

# FOURWHEELING ACADEMY

## YANKERS AWAY



*Old yellow yankers away (top); in with the new Master-Pull round towline.*

*Photo by Harry Lewellyn*

By Harry Lewellyn

We should all carry one. I feel naked without mine. The only thing I took on my Costa Rica adventure was one. Whips and chains and cables and ropes and straps all work, but some of these things are better than others. I used to call my tow rope recommendation a yank strap. However, something new has just hit the market. Now there's a choice. It's made from round rope, not flat, yellow strap stock. Let it be known, "yanker" is what I'll call my preferred tugger from now on.

I use yankers to tug and tow one vehicle with another. The common denominator is what they are made from. Nylon is the key to their effectiveness, and also the source of concern and danger.

This is the first of several articles on yankers and their use. What follows will

introduce the new guy on the block — the Master Pull Towline. In the November-December issue, I'll address using them. The final article will reveal a subtlety or two with regard to handling and storing all kinds of rope-like things.

### WHAT TO BUY

Don't fall prey to the "Great American Big Numbers Misconception"; i.e., bigger is better. Buy something that will work for you. Don't go for big numbers that you can brag about. Go for what's practical for your size vehicle.

For most SUVs, I recommend your yanker be 20 to 30 feet long and rated at 20,000 to 30,000 pounds (strong). Much weaker and you'll break it. I've got a garage full of failed 20,000-pounders. Too much stronger and they have less of the

elastic quality you'll learn to depend upon.

It must have loops at both ends, not hooks. Hooks, if dislodged, can become lethal projectiles (cannonballs). There will be more on the dangers and safety of yankers next issue. On the traditional flat yank strap, I like the loops that are reinforced by doubling over existing material. The ones that have an extra reinforcing piece sewn in the loop are stiffer and more difficult to place in a tow hook, particularly the hooks with a mouse. More on mousin' around next issue. The round rope design I'm reviewing for this article uses a short tube of braided nylon to protect the loops (see above picture).

The common denominator, short or long, strong or weak, flat or round, is *nylon*. Nylon has a stretchy quality that

allows a 30-foot strap to lengthen considerably and not yield so much as an ounce of strength. It's this elastic quality that we'll learn to take advantage of when really stuck. Other materials like hemp, cotton, polypropylene and polyethylene weaken when stretched. Typically, these readily available highway devices are shorter (six to 12 feet long) and have a hook at each end. Avoid them like the plague! You'll hurt someone or something if you don't. They are easy to misuse in serious unpaved applications.

### ROUND ROPE

For a couple of reasons that will follow, for years, I've suspected round rope would make better yankers than flat strap. The photo (above) is of one of my first attempts with a round, twisted nylon rope.

Ropes and knots fascinate me and what's pictured is a traditional work of art. The ends are whipped with string. The loop, or eye if you hail from the



*Twisted rope and braided eye by Walt Travers*

*Photo by Harry Lewellyn*

nautical world, is beautifully braided (spliced) to become one with the balance of the rope. The purpose of the black line tracer will be explained two issues from now. Walt Travers of Camarillo, Calif. made these.

### NEW DESIGN

Emil Bjornsson, founder of Master-Pull Towlines, makes a dream-yanker. His superior product is now on the shelf. The rich tradition of the sea permeates his skills and knowledge. He worked as an Icelandic fisherman for many, many years.

The Master-Pull product that's under scrutiny is a 30-foot long, 7/8-inch diameter, 28,500-pound, double-braid, round nylon rope yanker. It has reinforced, spliced eyes at both ends and comes in a handy carrying bag. I chose navy blue. It's available in black, red, woodland green or brown, and either jungle or desert camouflage.

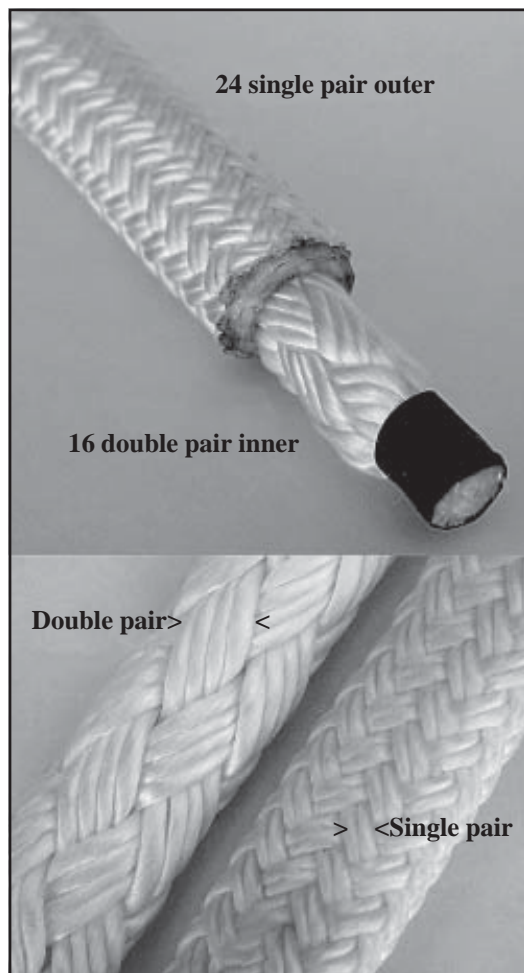
Double braid means one rope within another (see photo left). Both inner and outer ropes are tube-like, only one fits within the other. The outer rope is made of 24 single twisted pairs and the inner rope of

16 double pairs. According to Emil, "The inner rope provides most of the strength. The outer rope adds a little strength, but is mostly for protection."

When first received, I thought the eyes were of the simple Chinese finger-trap design. Since I'd seen many highway-type polypropylene ropes use this questionable technique, I doubted the reliability, but soon learned how wrong I was. The eyes are manually spliced into his topline. See the sidebar on the next page for how that's done.

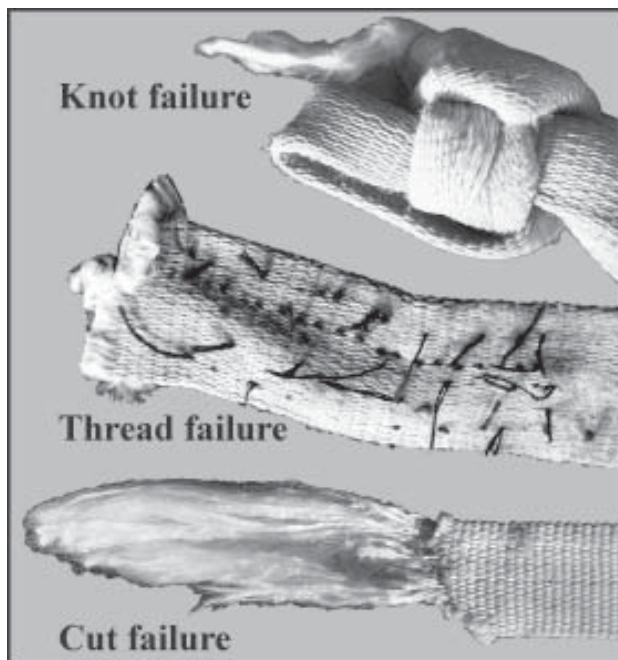
### INSPECT YOUR STRAP

Half of my garage is full of broken flat straps and the other half with failed ones. Regardless of design, before each use, inspect your yanker. You can do most of this with your eyes closed. Really! It's easy! Simply glide your hand over the entire strap. Voids, fuzziness and irregularities are your clue to inspect closer.



