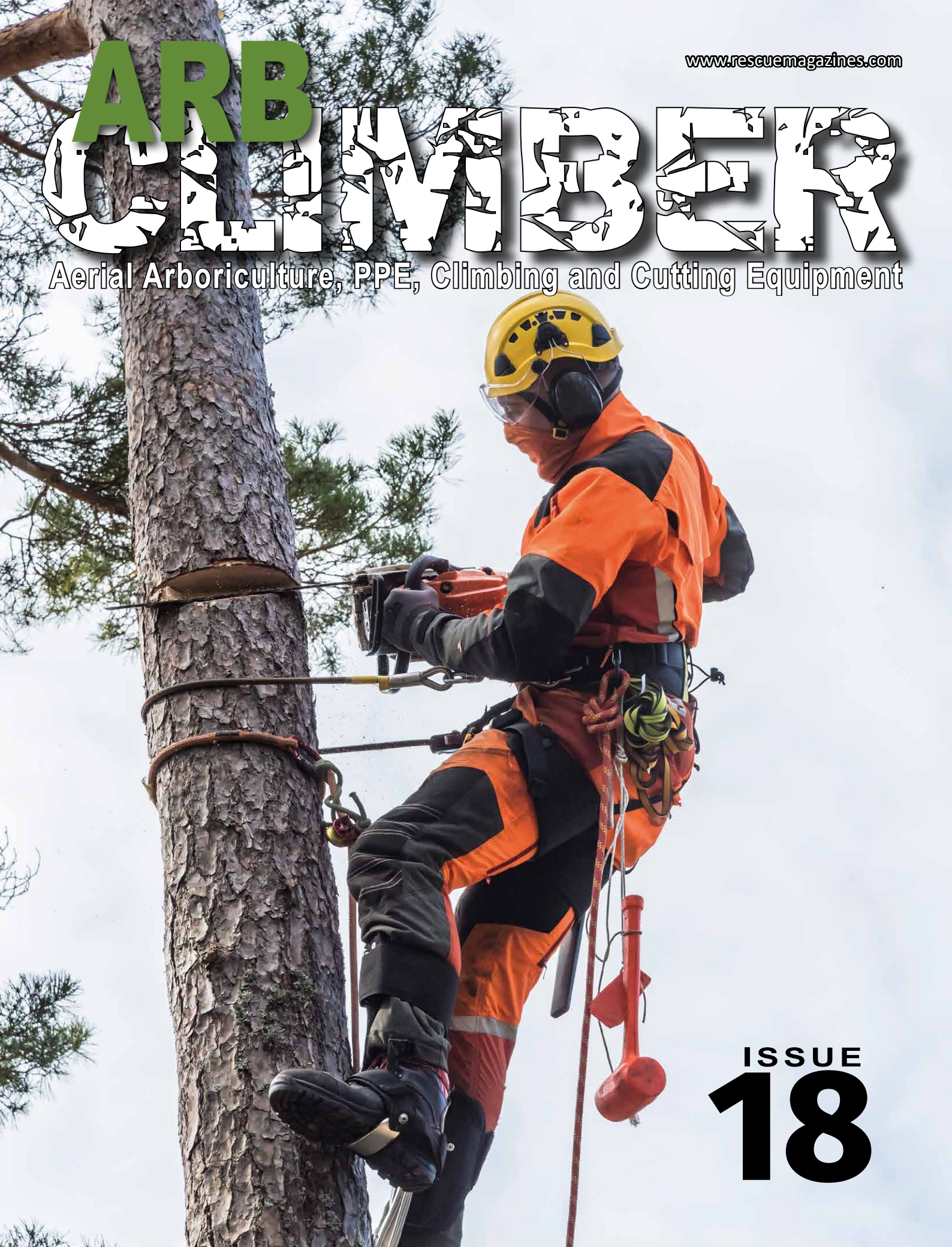
www.rescuemagazines.com

ARB CLIMBER

Aerial Arboriculture, PPE, Climbing and Cutting Equipment



ISSUE 18

ARB CLIMBER

issue 18

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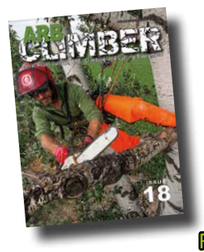
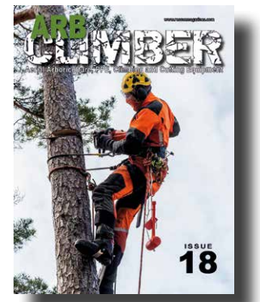


FRONT COVER:

Issue 18's cover was actually our reserve 'stock' image but it has ended up being more appropriate than our original cover above by John Evans which is a great dynamic shot that we will still try to use in 2021. Per Björkdahl's image captured a portent of things to come. This Swedish arborist is wearing a face mask to counter sawdust but it now also works for Covid'19 when interacting with colleagues and clients! His Petzl Vertex helmet has an integrated goggle/visor so this bandana-style face mask actually does a better job of protecting you from dust inhalation than the usual full face visor. Plus it's light and easily washed. See Petzl Vertex Helmet review on page 14.



www.rescuemagazines.com

Running Rings Around....

Designed to meet the demanding requirements of arborists and professional riggers, these rings feature an ultra-smooth interior radius for smooth, predictable movement on a harness bridge or as part of a friction saver. The best-in-class strength ratings are testament to the quality of the material and production techniques; power users will appreciate the Radius Rings superior durability. Because these rings cannot accidentally open, they are ideal for remote anchor points where nothing can be left to chance.

Radius Ring 28mm

Model#:	81520
Finish:	Orange Anodized
Dimensions Inside Diam	28mm / Outside Diam 48mm
Thickness:	12.7mm (.5”)
Weight:	35 gr (1.2 oz)
3 Sigma MBS:	38kN (8542 lbs.)
Retail Price: $13.95	

Radius Ring 40mm

Model#:	81540
Finish:	Blue Anodized
Dimensions Inside Diam	40mm / Outside Diam 61mm
Thickness:	12.7mm (.5”)
Weight:	46 gr (1.6 oz)
3 Sigma MBS:	40kN (8992 lbs.)
Retail Price: $15.95	Both rings Made in USA

www.smcgear.com

ROPERUNNER EVOLVES

ED: Kev Bingham's original baby opposite continues to impress new users while another of his successes, the roperunner, also draws plaudits including a somewhat optimistic description by one large arb outlet as the most popular and most advanced SRT device ever made! The Roperunner is nevertheless a great device and has been given a hot-forged makeover in the form of the PRO by SherillTree's Notch brand taking it from Kev's original concept to DMM-esque style cool curves and reinforcing.

Designed by Notch with original inventor Kevin Bingham, the Notch Rope Runner Pro has enhanced ergonomics and rope friendly edges. The Notch Rope Runner Pro is the ultimate SRS mechanical device.

- Incredibly easy SRT or DRT climbing
- Unparalleled smooth one-hand descent
- Fully mid-line attachable (stays in one piece!)
- Rope friendly edges
- Flattened 'bird' sections for comfort when descending
- Multiple friction settings
- Integrated central tending point for attachment to a chest harness
- Improved sealed ball bearing pulley
- Designed by Notch with original inventor Kevin Bingham
- Internal spring keeps it safe from dirt and debris
- Slic pins keep all of the parts together when the device is opened
- Super-cool gunmetal grey color
- Rope Diams: 11 – 13mm
- Working Load Limit: 308lbs (140kg)
- Weight: 15oz (425g)
- Materials: Hot-forged aluminum, stainless steel, nylon
- COST: $350

www.sherilltree.com

NEW CERTIFIED WRENCH KITS

[ED: I'm having deja vu but this is a Sept 2020 release]

ISC has announced the launch of the new Rope Wrench System Kits. The new Rope Wrench system has been third-party tested and certified by a Notified Body, to PPE ‘Regulation 2016/425’.

The new kits allow users to climb in compliance with the latest European best practice regulations. Since it’s not possible to CE certify the Rope Wrench as a single item (due to there being no applicable standard, for the Rope Wrench), it was necessary to certify an entire system. Therefore, the PPE Regulations Certification applies to full kits, when used in their entirety.

NEW ROPE WRENCH KITS

Hardware:
Rope Wrench, fitted with Twin-leg Tether PHLOTICH Hitch-minding Pulley Aluminium HMS Karabiner (Supersafe Triple-lock Gate)

Cordage:
Hitch Cord: Teufelberger OP 85cm e2e Hitch (10mm)

PLEASE NOTE: For compliance labeling reasons, Hitch Cords must be sourced from ISC (via your ISC Retailer).

Rope Options:
Teufelberger drenaLINE (Choice of sewn or 'spLIFE' spliced termination. Range of lengths available) OR Teufelberger Xstatic (Sewn terminations only. Range of lengths available). The above kits are Certified to PPE Regulations when used in their entirety, with the hitch cord in a 5-wrap Distel configuration [see user manual].

Spare Parts: Hardware and Cordage components are also available to purchase separately, in order to allow the supply of spare/replacement parts.
Pic Above: kit assembled on Teufelberger drenaLINE.

www.iscwales.com

RNR Aluminum Elite

The World's lightest 40kN/9000lbf Carabiner

Built as the new workhorse for rope access and rescue, the ELITE is one of the lightest carabiners to meet the full-strength, 9,000 lbf. rating.

Rated to 40kN, this carabiner weighs only 4.6 oz – almost 10% lighter than other G-Rated aluminum 'biners and less than half the weight of steel carabiners. The Elite is forged from aircraft-quality, heat-treated aluminum and features a KeyLock Nose to prevent snagging on webbing, ropes and harnesses! Available in rescue red and gunmetal. Whether you're fighting fires, working at height, saving lives or in a combat zone, the ELITE has you covered. This is a reforging of Omega Pacific's revolutionary G-FIRST. [*ED: OP unfortunately now closed down*]

Specifications
Material: Aluminum
Finish: Anodized
Dimensions: 5.04" x 3.07"
Gate opening: 1.2"
Weight: 4.6 oz
3 Sigma test:
Major axis – 40kN
Minor axis – 11kN

Gate open – 11kN
COST: $28
Colours: Gun-metal or Red
Web: **www.rocknrescue.com**

[ED: Difficult to get too excited about regular safety helmets that don't make you look like a fighter pilot or Darth Vader but last year's update of 3M's X5000 series (you'll see them as the X2 and X4) has some worthwhile features; the red patch is a UV indicator which fades to white with UV degradation of the shell and thus its safety or otherwise in the event of an impact – they all deteriorate with age and use but most climbers push them far beyond safe lifespans. Ventilation for active climbers can be crucial and the 5000 series has a rear 'grill' entraining air front to back via the side vents....allegedly and it uses an easy ratchet size adjustment]

The 3M™ SecureFit™ Helmet Kit offers comfort and protection for those who work at and around height in the Forestry and Arboricultural Sector.

- Inspired by climbing helmets with a brimless design to give you a clear upward view
- Accessory slots and clips are compatible with a variety of 3M faceshields, earmuffs and other accessories
- Proprietary UV indicator that lets wearer know when to replace helmet with UV exposure
- STANDARDS: ANSI/ISEA Z89.1. Either EN12492 or EN397 (depending on chin strap configuration) but not both standards simultaneously
- Approved for Lateral Deformation and Molten Metal splash
- WEIGHT: 805g (clean)
- HEAD SIZE: 50-63cm
- COLOURS: Black, Blue, Green, Neon Green, Orange, Red, White, Yellow
- TEMP RANGE: -30-+50C
- COST £120/€125

3M™ SecureFit™ Safety Helmet, X5000 Series, provides secure, comfortable and adjustable head protection for arborists and foresters. Our helmets feature six different settings to adjust positions and 4-point chin strap selector systems to switch between EN397 (industrial safety helmets) or EN12492 (helmets for mountaineers) certification standards. X5000 Series safety helmets are vented, brimless and have 3M™ UVicator™ Sensors that indicate levels of exposure to damaging ultraviolet (UV) light. They have easily-adjustable, 6-point ratchet suspension systems which feature the exclusive 3M™ Pressure Diffusion Technology. 1000Vac Dielectric.

www.3M.com

NEW from PETZL

[ED: Far too many new products coming out for us to cover in one issue but hardware from Petzl is always worth a mention and these two items, the Spin, Petzl's answer to the Rock Exotica Omni and the Eject Friction-saver will be out next year and reviewed in ARBCLIMBER]

The EJECT adjustable friction saver allows the work rope to be set up, without damaging the tree, even in narrow forks. It offers multiple setup configurations on one or two branches and has an adjuster that allows precise length adjustment of the friction saver. Rope ascents and movement in the tree are optimized, thanks to the high-efficiency pulley which facilitates rope glide at the anchor. The included retrieval ball makes the system retrievable from the ground. The system enables wrap-around or choked setup on the anchor branch.

EJECT

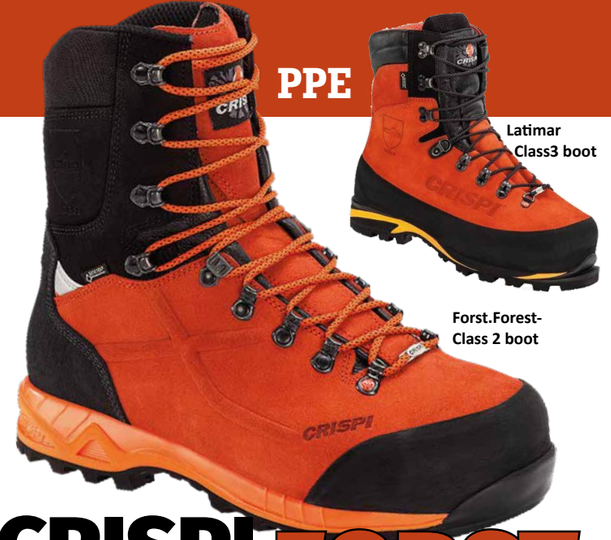
• Breaking strength: 25kN • Maximum load: 250kg • Certification(s): CE EN 795 B, CE EN 12278, EAC, TS 16415 • Material(s): aluminum, stainless steel, nylon, polyester • Weight: 490g • Rope diameter: 11-13mm • Sheave: 28mm/sealed ball bearings • Efficiency: 95%

SPIN Swivel-Pulley

3 models with triple-action opening of the moving side plate even with gloves. A red visual warning when unlocked. Swivel allows pulley to be oriented under load and accepts up to 3 carabiners Basic Model= • Weight: 290g • Standards: CE EN12278, NFPA- G, UIAA • Material: aluminum, stainless steel, nylon • Rope diam: 7-13mm • Sheave: 38mm sealed ball bearings • Max working load: 4x2= 8kN • MBS: 36kN • Efficiency: 95%

FLOW (left) 11.6mm and **CONTROL** (below) 12.5mm Arb Climbing Ropes: Low stretch kernmantle, high-strength rope with excellent handling, for tree care. The EverFlex technology guarantees great flexibility and handling over time in both ropes. Come with a splice at one end. Splice passes through the ZIGZAG/PLUS. Two colours and three lengths.• Diam: 12.5mm 11.6mm •Material(s): polyester • Certification(s): CE EN 1891 type A, ANSI Z133 • Weight per meter: 115 g 102g • Strength tied with figure-eight knot: 15 kN •Strength with splice: 19 kN 15kN • Impact force (factor 0,3): 5,2 kN • FF1 falls: 8 • Construction: 24 carrier • % sheath: 62% 55% • Static elongation: 3.1% 2.8%

www.petzl.com



Latimar Class3 boot

Forst.Forest- Class 2 boot

CRISPI FORST KL2 GTX

class 2 chainsaw boot

ED: A new chainsaw boot from Italian manufacturer Crispi that some of you will have missed or maybe already spotted at your local outlet since they came out during the spring 2020 Covid lockdown! Crispi is a brand we've know in mountaineering and work boots for several decades but they've tended to make chainsaw boots for other companies so they're not so familiar under the Crispi name. The new Forst or Forest in English, is a Class 2 chainsaw protective boot (24m/s or 79f/second for what it's worth) and it immediately inspires confidence because it uses a Vibram sole and GoreTex membrane. These aren't necessarily the absolute best performing components despite their profiles but they are among the top-performers with renown high quality so who's arguing. With an extreme mountaineering boot background that we always consider to be best pedigree for well fitting, functional boot, Crispi has incorporated a whole heap of Three Letter Abbreviations for design features that are great but largely variations on themes seen on other quality boots. In the case of the Forst boot, its BLC, CCF and TWT – basically the upper-to-insole board lasting, shock-absorbing inserts in the sole and reinforcing across the sides above the arches, similar to the 'X' that we see on Haix boots. Still, it does show some extra thought and attention to detail. As a comparison the Forst/Forest isn't quite the full 'alpine' style chainsaw boot of their heavier Class 3 (28m/s or 92ft per second) Latimar boot (above right). That one may be discontinued but was around £300 and weighs more than twice the Forst. Forst has a host of bespoke features and constructions that make it a something of a cross between the Latimar and ArbPro's Evo opposite A fine all-rounder but still better for temperate to cold countries than palm-trimming in Death Valley.

CONSTRUCTION

Upper:	Water repellent crust leather
Lining:	Gore-Tex
Insole:	Differentiated structure Removable Insole P100+Cambrelle®
Protection:	Aluminum Toe-Cap 701J and rubber outer toe cap
Sole:	Vibram® MEGAGRIP/polyurethane shock abs. midsole & CCF insert
Standards:	EN ISO 17249:2013 KL2 CI E WR WRU SRA
Sizes:	EU 39-47 EU43=UK8.5 US9.5
Weight:	930g/2lb for a size 43 boot
Cost:	£310/$420/€350
Web:	www.crispi.it

Climber keep calling in sick?

[ED.....*keep them on their toes by threatening to buy one of these. Far be it from us to feature kit that puts climbers out of business but not all arb companies can get good climbers or the workload is just becoming too much for the climbers you have available. Enter the GT Total Tree Control Grapple Saw....*]

WORKING SAFER

The mechanical felling of trees with a felling grapple is gaining in popularity. The biggest advantage is that the process is safer and more efficient than with traditional techniques. The new models of GMT Equipment's grapple saws have been specially developed to make it possible to hold tree parts after the moment of sawing. Not only is the tilt cylinder of the grapple blocked, but so is the movement in all directions in the cardanic suspension. That means: flexible installation and fixed removal at the push of a button! There is no limit to the holding of the sawn tree sections, but for safety reasons, they are set at the factory to the maximum permitted loads of the crane on the load-bearing vehicle. The design and operation have recently been patented.

TTC: MORE POSSIBILITIES WITH LESS MANPOWER

Director Michel Gierkink of GMT Equipment provides the technical explanation: “We have fitted a double knee joint above the rotation section and the attachment to the crane or telescopic handler. Each knee joint has a hydraulic cylinder and a number of brake linings. These brake linings are clamped in place by the hydraulic cylinder pushing both suspension lugs toward each other. One push of a button suddenly transforms our pivoting grapple saw into a fixed grapple saw. This makes it possible to pick a branch from the tree exactly in the position in which it is attached. This allows you to work much cleaner when picking apart and removing entire trees.”

GMT Equipment noticed some customers need more control when removing branches. TTC combines the advantage of movement flexibility with the ability to keep or hold tree sections in position when removing them. The crane or telescopic handler operator can now bring the felled timber to the ground with even more possibilities when felling when there is little or no room to manoeuvre, particularly when there are surrounding objects such as houses, above-ground power and telephone lines or other obstacles. As a result, little loose wood ends up on the ground, which also saves a lot of manpower.

The Total Tree Control system has two variants: a 16 inch (GMT035 TTC) and a 20 inch (GMT050 TTC) felling diameter. This method of felling is ideal for felling trees in built-up areas, along roads, near high-voltage cables and in other places that are difficult to reach. GMT Equipment's grapple saw is extremely robust and can be applied to any vehicle with a crane arm and gripping function without major intervention or electronic aids. The grapple saw can be applied to the tree or branch from all angles, unlike other brands/types where the felling grapple is built-in and the positioning options are very limited. GMT has designed a quick coupler system, which makes it easy to switch the grapple saw with other attachments for the same vehicle. The GMT Fly Jibs were developed in 2019 for the installation of the grapple saw on truck-mounted cranes and telescopic handlers. This crane extension ensures that the grapple saw can move freely and rotate 360 degrees when the crane is in the highest position.

www.gmt-equipment.com

BATTERY-POWERED CHIPPER

[ED: This isn't a new product having been introduced almost 2 years ago by Danish company TP Wood Chippers (Linddana) but it remains a rare animal. I have to confess that in the course of our Echo Battery saw review on page 70, I originally made the statement that chippers required too much grunt to be battery powered until Adam pointed this model out to me. We're highlighting it here, not necessarily to promote it as an excellent product because, frankly we have no idea, but because the concept is excellent. Remember, this is battery-powered NOT mains electrical. It's a little odd that this isn't more widely recognised or indeed that TP Chippers themselves don't make a bigger deal about it so we can assume that it's an area of the market that will see further development and improvement. Nevertheless, if batteries can power a chipper and all the 'grunt' that requires, it highlights the further expansion of battery chainsaws and other outdoor tools that we can expect to see in the coming years. Petrol and Diesel WILL be phased out sooner than we all thought. This TP chart offers a useful insight into the comparative performance of the three current chipper 'fuels' even if the battery spec might still be a little optimistic in not taking into account battery degradation and rapid draw-down when overloaded as inevitably happens with chipper-feeding].

