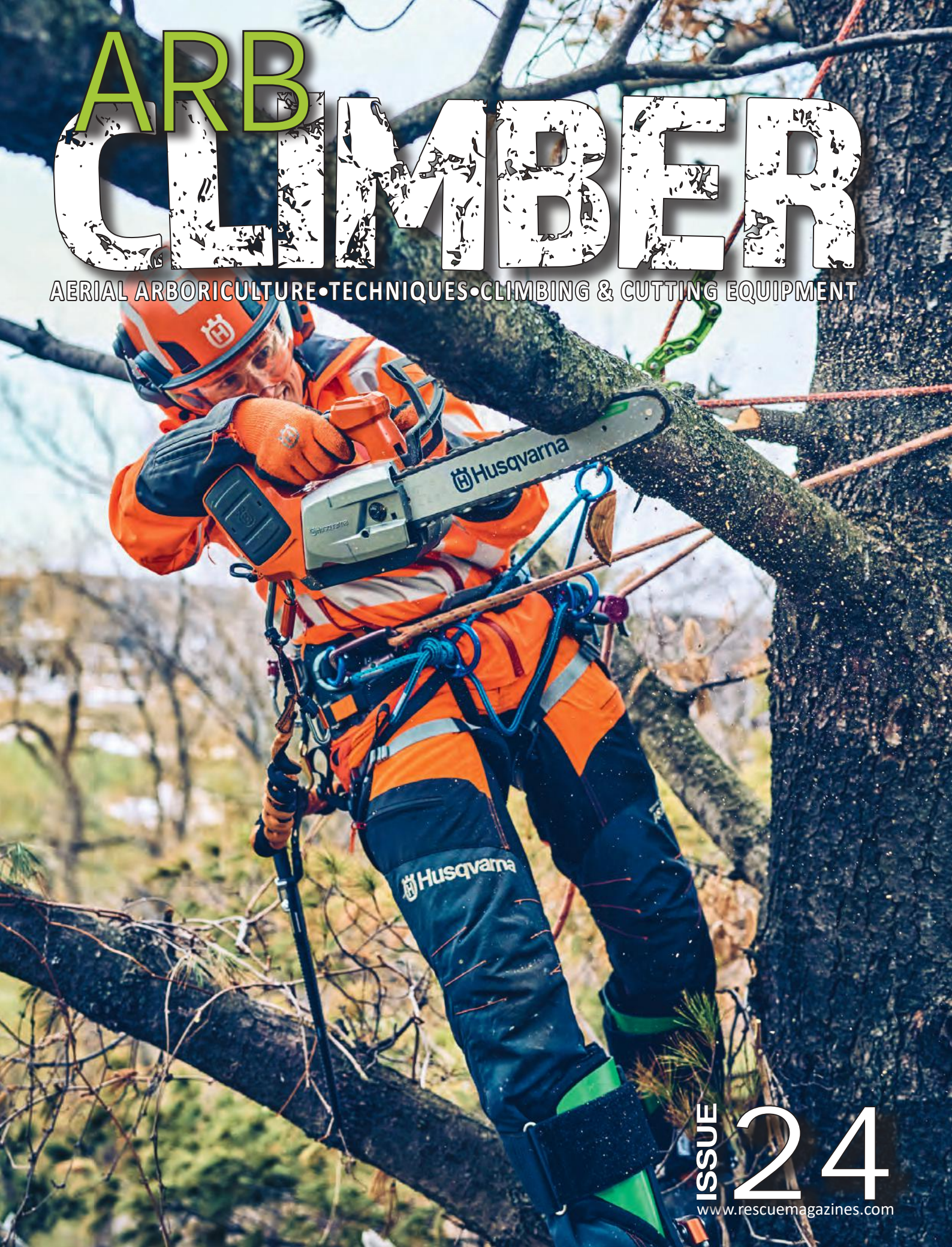


ARB CLIMBER

AERIAL ARBORICULTURE • TECHNIQUES • CLIMBING & CUTTING EQUIPMENT



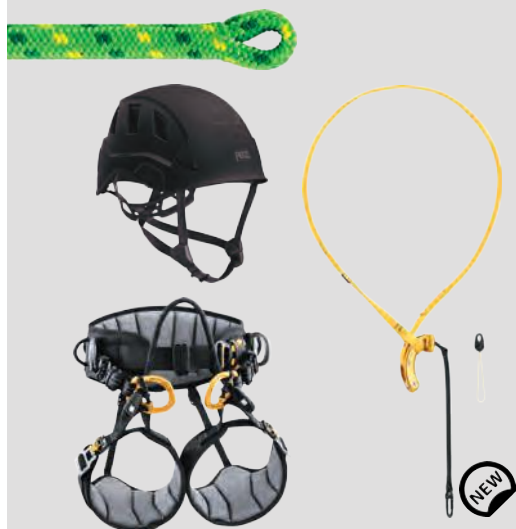
ISSUE

24

www.rescuemagazines.com



SCAN ME



A tree care solution which includes the new NAJA, a SEQUOIA harness, STRATO VENT helmet and a FLOW rope.
petzl.com

PETZL TREECARE SOLUTIONS

The new NAJA friction saver is easily retrievable from the ground and features an integrated high-efficiency pulley which facilitates rope glide at the anchor. The strap uses four different adjustment positions to adapt to different branch diameters and can also be expanded with additional straps. The included retrieval ball and MINO carabiner makes the system easily retrievable from the ground.



Access
the
inaccessible®

ARB CLIMBER issue 24

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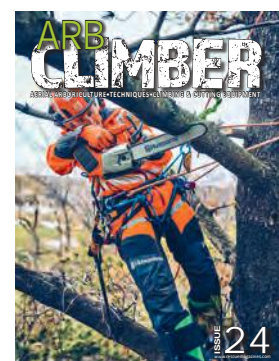
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unless otherwise credited



FRONT COVER:

Issue 24's cover, like #22 and 23 could be focused on many things, battery chainsaw, personal protective clothing, harness or rope and hardware, all of which is part of Husqvarna's burgeoning portfolio. But in this case it's their continued drive towards battery tool development and on page 10 you'll find the latest development.



Oops, we did it again.

We pioneered another game-changing chainsaw innovation.

Introducing the world's first battery chainsaw with a clutch. Stay in the cut longer – with added torque and exceptional cutting performance. Just like the inertia chain brake, Air Injection™, and AutoTune™, we expect the others to follow us soon. But they'll never beat the original.

Feels like gas, performs like gas, but with all the benefits of battery. **How's that for coming in clutch.**



Use rain or shine

IPX4 rating for most weather conditions



Easy to use & maintain

Instant on/off with less parts to maintain



Performance equivalent to gas

Power on par with 40cc engines



Active cooling technology

For consistent power and longer battery life





Husqvarna®

NEW

T542i XP®



NEW

542i XP®



“Wow, so much power – instantly.”

Krista Strating

Arborist | Ontario, Canada

SCAN FOR
EXCLUSIVE
UPDATES



DMM KINISI MAX

DMM have evolved from supplying hardware to producing the complete harness at our new production facility here in North Wales. Kinisi's patented 10mm rope bridge adjuster (left) provides easy configuration for comfort and optimised positioning. The rear restraint point (inset) on the back of the harness is easy to locate and doubles as a secure attachment point for a chainsaw lanyard. The two side rings provide work positioning attachment points. Two forward Ds (bridge-adjuster) provide suspension attachment points and can be positioned to suit your centre of gravity for comfort and manoeuvrability. Sliding aluminium buckles allow for smooth and hardwearing adjustment. Moveable webbing stoppers allow the use of personalised webbing lengths (inset). Maximum comfort and support. Webbing is woven through a supporting material and then padded with foam, providing comfort by spreading the user's weight over a large surface area. This structural webbing is then slimmed down where bulk would inhibit movement. All hardware is optimised to be textile friendly and reduce webbing wear. Replaceable components for enhanced lifespan. Users have the option to replace the pads, elastic keeper loops, leg elastics and loops, rear elastics, riser webbing, bridges, and bridge hardware.

In addition to EN358 & 813 - Independently evaluated to the requirements of ANSI, ASNZ, CSA and ASTM (except it has a rear attachment & some structural webbing under 41mm).

[ED: The much lauded Kinisi has arrived as the most expensive arb harness in Europe ever...to date. £650/\$850/€770 and what a magnificent beast it is although you would be forgiven for thinking that it looks mighty familiar. It is clearly a re imagining of the Teufelberger Tree-Motion reviewed later this issue with its mass of attachments). And there are two reasons for that - one is the Banksy-like genius of Treemagineers being behind the design and the other was the inter-relationship between DMM and Teufelberger that now appears to have ended - DMM have long been the metal-artists to beat when it comes to the coolest of designs but that artisan approach is hugely expensive so it would help to have a sugar-daddy to help cover the costs. We'll see. In the meantime, there is one clear reason why you would pay the most you've ever paid for a harness and that is the twin cams on the bridge D-ring that enable you to dynamically adjust the lengths of each bridge independently. The rope friendly ribbed cams are a brilliant innovation and coupled with a lovely rear restraint (not belay as we were told off for calling it) that's far too good to be a mere chainsaw attachment and buckles and metal-work that is just that bit nicer than your regular top-end harness and you have the makings of a Maserati SUV - bit more functional than the Maserati sports but far more style than a Dodge RAM. Most arborists are likely to want hardwearing functionality at a reasonable price over the ultimate in design quality and therein lies one of the problems with DMMs business model, they can be a little too flash for a generally down-to earth and budget conscious market.]





VAST CUSTOMISATION OPTIONS

- Customisable rope and webbing bridges. Available in a variety of different terminations and lengths.
- Removable webbing stoppers. Webbing lengths can be shortened to the user's requirements.
- Bosun Chair compatible. Eyelets on the forward Ds can be combined with the Bosun Chair kit.
- Attachment slots for non-PPE upper assemblies.

DMM COMPONENT COMPATIBILITY

- DMM harness accessories. Pre-cut holes allow use of XSRE carabiners, Stowaways, and the Caiman.
- Multiple storage solutions. Gear brackets allow use of the Vault range and Parking Lot.
- Harness attachments for restraint according to EN358. Rear restraint point can be used with classic DMM hardware such as the PerfectO, Ultra O, and AmericanO.
- Harness attachments for work positioning according to EN358. Side rings can be used with classic DMM hardware such as the PerfectO, Ultra O, and AmericanO.
- Harness attachments for suspension and work positioning according to EN813. Forward Ds are compatible with DMM connectors. Rope bridges work with a range of hardware including Anchor Rings, Ultra O, Axis Swivels or the Rigger Pulley. Webbing bridges work with Anchor Rings, AmericanO, Compact Shackle, and Axis Swivels.

COST: £650 \$850 €800

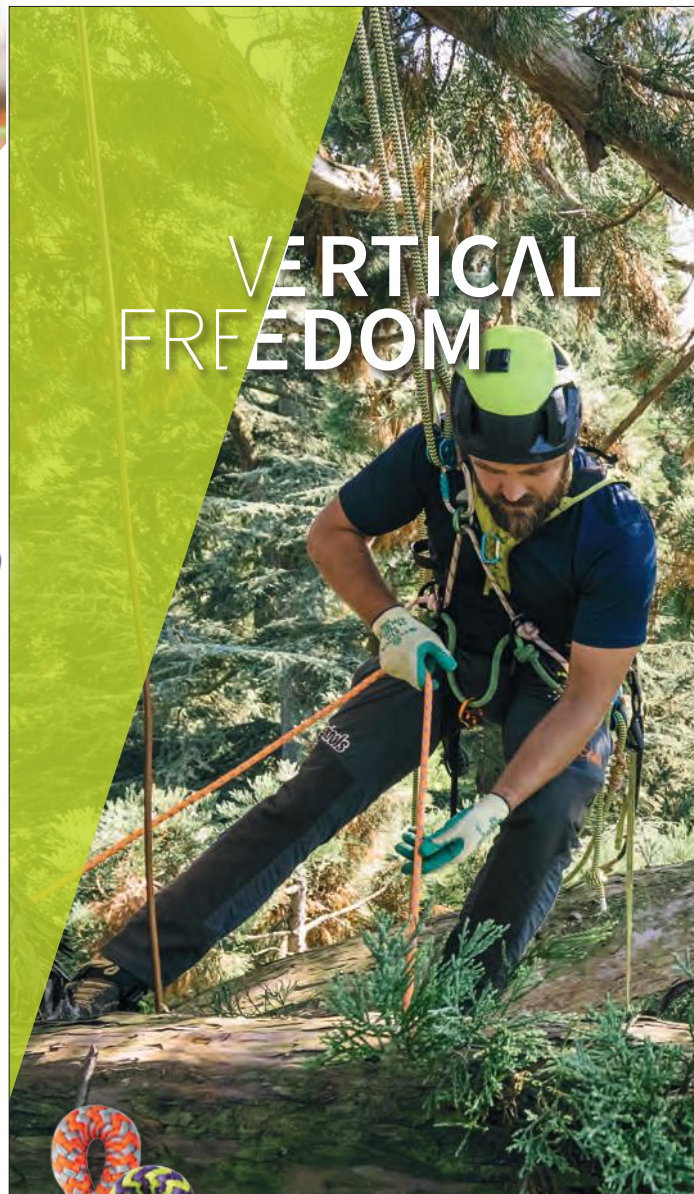
WT: 2.4/2.8/3kg

SIZES: Small- 65-83cm/25-33" waist. 44-59cm/17-23" leg
Med- 75-102cm/31-40" waist. 47-63cm/18-25" leg
Large- 88-123cm/35-48" waist. 51-73cm/20-29" leg

Max User Weight 150kg/33lb

www.dmmwales.com

VERTICAL FREEDOM



Innovative termination for tree climbing ropes

SPLY

The splice has a long tradition in the field of tree care as a compact and clean rope termination. EDELRID has launched a new and innovative eye splice for the Woodpecker tree care rope: the SPLY. Particularly compact and flexible, this can be easily threaded through all belay devices. At the same time, the splice offers enhanced safety as part of the load-bearing core runs through the entire eye. The SPLY is handmade in Isny and has a minimum breaking strength of 15 kN.

www.edelrid.com

EDELRID 

PERSONAL TRAUMA KIT

[ED: regulars will know our enthusiasm for self-reliance when it comes to timely treatment of injuries. If you do nothing you could easily die waiting for emergency services to reach you. Don't just carry first aid, carry a trauma kit with a minimum of a CAT tourniquet, trauma bandage and Celox or similar. This pack from MediArb in the UK fits the bill nicely. Cost is £99/ \$135/€120]

Personal Trauma Pouches are designed to be used as an individual first aid kit that can be attached to a harness / belt. All the contents are securely kept neat and tidy using elasticated pockets.

CONTENTS:

- 1 x Celox Granules
- 1 x Resuscitation Face Shield
- 1 x Sterile Eye Wash Pod
- 1 x Emergency Whistle
- 1 x CAT G7 Tourniquet
- 10 x Assorted Plasters
- 1 x Disposable Gloves
- 2 x Finger Bandages
- 1 x Trauma Bandage
- 1 x Sterile Wipe

www.mediarb.co.uk

rock exotica Down Rigger



The DownRigger is an aerial friction device, used for lowering limbs quickly and efficiently. With its light weight and compact size, it can be connected and operated overhead, or at the base of the

FTC-Tree FREEXION



With a secured opening of the front pin, the FREEXION can be installed in the middle of the rope, for an easy set up.

[ED: when it comes to friction-hitch adjuncts, the Rope Wrench had the field to itself for quite some time and these days has about four variants including the Apex but if you discount the Zig-Zag-specific Chicane. the FREEXION from FTC TREE in France is the first to contest Wrench's dominance. It's a little bulkier and not as sleek in appearance as the Wrench but it has 3 adjustment positions and is able to take manage a two-person load.]

FREEXION allows you to progress with a friction hitch on a single rope, and to move in all directions (up/down/transversal). CE certified and can be used with all EN 1891 ropes (type A) from 11.5 mm to 12.5 mm diameter. Its 3-position adjustment system (hard/medium/soft) allows you to modify the angle of the system. You can also adjust and create more or less friction according to the rope diameter, the climber's weight, or simply adapt your way in the tree to a given situation.

The FREEXION is the first system of the kind that doesn't need to be taken off the rope or taken apart to change the friction. You can change the friction at any time, in just a few seconds, or reduce the load on the friction hitch: no need for tools, you just press simultaneously both ends of a double button. It's so practical! In the tree, you only need to change position of the tether's pin to change the friction of the FREEXION and modify the braking. Eg: High up in great trees, with a heavy rope weight, you pull the tether to set the selector on the soft position and lessen the friction. Once the rope weight is lighter, a little further down the tree, you can set the position back to medium or hard and increase the braking. You can also climb



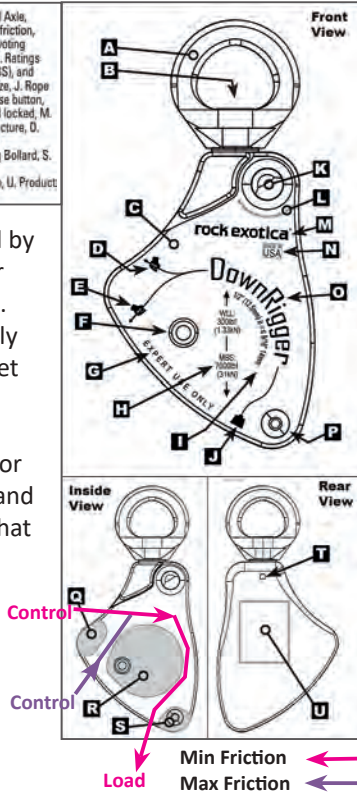
rigging system. The DownRigger applies friction to

the rigging line when weighted by the load, allowing the operator to control the descent by hand. Unweighted, the line pulls easily back through the device to reset the system. The DownRigger features the well-known Rock Exotica swivel top that allows for easy alignment with the load, and the double-locking side plate that allows mid-rope attachment

Cost: £250/\$300/€270
 Rope: 12.5-14mm / ½-⅝"
 Wt: 453g / 16oz
 Dims: 168 x 83mm / 6.6 x 3.25"
 Sheave: approx 50mm / 2"
 MBS: 31kN / 7000lbf
 WLL: 1.33kN / 300olbf (@23:1)

www.rockexotica.com

Front View - A. Swivel top, B. Swivel Axle, C. Sideplate, D. Rope path for lower friction, E. Rope path for higher friction, F. Pivoting Bollard Axle, G. Product branding, H. Ratings for Minimum Breaking Strength (MBS), and Working Load Limit (WLL), I. Rope size, J. Rope path toward load, K. Sideplate release button, L. Button must be fully extended and locked, M. Manufacturer, N. Country of manufacture, O. Product name, P. Fixed-Bollard Axle
Inside View - Q. Fairlead, R. Pivoting Bollard, S. Fixed Bollard
Rear View - T. Swivel axle spring pin, U. Product warnings



in the morning with a dry rope in the hard position and in the rain switch to soft position because of slight diameter increase induced by the changing weather conditions. The FREEXION TETHER has been designed with an extra loop to connect a carabiner and add extra friction for rescue purposes. The shape of the FREEXION has been developed to make it easy to switch from SRT to DRT work. The device can then be used to push your hitch, so there's no need to disconnect your system. The system is designed to be very compact, thanks to the short, flexible tether connection. During the ascent, the system is positioned low and close to the body, so the climber has a very upright position and doesn't need to put his hands very high up. As a result, there's plenty of room for movement. The FREEXION SYSTEM is compact and capable of large lateral movements, added to the possibility of adjusting friction. It is very easy to switch from SRT to DRT or reduce/increase friction to adapt the system to your work.