*Double braided rope*

*Photo by Harry Lewellyn*



*Flat strap failure modes*

*Photo by Harry Lewellyn*

Slipping your hand over a new yanker is reasonably safe, but be more cautious with used ones. Small embedded sticks and metal may draw blood before drawing your attention to their presence. I'll now open your eyes as to how yankers fail and

# SPLICED EYES

Eye-splicing is extremely labor intensive. Not that you really need to know, I thought I'd give you the inside scoop on how they are made. Maybe it's more like the inside-out scoop.

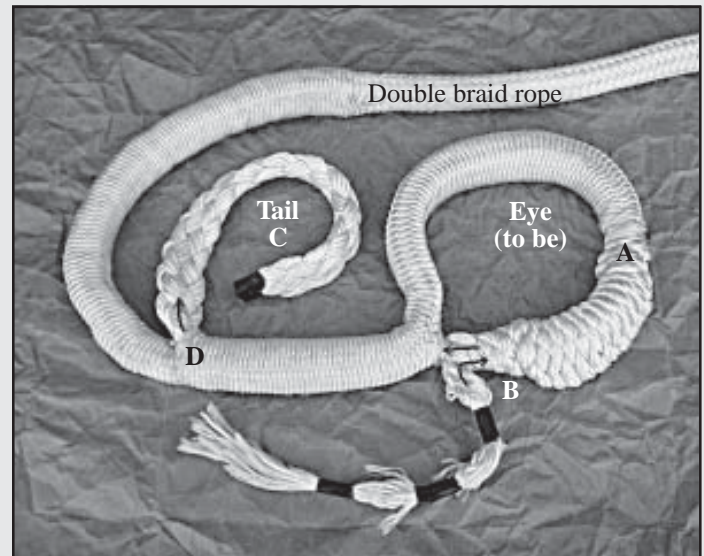
Remember double braid means one rope within another. One of the first steps involves literally turning a length of the rope inside out. The inside is first removed from within the outside. The (real) outside is now fed back into and through the (real) inside. This crossover point (inside-outside swap point) is designated A in the photo. This figure shows an eye under partial construction. For ease of photography, there is no reinforcing tube shown on this eye.

The tail of the outer, now inner rope is then tapered by selectively cutting strands in a very specific manner. This tail eventually gets pulled entirely inside the real inside, now functional outside, to the right. That happens at point B.

The eye is then reduced in size by pulling the inside tail (C) out and up until the crossover point (A) is just inside the real outside at point D. With more specialized cutting and tapering, tail C is also made to disappear within. But you ain't done yet.

Under tension, the eyes function impeccably. Under potential no-load mishandling, the eye could move, so a lock stitch (not shown) makes two passes through the entire rope at about point D. This insures the eyes stay put.

There are no machines that make this kind of eye-splice. The process takes special tools and skilled labor. Emil is very proud that he has not caved to the economies of offshore production. His product is totally America made, including the carrying bag.



*Double braid eye construction*

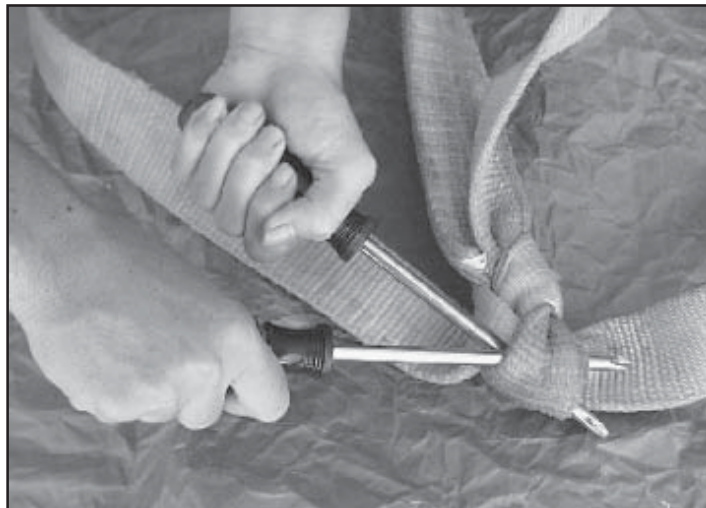
*Photo by Harry Lewellyn*

let you know why the Master-Pull Towline is better.

## FAILURE MODES

I have experienced four yank strap failure modes. One has to do with the thread that is used to sew the loop into a flat strap. Another is related to knots in flat straps and the most common is due to contact with hot or sharp things on either the tower or towee. The last is simply overstress misuse, which I'll address next issue.

I'm disappointed some loops are sewn with cotton thread. I prefer synthetic materials to natural threads in this application. Once wet, cotton thread seems to weaken; hence, the loop becomes less reliable. I think it has to do with shrinkage, just like in our blue jeans. Loops that have been wet, but now even dry, are weaker than loops that have never



*Untying flat strap knots is tough!*

*Photo by Harry Lewellyn*

been wet.

As you'll read shortly, knots reduce the strength of what they are tied in.

What crops up again and again are cuts and burns. Here, the yanker touches

something on the 4X that does damage. Sharp metal edges are everywhere and exhaust components can easily exceed 505°F, the nylon melting point. And unfortunately, more often than not, the damage is only partial, not total. With total failure, you can't use it. With partial failure, we're inclined to dangerously "give it a try," anyway. Here's what I do to prevent this common malady.

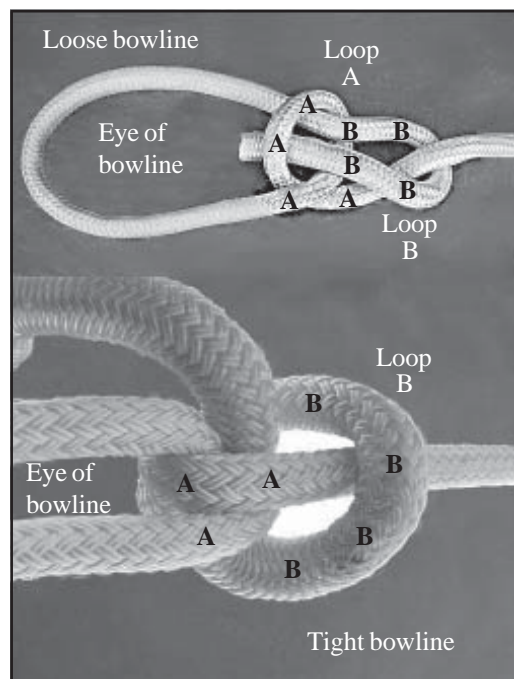
## YANKER PROTECTORS

Sharp and hot things under the 4X can cut and damage yankers. A damaged strap or rope is weaker and thereby more dangerous. I've got a way to prevent that.

I have two pieces of lower radiator hose that are threaded onto my yanker. These are visible on my flat yank strap

in the first photo. After the attach-loop is in place, and before I leave the installation, I inspect for potential yanker burn and cut contact points. When found, I simply slide the yanker-protector hose into place and tape it down. The sharp or hot metal now gnaws away at only the protective hose, not the vulnerable yanker.

I use lower radiator hose because it is typically tougher than upper hose. The



*Loop B always stays loose for untying.*

*Photo by Harry Lewellyn*

lower hose is on the suck side of the water pump and must be stronger to prevent collapse when hot. Go for a hose that has built-in reinforcing wire.

## STRAP LENGTH

My yanker is always the wrong length. It puts the tow vehicle right in a ditch, up a hill or just around a corner. I like to be directly ahead of or behind, on level ground. With flat yank straps, to make 'em shorter with knots takes caution and some skill. I'll cover makin' 'em longer in the next article.

## KNOTS WEAKEN ROPE

Be aware the rope books tell us knots weaken the material they are tied in, regardless of flat or round. As a rough rule of thumb, figure a knot is only half as strong as the base material. The books I have say a bowline weakens a rope by 35%.

