and benefits of both products. Introduced in 1992, Cummins Premium Blue 2000 is the first oil designed for today's high-technology diesel engines. Premium Blue oil, introduced in 1984, is so advanced that its original formulation has never been changed, even to meet today's rigid API service classification. Cummins Engine Co., Inc., 800-DIESELS.

Safety Storage, Inc., introduces its N-Series line of chemical and hazardous materials storage lockers. Available in six sizes, the prefabricated, movable steel lockers are designed for single or double tier storage. Units available with floor space up to 179 square feet and sump capacities up to 660 gallons. Standard features include continuously welded, heavy-gauge steel construction, secondary containment sump, removable steel floor grating, chemical resistant coating, and security locking system. Safety Storage, Inc., 2301 Bert Drive, Hollister, CA 95023. Phone: 800-344-6539; 408-637-5955; FAX: 408-637-7405.

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The Stihl BT 106 has a 2.1-cubic-inch (34.4 cc) engine which produces a maximum on-load drilling speed of 180 rpm. This model features a 41.5:1 gear ratio and will accept Stihl drilling attachments up to 6 inches in diameter and 27.4 inches in length. The unit weighs just 16.5 pounds without a drilling attachment and is designed for one-person operation. The lightweight BT 106 is ideal for farming as well as other commercial applications. Stihl, Incorporated, P.O. Box 2015, Virginia Beach, VA 23452-2015. Phone: 804-486-9100.

Ciba Turf & Ornamental Products announces that Alamo®, the company’s oak wilt and Dutch elm disease control product, is available in quarts. Alamo was previously available in only 4-ounce packages. Ciba also reduced Alamo’s price. Currently, Alamo is applied through tee jets inserted into the flare roots of affected trees. Extensive testing and use in many states has shown the effectiveness of the product in controlling oak wilt and Dutch elm disease, two of the most devastating tree diseases in the United States. Turf & Ornamental Products, Ciba-Geigy Corporation, P.O. Box 18300, Greensboro, NC 27419. Phone: 910-547-1160.

The Eagle 40, manufactured by AmeriQuip, is a trailer-mounted, articulated aerial lift with a 40-foot working height. It features positive bucket leveling, 360-degree continuous rotation and outstanding portability. At only 63 inches wide, it is ideal for indoor as well as outdoor use. Proportional hydraulic controls with neutral position interlock allow simultaneous two-function operation and complete feathering capability. Heavy-duty, quick-adjust outriggers are an integral part of the lift. The Eagle 40 is available with a gas engine or electric power. Eagle Aerial Lift, AmeriQuip, 1480 Arrow Hwy., La Verne, CA 91750. Phone: 800-824-9776, 909-392-2033. FAX: 909-392-4651.

Multitek now offers two John Deere engine power choices for its popular Model 2020 series Fuelwood Processor. Multitek recommends the Deere Model 3014-D to power the Multitek Model 2020SL. The 3014-D is a three-cylinder, low-noise, fuel-efficient diesel rated at 33 hp, featuring high water temperature and low oil pressure automatic engine shutdown. The Model 2020SL processor uses a lift arm to feed logs to the processor and production is rated at one cord per hour with one operator. The John Deere diesel Model 4019-T is a water-cooled, turbocharged engine rated at 54 hp. It will boost production to two cords per hour with a two drag chain logdeck. Multitek, Inc., P.O. Box 170, Prentice, WI 54556-0170. Phone: 800-243-5438.

The Rapco Terminator is superior for cutting stumps out of the ground. According to advance information during testing, Rapco’s ‘Terminator’ carbide chain is said to be three times more efficient and better than the company’s standard tough carbide used for high-impact applications. Rapco Carbide Chains, P.O. Box 5219, Vancouver, WA 98668. Phone: 800-959-6130.

The Shindaiwa PowerBroom consists of a rotating sweeper drum with 12 rubber-like fins. This drum is mated to a conventional Shindaiwa hand-held trimmer shaft and engine, and its design - light weight and balanced - makes it perfectly suited for moving everything from dirt and gravel to almost any wet material or liquid. The PowerBroom’s versatility should make it one of the most sought-after items in many markets, including construction, roofing, farming, etc. Shindaiwa, Inc., 11975 S.W. Herman Road, P.O. Box 1090, Tualatin, OR 97062. Phone: 503-692-3070.

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HELP WANTED

Applications are being accepted for climbers/sales reps for a growing tree service company located in central New Jersey. If you are an experienced and trained professional who is interested in improving your future, call 908-658-9090.

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Experienced climber and sales rep, in SE Pennsylvania. Foreman capabilities desirable. We do professional work, year-round, in every area of arboriculture and landscaping. Established for 34 years. Mail resume to Acme Tree Service & Landscaping, Inc., 203 Woodland Ave., Morton, PA 19070 or call 610-399-6868.

Relocate to Hawaii and work year-round. We are an established tree company seeking an arborist with climbing experience that includes rigging, pruning, shaping and working around utility lines. Aerial bucket truck experience is also required. Pay is based on experience with an excellent opportunity to advance to a supervisory position. Benefits include paid medical, dental, federal holidays, vacation, 401(k), and profit-sharing. Send resume with salary history and employment references to: Jacunski's Complete Tree Service, Inc., P.O. Box 4513, Hilo, Hawaii 96720.