- COST device&tether-only: £160/\$210/€190
- 11.5- 12.5mm rope
- Locking pin and easy opening to fit anywhere on rope
- push-button friction adjustment
- Replaceable Polyester/Dyneema tether
- FREEXION+Tether = 205g/7.2oz
- Dimensions: 110 x 60 x 30mm (4.3 x 2.4 x 1.2")
- Purchase separately (price above) or as 4-piece system

www.ftc-tree.com



Increase your gear carrying options PORTER XL



Patented large-volume material and tool carrier for work harnesses.



www.singingrock.com



World's First BATTERY CHAINSAWS with a Clutch

The all-new T542i XP® and 542i XP® are the world's first battery chainsaws with a clutch, offering a kick-start of energy at the beginning of every cut and the familiar feel of petrol/gas-powered counterparts.

Husqvarna has done it again, revolutionizing how tree pros approach their workday with the introduction of the world's first battery-powered chainsaws with a clutch. With the power equivalent of a 40cc gas engine, the T542i XP® and 542i XP® chainsaws are "coming in clutch" and elevating the game of industry-renowned Husqvarna battery-powered performance.

With the introduction of the clutch, users experience a kick-start of energy at the beginning of every cut as the clutch engages. Users can cut up to 10% more when compared to Husqvarna's current professional 40 V battery chainsaw platform without the clutch feature.

Equipped with a clutch, the new T542i XP and 542i XP provide the familiar feel of a gas-powered engine, but with a fraction of the noise and no fumes. **With the average takedown of a tree requiring up to 40 pull-starts**, the ability to start these saws with the push of a button means climbing arborists can maximize efficiency while on-the-job.

"These industry-first chainsaws are in direct response to the needs of professionals who demand innovations that enhance their workdays," said Alvaro Trinidad, VP/GM of Husqvarna Group North America. "The clutch enables users to experience a more aggressive response and enhanced capability while cutting."

Operating on Husqvarna's 40 V ecosystem, the T542i XP and 542i XP require minimal downtime for maintenance. Gone are the hassles of gas, air filters and costly engine repairs. Husqvarna's innovative active cooling technology provides consistent power and longer battery life. An IPX4 rating ensures operation in most weather conditions. Additionally, these chainsaws come equipped with SP21G X-Precision cutting equipment to further enhance the cutting performance of the chainsaw.

www.husqvarna.com



FEATURES

Robust in every detail, these saws provide long-lasting performance even in demanding environments and conditions. Our clutch cover design significantly reduces the risk of clogging. And the patented digital oil sensor alerts you when it is time to fill up – ahead of time.

- **Rim sprocket:** A flexible and durable solution that simplifies changing to other equipment
- **Improved clutch cover:** Optimized sawdust removal for less clogging and fewer interruptions
- **High chain speed:** Fast cuts and less risk of splinting wood for better, more efficient results
- **Adjustable oil pump:** Adjusts the amount of oil used according to each task for optimized performance
- **Digital oil sensor:** Gives you a heads up to fill up chain oil when needed, reducing chain wear.
- **Heated handle model available:** Keep your hands warm, even in cold climates (XP® G model available)
- **Battery status display:** The panel clearly displays the current battery status at all times.
- **IPX4 – all-weather proof:** Designed to withstand rain, snow, heat and cold for reliable operation in all weather



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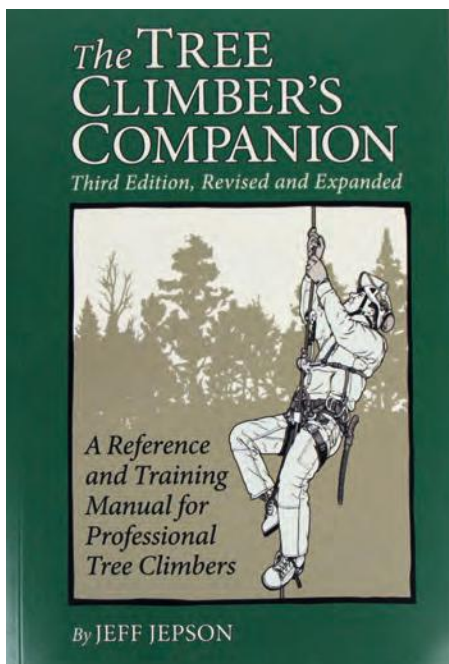
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- ▶ **TRAINING** Keeping good employees is a challenge. TCIA's new **Portal for Online Courses** (free for TCIA members) will help you create a career pathway for employee growth.
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- ▶ **BUSINESS STRATEGY** Are you looking to enhance revenue, streamline business operations, and elevate your company's profile? Business services like our **Business Solutions Webinar Series** can help.



the TREE CLIMBER's COMPANION 3rd Edition

by Jeff Jepson

Wesspur recommend this guide for new employees, rec climbers, and tree workers, due to it's clarity and the high quality of the descriptions and illustrations. The Tree Climber's Companion is the best-selling pocket reference for tree climbing techniques, equipment selection, and provides instruction on basic methods of entering the tree, working safely, and getting back down. A great guide for beginners who want to get started with the safest and most modern equipment and techniques, or old-timers looking to learn some new tricks.

This guide is one of the best sources for learning about the equipment featured in this catalog. No book can replace hands-on instruction, but the ***Tree Climber's Companion*** makes a great manual to aid in the training of new recruits.

The Tree Climber's Companion by Jeff Jepson has been the best-selling pocket guidebook for tree climbers for decades. Many beginning groundies and climbers got their start learning climbing knots, techniques, and safety concepts from this book. This book was often given to new hires, and at **WesSpur**, we included one in every tree climber starter kit. But things have changed A LOT in tree climbing in the last few years. Now this 3rd edition of *the Tree Climber's Companion* is thoroughly updated and expanded to be up to date with modern tree climbing techniques, equipment, and standards. The 2nd edition of Jeff's book was 103 pages... this third edition is 192! The updated content includes:

- Climbing preparation
- Tools of the trade
- Pre-climb inspections
- Installing climbing lines in the tree
- Climbing systems

- Ascending techniques
- Work-positioning techniques
- Rigging and tree removal techniques
- The Well Prepared Climber
- Descending the Tree
- "Entering the Tree" expanded to address developments in moving rope systems, stationary rope systems, and climbing with spikes
- Improved "Knots for Climbing and Rigging" section

The terminology has been updated to reflect changes, and the book now includes a glossary and "Random Advice for the Climbing Life". Many new illustrations enrich this edition.

ABOUT THE AUTHOR: Jeff Jepson and his wife Bonnie began Beaver Tree Service in Longville, Minnesota in 1989. Along with being a climber, groundie, and certified arborist since 1999, Jeff has written several other books for the tree care profession, including *To Fell a Tree*, *Knots at Work*, and *Groundie*.

ABOUT THE ILLUSTRATORS: Bryan Kotwica has been illustrating books, magazines, and catalogs for the tree care industry for over 25 years. He has also been a professional tree worker and certified arborist for just as long. Rick Kollath has been climbing mountains since 1975. His ascents include two routes on Yosemite's El Capitan, and Switzerland's notorious Eiger North Face. His other passion is drawing pictures, a "hobby" he began in pre-school.

Approx \$19.50

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00:04



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UK South Coast		TREE KIT treekit.com
UK North East		GUSTHARTS gustharts.com
UK North West		SKYLAND EQPT skylandequipment.com
UK South West		SORBUS INTERNATIONAL sorb-us-intl.co.uk
USA North-East		ARBORTECH SUPPLY arbortechonline.com
USA North		ARBSESSION arbsession.com
USA North-East		GAP ARBORIST SUPPLY gaparboristsupply.com
USA East		MOUNTAINTEK mountaintek.com
USA North West		WESSPUR wesspur.com

STOCKISTS in this colour sell and/or can order: ArbCl

Arb supply stores that stock **ARBCLIMBER** ALL have a wide range of rope-related equipment, including ropes, hardware, harnesses, helmets etc. as well as chainsaws, boots, clothing etc. Now that SRT/SRS is an accepted area of tree work, the rope-related equipment is often the same and even if it's not they can get it in for you. In the case of suppliers shown in red (opposite) that stock **TECHNICALRESCUE** and **WILDERNESS SAR** magazines as well as **ARBCLIMBER**, these are already rescue and access equipment suppliers of note so they can

7/593 Withers Rd	Rowse Hill	NSW 2155
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Bay 8, 141 Commercial Drive	Calgary, AB	T3Z 2A7
605-1515 Broadway St	Port Coquitlam, BC	V3C 6M2
1645 Bonhill Road #1 & 2	Mississauga, ON	L5T1R3
Aganavej 22	Greve	2670
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Timber, Wilderness SAR & Technical Rescue magazines

sort you out whether you're an arborist or a rescue agency.
For rope-related equipment in particular, you should check out your local ARB supplier or Rescue supplier, if you haven't already, and be amazed by the amount of kit you recognise. **If you would like to stock our magazines** (and aren't located next to our existing stockists),
[email us: admin@rescuemagazines.com](mailto:admin@rescuemagazines.com)

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More Information



ActSafe PMX

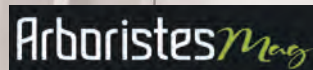
- working load limit (WLL) of 250 kg
- 17 m / min at 100 kg
- suitable for 11 mm ropes



ActSafe ACX

- simplifies and accelerates work on complex or difficult to access structures
- power-saving use
- remote control up to 150m

with thanks to:



ANCHOR FORCES

Forces exerted on an
anchor during SRT/SRS

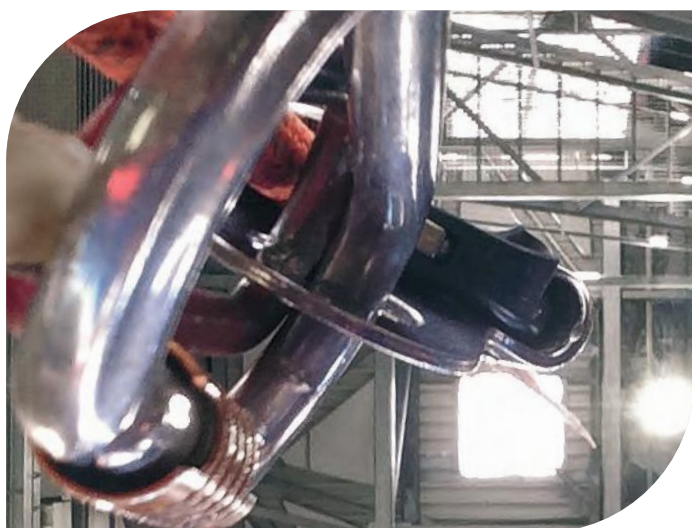
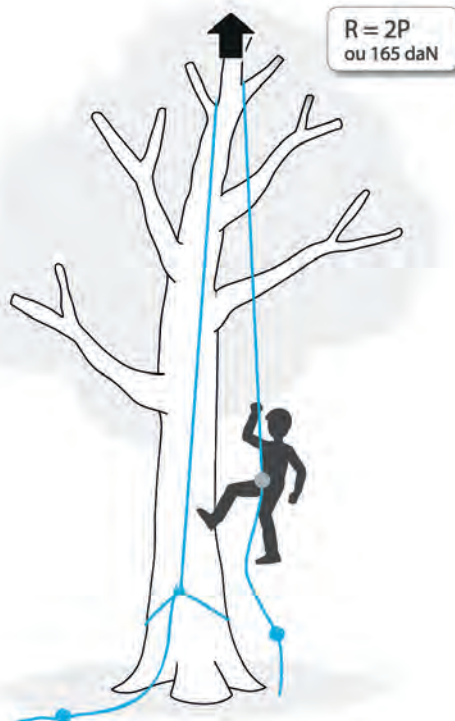
Photos by *Laurent PIERRON*

The development of single-strand access techniques with rope locking at the base of the tree modifies the distribution of loads on the anchors. These new work configurations require consideration of the application of the pulley effect during the access phases.

The tests carried out aim to measure and understand the distribution of forces in the access system according to the different parameters (rope, anchoring, installation). All of the tests were carried out in the laboratory, trying to be as close as possible to reality. A climber equipped with force sensors was moving on a rope. We measure the efforts at different points.

What is the real impact of the pulley effect on the anchors depending on the friction and/or the different types of anchors?

- The use of a pulley maximizes the effort on the upper anchor (pulley effect).
- Significant friction on the top anchor (passing the rope over a branch) reduces the effort on the top and bottom anchors.
- Friction can occur either at the top anchor, or on the strand descending towards the bottom anchor by multiplying the passages against branches.
- Friction increases on a large diameter branch covered with rough bark or when passing a "V" fork.
- If the rope rubs on many branches with changes in angles, it is possible to significantly reduce the forces at the bottom anchor. In this case, the effort at the high anchor will be minimum, i.e. 1.6 to 2 times the weight of the climber (example: $R = 1.6 \times 80 \text{ daN} = 130 \text{ daN}$, R being the effort at the high anchor).



TECHNIQUES

Does the elongation (elasticity) of the rope play an important role in the force exerted at the anchor points?

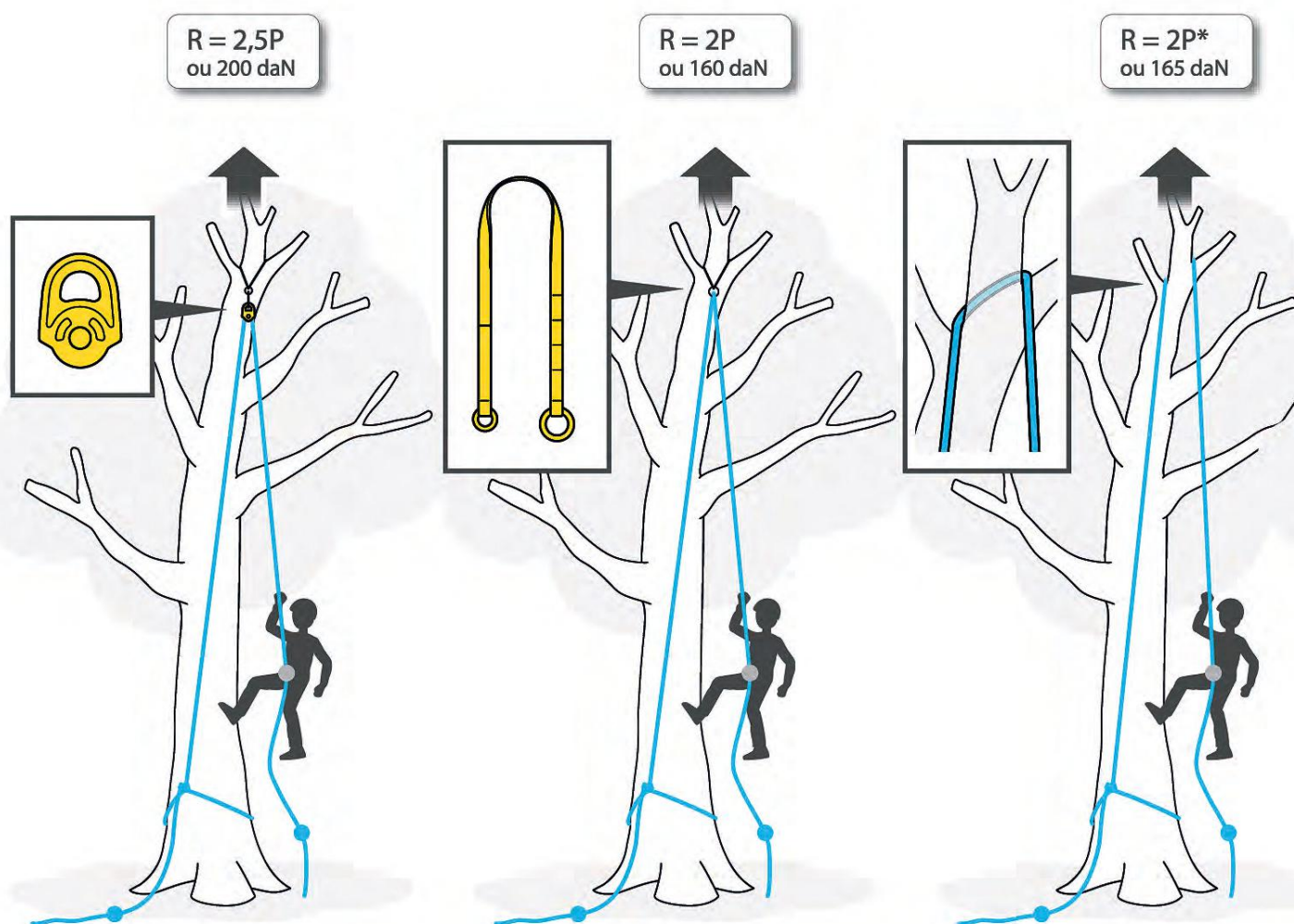
- For semi-static or "Dyneema" ropes, under normal conditions of use (without falls or shocks), extending the rope has very little impact on the forces exerted at the points of anchors (top/bottom/climber). This result is valid regardless of the anchoring mode chosen (locking at the top or bottom).
- On "Dyneema" rope, the force on the anchor point is slightly greater compared to a semi-static rope in normal use.
- The force at the anchor point increases very quickly when there is a dynamic overload, fall or shock, even of low intensity. "Dyneema" type ropes have a very low elongation and therefore also a very low absorption capacity.
- In the event of a shock, there is almost no absorption in the system. It is the climber who absorbs the shock, hence a very real risk of **increased injury**.

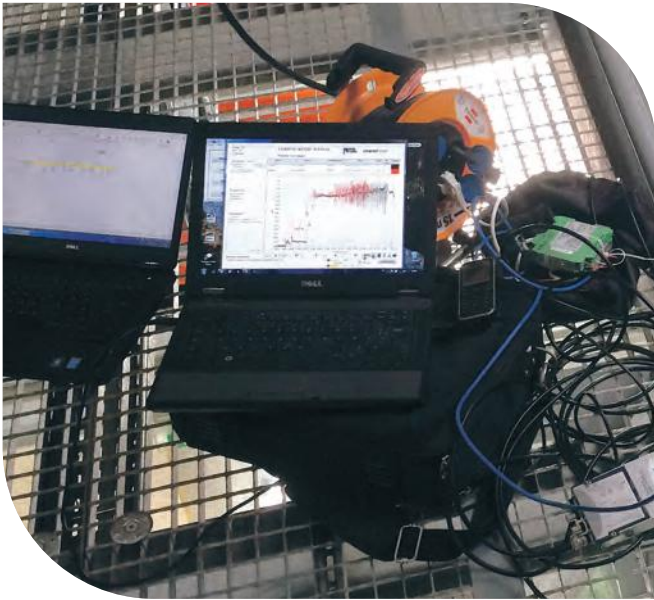
What are the real differences in effort at the top anchor between blocking the rope at the foot of the tree and anchoring the rope at the top (fixed rope)?

When locking at the bottom, the forces are distributed evenly (approximately 2/3 at the top to 1/3 at the bottom).

The effort at the high anchor is: 2.5 times the weight of the climber with a high-efficiency pulley, 1.6 times the weight of the climber if there is a lot of friction in the system.

In the case of locking at the top (fixed rope), the effort at the level of the climber is equal to the effort at the level of the anchor. The effort in the high anchor (R) is approximately 1.6 times the climber's weight.





The measurement of a force or effort: a force is measured using a dynamometer, it is expressed in DecaNewton (daN).