The literature goes further and says, do not tie knots in flat straps. I have one flat strap that broke right at my bowline (see photo on p.3). I suspect knotted flat stock is even weaker than knotted round rope.

## NAUGHTY KNOTS

The typical, flat, yellow yank strap is a naughty, knotty nightmare. With the massive forces that are characteristic of serious, *get'em unstuck* yanks, the strap stretches, the knot tightens, never again to be untied. I think I could drive nails with some of the knots I've put in flat yank straps.

The only way I've found to untie tight, flat strap knots is with two screwdrivers. With hammer, I first drive one Phillips through the knot, without cutting or stretching the fibers. Then I pound another along side. Finally, with continuous back and forth action, I loosen the knot until I can finish untying it by hand (see photo p.4).

## NICE KNOTS

Master-Pull products are more knot-friendly and make knotted length adjustment a simple pleasure. Use knots known to be easy to untie after tensioning, like a bowline. Simply tie the loop where needed and stow the balance safely out of the way. Excess can temporarily be thrown in the SUV through the back window.

The real macho way to do it is "figure eight" it around the front bumper.

The figure shows a bowline in construction and another under tension. The essence of a bowline is that loop A tightens on the eye and loose end of the line while loop B remains loose. The bright white in loop B on the tight bowline clearly shows it is still loose. When relaxed, loop B is easily bent over the loose line and then untied, all by hand.

## TUG TEST

My poor ol' magnolia tree bore the brunt of my tug attack. To be fair, I looped a flat strap in series with the round one and yanked away. With this configuration, both received equal pull. There was no way one got tugged more or less than the other.

Both were identically strained, neither broke, and the results were mostly as expected. The bowline in the Master-Pull

untied easily and the flat strap required the screwdriver treatment. What surprised me was that the flat-to-round, interface "knot" was reasonably difficult to untie, too. You'd expect that a light push would untie a "loop-through-loop" attachment knot. But the flat stock mischievously resisted separation. Naughty knot or not, I primarily wanted to test stretch factor.

Again, Master-Pull revealed its superiority. It stretched easier. This means it will feel gentler when you really give 'em hell in a serious yank!

The flat strap material is more tightly woven than its round relative, and hence elongates less. Less give means immediate and more intense yanks. When you need momentum to get unstuck, more elasticity works better. Round is gentler.

The unstressed round strap measured exactly 30 feet long. The traditional flat strap was 29 feet, 6 inches long at rest. When stretched, round went to 34 feet, 4 inches while the flat guy only went to 30 feet, even. Longer means easier! That's 14+% stretch for Master-Pull and only 1.7% for the traditional flat yellow strap.

## ADVANTAGE ROUND

Master-Pull round towlines have three distinct advantages. Primarily, they can be easily knotted and unknotted by hand. That alone is enough for me to use it. Two, the eyes are spliced vs. sewn into the base material. No additional thread is used to make the eye. This all but eliminates this annoying failure mode. Third, the net (elastic, nondestructive) stretch is greater, which results in more gentle yanks. I also like the way a round rope stores vs. flat stock.

For the next several months, I'm offering the 30-foot, 28,500-pound Master-Pull Towline with storage bag for sale. It's a bargain. I pay tax and shipping. See our newsletter to order.

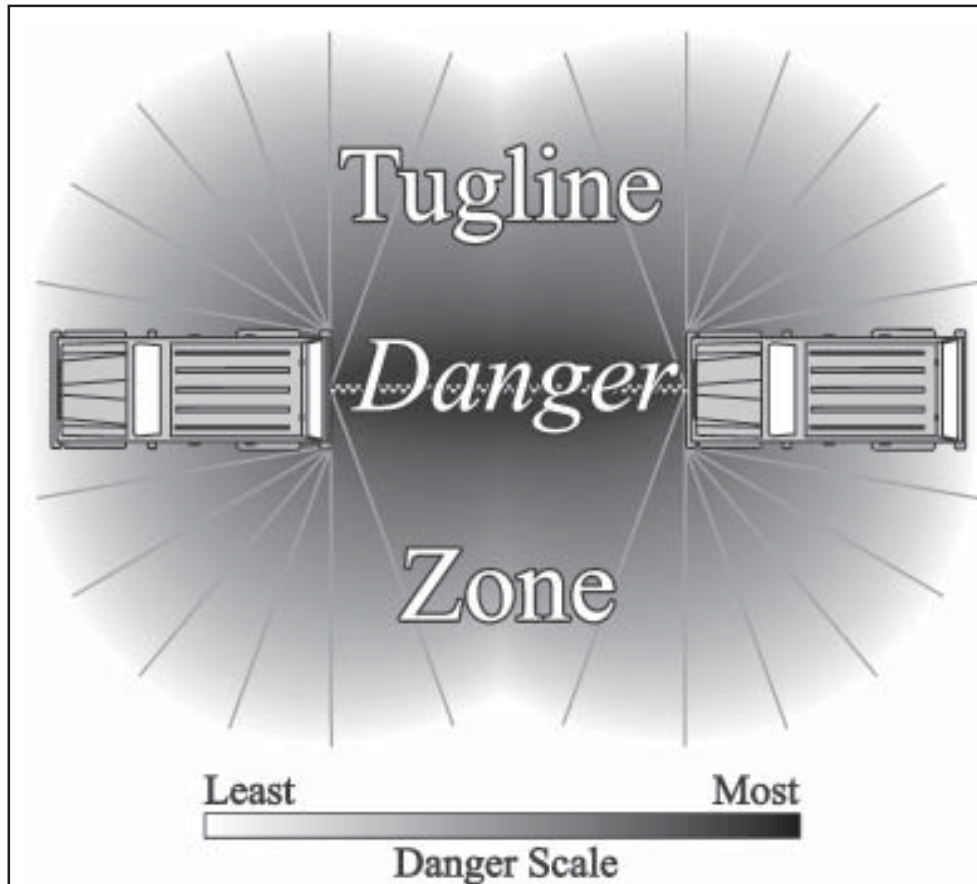
## NEXT MONTH

Next month I'll attack the process of towing and tugging. We'll learn how to hookem up, what to connect to, DOT holes, the "Coyote chain," mousing the hook, yokin'em up, pullin'em clear back to camp and about the cautions and dangers associated with towin' and tuggin'.



# FOURWHEELING ACADEMY

## TUGGING BASICS



**Figure 1** Relative danger in the tug zone

© Jan. 2000 by Harry Lewellyn

By Harry Lewellyn

### INTRODUCTION

Repeating from last month: "Let there be no doubt: Towing and tugging one vehicle with another can be dangerous. In your well-meaning attempt to help, you can do serious harm. And that should come as no surprise when you consider the size, weight, horsepower and rock-throwing tires on the vehicles we take off road. It is easier than you think to break parts and injure people when towing and tugging." Define, enforce and respect a *danger zone* encompassing the work area as shown in Figure 1 and explained in "Define the Danger Zone" on page 13. Tugging can be treacherous!