We are a full service arboriculture firm with offices in the Midwest and the East Coast. With our continued expansion, we are seeking qualified arborists for production, plant health care and sales positions within our company. We consider safety, quality, production and communication to be the foundations of proper tree care. If you believe the same and wish to make arboriculture a career, we would like to hear from you. Send your resume with salary history to Carol Demski, do The Care of Trees, Inc., 2371 S. Foster Ave., Wheeling, IL 60090. Phone: 708-394-4220.

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Arborists/arborist trainees quiz. Do you like sales? Y/N • Do you like operations? Y/N • Do you like management? Y/N • Are you serious about your career? Y/N • Do you have the desire and drive to be the best in the industry? Y/N • If you answered yes to more than two of these questions, we want to meet you at TCI EXPO Booth #328. We've got the whistle and bells; see you there, Arbor Care! Phone: 408-153-5922, ext. 105.

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1990 GMC Topkick, diesel, with LR50 Asplundh chip box, cab guard, tool boxes, tool lines, $33,900; Vermeer model 206 stumpcr, $3700; Tree Farmer skidder, diesel with 42' Asplundh, tool lines, tool boxes, $19,000. Phone: 519-945-4385; after 6 p.m., 519-969-5451.


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Please use this form to order Ropes, Knots & Tree Climbing. Mail this form and payment to: National Arborist Association, The Meeting Place Mall, Route 101, P.O. Box 1094, Amherst, NH 03031-1094.

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November 94

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1993 VO-50 complete forestry package, 2000 miles, diesel, new condition, $63,000; 1988 VO-50 complete forestry package, 32,000 miles, diesel, excellent condition, $40,000; 1978 Ford 4x4 rear mount 50-foot Skyworker, good condition, gas, $18,000; 1985 Brigadier with 85 Prentice 120 L-10 Cummins dies. 8-sp. L.H. Custom-built body, 54,000 gvw, $36,000 1981 International cab over, 33,000 gvw, new diesel eng. & trans., with 1989 F-90 Prentice, low hours, excellent condition, $22,800. Community Tree Service, 508-256-0341.

Husqvarna & Poulan saw clearance - last month of mail order business - many sizes left - 242, 272, 394, 51, 254, 257, 268, 250, 180 and others; chains: 16" - $10; 20" - $12; some rope left. The Tree Barber, 601-373-6423 (Wayne) Jesus is Lord.

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A Sticky Situation

By James Tuttle

As I walked the apartment complex to bid the tree pruning, I remember thinking what a great and enjoyable experience this was going to “bee.” I had about five years of rope and saddle experience. However, this would be the first time that the trees were close enough and tall enough that it would be easier to go from the top of one tree to the top of another. The interior courtyard of the complex was an almost unbroken canopy, vastly different from the tree-dotted expanse of the plains of northwest Texas.

The residents really enjoyed watching the birds and squirrels. The maintenance man at the complex had built several two-sided boxes for the squirrels. The boxes were hung 20 to 30 feet high, in the first or second crotch.

One of the boxes had been colonized by a bee swarm a couple of years before. The management wanted the bees removed, and the maintenance man was really curious as to our plan. He offered everything from the use of an extension ladder to the name of a local beekeeper. We gladly called the beekeeper.

When the elderly beekeeper accepted the offer of the extension ladder and prepared to go up, I had a counteroffer. Since I already had two climbing ropes in the tree, I suggested that if he would tell me what to do, I’d go get the bees.

He gave me the smoker and explained its use. Then he gave me a 30-foot piece of ski rope to lower the hive. When I got within about eight feet of the hive, I started blowing smoke at the entrance and the bees began to swarm the hive and gorge on honey. By the time I got to the hive, some were already quite docile.

After tying the box with the ski rope and cutting the wires that held it in place, I began to lower the box, the bees and about 10 gallons of honey. None of this seemed to bother the bees very much.

When the box was about six feet from the ground, the knot slipped out of that slick ski rope and the box hit the ground. The bees got real bothered real quick.

They immediately swarmed to where their home had been. Coincidentally, that’s where I was. And some were no longer docile. As a matter of fact, they were really upset.

Fortunately, I was able to undo one of my snap hooks, swing clear and escape.

The beekeeper managed to salvage the queen and the swarm. I salvaged five gallons of honey and my composure. That was the last time I ever used anyone else’s equipment to do any rigging.

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You would have to go way back in time to BEAT our PRICES!

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James Tuttle owns and operates Tuttle Landscape Company in Wolfforth, Texas.

Do you have a story for From The Field? TCI will pay $100 for published articles. Submissions become the property of TCI and are subject to editing for grammar, style and length. Entries must include the name of a company and a contact person or they will not be considered for publication. Articles and photos must be received by the first day of the month for the following month’s issue.
When you attend a Mauget Micro Injection Seminar, you join a growing family of arborists and applicators who are concerned about tree health and the environment.

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