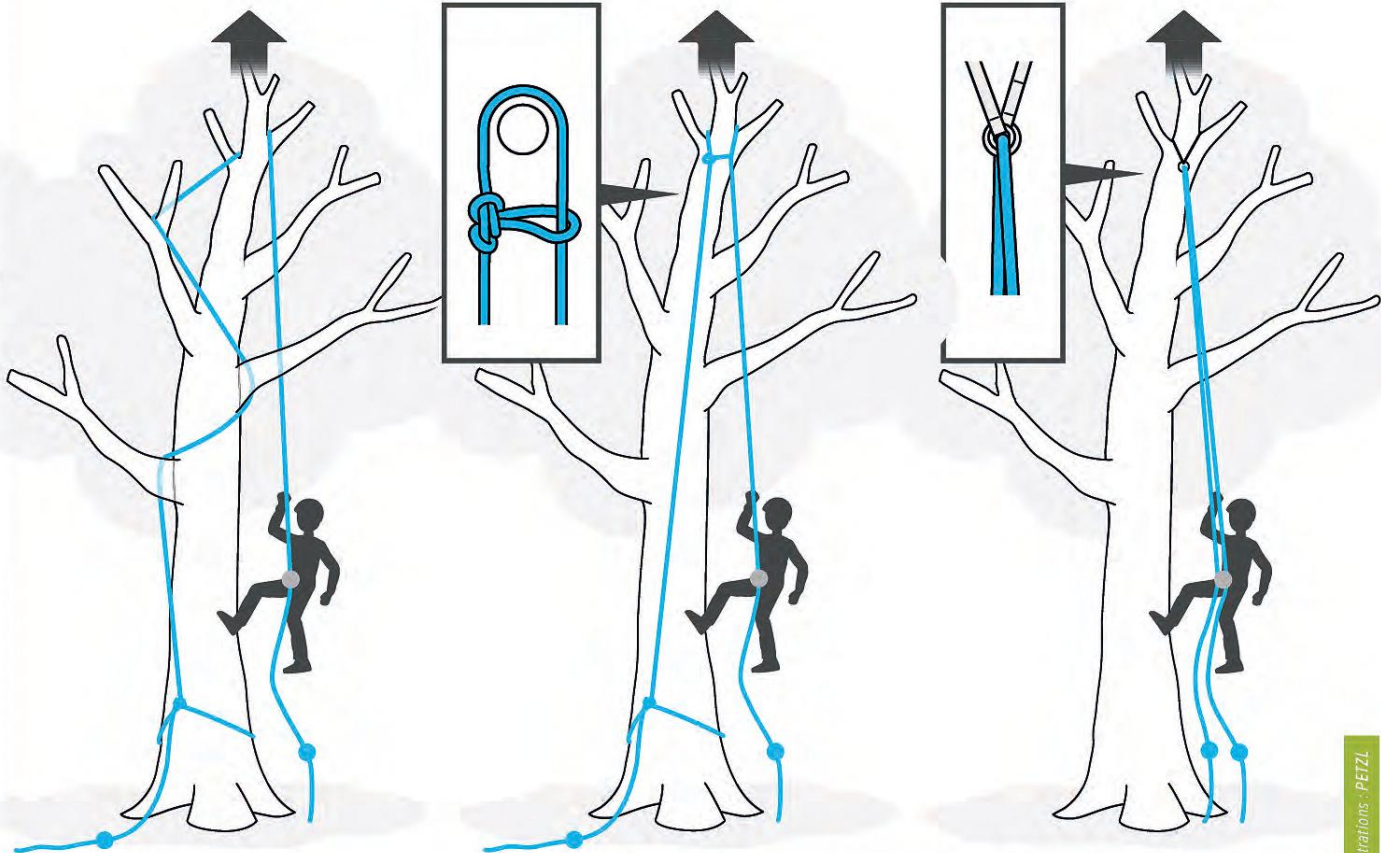
- One decaNewton (daN) is equivalent to 1 Kgf.
- A mass of 80 kg suspended from a rope exerts a force (the weight) of approximately 10 times its mass, or a force of 80 daN.



$R = 1,6P$
ou 130 daN

$R = 1,6P$
ou 130 daN

$R = 1,6P$
ou 130 daN



* L'effort à l'ancrage haut dépend des frottements à l'ancrage, du diamètre et de la rugosité de l'écorce.

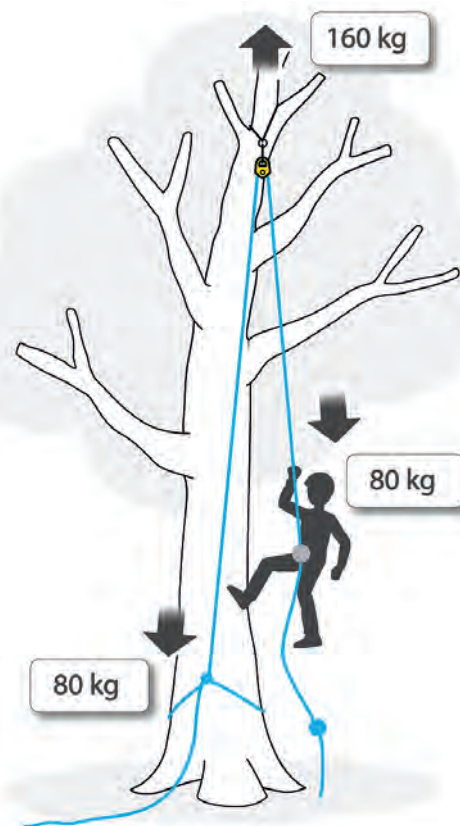
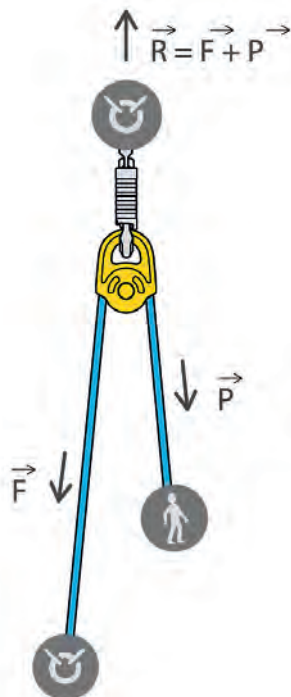
Illustrations : PETZL

THE PULLEY EFFECT

THEORETICAL....

P is the force (or effort) generated by the climber on the rope. F is the force generated at the bottom anchor, R is the force generated at the top anchor. At equilibrium, the reaction R of the support is equal to the addition of the forces P and F.

If we take the example of a blocking of the rope at the foot of the tree, in pruning in theory with a pulley with perfect efficiency, we should have in suspension: If P = 80 daN, P is the force (or effort) generated by the climber on the rope. F=80daN F is the force generated at the bottom anchor, R=160 daN R is the force generated at the top anchor.



PRACTICAL

We carried out a series of tests to verify how this theory applies in current pruning practice (No shocks or falls). In our workshop the climber goes back on the rope with mechanical ascenders (*Basic, Croll, Pantin* right foot, left foot). The climber progresses smoothly.

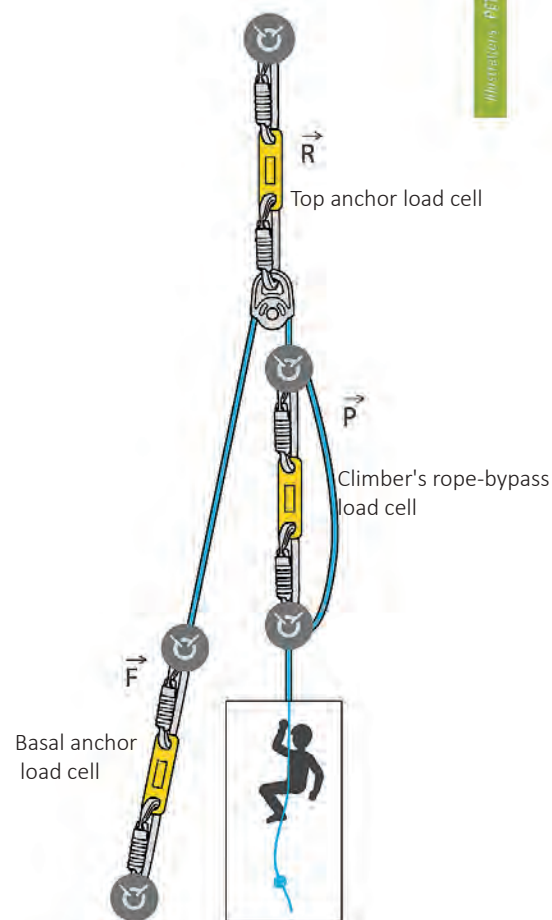
Test protocol:

- Climber + equipment 80 kg.
- Rope ascent (blocking on the ground), rope angle less than 30°.
- Height 10m and 20m.
- Rope with 4% elongation.
- Low anchor, RIG PETZL.
- Normal, smooth, smooth climb.

The variable is the type of top anchor, we tested:

- A high efficiency pulley (Rescue).
- A fake ring fork (eg *Petzl Treesbee*).
- A branch (fork 10 cm in diameter), opening angle of 30° and with thin bark (*Sophora.spec*).

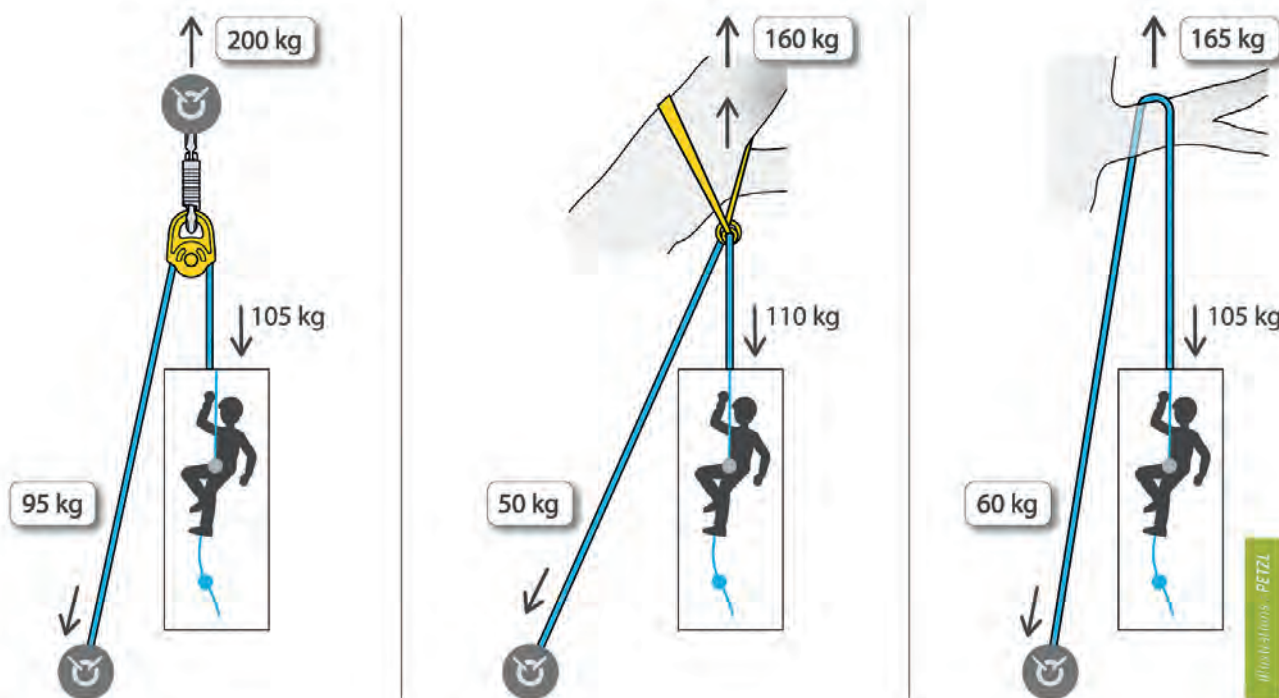
Three force sensors in parallel record measurements at the low anchor, at the high anchor and on the climber's rope. To ensure the repeatability of our protocol, each test was repeated three times on each height and for each configuration. For ease of understanding, the value retained is the Maximum value during the ascent phase.



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ROPE 4% Elongation	R- EFFORT Top Anchor (daN)	F- EFFORT Basal Anchor (daN)	P- EFFORT Climber's Rope (daN)
PETZL RESCUE PULLEY	200	95	105
PETZL TREESBEE FALSE CROTCH	160	50	110
BRANCH FORK NATURAL CROTCH	165	60	105

A) On a pulley, we can remember that the force on the high anchor R is approximately 2.5 times the weight of the climber, during a normal, smooth climb.

$$2.5 \times 80 \text{ daN} = 200 \text{ daN}$$

The effort at the bottom anchor = the effort on the climber's rope

With the use of a pulley on the high anchor, the pulley effect is verified.

B) On a false fork, the radius of curvature of the rope is large. On a branch, friction is significant. The greater the friction surface, the more friction there will be. (Be careful, the type of bark impacts this friction).

Increase in fork diameter = reduction in effort at the top anchor.

In these two cases, the high anchoring is less stressed than with a pulley. The lower blocking F is also less required, by around 35% compared to the use of a pulley during the climber's ascent.

In this case the force on the high anchor R is approximately twice the weight of the climber.

$$2 \times 80 \text{ daN} = 160 \text{ daN}$$

The theoretical pulley effect ($F + P = R$) therefore does not apply when passing the rope directly around a wooden axis or when using a false fork (ring type).

It's a bit as if part of the effort is lost through friction. The anchoring is less stressed than with a pulley.

It is interesting to note that the more friction there is at the anchor (larger diameter of the branch for example) the lower the force at the upper anchor (R).

If the friction on the descending strand becomes too great, we will approach the values of a fixed rope at the top anchor (locking the rope at the top), and the pulley effect no longer applies.

Caution: When installing a disengageable system (for rescue, for example), these friction effects can make it difficult for a victim to descend. Loss of comfort and fluidity.

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TEST PARAMETERS....

- Climber + equipment 80kg
- Rope ascent (anchored at the base), rope angle less than 30°
- Height 10m and 20m
- A branch (fork 10 cm in diameter), with thin bark (eg. *Sophora*)
- Low anchor, PETZL RIG
- Normal, smooth, fluid climb

The variable is the type of rope we tested:

- Rope elongation: less than 1.5%
- Rope elongation: between 1.5% and 3.5%
- Rope elongation 3%
- Rope elongation: 4%

Three load-cells record measurements at the base anchor, at the top anchor and on the climber's rope. To ensure the repeatability of our protocol, each test was repeated three times on each height and for each configuration. F=80daN F is the force generated at the bottom anchor, R=160 daN R is the force generated at the top anchor.



Max Effort	R- EFFORT Top Anchor (daN)	F- EFFORT Basal Anchor (daN)	P- EFFORT Climber's Rope (daN)
PETZL PARALLEL EN 1891 Type A, elongation 3% - Nylon	164	48	116
TEUFELBERGER PLATINUM EN 1891 Type A, elongation 1.5% - Polyester/Nylon	167	55	112
LIROS RACER elongation <1.53% Polyester sheath/Dyneema core	180	66	114
REFERENCE ROPE EN 1891 Type A, elongation 4% -	165	60	105

The tests carried out do not show any significant differences in the distribution of loads between the CE EN 1891 type A ropes, whatever the type of anchor (variable added during the test).

We note an increase in anchoring force for the Dyneema rope. The comparison values used in the table are the maximum values during the ascent phase, the average values being slightly lower than these data. In normal use, there is no considerable difference in anchoring forces. Be careful, the forces increase very quickly in the event of an impact and/or fall on a rigid system such as a dyneema rope.

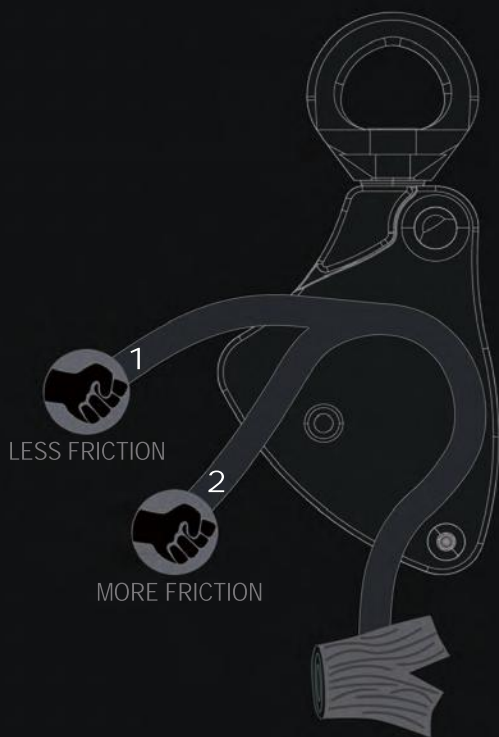
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FIXED SYSTEMS: DIFFERENCE IN EFFORTS

What are the efforts when accessing a fixed rope? Rope lock setup with a bow tie in arborist activity. In 2014, a study carried out with the French Speleology Federation and Petzl made it possible to quantify the effort at the anchorage level when a climber progresses in the SRT system (fixed rope), on a 9 mm semi-static rope.

TEST PARAMETERS....

- Climbers of 65, 74 and 81 kgs.
- Ascent on fixed rope (20m).
- 9 mm CE EN1891 rope, elongation 3.6%.
- Normal ascents and descents without jerks.
- Sudden ascents and descents (simulating the ascent of a beginner in the practice or a repositioning in the ascenders in a "brutal" manner).
- Variable: the weight of the climber

A force sensor records the measurements at the top anchor of the fixed rope. To ensure the repeatability of our protocol, each test was repeated three times.

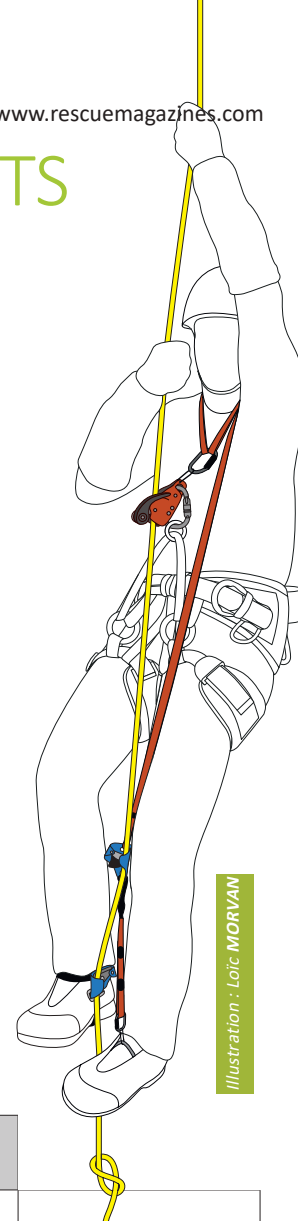



Illustration : Loïc MORVAN






Different ascent and descent configurations on a 20 m rope.

TESTER	R- EFFORT Top Anchor (daN)	F- EFFORT Basal Anchor (daN)	P- EFFORT Climber's Rope (daN)	
1 (81kg)	124	129	95	129
	133		96	
2 (65kg)	89	90	78	78
	90		78	
3 (74kg)	135	122	92	92
	108		92	
“RIGOROUS” ascent/descent: 9mm rope				
1 (81kg)	178	187	249	262
	195		275	
1 (81kg)	126	131	220	223
	135		225	
2 (65kg)	149	158	238	245
	167		252	

When the 80 kg climber climbs back onto his fixed system smoothly, he generates an effort of 130 daN. Which represents 1.6 times its weight going up and 1.2 times coming down. For the same ascent but with less fluidity, the effort is 186 daN on average during the ascent phase, i.e. 2.3 times the climber's weight, and on descent 261 daN on average, i.e. 3.2 times the climber's weight. We can keep in mind that the force at the top anchor is:

- 1.6 to 2 times its weight when climbing depending on fluidity
- 1.2 to 3 times its weight when descending

SUMMARY & PERSPECTIVES

	ASCENT & DESCENT Fluid/Smooth	ASCENT & DESCENT Rushed/Rigorous	RESCUE	EASE of SET UP
	2.5x Climber weight on top anchor	Not Tested	✓✓✓✓ easy and fluid	✗ Very difficult/time consuming
	2x Climber weight on top anchor	Not Tested	Possible by installing a ground-retrievable system but be beware of high friction during rescue	✗ Difficult/Time consuming
	2x Climber weight on top anchor	Not Tested	Possible by installing a ground-retrievable system but be beware of high friction during rescue	✓✓ Very easy
	1.6x Climber weight on top anchor	2-3x Climber weight on top anchor	Limits range of options in the event of an emergency	⊖ Easy but takes a little longer
	1.6x Climber weight on top anchor	2-3x Climber weight on top anchor	Limits range of options in the event of an emergency	⊖ Easy but takes a little longer

The results obtained will not change current practices. This was not the purpose of these tests. We just wanted to understand the levels of loading for the various systems we use.

