TECHNICAL RESCUE

USAR/EXTRICATION•CON-SPACE•ROPE & WATER RESCUE•EMS•TACTICAL

ISSUE 86
www.rescuemagazines.com

A technical rescue solution including the new XENA® headlamp, FALCON harness, MAESTRO® Descender with integrated progress capture pulley and STRATO® VENT helmet. petzl.com

PETZL RESCUE SOLUTIONS

Whether day or night, on a rock face, or at the bottom of a cave, rescuers don't stop.

When facing these critical situations rescue workers know that powerful and robust lighting and high performance gear are an absolute necessity. Petzl brings its expertise with products that are completely adapted to the demands of your work.

PETZL®

Access the inaccessible®

TECHNICAL RESCUE issue 86

CONTENTS

FRONT COVER:
Holmatro's Omnishore system can perform all structural shoring tasks safely with just 6 interlocking struts and a bundle of head and foot accessories. See page 40 for the Guide to Shoring Struts

ISSN: 1351-136X
EDITOR: Ade Scott
admin@rescuemagazines.com
RESEARCHERS:
Charlotte Ina-Sterland
Adam Jones, Gary Cross
Brian Robinson

CONTRIBUTING EDITORS:
Rope Rescue: Reed Thorne (USA
Extrication: Rich Denham (UK)
SAR/Tactical: Roland Curll (Australia)

CONSULTANTS/CONTRIBUTORS:
USAR/Extrication-UK: Nick Appleton
Rope/USAR-Canada: Greg Churchman
SWR-USA: Dr Mike Croslin, Mitch Sasser
Coastguard-UK: Rich Hackwell
Trauma/Tactical-UK: James Hutchens
USAR/Rope-UK: Adam Jones
Trauma/Heli-Oz: Cameron Edgar
Dive/Police-USA: Mark Phillips
Con-Space-UK: Brian Robinson
Boat Ops-UK: Chris Walker
SAR/Heli-RSA: Rob Thomas

EMAIL: **admin@rescuemagazines.com**
[Note the 's' in 'magazines' for the above]
#86CONTRIBUTORS/& ASSISTANCE:
Nick Appleton • Rich Denham
Dr Steve Glassey • Charlotte Ina-Sterland
Adam Jones • Reed Thorne

PHOTOGRAPHY this issue:
Nick Appleton • Rich Denham
Steve Glassey • Adam Jones
Richard Paice • Reed Thorne

SUBSCRIPTIONS
3 PRINT issues including postage
UK/Ireland/USA mainland/Canada **$20**
Worldwide **$25 + $5 postage**
6 PRINT issues including postage
UK/Ireland/USA mainland/Canada **$40**
Worldwide **$40 +$10 postage**
DIGITAL/pdf versions are normally $6 for 3 issues and $10 for 6 issues **but currently being provided FREE until further notice.**
NB Hawaii & Alaska = Worldwide mail rates

ADVERTISING: Kelly Matthews
rescuemagazine@aol.com
WEBSITE: **www.rescuemagazines.com**

OmniShore

Safety secured.

OVERCOME UNLIMITED SHORING CHALLENGES WITH A MINIMUM NUMBER OF COMPONENTS

OmniShore is the world's first and only shoring solution that allows you to build any application with a system of only six different struts. Construct any length up to 17 feet or 5.2 meters with five different struts and without fixed length extension pipes, saving weight and space on your truck.

EXPERIENCE A QUICK AND EASY SETUP IN ONE INTUITIVE WORKFLOW

Our patented Trident Coupler always fits with ease.
You can only connect two struts max, so any connection you can make is 100% safe and offers you twice the plunger stroke.
Moreover, every singleaccessory fits the Trident Coupler as well as the plunger end of each strut.

PATENTED

TWO CONNECTED STRUTS = TWICE THE PLUNGER STROKE.

Exact measurement is not needed

Two connected struts offer twice the plunger stroke, eliminating the need for precise measurement and allowing fast setup during demanding, time sensitive situations.

EXCEPTIONAL SHORING POWER. READY TO SECURE SAFETY.