TP Linddana introduces an environmentally friendly electrical chipper with a powerful 96V Li-ion battery pack.
Linddana's new TP175 Mobile El chipper is a productive and environmentally-friendly choice, thanks to its powerful electric motor with extra torque: 0% CO2, 0% NOx and zero particles. At the same time, sound levels from the electric motor are significantly lower than those of a diesel engine. Lithium-ion technology means that battery-powered machines are now able to match motor-driven machines in both power and performance. The new electric chipper can process wood diameters of up to 175 mm and produces up to 6 m3 of wood chips in an hour. EU diesel emission regulations came into force from 1 January 2019 after this date, diesel motors of over 25 HP must either be fitted with a particle filter or replaced by motors of less than 25 HP. The 96 volts LMC electric motor of the new chipper provides 30 HP and with torque of 85 Nm, it has plenty of power to spare. The 150 Ah capacity of the Lithium-ion battery pack ensures approx. 2 hours of normal operation and up to 4 hours if charged at the same time by a power source of 230 or 380 volts. The batteries have a five-year guarantee. The machine is a rotary disc chipper with the TP Opticut system, which has two blades and a 60cm rotating disc. Noise levels are limited thanks to the electric motor. Running and maintenance costs are low and, as explained, there are no polluting emissions.5-year guarantee on batteries.
TP 175 Mobile El weighs less than 750 kg and can therefore be transported with a standard driver's license. With its height-adjustable output tube and folding funnel, the chipper is compact, both during transportation and when in storage. WEB: tpchipper.com

BATTERY VS PETROL AND DIESEL

CONSUMPTION MAX. CAPACITIVE LOAD / CO2 EMISSION

Model	1 hour		100 hours	
	Consumption	CO_2	Cosumption	CO_2
175 MOBILE E ZE (28,6hp/21kw)	4,5 kw	0,9kg	450 kw	88 kg
175 MOBILE Benzin (37hp/28,6kw)	11 l	26 kg	1100 l	2650 kg
175 MOBILE Diesel (25hp/18,4kw)	3,6 l	9,6 kg	360 l	960 kg

OPERATIONAL COSTS / INVESTMENT

Model	Cost (€)		Cost (€)	Woodchipper
	1 hour	100 hours	500 hours	Index*
175 MOBILE E ZE (28,5hk/21kw)	1,07	107	535	133
175 MOBILE Benzin (37hk/28,6kw)	12,35	1.235	6.175	94
175 MOBILE Diesel (25hk/18,4kw)	6,12	612	3.060	100

* Operating costs excl. service and maintenance of diesel and gasoline engine. According to danish price level.
Warranty: Battery 5 years / woodchipper 3 years

TP 175 MOBILE E ZE SPECIFICATIONS

Max. wood diameter:	**175 mm**
Infeed opening HxW:	**175 x 191 mm**
Chipping principle:	**Disc chipper with TP TWIN DISC™ and TP OPTICUT™**
In feed angle:	**Parallel to driving direction**
Feed rollers:	**2 horisontal**
Disc diameter:	**599 mm**
Disc weight:	**69 kg**
Disc rpm:	**1450 rpm**
Number of blades:	**2**
Counter steel:	**1 horizontal and 1 vertical**
Chip size:	**4-12 mm**
Engine/Battery:	**ME1507 PMAC med -Lithium NMC LiNiMnCoO2**
Engine power:	**28,5 hp / 21 kW 40,5 hp /30 kW (60s peak effect)**
Battery:	**65V with 288 Ah**
Capacity:	**Up to 8 m3/h**
Weight:	**827 kg**
Height (storage/transport):	**1750 mm**
Height (operation):	**TP VARIO SPOUT: (1965-2440mm)**
Length (operation):	**3615mm (4113mm)**
Width:	**1416mm**

ARBORFLEX®

the ultimate revolution in chainsaw protection

Arborflex has been designed to give you a multitude of trouser options to suit a variety of applications. Combine your choice of Arborflex Skin with the Arborflex Base to suit the required level of protection and performance

build your own chainsaw trousers

CHOOSE YOUR BASE

Arborflex A
Class 1 Type A
Provides Front Protection

Arborflex B
Class 1 Type B (A+)
Front protection & half leg at back

Arborflex C
Class 1 Type C
Full leg protection

CHOOSE YOUR SKIN

Pro Skin

Mid Skin

Casual

Storm

For the full colour options available in each range visit our website

www.arbortec.com/arborflex

ARBORTEC®

PETZL VERTEX vent HELMET

By **Ade Scott & Adam Jones**

SPECIFICATIONS

	STRATO	STRATO vent	VERTEX	VERTEX vent	KASK Plasma*	Pfanner PROTOS*
MODEL:						
WEIGHT:	435g (445g)0.96lb	415g (425g)0.9 lb	490g (495g)1lb	490g (495g) 1lb	420g / 0.9 lb	863g/1.9lb
HEAD SIZES:	53-63 cm	53-63 cm	53-63 cm	53-63 cm	51-62 cm	54–62, & 56–64
ORIGIN:	FRANCE	FRANCE	FRANCE	FRANCE	ITALY	AUSTRIA
STANDARDS. EN:	397*, 50365~	12492	397,12492#,50365~	397,12492,	12492	397, 12492, 1077, 1078
US:	ANSI Z89.1.1.E	ANSI Z89.1.1.C	ANSI Z89.1.1.E,	ANSI Z89.1.I.C,	ANSI Z89.1	ANSI Z89.1
Others:	EAC		EAC,AS/NZS1801	EAC		
COLOURS:						>20 colour options
	( )	( )	( )	( )	( )	
COST incVAT@:	£74/€90(£84/€99) $125 ($135)	£74/€90(£84/€99) $125 ($135)	£65/€79(£74/€92) $100 ($110)	£65/€76(£76/€88) $100 ($110)	£72/€77 (£86/€92) $130 ($140)	£138/€154* $130*

* Meets all requirements of the EN 397 standard, except the requirement for internal vertical clearance.
\# Meets all requirements of the EN 12492 standard, except the ventilation requirement
~ EN50365 meets the EN 397 standard in part
*Super Plasma PL
Hi Viz colour version shown in brackets( )
@COST = Shell/cradle only £=RRP exc VAT for personal use
* Helmet-only. 'Arborist' version is sold complete

You have to hand it to Petzl; when they specialise, they really do specialise. It must be a annoying to other manufacturers that they have to play catch up whenever Petzl release a new helmet. Kask and Pfanner would probably beg to differ but we can safely put Petzl towards the top of the tree, not only for their hardware but also their helmets and headlamps, the latter of which they pioneered.

Despite being the preferred brand since the release of the Ecrin, Petzl helmets have often been our highly trusted alternate rather than primary helmets. Our 'helmet-of-the-moment' has often been a model that offers something a little different; Camp's Rockstar had a smaller profile than the old Ecrin, Gallet's F2 accepted ear defenders and visor and had an integrated lighting attachment, Team Wendy's ski and tactical models had insulation, rails and integral lighting etc. However, aside from pandering to personal preferences, our standard-issue helmet has been a Petzl and in particular the Vertex/Best, for rope and water rescue and tree work – a true all rounder.

The post-2019 Vertex marches on as a slightly heavier weight option of the Strato-Vertex duo, able to take the same extensive range of accessories, but it's the updated 2019 version we've been using for this review; with its vivid hi-viz yellow rather than standard custard colour.

With this latest re-vamp, and with the introduction of the Strato, Petzl have gone to town on accessorising. In fact, you could easily spend more on the accessories than the helmet itself. These helmets have made themselves a one-stop-shop for every eventuality: If they had a kevlar layer they might have captured the military market too.

As Adam is about to expand upon, the Strato and Vertex remain lighter than the market-leading 'heavy' option, the Pfanner Protos (at least they do before you pile on every accessory in the range), but the costs are comparable. Within those two Petzl models the Strato is the lighter version by virtue of a polystyrene insert in place of the Vertex' 6-point cradle. This is why Strato (below right) doesn't quite meet EN397's requirement for clearance between the head and the helmet interior which can compress in an impact. With the Vertex there is plenty of clearance to absorb that shell distortion; with the Strato the Polystyrene has a two piece construction so that it too can compress more than usual before contacting your skull. This review is for the <2019 models but pre2019 helmets and accessories are still widely available.

HISTORY

Prior to WW2, apart from rope, the safety aids available to climbers were very limited with the wearing of helmets virtually unheard of. The necessities of war led to the development of nylon/polyamide ropes and lightweight carabiners eagerly adopted by an emerging new generation of sport climbers but helmets lagged behind. Most were designed to protect only from stone fall with the only helmet offering protection in the event of a fall being the motorcyclist derived Compton Climber. This was heavy and cumbersome and few chose to wear it. These helmets were glass reinforced polyester resin shells with a 7mm thick layer of cork glued to the inside surface. Britain's legendary climber Joe Brown designed a helmet that was lighter than the Compton with at least comparable protection. That glass-fibre classic was still produced up to 1996 but an earlier introduction of a UIAA standard allowing lighter, unpadded construction led to new helmets that used the now familiar suspension cradle within an injected moulded, polymer shell. These were not only substantially lighter but cheaper.

However, helmets weren't universally adopted in an era of free style. Climbers were busy trying to reduce all weight and cut away anything that inhibited 'connection' with the rock. Helmets were therefore often seen as 'uncool' though alpine mountaineering embraced them out of a greater sense of self-preservation. Luckily for rock climbers, mountaineering and caving continued to drive helmet development with models that were just as well suited to rock climbing. Foam or polystyrene inserts even made a comeback such that most of the lightest climbing helmets now have this type of protection in favour of webbing cradles. For most arborists, helmet development was largely irrelevant because traditionally, the modified 'building-site' helmet had been the favoured design. Those arborists who were also mountaineers were aware of and used sport climbing helmets but the limitation was a lack of integrated ear-defenders and visors. These didn't really become incorporated into climbing helmet design until the nineties and that was quite possibly driven more by firefighter helmets than the arb industry. Nevertheless, the arb industry's wholesale move away from prusiks, laid rope and site helmets and towards rope-access/SRT after the turn of this century led to interest from the sport manufacturers in catering to this 'new-found' and previously un-catered for market. And few were as quick to capitalise on the new helmet demand than Petzl. They have been one of the three top climbing helmets since the start of this modern climbing arborist era. So long, in fact that millennial arborists will have been familiar with the Vertex for their entire career even if they didn't use it.

IN ACTION

As of 2020, Petzl has four different models (excluding colour variants). These are:

- VERTEX
- VERTEX VENT
- STRATO
- STRATO VENT

with the hi-viz being a colour option for all four models.

We're concentrating on the Vertex rather than Strato because we've been using the newest VERTEX® VENT HI-VIZ as an update to our Vertex Best but everything we discuss in relation to the accessories also applies to the very similar STRATO

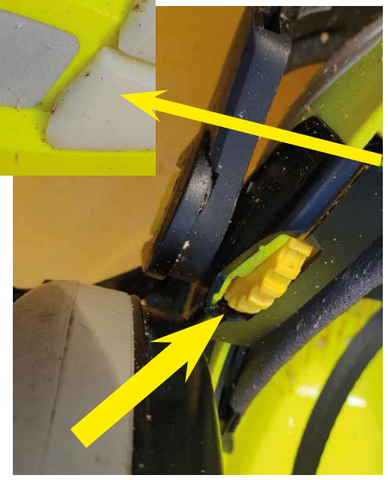
which, as already mentioned, differs in being a bit lighter with a foam insert rather than suspension cradle. It remains the case that the suspension cradle affords greater protection from impact from above but it's a performance gap that is closing. The old 'BEST' variant has gone because Petzl has come up with a genius new chinstrap that can be modified to meet the two standards that previously required a different chin strap depending on use; one for

climbers where the chin strap could withstand a load of 50kg so that you don't end up losing your helmet while climbing and one that breaks away at 25kg to avoid the risk of strangulation or hang-up for ground workers. This 'DUAL' chin strap is, for us, the single most important difference with our older models. It is separate from the suspension cradle so can be easily cleaned or replaced and comes in yellow or black. The ability to switch between standards may be useful for some larger companies but the average arborist is using his or her own climbing helmet in the tree and maybe on the ground and is NOT going to be getting a screwdriver out to switch to ground-mode. It just simplifies purchasing and gives the option to use the same helmet at height meeting EN 12492 or on the ground meeting EN397. However, If there is anything negative to point out, it is the fiddly nature of the chin strap clasp. Once the user is familiar with it, it is not an issue but initially, pressing the small button to defeat the retainer is a bit of a challenge. Especially if your hands are cold and wet or gloved.

As Ade mentioned, we've been using all of the Petzl helmet models on and off since their various introductions so we consider ourselves pretty familiar with their features and performance but not always as our favourite helmet even if we've never had any complaints. The VERTEX VENT helmet is very comfortable, thanks to its six-point textile suspension and CENTERFIT and FLIP&FIT systems, which guarantee that the helmet fits securely on the head and more importantly stays in the middle – some of our rear-mounted ratchet adjustment systems on other brands causes the shell to sit too far forward in relation to the cradle when used on the outer limits of adjustment. This can make it rear or front-heavy whereas the Vertex/Strato always sits roughly in the middle. Adjustment remains the same as the previous version with two 'cogs', (arrowed above-right) one either side of the shell on the forward sloping edge, which you can easily adjust with your thumbs while holding the shell with the rest of your fingers or whatever fingers you have left after a career in arb work.

Our 'VENT' version has ventilation holes with sliding shutters to allow airflow through the helmet. For true conformity to EN12492 (helmets for mountaineers), the vents should be open. The vents are quite large and located about two thirds up the shell laterally on both sides. These are adjusted easily by pulling down or pushing up on the two slightly protruding nubs in the two centre vents. These are easy to locate and allow for trouble free adjustment without need to remove the helmet. Vents are a great option when you're overheating and the location and size of these vents is so much better than some of our early vented helmets where the vents were far too small and set far too high on the shell to give the kind of airflow these do. Remember to close or partially close the vents when working in congested canopy because the holes are large enough to allow ingress of quite large twigs which could be painful. They'll also let in water of course. Vents need to be closed if you're operating near powerlines and the lack of vents that might transmit arced electricity straight to your head is a key reason for the existence of the non-vented VERTEX model which is a better choice if your work is predominantly power line clearance.

The High-Viz version features a more vivid florescent yellow shell than the standard Petzl-yellow shown in the accessories image opposite. There are reflective decals along both sides, visible in the image on the left as the grey band beneath the ear-defenders) and luminous plastic headband clips which you can see just forward of the decal (arrowed)- there is one of these clips in each 'corner' of the helmet. There are further reflective decals all along the crown running from back to front (see title image) so, all-in-all there is optimal visibility of the worker, day or night which could only be improved by incorporating a light bulb on top. Come to think of it, Petzl already has this covered because you can fit a headlamp module to the protective visor cover as shown in the title image. There is a roughly 14% price premium on the enhanced visibility afforded by the High Viz versions available as an option on all four models.



The Vertex Vent is a modular helmet, produced and designed to protect operators in many differing professional settings. It is this modular nature that has allowed for the seamless integration into the world of arboriculture with some arb-specific accessories on what is otherwise a general purpose helmet. A number of brands, including Petzl, have taken the wise choice to be compatible with other manufacturers' accessories such as MSA Sordin, 3M or Peltor for ear protection. Petzl themselves don't make ear defenders but they do make the two goggle-visors and two full face visors. There is also a nape protector, visor protector, headlamp, helmet cover (we've got one but it never gets used!) protective bag, name badge or company logo holder, extra reflective decals if you don't already have the High Viz model and extra padding.

We've been using these specific helmets for around 8 months, with differing experiences dependent predominantly on the selection of varying visor/eye protection options and size of the wearers' heads. The base helmet is obviously a solid and proven design so it's the 'furniture' we really need to consider. The six point linkage for the head strap and fixing is both comfortable and provides good security, protection and stability. As mentioned earlier the Vertex conforms with EN397, in part by the gap created between the shell and the wearers head. This standard is designed to ensure that the user is protected from predominantly falling hazards, testing involves dropping a 5kg, hemispherical weight and separately a 3kg pointed weight from a height of 1metre. The helmet is placed on a head shaped former and the transmitted impact force measured must not exceed 5kN. For penetration, the tip of the pointed weight must not make contact with the surface of the head (measured by completion of an electrical circuit). We wonder how that works with vent-holes large enough to permit entry of that pointed weight?

The straps also contribute to the protection, not only by keeping the helmet in place but also absorption of energy following an impact and in the case of the ground-work version, by failing when tension is applied; pulling the helmet away from/off the wearers head.

Below the vents are the Type-2 connection points for ear protection. These familiar slots will accommodate what has become the standard fitting for optional ear protection and allow for easy replacement should the need arise. Through normal use we have noticed that the lugs which grip and retain the hearing protection in these slots are not always perfect. We have found after minimal wear the grip has lessened and the ear pro has frequently come loose. It is hard to say whether this is a result of attrition from use or just a one- off weakness due to minor incompatibility but it is not something that we have experienced before with Petzl helmets. Since Petzl don't make the ear defenders we can assume that not all brands will marry up as well as they should. Historically, the ear protection mounts have also provided an adjustable fixing for face/eye protection with the side clips for mounting the visor carrier being part of this system and Petzl have previously followed this design. The Vertex (and the Strato) move away from this by offering the opportunity to use a stand-alone Petzl system, this is the Easy Clip system (pics right). The helmet will initially come out of the box with the cover plates in place, the user can then opt to use Easy Clip accessories, this is where the true modular nature of the helmet becomes apparent.

Once the cover plates on either side have been replaced with the attachment fittings, attaching mesh/polycarbonate face shields (Vizen) or polycarbonate eye protection (Vizir) is very easy. Both options have a sprung retainer which when depressed slips easily onto or off the lugs (arrowed-in the picture overleaf). The mesh visors (these days called face-shields) are mounted on a not unfamiliar visor carrier, allowing for easy replacement when required. There are two fundamental options for the full face visors; metal mesh or clear plastic. You will all be familiar with the benefits and advantages of mesh versus clear visors and these Petzl offerings have the same merits or otherwise if you discount the excellent new attachment/articulation option which makes changeovers much slicker. The mesh on

this visor seems finer than our regular mesh and initially seemed great because it filters out finer chippings but once the rain set in we quickly found that water droplets can fill the gaps, forming a film between the wires. This is common to many metal and plastic mesh visors and results in an almost pixelated view of the world making it very difficult to operate. (Pic left). The second problem we experienced and something that is again, all-too familiar with other mesh visors, was with the bottom of the Vizen visor separating from the frame. This seems similar to clothing when insufficient material has been hemmed and the stitching fails. Here, the edge of the visor was clearly not sufficiently affixed and even with more care than we would normally take, the edge has pulled away. The mesh version costs £53/$75/€54 and we don't see this problem with the £59/$80/€60 clear plastic options. The polycarbonate (Vizen) face shield and goggle-style eye protection (Vizir) are either tinted (pic left) or clear (pic below left). Physically they are both the same design and affix in the same way as the mesh visors, to the Easy Clip lugs. To protect the surface of the Vizir from unwanted scratches because they cost around £48/$65/€47 a pair or around 10% more for the smoked lens version, you can get an Eye Shield Protector for about £17/$35/€24. This is opaque and mounts on the front of the helmet providing a sanctuary for your clear or tinted visor when not in use. You can also attach a head torch to this should you wish. Needless to say, we make every endeavour to finish before darkness falls and wouldn't normally keep the headlamp attached during standard work but it comes into its own for storm work when conditions and light-levels might be less favourable. The head circumference of 53-63cm/21-24" is comparable to pretty much all other helmets currently and is easily adjusted to suit the individual wearer. Broader size adjustment catering more for your fat head (as distinct from the length adjustment of the cogs) can be made via an adjuster on the head band, this also alters the working position of the face protection in relation to the wearers face.

We don't hesitate to recommend this latest Vertex and the Strato, the Vertex in particular is quite simply an industry icon and all four models have put themselves ahead of most with a fine array of accessories. It's a congested area of the market with many quality helmet models available from respected brands and you'll probably already have a favourite, perhaps chosen simply on how it looks which is as good a reason as any for like-quality models. Add this one to your list of options.

Petzl Croll 1975

Petzl Croll Lg 2020

Clog 1960s

Clog/ISC 2020

Clog/Wild Country 2020

Gibbs 1965

Gibbs 2019

Last time we thanked Mountaineers for the handled ascenders but the chest ascender in the form of Petzl's Croll and the rope grab or lever-cam ascender in the form of the Gibbs are firmly back in the cavers' camp having first appeared as manufactured products in the 60s and 70s. We'll cover lever-cams on page 38 as a separate development because they are rarely used as rope climbing ascenders by arborists and instead used in secondary systems and for hauling. It must be clearly stated at the outset, that we consider ANY toothed cam ascender, which is necessarily aggressive in order to grip even a wet or icy rope during ascending, best used ONLY for ascending/rope climbing. That's why the second part of this guide has r*ope grabs* like the Petzl Rescuecender(2) and CMC Ascender(7) listed with a range of uses columns while these hand and chest ascenders don't. The risk of imparting shock load or much higher loads than you might intend when using them as a back up or a haul-cam is great and potentially catastrophic. This can even be the case in something as seemingly benign as a flip-line because you could slip and fall onto it but this is admittedly unlikely to do much more than damage the sheath. Nevertheless, a more forgiving smooth or ribbed cam wouldn't and is a better choice. This does not alter the fact that with good management you could easily use most of these devices and especially the six 'emergency' ascenders we've included for all of the uses shown in the rope grab/ lever cam guide. But we wouldn't want to recommend ANY of those other uses in this first part – it's up to you to decide if you're OK to use toothed cams as lanyard adjusters or haul cams etc. When you ascend you regularly generate 2kN of load simply because of the 'bounce' and dynamic activity of moving so it wouldn't take much of a harsh sit-back to start pushing 4 or 5kN. If you can generate such forces in ascending, anything more in activities that can or do accumulate extra force is likely to be too close for comfort so why take the chance? Ascenders for ascending because they grip all kinds of rope in all kinds of conditions and rope grabs with their more rope-friendly cams for all the other jobs (including ascending in most cases!).