It is interesting during a test report to see what other possible applications of the results obtained are. Friction, for example, is a parameter known to everyone in trees. We have all had difficulty retrieving a rope due to excessive friction.

It may be useful to have friction when dismantling to reduce the loads on the pulley or when installing the access rope to reduce the effort at the top of the rope. This last configuration leads us to ask ourselves an important question:

Is it necessary to use equipment-heavy retrievable systems?

- Increased friction can complicate use of a retrievable system.
- If there are too many branches, evacuating an injured person to ground will be very difficult and complex.

The use of rope with a low percentage of elasticity (Dyneema rope) is a relatively common practice. We were able to observe that the differences in elongation between the ropes have very little impact on the forces on the anchors, at least during “normal” use. This is obviously not the same in the event of dynamic movements (pendulum, etc.), shock or fall. The body has an absorption capacity but it remains limited.

Therefore, it seems preferable to have a rope with elongation capabilities. The difficulty is to obtain the right compromise between elasticity, climbing comfort and safety... Because even if we strive to avoid shocks or falls, the extension capacities of the rope in these extreme cases can limit the otherwise dire consequences of a fall. The very efficiency of a pulley demonstrates how easy it is to generate quite significant forces on the top anchor even without any shock thanks to a smooth ascents.

It is therefore very important not to underestimate the dimensions and orientation of the high anchor. Regardless of the type of rope, the friction or the type of anchor, in normal situations of use, during a smooth ascent the top “anchor” will support at least the equivalent of 1.6 x the weight of the climber. In the event of an unforeseen event (small shock or other), it will have to support a much greater load. And in all cases it is necessary to consider rescue, where two people may be on the same anchor.

Select your anchor with these notions in mind.



Crédit photo : Laurent PIERRON

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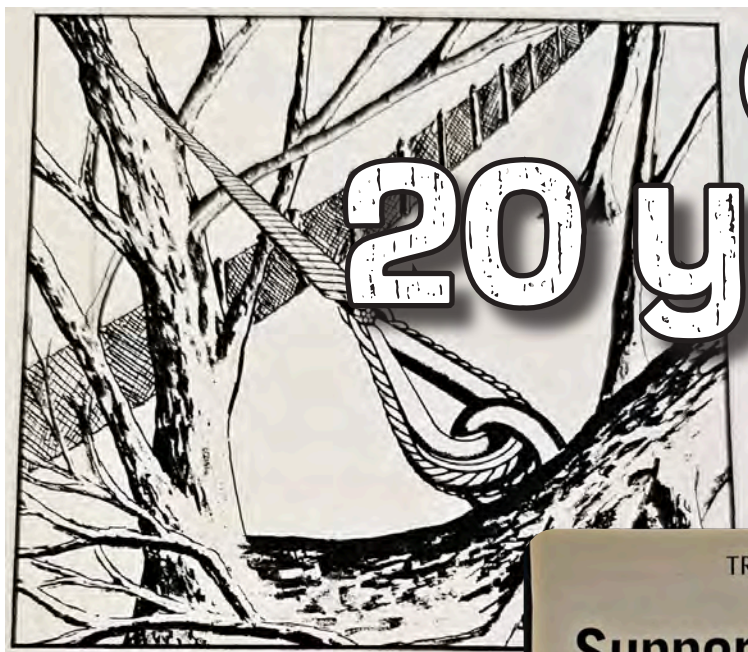
Photo courtesy of Tim Werner and Frank of ArbDogs Inc.



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CABLING

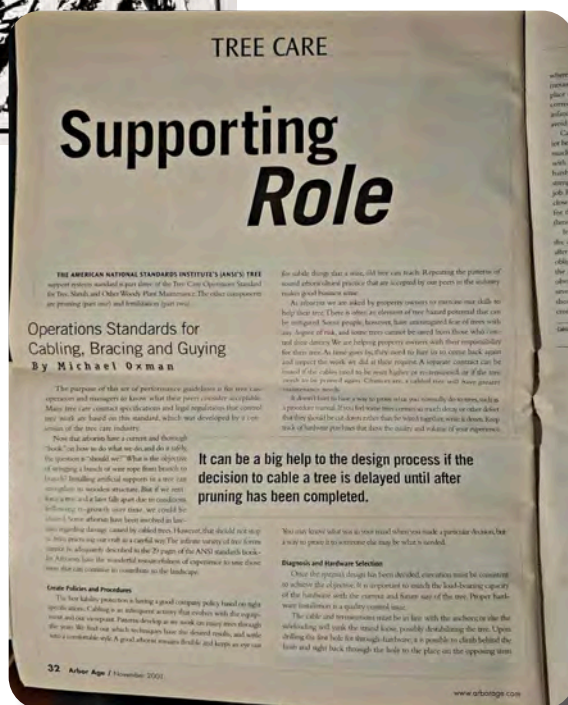
20 years on

Michael 'Ox' Oxman is a career arborist who began climbing on manila rope, right out of high school in 1970. Also a keen recreational climber, he now lectures on tree subjects at conferences, produces videos & is a content creator on social media platforms.

This is a hybrid, composed of something old, and something new. A penpal arborist friend named Ali [Selka] was commenting on the ANSI tree cabling book of standards, so I sent this reply. It is my love letter from a ghost of trees past to arborists of the future.

In my reply, I did not give any new information, only my interpretation of WHY we still need such specifications, 20 years after release of the standard.

"Moving this discussion of cabling over here so we don't lose it. A while back, a new ANSI American National Standards Institute publication on installing Tree Support Systems was created. At the time, I was asked by Arbor Age Magazine editor John Kmitta to review the book.



It didn't seem all that involved. Whoa, was I ever wrong! New methods of attaching hardware, new materials, and new ideas about how much slack should be in these braces keep coming along.

I kinda had an epiphany when a cabling job on a nasty tree came up for a company where I occasionally did contract climbing. This genius arborist had some overbuilt chain hanging around, and had it in his head to wrap that rascal.

TOP BRANDS

My authority was limited, and I was unable to dissuade this cowboy arborist from folly, and terminate into the wood, rather than encircle the poor defenseless little tree. That business relationship ended with the realization of the poor fellows inability to apply the results of scientific research.

It made me more confident and resolved to quit listening to folks that were clearly unqualified for their job description. The outcome was my ability to be able to allow my brain to distinguish the component processes of cabling into best-case scenarios.

So, now we switch to a time a couple decades later. People are still struggling to reconcile the ability to impose invasive treatments on marginally viable trees in order to preserve them. We always will, because we are softies, eager to please our clients, and willing to pull out all the stops to prolong the lifespans of some wonderful trees.

Here's a recent Facebook discussion that contains some retrospective:

What if you wrote a book review, Ali Selka? For those who are wondering what Tree Support Systems are all about. For Martians who arrive on Earth sometime in the future, and are trying to determine human civilization's proclivities.

Believe it or not, there was a time when arboriculture literature was new. Someone had to take work practices that were being used in the field, and put down standards and best practices in print.

After those standards were published, it was our job to read & assess them. How the standards were accepted was anybody's guess. But we tried.

We knew that consistency in how tree care operations were carried out all over the world, was all over the map. The amount of education an arborist had consumed was determined by a lot of things outside the control of any organization or social circle.

CABLING-20 years on



The diligence that any individual arborist conducted their tree treatments with was undisciplined.

So, to achieve better quality in the industry, we needed to agree. To do that, we needed to have access to study material that we could all use as a target for creating goals for improvement. This process is still going on. Peer pressure was the way forward, as it still is now.

So Ali, as the prime mover & shaker for arborists on Facebook, your opinion matters. But we only know, so far, that the ANSI A300 (Part 3) book held your attention for a day.

You have contained within your head a whole book about weak wood that sometimes needs a prop. You can feel the branch moving below your feet, and can sense when it is piano-wire tight. You have felt the fulcrums creak in the forks that are the most likely points of fracture. You instinctively cut the proper amount of weight from the crown, but sense that stability is still elusive. You have compared the current tree with thousands of similar scenarios where failure was imminent, and heard the bell ringing: "Reinforce me!"

So, will your sharing consist of merely letting your Facebook community hear about fascination with structural analysis? Or, will you be our teacher of important facets of this fascinating field of tree care?"

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THE WORLD ACCORDING to OX

climbing Sugar Mama

Ox along with with Fellow photographers Roger Barnett, Evan Clark & Greg Crevier together with Chris Coates, Greg Kelleher, Jason Tubbs, Luis Galvan, Gabriele Triebe & Zac Smith.....



A dozen arborists reconvened as rec climbers following the 2023 NAOM North American Open Masters tree climbing competition in Oregon to climb Sugar Mama.

Sugar Mama is a local tourist attraction next to the Prospect Ranger District office, an hour's drive from where the competition wrapped up the previous day at Jim Belushi's Farm. Crater Lake is another nearby popular destination, a dormant volcano that several of our people visited while in the neighborhood.

Pinus lambertiana (commonly known as the sugar pine or sugar cone pine) is the tallest and most massive pine tree, achieving heights of 83 meters (273') tall, and 11' dbh. The species name *lambertiana* was given by the Scottish botanist David Douglas, who named the tree in honour of the English botanist, Aylmer Bourke Lambert. It is native to coastal and inland mountain areas along the Pacific coast of North America, as far north as Oregon and as far south as Baja California in Mexico.

Sugar Mama is a large diameter Sugar Pine tree, on flat ground, with easily accessible parking at the Rogue River - Siskiyou National Forest compound. The forested area around the tree has been recently logged in a thinning harvest, clearing the smaller trees and brush out of the way for open Big Shot line launching.

There were a few long ropes (full spool) shared for initial

access, and after the climbers reached the main fork, they transferred to their individual short lines, clearing the way for those who followed. These 65m (200') short lines were then canopy anchored at various locations among the 2 roomy main tops of the tree. It rained a bit, so the climbers did not spend much time aloft. The largest crowd at any one time in the tree was a group of 5 climbers.

The types of SRT ascent/rappelling hardware used by most climbers at this excursion were composed of 3 main systems. 1) Roperunner; 2) Zigzag; and 3) Rope Wrench. For the purposes of this story, we will just assume that readers of **ARBCLIMBER** magazine will be only too well informed about the use of these 3 different rope tool methods.

One innovative device that does merit more exposition is Big Jim's Hitchbreaker shown in wood in the title picture above. This is an accessory used to aid in release of the prussik hitch on a Rope Wrench. The Hitchbreaker covers the top of the upper spiral of the prussik cord, allowing even downward pressure on the knot for a smooth release. Rappel speed is easily controlled, with the thumb and fingers shielded from contact with the moving rope, for a pain-free descent. The concave socket on the underside of the doughnut-shaped Hitchbreaker is machined to match the coil of cord wrapped around the climbing line just below the wrench.



Big Jim's Hitchbreaker was invented and is manufactured by retired utility arborist Jim Pavlicin. Jim hand-crafts each item in New Jersey, USA, and has developed a variety of sizes & versions. There is even a midline attachable version, with rare earth magnets and a bungee holding the 2 halves together. Jim travelled the Oregon Trail from his home, and brought along a Conestoga Wagon load of Hitchbreakers as prizes for the NAOM competitors & judges.

It should be noted that there are many difficult nuances involved in tackling an expedition in a tree of this size. It would be unwise for climbers to attempt such a challenging endeavor without adequate training and experience. Better yet, find a mentor. This begs the question-"How do you get information about climbing old-growth trees?" One answer is to join the Facebook group called 'Old Growth Tree Climbing' (which is moderated by Ox).

This is not child's play. Support from the team was enhanced by just having spent a week in a competitive event with volunteers, judges and technicians intimately involved in interaction with the competitors. The communication among people in this group was finely tuned. There was noise from sporadic vehicles driving by on the nearby road, which made contact with people on the ground an issue to be compensated for.

Sharing of equipment is a complication not usually found in groups of fewer climbers in such enormous trees. Swapping ropes of varying diameters makes for changing friction qualities of shiny aluminum cams & bollards. Rain makes these devices act differently with climbers of varying body weight. In spite of these proclivities, it is sometimes simply safer to avoid congestion by exchanging tie-ins with someone who may be advancing up the trunk into your space.

Uncertainty can come from the fact that someone else has set the overhead anchor of the climbing line. Short ropes that do not reach from the top of the tree to the ground are suspect, and may crimp ones style, knowing that death awaits those who don't recognize they are near the end of the line. Swinging around on ropes can dislodge dead branches, which may fall on people down below. Slabs of loose bark can be caught by ropes running beneath the surface of the trunk. Just the density of the crown can block the view, and the ability to inspect conditions to ensure safety.

As the climbers returned to earth one by one, they were able to do a post-op evaluation. They watched each other self-belay down the lines, without assisting in any way, other than verbal callouts about how much distance remained. They evaluated each move, assessing how things had gone, and how they could go smoother under different circumstances. The last climber of the day touched down at 6:30 PM. It is common for unseen obstacles (such as ropes getting stuck) to cause delays, and leave climbers still up in the tree in the dark. We were lucky that didn't happen on this day.



STRICKEN ASH DISMANTLING

by **Chris Girard**

Chris Girard is an ISA Certified Arborist, a Society of Professional Rope Access Technicians (SPRAT) Level 1 Technician. He is the owner of Girard Tree Service, a 15-year TCIA member company based in Gilmanton, NH USA

Photo 7: See page 38

I installed a Rock Exotica 2.6 Swivel Omni-Block (WLL = 20 kN), directly opposite (180 degrees) from the three-strand, side guy line.



EAB or Emerald Ash Borer is a beetle (*Agrilus planipennis*) borne- disease affecting US and Russian ash, primarily black Ash (*Fraxinus Nigra*) but certainly able to infect European Ash (*Fraxinaus excelsior*) and indeed is already in Europe hot on the heels of ash-die-back (caused by the fungus *Chalara Faxinea*). Both North America and Europe has seen devastation of the Ash species and until they can be replaced - probably by the more resilient *Fraxinus mandschurica* - arborists are going to see a lot of work involving ash trees that are inherently dangerous to climb and dismantle because of their structural demise.

Trees killed by emerald ash borer (EAB) can be dangerous to climb and rig. In this article, we'll look at felling, climbing and rigging critical-risk trees killed by EAB.

A QUICK EAB REFRESHER

Emerald ash borer was first discovered in the United States in southeastern Michigan in 2002, but experts think it probably was introduced sometime in the 1990s. This pesky little "pest" most likely caught a free ride over from Asia on infected ash wood used in shipping pallets.

Since then, it has migrated east and west, causing death and destruction to North American native ash trees. According to at least one pest-control professional I've talked with, EAB also has indirectly caused the death of tree workers who were unfamiliar with the process in which ash trees die after being infested by the pest, and were tasked with having to rig or fell the dead trees.

Here in New Hampshire, where I live and work, EAB was first discovered in 2013 in Merrimack County, which is in the central part of the state. This extremely destructive, invasive insect has since invaded nine out of the 10 counties here, and shows no signs of stopping until it infests and likely kills every last ash tree.

RESTORING A WOODS LINE

Recently, Girard Tree Service LLC, which I co-own and operate with my wife, Heide, had the opportunity to restore an old woods line along a stone wall on an historic farm site. (Photos 1 and 2) The property has an abundance of beautiful sugar maples (*Acer saccharum*), as well as many ash trees (*Fraxinus*), of which there are 18 types, or species, in this country. Every last one of the ash trees along this stone wall was dead. On top of that, wouldn't you know it, the location is in Merrimack County, less than five miles from "ground zero" of the first EAB detection site in New Hampshire. So I knew most – if not all – had been dead for years.

To restore the wood line to its former glory was going to

STRICKEN ASH DISMANTLING

be a multi-day task, as most of the trees also were heavily entangled with and being "choked out" by bittersweet vines, another invasive species from Asia. Anyone who has ever had the "pleasure" of working and climbing in trees with this horrible tangle of Mother Nature's finest knows how time consuming and frustrating the work can be.

We started the work knowing most of the ash trees could be felled into the open field adjacent to the stone wall. But a few were going to have to be climbed and rigged with pull ropes, and one was going to have to be rigged/pieced out. Ours is a small, family-run business, and I have a policy that I will not put my climbers in any seriously dead trees. I won't take a chance on something happening to them. Therefore, I always climb the really sketchy trees myself, and all these dead ash were more than sketchy – they were in critical-risk condition.

ASSESSING THE CATEGORY OF RISK

Tree work is an inherently dangerous job, as everyone knows. For that reason, climbers must perform a tree and site inspection before beginning any climbing operation. According to various sources I've come across, there are four categories to be aware of when doing an evaluation: **1. low-risk; 2. moderate-risk; 3. high-risk; and 4. critical-risk** trees. There is so much that goes into evaluating whether a tree is safe to climb that it is beyond the scope of this article. Please refer to TCIA's "Best Practices for Rigging in Arboriculture" manual for additional information that will help you make a sound judgment.

Suffice it to say, all the ash trees we were dealing with fell into the category of critical-risk trees, but not all for the usual best-management-practices (BMP) reasons. What a lot of tree workers fail to realize about trees killed by EAB is that the way they die greatly affects the condition they are left in. EAB will usually kill a tree in two to five years, generally on the earlier end of that span. The larvae tunnel up and down under the bark, feeding on the xylem and phloem, interrupting the nutrient flow to the tree, depriving it of the necessary food source and leading to a fast decline and death.



Photo 1: Before photo. All photos courtesy of the author.



Photo 2. After photo. The task was to restore an old woods line along a stone wall on an historic farm site. The line included beautiful sugar maples (*Acer saccharum*), as well as many ash trees (*Fraxinus*).

Once this happens, the transpiration cycle stops within the tree. The structural integrity breaks down quickly and can leave the tree in a very brittle, but hard, condition. So even though you do your pre-climb inspection, sounding the stem with a mallet, and it sounds and feels strong, the actual condition may be just the opposite. You can use a drill to check the soundness of the stem, but this also can be misleading, as the tree will appear solid, without any internal cavities or rot.

A FALSE SENSE OF SECURITY

This solid appearance lulls the climber into a false sense of security. When they begin rigging operations as they normally would, thinking the tree is solid, it can fail on them, possibly causing injury or a fatality.

Typically, critical-risk ash trees will break off within the first 10 feet or so of the ground. This is especially true during negative-rigging operations, when the stem/trunk begins oscillating as a piece comes over. Yes, the BMPs for rigging can help with your initial evaluation, but this is where knowing the species of the tree and the history of EAB, and having someone with a lot of experience, can save your life.

All the ash trees I had to climb and rig with a pull rope on this job were taken down safely without any mishaps. By the last day of the work, we had one more ash to take down, and this was the largest and most critical one. I decided to rig it down. Although I could have just cut and chucked down pieces without any rigging, I decided to use this tree as a training opportunity for my crew.



Photo 3: This particular tree was being used as a “guy pole” for all the utilities across the street. The utility guy line was non-energized and was located about 20 to 25 feet up the stem.