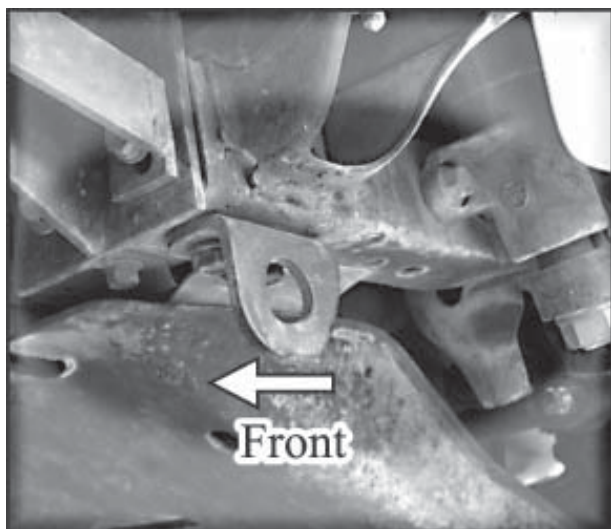
### TREACHEROUS TUGGING

If towing is dangerous, then tugging is treacherous. It requires a crawl, walk, and then finally the deadly "run" approach, only when absolutely necessary. To start off running, with little or no experience, is irresponsible. This article builds on two previous *FOURWHEELING ACADEMIES* and in no way should be considered a stand-alone source for tugging. I make frequent reference to *YANKERS AWAY* (September-October '99) and *TOWING BASICS* (November-December '99). So let's first chill your spine with a few horror stories, hear how others

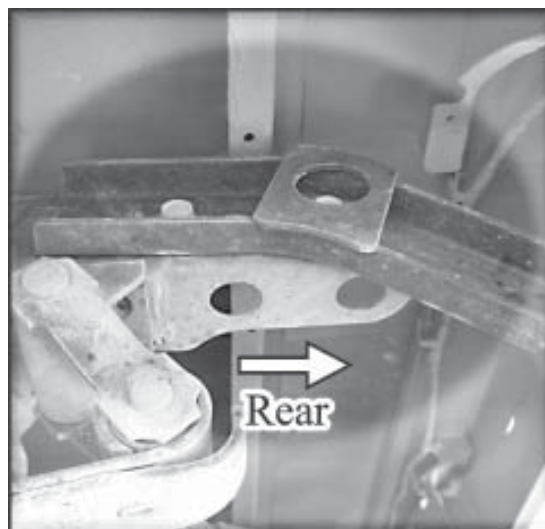
helped me improve *TOWING BASICS*, then get on with how to tug.

### HORROR STORIES

Tightly stretched things of any sort can be deadly ... if they break or come loose! How about a few wakeup horror stories of unknown origin? There's the one about the strap with a metal hook that broke loose from its attach point. The hook came through the pickup's back window and killed the driver with a blow to the back of his head. Same story, but this time through the windshield, with a trailer ball, in the face! Different strap, spectator too close, strap cuts off legs. Another version except this time it's the onlooker's



**Figure 2** Toyota "D-hole" front attach plate  
Photo by Harry Lewellyn



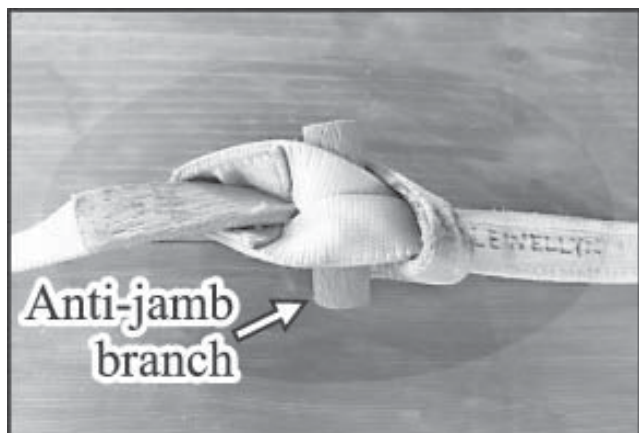
**Figure 3** Toyota "D-hole" rear attach plate  
Photo by Harry Lewellyn

head! Think of everything you use between two vehicles for towing or tugging as howitzer-size slingshots!

metals are crystalline structures and I should have more accurately said recrystallizes. He goes on to clarify that Department of Transportation

holes are only required on vehicles that will be carried on car carriers. He owns "Big Mama," the 4X Chevy Van that towed me up from Urique Canyon in the Copper Canyon complex (see Bury my Ford in Cerocahui, January '98). Actually, it's wife Cindy's regular transportation. Since it's a 2WD to 4WD conversion, it lacks D-holes in the front. That may be due to the 4WD mod or that it was never designed to be hauled on a car carrier. Finally, he points out that a slip hook, when attached

to a D-hole, puts the full stress on the hook. More on this later. Myrna Wosk (La Jolla, CA) noticed her Toyota had another kind of "D-hole" attach plate. See Figures 2 and 3 for two variations that I would be skeptical to use for an all-out tug. I have no idea how many different "D-holes" there are in the world and would welcome your enlightenments. These will be used to continually update Web material.



**Figure 4** Anti-jamb separator (untaped)  
Photo by Harry Lewellyn

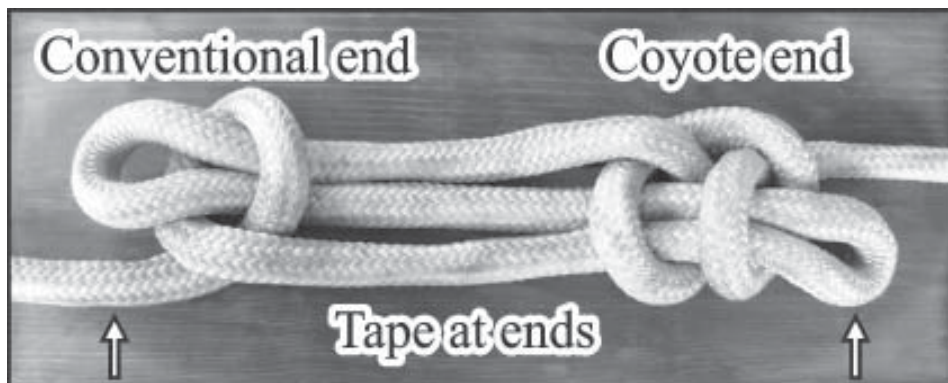
Here's a true tale of what happened to my lumberjack uncle with just a ridged cable. His log-towing cable breaks, snaps forward and wraps and crushes him to the open seat of his Caterpillar. Several months in the hospital straightened out a couple of broken ribs, arm and damaged internal organs. Taut things of any sort can be deadly if they break or come loose! Don't take tugging loosely!

**FEEDBACK**

Fellow engineer Ken Obenski, P.E. (San Diego, CA) had several comments. I may have misled you when I said, regarding welding tow hooks to the frame, "... crystallizes and becomes very brittle — weak." He correctly points out all

points out that a slip hook, when attached

"Loop-through-loops" drew comments from Frank Harris (Ramona, CA) and Jay Center (Mission Viejo, CA). Both suggested what I'll call an "anti-jamb" separator to join two flat strap loops. See Figure 4 and understand the last step would be to tape the anti-jamb in place (not shown). It would certainly simplify untying (have tested it) and I believe (never tested it) round material like a dowel or branch will stress the straps less than, say, a sharp-cornered 2x4 or other rectangular material. My only reservation



**Figure 5** Conventional and Coyote sheepshanks for shortening rope  
Photo by Harry Lewellyn



**Figure 6** A class III towing insert  
Photo by Harry Lewellyn

with this, as they both pointed out, is you've added a "cannonball" to the circuit.

Frank adds that a sheepshank is a nautical way to shorten a rope. Note I've shown the conventional knot (left end) and the Coyote version (right end) in Figure 5. My past experience with a trucker's knot (a half sheepshank of a sort) has shown the double loop (half hitch) approach withstands more stress. And with a little tape at the ends (not shown), you'll ensure either approach stays tied with and without stress.

Blaine Johnson (Dana Point, CA) suspects the class III trailer receiver pin through yanker loop may bend the pin (last issue, Figure 7). I've broken pinned yellow yankers and the pin remained straight, but have never tested round towlines. They would definitely centralize the force on the pin and could bend it. His comment brought to mind another towing and tugging class III insert. See Figure 6.