HISTORY

The most basic of hand ascenders existed from the 60's, in the form of devices like Denny Moorehouse's 'Clogger' hand ascender while Petzl's first entry into the rope ascender market wasn't until 1975 with Croll chest ascender. This was a direct evolution of the mountaineering Jumar rather than handle-less Clogger and was intended, by inventor Dressler, to be specifically for use in caving. Fernand Petzl had been one of the world's leading cavers since the 30's and was already producing kit like caving ladders, mountaineering bivi platforms and of course his revolutionary electric headlamps, but it was actually other luminaries of the 60's like Moorhouse, Dressler, Jusi and Marbach who came up with ascender and descender designs which Fernand Petzl was able to refine and bring to production before beginning his own prolific rope hardware inventing. The Croll was designed to sit flatter against the chest, with a top eye that

NON-HANDLED ASCENDERS/CAMS

CHEST ASCENDERS
HAND ASCENDERS
ROPE GRABS
EMERGENCY ASCENDERS

images NOT to scale

angles backwards and a bottom eye that extends around the curve of the channel to allow the harness carabiner to sit flat. Chest ascenders are connected between the sit harness and chest harness so as to limit rotation during ascent and therefore be more efficient for climbing. It was a design quickly taken up by the Kong Cam Clean (1) and these two models remain largely unchanged in design to this day. The silver Croll opposite from Doc Storrick's collection is one of the earliest, probably from 1975/76 because it has the F. PETZL stamp rather than simply PETZL but you can see from the modern Kong Cam Clean (1) from 2020 and a plethora of similar models in these tables, that the traditional design of the Croll is still a market leader. Incidentally, ISC went away from the Clog-style ascender and instead concentrate on lever-cam rope grabs. As a sign of the times, the red model shown opposite is not actually made by ISC.

MODERN DESIGN

That's not to say there haven't been developments and improvements in cam design and safety but as far as the frame is concerned perhaps the most obvious new features are CAMP's rollers on their Turbo-Chest (3 -of which more later), and the incorporation of a swivel-eye in the Czech, Rock Empire Chest Up (4) and Skylotec's Get Up (5). Skylotec's is a 180° integral shackle bolted to the frame while Rock Empire's is a 360° swivel incorporated 'within' the frame with the addition of a bolt-on retainer. It will be interesting to see how this stands up to prolonged wear. All four of these models and a few others also exhibit the modern trend towards a 'tab' on the safety cam to enable easier manipulation of the cam for large or gloved hands. If you're looking for something different, these and Kong's Futura Body (9) with it's diminutive size and angled and twisted bottom eye along with Beal/Edelweiss's Hold-Up/ B16 (6) with their extraneous eye or the similarly extruded Kalias Chest-Up model might be worth a look. What's with the preponderance of 'Up'-named models these days?

EXCLUSIONS

We have NOT included in this Guide, Fall arresters like the Rockers, UAscend, CAMP Lift etc. even though they will function well as an ascender because we have to draw the line somewhere and, in reality, if we were to include ALL devices that can function as an ascender that would include all cam descenders and hybrids! We have also not included the larger Progress Capture Devices like the Petzl ProTraxion or SMC Advanced HX but we have included smaller 'emergency' ascenders which include smaller PCDs like the Petzl Micro-Traxion, Kong Duck (8), Edelrid Spoc and CT RollNLock. These meet EN567 as an ascender but also function as a pulley and along with the Wild Country Ropeman style mini ascenders are considered to be 'emergency' ascenders but they do function well across a variety of tasks. The ultimate emergency ascenders, the Petzl Tibloc and Skylotec Ringo are included in the second part of this guide because they load directly through the cam rather than the frame even though they are one and the same. PCDs are available as a separate GUIDE in TECHNICAL RESCUE #73. We haven't included the heavy-duty fall-arrest 'grabs' like the original Altochute or Stickrun. These are intended to run up AND down even though they are superficially very similar to lever cam ascenders like the Gibbs and

Rescuecender. Where there's any doubt we've simply gone for those aimed at climbers rather than industry.

If we leave out the CAMP TURBO CHEST for now, the difference between a CHEST and HAND/BASIC ascender is pretty much just the orientation of the attachment eyes which extend 'around-the-corner' on the chest versions to enable it to sit flat on the chest. But there can be other subtle differences. These two Petzl models show this well – the Hand or Basic ascender on the left is designed to be grasped in the palm of the hand and has a 'comfort' grip on the shoulder. The Croll on the right is Petzl's smaller model with a reinforced cam-enclosure to improve wear. [NB: an early report from Italian and UK cavers indicating that the reinforcement wear could cause rope damage was investigated and dealt with- see Emag#28]. The cam safeties are different because the hand is in a different position on each during use. Both clip onto the frame out of the way during rope installation (CAM-PARK in our tables). The new crop of swivel versions mentioned earlier are labelled as 'chest' ascenders by the manufacturer but can easily be used for all of the same purposes as hand/basic ascenders bearing in mind the reservations we expressed earlier about overloading toothed cams:

- Progress Capture in haul systems
- Lanyard/Flip line/Rope length adjusters
- Top Ascender
- Self Belay/Fall Arrest (maybe but beware!)

OTHER FEATURES...

TOP EYE: That obvious top eye can serve the same purpose it did on the handled models but for chest ascenders it is a specific chest harness attachment point, so, the other uses are:
1) to clip a carabiner around the rope thus ensuring the ascender cannot detach completely
2) as a hauling aid or to anchor for hauling – in this function the little man symbol or 'UP' arrows should be upside down!
SAFETY CATCH: If the safety catch clicks to the disengaged position too easily during use you could be in for a scary drop. You never downclimb by releasing the cam via the safety catch and should instead press or 'thumb' the actual cam where sideways and/or downward pressure from your thumb or finger on the cam itself is enough to release the rope but will then enable it to re-engage the second you removed your thumb. For this reason some cams have a more pronounced bottom edge while others have an opening or additional material to facilitate better thumb purchase.
RELEASABLE CAM UNDER LOAD: Climbing Technology now has an additional pillar on their safety catch which, in the event of a rope or debris-jam halting your progress, or for safer downclimbing, acts as a pivot-post to provide leverage against the frame and force the cam off the rope. This takes some force if the cam is under load so cannot be released by accident. We have previously seen this on Krok ascenders and will crop up on others but we're told it's a patented CT design. Shown as ■=**leverage cam** in the CAM-PARK column the tables.

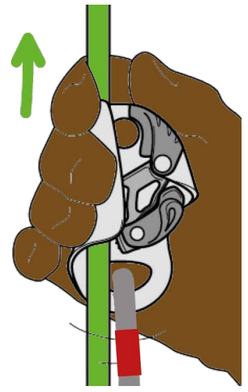
ROLLERS: CAMP has incorporated rollers into their excellent Turbo-Chest (above & right). This isn't a new idea, roller-boxes were used in caving systems back in the 60's and 70's as a separate chest or waist attachment to improve rope glide and climbing efficiency but not integrated into the ascender itself. This helps keeps the rope and cam in line during twisting and manoeuvring which otherwise creates unequal loading and stresses along the length of the cam enclosure. The top roller can also function as a deviation pulley during hauling (pic right).

CHINESE & RUSSIAN MANUFACTURE

China is a continual problem for us because, in between counterfeits, so many prominent companies (even manufacturers) in the access and rescue sectors buy in Chinese products to rebadge as their own.
We have only recently included Chinese companies under their own names because some have transparent and comprehensive websites and can be contacted for information, most notably Anpen. But no sooner had we included Xinda products in a previous guide than they were seriously called out by trading standards in the US and Europe for having helmets mislabelled as meeting standards that they absolutely did not. We can be fairly sure that European companies rebadging products have satisfied themselves of standards adherence but we remain a little bit sceptical because companies like Lixada, Magideal, GM, New Doar, SUT, Camnal, Lepard, Tupa and Yundxi are difficult to pin down or tell their products apart. You ***will*** find models on Amazon etc that look identical but have different specification. We can only quote the data supplied to us but we often double-check by scaling the image. We've included Anpen and cautiously included SOB, Xinda and SE Peak but ***don't*** take that as an endorsement. SE Peak is a German brand used by Shanghai Liedell and maybe also Taiwan's NalHon which seems to have identical products! We haven't included Camnal/Lixada's Camp Turbo look-a-like or NalHon's 'CMI Ropewalker'. We have included Kailas as well-specified with a comprehensive website and unique products but had to delete Taiwanese company Adela for lack of data and responses. It's even harder to track down Russian companies which often develop their own unique and interesting products but unfortunately also make close copies. As do KROK but we've stuck with them as the sole Russian entry because they have a comprehensive website and answer emails.

ARBORIST USE of ASCENDERS/CAMS

It has to be said that the use of chest ascenders and hand ascenders in particular is currently quite limited amongst arborists. Most arborists use either a hybrid system with a descender/ascender like the ZigZag, Akimbo, SpiderJack or Roperunner or a hitchclimbing knot system. If they are used, chest/hand ascenders are most often a third ascender set up on the harness between a foot and/or knee ascender below and a handled ascender above. Competition climbers are regular users as they look for increased speed and efficiency between point A and point B with no pesky tree work to undertake in between but most arborists prefer a system which allows much greater upper-body manoeuvrability. However, a chest ascender worn between the sit and chest harness can be a useful reserve or intermittent item even if it is not the primary system and not always connected to the rope. If it's on your harness it's out of the way and can be attached temporarily for long entry climbs but released from the main rope during canopy work.



Some folk prefer a non-handled ascender as their top ascender instead of the much bulkier handled models and old-hands in particular like the ease of movement of the ascender afforded by simply grasping the frame rather than inserting into a handle particularly with gloved hands. However, for rope climbing, the hand or basic ascenders are most often seen as a knee or floating cam between a foot ascender and the chest and/or top (handled) ascender.
While the four types of ascender we are describing here are largely interchangeable for all tasks, some are better at one or more tasks than others. Chest ascenders, by definition are best used directly attached to your harness but most, if not all can still do what the hand and lever-cam ascenders can. The commonest uses for all ascenders and rope grabs are:

- Ascending/Rope-climbing
- Self-belay/back-up during climbing and this is a use that may increase if two-rope systems are mandated NB: this is largely for dedicated fall-arresters but also smooth cam and some ribbed cam devices – ***there are huge risks to using toothed cams for self-belay even where it is implied or stated as an acceptable use for any given device***
- lanyard & flip-line/pole strap rope length adjustment
- direct hauling and progress capture in a haul /raising system *but monitor your input forces and loads carefully*.

The key proviso to all that we have written so far and will write in the Lever-Cam/Rope Grab section is that ***any ascender with teeth is best used for ascending-only because it will cut into and maybe sever the rope if over-loaded***. Some Rope grabs will too but are more often designed to slip at around 4 or 5kN, toothed ascenders will rarely slip unless they're stripping rope!

IN THE FOLLOWING TABLES:

ORIGIN:
The country selling the product but this is not always the same as the country of manufacture. Where we know, there is an inset flag to show where it is made.

COST: approximate, rounded up and inclusive of local taxes which are generally from 10% and more often 20% in Europe. Often priced much lower locally or online.

WEIGHT: for a single ascender/cam without a carabiner

DIMENSIONS: Width x Height x Depth/thickness but this last one is not always given – the depth is dictated by the cam enclosure but in lever cams this is also increased by the length of the axle pin which may have a locking nut or spring-release mechanism (pip-pin). Even for hand and chest ascenders the depth may vary from reality if the quoted measurements don't include protruding rivet heads etc.

MATERIALS: When we say 'Alloy' we mean Aluminium Alloy unless otherwise specified. These are practically all alloy so we've differentiated the construction rather than the material. Most are shown as 'Stamped' meaning that a flat plate of metal is cut to shape then forcibly stamped and rolled into form. Extrusion forces heated metal through a die to create the shape, hot-forged too takes heated metal and forces it into shape like a smithy making a sword or horseshoe. Milled takes a solid lump of alloy and carves/mills it away to create the desired shape, like a sculpture.

STANDARDS: for CE these fall into two categories EN 567 (rope clamp Ø 8-11mm) for sport use and EN 12841 B (rope adjustment device Ø 10-13mm) for professional use. Unlike the handled ascenders which generically met EN567 with a few meeting EN12841-B, this Guide includes lever-cam 'ascenders' meeting a wider range so we have to be more specific than simply using 'CE' as a coverall for the applicable European standards. EN567 (ascenders) is still the most common standard in this list but is generally for ropes up to 13mm rather than the original 11mm sport limit. EN12841 for rope adjusters takes in ascenders (-B) hybrids and descenders (C) and fall arrest devices (A) which can all act as ascenders. These require a slightly larger diameter rope so the lower limit is higher – usually around 10mm rather than 8mm. The Mini PCD's may also have EN12278 for pulleys. UIAA is the mountaineering standard with some enhanced testing and EAC applies to Russia and its southern satellite states. Lever cam rope grabs have further standards listed separately.

ROPE DIAM RANGE: It is best to always use the millimetre sizes in ALL of our MARKET GUIDES because the fractional inch equivalents are less specific. 1/2" for instance can be anywhere from 12 to 13mm. Fatter ropes make progress harder but too thin a rope can be positively dangerous as it can jam between the cam and enclosure. ***It's best to ignore the lowest and highest rope diameter claims.*** Remember that a rope will often get fatter with age so if it was a tight fit with a new rope it may become too large with use and stress the cam enclosure if heavily loaded. The rope range quoted uses the lower limit for EN567 up to the sometimes higher limit for EN12841- B. More often than not EN12841-B starts at 10mm rather than 8mm.

WLL(SWL): is the weight of person actually climbing or the weight that can be pulled/hauled before either the rope begins to tear or the cam enclosure unfolds. A small button or 'crease' in the frame on most models stops the cam from flipping upwards under high load if the cam enclosure starts to unfold/bend resulting in an unstoppable downward slide- this is why both ascenders in a Texas-rig-style, two-ascender system, should have direct connection to the harness. Having just a foot ascender doesn't constitute a safe back-up, it's really a third ascender to improve climbing efficiency because if your top ascender were to fail/slip/be accidentally removed, the foot ascender is unlikely to hold you upright unless you had spookily anticipated the precise moment of top-ascender failure! Some WLL figures quoted are suspiciously high and are more likely simply to be an extrapolation of the MBS. Where we see 4kN quoted it is likely to be a re-interpretation of EN567's requirement for a 4kN load to be held at 5 different spots along a fixed rope of minimum and maximum diameters within the ascenders rope range. Most will quote a WLL based entirely on the standards they have met even though their actual capability may be much higher – 100kg for EN567 or 120/140kg for EN12841-B etc.

The **MBS** figure is largely irrelevant as it refers to the strength of the frame, or to be more exact, the ascender's connection eye(s) and even this will vary with rope size. 4kN is usually the lower limit for what may range up to and beyond 12kN for larger rope. For lever cams there is no end-to-end connection and an MBS is often not given because the rope will slip through or perhaps fail before the cam enclosure. If you were to use the framed ascenders as a carabiner or a link in a hauling system rather than as the means to exert the pull this might come into play as you try to stretch the frame end to end, otherwise, for operational use, don't worry about it because the failure mode, if you overload the ascender, will be the cam or the rope, probably the rope.

(Bottom) EYE DIAM: Not necessarily the actual size of connector/carabiner you can get into the bottom eye. Round eyes tend to be a true diameter in which case your carabiner/bar would need to be slightly smaller than this figure.

CAM-PARK: This applies to virtually all handled ascenders and is the ability to hold the cam off the rope completely, generally by clipping the safety catch onto the opposite part of the frame. This facilitates easier rope installation/removal. ■='leverage cam' extra post to release cam under load see p24

ANTI CAM-INVERT: This is now a custom-incorporated pinch in the frame material or a 'knob' to stop the cam rotating too far and releasing out of the top of the frame under high load. This was originally mitigated by clipping a carabiner through the top eye and is still used as such by many.

COLOURS: the colour of the frame or cam enclosure**.** Different model colour options are separated by a comma. A forward slash/ indicates two (or more) colours on one model which, for Rope Grabs may be a cam-colour. Unlike the handled ascenders, there are not many left AND right hand models. Left-hand model colours are shown in burnt orange.
See the lever-cam section for further, different data headings.

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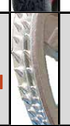
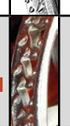
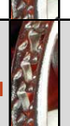
images NOT to scale	MODEL	COMPANY	ORIGIN	COST	WEIGHT	DIMENSIONS Width x Height x Depth	STANDARDS		MATERIALS ALLOY SHELL CAM	CAM	ROPE DIAM RANGE	WLL/ MBS	(Bottom) EYE DIAM	CAM-PARK	ANTI-CAM INVERT	SERIAL NO	HAND/BASIC	CHEST/offset	COLOURS RIGHT LEFT	NOTES	WWW.
	Explorer Chest Retrofit	3M/ DBI SALA/ ROLLGLIS		$185 A$182	170g 6oz	104x65mm 4x2.6"	EN567 NFPA AS/NZS4488		Extruded Stainless Steel		11*-13mm 7/16 -½"	300kg 661lbf 7.9kn 1776lbf	15mm 0.6"			■		■	GOLD	Was SRTe. Still sold but this and std model discontinued by 3M. Top 'eye' is for webbing.*Prod-Info states 10.5mm but 11mm is printed on the device.	3m.com.au
	Olymp	ALPIDEX		€36	154g 5.4oz	100x78x33mm 4x3x1.3"	EN567 UIAA		Stamped StainlessSteel		8-13mm 5/16 -½"	4kN 900lbf	18mm 0.7"	■	■			■	BLACK, GOLD, COPPER		alpidex.com
	A12	ANPEN		$49	163g 5.8oz	121x76mm 4.7x3"	EN567		Stamped Aluminium		8-13mm 5/16 -½"	5kN 1124lbf	20mm 0.8"	■	■	■		■	BLUE, ORANGE, BLACK	Also a 12AA model but details are sketchy!	en.anpen.net
	Hold Up	BEAL		£32 $48 €40	90g 3.2oz	82x74x59mm 3.2x2.9x2.3"	EN567 EN12841B		Extruded StainlessSteel		8-13mm 5/16 -½"	100kg 220lb	*15mm 0.6"	■	■	■		■	GOLD	*15x18mm	pro.beal-planet.com
	Tract Up	BEAL		£39 $54 €36	78g 2.7oz	65x35mm 2.6x1.4"	EN567 UIAA		Stamped* Aluminium		8-11mm 5/16 -7/16"	2kN 450lbf	19mm 0.8"	■		■	■		GREEN	*Stainless steel eye/ pulley	pro.beal-planet.com
	Solo 2	CAMP		£55 $70 €50	95g 3.4oz	95x57x24mm 3.7x2.2x0.9"	EN567 EN12841B UIAA		Stamped HardenedSteel		8-13mm 5/16 -½"	140kg 308lb	14mm 0.5?"	■		■	■		BLACK, SILVER		camp.it
	TurboChest	CAMP		£85 $90 €81	110g 3.9oz	94x59x39mm 3.7x2.3x1.5"	EN567 EN12841B UIAA		Stamped HardenedSteel		8-13mm 5/16 -½"	120kg 265lb	16mm* 0.6"	■		■		■	RED, BLACK	Equipped with two patented rollers for a smooth interface with the rope. *17x16mm	camp.it
	Nahuel 2019	CLIMAX		£34 €31	165g 5.8oz	118x80x35mm 4.6x3.1x1.4"	EN567		Stamped StainlessSteel		8-13mm 5/16 -½"	100kg 220lb 4kN 900lbf	19mm 0.8"	■	■			■	BLUE	Also rebadged from chinese original as Lapard, GM Climbing, Xinda, Epic Peak, Vento, NTR, Rock Empire etc.	productosclimax.com
	Nahuel 2020	CLIMAX		£36 €33	122g 4.3oz	110x68mm 4.3x2.5"	EN567 EN12841B		Stamped StainlessSteel		8-13mm 5/16 -½"	100kg 220lb 4kN 900lbf	*15mm 0.6"	■	■	■	■		BLACK	*29x15mm	productosclimax.com
	Chest Ascender +	CLIMBING TECHNOLOGY		£45 $70 €53	147g 5.2oz	105x74x23mm 4.1x1.9x0.9"	EN567 EN12841B UIAA		Stamped StainlessSteel		8-13mm 5/16 -½"	140kg 308lb	19mm 0.75"	■	■	■		■	GREY	Also rebadged by others inc 'Bonrack'. Listed as 'Evo' by some stockists ■=leverage cam	climbingtechnology.com
	Chest Ascender HC	CLIMBING TECHNOLOGY		£47 $70 €55	147g 5.2oz	105x74x23mm 4.1x2.9x0.9"	EN567 EN12841B UIAA		Stamped StainlessSteel*		8-13mm 5/16 -½"	140kg 308lb	19mm 0.75"	■	■	■		■	BROWN	*HC= Hard-coated cam for improved abrasion resistance. ■=leverage cam	climbingtechnology.com
	Ascender Simple +	CLIMBING TECHNOLOGY		£42 $54 €48	150g 5.3oz	110x74x23mm 4.3x2.9x0.9"	EN567 EN12841B UIAA		Stamped StainlessSteel		8-13mm 5/16 -½"	140kg 308lb	20mm 0.8"	■	■	■	■		ORANGE	■=leverage cam	climbingtechnology.com