ENCOUNTERING A UTILITY GUY LINE

This particular tree was being used as a “guy pole” for all the utilities across the street. (Photo 3) The utility guy line was non-energized and was located about 20 to 25 feet up the stem. I decided to leave the guy line in place and use it to my advantage before having the utility companies come in and remove it. Knowing how I was planning to rig and load the ash tree, I knew leaving it in place would give me added stability during the removal process.

Some might think this was an unsafe thing to do, but I used to do utility relocation work as a New Hampshire DOT engineering technician. Most utility poles in the U.S. are 40 feet in height and sunk approximately 6 feet into the ground. This is more than enough hold for a back guy on a tree stem that I was not planning on loading heavily. Now don’t get me wrong, I am not advocating that tree workers should use their local utility poles for anchoring lowering devices and other hardware! But my margin of error here was minimal.

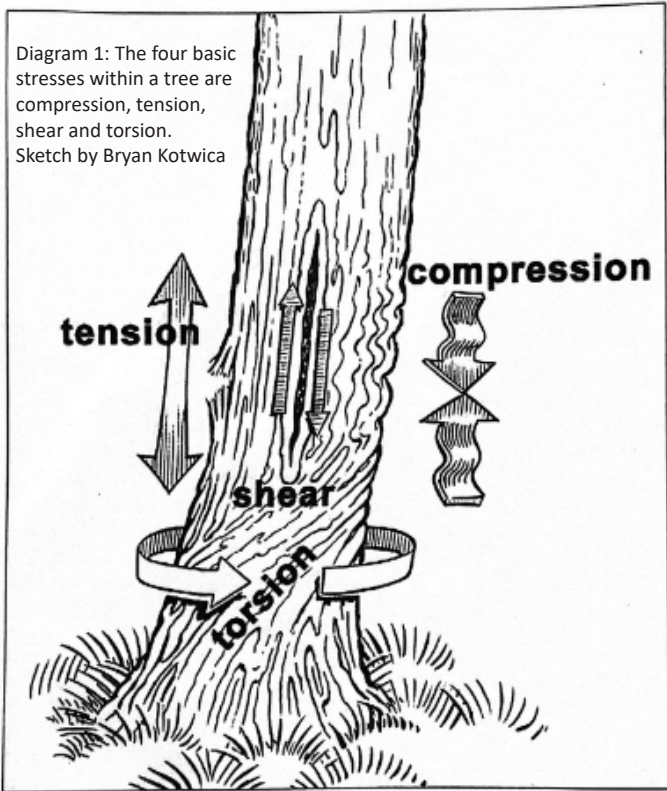


Photo 4: This particular ash was about 60 feet tall. Most of the bark had sluffed off years earlier. Notice the EAB larval tunnelling in the wood.

FULLTREE-RISK ASSESSMENT

We had the honor of having Tchukki Andersen, BCMA, CTSP and TCIA staff arborist, on site for a visit, and she and I did a full tree-risk assessment before I started climbing. This particular ash was about 60 feet tall with a diameter at breast height (DBH) of around 20 inches, and had been dead for six to eight years. It had severely compromised basal roots – with more than 60% significantly decayed. Most of the bark had sluffed off years

Diagram 1: The four basic stresses within a tree are compression, tension, shear and torsion. Sketch by Bryan Kotwica



earlier. (Photo 4)

It is recommended not to climb trees in this condition, and to use an aerial lift or other access method to gain entry instead. However, with proper training and knowledge, there are – in my opinion – acceptable ways to climb and work in critical-risk trees.

The first thing I did was bring out my bags of 10,000-pound load-binder straps. Using these ratchet straps on the stem and placing them every 5 to 6 feet greatly reinforces the trunk. Doing so in this case also gave me some reassurance, especially knowing how this tree was being stressed and the forces it was going to need to endure during rigging operations.

BASIC STRESSES WITHIN A TREE

There are four basic stresses within a tree: compression, tension, shear and torsion. (Diagram 1) This ash was being stressed across all four planes, having cracks both longitudinally (vertically) and latitudinally (horizontally). I made sure to put the straps along both lines of compromise to try and mitigate the strength loss as much as possible.

For anyone interested in learning more about tree mechanics and failures, I highly recommend the German author Claus Mattheck's book, *"The Body Language of Trees."* It is not an inexpensive book but is worth every penny spent on it (especially for engineering nerds like me).

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Photo 5: As I began climbing the tree, it felt just as I thought it would – hard and brittle.
Photo 6: My plan for this tree was to rig out the top, almost directly opposite the utility guy line, but first I wanted to set an additional side guy line and run it down to a sturdy ground tree in the woods.



MY PLAN AND EQUIPMENT

As I began climbing the tree, it felt just as I thought it would: hard and brittle. As I climbed, I was able to cut off some of the lower front and rear branches below the guy wire and along the stone wall and field. I climbed to where I was planning to take out the top of the tree and set up the next stage of mitigation and rigging equipment.

My plan was to rig out the top, almost directly opposite the utility guy line, but first I wanted to set an additional side guy

line and run it down to a sturdy ground tree in the woods. I used our Maasdam rope come-along with Samson Tree-Master ½-inch (12-mm), three-strand, hard-lay line. This little rope puller has a 1,500-pound pulling capacity, though in this scenario I only put a few hundred pounds of tension on the line. (Photos 5 and 6)

Next, I installed a Rock Exotica 2.6 Swivel Omni-Block (working load limit [WLL] = 20 kN), directly opposite (180 degrees) from the three-strand, side guy line (see title shot on page 34). From this block, I installed a Samson Stable-Braid ½-inch (12-mm) rigging line (minimum breaking strength [MBS] = 8,800-pounds), which was going to be my lowering line. This line also would act as a stabilizing line, working in conjunction with the other two guy lines that were in the tree. This setup (including the utility guy wire) would form a stable triangle, allowing the vector forces to act in the most favorable and safe direction when rigging out the pieces.

Also, the lowering line was not run straight down to the base of the ash tree and the lowering device, as I did not want to set up a large bending-moment arm. Nor did I want to load the tree in tension. Instead, I ran the lowering line down at an angle of approximately 45 degrees to an adjacent rescue pulley and sling on a nearby maple tree. Then, the line ran over to another small redirect fairlead pulley, which guided the lowering line into our Hobbs H2 Lowering & Lifting Device (LD) mounted on another sturdy maple tree. (Photos 8 and 9). There are many new and great LDs out there now in the tree care industry, which is a wonderful thing, but we must always remember that it was the late, great arborist Ed Hobbs who gave us the first one.

side by side photos of two tree trunks with pulleys

Photos 8 and 9: The lowering line ran down to an adjacent rescue pulley on a nearby maple tree (left), then to another small redirect fairlead pulley, which guided the lowering line into our Hobbs H2 Lowering & Lifting Device (LD) mounted on another sturdy maple tree (right).

ADVANTAGES OF THE RIGGING SYSTEM

Installing the rigging line and hardware in this manner achieved multiple things for me.

1. It gave my ground worker, who was running the LD, a safer place to stand away from the drop zone. With the condition of this critical-risk tree, it was imperative that everyone stayed far away from the rigging operations.
2. It added rope to the rigging system. Any time you can add more rope to your system, you increase the energy absorption and manage the forces better. This is due to having more elongation (stretch) with the additional rope.
3. It reduced forces on the rigging system. By changing the angle into the block (opening up the angle more) and having the LD located on another tree, I was able to lessen the reaction force on the rigging point (Diagram 2) and load the stem into

compression rather than tension. (Refer back to Diagram 1) Diagram with arrows showing a range of angles. Diagram 2: By changing the angle into the block (opening up the angle more) and having the lifting device located on another tree, I was able to lessen the reaction force on the rigging point. Graphic from TCIA's Best Practices for Rigging in Arboriculture manual.

There are more reasons why you may want to move your LD to another tree. For additional information, see "Seven Great Reasons to Relocate Your Lowering Device," by Anthony Tresselt, in the July 2022 issue of Tree Care Industry Magazine.

SETUP IS COMPLETE AND RIGGING BEGINS

After everything was set up, we began rigging out the tree. I made sure to pre-tension each piece before cutting it. This limits the fall distance and reduces that initial "hit" as the piece is caught by the rigging line. This in turn reduces the "shock load" on the stem and climber. Shock loading is the sudden impact from a load coming rapidly onto a slack rope, also called dynamic loading. The following is a good rule of thumb and comes from my friend and mentor Don Blair: For every foot of fall, the piece gains a unit of weight plus one. For example, a 500-pound chunk falling 4 feet will hit the rigging with about 2,500 pounds of force.

STRICKEN ASH DISMANTLING



Photos 8 and 9 : The lowering line ran down to an adjacent rescue pulley on a nearby maple tree (left), then to another small redirect fairlead pulley, which guided the lowering line into our Hobbs H2 Lowering & Lifting Device (LD) mounted on another sturdy maple tree (right).

My foreman, Brandon Eldridge, did an excellent job of letting the pieces run smoothly. We were able to rig everything above the attachment of the utility guy wire down safely. For that last piece, I actually decided to just put a tag line on it and pull it over without having to press my luck. (Photo 10) We left the

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TECHNIQUES

stem with the guy line attached. I was not about to cut their support, but we did notify the utility that they were going to have to come in and set a new guy pole of their own. Then they were going to fell the remaining stem.

Back of a man in a green shirt with a white helmet pulling on a rope from the top of a dead tree
Photo 10: For that last piece, I decided to just put a tag line on it and pull it over without having to press my luck. We left the stem with the guy line attached.

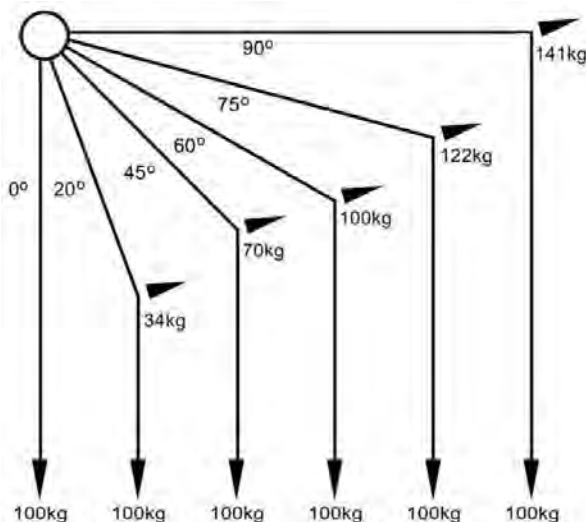


Photo 10- right: For that last piece, I decided to just put a tag line on it and pull it over without having to press my luck. We left the stem with the guy line attached

Everything came down just as planned. I was able to demonstrate (even though my crew already knew) that climbers can sometimes work in critical-risk trees if the necessary precautions and mitigation steps are adhered to. But again, it is always up to each individual to decide if the job can be completed safely. Many thanks to my great crew – Brandon Eldridge, Sam Wagner and Cody Leblanc – for helping accomplish this technical removal.



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FORESTWEAR

BACK to BACK

Transport Bags & Organiser Packs

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Thanks to our colleagues **Arboristes Mag** in France for this excellent guide to 14 top transport bags and organisers available in Europe. This is a useful introduction to our bag guide in the ARBORIST BUYERS GUIDE with over 100 bags and on page 56 we have extracted just the organiser-style bags as a stand-alone Market Guide. French-speakers can check out Arborist magazine's website at www.arboristes-mag.com



Just like shoes or clothing, transport bags for arborists have improved year after year, going from simple modified hiking backpacks to real tools specific to the profession. The offer is immense and many manufacturers have joined in, offering increasingly wider ranges.

To know on what criteria to choose your bag, you must first distinguish the bags according to their different applications (rope bag, transport, organization of equipment, etc.). In all cases, they must be waterproof and robust in order to withstand the constraints of the job.

Rope bags, which are used exclusively for transporting and storing ropes, are often “bucket” shaped and very ventilated in order to ventilate the bag and be able to dry the ropes even when stored. They are often worn over the shoulder or in the hand. “Simple” transport bags offer a larger volume to transport equipment in addition to your ropes. They generally consist of a single large storage space (sometimes with partitions) and a few additional pockets, but no hanging or equipment organization systems. They are equipped with carrying systems.

The bags that we have chosen to compare are those for organizing and transporting equipment. They meet the same criteria as “simple” transport bags but are much more complex in their structures and their development is specifically adapted to arborists. Indeed, when we talk about security, this implies having equipment in good condition and protected from various external attacks, we must also be able to identify it. Furthermore, at the work-site, it is essential to have everything with you and readily available - time is money!



To meet these criteria, the equipment organization and transport bags are equipped with different attachment systems (carabiner loops, equipment attachment, rings, etc.). They have several specific compartments and/or pockets (helmet pocket, mesh pocket, elastic or retaining strap, etc.). Some even offer additional options like a rain cover, rope tarpaulin, rope bucket, kit id labels, etc. For better durability they are often reinforced and/or lined (anti-abrasion bottom, anti-storm flap, etc.). They have several carrying systems (by hand, on the back, over the shoulder, etc.) and generally have an ID panel.

In this category of bag we see several designs: backpacks and “luggage” type bags which can lay flat, in these 2 cases the different types of carrying are offered. Then comes the principle of opening: total opening for access and direct vision of all the equipment, the bag unfolds completely once on the ground or opens from above, which only allows the one type of access to the interior but which generally offers more options on the outside (pockets, equipment holder, etc.).

Your choice will be made according to your practice and your habits, because despite the specific location suggestions, the organization of your bag depends only on you!





WEIGHT, DIMENSIONS & VOLUME

It is important to compare the weight/volume/dimensions ratio for each bag, because your carrying comfort will depend on it. The weight necessarily varies depending on the volume and dimensions of the bag but above all due to its equipment, the materials used and its structure.

EXTERIOR MATERIALS AND LINING

All materials used for the exterior of the bags are waterproof and robust, some are anti-abrasive. The strength of the bag will also depend on the way in which the elements are assembled together: welded, heat-sealed, sewn... Not all bags have a lining, however this helps improve waterproofing and to create additional storage spaces, it also allows for a better finish.



CARRYING & GRAB HANDLES

Straps for carrying by hand duffel-style or on the shoulder. Lift/Grab handles can be used to carry, haul or manoeuvre the bag



STORM FLAP

It is an additional lid which caps the top of the bag.

LATERAL REINFORCEMENTS

Elements which reinforce the structure of the bag so that it keeps its shape well.



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IDENTIFICATION CARD

A full-page photograph of an arborist working in a tree. The arborist is wearing a black helmet, a black sleeveless shirt with a blue 'Ambassador' logo, black pants with a 'Teufelberger' logo, and red gloves. They are using a red rope and a pulley system to work on a tree branch. The background is a dense forest with sunlight filtering through the leaves.

Arborist tools

for every situation



Helmet pouch, straps or mesh on top of the bag

Carrying and grab handles
Top and/or side. Hand-carry handles have reinforcements or padding.

Identification card holder

Storage pouches/pockets
Clear pockets enable you to see what's stored as do inside mesh pockets for larger items or larger quantities of kit.

Carabiner loops
Straps sewn into bridges (Daisy Chain type) on the bag to hang your carabiners. These loops can also accommodate small equipment.

Shoulder Straps

Elastic retainers
Just like web straps, they allow you to store or hold equipment along the body of the bag.



Gear loops
Can be configured like a harness with broad, open loops or small plastic eyes for specific attachments like the two shown below these two gear loops.

Mesh pockets

Ventilation
Bag ventilation systems (holes, grids, nets, etc.).



Straps
May be a Molle-style weave of straps or longer buckled straps that can hold larger items like a coil of rope.

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













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	MATERIALS - OUTER FABRIC	Polyester/PVC	PVC-Free TPU	800D coated Polyester
	- LINING	 -	 -	 Polyester
	VOLUME	70L (+ 40 & 90L versions)	85L (+ 65L versions)	90L
	DIMENSIONS <small>Length x width x depth</small>	63x38x29cm	72x37x27cm	64x35x35cm
	WEIGHT	2.6kg	1.6kg	2.1kg
	Equipment web Straps	 6 adjustable	 4 external	 2 External
	Equipment Elastic straps	 -	 -	 -
	Carabiner Loops	 14 external	 -	 12 external
	Hardware Fasteners	 6 external	 8	 2
	Helmet Pouch/Pocket	 -	 Adjustable volume	 -
	Exterior Pockets	 1 mesh	 -	 -
	Interior Pockets	 1 + 3 mesh	 1 + 1 mesh with key holder	 1 + 1 large mesh
	Partition Wall	 -	 -	 -
	Integrated Rope Bag	 -	 -	 -
	Carry Handle(s)	 2 + 1 Large padded	 can use shoulder straps as handles	 2
	Grab/Lifting Handle(s)	 2	 4	 2
	Shoulder Straps	 Removable	 Removable	 Ergonomic/Stowable
	Waist Belt	 -	 -	 -
	Padded Back	 -	 -	 -
	Reinforced Sides	 -	 -	 -
	Storm Flap	 -	 -	 -
	Rain Cover	 -	 -	 With its storage pocket
	Waterproof			
	Ventilation	 -	 -	 -
	ID Card holder			 Card supplied
	Reflective trim/panels	 -	 -	 -
	OTHER COLOURS	 	-	+Neon rain cover
SUBJECTIVE OBSERVATIONS				
COMFORT	Average	Average	Comfortable to back-carry	
ROBUSTNESS	Durable seams and reinforced, abrasion-resistant bottom.	Excellent durability for intensive use. Reinforced bottom	Very resistant. Reinforced, abrasion-resistant bottom.	
AVANTAGES	Carrying in a backpack or over the shoulder. Closures lockable with padlock (not supplied). Very visible color. Very complete and versatile. Safety clip for keys. Low prices.	Large storage capacity. Can be placed upright or flat. Carrying in a backpack or over the shoulder. TPU cover (resistant and recyclable, chlorine-free). Closures lockable with padlock (not supplied). Very visible color. Very complete and versatile. Light.	Large storage capacity. Can be placed upright or flat. Carrying in a backpack or over the shoulder. Rain cover provided. Very visible color. Very complete and versatile. Light. Identification card provided with emergency alert message. Closures lockable with padlock (not supplied).	
DISADVANTAGES	lacks rigidity	Semi-rigid	Semi-rigid	
OPTIONS			CUBE BAGS, small storage bags (not supplied).	