## TOWING AND TUGGING DEFINED

My crawl, then walk and finally run approach definitely applies to tugging. Don't be a jerk and go for the gold on the first tug. The balance of this article assumes you have the two vehicles properly attached to each other, both vehicles' paths are clear and the stuck vehicle is safe to move. Above all, make sure the brakes and steering work on both vehicles, and both drivers have calmed down from whatever caused the problem.

Towing is simply the process of taking the slack out of the yanker, applying power and hoping your *compadre* follows

closely behind. With a disabled 4WD, this would almost certainly be the case. But, if the other turkey is stuck, he may be more stubborn.

## CRAWL

Still within my definition of towing (pulling with no slack in the towline) is to apply horsepower until the tires spin. Depending on the traction, you may produce considerable force, but don't depend on it. Don't be surprised if the tires spin earlier and easier than you ever imagined! With proper attachment and the equipment in top condition, "crawling" danger is minimal. We've only begun to crawl.

## WALK

When you put slack in the yanker and try to snatch 'em out, you've entered the realm of tugging. Tugging begins with the process of introducing slack in the towline and driving off like a trip to the market, neglecting your partner is attached. Even with proper attachment and shiny new equipment, danger now enters the scene. You've just begun to walk.

## CAUTIOUSLY! RUN!

Once you introduce 10 or more feet of slack (arbitrary Coyote number) in the line and drive off like your worst nightmare is on your tail, you've entered the realm of running. This is very dangerous regardless of equipment, conditions or experience!

A running tug, yank, snatch, jerk or whatever you choose to call it is dangerous! Tugging is unforgiving! It demands attention to safety and detail! It produces unimaginable force on every element in the circuit! One neglected element blows the fuse! It makes about as much sense to ignore any tug detail as it does to moor the Queen Mary on a shoestring!

## PRELIMINARIES

As covered in TOWING BASICS: Inspect your equipment, attach only and directly to the frame, slide yank protectors into place, mouse the hooks and attach-chains, don't use yokes and take these additional precautions. Don't take shortcuts, but first, two simple basics!

## TWO BASICS

Here are two simple basics that will most likely be neglected until you really need them. Try very hard to get unstuck going straight and downhill. Turning offers rolling (more stuck) resistance. Next

time you're struggling along in the soft stuff, throw in a little turn. Don't be surprised if you slow down or get stuck. Straight is easier than curved, but don't drive off a cliff trying to stay straight!

Being the creatures we are, if we get stuck headed uphill, we'll most assuredly try to get unstuck in the same direction – uphill! Put Mother Nature to work for you, not against you. Real numbers: It is about 40% easier to get unstuck going down a measly 10° grade than it is to try up the same slope! I've seen situations where it's hard to tell which way is up on a 10° grade, but remember, Mr. Trapped could come coasting down into Mr. Jerk!

## PARACHUTE THE TOW/TUG LINE

Install what I call a parachute. This is a blanket, sleeping bag or other large "cloth" that will act as an airbrake if the yanker breaks. I've seen people use jackets, sweaters and floor mats, but I question these little things. You drape the 'chute at the middle of the extended yanker (Figure 7).

I have no data to validate this tradition, but for now, I see no reason to change it. The thought is that if the yanker breaks, the blanket and yanker will lock together and drag the lethal monster to a speedy, harmless halt. Some of the times when I've broken yankers, they have jumped out from under the blanket, or broke beyond it, and still sped along their merry way. But until I perform definitive tests, I practice and recommend you use a parachute.

## RAISE THE HOOD

Another recommended safety practice is to raise the hood on the vehicle that has the line attached to the front. This is most likely the 4X being towed, but who's to say the tugger isn't pulling backwards. And let there be no doubt, once force is applied, danger is present at both ends. The raised hood acts like a shield to keep a breaking line out of that driver's face. Use a parachute and raise your hood, but avoid the foolish alternative that follows.

## FOOLISHNESS

I've heard you can fill one-gallon plastic containers with water, thread the handles along the yanker and presume this will slow down the splintered strap. I haven't tested it, but I don't believe it! If you're truly talking about forces in excess of 20,000 pounds, I see plastic water bottles as either lethal cannonballs or stationary, handle-less containers at

best. I believe it would be the latter. If a handle will support 20,000 force-pounds, shouldn't it be able to support 20,000 pounds of weight? Can you picture lifting two or three 4Xs from one plastic handle? I can't! Forget the plastic bottle farce!

## CHAIN HOOK CAUTION

Your chain may be similar to the Coyote Chain I sell (see a newsletter). It uses transportation-quality chain and hooks, but it is not intended for an all-out yank. I suspect the hooks won't take

off to the side, visible and within earshot of both drivers. Both drivers should have their director's-side window down to ensure verbal communication.

## DEFINE THE DANGER ZONE

Define the danger zone for all to avoid. This applies to participants, spectators, pets, other vehicles and anything of value. My method is an overkill but, understand clearly, yanker break-forces are potentially lethal. I won't argue whether the yanker could do damage in every square inch of the danger zone, I'll only say it's definitely safer outside vs. inside this area.

Here's how to define the danger area. Mentally disconnect the yanker from one end, hold it taut and walk around the tethered end/4X. Do the same for the opposite end. This will draw out something like a figure eight. This is the danger zone. Only drivers and, when absolutely necessary, the director should be within this zone. See Figure 1 on page 10. Dark is most dangerous and if I could have made it red, I would have!

Another general rule is to avoid the towline even during setup. That means don't walk on it, over it and definitely don't straddle it. The assumption is that it could go taut at any time. The testosterone gender is naturally sensitive to and acutely aware of the dangers of straddling anything that could snap up between your legs!

## AVOID THE TOWLINE

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## HOW TO TUG

So a push by hand didn't work and a tow just smoked the tires. The yanker is safely attached and parachuted, the onlookers are outside the danger zone and the director is in place. One at a time, he calls to the front, then rear drivers, "Are you ready?" When both acknowledge, "Yes," the process begins.

First, give traction another try. Take out all of the slack and try a gentle pull. It's fair to give it a couple of goes, but you don't need to bury yourself trying. If crawl doesn't work, try walk.

Put a couple of feet of slack in the yanker and drive off like no one was attached. If slight progress is gained, do it again. It's completely OK to recover Mr. Stuck a foot or two at a time. It doesn't always have to be a one-shot deal. With no success, cautiously, **very cautiously**, try run.

Run gets progressively more dangerous. In essence, your 4X and movement add momentum to a traction-only tow. More slack and speed mean more momentum. The tug energy builds with the square of the speed. This means **20 MPH is sixteen times** more powerful than **5 MPH!** High-speed yanks introduce severe death and destruction potential. The yanker is like the energy stored in a giant rubber band. You can think of it roughly like smashing speed you reach. Your airbags go off at a 12 MPH impact! Thank you, Ken Obenski, for the concept and data.

## CHANGE SOMETHING

If two or three serious, all-out yanks don't work, I recommend you change something. Experience speaks.

A Suburban, San Felipe Sand Blast tour participant is buried to the frame in Baja mud. His massive weight had stuck him good! A full-size pickup's full-speed tug didn't work (plan A). We put two 30-foot straps in series only to break one strap (plan B). The nylon strap (only) went through the grille and seriously into the air conditioning/radiator. We paralleled two trucks and proceed to yank (plan C). Still no success! We switched to plan D. We jacked it up and put stuff under the tires. Three dirty hours later, the damaged Suburban was out.

The essence of the message is that yankers are great recovery tools, but not always the final solution. Don't kill yourself and others trying to perform the impossible!