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	RollNLock	CLIMBING TECHNOLOGY		£70 $81 €83	80g 2.8oz	68x33x24mm 2.7x1.3x1"	EN567 EN12278 UIAA		Stamped Alloy		8-13mm* 5/16 -½"*	4kN 900lbf	18mm 0.7"	■	■	■	■		ORANGE	*Also 10-16mm web in exceptional circumstances	climbingtechnology.com
	Evo Chest	COURANT		€47	130g 4.6oz	105x74x23mm 4.1x2.9x0.9"	EN567		Stamped StainlessSteel		10-13mm 3/8 -½"	100kg 220lb 6kN 1349lbf	19mm 0.75"	■	■	■		■	BLACK	■=leverage cam	mycourant.com
	Chest Ascender	CYPHER		$60	147g 5.2oz	105x74x23mm 4.1x2.9x0.9"	EN567 EN12841B		Stamped StainlessSteel		8-13mm 5/16 -½"	140kg 308lb	19mm 0.75"	■	■			■	GREY	■=leverage cam	cypherclimbing.com
	Wind Up	EDELRID		£45 $70 €51	140g 4.9oz	105x74x23mm 4.1x2.9x0.9"	EN567 EN12841B		Stamped StainlessSteel		8-13mm 5/16 -½"	140kg 308lb	19mm 0.75"	■	■			■	GREEN	■=leverage cam	edelrid.de
	SPOC	EDELRID		£60 $53 €65	60g 2.1oz	60x50x10mm 3.4x2x0.4"	EN567 EN12278		Stamped Aluminium		7-11mm 9/32 -7/16"	15kN 1686lbf	18mm 0.7"	■			■		GREEN		edelrid.de
	BS16	EDELWEISS		£35 $50 €36	160g 5.6oz	82x74x59mm 3.2x2.9x2.3"	EN567 EN12841B		Extruded StainlessSteel -		8-13mm 5/16 -½"	100kg 220lb	*15mm 0.6"	■	■	■		■	BLACK	*15x18mm	edelweiss-ropes.com
	Micro B	EDELWEISS		£36 $55 €39	78g 2.7oz	65x35mm 2.6x1.4"	EN567 UIAA		Stamped* Aluminium		8-11mm 5/16 -7/16"	2kN 450lbf	19mm 0.8"	■		■	■		RED	*Stainless steel eye/ pulley	edelweiss-ropes.com
	InduVentral W51630	FIXE		€42	248g 8.8oz	120x80mm 4.7x3.1"	EN567 EN12841B		Stamped Aluminum		8-12mm 5/16 -<½"	100kg 220lb 4kN 900lbf	20mm 0.8"	■	■	■		■	RED	Also Fixe 'Dome' model with no anti-cam invert which is the same model as Climax Nahuel	fixeclimbing.com
	Compact D41	HEIGHTEC		£46 $68	160g 5.6oz	115x75x23mm 4.5x3x0.9"	EN567 EN12841B		Stamped HardenedSteel		9-13mm 3/8 -½"	125kg 275lb	15mm 0.6"	■	■	■	■		GREEN		heightec.com
	Sync D44	HEIGHTEC		£55 €59	140g 4.9oz	95x75x25mm 3.7x3x1"	EN567 EN12841B		Stamped HardenedSteel		10.5-12mm 7/16-<½"	125kg 275lb	*<50mm <2"	■	■	■		■	ORANGE	*Fixes direct to chest harness webbing but can still be detached	heightec.com
	Twist D42	HEIGHTEC/ PMI		£46 $68 €49	150g 5.3oz	105x70x35mm 4.1x2.75x1.4"	EN567 EN12841B		Stamped HardenedSteel		10-13mm 3/8 -½"	125kg 275lb	16mm 0.6"	■	■	■		■	GREEN		heightec.com
	Cam Clean	HONEYWELL MILLER/KOMET		£99	150g 5.3oz	115x74x#40mm 4.5x2.9x1.6"	EN567 EN12841B NFPA		Stamped HardenedSteel		8-13mm 5/16 -½"	100kg 220lb 5kN 1124lbf	*17mm 0.7"	■				■	RED, BLUE	#figure includes curved eye - body only depth is 23mm/0.9" *17 x 21 mm	honeywellsafety.com

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	RP229	ISC		£51 $65	130g 4.6oz	116x75x24mm 4.6x3x1"	EN567		Stamped StainlessSteel		9-13mm ⅜ -½"	140kg 308lb 2.5kN 562lbf	*17mm 0.7"	■		■		■	RED, BLACK	Also rebadged by Checkmate, Stein, WestfallPro and others. *17 x 21 mm	iscwales.com
	Chest-Up	KAILAS		$108	106g 3.7oz	97x66x31mm 3.8x2.6x1.2"	EN567		Milled Aluminum		8-13mm 5/16 -½"	140kg 308lb	20mm 0.8"	■	■			■	BROWN		Kailasgear.com
	Cam Clean	KONG		£42 $65 €55	150g 5.3oz	115x74x#40mm 4.5x2.9x1.6"	EN567 EN12841B UIAA		Stamped HardenedSteel		8-13mm 5/16 -½"	100kg 220lb 5kN 1124 lbf	*17mm 0.7"	■				■	GOLD, BLACK	#figure includes curved eye - body only depth is 23mm/0.9" *17 x 21 mm	kong.it
	Duck	KONG		£45 $76 €47	70g 2.5oz	63x31x22mm 2.5x1.2x0.9"	EN567		Stamped# Aluminium		8-13mm* 5/16 -½"*	100kg 220lb	18mm 0.7"				■		GREEN, BLACK, RED, BLUE	#Eye/pulley is stainless steel * Also operates on 10-15mm webbing	kong.it
	Futura Body/ Futura Body Tactical	KONG		£52 $90 €69	80g 2.8oz	82x48x35mm 3.2x1.9x1.4"	NFPA-L EN567 EN12841B UIAA EAC		Extruded HardenedSteel		9-12mm ⅜ -< ½"	100kg 220lb	*15mm 0.6"	■	■	■		■	BLACK	*Lower eye is twisted and angles backward and measures 18 x 15 mm	kong.it
	Modular	KONG		£40 $66 €41	170g 6oz	114x78x25mm 4.5x3x1"	NFPA-L EN567 UIAA		Stamped HardenedSteel		11-13mm 7/16 -½"	100kg 220lb	14mm 0.55"	■	■		■		BLACK, BLACK, RED, BLUE	can be retrofitted to Kong winches and with a handle etc.	kong.it
	Ventral FA7001500	KRATOS SAFETY		£41 €40	160g 5.6oz	115x75x21mm 4.5x3x0.8"	EN567		Stamped Aluminium		10-12mm ⅜-<½"	4kN 899lbf 15kN 1686lbf	13mm 0.5"	■			■	■	BLACK		kratossafety.com
	Chest	KROK		$30* €25*	210g 7.4oz	112x73x24mm 4.4x2.9x0.9"	EAC		Stamped Steel		9-12mm ⅜ -<½"	4kN 899lbf 15kN 1686lbf	24mm 0.9"	■	■			■	GREY	Steel version available 640g, 20kN. ■=leverage cam * excludes duty/import taxes & shipping	krok.biz
	Basic	KROK		$25* €22*	245g 8.6oz	104x71x26mm 4x2.8x1"	EAC		Stamped Steel		8-12mm 5/16 -<½"	4kN 899lbf 15kN 1686lbf	15mm 0.6"	■	■		■		GREEN, BURGUNDY	Powder coated. ■=leverage cam Steel frame version shown +40g * excludes duty/import taxes & shipping	krok.biz
	Stregor	KROK		$37* €37*	75g 2.6oz	63x34x31mm 2.5x1.3x1.2"	EAC		Stamped Steel		9-12mm ⅜ -<½"	4kN 899lbf 15kN 1686lbf	*16mm 0.6"				■		BLUE	*19x16mm * excludes duty/import taxes & shipping	krok.biz
	Stregor lite	KROK		$42* €36*	49g 1.7oz	57x33x24mm 2.2x1.3x0.9"	EAC		Stamped Steel		8-12mm 5/16 -<½"	4kN 899lbf 15kN 1686lbf	16mm 0.6"				■		GREEN	* excludes duty/import taxes & shipping	krok.biz
	Basic	PETZL		£49 $85 €51	85g 3oz	104x64x30mm 4x2.5x1.2""	EN567 EN12841B UIAA EAC		Stamped Stainless Steel		8-11mm 5/16 -7/16"	140kg 308 lb	16mm* 0.6"	■		■	■		SILVER	*28 x 16mm	petzl.com

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	Croll-S	PETZL		£50 $75 €53	83g 2.9oz	97x58x30mm 3.8x2.3x1.2"	NFPA EN567 EN12841B UIAA, EAC		Stamped Stainless Steel		8-11mm 5/16 -7/16"	140kg 308 lb	22mm 0.9"	■		■		■	GOLD	stainless steel wear resistant plate fitted	petzl.com
	Croll-L	PETZL		£50 $75 €53	140g 4.9oz	110x70x30mm 4.3x2.75x1.2"	NFPA EN567 EN12841B UIAA, EAC		Stamped Stainless Steel		8-13mm 5/16 -1/2"	140kg 308 lb	22mm 0.9"	■		■		■	GOLD		petzl.com
	Micro-Traxion P53	PETZL		£74 $130 €75	85g 3oz	65x55x24mm 2.6x2.2x1"	EN567 UIAA		Stamped Steel		8-11mm 5/16 -7/16"	2.5kN 562lbf	18mm 0.7"	■		■	■		GOLD		petzl.com
	CD201L/202L UltraLight	PROTEKT		€30	135g 4.8oz	110x75x30mm 4.4x3x1.1"	EN567		Stamped Steel		8-12mm 5/16 -<1/2"	4kN 899lbf	21mm* 0.8	■				■	BLUE RED	21.8x23mm Also badged as Proverti	protekt.pl
	TREEUP CD201/202	PROTEKT		€47	220g 7.8oz	134x86x28mm 5.3x3.4x1.1"	EN567		Extruded Steel		8-13mm 5/16 -1/2"	100kg 220 lb	20mm* 0.8"	■			■		BLUE RED	*27x20mm Also badged (made by?) GT	protekt.pl
	Chest Up	ROCK EMPIRE		€54	118g 4.2oz	99x62x30mm 3.9x2.4x1.2"	EN567 EN12841B		Hot-Forged? Aluminium		8-11mm 5/16 -7/16"	4kN 899lbf	16mm 0.6"	■	■		■	■	ORANGE, BLACK	Swivel eye	rockempire.cz
	Chest	ROCK EMPIRE		€54	163g 5.7oz	118x78x32mm 4.6x2.8x1.2"	EN567		Stamped Stainless Steel		8-13mm 5/16 -1/2"	4kN 899lbf	19mm* 0.75"	■				■	BLUE	Also rebadged from chinese original as Lapard, GM Climbing, Xinda, Epic Peak, Vento, NTR, etc.*23x19.5mm	rockempire.cz
	S-206	S.E.PEAK Shanghai Leidell Ind Co Ltd/NalHon		£36 €33	122g 4.3oz	110x68mm 4.3x2.5"	EN567 EN12841B		Stamped StainlessSteel		8-13mm 5/16 -1/2"	100kg 220lb 4kN 900lbf	*15mm 0.6"	■	■	■	■		BLACK, BLUE, PINK	*29x15mm	en.sepeak.net
	Chest	SAFETEC		$48	160g 5.6oz	118x80x30mm 4.6x3.1x1.2"	EN567		Stamped Stainless Steel		8-12mm 5/16 -<1/2"	4kN 899lbf 20kN 4496lbf	19mm 0.75"	■				■	BLUE	Variation of the Rock Empire model above.	safetecbr.com.br
	Chest Croll RA009	SAR PRODUCTS		£54	130g 4.6oz	105x74x23mm 4.1x2.9x0.9"	EN567 EN12841B UIAA		Stamped StainlessSteel		8-13mm 5/16 -1/2"	100kg 220 lb	19mm 0.75"	■	■	■		■	BLACK	■=leverage cam	sar-products.com
	Cam Clean	SINGING ROCK		£47 $65 €54	125g 4.4oz	100x70x35mm 4x2.75x1.4"	EN567 EN12841B		Stamped StainlessSteel		8-13mm 5/16 -1/2"	120kg 265 lb 12kN 2697lbf	19mm 0.75"	■		■		■	BLACK	Updated model. Safety catch has a secondary trigger to allow safer cam-release for short downclimbs	singingrock.com
	Chest (AC30)	SKYLOTEC (ANTHRON)		£45 $60 €57	140g 4.9oz	118x79x30mm 4.6x3.1x1.2"	EN567 EN12841B UIAA		Stamped Aluminium		9-13mm 3/8-1/2"	4kN 899lbf 14kN 3147lbf	13mm 0.5"	■		■		■	BLACK, BLUE	Skylotec Germany owns Anthron Slovenia. Anthron brand-name being phased out	skylotec.com (anthron.si)

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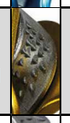
	**Hoist (AB20)**	**SKYLOTEC (ANTHRON)**		£62 $70 €67	150g 5.3oz	104x75x30mm 4.1x3x1.2"	EN567 EN12841B UIAA		Stamped Aluminium		9-13mm ⅜-½"	4kN 899lbf 14kN 3147lbf	13mm 0.5"	■	■	■	■	■	BLACK	Skylotec Germany owns Anthron Slovenia. Anthron brand-name being phased out. Also rebadged by 'Skalt'	skylotec.com (anthron.si)
	**Get Up** H-210	**SKYLOTEC**		£90 €87	123g 4.3oz	129x122x66mm 5x4.8x2.6"	EN567 EN12841B		Stamped Aluminium		8-13mm 5/16 -½"	140kg 308 lb	13mm 0.5"	■			■	■	GREY/ Orange	Integral shackle-eye	skylotec.com
	**RB16AAA**	**SOB**		$28*	120g 4.2oz	115x78x20*mm 4.5x3.1x0.8"	EN567 EN12841B		Stamped Aluminium		10-13mm ⅜ -½"	100kg 220 lb 4kN 899lbf	22mm 0.9"	■	■			■	GOLD	*the 20mm is probably just the cam enclosure NOT the max including the angled bottom carabiner eye	chinasob.com
	**Chest**	**US CLIMB**		$60	154g 5.4oz	101x84x33mm 4x3.4x1.3"	EN567 UIAA		Stamped Aluminium		8-13mm 5/16 -½"	4kN 899lbf	18mm 0.7"	■	■			■	GOLD		usclimb.com climbclean.com.br
	**Ropeman 1**	**WILD COUNTRY**		£45 $50 €50	62g 2.2oz	55x36x31mm 2.1x1.4x1.2"	EN567 UIAA		Hot-Forged Aluminium		10-13mm ⅜ -½"	400kg 880lbf	13mm 0.5"	■			■		ORANGE, BLUE		wildcountry.com
	**Ropeman 2**	**WILD COUNTRY**		£50 $55 €55	92g 3.25oz	55x36x31mm 2.1x1.4x1.2"	EN567 UIAA		Hot-Forged StainlessSteel		8-13mm 5/16 -½"	400kg 880lbf	13mm 0.5"	■			■		BLACK, GOLD	*There was also a Ropeman mk3. narrower than the mk1/2 but was discontinued*	wildcountry.com
	**OCA** H-XS01	**XINDA (BINFEN OUTDOOR)**		$27*	112g 3.9oz	102x72mm	EN567 UIAA		Stamped Aluminium		8-13mm 5/16 -½"	150kg 331lb	20mm 0.8"	■			■	■	BLACK, RED, GREY,- GOLD,BLUE	Fold-down safety catch keeps it out of the way. Hardened frame coating	xindaoutdoor.com
	**Chest** HXS03	**XINDA (BINFEN OUTDOOR)**		$15*	150g 5.3oz	115x75mm 4.5x3"	EN567		Stamped Aluminium		8-13mm 5/16 -½"	150kg 331lb	20mm 0.8"	■				■	BLACK, ORANGE, BLUE	No hardened coat - regular anodizing	xindaoutdoor.com
	**PCA (DeLuxe)** HXS02	**XINDA (BINFEN OUTDOOR)**		$26*	150g 5.3oz	115x95mm 4.5x3.7"	EN567		Stamped Steel		8-13mm 5/16 -½"	150kg 331lb	20mm 0.8"	■				■	BLACK, RED, GOLD, GREY	Hardened frame coating & enhanced safety catch ■allows release when jammed. See CT models	xindaoutdoor.com

NOTES COST: Approx & inc local tax/VAT * excludes duty/import taxes & shipping WLL: Where no WLL is given by the manufacturer we may show a Max Load based on approx 10:1 of MBS N/A: info Not Available/not given USE: ■=OK but not ideal

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LEVER-CAM ROPE GRABS

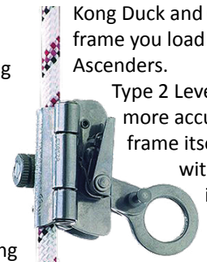
Very distinctive in appearance, this group of 'ascenders' is more often called 'rope grabs' these days. Despite their origin as an ascender, lever cams are not often used as ascenders for progressive ascent of a fixed rope except in caving. Instead they are mostly used in tree work for:

- **Haul-Cam** and **Progress capture** in haul systems. NB: Progress-capture only requires it to hold the weight being hauled but a haul-cam can be subjected to many times the actual load because of the input forces of the haulers and the mechanical advantage of the system which inevitably adds friction to the effort. Consider using a load cell to monitor your input forces and loads.
- **Flipline/Pole-Strap**, **Lanyard** or **rope length adjuster which** will never load the cam beyond your single bodyweight and often not even that since the arborist only leans against the strap rather than hanging on it. Unless you slip.
- **Work positioning/safety** – which might include ascending and fall arrest. This will/may take full bodyweight in a vertical system and could take a small shock load in the event of a slip or primary system failure.

The term 'Rope grabs' was originally used for industrial fall arresters like the Komet Altochute/StickRun (right), some of which function and look like a knobbly Gibbs-style ascender but are usually quite obviously different thanks to mostly being all-steel construction, often having tandem cams (rather than the single cam in this guide) and being the size and weight of a small planet. Such mobile fall-arresters often require a very specific rope brand and model and are not certified to operate on anything else. Not all are steel, the Buck 5004T Rope Grab (right) is alloy but **we have not included any of these industrial-specific mobile fall arresters**. If you are tempted, because your mate in the power company gave you one, it would flag up to rival companies that you don't have the most appropriate gear for the job. Over the years and particularly thanks to the arb industry, the term 'rope grab' has come to mean any cam-&- shell device which 'grabs' and holds a rope. This is despite the fact that it would be a fatal mistake to think that all devices now called a rope grab can act as a fall arrest device. It is in fact, far better to assume that NO Rope grab can be used for fall-arrest unless it specifically says so in the instructions or meets EN 353-2 for mobile fall arresters.

A lever-cam rope grab comprises a cam 'shell' or frame (which is basically a rope channel) and a pivoting cam with a connection eye that, when loaded, rotates onto the rope and squeezes it between the cam and the frame. The frame may have a 'relief' channel or scalloping which allows part of the rope to escape the cam-frame squeeze-point which might otherwise result in complete severing of the rope if overloaded. Most cams are cast or milled aluminium with a hardened coating to prevent undue wear. They have transverse ribs and ridges running across the face of the cam to increase grip on the rope without the aggression of teeth which is why they are generally more suited to high-loads and hauling.

These devices are further defined and distinguished from regular frame ascenders we covered in the first part of this guide by the guru of hardware Doc Storrick as type 1 and type 2 Lever Cams. A Type 1 cam is levered against the rope directly via your loading rather than indirectly via the frame as with a standard ascender. Indeed, it's Storrick that first took issue with some companies calling their devices a rope grab when it was clearly a type 1 Lever Ascender! I think he's now firmly lost that battle but it doesn't mean he wasn't right to raise the point in the early days. Within this category there are a sub-section of mini, emergency ascenders like the Petzl Tiblock and Skylotec Ringo which are technically not type 1 lever cams but they work by directly loading the cam as a single component with the body so it's close enough for us. The original mini ascenders were of course the Wild Country Ropemen but these and the Kong Duck and CT Roll 'N lock use a pivoting cam and it's the frame you load initially so they are in with the Basic/Hand Ascenders.



Type 2 Levers are where a completely smooth 'cam' or more accurately 'bar' is loaded against the rope. The frame itself further pivots to create further contact with the rope at the top. The Petzl Shunt (7) is the original proponent of this design and having once ruled the rope access world it is now largely confined to the sports

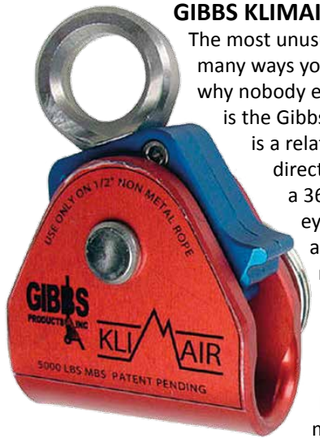
catalogue. See Emag#22 for discussion of the Shunt's revised capabilities as of 2011. Despite the multi-roles it had when first introduced, the Shunt is now sold only as an abseil/rappel backup device. However, it can obviously still function as an ascender. Uniquely in this Guide, the Shunt can operate on two ropes but the Shunt had slippage issues at moderate to high loads which needed to be mitigated or accounted for in your rigging or system set-up. The Shunt's baton was taken up by the Brazilian Safetec Duck (6) and Enforcer models. Unlike a type 1 lever cam, the frame on a type 2 can be rotated by hand against the force of the pivot to lessen the holding force. Not something you would necessarily want to do much but it better demonstrates the difference between type 1 and type 2 lever cams.

The granddaddy of all manufactured lever-cam ascenders is the Gibbs (2) This was introduced in 1965 by brothers Charles and Peter Gibbs, Charles the inventor, Peter the manufacturer but both were prominent cavers. They were soon adopted by mountaineers and then by rescue for a whole range of applications that they weren't necessarily designed for. In the latter part of the last century their use in rescue tailed off in favour of other emerging devices because some high load applications caused the cam to severely damage, if not sever the rope. That's why you see all the non-sport models with a 'NOT FOR SELF BELAY' inscription. In European standards terms this can be a little confusing because EN567 for ascenders/rope clamps defines 'self-belay' as a constituent requirement for any ascender to meet, not because it is a fall-arrest device in the sense of the afore-mentioned EN353-2 standard, but because the climber may slip or accidentally release an ascender during climbing and fall back onto it – we would probably call that fall-arrest but UIAA defines it as self-belay. Despite this being more of a user-problem in terms of using the correct Gibbs for the correct application, the Gibbs was eventually swamped by competitors, most notably Rock Exotica's Rescuecender (5). We considered this to be the finest lever-cam ascender on the market at that time and CMC's Ascender (4)obviously shares some ancestry. Prolific ascender-makers CMI introduced their renowned hardened cams to an extensive lever-cam range which is quite striking in appearance (1) and has sold well into the arborist industry with tough stainless steel models. Rescuecenders were eventually bought by Petzl who discontinued the original design (5) but continue to work some magic with the design producing perhaps the most complex model to date (3).