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SPEC	45L	45L	60L	77L
	70x40x20cm	62x32x23cm	58x40x35cm	68x40x26cm
	2.5kg	2.7kg	2.4kg	2.7kg
ORGANISATION	✓ 1 removable with eqpt holder	✓ 3 external	✗ -	✗ -
	✗ -	✗ -	✗ -	✗ -
	✓ 15 internal	✓ 40 internal	✓ 22 internal + 7 external	✓ 16 external + 24 internal
	✓ 9 internal+ 6 on the strap	✗ -	✗ -	✗ -
	✗ -	✗ -	✗ -	✓
	✗ -	✓ 2 + 1 mesh	✓ 2	✓ 2 + + 1 large mesh
	✓ 3 large mesh + 3 sml mesh	✗ -	✗ -	✓ 1
	✗ -	✗ -	✗ -	✗ -
CARRY	✗ -	✗ -	✓ 1	✓ 1
	✓ 4	✓ 2	✓ 1	✓ 2
	✓ ergonomic & removable	✓ ergonomic	✓ Removable	✓ Removable
	✓ ergonomic	✓ strap	✗ -	✗ -
	✓	✓	✗ -	✓
	✗ -	✓ removable	✗ -	✗ -
	✗ -	✗ -	✓	✓
	✗ -	✗ -	✗ -	✗ -
	✓	✓	✓	✓
	✗ -	✗ -	✗ -	✗ -
	✓ + internal plastic pocket	✓	✗ -	✗ -
	✗ -	✗ -	✓ Logo	✓ Logo
	-	-	-	+Neon rain cover
	SUBJECTIVE OBSERVATIONS			
	Very comfortable to back-carry	Very comfortable to back-carry	Average	Comfortable to back-carry
	Very durable	robust and padded materials	Non-slip textured base. Robust fabric and reinforced seams.	Non-slip textured base. Robust fabric and reinforced seams.
	Chest buckle with emergency whistle. Quick opening system for direct access to the equipment. Rope ground tarp provided. Very complete and versatile. Removable strap with hardware fasteners.	Can be installed on harnesses. Fully unfolds for direct access to equipment with Velcro closure like a tool box. Keeps shape well	Adaptable in volume. Storm flap. straightforward, efficient design. Being superseded by Approach	Adaptable in volume. Storm flap. straightforward, efficient design. Being superseded by Pro-Access see page 65
	Not much room for larger equipment. Lacks rigidity.	Not much room for larger equipment.	Inconvenient buckle closure system. Semi-rigid. Expensive.	Inconvenient buckle closure system. Semi-rigid. Expensive.
	✗	2.5L Spacecraft bag (1 supplied, possibility of adding several).	✗	✗

		PYTHON AT104-50	PRO WORK	DOCK
				
CARRY ORGANISATION SPEC	BRAND	 ARBORTEC	 BEAL	 COURANT
	COST	£120 \$146 €87	£136 \$140 €128	£79 \$123 €80
	MATERIALS - OUTER FABRIC	Polyester/PVC	PVC	1680D Ripstop
	- LINING	✗ -	✗ -	✗ -
	VOLUME	50L	60L (+ 45L & 35L versions)	60L
	DIMENSIONS <small>Length x width x depth</small>	72x35x22cm	80x36x25cm	70x31x24cm
	WEIGHT	2.2kg	1.5kg	1.7kg
	Equipment web Straps	✓ 2 external with clips	✗ -	✗ -
	Equipment Elastic straps	✓ 1 external with clips & loops	✗ -	✓ 2 External
	Carabiner Loops	✓ 10 external	✗ -	✓ 10 external+ 3 internal
	Hardware Fasteners	✗ -	✗ -	✓ 2 eyes + 2 external loops
	Helmet Pouch/Pocket	✗ -	✗ -	✗ -
	Exterior Pockets	✓ 2	✓ 1 plasticized	✓ 2 mesh
	Interior Pockets	✓ 1 + 1 large	✓ 1	✓ 1 plasticized
	Partition Wall	✗ -	✗ -	✗ -
	Integrated Rope Bag	✗ -	✗ -	✗ -
	Carry Handle(s)	✗ -	✓ 2 external + 1 internal	✗ -
	Grab/Lifting Handle(s)	✓ 2	✓ 2	✓ 2
	Shoulder Straps	✓ ergonomic & removable	✓	✓ Ergonomic
	Waist Belt	✓ ergonomic & removable	✓	✗ -
	Padded Back	✓	✓	✓
	Reinforced Sides	✗ -	✗ -	✗ -
	Storm Flap	✗ -	✓	✗ -
	Rain Cover	✗ -	✗ -	✗ -
	Waterproof	✓	✓	✓
	Ventilation	✗ -	✗ -	✓
	ID Card holder	✓	✓	✓
	Reflective trim/panels	✗ -	✗ -	✓ diagonal trim
	OTHER COLOURS		-	-
SUBJECTIVE OBSERVATIONS				
COMFORT	Very comfortable to back-carry		Comfortable to back-carry	
ROBUSTNESS	Very durable		Very durable	
AVANTAGES	Allows the transport of a heavy load over a long distance. Very versatile. Belt with key ring pocket. Very visible color. Very complete and versatile. Light.		Particularly suitable for heavy carrying. Very light. Storm flap.	
DISADVANTAGES	Semi-rigid		No buckles or gear attachments. Lacks rigidity.	
OPTIONS	✗		✗	
				Can attach rope bag (not supplied) to shoulder straps. Carrying belt

TRANSPORT/ORGANISER PACKS

	COBRA	BUCKET BACKPACK	CROSS PRO XL	MIGHTY/LAZY MULE
				
	 ARBORTEC	 ARBPRO	 COURANT	 TEUFELBERGER
	£166 \$264 €189	£108 \$150 €120	£140 \$300 €180	£325 \$350 €314 (Mighty)
	Polyester/PVC	PVC	1680D Ripstop	600D Waterproof PVC
	✗ -	✗ -	✗ -	✓ Polyester
SPEC	65L	75L (40 & 60L option)	75L (54L option)	80L
	66x35x35cm	60x40x30cm	82x35x27cm	67x38x38cm
	3.8kg	2kg 4.4lb	3.7kg	3.8kg
ORGANISATION	✗ -	✗ -	✓ 2 internal with attach clips	✓ 1
	✗ -	✗ -	✓ 2 external + 9 internal	✗ -
	✓ 35 external	✓ 10	✓ 29 internal + 7 external	✓ 72 external
	✓ 4 external alu rings	✗ -	✓ 4 external eyes	✓ 4 internal + 7 external
	✗ -	✗ -	✗ external attachment kit	✗ -
	✓ 2 large + 1 large mesh	✓ 2	✓ 3 + 1 reinforced	✓ 3
	✓ 1	✗ -	✓ 2 plasticized + 6 mesh	✗ -
	✓ removable	✗ -	✗ -	✗ -
CARRY	✓ can be used independantly	✗ -	✗ -	✗ -
	✗ -	✓ 2	✗ -	✓ 2
	✓ 2 replacable	✓ 1	✓ 6 + 1 for hauling	✓ 2
	✓ removable	✓	✓ ergonomic & removable	✗ optional accessory
	✗ -	✗ -	✓ ergonomic & removable	✗ optional accessory
	✓	✓ Thin pad	✓	✓
	✓	✓	✗ -	✓ removable
	✗ -	✗ -	✗ -	✗ -
	✗ -	✗ -	✗ -	✗ -
	✓	✓	✓	✓
	✓	✗ -	✗ -	✗ -
	✓ + internal plastic pocket	✓	✓	✗ -
	✗ -	✗ -	✗ -	✓ Logo
			-	-
SUBJECTIVE OBSERVATIONS				
	Comfortable to back-carry	Comfortable to back-carry	Very comfortable to back-carry	Comfortable to back-carry
	Very durable	Very durable	Very durable	Very durable. Reinforced base
	Adaptable volume. Rope feed while inside the bag. Well ventilated for drying ropes + drain hole under the bag. Very visible color. Super complete and versatile. Keeps its shape well. Built-in rope bucket that can be used independantly. Partition wall. Additional rope bag.	Rope feeds without removing it from the bag. Closures lockable with padlock (not supplied). Very visible color. Light. Low price.	Fully unfolds for access to kit. Logos for uqpt types (supplied). Wasit belt has eqpt attachment points. 300kg haul/heli-strap. highly visible. Super complete and versatile. Lockable closures with padlock (not supplied)	Large storage capacity. Adaptable in volume. Feet + 2 transport wheels for the LAZY MULE. Very complete and versatile. Keeps its shape well. BUCKET MULE rope bag fits inside.
	Heavy, quite expensive	Only 10 hardware attachments.	Heavy. Semi-rigid. Expensive.	Not practical without the optional back carry straps.Heavy. Expensive
	✗	✗	Cross rope bag can attach ventrally.	Accessories inc rope bucket. Gear MULE (small pack) clips to front

BACKtoBACK USER REVIEWS

All materials used for the exterior of the bags are waterproof and robust, some have an additional anti-abrasive layer such as *MAMBA* from Arbortec, *KOOMPASSIA* from FTC TREE, *DUFFEL* from Petzl, *PRO DELUXE* (updated to the *PRO ACCESS*) and *PRO GEAR* from Notch as well as the *MIGHTY* and *LAZY MULE* from Teufelberger. The *KOOMPASSIA* bag from FTC TREE has a very good quality/price ratio, it has no equivalent on the market, very bulky, it is one of the few to have a real pocket for the helmet (along with the *DUFFEL* from Petzl and the *PRO GEAR* from Notch), its use as a backpack is comfortable and, the real plus, it has a rain cover. In addition to easy access to equipment, it can be placed flat or upright like the Petzl *DUFFEL*.

The *CROSS PRO* from Courant is also unique on the market (along with the *SPACECRAFT* from CAMP, much smaller) due to its fully opening design like a tool bag, it is surely the one that offers the most storage options and hooks. It is the only one to offer a winching and heli-hoisting strap (300 kg guarantee). Small downside on the durability of the seams on the zipper. The *PRO WORK* bag from Béal and the *BUCKET BACKPACK* from Arbpro are solid performers but a



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little basic -they only offer a few equipment holders and storage - but light, very solid and inexpensive.

In the low price ranges with large volumes we have the *DUFFEL* from Petzl and the *MAMBA* from Arbortec which have sufficient storage space. Just like the *KOOMPASSIA* from FTC TREE and the *COMBI PRO* from Béal, these bags, such as those designed for sports, open entirely from the top which allows easy access to the equipment. They also allow shoulder carrying, but be careful with the straps which, once the bag is placed flat, are in contact with the ground; they are removable but handling remains impractical. FTC TREE solved this problem on the *KOOMPASSIA* by placing the straps on top of the bag, with specific storage to hide them.

The Courant *DOCK* bag is the perfect compromise between strength, volume, weight and storage options at a very low price. Together with Arbortec's *COBRA*, It is the only one on our list to have ventilation holes. Comfortable to wear on the shoulders and back, it would benefit from an additional carrying belt (available as an option). A useful feature should be noted on the *BUCKET BACKPACK* from Arbpro and the *COBRA* from Arbortec which have a hole for pulling the rope without removing it from the bag. Other systems are available on certain bags (see tables) such as the whistle, the storm flap, the key ring, lockable padlock closures, identification or partitions.



The ARBPRO ROLLY BOX

In the organization and transport of equipment category there is a separate bag that was difficult to compare given its design and its large volume. This is the *ROLLY BOX* from *Arbpro*, a real storage and transport box which can be used as an independent container (in a vehicle for example) or in combination with the *Beach Rolly* from *Eckla* equipped with an extension. *SilverBull* also make a gear 'apron' for the *Beach Rolly* which could be used in conjunction with the *Rolly Box*.



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Organiser kit bags & Packs

Our free **BUYERSGUIDE** to **ARBORIST EQUIPMENT** has an expanded and regularly updating version of this guide with over 100 bags. These are either simple rope bags or 'complex' transport packs and duffles designed to transport a climber's entire day's kit so they have organisational features built into them: pockets, Molle/attachment eyes, gear loops etc. This particular Market Guide has picked out the key organisers that present your kit either by laying out flat or in a cabinet style with dividers and eyes that keeps everything separate. Some are from access & rescue rather than specifically arb but all organiser bags cross over to some extent. **THROWLINE BAGS** will be a separate guide and there will also be more **ROPE ACCESS & RESCUE BAGS** in the **ROPE EQTP BUYERSGUIDE**. This Market Guide does not include the many multi-role rucksacks, SAR and trauma packs that easily double as rope gear organisers.

This introduction and the KEY to the tables covers *all* transport/rope bags, not just lay-flat and 'cabinet' organisers.

Rope bags have been around as canvas 'buckets' and bags since humans first took to the sea but in the modern era we have cavers to thank for the original hard-wearing, water and mud resistant tackle bags. They were usually in bright yellow, blue or red PVC in Europe or blue and orange Cordura in North America, with a draw-cord closure and single 25mm/1" shoulder strap or two if you were posh and could afford a longer rope. This is pretty much the template for bags even now, some 50 or so years on. PVC and Cordura are still common fabrics, yellow is still a thing and a simple web shoulder strap or straps are also just as functional today as they always were. Cavers rarely looked at anything more sophisticated because it meant more to get wet and dirty, more to snag and too large for a tight squeeze. So it was climbers and rescuers who took bags to the next level.

Mountaineers were using rucksacks all along of course and these large, carry-all products naturally organised your kit

pretty well with exterior pockets and interior compartments

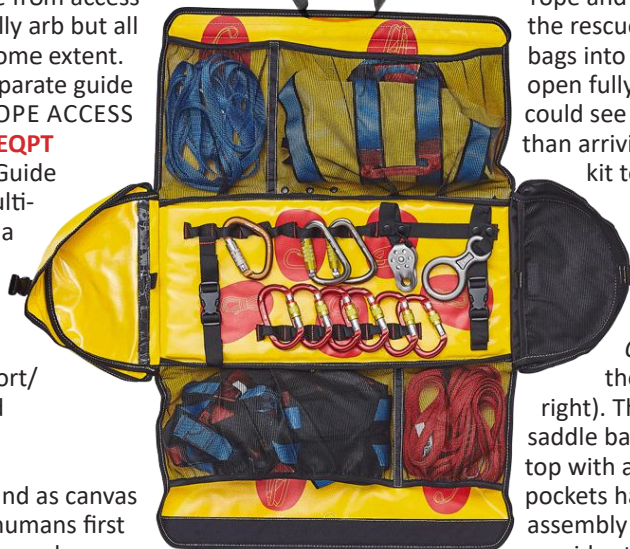
so the

obvious thing for rope-heavy activities that weren't restricted by tiny cave entrances was to marry the rope/tackle bag with a rucksack and have a tackle bag with shoulder straps, hauling eyes and with an array of pockets, pouches and loops. This would allow you to organise all your carabiners/hardware and software around your well-stowed rope and harness. Even more sophisticated was the rescue industry's further development of these bags into larger (team) packs and allow them to open fully to be laid out on the ground so that you could see everything clearly and work quickly rather than arriving on scene and tipping out whole piles of kit to find the one item you needed.

We first moved up from simple tackle bags using CMC's *Heavy Rescue Organiser* which they still make (pic right). This is a kind of saddle bag that has a stiff

top with a handle from which two sets of pockets hang down on each side and the whole assembly is strapped to a regular rope bag which provides the shoulder straps for back-carry. On arrival you simply disengage your rope bag with your

organiser pockets sat next to it like a collapsed calf. We're not sure of the exact evolution but we began seeing (and using) rock-climbing bags with a pull out ground tarp as an ad-hoc organiser of sorts because it allowed us to tip out our kit more safely and cleanly and quickly organise the necessary equipment groups so that anyone could see what was what. Not long after that the true, afore-mentioned transport/organiser packs appeared that had all your kit already clipped into eyes and daisy chains - inside and outside - and arranged into pockets, see-through and semi-see-through mesh pockets and you simply arrived on scene, unzipped or unbuckled the entire bag and laid it in some kind of crucifix shape on the ground. And that's pretty much how things remained for the next twenty or thirty years. Loads of great bags but all a variation on the same themes. Lyon's pack on p64 is a 'roll'



ORGANISER/TRANSPORT

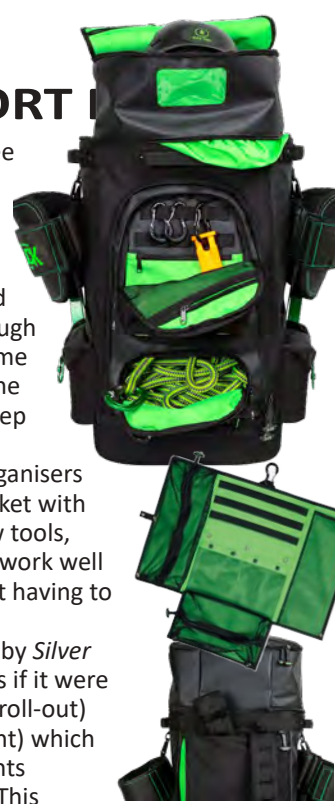
rather than bag intended for rescue, but trust me it's an excellent arb organiser as well. The *Lotus* opposite is CMC's most recent incarnation of their excellent bags that have been market leaders since the seventies. Daisy chains and Molle style individual attachments adorn all organiser bags and CAMP's *SpaceStation* (right) uses dozens of eyelets around the frame of the case. *Teufelberger's Mule* has no less than 81 outside attachment points but a relatively clear, duffle style interior. See-through pockets in mesh or plastic are again a feature of most packs. Some back systems like the *Lotus*, are as good as any long-range expedition pack and load bearing (hauling/carrying) handles/eyes are clearly marked in red on this one. Rope access became a much bigger market than rescue and so was able to drive production of a wider range of products than we might otherwise have had but it was the adoption of technical hardware and 'SRT' techniques in the arb industry that kick-started a whole new drive to produce rope/tackle bags, duffles/duffels and organisers for a burgeoning and willing market.

Duffles are the most common transport format because all sports and work-types use them so we've included the *Petzl*, *Native Arb*, *Arbortec* and *FTC TREE* models as representatives of the genre here but there are many more. This guide is limited to only 18 larger organisers, but our **BUYERSGUIDES** have 100s. Most duffles have organising features like *Koompasia's* helmet pouch above-right but the most complex organisers are still produced by the old guard like CMC in the US, *Courant* in France and CAMP and *Kong* in Italy. They now have virtually every climbing/arb producer in the world to compete with because bags are relatively easy to make and don't have quite the same safety and standards concerns as most other access-related equipment. Some companies like *Silver Bull* have based their entire company on bag production and carved out a great niche in the arb industry as a name you can trust because that is literally all that they make. Their *Climber 'Day'* bag on the right highlights one of the unique features of arb bags compared to access and rescue bags - saw pouches. These are open-top outside pouches to house long-bladed pruning saws and in some cases like the *ArbPro Transporter*, a pouch and straps to secure your climbing spikes. Others have diversified more recently into bags from their main specialisations like *Teufelberger* who have bags that are clearly related to their innovations with the *Tree Motion* harness like this bucket (pic right). This used a base material that has hundreds of holes and shapes cut-out to accommodate carabiners, cord and loops meaning you have infinite attachment options.

Many bags have a drain hole in the bottom to let out water that can accumulate on your rope after a day of working in the wet. We used to use these as a tie-off hole for our ropes with a double fisherman's tied as a barrel termination. Frowned upon now as not only blocking the drainage hole but also exposing the knot to loads of abuse - can't say we were ever affected by either concern, we were more worried about losing our bag and marking the end of the rope with that bag should an incident push the limits of our bagged rope lengths (ie. we're

about to ab off of the end!) Unlike tree work, it's not always so easy to judge distances on a long-drop, in the dark and doing it in a rush and on the fly so to speak!. There have always been drawstring lidded bags that could deploy rope through their rectal-style opening but some models have a sealable hole in the lid to allow rope deployment but keep water out when not in use. Something overlooked by most bags including the organisers in this guide, is the incorporation of a pocket with a range of pen-style pouches for chainsaw tools, screwdrivers, sharpeners etc. That would work well as a lid-organiser easily accessible without having to open the whole pack. The cabinet-style approach is exemplified by *Silver Bull's Multuse* which can be suspended as if it were a cupboard (with inclined shelves to stop roll-out) and *Buckingham's Backpack Pro* (top-right) which is a stand-up backpack with compartments that unzip to clearly show what's inside. This pack demonstrates quite a few nifty features that can be found spread around the other bags in our guides. Kevlar reinforcement of the bottom and side pouches allows climbing spikes to be safely stored and these clip to their own little hooks. The top compartment is for your helmet or your sandwiches or whatever else you want to get to quickly. The middle compartment can be configured as a dry-box to keep your warm clothing separated from a wet rope and this can accept an add-on 'Garage' which is a detachable Molle board with pouches to better store and present your hardware. This adds around \$65 to the base cost of \$415 making this one of the more expensive on the market but also the most complex. On the right you can see how the rucksack straps can be stowed out of snags way and immediately behind this padded back panel is another slim pocket to house a laptop or similar, delicate electronics.