Figure 7 Parachute employed on tow-/tugline Photo by Harry Lewellyn

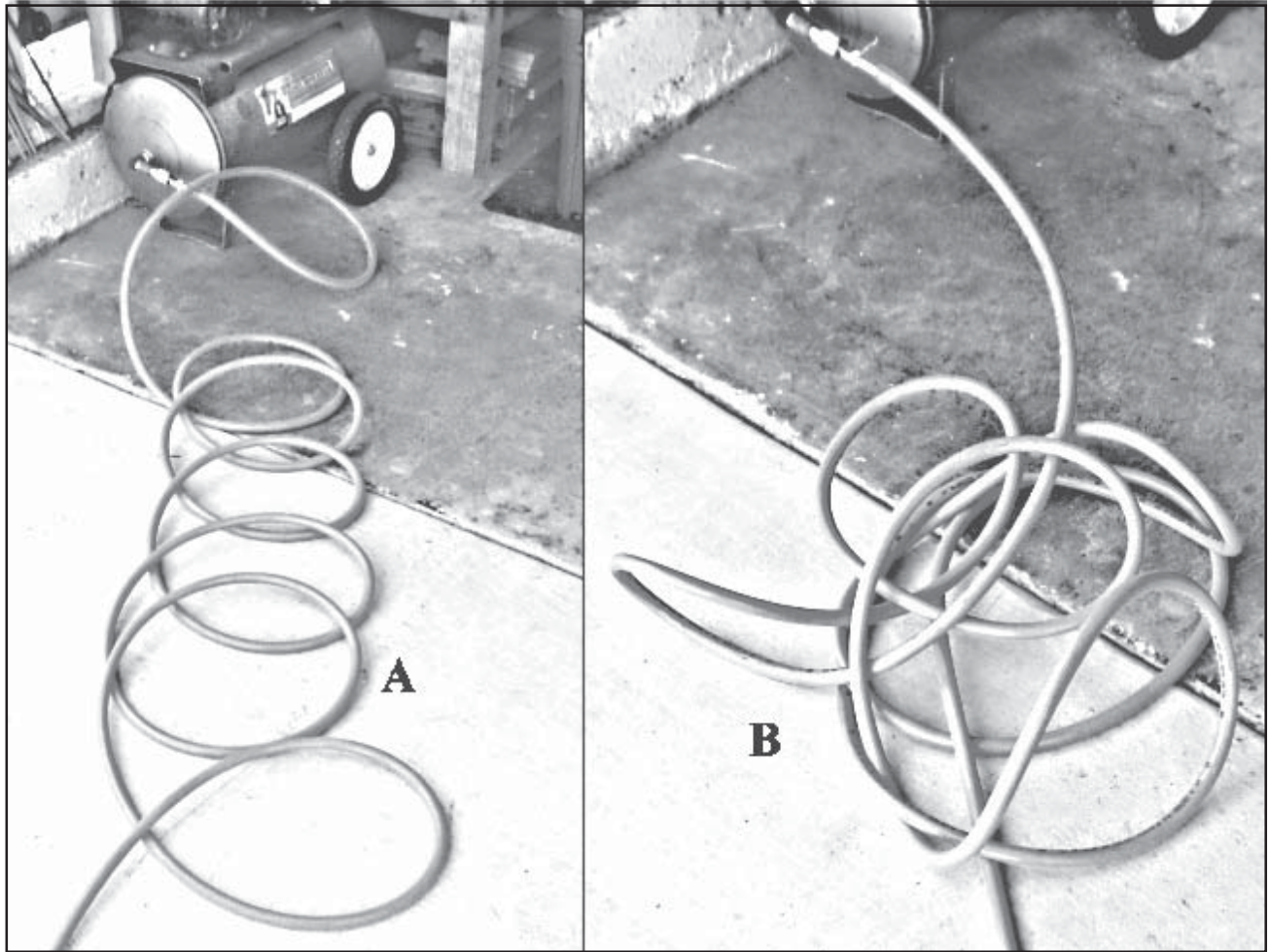
it! The stuck Suburban story that follows bears witness to the forces involved. Next time you pass by a Suburban, inspect the size of the front tow hooks. By the time the stuck Chevy was moving on its own, the hooks were considerably straighter!

## ASSIGN A DIRECTOR

You primarily need a traffic cop, a director, *un jefe*, in addition to two rational, competent drivers. This is someone who will clear the onlookers, check the connections and ensure both tuggee and tugger are alert and ready for action. He gives the go-ahead, narrates the continuing process and is prepared to immediately shut down the whole shebang if something goes awry. He should be safely

## FOURWHEELING ACADEMY

# Loose Ends



**Figure 1** Most coiled hoses and ropes end up in a mess like B above when uncoiled.

Photo by Harry Lewellyn

By Harry Lewellyn

This article ties up all the loose ends of the last three **FOURWHEELING ACADEMYS**: *Yankers Away*, *Towing Basics* and *Tugging Basics*. First, I'll correct a mistake I made, then present a little known rope-coiling technique that will end your kinky uncoiling problems as pictured above. Finally, I expose the sneaky yoke monster, as I call it.

### GRAB HOOK CORRECTION

(reprint corrected) Referencing *Towing Basics* (Nov.-Dec. '99), figures 9 and 10, I'm wrong. Emil Bjornsson of Master-Pull had called this to my attention in a telephone conversation and Marc Cooper drove home my error with several lengthy, well-documented e-mails. Figure 9 is the correct way to use a grab

hook and not Figure 10 as I wrote. As I've said so many times before, I do my best, but when you know otherwise, tell me! My objective is to provide the best information possible, even if it means admitting to the terrible W (wrong) word!

Marc points out that as shown in Figure 9, the hook is only bearing half the loop load. The other half of the

loop load is borne by the “chain-side” of the loop. Further, since the hook and the chain sides of the loop are almost parallel (no yoke monster effect — explained below), there is no reduction in the total load capacity of either the chain or hook.

He goes on to point out the Figure 10 configuration will choke (“slip knot”) down on the yanker and crush it. Not

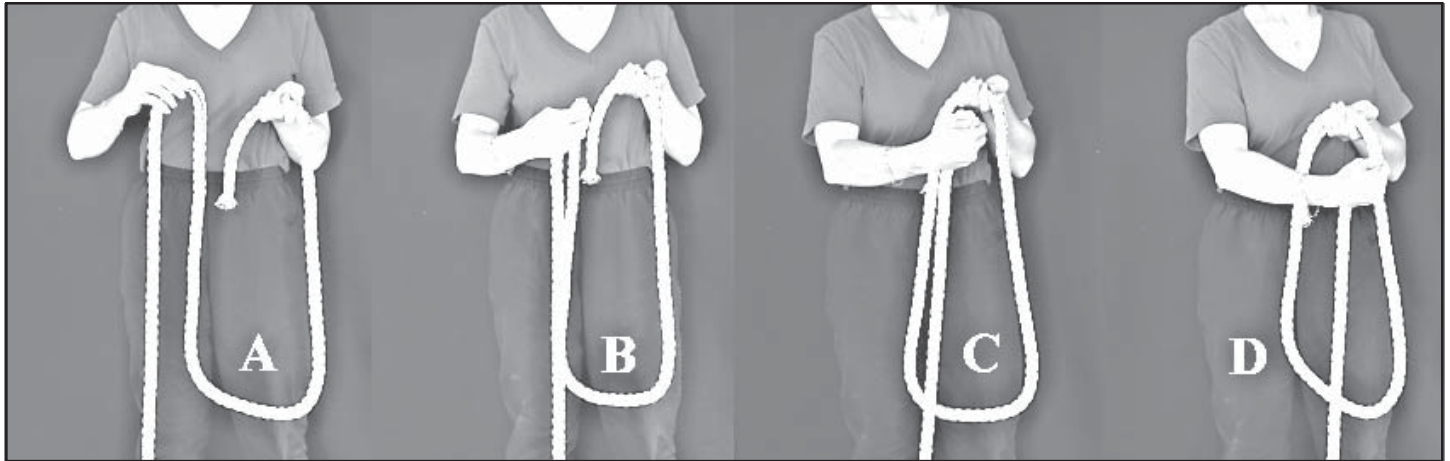
## UNCONVENTIONAL COIL

He was coiling his cables in a most unusual way. When asked why, he said, “Watch.” He pulled the cable completely from its coil without so much as a single snag. It lay absolutely flat and free before me. “Hey, I gotta learn that,” I exclaimed! He went on to explain that the last thing a movie unit wants is to

garden hose problems! Remember, Emil had been an Icelandic fisherman for years, so his experience is real-world based.