Back to Gibbs devices which never went away and having expanded their range in the 1980s and 90s to take in rescue-sized ropes from 1/2" to 3/4" they began to find new markets in treework and rope access in the early 2000s as well as continuing to service traditional caving, mountaineering and rescue. Key differences between models are shell material – alloy or stainless steel, rope capacity, whether the device is detachable via a spring pin or bolted and needs to be fed and whether it is has free running or sprung cams or both. The former relies on loading the cam to hold rope position while the sprung cam automatically pushes the cam

onto the rope so that it holds position even with no load. The heavier-duty models have thicker shells and greater clearance for increased rope diameter variations as well as high load applications. Gibbs are an iconic design in the rope industries little changed in over 50 years and still recognisable in many models with their webbing cam/release pin attachments. They continue to rank as by far the largest range of lever-cam rope grabs in the world with 11 models which seem to alter in some way on a frustratingly regular basis, always the way with genius inventors!

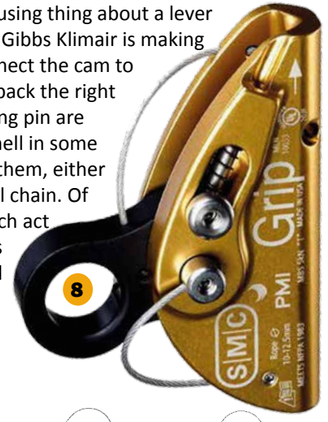
GIBBS KLIMAIR



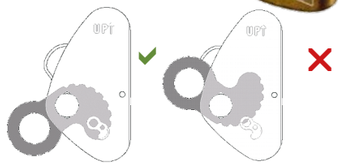
The most unusual model and in many ways you have to wonder why nobody else ran with this, is the Gibbs Klimair. This is a relatively small bi-directional model with a 360 degree swivel eye and removable axle-pin. Instead of mounting the cam eccentrically so that the cam will only allow rope to feed in one direction like every other lever-cam, the Klimair has it centrally mounted like a see-saw, able to pivot both ways with ribs along the entire quadrant to grip the rope in either direction but missing in the middle section so as to allow rope to run through. This is most often used on fliplines/lanyards/pole-straps where you might otherwise use a small prusik cord as that is also bi-directional. A double rope length with a hook on both ends enables you to create two fliplines on the same lanyard, usually called a 2-in-1 utilising a 2-way prusik. You can bypass branches while remaining attached at all times by throwing the tail around the trunk above the branch and clipping back to your harness side-D while your lower pole strap is still connected. Take your weight in on the top rope long enough to release the bottom eye and slide the prusik/Klimair up the rope until it can take your weight again. You are never fully disconnected and the Klimair is able to take load one way as the lower strap and then the opposite way on the upper strap. Despite loading both ways the cam will slide when de-weighted with the cam either centrally positioned or you thumb the cam against the direction of travel.

Don't be fooled by the delineation of Gibbs models into Sport, Rescue and Arborist models. Arborists usage will cross into all three Gibbs Categories so, apart from the Klimair and bolted models intended more for flip lines/lanyards, use the data in the tables to decide which model best suits your requirements.

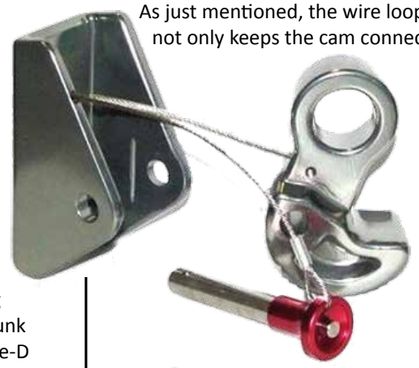
CAM RETENTION



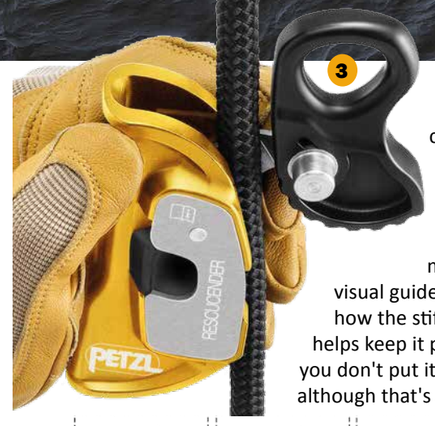
For novices, the most confusing thing about a lever cam device apart from the Gibbs Klimair is making sure that when you disconnect the cam to insert the rope, you put it back the right way up! The cam and locking pin are always connected to the shell in some way so that you can't lose them, either by a wire, webbing or small chain. Of these, the stiffer wires which act as springs to hold the cams positions on the rope, tend also to orient the cam the right way. But not always. If there's enough wire/ cord/tape you will be able to accidentally flip the cam upside down as in this ISC demonstration (right). Petzl's re-imagining of the Rescuecender (3) uses a retractable, solid connection which only allows you to reconnect the cam the correct way up.



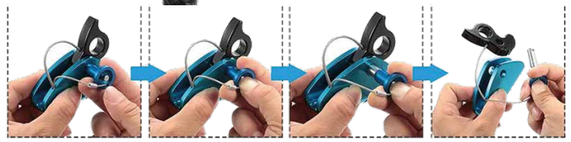
As just mentioned, the wire loop you see on most cams not only keeps the cam connected, it also acts as a spring to maintain enough load on the cam to hold it in position on the rope when not loaded. With no spring, the cam is effectively free-running and this means it doesn't have to be manually moved down a rope as it will slide when it is not loaded. This mode of operation is a consequence of its use as a back-up device when climbing/ abseiling. The fact that a device has a free-running function implies that it is suitable for fall-arrest but this is not a wise assumption with any camming device – check suitability.



By far the commonest connection for removable cams is a pip-pin or push-pin as in the USClimb and SE Peak (rebadged as Lixada) models above. Earlier we mentioned the sprung and free-running options with some models allowing both options in the one device so we'll use the Gibbs usage description for



converting a sprung cam to a free-running cam to also serve as instruction on the push pin and before that, Lixada's rebadged SE Peak model has a useful visual guide and you can see how the stiff wire on the cam helps keep it properly oriented so you don't put it back upside down although that's always possible.



GIBBS Pin-use & sprung to free-running conversion

Assembly: *Depress button on pin and pull pin out until cam swings free. Place Ascender on rope and align holes in cam and shell. Depress button and insert pin.*

Convert to Free Running Mode: *Remove the small screw in the black or white spring cover. The spring will rotate freely. Do not remove the screw in the cam. Do not try to remove the spring.*

Reconvert to Spring Loading: *Hold cam down and re-insert screw in spring cover.*

Our all-time favourite (and that's very subjective) Rock Exotica Rescuecender shown on page 39 used a fixed sprung pin to keep the cam pin in place similar to the latest SMC/PMI Grip (8). While there was definitely no risk of losing that and it protruded far less than a large pip or push-pin it does represent an extra action since there is still a removable pin acting as an axle. Hugh Banner's HB cams (which we managed to bend the eyes of in testing) are no longer with us but the SMC/PMI Grip is an evolution of those models with the same sprung pin retention and gentle body-curves. Aside from the many Gibbs models, the models we see the most in 2020 are the CMI Ropewalkers (1) discussed earlier and the ISC RP Grabs (9) adopted by a number of other manufacturers/distributors like Stein and Courant because they're well made and there's often no point in reinventing the wheel.

CAM EYE MODIFICATIONS

We've already mentioned the Gibbs Klimair with its (so far) unique swivelling eye but there are some with a fixed eye that has been rotated 90 degrees to the norm. Rock Exotica have their RockGrabs 90 (pic bottom), named after Rock Thompson not an indication that it is intended only for rock climbers while the BuckGrab (inset bottom) was the first to patent the 90 degree eye. The reason for the offset is to help the device lie flat and in the same plane as the connecting carabiner. This negates the need for a twisted shackle used by some including the arborist in the image above but it does mean they may apply cross-gate loading if you try to use a standard carabiner in conventional ascending mode. Adverse torque on the carabiner and cam-eye is something to look out for with the relatively 'thick' profile of many lever cams. Something else you may notice on one or two cams is an extra horn emanating from the carabiner eye as part of the cam assembly. This has been adopted by Petzl on the MicroGrab pictured left as a much bigger feature than on one of the original innovators, Jerry Smith's now discontinued PRG (right) from 2008. ProClimb's uniquely rubber-covered-333 (pic inset top), the Russian Krok and both Chinese Xinda/Lixada models also have these horns as much larger features. It makes 'thumbing' the cam for downward movement or pulling through of rope a little easier thanks to increased leverage and a larger surface contact area. This is particularly useful when adjusting length on a pole-strap or lanyard, when resetting the haul ready for another pull or downclimbing if ascending.

IN THE FOLLOWING TABLES additional to the notes on page 26.....

DIMENSIONS

As usual this is **HEIGHT** by **WIDTH** by **DEPTH (measured from SIDE-to-SIDE)** but not everyone quotes the depth. The terms width and depth can be a bit confusing because they are interchangeable. For our purposes, the width is measured from the back edge of the cam shell to the front of the carabiner eye. The Depth is the side-to-side measurement as you look at the cam-face. Some manufacturers may just be quoting the cam enclosure without any bolt-heads. We have therefore given two figures in many cases – the first is just the cam enclosure/frame without any pins or bolts and the second figure in burnt orange is the length of the bolt or pin e.g. 26/67mm which is always more than just the cam enclosure. Some, like the Rock Exotica models (pic left) don't have any bolt heads; the bolt is flush to the frame and kept in place by a locking pin through the frame. Height can also be an optical illusion because we expect this be the greater figure but some are wider than they are tall – the ISC 203/209 for instance is 20mm wider than it is high.

CHINESE & RUSSIAN

As always we have to add a proviso about Chinese and Russian manufacture. The Chinese continue to increase their ranges in any given market sector of the rope access market by supplying an off-the-shelf and often extremely well made product that can be rebranded. But not always 'well-made' and not always with appropriate standards despite the markings on the product. In fact, Lixada's AZW031 grab which is the same as Xinda's XD-Q9666 was omitted because its picture had EN341 stamped on it which is a descender standard; that may be a typo but it doesn't inspire confidence. We've seen other ascenders with a carabiner (connector) standard printed on them. Xinda also annoyed us recently with some ridiculously poor safety helmets that clearly didn't meet their labelled standards and this has again made us wary of their products but, as we see with their chest ascender they do have some unique designs. We haven't included their Gibbs look-a-like under their name but Spanish company Climax sells it as the Otto so it has been included because we should be able to trust their certification since they would need to meet EU standards as a member of the EU.

Russian devices are more 'off-the-wall' than 'off-the-shelf' but always interesting. We mostly show KROK which purports to meet European standards and has a good website and provides us with data but you'll need to satisfy yourself that these are appropriate to your needs.

FOR ALL ASCENDERS & GRABS, THE OPTIMUM ROPE SIZE IS IN THE MIDDLE OF THEIR QUOTED ROPE RANGE ESPECIALLY FOR HIGH LOADS

STANDARDS

Once again, it is the European standards that best define the capabilities of different types of ascender/cam although the US NFPA does at least narrow your options to ONLY the most applicable available to North American rescue users which is often a great indicator for tough gear for arborists.

- EN353-2 – Mobile Fall Arrest
- EN358 – Lanyard adjuster
- EN12841 typeB – Industrial ascender
- EN567 – Sport Ascender
- EN365 – Generic PPE Fall Protection

EN12841 type B – and **EN567** are ascender standards but EN567 is just for sport/climbing ascenders and does NOT include a fall test. However, this doesn't necessarily mean that EN567 ascenders are less applicable to arborists because the fall test for EN12841-B incorporates a 'dynamic lanyard' or shock absorber which is routinely used in rope access but not yet (if ever) by arborists. Despite being an 'ascender' standard some devices like the Rock Exotica Rockgrabs tested to EN567 are NOT intended to be used as ascenders.

EN365 is a generic standard for fall arrest PPE maintenance and marking etc. so most rope grabs would meet it and is rarely quoted other than in paperwork.

Many of these lever cams are shown as meeting only one or two of these specific standards and we often find that devices of pretty much the same design and load rating show different standards – this is almost certainly down to the market that the manufacturer sees for the device rather than the actual capabilities. There's no doubt that most EN353 and 358 models without an offset eye would function adequately as ascenders. However, in these days of litigation you may need to prove it is 'Fit-for-Purpose' if a device doesn't show your required standard. One thing to note, as with hand and chest ascenders is that the minimum and maximum rope diameters quoted should largely be avoided except for special purposes. Thinner rope may tend to slip more readily and larger ropes may be damaged more easily under high load.

FIXED & DETACHABLE

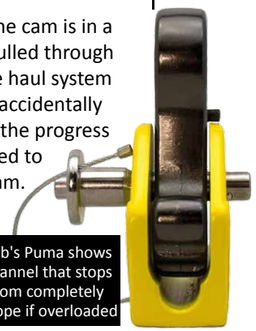
Very few, if any rope grab cams are truly fixed – they will all detach but here we use 'FIXED' to describe a bolt requiring tools to dismantle and 'DETACHABLE' to describe a spring-release pin easily removed by hand.

USES

LAD meaning LENGTH ADJUSTING DEVICE for longer lanyards or FLIP LINE/POLE STRAP. Any camming device, whether it's an ascender or a descender or both, will function as a length adjuster on a lanyard or flip line. Here we are primarily concerned with flip-lines/pole straps because the longer work positioning lanyards use length adjusters which pay-out under load AND take in. Ascenders/rope grabs only take-in unless you fully release the cam which is dangerous, so are best suited to short lengths on your pole strap around the main trunk. Many arborists use their longer lanyards as a pole strap but bespoke fliplines often have a wire core to resist being cut in what is a high risk place to be during cutting.

Just to reiterate, every ascender or rope grab within this category will function as a polestrap/flipline adjuster but some are more compact and some simply do it better. We listed the bolted models with an orange box as MOST appropriate because they are more compact than pip-pin models. The Fusion Puma model below clearly shows how a sprung pin or pip-pin can virtually double the width of the device. Bolted devices fed onto the rope or flipline can't subsequently be accidentally removed from the rope or reconnected incorrectly. If you're on a budget that might be seen as a disadvantage because you can't multi-task your kit! Nevertheless the more compact rope grabs are far better in this role than, for instance, a huge-great handled ascender, they're easier to feed through more rope and they usually have a ribbed cam rather than teeth so are kinder on your rope and again rope is more easily paid out without continually 'catching' or snagging on the teeth. Those devices designed primarily as flip-line adjusters are also at the least expensive end of the spectrum. That's not to say they're not well made but if it costs less that $50 it's probably not what you want as a critical component for hauling or ascending.

HAUL: hauling includes two distinct tasks for cams –
1) **HAULING**, as with the Rescuecender above in a simple 3:1 pulley system. This is where the cam moves with the rope, physically grasping the rope while the mechanical advantage or pulley system pulls it in, usually with the help of ground-crew pulling the end of the rope.
2) **PROGRESS CAPTURE DEVICE (PCD)** where the cam is in a fixed position so it doesn't move while rope is pulled through during hauling but then holds the load when the haul system stops taking in for rest or it the rope were to be accidentally released. It stops you losing the rope and losing the progress made during hauling. Haul cams may be subjected to much higher forces than the progress capture cam. These days there are a number of dedicated PCD's with integrated pulleys like the Petzl Traxion and larger more complex models like the SMC Advanced Tech HX. These negate the need to use a separate cam as a PCD and most can be used as stand-alone pulleys. Smaller PCDs that function as ascenders as per EN567 have been included in the first part of this Guide since they load via the frame as well as the cam but they are designed specifically to be used as part of a pulley system rather than for ascending, indeed, most of them can operate just as a pulley with the cam detached. Again, hauling is a rather arbitrary category since ALL ascending devices will haul up to their given load ratings. However, some, like the Gibbs, have reinforced cam-shells to better cope with high CONSTANT loads. That strength does not translate to dynamic loading though. Gibbs are at pains to point out when one of their many devices is NOT to be used for self belay though they don't make the distinction between ascending and self-belay – see our notes below. Also on hauling, if you're creating a haul system from components it is easier to do this with a detachable rather than fixed cam where the rope needs to be fed through the device or you have to unbolt it.



Fusion Climb's Puma shows the rope channel that stops the cam from completely severing a rope if overloaded

ASCENDER: This is a tricky one because any camming device can be used to ascend but not all are suitable. Ascending requires the device to be loaded with a single bodyweight with careful weight transfer to an anchored rope with *no shock load*. However, some, like the offset-eye models by Rock Exotica and Buckingham, specifically *preclude* ascending because their eyes are more susceptible to carabiner torqueing. Two instances when shock-load can occur are.....
1) when you sit back down or load an ascender you have just moved and do it too harshly – you may even 'fall' back onto it during reset instead of a controlled loading. This creates increased shock or impact force at the cam-rope interface and will be exacerbated when you are fatigued.
2) Failure of one of two cams being used or one fails to grip properly and slips down the rope or you accidentally remove it from the rope. In any of these cases you may 'fall' onto the second ascender applying a shock load that might be similar to SELF BELAYING described below. This obviously isn't intended and isn't the ascending perfection that ascenders/grabs prefer but virtually all can cope well enough.

SELF BELAY differs from ASCENDING in that the device is intended to follow you up the rope (or you move it up manually) while you are climbing and it will arrest you should you fall. There is often a period of climbing when slack develops between you and the cam and if you fall, the cam will be shock loaded albeit mitigated by stretch in the rope above the device which will absorb a lot of the impact Nevertheless this is NOT a mode of use that many ascender manufacturers would recommend or even imply. Following self-belay accidents on Gibbs SPORTS ascenders, Gibbs placed stern warnings on their devices and added devices to their range more suited to higher loadings but still NOT self belay. Industrial climbers mitigate this with shock absorbers and some in this list mandate a shock absorber if being used for self belay/fall arrest. The Climax Otto is interesting; it's clearly a copy of the Gibbs but it comes with a short sling attachment which negates inappropriate torque on a carabiner and is intended primarily as a fall arrester. Rescuetech1 sell the Gibbs with their own short sling attached but not for fall arrest. Don't say we didn't warn you about this whole fall-arrest/self-belay subject. **Double-check your devices suitability.**

Thanks to Paul Witheridge

www.rescuemagazines.com

images NOT to scale	MODEL	COMPANY	ORIGIN	COST	WEIGHT	DIMENSIONS Width x Height x Depth-Frame/Pin	STANDARDS		MATERIALS SHELL CAM	CAM	ROPE DIAM RANGE	WLL/ MBS	EYE DIAM	FIXED	DETACHABLE	SERIAL NO.	LAD	HAUL	ASCENDER	FALL ARREST	COLOURS	NOTES	WWW.
	**Viper Lt** AC4000	**3M Protecta**		£80 €98	176g 6.2oz	85x45x26/65mm 3.4x1.8x1/2.6"	EN353-2 EN358		Aluminium Aluminium		12.5mm ½"	15kN 3372lbf	18mm 0.7"		■		■	■	■	■	BLACK	Only available in certain European countries. Not UK, US, AUS/NZ but plenty of similar options	3m.beratertool.de
	Hold Up	**ATN**		$90	295g 10.4oz	88x90x44mm 3.5x3.5x1.7"	-		StainlessSteel StainlessSteel		9-16mm ⅜-⅝"	n/a	17mm* 0.7"		■				■		GOLD* SILVER	A CMI made sailors' device for mast climbing in a marine environment. #Original version in aluminium *shackle - may vary	atninc.com
	BuckGrab 5004b 5004BQ4	**BUCKINGHAM**		$112	172g 6oz	70x73x32/42mm 2.8x2.9x1.25/1.7"	ASTM		Aluminium Aluminium		12.7mm ½"	n/a	16mm 0.6"	■			■	□			GREEN	5004BQ4= Bolt has a split ring option. 90° offset eliminates the need for a locking twisted clevis	buckinghammfg.com
	Otto	**CLIMAX**		£62 €62	281g 9.9oz exc sling	104x78x28/65mm 4x3.1x1.1/2.6"	*EN353-2		Aluminium Aluminium		8-12mm 5/16 -<½"	15kN 3372lbf	18mm 0.7"		■				■	■	GOLD	*This is the Chinese 'GM Climbing' model and clearly a Gibbs copy but sold in Europe. by Climax with the extension sling for fall-arrest	productosclimax.com
	Ascender	**CMC**		$99	252g 8.8oz	114x76x25/58mm 4.5x3x1/2.3"	NFPA T/G		Aluminium Aluminium		11-13mm 7/16-½"	*5kN 1124lbf	25mm 1"		■	■	■	■	■		RED	*MBS for 11mm MBS=11kN for 13mm	cmcpro.com
	Ropewalker Aluminum	**CMI**		$96	200g 7oz	102x76x19x57mm 4x3x0.75x2.25"	-		Aluminium Hardened-Steel		11-16mm 7/16-⅝"	33kN 7500lbf	25mm 1"		■		■	■	■		RED	Wired Pip-pin	cmigearusa.com
	Ropewalker Stainless	**CMI**		$106	312g 11oz	102x76x19x57mm 4x3x0.75x2.25"	-		Stainless Steel Hardened-Steel		9-16mm ⅜-⅝"	33kN 7500lbf	25mm 1"		■		■	■	■		SILVER	Hard-coated cam with lifetime warranty	cmigearusa.com
	Arborist Ropewalker	**CMI**		$92	198g 7oz	102x76x19x38mm 4x3x0.75x1.5"	-		Aluminum Hardened-Steel		11-16mm 7/16-⅝"	33kN 7500lbf	25mm 1"	■			■	■	■		RED	Stainless Bolt secures cam closed for lanyard use	cmigearusa.com
	RP209	**COURANT**		€78	180g 6.4oz	64x85x32/62mm 2.6x3.4x1.3/2.4"	EN353-2 EN567		Aluminium Aluminium		10.5-13mm ⅜-½"	140kg 308lb 2.5kN 562lbf	19mm 0.75"		■	■	■	■	■	■	BLACK		mycourant.com
	Rescue Rope Grab	**CRESTO**		€129	374g 13.2oz	98x90x44/78mm 3.8x3.5x1.75/3.3"	EN567		Aluminium Aluminium		8-16mm* 5/16-⅝"	600kg 1320lb	22mm "		■	■	■	■	■	■	GOLD	NB: intended primarily for use in rescue hauling hence the arrow opposite to ascending direction. Also fits webbing 21-32mm wide	cresto.com
	Puma Grab II 12mm	**FUSION**		$41	335g 11.8oz	113x99x63mm 4.4x3.9x2.5"	EN567 ANSZI		Aluminum Aluminum		7-12mm 3/32 -<½"	23kN 5170lbf	24mm 1"		■			■	■		GREEN		fusionclimb.com
	Puma Grab II 16mm	**FUSION**		$41	300g* 10.6oz	113x99x63mm 4.4x3.9x2.5"	EN567 ANSI		Aluminum Aluminum		12-16mm ½-⅝"	23kN 5170lbf	24mm 1"		■			■	■		BLACK, YELLOW	*Larger rope version is lighter because more shell has been removed to fit 16mm rope	fusionclimb.com