Finally, we should mention the **WHEELED PACKS**. The *Teufelberger Mule* and *Singing Rock Movement* have low-profile wheels which is becoming more popular. Then there is the cart-style. This may have originated with freshwater anglers in Europe who have, for decades, moved their mountains of kit from car to lake as a stack of boxes/cases/bags on light alloy trolleys. Some like the aforementioned *Mule* and the *Big Backpack* add optional integral wheels to an existing design but others, like this *ArbPro Rolly* are used with an optional *Eckla*-style trolley if you intend to move it off the truck! It is a partitioned 'cabinet' with a large rope bag in the top shelf and smaller tackle bags in the bottom. In fact the shelf even comes out to provide a firm, clean work surface. Hardware is housed in a detachable case sat on the top. The large 'box' can accommodate much longer pole equipment like pole-saws and line-launchers nestled into pouches on the side and secured with straps. The majority of arborists are working within a few hundred yards of their vehicles so this cart approach is the definition of taking the weight off....



MARKET GUIDE

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IN THE FOLLOWING TABLES:.....

A large, modern transport pack is quite complex with a whole load of different features that are not always apparent from simply looking at a bag in the store. These are primarily CLIMBERS packs but will double as rigging packs. This guide does not include basic rope bags, instead these all have pockets &/or eyes to better organise your kit as well as rope storage.

COST: Approximate. Includes local taxes but can vary due to exchange rates, other taxes etc. We generally round up the cost to the nearest Pound£, US Dollar\$ or Euro€ **Simple currency conversions are shown in orange** for reference - they are lower than the actual price because it does not take into account import duty, shipping or tax.

ORIGIN: Is the country of the company selling the item, not necessarily the same as the origin of the product itself which is shown as an inset flag where we know.

STYLE/FUNCTION: The bags in this guide can be defined as one or two of the following

- **BUCKET/ROPE BAG** - an upright, top-feeder that holds its shape to allow rope to be fed in or out.
- **BACKPACK:** two shoulder straps and maybe a waist belt but either way- carried on the back giving both hands free to carry even more stuff. Often a combo with a rope bucket.
- **DUFFLE/DUFFEL:** a horizontally carried bag with handles on the top. May also has hidden rucksack straps in the base to convert to vertical orientation.
- **TRANSPORTER:** a multi-compartmented pack - usually a rucksack style - that will either present the equipment in a cabinet style or will open out entirely on the ground to show everything in pockets/pouches or attached.

VOLUME: in Litres/liters nobody uses gallons for this any more!

NOMINAL/INTENDED ROPE CAPACITY: As provided by the manufacturer but varies with the diameter. In organiser packs, rope storage may only be part of the overall volume whereas it may be all of the internal volume in a dedicated rope bag/duffle.

46m/150ft x 12.7mm/1/2" = 76m/250' x 11mm 7/16" = 91m/300' x 9mm 3/8"

WEIGHT: empty with no optional extras included

MAX DIMENSIONS: Height and the width and in some cases, a third figure which is the depth front-to-back. These figures are for the body of the bag and do not include extraneous handles or external pouches that are stuffed to bursting.

2xBACK STRAPS=rucksack style carrying straps

1xSHOULDER=a single strap for slinging over your shoulder

WAIST BELT=rucksack style waist belt to keep the pack tight to your body when walking any distance

[PADDED]=in brackets[] indicates straps padded for comfort.

BACK/LUMBAR PADDING=padding on the pack itself rather than straps, again for improved comfort carrying a heavy load. Lumbar is lower back, behind the waist belt if there is one.

DETACH/STOW CARRY STRAPS: refers to rucksack style straps that can either be ditched entirely or can be stuffed into an integral pocket so that no straps are exposed to snagging.

REINFORCED SIDES (Free-standing)=the pack has stiffened panels or bars that keep the bag upright during rope feed.

CARRY HANDLES WLL ENDS SIDE dedicated carrying handles with ergonomic adjuncts to make carrying a heavy weight more comfortable. Mounted on the top or for duffel-style side-carry. Can also be used to clip on kit. **WLL**=the max weight you can carry via these handles or an additional haul eye.....



The advertisement features a large, detailed image of a yellow and black KONG SPIN helmet on the left. To its right, three smaller images show the helmet from different angles: front, side, and back. The background is a textured, brownish surface. The KONG ITALY logo is in the top right corner. Below it, text states: 'conform to CE EN 397 and ANSI Z89.1-2009 | UNI Size | just 385g | removable and washable padding'. A large, semi-transparent 'SPIN' text is centered at the bottom. In the bottom left corner, there is a QR code and the website 'www.kong.it'. In the bottom right corner, it says 'available in North America by' followed by the KONG USA logo and 'www.kongusa.com'.

ORGANISER/TRANSPORT PACKS

ADDITIONAL HAUL **WLL** **SEWN EYES** **RINGS** Top handles can be used for hauling but there is often a separate sewn loop or metal ring around the top of the pack.

BAG OPENS FLAT to DISPLAY KIT The whole bag unzips or unbuckles to expose the interior. Can also include organisers with detachable, opening display panels/boards.

HELMET [SAW] POCKET/POUCH **CORD** Designated for use with a helmet or saw but can obviously be used for anything that will fit. Climbers packs often use bungee cord on the outside front or top of the pack but some have a separated helmet pocket on the top as it should be the first thing you put on. **INTERNAL PARTITION** a means to divide internal space eg. for 2 ropes or to keep clothes dry-not just a pocket. Some packs come with their own **ROPE TOOL BAG** or are an option ☐.

GEAR (individual) EYES **EXTERNAL** **INTERNAL** These can be daisy chain eyes, Molle eyes or individual plastic eyelets but all are intended to clip one carabiner and/or clippable hardware

GEAR LOOPS [STRAPS] **EXTERNAL** **INTERNAL** harness-style larger semi-circles of cord or plastic that allow multiple items to be clipped into the same loop. All handles could be used as a gear loop! **[STRAPS]** [in brackets] is securing web with buckles

TOTAL POCKETS **EXTERNAL** **INTERNAL** The total number of closable pockets and open pouches outside and **inside** the bag.

of which.. MESH/CLEAR **EXTERNAL** **INTERNAL** of the total number of pockets those which are clear plastic or open mesh allowing free drainage but more importantly visibility of the contents. Mesh makes the bag lighter than a full, heavy duty enclosure.

CLOSURES Velcro **POP Zipped** **Draw-Cord Buckle** Referring ONLY to the outside pockets - a colour square indicates the type of closure

and the number is the pockets that have that specific closure.

WATERPROOF VENT HOLES **DRAIN HOLES** Some are more waterproof than others especially with a **roll-top** closure. Being waterproof does not preclude having side **air vents** and base **drain holes** as 'waterproof' refers to rain from the top not complete inundation. See our **WATER RESCUE BUYERS GUIDE** for completely waterproof bags.

LID **POP ZIPPED** **DRAW-CORD BUCKLE** **ROLL-TOP** Referring ONLY to the top lid and compartment doors. **Pop**=Press stud. **Roll-Top** always has buckles to join the two ends.

LOCKABLE: the main compartment(s) can be locked with a small padlock (not usually supplied). Needs a chunky YKK style zip large enough to clip in a padlock clasp but may be a tougher, bespoke locking mechanism like the *FTC TREE Koompatia*.

ID PANEL: a small-see-through rectangle for a luggage style label or large enough for an inventory of the contents.

END/SIDE STRAPS: in addition to the carry straps these are adjustable webbing straps on the sides that can either act to compress the bag to a smaller size if it's not fully filled or you can secure items behind them. Side straps are often set above open pouches that can house a saw, pole or spikes or **end** straps can be used to secure a hank of rope or a tarpaulin etc.

REFLECTIVE TRIM: not seen as much on arb packs as they are on rescue packs- light reflective to provide high visibility.

TARPAULIN: a separate or integral ground sheet. ☐=if an option

RAINCOVER: a separate cap or complete cover. ☐=if an option

MATERIALS: just the main body panel materials

OTHER COLOURS: colours available *OTHER* than the colour shown in the product image at the top of the column.



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Images NOT to Scale Eqpt not included					
MANUFACTURER		ARBORTEC	ARPRO	BEAL	BUCKINGHAM
MODELS (in range) VARIANT		Mamba 70/90 AT101	Rolly Box	Combi-Pro 40/80 BSAC	Backpack Pro w/Garage 4377 4378
ORIGIN					
COST (inc Tax/VAT) (currency conversion only)		£104/117 \$125/141 €107/120	£290 \$469 €336	£130/145 \$155/220 €145/173	£328 /380 \$415/481 €382/443
STYLE/FUNCTION		DUFFLE	CABINET ORGANISER	ORGANISER	CABINET ORGANISER
SPECIFICATIONS	VOLUME(S)	70/90L	225 + 30L	40/80L	90L
	NOMINAL/INTENDED ROPE CAPACITY	<270/350m x11mm* <540/700' x ½"	2x 80m+1x160m x 11mm 2x 160'+1x320' x ½"	40/60m x 10.5mm 80/120' x ½"	300m x 11mm 600' x ½"
	WEIGHT empty	2.6/2.88kg 5.7/6.3lb	n/a	1.96/2.5kg 4.3/5.5lb	3.36-4.5kg 7.4-10lb
	DIMENSIONS (unfilled)	60 x 35 x 30cm 24 x 14 x 12" 65 x 35 x 35cm 26 x 14 x 14"	75 x 60 x 50cm 29.5 x 23.6 x 19.6" 45x 40 x 15cm 17.7 x 15.75 x 6"	60/72 x 21/26cm 24/28 x 8/10"	81 x 41 x 26mm 32 x 16 x 10"
TRANSPORT	2xBACK STRAPS1xSHOULDERWAIST BELT [PADDED]	■* ■ -	- - -	■ - ■	■ - -
	BACK/LUMBAR PADDING	- -	- -	■ ■	■ ■
	DETACH STOW CARRY STRAPS	■ / - -	- -	- -	- ■
	REINFORCED SIDES (Free-standing)	■*	■	■	■
	CARRY HANDLES WLL ENDS SIDE	2 * 2	- -	1+1 1	*5 -
	ADDITIONAL HAUL WLL SEWN EYES RINGS	- -	- -	1/2 -	1 -
STOW EQPT	BAG OPENS OUT to DISPLAY KIT	PARTIAL	PARTIAL	YES	PARTIAL
	HELMET [SAW] POCKET/POUCH CORD/WEB	- -	■ ■	- -	■ ■
	INTERNAL PARTITION +ROPE TOOL BAG	■* - -	■ ■ ■	■ - / ■ ■	■ -
	GEAR (individual) EYES EXTERNAL INTERNAL	14 6	- -	-10+popper loops/-15+7	16 35
	GEAR LOOPS [STRAPS] EXTERNAL INTERNAL	- -	- -	2* 7*	*5 -
POCKETS	TOTAL POCKETS EXTERNAL INTERNAL	1 4	6 1 + 30L pouch	0 4	*7 4
	of which..MESH/CLEAR EXTERNAL INTERNAL	1 4	- 1*	- 3	- -
	CLOSURE VELCROPOP ZIPPED DRAW-CORD BUCKLE	■ 2	■ 1	■ 3*	■ 5 ■ 2
	WATERPROOF VENT HOLES DRAIN HOLES	■ - -	■ - -	● - -	● - -
	LID VELCROPOP ZIPPED DRAW-CORD BUCKLE ROLL-TOP	■	■	■	■ + ■
FEATURES	LOCKABLE ID PANEL END/SIDE STRAPS	- ■ ■ ■	- - - ■	- ■ - -	- ■ - -
	REFLECTIVE TRIM TARPAULIN RAINCOVER	- - -	- - -	■ - - / ■ - -	- - -
OUTER MATERIALS		Polyester/PVC	680 g/m² PVC	PVC 1100g/m²	Vinyl, Cordura, Kevlar
OTHER COLOURS		■ ■	■ ■	■	-
NOTES		Also 40L version *when duffel handles used as backpacks. *reinforced detachable base to protect spikes *max-if no other internal contents	Wheeled trolley optional. 30L pouch has 2 dividers Clear sleeve in back of box	80L=pull-out rope tarp. *sturdy enough to be a light handle. *6-loops detachable *1 clear pouch can be for water	*Inc padded laptop pocket *carry handles = gear loops. GearGarage is a detachable hardware board with numerous eyes & pouches.
WEBSITE		arborotec.com	arpro.it	beal-planet.com	buckinghammfg.com



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TYPE 1 & 2, EN 397, NFPA 1951



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CRAFTED FOR THE PROS**

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Sheath - 100% Polyester



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Basket MBS: 27.6 kN (6204 lbf)
Technora/polyester sheath



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7 sizes: XXS, XS, S, M, L, XL, XXL
Materials: synthetic leather, cowhide, spandex

MARKET GUIDE




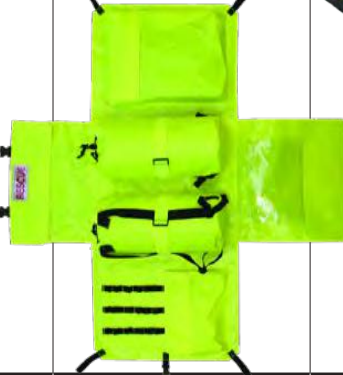





Images NOT to Scale
Eqpt not included



MANUFACTURER		CAMP SAFETY	CAMP SAFETY	CMC RESCUE	CMC RESCUE
MODELS (in range) VARIANT		Hold 40 2789	Spacecraft 45 2790	Lotus Tech Pack 37 441120	Rigtech Pack 42 441110.
ORIGIN					
COST (inc Tax/VAT) (currency conversion only)		£75 \$110 €67	£210 \$286 €258	£162 \$205 €176	£202 \$256 €236
STYLE/FUNCTION		CLAMSHELL BACKPACK	ORGANISER	ORGANISER	ORGANISER
SPECIFICATIONS	VOLUME(S)	40L	45L	37L	42L
	NOMINAL/INTENDED ROPE CAPACITY	100m x 11mm 200' x ½"	150m x 11mm 300' x ½"	122m x 11mm 400' x ¾"	100m x 11mm 200' x ½"
	WEIGHT empty	650g 1.4lb	2.6kg 5.7lb	2.37kg 5.2lb	2.8kg 6.2lb
	DIMENSIONS (unfilled)	56 x 30 x 20cm 22 x 12 x 8"	62 x 32 x 23cm 24 x 13 x 9"	50 x 33 x 23cm 20 x 13 x 9"	56 x 46 x 21cm 22 x 18 x 8"
TRANSPORT	2xBACK STRAPS1xSHOULDERWAIST BELT [PADDED]				
	BACK/LUMBAR PADDING				
	DETACH STOW CARRY STRAPS	- -	- -		- -
	REINFORCED SIDES (Free-standing)	-		-	-
	CARRY HANDLES WLL ENDS SIDE	3 1	- 1	1 2	- 1
	ADDITIONAL HAUL WLL SEWN EYES RINGS	1 50k/110lb-	1 50k/110lb-	- -	- -
STOW EQPT	BAG OPENS OUT to DISPLAY KIT	PARTIAL	YES	YES	YES
	HELMET [SAW] POCKET/POUCH CORD/WEB	- -	- -	- -	- -
	INTERNAL PARTITION +ROPE TOOL BAG	- - -	- - -	- - -	- - -
	GEAR (individual) EYES EXTERNAL INTERNAL	14 -	3 30	12 +16 web eyes 20	6 24
	GEAR LOOPS [STRAPS] EXTERNAL INTERNAL	- 2	- -	- 1	1 2
	TOTAL POCKETS EXTERNAL INTERNAL	3 -	3 *	4 7	2 7
FEATURES	of which..MESH/CLEAR EXTERNAL INTERNAL	1 -	- -	- 6	- -
	CLOSURE VELCROPOP ZIPPEDDRAW-CORDBUCKLE				
	WATERPROOF VENT HOLES DRAIN HOLES				
	LID VELCROPOP ZIPPED DRAW-CORD BUCKLE ROLL-TOP				
	LOCKABLE ID PANEL END/SIDE STRAPS	-	-		-
	REFLECTIVE TRIM TARPAULIN RAINCOVER	- - -	- - -		
OUTER MATERIALS		500D PVC	500D PVC	PU-coated 840D Ripstop	1000D Cordura
OTHER COLOURS		-	-	-	
NOTES			Comes with 2.5L detachable gear bag-clips inside main bag.		*Lid buckles act as end-to-end compression straps. Padded side pockets. Whistle on sternal buckle. 3 lash panels. 2x toggled bungies on lid.
WEBSITE		camp.it	camp.it	cmcpro.com	cmcpro.com

ORGANISER/TREE/PO					
COURANT	COURANT	EDELRID	FTC TREE	HUSQVARNA	KONG
Cross Pro 54 XL75 PSCPB..++	Cross Evo 45 PPLSSCC4	PPE Backpack 45 883101000170	Koompassia	Gear Pack 70 534 10 18-02	Convoy 56 982002N00KK
£164/225 \$230/300 €188/259	£143 \$170 €146	£108 \$160* €110	£140 \$178 €160	£185 \$260 €250	£240 \$325 €286
ORGANISER	ORGANISER	BACKPACK	DUFFLE BACKPACK	BACKPACK	ORGANISER
54/75L (inc 17L rope bag)	45L (inc 17L rope bag)	45L	90L	70L	56L + 19L rope bag
75m x 11mm 150' x 1/2"	75m x 11mm 150' x 1/2"	90m x 11mm 180' x 1/2"	<270/350m x11mm* <540/700' x 1/2"	75m x 11mm 150' x 1/2"	100m x10.5mm 150' x 1/2"
2.7/3.4kg 6/7.5lb	3.25kg 7.15lb	950g 2.1lb	2.1kg 4.62lb	2kg 4.4lb	2.6kg 5.8lb
76 x 32 x 25cm 30 x 13 x 10" 88 x 36 x 27cm 35 x 15 x 11"	59 x 42cm 23.3 x 16.5"	66 x 36 x 10cm 26 x 14 x 4"	70x35x30cm 28 x 14 x 12"	76 x 36cm 29.5 x 14.2"	80 x 35 x 26cm 31.5 x 13.8 x 10.2"
1/2 4 200kg/404lb	1 2	1 -	2 2	1 2	1 2
1 300kg/660lb -	- 1 210kg/462lb	1 40kg/88lb -	- -	- -	1 -
YES	YES	PARTIAL	PARTIAL	PARTIAL	YES
YES +	YES +	- - -			
6/5+4 20/29+19molle	- 13 +4 poppered)	20+2* 20	12 + 2 -	2016	5 24
0/2 [2]	- 3	- 2			- -
*1/*1+*2+*1 11	- 5	2 6	2* 4	5 1	6 6
- 8	- 5 elasticated	- 3	1 4	- 1	2 6
1680D Ballistic nylon YKK zips	PVC	Ballistic Nylon	800D ripstop coated Polyester	900D	PVC
100%less. Zipped lids both ends. Internal pocket sizes adjustable a poppers. *Internal key pocket opened from outside. Kit ID labels. Bottle Holders. *Padded&shaped.	unzips at both ends. Includes the Cross Light rope bag.	* + 2 metal rings if not used to attach shoulder straps *Black version lacks reflective - 12% cheaper	*1 pocket = helmet but could be used for anything. *max-if no other internal contents *Reflective on rain cover	Additional zipped side entry. Integral first aid pocket. *Lid buckles act as end-to-end compression straps	Optional 19L rope bag and helmet securing straps
mycourant.com	mycourant.com	edelrid.com	ftc-tree.com	husqvarna.com	kong.it