## CONVENTIONAL PROCESS

Figure 2 is a series showing the conventional coiling process. I used a large twisted rope with an added black



**Figure 2** Jenna begins to lay in the first loop in A. Note the wrist action in B, C and D. She has completed one conventional clockwise loop in D. Photo by Harry Lewellyn

too cool! He makes reference to the “Crosby” product guide ([www.slingchoker.com/sling2/index.htm](http://www.slingchoker.com/sling2/index.htm)) and [bbchain.com](http://bbchain.com) to substantiate his information. Thanks, Marc, for the enlightenment.

## CONVENTIONAL COIL

If you’ve ever fussed with uncoiling a garden hose, you’ve suffered kinking problems that are common to air hoses, ropes, cables, CB radio antenna coax and power leads, and yankers of all sorts. Pulled from a neat nest, the item will try to twist and eventually become a tangled mess (cuts off the water flow, in the case of the garden hose). My compressor air hose easily demonstrates this (see Figure 1A, ready to knot up, and Figure 1B, knotted). With flat, yellow yankers, it’s even worse. I discovered what follows while watching a professional audio technician on the “Adventure Crazy” (see the Travel Channel) shoot in Costa Rica.

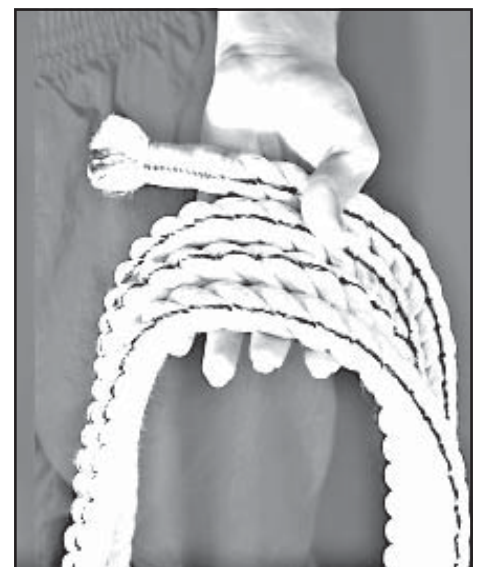
waste precious production time watching him undo cable catastrophes.

## OTHERS’ EXPERIENCE

I shared my discovery with a knotty nautical friend. He insisted centuries of seamen have always coiled a conventionally clockwise-twisted rope in the conventional clockwise direction and there couldn’t be a better way. I’d been taught the same thing when driving a truck decades ago. However, after seeing my unconventional coiling method demonstration, he acknowledged the results were flawless.

In another conversation with Master-Pull’s Emil Bjornsson, I related my discovery and he said, “What’s new, we have to do the same with steel fishing net cables or we’d kink and kill ’em the first time off the deck.” He called it an over and under coil. With next to no thought, I knew he was right on!

Follow Jenna’s right hand and note the flip-wrist “twist” action needed to coil the rope so it will



**Figure 3** This shows three conventional, CW loops. Photo by Harry Lewellyn

lie flat in the holding hand. Figure 3 shows a flat-lying rope in the holding hand with no crossovers.

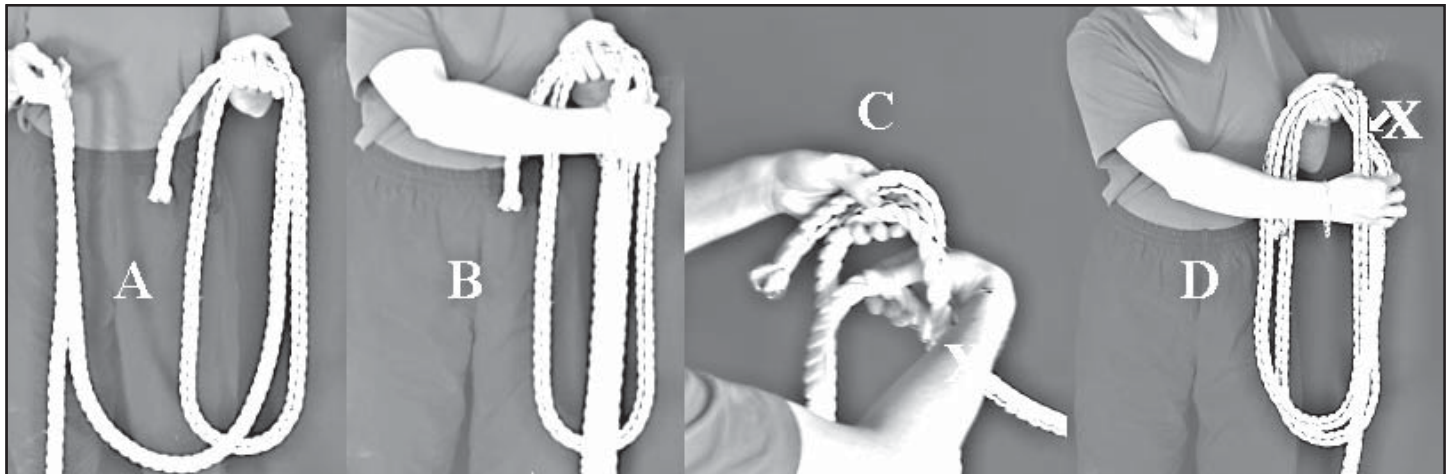
New method or old, I also slide my forefinger and thumb to aid the rope-twist action. With the conventional coiling process, the twisting action is always in the same (clockwise) direction. This is where the uncoiling problem lies.

is no problem when the loose end is free to twirl.

Try this to see what happens if both ends are fixed. Uncoil and lay straight and flat (no kinks) your garden hose while still attached to the faucet. Now go to the water delivery end and start to neatly coil the hose in your holding hand while walking toward the faucet.

It's not particularly easy to understand or do, so here's a blow-by-blow description.

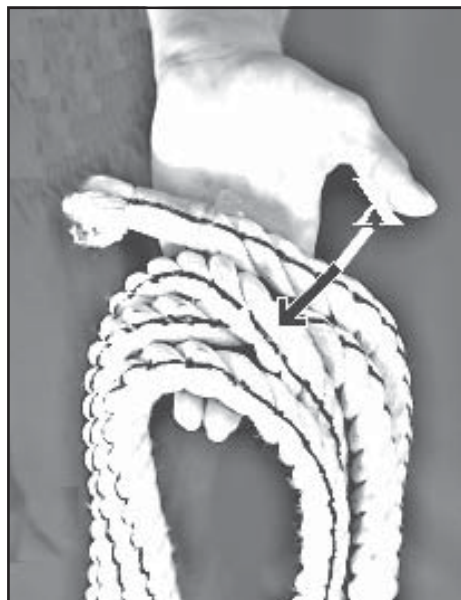
Lay the first coil in your holding hand clockwise (CW), as usual (Figure 4A). The next coil is laid in with a counterclockwise (CCW) twist action. In Figure 4C, note Jenna must acutely bend her right wrist and reach in under the



**Figure 4** Jenna has laid in the first CW loop in A. In B, she begins the first CCW (under) loop. Note in C she must cross under the first CW loop. D shows the under loop completed and X indicates the cross under in both C and D. Photo by Harry Lewellyn

## COIL TEST

Coiled as above, you have twisted the entire rope in one direction, which



**Figure 5** This shows three loops with X the under loop. Photo by Harry Lewellyn

You will eventually reach a point where you can no longer coil the chaotic, severely twisted and kinked mess. After you've mastered the unconventional method, try it again. You'll reach the faucet with no problem!