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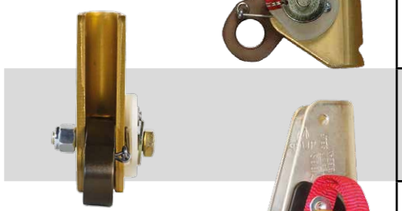
	Sport #1	GIBBS PRODUCTS		$55	195g 6.9oz	104x76x63mm 4x3x2.5"	-		Aluminum Aluminum		11-13mm 7/16-½"	11.3kN 2550lb	17mm 0.67"		■		□	□	■		GOLD	single-person load only. Free-running only, no spring option	gibbsproducts.com
	Sport #2	GIBBS PRODUCTS		$61	200g 7oz	104x76x63mm 4x3x2.5"	-		Aluminum Aluminum		11-13mm 7/16-½"	11.3kN 2550lb	17mm 0.67"		■		□	□	■		GOLD	spring can be removed	gibbsproducts.com
	Rescue #3	GIBBS PRODUCTS		$75	236g 8.5oz	104x76x28/63mm 4x3x1.1/2.5"	ANSI		Aluminum Aluminum		11-13mm 7/16-½"	22.24kN 5000lb	17mm 0.67"		■		□	■	■		GOLD	spring can be removed	gibbsproducts.com
	Rescue/ Arborist #3B	GIBBS PRODUCTS		$75	230g 11.6oz	104x76x28/56mm 4x3x1.1/2.1"	ANSI		Aluminum Aluminum		11-13mm 7/16-½"	24.02kN 5400lb	17mm 0.67"	■			■	■	□		GOLD	spring can be removed	gibbsproducts.com
	Rescue #3S	GIBBS PRODUCTS		$75	331g 11.7oz	104x76x28/63mm 4x3x1.1/2.5"	ANSI		Aluminum Aluminum		11-13mm 7/16-½"	24.02kN 5400lb	17mm 0.67"		■		□	■	■		SILVER	also called ~3SS and previously called #2SS! spring can be removed	gibbsproducts.com
	Rescue #3SF	GIBBS PRODUCTS		$75	331g 11.7oz	104x76x28/63mm 4x3x1.1/2.5"	ANSI		Aluminum Aluminum		11-13mm 7/16-½"	24.02kN 5400lb	17mm 0.67"		■		□	■	■		SILVER	Free-running only - no spring option	gibbsproducts.com
	Arborist #3SB	GIBBS PRODUCTS		$75	320g 11.3oz	104x76x28/56mm 4x3x1.1/2.1"	ANSI		StainlessSteel Aluminum		11-13mm 7/16-½"	24.02kN 5400lb	17mm 0.67"	■			■	□	□		SILVER	spring can be removed	gibbsproducts.com
	Rescue/ Arborist #4	GIBBS PRODUCTS		$81	310g 10.9oz	104x90x30/63mm 4x3x1.2/2.5"	ANSI		Aluminum Aluminum		14-19mm 5/8-¾"	25kN 5650lb	17mm 0.67"		■		□	■	■		GOLD	#4B (bolted) appears to be discontinued but is an easy retrofit. spring can be removed	gibbsproducts.com
	Rescue/ Arborist #4S	GIBBS PRODUCTS		$81	425g 15oz	104x92x30/63mm 4x3.6x1.2/2.5"	ANSI		StainlessSteel Aluminum		14-19mm 9/16-¾"	25kN 5650lb	17mm 0.67"		■		□	■	■		SILVER	spring can be removed	gibbsproducts.com
	Arborist #4SB	GIBBS PRODUCTS		$81	414g 14.6oz	104x92x30/56mm 4x3.6x1.2/2.1"	ANSI		StainlessSteel Aluminum		14-19mm 9/16-¾"	25kN 5650lb	17mm 0.67"	■			■	□	□		SILVER	Alloy case version still available from stockists. spring can be removed	gibbsproducts.com
	Arborist Klimair	GIBBS PRODUCTS		$110	156g 5.5oz	75x50x23/32mm 3x2x1/1.2"	ANSI		Aluminum Aluminum		11-13mm 7/16-½"	22.24kN 5000lb	17mm 0.67"		■		■	■	■		RED/BLUE	Two-way device with swivel. Can run in either direction- locks when loaded	gibbsproducts.com
	Mini Ropegrab RP203	ISC		£54 $78 €66	176g 6.2oz	65x85x32/40mm 2.6x3.4x1.3/1.6"	EN353-2		Aluminium Aluminium		10-13mm 3/8-½"	140kg 308lb 2.5kN 562lbf	19mm 0.75"	■		■	■	□	□	■	RED	Also rebadged by Yates	iscwales.com

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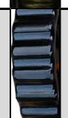
	**Mini Ropegrab** RP209	**ISC**		£66 $94 €78	180g 6.4oz	65x85x32/62mm 2.6x3.4x1.3/2.4"	EN353-2		Aluminium Aluminium		10.5-13mm ⅜-½"	140kg 308lb 2.5kN 562lbf	19mm 0.75"		■	■	■	■	■	■	RED	RP201 R-Clip version discontinued. After Nov2017 cord used to retain the pin instead of wire	iscwales.com
	**Ropegrab** RP205	**ISC**		£65 $82 €79	302g 10.6oz	99x98x40/67mm 3.9x3.9x1.6/2.6"	EN567		Aluminium Aluminium		14-16mm 9/16-⅝"	140kg 308lb 2.5kN 562lbf	24mm 0.9"		■	■	■	■	■		RED	RP206 R-Clip version discontinued. After Nov2017 cord is used to retain the pin instead of wire	iscwales.com
	**Ropegrab** RP204	**ISC**		£47 $82 €68	299g 10.6oz	99x98x40/46mm 3.9x3.9x1.6/1.8"	EN567		Aluminium Aluminium		14-16mm 9/16-⅝"	140kg 308lb 2.5kN 562lbf	24mm 0.9"	■		■	■	□	□		RED		iscwales.com
	FA2010300B	**KRATOS SAFETY**		£67*	176g 6.2oz	62x85x28/60mm 2.5x3.4x1.1/2.4"	EN353-2 EN358		Aluminium Aluminium		11mm 7/16"	15kN 3372lbf	17mm 0.6"		■		■	■		■	GREEN, BLACK	*Price includes captive-eye steel carabiner	kratossafety.com
	Brig A	**KROK**		$30* €26*	170g 6oz	80x90x26/37mm 3.2x3.5x1/1.5"	EAC		Aluminium Hardened-Steel		10-18mm ⅜ -¾"	12kN 2697lbf 15kN 3372lbf	16mm 0.6"	■			■	■	■	■	BLUE	* excludes duty/import taxes & shipping	krok.biz
	**Tibloc 2**	**PETZL**		£30 $45 €32	35g 1.2oz	55x39x22mm 2.2x1.5x0.9"	EN567 UIAA EAC		Stainless Steel		8-11mm 5/16 -7/16"	140kg 308lb 4kN 899lbf	10-12mm* 0.4-0.5"		■	■	□	□	□		ORANGE	Emergency ascender/hauling device *minimum and maximum carabiner bar size to use, not eye diam.	petzl.com
	**MicroGrab**	**PETZL**		£84 $80 €85	150g 5.3oz	76x84x36mm 3x3.4x1.4"	EN567 NFPA-T EAC		Aluminium Aluminium		8-13mm 5/16 -½"	140kg 308lb 5kN 1124lbf	16mm 0.6"	■		■	■	□	□	■	BLACK		petzl.com
	**Rescuecender**	**PETZL**		£96 $100 €97	260g 9oz	110x82x36mm 4.3x3.2x1.4"	EN567 EN12841B NFPA-T EAC		Aluminium Aluminium		9-13mm ⅜-½"	140kg 308lb 5kN 1124lbf	20mm 0.8"		■	■	■	■	■		GOLD	Red 'unlocked' warning indicator shows when cam is not properly secured	petzl.com
	**Shunt**	**PETZL**		£63 $85 €66	188g 6.6oz	110x80x55mm 4.3x3.2x2.2"	EN567 UIAA		Aluminium Aluminium		8*/10-11mm 5/16*⅜-7/16"	#1-8kN 225-1800lbf 20kN 4496lbf	16mm 0.6"		■	■	□		□	■	SILVER	*double ropes >8mm Single ropes > 10mm # rope dependent	petzl.com
	**Grip**	**PMI**		$77	190g 6.7oz	98x74x35/47mm 3.9x2.9x1.4/1.85"	NFPA Berry-Compliant		Aluminium Aluminium		10-13mm ⅜-½"	5kN 1124lbf (3Sigma)	18mm 0.7"		■	■	■	■	■		GOLD	Co-Produced with SMC	pmirope.com
	**Better-Grab2** USR-MRG-333	**PRO CLIMB (US RIGGING)**		$60	249g 8.7oz	71x90x40mm 2.8x2.5x1.6"	ANSI		StainlessSteel /Rubber Aluminium		*11-16mm *7/16-⅝"	24.02kN 5400lbf	16mm 0.6"	□	□		■	■			GREY	Rubber coated frame. *min wire core flip-line=13mm,1/2" 300 model discontinued	usrigging.com
	**Alu Mini RopeGrab** USR-MRG-200	**PRO CLIMB (US RIGGING)**		$40	312g 11oz	74x65x30/40mm 2.9x2.6x1.2/1.6"	ANSI		Aluminium Aluminium		*11-16mm *7/16-⅝"	24.02kN 5400lbf	16mm 0.6"	■			■	□			SILVER	*min wire core flip-line=13mm,1/2"	usrigging.com

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	RG4-90	ROCK EXOTICA		$95	227g 8oz	60x73x32mm 2.4x2.9x1.3"	EN567		Aluminium Aluminium		13.5-16mm ½-⅝ "	140kg 308lb 4kN 899lbf	15.8mm 0.625"	■		■	■	■			SILVER	90° offset eye. Despite being EN567 this is NOT intended for ascending because of carabiner torque	rockexotica.com
	RG2-90	ROCK EXOTICA		£78 $88 €112	142g 5oz	60x73x32mm 2.4x2.9x1.3"	EN567 ANSI		Aluminium Aluminium		9-13mm ⅜-½"	140kg 308lb 4kN 899lbf	15.8mm 0.625"	■		■	■	■			GOLD	90° offset eye. Despite being EN567 this is NOT intended for ascending because of carabiner torque	rockexotica.com
	RG2	ROCK EXOTICA		£78 $88 €112	142g 5oz	66x98x35mm 2.6x3.9x1.4"	EN567		Aluminium Aluminium		9-13mm ⅜-½"	140kg 308lb 4kN 899lbf	15.8mm 0.625"	■		■	■	■			GOLD	Despite being EN567 this is NOT intended for ascending because of carabiner torque	rockexotica.com
	S-008/009	S.E.PEAK Shanghai Leidell Ind Co Ltd/NalHon		$45 €85	180g 6.4oz	85x77x28/62mm 3.4x3x1.1/2.4"	EN353-2 EN358		Aluminium Aluminium		11-13mm 7/16-½"	15kN 3372lbf	16mm 0.6"		■	■	■			■	BLUE	same or similar models 'badged' as Lixada, NTR-Jiangsu, Yundxi etc. S-009=Bolted version see below for dims	en.sepeak.net
	S-010/011	S.E.PEAK Shanghai Leidell Ind Co Ltd/NalHon		$45 €85	172g 6oz	85x77x28/41mm 3.4x3x1.1/1.6"	ANSI		Aluminium Aluminium		11-13mm 7/16-½"	15kN 3372lbf	16mm 0.6"	■		■		□		■	BLUE	90° Offset eye. S-011 = Sprung pin version - see above for pin length & weight	en.sepeak.net

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	**Duck** T01	**SAFETEC**		£102 $147	270g 9.5oz	105x75mm 4.1x3"	EN12841A NBR		Aluminium Aluminium		*11mm 7/16"	120kg 265lb	17mm 0.67"		■	■	■	□	■	SILVER/ YELLOW	*Single or Double Ropes	safetecbr.com.br
	**Duck R** T02 *T02L	**SAFETEC**		£108 $155 €125	290g 9.2oz *325g 11.5oz	100x80x47mm 3.9x3.2x1.8"	EN12841A		StainlessSteel Aluminium *StainlessSteel		10.5-11mm 7/16"	100kg 220lb	19mm 0.75"		■	■	■	□	■	SILVER/RED	Tested to 200kg for rescue at FF.0 or less * Stainless Steel cam is silver, (alu is red)	safetecbr.com.br
	**Enforcer** T03L TO3H*	**SAFETEC**		£120 $190 €167	305g 10.8oz *400g 14.1oz	100x80mm 3.9x3.2"	EN12841A ANSI NBR		StainlessSteel Aluminium *StainlessSteel		10.5-12mm 7/16-<1/2"	200kg# 440lb	19mm 0.75"	■		■		■	■	■	*SILVER. SILVER/RED	* Stainless Steel cam is silver, (alu is red). #Heavy duty - specifically designed for rescue loads. ↓=cam-rope interface in profile	safetecbr.com.br
	**Ringo**	**SKYLOTEC**		$87 €58	52g 1.8oz	70x40x18mm 2.7x1.6x0.7mm	-		StainlessSteel StainlessSteel		8-13mm 5/16 -1/2"	-	10mm 0.4"		■			■	□		SILVER	Emergency Ascender/ hauling device. Note Skylotec also has 'Ergograbs' only sold as part of fliplines	skylotec.com
	**Rope Adjuster**	**SL TECH**		$45	181g 6.4oz	62x85x28/40mm 2.5x3.4x1.1/1.6"	EN353-2 EN358		Aluminium Aluminium		11mm 7/16"	15kN 3372lbf	17mm 0.6"	■		■	■	■		■	SILVER/ BLUE	Recently replaced this version of the Sl Tech Rope Adjuster: 	securitelandry.com
	**Grip**	**SMC**		$79	190g 6.7oz	98x74x35/47mm 3.9x2.9x1.4/1.85"	NFPA		Aluminium Aluminium		10-12.5mm 3/8-1/2"	5kN 1124lbf (3Sigma)	18mm 0.7"		■	■	■	■	■	GOLD	Co-Produced with PMI	smcgear.com
	**Climb Right Fixed Pin Rope Grab 85528**	**SPYDER MANUFACTURING**		$80	195g 6.85oz	76x70x32/45mm 3x2.75x1.25/1.75"	ANSI		Aluminium Aluminium		12.7-16mm 1/2-5/8"	178kg 350lb	19mm 0.75"	■		■	■	■			GOLD		spyderman.com
	**Climb Right Fixed Pin Rope Grab Mini 85568**	**SPYDER MANUFACTURING**		$76	166g 5.85oz	64x69x32/45mm 2.5x2.7x1.25/1.75"	ANSI		Aluminium Aluminium		10-12.7mm 3/8-1/2"	178kg 350lb	19mm 0.75"	■		■	■	■			GOLD		spyderman.com
	**Climb Right Rope Grab 85538**	**SPYDER MANUFACTURING**		$90	207g 7.3oz	76x70x32/65mm 3x2.75x1.25/2.5"	ANSI		Aluminium Aluminium		12.7-16mm 1/2-5/8"	178kg 350lb	19mm 0.75"		■	■	■	■			GOLD		spyderman.com
	**Climb Right Rope Grab Mini 85578**	**SPYDER MANUFACTURING**		$84	179g 6.3oz	64x69x32/65mm 2.5x2.7x1.25/2.5"	ANSI		Aluminium Aluminium		10-12.7mm 3/8-1/2"	178kg 350lb	19mm 0.75"		■	■	■	■			GOLD		spyderman.com
	**Rope Grab**	**STEIN**		£54 €55	176g 6.2oz	65x85x26/40mm 2.6x3.4x1/1.6"	EN353-2 EN567		Aluminium Aluminium		10-13mm 3/8-1/2"	140kg 308lb 2.5kN 562lbf	19mm 0.75"	■		■	■	□	□	■	BLUE		steinworldwide.com

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LEVER-CAM ROPE GRABS

images NOT to scale	MODEL	COMPANY	ORIGIN	COST	WEIGHT	DIMENSIONS Width x Height x Depth-Frame/Pin	STANDARDS		MATERIALS SHELL CAM	CAM	ROPE DIAM RANGE	WLL/ MBS	EYE DIAM	FIXED	DETACHABLE	SERIAL NO.	LAD	HAUL	ASCENDER	FALL ARREST	COLOURS	NOTES	WWW.
 	THRG1	TREEHOG/ ARBORTEC		£42 $54 €45	180g 6.4oz	85x45x22/40mm 3.4x1.8x1/1.6"	EN 567		Aluminium Aluminium		9-13mm ⅜-½"	15kN 3372lbf	18mm 0.7"	■		■	■	□	■		COPPER		treehog.co.uk
 	THRG1	TREEHOG/ ARBORTEC		£48 $61 €51	175g 6.2oz	85x45x22/60mm 3.4x1.8x1/2.4"	EN 567		Aluminium Aluminium		9-13mm ⅜-½"	15kN 3372lbf	18mm 0.7"		■	■	□	■	■		COPPER		treehog.co.uk
	Block	US CLIMB		$64	176g 6.2oz	85x45x26/62mm 3.4x1.8x1/2.4"	EN 567		Aluminium Aluminium		9-13mm ⅜-½"	15kN 3372lbf	18mm 0.7"		■		□	■	■	■	BLACK		usclimb.com climbclean.com.br
	Block2	US CLIMB		$103	374g 13.2oz	98x90x44/62mm 3.8x3.5x1.75/2.4"	EN567		Aluminium Aluminium		8-16mm 5/16 -⅝" <30mm web	600kg 1320lb	18mm 0.7"		■		□	■	■		GREY	Larger device which runs on 30mm webbing as well as rope	usclimb.com climbclean.com.br
	XD-Q9666	XINDA (BINGFEN OUTDOOR)		$17*	239g 8.4oz	105x85mm 4.1x3.3"	n/a		Aluminium Aluminium		8-12mm 5/16 -<½"	15kN 3372lbf	16mm 0.6"	■			■	□		■	SILVER/RED	* excludes duty/import taxes & shipping	xindaoutdoor.com

NOTES COST: Approx & inc local tax/VAT * **excludes duty/import taxes & shipping** DEPTH/THICKNESS: /76mm, figure in burnt orange is the length of the bolt/pin N/A: info Not Available/not given USE: ■=OK but not ideal ■=Best Suited to this use

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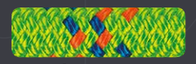
3/4" Green

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JUST FOR THE HELL OF IT

How recreational tree climbing can beat Covid lockdown stagnation

by Ade Scott & Charlotte Ina Sterland

In the case of these Moroccan Amani goats, it's not quite 'for the hell of it' as their tangible rewards for climbing are better access to softer green leaves and fruits, safety from ground predators and being able to inappropriately wolf-whistle passing good-looking goats – not much political correctness in goatdom.

For human arborists, if you can resist the urge to superimpose a dollar or pound sign on every tree you see, you could join a growing mass of 'civilians' who have taken up tree climbing as a hobby. Nothing new in climbing trees obviously; what's most surprising is that it isn't a more widespread activity since it has all kinds of benefits – it's cheap and accessible, it's good exercise, it's good for your mental well-being (ask the Japanese) and it can often give you the best view in the neighbourhood, town or even county so there's a bona fide objective or reward to the climb.

It should be the case that recreational

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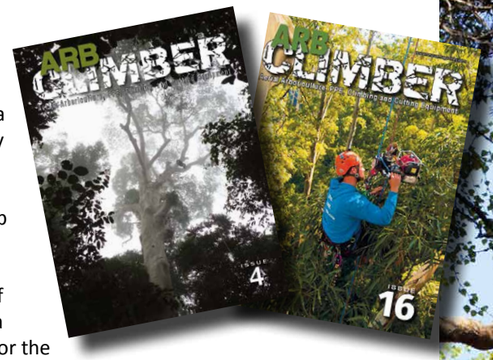
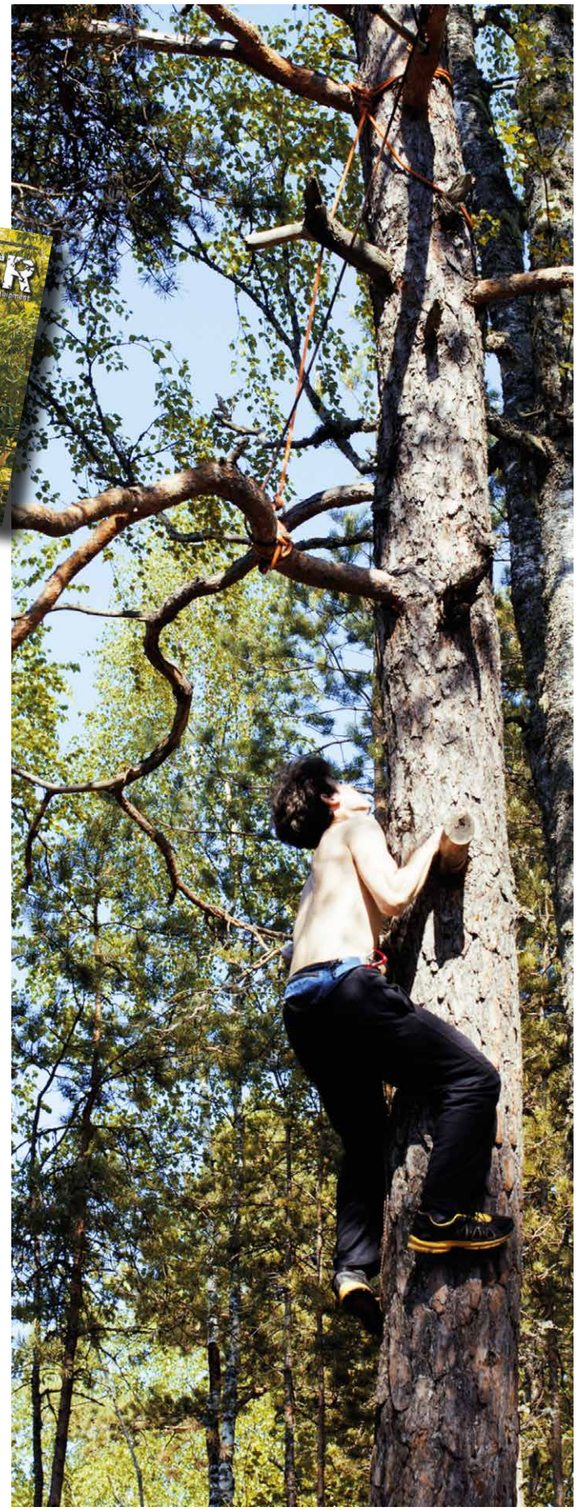
tree climbing is every bit as huge as rock climbing and mountaineering but it's not even close, not even close to niche disciplines like bouldering or indoor wall climbing so it might be a case of not being able to see the wood for the trees. If you walked down your street and saw a lone, full-grown man quietly perched at the top of a tree you're more likely to call the police than shout up, 'HOW'S THE VIEW?'.