MARKET GUIDE

Images NOT to Scale Eqpt not included					
					
MANUFACTURER		LYON EQUIPMENT	NATIVE ARB	NOTCH EQPT	PETZL
MODELS (in range) VARIANT		First Response 50 LS35.2X20LSBMOD..	Kit Bag 100	Pro Access 60 53444	Duffel 65/85 S045AA00/ S045AA02
ORIGIN					
COST (inc Tax/VAT) (currency conversion only)		£271*-326* \$340-414 €315-382	£82 \$103 €96	£192 \$250 €235	£144/156 \$140/160 €150/160
STYLE/FUNCTION		ORGANISER	DUFFLE	ORGANISER	DUFFLE/BACKPACK
SPECIFICATIONS	VOLUME(S)	50L	100L	60L	65/85L
	NOMINAL/INTENDED ROPE CAPACITY	2x 80m x 11mm 2x 160' x ½"	2x 50m x 12mm 2x 164' x ½"	75m x 11mm 150' x ½"	<260/340m x11mm* <520/680' x ½"
	WEIGHT empty	1.91kg 4.2lb	2.2kg 4.4lb	2.63kg 5.8lb	1.35/1.55kg 3/3.4lb
	DIMENSIONS (unfilled)	65 x 55cm 26 x 22"	75 x 45 x 30cm 26 x 22"	69 x 36cm 27x 14"	58.5 x 40 x 28.5cm 23 x 15.75 x 11.2" 70 x 40 x 32cm 27.6 x 15.75 x 12.6"
TRANSPORT	2xBACKSTRAPS1xSHOULDERWAIST BELT [PADDED]	--	--	■--	■--
	BACK/LUMBAR PADDING	--	--	■	--
	DETACH STOW CARRY STRAPS	--	--	■-	■-
	REINFORCED SIDES (Free-standing)	-	-	-	-
	CARRY HANDLES WLL ENDS SIDE	1 -	2 2	2 1	2 2 25kg/55lb
	ADDITIONAL HAUL WLL SEWN EYES RINGS	--	--	--	--
STOW EQPT	BAG OPENS OUT to DISPLAY KIT	YES	PARTIAL	YES	PARTIAL
	HELMET [SAW] POCKET/POUCH CORD/WEB	--	-[■]	■[■]	■-
	INTERNAL PARTITION +ROPE TOOL BAG	-[■][■]	--	--	--
	GEAR (individual) EYES EXTERNAL INTERNAL	- 18/20	20 6	6+2* 21	- -/6* -
	GEAR LOOPS [STRAPS] EXTERNAL INTERNAL	--	- [3]	--	- 8
	TOTAL POCKETS EXTERNAL INTERNAL	- 4/7	- 1	2 6	1 2 / 6 -
FEATURES POCKETS	of which..MESH/CLEAR EXTERNAL INTERNAL	- 2/1	--	- 5	1 1
	CLOSURE VELCROPOP ZIPPEDDRAW-CORDBUCKLE	■ 3/5	■ 1	■ 3 ■ 1 ■ 2	■ 3 / ■ 4
	WATERPROOF VENT HOLES DRAIN HOLES	■--	■--	■--	■--
	LID VELCROPOP ZIPPEDDRAW-CORDBUCKLE ROLL-TOP	■	■	■	■
	LOCKABLE ID PANEL END/SIDE STRAPS	--	■ ■ - ■	■ ■ - -	■ ■ - ■
	REFLECTIVE TRIM TARPAULIN RAINCOVER	■	--	--	--
OUTER MATERIALS		PVC	1000D Phthalate-free TPE Nylon	900D Polyester	TPU (PVC-free)
OTHER COLOURS		[■][■][■]			■
NOTES		inc 2x20L rope bags *Fully modular version with detachable bags & pockets *Empty modular pack=£120	Internal zip pocket for keys/ phone etc.	*a sewn eye on each backstrap.	*Using ALL interior space 4 of which are needed for rucksack straps (if used). Helmet pocket is dry storage separated in the interior
WEBSITE		lyonequipment.com	nativearb.co.uk	notchequipment.com	petzl.com



SILVER BULL	STERLING ROPES	TEUFELBERGER
Multiuse 63	Vertac 40/60 MDBAGVERTAC4060BK	Lazy Mule 80
£162 \$203 €156	£142/158 \$180/200 €166/185	£338/325 \$324/ 275 €326/ 314
CABINET ORGANISER	BUCKET/BACKPACK	ORGANISERWHEELED
63L	40/60L	80L
100m x 11mm 200' x ½'	>75/100m x 11mm >150/200' x ½'	>2x 75m x 11mm >2x 150' x ½'
2.5kg 5.5lb	1.35/1.55kg 3/3.41lb	3.74/3.5kg 8.23/7.7lb
63 x40 x 25cm 25 x 15.75 x 10"	56 x 34 x 22.5cm 22 x 13.3 x 9" 72.5 x 33.2 x 26.4cm 28.5 x 13 x 10.3"	68/65 x 45 x 38cm 27/18x 15"
- -		
-	-	
-		
2 2	2* 22.7kg/50/60lb -	1 2
- 1*	- -	- -
PARTIAL	PARTIAL	NO
- -	- -	-
- -	- - -	-
10 -	- 6	70+4 4
8 -	- -	7 -
- 1	1 4	2 -
- 1	- 3	- -
- -		- -
+		
	- - -	- -
- - -	- - -	- - -
PVC-coated canvas	recycled 600D Ripstop	600D PVC, 600D PU
Orang-utan=Ltd edition. 1,2 or 3 partitioned 'shelves' 3xLarge eyelets allow bag to be hung as a 'cabinet'	*+Rucksack straps can join to become duffel carry handles Integral NFC Chip. Keys clip in top pocket	Additional zipped side entry. 20L Gear Mule pack can be attached. Optional rope buckets fit tube profile
n/a	sterlingrope.com	teufelberger.com

ORGANISER/TRANSPORT PACKS

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Teufelberger

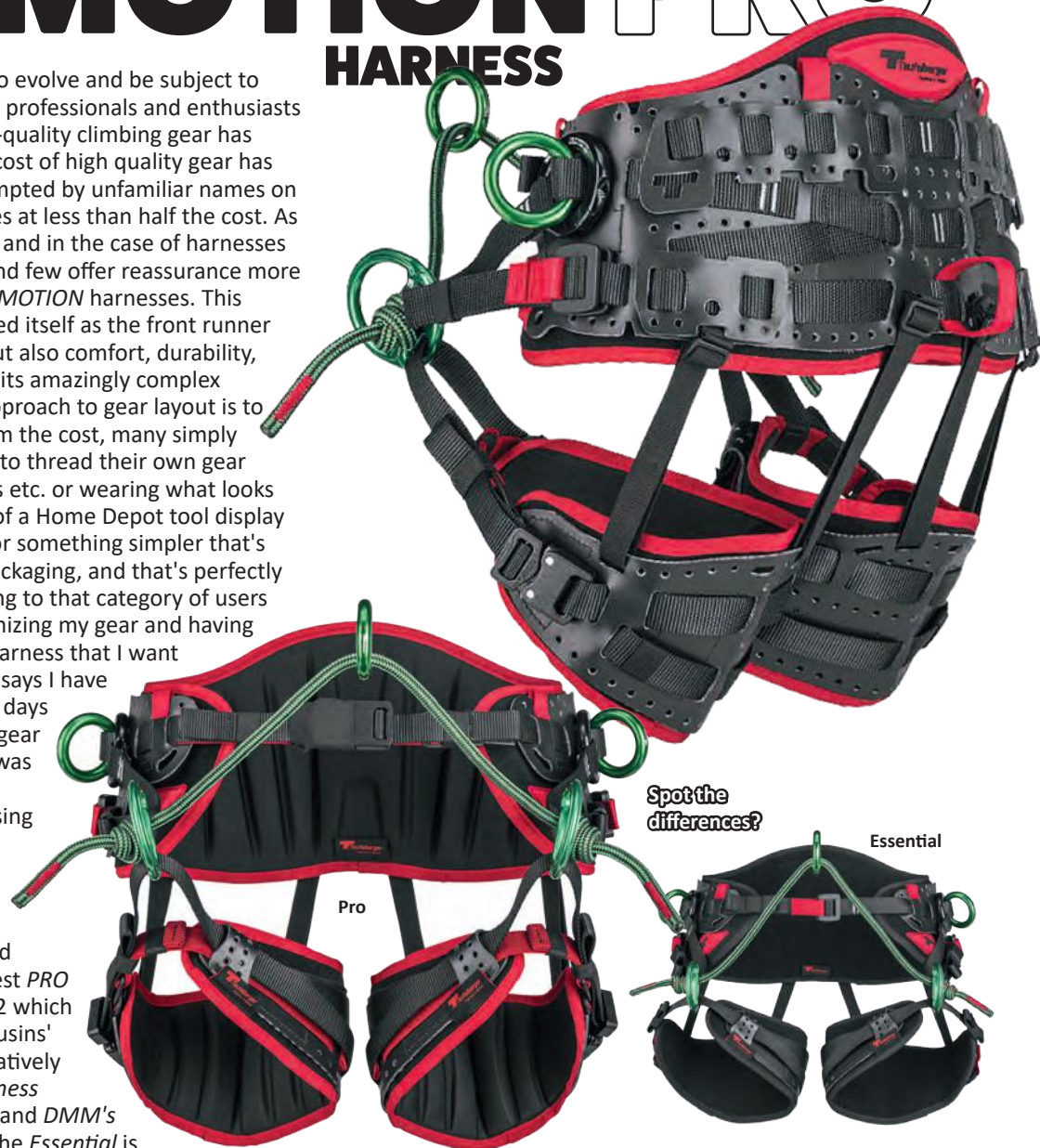
by Adam Jones

Adam is a veteran arborist with his own arb company. He is also a full time firefighter and spent over a decade in USAR and difficult-access rescue.

tree MOTION PRO HARNESS

As tree climbing continues to evolve and be subject to ongoing innovation among professionals and enthusiasts alike, the demand for high-quality climbing gear has never been greater. Equally, the cost of high quality gear has never been higher with some tempted by unfamiliar names on Amazon that offer similar features at less than half the cost. As always, you get what you pay for and in the case of harnesses that's often just peace of mind and few offer reassurance more than Teufelberger with their treeMOTION harnesses. This series of harnesses has established itself as the front runner for climbers seeking versatility but also comfort, durability, and safety. That's not to say that its amazingly complex appearance and do-it-yourself approach to gear layout is to everyone's taste. Quite aside from the cost, many simply don't want the 'hassle' of having to thread their own gear loops and attach their own hooks etc. or wearing what looks a little like something made out of a Home Depot tool display board, preferring instead to go for something simpler that's ready to go straight out of the packaging, and that's perfectly understandable. I however, belong to that category of users that likes to fiddle around customizing my gear and having it in exactly the position on the harness that I want it rather than where the harness says I have to have it. Do you remember the days when your harness just had two gear rings and a chainsaw hook? So I was an early convert to treeMOTION in 2007 but because I was also using two other harnesses, I did skip the last two updates, the EVO and S.LIGHT as it was difficult to justify the expense when my original was still going strong. And cost is certainly an issue. The latest PRO version is around £472/\$625/€582 which is actually a little less than its 'cousins' like the impressive but unimaginatively named Husqvarna Climbing Harness costing around £600/\$650/€555 and DMM's Kinisi costing £650/\$850/€770. The Essential is around 25% cheaper than the Pro and while it is a slimmed down version with a little less adornment, waist width and padding, some may see this as preferable in hotter weather aside from being less expensive.

While the latest versions of the treeMOTION harness have improvements, it's essential to acknowledge the strengths of previous treeMOTION versions. The treeMOTION EVO and treeMOTION S.Light have both been popular within the industry since their introduction and until they're worn out, they function as well now as they always have, so much so that there's not quite the rush to update to the newest model that there might otherwise be with 'improved' versions. We would probably say that the Pro represents 'enhancement' with more



kit stowage options, some hardware and strap changes and purposeful colour-coding rather than a huge 'improvement'.

The treeMOTION EVO, introduced in 2010, embraced several features that built a lightweight yet durable saddle, coupled with an adjustable waist belt and leg loops, it continued to build on the original treeMOTION concept offering versatility for stowing your gear and use of climbing systems plus a range of comfort adjustments. However, some users found the padding to be lacking, leading to discomfort during prolonged use. In response to feedback from climbers, Teufelberger released the treeMOTION S.Light in 2015, which tried to address the comfort issues of its predecessor while maintaining a lightweight design.

The addition of redesigned padding and improved ventilation made the harness more comfortable for extended climbs, earning praise from users for its ergonomic design, although not without some niggles, however personal for some users, particularly the male operatives who reported some discomfort! Possibly due to the slimmed down and lighter nature of the design?

The *Essential* and its beefed up counterpart the *Pro* have kept pretty much all of the good bits of their predecessors, got rid of one or two niggles and added some things which the *Kinisi* might argue it has taken even further:

- Colour-coding of life-support hardware (green) and buckle adjustment and non-life-support elements (red)
- Improved location of, and increased number of, gear attachment options - hard to believe that was even possible given the number on the original version
- An openable ring behind the side -'D' rings and in fact these can be moved and used as a rear-attachment instead of the new red webbing loop or on your bride(s).
- Larger area of belt and leg loop padding

The updated materials and construction purportedly improve durability (though we haven't had the *Pro* long enough to verify that) addressing some concerns about comfort and the longevity of earlier models. An example of this is the replacement of the round section elastic bungees, (pic left). You don't see bungee cord



Original
treeMotion



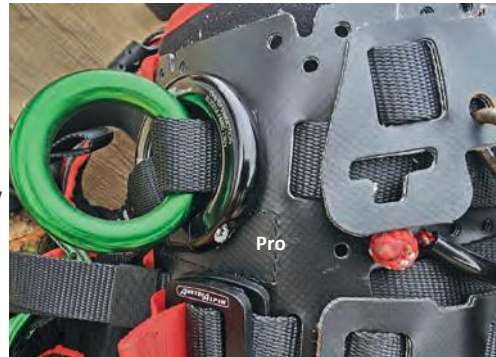
Original
treeMotion

on many harnesses and you have to wonder why. The switch to more conventional elasticated webbing may be a nod to a failed experiment but, as with most things on these harnesses, you can put back bungee cord back if that's





Original
treeMotion

your preference. Also, the previous models had two adjustable loops, located high on the rear of the waist band, (pic top-right) for holding an individual first aid kit. These have now disappeared altogether leaving the wearer free to affix the medical pack anywhere, anyhow.



Pro


Even the most refined designs, sometimes fall short, maybe not by much but still worth mentioning because the one notable negative, which we have experienced and received anecdotal feed back for, is a degree of slippage of the waist webbing during use. The *Austriapin* double D buckle, though newly refined, can hardly be said to be revolutionary so whether this has been let down by a newer, lower profile or perhaps slicker



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GEAR REVIEW

webbing we are not sure. The result being that to maintain a good fit the wearer may have to re-tighten the waist and/or leg loops, during work. This was the case regardless of the weather; it was experienced both during dry and wet conditions. However, at no point, did we feel that there was any increased risk to the users' safety,



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recognised and approved options for sterilisation. In terms of functionality, the *Pro* offers a plethora of strategically placed gear loops and attachment points for convenient storage and organization for tools and equipment, allowing climbers to keep essential gear within easy reach while ascending and working within trees. Overall, the now familiar configuration looks similar to previous models but there have been some strategic repositioning and there are more holes, some are larger than the original cord-only opening. The rear central saw attachment loop has changed. Originally a red or green aluminium ring it is now a red, nylon ring, rated to carry a load of up to 30kg. This is the factory standard but you can, if you prefer, choose to add a gated metal anchor ring, or cut the nylon ring off completely, replacing it as required with a metal ring. As with the previous models, we can add custom gear

loops as desired, using the multitude of holes available, which range in carrying capacity from 5kg to 10kg. The smaller holes, found across the waist belt are not specifically load rated, but certainly functional. The spacing is to match the attachment mechanisms like DMM's *Vault* range but *Teufelberger* offers a variety of gear loops and attachment points including gear loops, tool holsters, and gear bags but, in fact, the physical similarities between the *Kinisi* and the *treeMOTIONS* presumably allow for easy cross over of all accessories like DMM's *Tendon* which can install around the top of the waist belt using the gear loop holes. This provides a clever and tidy solution for lifting knee ascenders. Accessorising the harness extends well beyond the proprietary products, whether supplied by *Teufelberger* or DMM [ED: just about all of the 40 tool hooks listed in our **BUYERSGUIDE**s will fit *treeMOTION*]. Red colour-coding extends to the four attachment points for fitting either *Teufelberger*'s own chest rig, or potentially something from another manufacturer, such as *Courant*, C.A.M.P. *Edelrid* which all incorporate an elastic component to assist with ascending set ups. *Teufelberger* own chest harness, (if you like to coordinate your gear), is a more minimalist addition. The chest harness provides the ability to integrate one of many climbing systems, particularly for SRT/SRS ascent.

The replaceable 10mm rope bridge allows climbers to customize the length of the bridge. This was originally borrowed from *Teufelberger*'s sailing rope - the *Globe3000* with a *Dyneema* core and tight sheath making it ideal for high-frequency bridge ring travel. There is an option to add a second bridge offering the full spectrum of climbing systems and techniques. Again, options for creating an adjustable length bridge have always been present and if you can afford it the DMM *Kinisi*'s key difference is a camming rather than tied-off bridge union and swivelling side D back-ring that allows the riser to follow the line of the bridge unions. Overall, the *treeMOTION Pro* harness remains the standard by which all others are judged, even though its cousin the *Kinisi* surpasses it in some areas. There are times when the lighter, less 'cluttered' *Essential* harness is called for especially in heat but certainly, for me, the *treeMOTION* in any 'guise is my harness of choice, offering quality, comfort, adaptability and functionality - high praise indeed given the array of harnesses I have access to via **ARBCLIMBER**, **WILDERNESSAR** & **TECHNICALRESCUE** magazines.



despite having to pause to tighten the straps as required. On a decidedly positive note, the hook ended, red (not life support) elasticated positioning straps behind the waist belt hold the harness in place the instant you put it on enabling you to adjust the main buckle at your leisure without fighting the harnesses attempts to fall down especially when pre-loaded with gear - that can be a quite a weight.

Despite this possible slippage issue, some

of the most notable improvements are to adjustment of the fit. Connection between the bridge and the leg loops now has greater adjustment allowing greater control over the centre of gravity and it's amazing how this small change can impact your working day, just being in a slightly more ergonomic orientation. Colour-coding of highly visible red on all adjustment and non-life-support elements is a great improvement over the original, difficult to see black on black. The improved adjustability of leg and waist straps allows for a personalized fit and comfort is further aided by improved cushioned padding helping to distribute weight more evenly. The leg and back pads are located using hook and loop (Velcro-like) fastenings, this allows for removal for cleaning and or replacement if necessary. The range of materials used in this harness include polyester, Dyneema, nylon, aluminium, stainless steel, polymer and brass so cleaning is restricted to warm water ($\leq 30^{\circ}\text{C}$), mild detergent and hand washing only. For heavy soiling or contamination, an occasional wash with water temperature of $\leq 60^{\circ}\text{C}$ is permitted, so long as the immersion is for less than 1 hour. Washing machines and jet washers are a definite no. Time to break out the rubber gloves... If contamination is more significant (maybe a passing dog has peed on your kit?), Ethanol or isopropyl (70%) alcohol are

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The MSA 220 TC-O is STIHL's most powerful cordless arborist chainsaw to date. It's the first STIHL chainsaw that has an LED display and integrated oil sensor, which provides key information during operation. With equivalent cutting performance to the petrol MS 201 TC-M and long-service life, arborist professionals can take on the tough tree maintenance and removal jobs.

The new ADVANCE ProCOM headset and ear defenders on the X-CLIMB helmet allow you to communicate with workers on the ground seamlessly, with simple networking over vast distances for up to 16 people, plus much more.

**SMART, EFFICIENT, COMFORTABLE COMMUNICATION:
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