As already mentioned, Figure 1A shows my air hose partially uncoiled with the undesirable, unavoidable, accumulated "twist," just waiting to writhe like an injured snake into an awkward problem. This coil (Figure 1A — any hose, rope, cable, yanker, etc.) will eventually end up in a kinky, knotted mess as shown in Figure 1B if left unattended.

## UNCONVENTIONAL PROCESS

Figure 4 shows an alternative coiling method. Understand, in essence, what you are doing is alternating your "twist" action from clockwise to counterclockwise, then clockwise again and again. This action nets out to zero twist in the

first CW coil before the holding hand takes the CCW coil (Figure 4D). An X in Figures 4C and D locates the crossover. You can clearly see the remaining rope coming out from underneath the last coil in Figure 5. This is probably the reason Emil calls it the over and under method.

The third coil is again laid in CW (over), then the fourth CCW (under) and so on to the end of the rope. Your wrist/finger action alternates from CW to CCW twist. Note the unwieldy look of the crossover after just three coils in Figure 5. It takes an extra flip to get each CCW coil to lay in underneath. I recommend you learn this with string first. Having coiled as many ropes and hoses as I have over the years, I still find the new method very awkward. The key is to remember to alternate the twist between CW and CCW.

## UNCONVENTIONAL TEST

To test this method, I securely

clamped the starting end of the rope in my bench vice, dropped the coil, held firm the other end and walked to full length. I reached the end with no untwisting required. It works great!

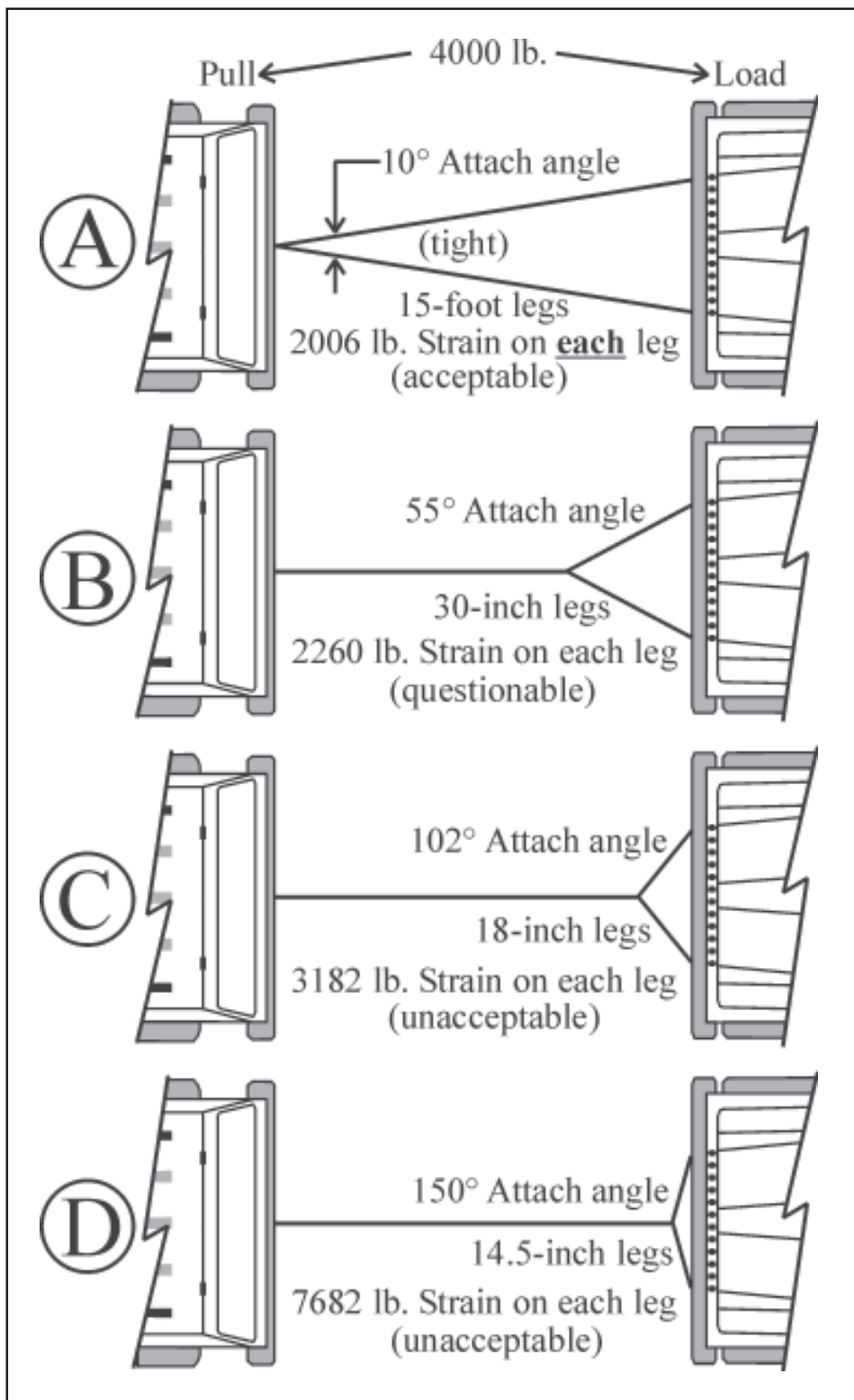
### YOKES AND SLINGS

I introduced and warned of yokes in TOWING BASICS (Nov.-Dec. '99, page 13). I once ran across a hardcore jeoper that had a chain tightly bolted parallel to, and from one end to the other on his bumper. I asked about its use. He was a chain and cable guy and thought he gained getting-unstuck advantage by being able to hook onto the chain at any left to right point. I tried to explain to the Chainman the yoke force he had created to no avail. What follows puts numbers on this destructive monster. The science and information is not new to those who use slings in lifting and rigging.

Figure 6 shows four typical yoke arrangements and the associated forces. I chose things you're likely to use for yokes like a yanker (A), tree saver (B) or Coyote chain (C). I assumed you have one hook at each end of the front frame rails. That measures 28 inches apart on my Explorer. I further assumed the vehicle to be a 4,000-pound load, as would easily be the case with bad mud. As the attach-point angle gets greater and greater, or the legs get shorter and shorter, note what happens to the strain on each leg. I particularly call your attention to the strain on the Chainman's setup (D). Understand the force monster can sneak up on you, so in industrial applications, OSHA and other safety agencies require slings be significantly derated. Further, for ease of presentation, the drawings are not exactly to scale.

### YOKE RECOMMENDATION

Keep the legs long and the attach angle tight. Assuming you have an undamaged standard 30-foot yanker, and the attach points are at about frame width, you're OK. As you widen the attach points or shorten the legs, the forces increase as you can see in Figure 6.



**Figure 6** The yoke monster becomes inconceivably large as the attach legs get short and the angle becomes broad! Photo by Harry Lewellyn

Where does all of this extra force go? It goes into pulling the two frame rail attach points together toward the center of the 4X. Keep it safe by only using yokes for towing and never in serious, all-out tugs.