There are a great many arborists who actually do take a busman's holiday and climb trees at the weekend without taking up a chainsaw and resisting further urges to 'trim' off branches to get a better view but for the most part, recreational tree climbers are from outside the arb industry. We have a number of readers who are from the film-making and scientific communities as well as recreational climbers. Our front Covers on issue 4 and 16 featured expedition tree climbing which could be viewed as the extreme end of recreational climbing, seeking out the tallest and most endangered trees on the planet in the remotest of areas.

When we say 'recreational' tree climbing we don't mean commercial high-ropes courses where a rope and ladders and cableways are slung between trees and you and the kids or maybe just the kids negotiate your way around an arboreal obstacle course. These are great places to play and acclimate to height but the poor old trees probably get a bit pee'd off with all the attention...look at the metalwork in this old girl.....


pic by K Barrowood



We mean actual hand over hand climbing of branches and/or rope ascending/descending. At it's most basic, climbing a tree for fun might be clambering around the branches of an old apple tree in your garden only a few feet off the ground, making a 'gorilla' nest in the forks of a gnarly old oak from which to chill and watch the world go by or scaling the heady heights of a pine or fir to see what the view's like. I remember as a college student free-climbing a giant redwood that sat amidst and above, a wood on a hill and was therefore the highest tree in our entire area even if it wasn't the tallest. It provided a unique and unrivalled view over the adjacent three counties, a view that few, if any, got to see and was the inspiration for a career in climbing. Later that same year, in 1983, the world's first recreational tree climbing school, TCI, was set up in the US by Peter Jenkins. Such schools are a great intro for novices because most tree climbing requires rope skills and equipment that aspires to the levels of a professional arborist. Some will treat it in much the same way as their earliest tree climbing experiences as a kid or as a freeclimbing rock climber, unencumbered by helmet, ropes and harnesses at all.... with all the attendant risks! In the current pandemic with regular regional and national lockdowns, we can expect to see a surge in tree climbing as folk realise that they have a whole new recreational, well-being and fitness training world right in their own back yard or at least a lot closer than the nearest rock climb/mountain or National Park and it comes compete with integral social distancing. For those less sure of simply striking out on their own there are a number of excellent recreational tree-climbing training or 'tree-experience' companies that can get your new hobby underway safely or take you on local trips or even international expeditions.

What all tree climbers have in common, whether recreational or professional, is a need to observe safe practice at all times. Fundamental among these is to wear a helmet though many will shun this as impinging on the natural experience. Next is to identify (and avoid) unsafe trees and branches especially if you're free-climbing. This is where experienced arborists have absolute mastery and recreational amateurs could come a serious cropper until or unless they teach themselves what to look out for. They can mitigate the risks with appropriate safety equipment and we'll take a look at climbing equipment in the next issue. Much of it can be exactly the same as a professional arborist's rig particularly if, to achieve the best view, you need to perform a lot of acro/aerobatics. But it can be a lot, lot simpler and cheaper than professional arborist stuff and two things you definitely won't need is a chainsaw and climbing spikes – it's the same mantra as mountaineering – leave no tracks or in this case, no huge gashes in the bark.

Charlotte Sterland, a professional rock climber and aerialist, has been a recreational tree climber for several years and gives us the what, where, why and how of recreational tree climbing.....


pic by Mihai Neacsu

CLIMBING ALL THINGS

The modern recreational side of climbing trees came after climbing rocks, which for me, came after indoor climbing walls and aerial trapeze. The wonderful side of climbing both rocks and trees is that they are all around, in nature. If you spend a summer getting to know routes on a crag, those routes are going to be there in years to come, not just for the week, you'll be able to revisit and see if you can do what you did again next year. Climbing a tree is a little different because it evolves more quickly, with age as well as from season to season so you can find different ways to climb the same tree year after year. That's if, hopefully, it's still standing in the future.

SAFETY

The amount of climbing you can do increases with your knowledge of and adoption of safety procedures. Once you have overcome the initial desire to climb everything and anything; and learned about the dangers of not knowing how to climb back down, it's easy to see that you really can climb anything if you become more expert in rope-work. Trusting your own rigging points to achieve a climb is both incredibly satisfying and nerve-racking, depending on how you perceive your own skills an the set-up you've decided to use.

Climbing is half skill and half safety-awareness/adoption. If climbers don't respect the frailty of a tree and how it changes in different weather as well as their equipment, it's more than likely that an accident or near-miss of some kind will put them off before long. Checks are really important with safety gear both for new and experienced climbers. As with rock climbing, complacency is the thing most likely to kill you. Don't be distracted when performing difficult moves or setting up critical rigging and attachments.
People will ask, "why go climbing?"

"Because it's there" is the commonly used mountaineering phrase but there are several other elements of climbing that make it so wonderful, not the least of which is 'being with nature' simply sitting on a high perch taking it all in. As already mention on the previous pages, physical exercise, a great view, a different perspective and splendid isolation (not forgetting that it's much safer to climb with a partner!). Tree climbing feels so delightfully childish that it's something we seem to abandon in teen years before returning in later years. We have trees all around us in both urban and rural places, yet getting up into them is not as straight-forward as it seems. It's such an unattainable and ridiculous pursuit for many people that it's only arborists who have enough of an incentive to actually climb up on a regular basis.

TRAINING AND TECHNICALITIES

Watching climbing films makes free climbing seem like the most exhilarating thing to do. This makes it much less attainable to folks on a day to day basis. Of course after a lot of training it could be wonderful to make a glorious ascent with nothing but you and the sun to encourage you, but getting there matters too. Training is so much fun, and it involves a lot of rope, carabiners and safety chain analyses. My favourite quote from a most personally influential climbing instructor is, "Where am I? What am I doing? Am I safe?" Something which would be useful in almost any scenario. I had first expected when learning to climb trees that I'd be able to scale up giant pine trunks, but there are certain trees which are good for climbing; oak trees, beech trees and trees with lots of branches, conveniently placed. Tree climbers set up rope systems to allow the ascent up a rope which is suspended from a branch of a tree, so much of the current tree climbing experience is to be able to ascend into the leafy crown by prussiking up (using small pieces of rope designed to catch if you fall).

Knowing how your equipment works, understanding the system as a whole, from climber, to anchor, back to ground, is just one way I like to look at climbing of any kind. Physical climbing technique is a great bonus on the movement side of things, since many climbing moves are deliberately rehearsed to make certain steps easier and really do occur in nature. It's the framework which route-reading and natural climbing movement hang on.

EXHILARATION OF GAINING HEIGHT

While it is wonderful to be high up, it can also be frightening. Above a certain height there is a natural kind of fear that kicks in and this will be true of novices and even the more experienced if they suffer a near-miss of some kind. Trees are never going to attain the heights involved in big wall and cliff climbing and rarely have the same degree of exposure so it's an altogether more pleasant and engaging environment rather than the often adversarial nature of a difficult rock climb. Some of the most experienced recreational climbers admit that they need to reacclimatise to height when they haven't climbed for a while. This is rarely, if ever, the case with professional arborists but those that climb recreationally in their spare time, should be more wary of complacency. In work systems, arborists climb a fixed rope and often only 'climb' a tree when using climbing spikes. In sport climbing, unless soloing, you are more likely to climb using the branches and a rope controlled by a belayer below. In the current Covid times, this provides great contact with your friend(s) while remaining socially distanced. Where you might get into difficulties on your own, a climbing buddy can help work out routes and figure out problems.

MAKING SURE TREES ARE SAFE

I love climbing trees with no gear, just going up into the branches; I can use the same moves as with rock climbing and it's great to hold onto branches instead of holds, the only issue is that with really tall trees you can't necessarily get to the top very easily, which is where it's good to be able to put up a rope. Where-ever you climb, it's important to make sure the tree is safe, and not going to fail in some structural manner that could be foreseen. Die-back and cracked branches are something to look out for when initially deciding which trees to climb. Not just as something that might fail when you try to climb it but as falling debris from above if knocked off by your rope. Lightning strikes can also cause severe and often unseen hazards though the strike itself is often apparent from a long streak of missing bark on the trunk. Other dangers can include; tree roots, which could be a surprisingly bad trip hazard. Large areas of trunk with no bark can indicate sections of dead wood, which should not be climbed on. Double or triple trunk trees should be checked for weaknesses at the union; these can weaken during storm damage. Existing cracks, broken branch ends, thorns and hangers will all try to snag throw lines and climbing ropes.

Dead branches high in the crown of a tree can mean the tree itself is dying, as do brown leaves or the absence of leaves with the rest of the tree in full leaf. A lack of bark and signs of fungus may also indicate decay that is best avoided. Many perfectly healthy trees can show a range of fungus with no question of structural failure but why take the chance? Decay or rot pockets can exist on the upper side of a branch, unseen from the ground, so it's always best to climb closer to the trunk. Uprooted or leaning trees should ALWAYS be avoided. Dead trees are dangerous to climb; those with branches on the ground, missing bark, discoloured bark, absent buds, fungus growth; the presence of leaves in the middle of winter. Hazardous plants like poison ivy in North America are best avoided and also watch out for extraneous hazards that might startle or injure you – bee/wasp/hornet nests, spiders, nesting birds, snakes, bats etc. most are harmless but stay alert.

WHERE CAN TREES BE CLIMBED?

The best trees could be anywhere, in your garden, in the park or in the woods. Trees in parks can often look great to climb but, officially, permission should be sought from local councils, land owners or forestry agencies before climbing. Winging it could result in you being charged with trespass or criminal damage, so depending on the country/specific area, check if you think climbing is likely *not* allowed. As with rock climbing, it's good to go as a group if you're going somewhere remote, in case of an accident.

In the next issue we'll look at tree species and how easy, difficult or dangerous they are to climb. If we have the space we'll also get onto the equipment used by rec. climbers.

FTC 11.7mm CLIMBING ROPE

ARGIOPE

By **Adam Jones and Ade Scott**

It's always difficult to review a rope and come up with anything different to say that we didn't already say in a previous climbing rope review. We are victims of our own policy here because we virtually always, only review products we already know are good or has been recommended as being good. It would be more interesting to review a rubbish rope and spend a page and a half trashing its performance. We often mention less meritorious products in passing but luckily, our sector, by its very nature, weeds out poor products through injury and death or the threat of it. Bottom line, most life support products are pretty good – some better than others but more often than not a subjective perspective will decide if it suits your particular techniques and hardware better than others. The main exception to this are counterfeit products and those that might start out OK but deteriorate in performance or durability in a shorter period of time than more professional products that are expected to take more abuse and wear than a leisure/amateur product. They might both be extremely well made and well specified but expected usage is different – you wouldn't use your Aston Martin sports car to tow your chipper but that doesn't make it rubbish unless the salesman sold it to you as a really posh tractor. France has been one of the world's leading nylon rope manufacturers since their invention, first with Rivory Joanny, Cousin and Edelweiss and later with Courant and Beal. FTC is new to the game so we've left if for a while before reviewing the Argiope to ensure that any teething problems are ironed out and indeed, while our experiences have been largely good there have been some moans from users. However, we're pretty sure that FTC doesn't actually manufacture rope itself and this one looks like a modified Courant Komora, if so, Courant does have a long rope pedigree and we have had some pretty decent Courant ropes.

We wondered if FTC had accidentally omitted an 'R' in naming their climbing rope but apparently not so we keep having to correct our own spelling of 'ArgiRope'. Could it be named for *Argiope* the genus of spider that includes the Wasp Spider (pic opposite from Adam's garden)? If so, this genius spider has a web so strong and a level of expertise in high angle access and rigging that we and this rope, can only dream of. The Argiope has been specifically designed to be more comparable to a US-style rope with a much thicker sheath than is the norm in Europe. In fact, around two thirds of the rope's mass is the sheath and that is made of Polyester for improved wear resistance. The remaining third is made of nylon (Polyamide in Euro-speak) which is a generally stronger fibre in pure load capacity when it's dry. Having Polyester take the majority of load and abuse with nylon adding strength and flexibility is a fair compromise for arb work. This rope does get noticeably fatter with age as 16-strand Nylon construction often does and subsequently affects how it operates in certain types of hardware over time especially if they have relatively narrow operating parameters.

The ZigZag will accommodate up to 13mm rope so it could probably take an 8 months- pregnant Argiope as could the Akimbo which is also designed for ropes up to 13mm/1/2". You should take any excessive expansion-of your rope with-age as a natural indication that it's time for a new rope?

Argiope uses FTC's SlimTech splice – they all have their own names and designs – remember Teufelberger 'Slaice' in one of our previous reviews – and they mostly purport to be slimmer and stronger and Slim-Tech is no exception. It's slimmer because we can indeed ram it through a ZigZag with a little help from some accessory cord. Not sure about "stronger" though because the splice effectively halves the 3000daN available load capacity to around 1500daN whereas the Drenaline (32 str) is around 1650daN and the Sterling HTP Scion is around 2550daN. Still, this a climbing rope expected to carry only your gigantic-ass and maybe a colleague in the event of a rescue, not a rigging rope that could be subjected to very high loads exacerbated by impact (dynamic) loading. So 1500 daN or 3372 lbf should give you plenty of safety margin unless you have very, very poor climbing/ascending technique. Our splice is the same as in the ZigZag image opposite rather than the much tighter eye shown in the purple version shown opposite. Incidentally, Argiope is one of three climbing ropes used by Petzl in their test of the use of the ZigZag in a rescue situation with a 200kg load (the other being Yale's XTC and Teufelberger's Tachyon) so that, in itself is a good indication of its capabilities when brand new.

Note that some stockist sites and even FTC's own site show certain specification that is slightly different to the official documentation; 69% sheath% instead of 68% and 3000daN instead of 3200daN etc. The figures in our spec box overleaf are straight from the official, certification documentation and double-checked by the manufacturer. Anecdotal accounts from LOLER inspectors suggest that the SlimTech spliced ends hold up very well and show no significant degradation with regular use in the arb environment.

Argiope can be purchased with a splice at BOTH ends costing around €40 more and one of the ends sheathed in black – not sure if that's standard or just an option. It's a good idea to add a differential marking to one of the splices so that you can keep swapping out the anchored end and distribute wear more easily. You can use whipping cord or some approved tape with rope-safe adhesive to mark one of the ends. It is worth noting that the rope data marking system employed by some manufacturers around the splice often compromises the ability of slimline eye terminations to fit through friction devices. The Argiope has the ID Data at the opposite end of their single spliced ropes, but presumably runs into the same problem on a double spliced rope.

There are actually two Argiope diameters, both 16 strand, the yellow/red 'acid' colourway is a 13mm/ 1/2" rope whereas we're using the 1.3mm smaller rope because it more easily feeds into the ZigZag and self tends well, it is also very smooth with the Akimbo and RopeRunner. Even then, it's much easier to tie a carrier string around the sewn eye and feed that through your end-fed device first before dragging the eye through. I don't know why they don't just splice a short length of cord into the eye and have it emanating from the top of the eye for a few inches – I leave a tied loop semi-permanently larks-footed to my eyes.

The 11.7mm Argiope is a relatively light rope at 95g per metre for a diameter that is just under half inch. As a comparison the FTC larger Argiope 13mm Acid is a full 10g/metre heavier at 105g, Edelrid's Woodpecker 11.7mm is 95g , Drenaline 11.8mm is 96.5g, Petzl Flow 11.6mm is 102g and Marlow Vega 11.7mm is 101g. A high strength to weight ratio is something that all manufacturers strive to achieve and until there's a radical new material on the market they're all making variations on

SPECIFICATIONS

MODEL:	ARGIOPE
DIAMETER:	11.7mm /0.46"
ORIGIN:	France
COLOURS:	Blue/white, Purple/Yellow
WEIGHT:	95g/m 6.3 lb/100ft
MATERIAL:	Polyester Sheath, Nylon (polyamide) Core
CONSTRUCTION:	16 strand
SHEATH/CORE %:	68% /32%
ELONGATION:	2.5%
SPLICEABLE:	YES
STANDARDS:	CE EN 1891 Type A
WLL:	3000 daN
LIFESPAN-UNUSED:	10 years
WARRANTY:	3 years
K=1 KNOTABILITY:	1
COST- 50m (inc tax):	£221/$/€287/1x splice
WEB:	www.ftc-tree.com

the same theme – a different weave maybe, differing sheath-to-core ratio, materials drawn from nylon, polyester and maybe one of the Dyneema/aramid thread.

COLOURS

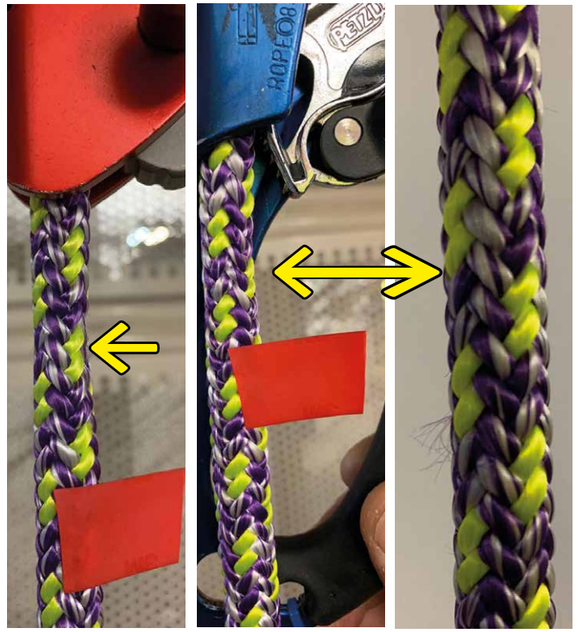
Unlike the bizarrely camouflaged Ivy ropes of old that disappeared into the tree's bark during treework (but were useful for film stunt-rigging), Argiope uses a high contrast colour that's more easily seen in the canopy – Blue and Blue-Berry which really means purple and yellow. The 13mm Acid rope mentioned earlier uses primarily yellow with orange, an even stronger contrasting colour in most trees but not so much in the Fall/Autumn!

IN USE & TESTING

Being a gram or two per metre lighter makes this just that bit easier to haul and to drag round a congested canopy – that might be largely in the mind knowing that it's lauded as a lighter rope but the power of the mind is just as good as if it was actually lighter. Lighter weight normally means less durability, we've had good results after 6 months of work when compared to our other climbing ropes....for the most part. That's based purely on appearance of the sheath and its operating characteristics rather than a destructive test of the strength remaining after 6 months of use, something we intend to do as a separate article using all of our older ropes once Covid has disappeared. The 16 strand sheath is very user friendly, soft on the hands and pliable for knotting and manipulation, but is does have some disadvantages brought on by these very attributes. There's a reason that the toughest ropes on the market are 24 or 32-strand kernmantle. A 16 strand arb rope wouldn't last very long on a mountain or a concrete structure. Luckily, despite appearances, tree-work is extremely forgiving when it comes to abrasion so the softer double braids and 16- strands dominate the arb market because they're simply much nicer to handle and work with. This particular 16-strand's sheath tends to snag relatively easily on the rougher barks and thorny species, resulting in loops pulling out and requiring manipulation to work back into place. Consequently, we are left wondering if this almost luxurious refinement in texture might be the rope's undoing? Quite literally! Check the tests opposite. We're currently also using a Czech rope with similar construction and that's even softer than Argiope with an even greater tendency to snag and 'pull-a-thread'. These types of rope certainly require you to use it with more care and attention than you might otherwise and may even cause you to choose a different rope for the harsher tree species. Another consequence of much softer rope is that it knots really well but can be much harder to untie after heavy loading and Argiope is no exception. However, with a spliced eye/eyes, tying a knot is not often required. Where it does crop up, it will only be carrying your body weight and because your ascending and descending techniques are so smooth (so we heard) knots won't become overloaded and cinch up so tight they need a marlin-spike to untie.

Excessive long-strand furring is often an indication of a fibre that's not coping so well with a particular device but that might be more the fault of an aggressive cam action than a poor rope. Nevertheless, we can make comparison between different ropes in the same device and in the case of the ZigZag and Akimbo the FTC rope fares at least as well as our other main climbing ropes, better than the old Marlow Aeris (but not their Vega) and slightly more pronounced furring than with the DrenaLine and Edelrid's Woodpecker. Argiope does seem to get 'fatter' quite early on. The ZigZag doesn't really care but future miniaturisation of SRT devices might be an issue. The thicker sheath of Argiope tends to negate bunching where a thinner sheath slides more readily over the much thicker core when compressed by a cam and concertina's up. To be fair to other manufacturers, most modern ropes have resolved this issue but there are still some around that don't take so kindly to SRT devices and are better suited to more traditional climbing systems or rigging. With a splice at each end there is definitely no chance whatsoever of milking the sheath off the end where it stretches and extends beyond the core like a sloughed snake-skin. Having said this, the length that we have on review has a splice at only one end so if sheath creep is a thing, we have not yet observed it. Of course, if there is a tendency to milk, this can actually be counterproductive with a double splice because it only stops the sheath milking off the end, it doesn't stop it milking and bunching up ahead of the tail splice and we have in the past, found that a concertinaed sheath can result in severing if a camming device hits it at speed.

To double check the sheath's resistance to snagging our informal ascender tests on the Argiope (pics opposite) used a toothed cam (Petzl ascender) and a smooth profile cam (ISC RP209) with an 80kg/176 lb load dropped in a factor 1 fall. The red tape marks the ultimate arrest position after impact and the device has been moved back up to view the 'damage'. This was an unused end-section of the review rope so it was effectively brand new. We were a little surprised that the toothed cam actually caused less physical damage than the rope grab. Having previously mentioned that our operational use had caused a number of snags and pulls, the drop tests didn't really cause a problem. This will be because the loading is so regular. When ascending for work no two 'grabs' are the same, the cam and even the angle-of-attack can change, the load changes and the speed changes. The rope section we've shown was the worst damaged of four toothed-cam tests and it shows just a few small fibre breaks. Initial compression by the cam puffed back out to a normal diameter with some massaging. The Grab caused more obvious compression (arrowed) on each drop that stayed visible for longer than the broader cam-contact area of the toothed ascender but again



no snags or pulls. We know that the rope does fur over time and does end up with loops and cut threads here and there but nothing that we don't see on any of the softer ropes. Now, if we were to compare this with our stiffer but much tougher 32 strand kernmantle ropes it would be a different story because, while they will exhibit short-strand furring with protracted use, they rarely show pulled loops and threads like these softer ropes but that's the price you pay for much nicer handling.

CONCLUSIONS

Argiope initially came in at the top end of the pricing scale, a rope akin to a Courant but priced as a high-end Teufelberger or Sterling and therefore a bold entry into a competitive market which is awash with established, popular ropes. Recently the retail cost has been reduced by some retailers in the UK and Europe in an effort to place the rope within budget of a larger group of customers. It remains to be seen if this new price-point is sustainable for FTC. The cost may not have been the only factor working against this rope's success if the susceptibility for snagging and pulling loops is an issue with the kit you're using. Either way, the cost (pre-discount), means that you're unlikely to choose the Argiope over a number of other proven performers unless you are faced with a limited range at your local store or it is discounted to make it more attractive. The majority of users will be happy with Argiope but some may need to look after it more than would be the case with one of the tougher/stiffer and more established ropes. Having raised these points with FTC, it must be said that they were pleasantly receptive to comment and were already aware of some issues raised by user/stockist feedback and changes may be afoot. We're always much happier when a company chooses to act upon feedback and improve a product than simply forge ahead unabashed. It leads to confidence in their products.

ARBCLIMBER STOCKISTS

NEW ARBCLIMBER STOCKISTS

We're very pleased to have another two new stockists; one in Oregon and one in Ireland. Both are Arborist suppliers but will also have TECHNICAL RESCUE & WSAR as well as ARBCLIMBER.

ARBORIST STORE USA

Central Point, OR, USA arboristore.com

DONEGANS IRELAND

Tanderagee, Bailieborough, Co Cavan Ireland. www.donegan.ie

Our stockist GAP ARBORIST SUPPLY in Pennsylvania has moved down the road from Gap to Kinzers:
3535 Lincoln Highway East, Kinzers, PA 17535.
Not sure if that requires a name change to Kinzers Arborist Supply?

US & CANADA

ARBORIST STORE
Central Point OR. **USA**
https://arboristore.com

ARBORTEC
Remmington VA. **USA**
www.arbortechonline.com

GAP ARBORIST SUPPLY
Kinzers, PA. **USA**
www.gaparboristsupply.com

MOUNTAINTEK
Hendersonville, NC. **USA**
www.mountaintek.com

WESSPUR
Bellingham WA. **USA**
www.wesspur.com

ARBORIST SUPPLY CO
Calgary, Aberta. **CANADA**
www.arboristsupplyco.ca

UNIVERSAL FIELD SUPPLIES
Mississauga, ON &
Port Coquitlam, BC. **CANADA**
www.universalfieldsupplies.com

EUROPE

ARBORIST SHOP
Liepāja. **LATVIA**
www.arboristshop.lv

CLIMBTOOLS/ BENK
Mülheim an der Ruhr. **GERMANY**
www.climbtools.de

CONDOR SAFETY
Menen. **BELGIUM**
www.condorsafety.be

FREEWORKER
Gilching. **GERMANY**
www.freeworker.de

GUSTHARTS
Blagdon, Tyne&Wear. **UK**
www.gustharts.com

HONEY BROTHERS
Guildford, Surrey. **UK**
www.honeybros.com

K2 ProfShop
Aertselaar. **BELGIUM**
www.k2profshop.be

NORTHERN ARB SUPPLIES
Sheffield, Yorkshire. **UK**
www.northernarbsupplies.co.uk

SEILTECHNIK
Hannover. **GERMANY**
www.seiltechnik-hannover.de

SKYLAND
Liverpool. **UK**
www.skylandequipment.com

SKYMAN
Kunštát. **CZECH REPUBLIC**
www.skyman.cz

SORBUS INTERNATIONAL
Frome, Somerset. **UK**
www.sorbus-intl.co.uk

TREEKIT
Bournemouth, Dorset. **UK**
www.treekit.com

PACIFIC

MORIKAWA PRO
Macau
www.morikawapro.com

ODSK
Nagano-Ken. **JAPAN**
www.works-odsk.jp

TREETOOLS
Auckland. **NEW ZEALAND**
www.treetools.co.nz

TCM
Melrose Park, SA. **AUSTRALIA**
www.treecaremach.com.au

ECHO BATTERY TOP HANDLE CHAINSAW DCS-2500T

By **Adam Jones**

[ED: It's taken a while, but our love affair with pro battery power that began in the 90s with modified motorcycle batteries and HT leads has not only come to fruition in the past several years, we're now seeing virtually EVERY product moving towards battery power for outdoor products. It's taken this long to come up with batteries that can provide the necessary power and duration for professionals and once the industry stalwarts Stihl and Husqvarna introduced battery-power to their professional ranges, the flood gates opened. We'll continue to see battery power and design improve and miniaturize but there will be a time lag between new battery developments and adoption by pro tools simply because so much time, effort and money has been spent on the current batteries and how they fit the tools. Customers too will want to know that the battery tool ranges they invest in now will be serviced throughout their working life and not simply discarded when the next new innovation arrives. That is why you don't see huge differences in the Stihl and Husky ranges which have now been around for almost a decade (if you include the design process) and why this new Echo uses existing Li-ion battery format albeit only the smaller 2Ah battery because they chose to give the battery a protective housing meaning the larger 3Ah battery won't fit. This is a similar battery housing to the Greenworks 110 but that's where similarities end!

Advantages remain the same for all battery saws

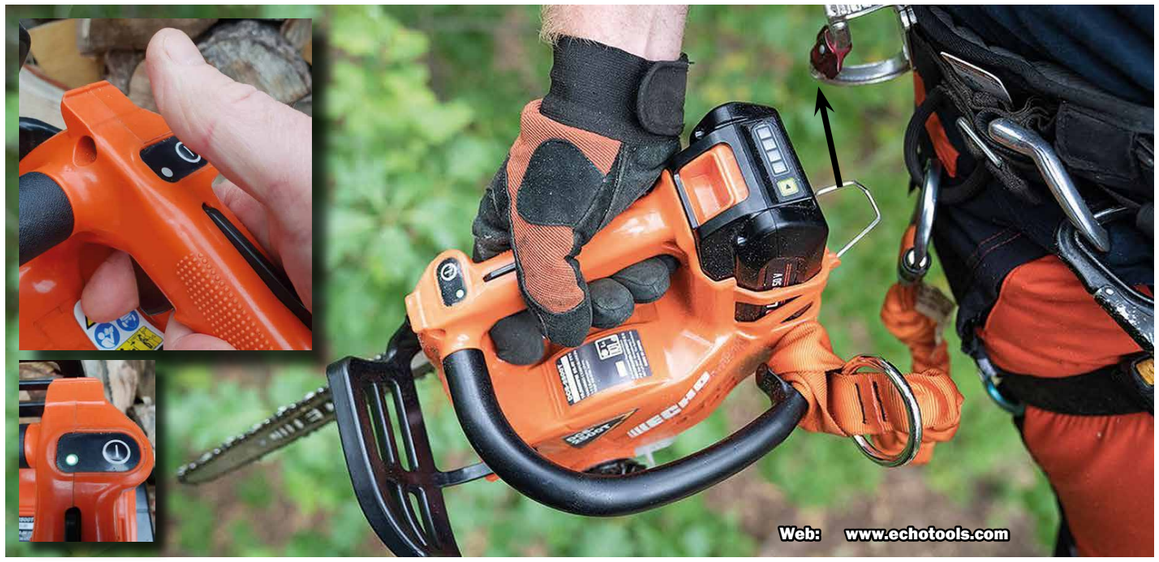
- *No exhaust fumes, good for your face, good for the environment.*
- *No liquid fuel and no sending the saw to ground for refueling. Extra batteries can be carried and hot-swapped in the canopy – Echo and the other orange brands also have backpack options for ultra-longevity but this does throw out the small and light argument except that the saw itself remains light. Of course, battery saws aren't necessarily much lighter than their liquid fuel counterparts because on-board batteries are pretty heavy and they don't get lighter as they run down!*
- *QUIET – in fact silent when you're not actively cutting allowing earlier and later working in urban areas, easier and safer communications and an all-round pleasanter working environment – you might even see more wildlife].*

The world we live in is changing, slowly we are awaking to the need to address issues of conservation and taking up more ecologically good practice, and as in all sectors, the arboricultural industry is evolving too.

The introduction of battery powered tools really took off with the development of Lithium Ion battery technology, giving better productivity and less down time. An important factor when you consider the cost of investing in battery kit. The need for high power output in our industry meant that there was some lag in the arrival of effective arb saws but now, nearly all power tools found on a tree work site have an electric option, from saws to blowers, brushcutters to hedgetrimmers and area lighting. We've even seen a battery powered chipper (see this issue's PRODUCTS and check out the power-source comparison chart) which shows how battery-to-power output has improved providing more 'grunt' than was previously possible; a greater ability to power through some serious resistance without stalling.

Echo currently has 12 battery tools in their tree and grounds care range which include leaf blowers, hedge trimmers, strimmers and most importantly (to us); chainsaws. Specifically of interest here is the top handled climbing saw, the DCS-2500T. Echo have some really positive history in top-handle saws with the 2511TES having gained a lot of respect in an industry of hard-to-please and sometimes, set-in-their-way operators. Although a petrol saw, the 2511TES' size and power have gained it many fans and cemented its place in many companies' armouries.

Echo's position in todays' environmentally conscious marketplace started with their battery back-handle models but to keep up with the other two key orange brands, Echo needed to get with the ecological program and come up a battery top-handle that was worthy of their reputation for petrol/gas top-handle saws. The 2500T benefited from being able to look at feedback from Husqvarna and Stihl's market-leading battery saws. Echo were unlikely to be able to beat them at



their own game but they could mimic the success of the TES and its predecessors by having a smaller, lighter saw that was noticeably more manoeuvrable in the hand. They certainly achieved this because your first impression is that you are living the old-timers' battle cry – '*that's a freakin' toy*' and have actually picked up a toy. The clean, shiny plastic body has little substance to it and weighs nothing in the hand (1.6kg). Once the battery and bar are fitted and oil chamber filled the true working weight is around 3.1kg/7lb.

The 2500T is one of only a handful of top handled battery powered electric chainsaws designed specifically for use by climbing arborists in aerial operations. It is compact and very well balanced. There are options for bar length. We elected for the 25cm/10" option, and also stayed with the supplied Echo bar with solid rather than sprocket nose which is an option. Apart from the chain, I tend to stick with the tool's own branded components but Panther, Tsumura or Sugihara bars are all good alternatives. The length suggested is 25cm/10" but some may extend this, presumably for better reach rather than diameter of cut but if you're cutting larger material you're wandering into a requirement for more grunt than this size saw provides and I would suggest a larger saw instead. Think of this as a scalpel rather than bone-saw with the narrower nose of the solid-bar allowing for more precise placement in tight angled branch unions and the finer chain giving a razor-like cut while sharp.

SPECIFICATIONS (Orange-brand Comparisons)

	ECHO	STIHL	'HUSKY'
MODEL:	DCS-2500T	MSA161T	T535iXP
WEIGHT-body only:	1.6kg /3.25-3.5lb	2.1kg	2.4kg/5.3lb
BATTERY WT:	1kg / 2.2lb	0.9kg/2lb	1.3kg/2.9lb
BATTERIES Ah:	Lithium Ion – 2	Li-ion-2.4,4.8,6,7.8	Li-ion – 2.6,5.2,9.4
VOLTAGE:	50.4v	36v	36v
RUN TIME:	<20 mins (2Ah)	<18mins (2.4Ah)	<65mins (2.6Ah)
BAR LENGTHS:	20,25cm/8, 10"	25,30cm/10,12"	25,30,35cm/10,12,14"
OIL CAPACITY:	0.12 L	0.1 L	0.21 L
APPROX COST :	*£281/$439/€426	*£564/$630/€620	*£570/$700/€700

* body/2 Ah battery/charger, * body/2.4 Ah battery/charger, * body/2.6 Ah battery/charger

The general configuration of the saw is consistent with the new norms: chain brake, dead-mans' trigger and handle all very familiar. Unlike the title image, which is a manufacturers studio-shot, the top handle is anti-slip and has a convoluted finish (lots of raised dots) for added grip. The low-profile power switch is located on top beneath a rubberised covering. This allows easy operation with the thumb. Beyond the switch, the handle forms a patented thumb rest (the little 'horn' in front of the screw hole). This offers user-comfort and allows for a little downward pressure to be applied when required. It also gives your thumb somewhere to live during work that isn't hovering on or around the button with the attendant risk of accidentally pressing it when you don't want to. For activation, your thumb presses on the raised membrane switch until you get the green LED illuminated, if the chain-brake is applied this LED will flash.

Once the power is on, you have about 90 seconds to depress the trigger or the power button will need to be reset. The power can be proportionally varied with the trigger, allowing for good control which is important if you are involved in delicate pruning. Repeated flicking of the trigger when the power is on will eventually result in the cessation of operation, and the LED starting to flash a warning. This safety measure ensures that repeated partial trigger compression has to be checked, this clearly eliminates the risk of inadvertent operation, perhaps while holding the saw and relocating? The chain-brake has a very positive action; it's close proximity to the front of the side handle results in rapid and effective actuation. One area of slight concern was the lack of an inertia brake given that the diagonal handle naturally draws your hand away from the activation zone of the mechanical chain brake. We couldn't get that to activate in a simulated kick-back any time our hands

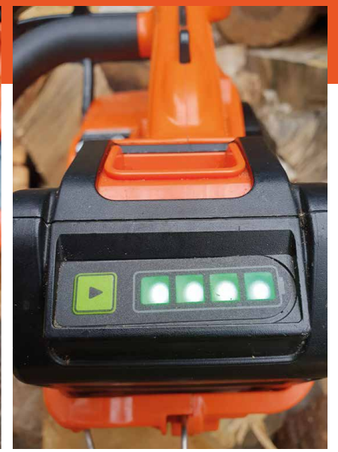
strayed too far from the trigger handle. Clearly this is a short bar so it doesn't represent a great risk but is still something to bear in mind.

The diagonally sloping side-handle follows the same pattern as the petrol Echo 2511TES, sloping back from the front to the rear. As we said when we first looked at the 2511, this thoughtful consideration in the design provides an incredibly good and versatile positioning option for two handed use.

The rear end does appear bulky, this is where the battery is housed, slotted in from above and locked into place with a positive retaining mechanism so there is no chance of it dropping out. Access to the bar and chain is as expected, via a removable side plate, the 13mm retaining nut is captive so time lost searching through a pile of sawdust is not a worry. Chain tensioning is also managed here and below the cover is a rolling chain-catcher. As with all chainsaws, the need for lubricant oil to the bar is unavoidable (use biodegradable options), easy access to the oil flow adjustment is found on top and the oil tank has a tool-less cap and a capacity for 0.12ltrs/4.05fl oz(US), plenty for one or two battery charge cycles but important to check.

Operation is begun following your standard pre-use checks: chain tension and condition, battery charge (4x on-board LEDS show green for degrees of charge) , oil level and general component security. Power is derived from an energy efficient, brushless motor which is supplied by a 2Ah, 50.4v Lithium-ion battery (£175/$190). The run time is quoted as up to 20minutes, which puts it well behind maximum potential running times of Stihl or Husqvarna's larger battery options. Having said this, it would be prudent to have two or more batteries anyway and with 80% capacity being attained after only 24minutes on charge (42minutes to full charge) your down time will be limited (fast charger £125/$110). Unlike Echo's other tools this saw cannot be upgraded to Echo's 4Ah battery because it's twice the height of the 2Ah battery and doesn't fit in the housing. This is at odds with the marketing blurb and arguably a limiting factor, especially when market contenders offer a variety of amp hour battery options in the same sized units. Even with this as an option the increase in runtime between Stihl's AP200 and AP300 batteries is only around 8 minutes! We can't yet comment on battery performance in ultra-low temperatures – this is when battery life can be curtailed. While that's the same for any saw, this one starts with a lesser run time so it's probably best as a temperate climate saw, more suited to springtime in Paris or Charlotte than mid-winter in Narvik or Winnipeg. Converting this potential energy into meaningful work output effectively is key, and the work environment for any chainsaw is likely to be harsh and unforgiving even in reasonable temperatures. The IPX4 rating means this is rain-proof with the battery fully engaged to protect the contacts but don't submerge it. Dust ingress to the inner reaches is abated by fine filters, which allow enough airflow for cooling while maintaining adequate protection. The baked on dirt that you get so accustomed to on the petrol saws is obviously not an issue for an electric saw, but the sprocket area behind the side cover will need regular attention as the tacky quality of chain oil and mechanics of use will soon choke this space with debris.

We have already covered the handles but not mentioned the nifty connection points for attaching to your lanyard and tool clip, there are two and how you use them will be down to the individual. I would bet that, like us, some will read this having already attached your tool strop to the wire clip on the rear of the saw? It seems obvious and is in line with a lot of the other top handle saws that you may also use. In the case of the 2500T, The wire is for hooking the saw directly to your harness hook. You you should be attaching your tool strop to the rear of the side handle, there is a lanyard hook here (pic right) which will prevent the connection from migrating the length of the handle. Take a look at the main picture on the previous page. The rear wire attachment is called the Quick Draw Harness Ring. Although not very ring shaped, the profile is such that,with a little practice, you can easily clip it onto a tool clip (unless it is one with a manual locking mechanism?), and then with a slight rotation you can cam the wire onto the gate and open to release while only holding the saw. Quite clever eh?



Using the saw is a pleasure, if it was acceptable to mention one-handed use, we would say that this saw is the ultimate exponent of Zorro-like wrist actions, that's how light and manoeuvrable it is. But it's not so we'll move on to the nearly zero vibration and noise limited to a low whine so you are immediately in a better, more chilled work-place.

These attributes come with some compromises in power and limited scope of work. We must not forget that this saw is designed for smaller diameter pruning cuts, whether that be in the form of reduction and shaping work or removal of deadwood. The serviceable battery charge will vary in relation to the work being carried out. As a comparison we used the saw following a full charging cycle of over an hour on the charger, firstly to re-pollard some lime/lindens, the regrowth was around 3 years and no single cut exceeded 24mm/1", the task was completed easily and we still had power to spare. After a similar charging cycle we attempted to reduce a cypress hedge, this involved multiple cuts of between 50mm/2" and 100mm/4", the battery drained well before the end of the task. Both jobs were small and using a conventional petrol saw (eg. 2511TES or MS150) would have been less than a tanks' worth of gas. The ¼" chain gives far better cutting efficiency that the early electric saws which were issued with ⅜" as standard, ¼" can now be considered an industry norm for all of the smaller top handled saws. This is an obvious point to raise but a clear indication that there is a direct relationship between longevity of battery life and the workload. You cannot force cuts with battery-power in the way you can with petrol saws, that will draw power exponentially. With a second and even a third battery on your harness (in a first-aid style pouch perhaps) and a charger on site, longevity is not a concern, it's just a case of altering your work practice and even cutting technique slightly. Limiting the battery to the 2Ah option is a negative even if you carry extras and this has been cited by some stockists as a reason NOT to stock this particular saw but we feel this belies its true value as a work tool since the 2Ah battery of other models have comparable run times. The difference is they also offer higher Ah options. If Echo can get a higher Ah battery with the same size profile as the 2Ah these concerns will be answered.

We can't say that Echo has bested Stihl and Husqvarna in terms of performance but they have again taken 'small and light' to a new level. Chain speeds for all three of the smallest models are comparable - this Echo is around 18m/s, the Husky is 20m/s and the Stihl 19m/s. Noise levels too are within a few decibels of each other with the Echo being 89/101dB. That's only about 10% quieter than the petrol 2511TES during cutting but battery is silent on 'idle'. It's a tool of choice for smaller projects and finer work, for fruit tree pruning, for carvers and for indoor use in botanical park greenhouses etc. This saw is far tougher than initial impressions would imply and having so far had no problems at all that aren't battery run-time related, we are suitably impressed. As with all battery saws, make sure you keep that chain sharp.

STRATO® HI-VIZ

Head protection is more than just a helmet.

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The STRATO HI-VIZ helmet is very lightweight and comfortable, thanks to its CENTERFIT and FLIP&FIT systems. Integrable with Petzl vision protection, hearing protection and multiple accessories, it is an entirely modular helmet. The high visibility version features a fluorescent outer shell with phosphorescent clips and reflective bands, for optimal visibility of the wearer, in a tree or on the ground. Personalized versions available on demand. www.petzl.com

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