Perform all shoring operations with one system, build constructions quickly and easily and take control of every scenario with less people. This is OmniShore.

OMNISHORE CAN DO IT ALL

Vehicle shoring

Flawlessly execute vehicle extrication operations, whether you need controlled vehicle stabilization or lifting.

Trench shoring

Create multiple safe zones in shallow or deep trenches in a revolutionary way, so you can shore walls to prevent collapse and cave-ins.

High directionals

Everything you need to build high directionals to take on even the most challenging rope rescue scenarios.

Structural shoring

The most innovative, fast and safe way to support a structure with rakers, spot shores and more to prevent a collapse.

First responders need shoring equipment that is as intuitive, versatile and smart as they are. That is why we have developed OmniShore, a shoring system reimagined from the ground up and designed in accordance with unparalleled standards of quality and safety.

Patented innovations such as the Trident Coupler and OmniLock system allow you to build unlimited applications with less parts, experience a seamless setup with less handling and take full control with less manpower.

Learn more at holmatro.com/omnishore

holmatro
mastering power

NEWish ROPES by PETZL

[ED: These three new came out after we had compiled the previous Product Info in issue 85 We did add the details to our **ROPE EQUIPMENT BUYERS GUIDE** *(low stretch Ropes) but here's the full set of info from Petzl]*

SPECIFICATIONS	BEAM	VECTOR	DURALINE
INTENDED ROLE	ACCESS/RESCUE/TAC	RESCUE	TAC/IND/RESCUE
DIAMETER	11.3mm	12.7mm	10.5mm
MATERIAL Sheath Core	Polyester Nylon	Polyester Nylon	Aramid Nylon
CONSTRUCTION	32 carrier	32 carrier	32 carrier
CERTIFICATION	CE EN 1891 type A, NFPA G, CI 1801 Low Stretch, XF 494	CE EN 1891 type A, NFPA G, CI 1801 Low Stretch, XF 494	CE EN 1891 type A, NFPA T, UKCA, XF 494: FZL-S-Q10.5
WEIGHT /m lb/100'	90g 6 lb/100ft	113g 7.6 lb/100ft	75g 5 lb/100ft
MBS	40kN	45kN	29.5kN
MBS with fig 8	20kN	25kN	18kN
MBS Sewn Termination	-	34kN	-
IMPACT FORCE (Factor 0.3)	5.9kN	5.4kN	6kN
NUMBER FACTOR 1 FALLS	>20	>20	>5
SHEATH %	36%	45%	40%
STATIC ELONGATION	2.5%	2.4%	2.3%

BEAM

High-strength, low stretch kernmantle rope with good handling for rescue. The *BEAM* 11 mm rope is designed for rescue professionals. Its diameter provides a solid grip and great strength. The specific rope construction limits compression and low elongation provides superior efficiency and comfort when handling heavy loads. *EverFlex* technology makes the rope highly flexible, providing excellent handling over time under a variety of conditions. The rope is available in four colours and four lengths. Standard diameter provides a solid grip and great strength when handling heavy loads
Consistent performance over time:
- Specific construction (nylon core and polyester sheath) with a weave that limits rope compression under heavy loads

- *EverFlex* technology provides great flexibility over time and under a variety of conditions (water, dust, mud), maintaining excellent handling and optimal performance with devices
- Low elongation provides superior efficiency and comfort when handling heavy loads
- Available in four colours for easier identification of different kits (white, yellow, blue and red)
- Std lengths: 60m/200', 90m/300', 180m/600', 365m/1200'

VECTOR

High-strength, low stretch kernmantle rope with excellent handling for rescue. The *VECTOR* 12.5 mm rope is designed for rescue professionals. Its large diameter provides a solid grip and great strength. The specific rope construction limits compression and low elongation provides superior efficiency and comfort when handling heavy loads. *EverFlex* technology makes the rope highly flexible, providing excellent handling over time under a variety of conditions. The rope is available in six colours and four lengths.

- The rope's large diameter provides great strength and excellent grip when handling heavy loads
- Consistent performance over time:
- Specific construction (nylon core/polyester sheath) with a weave that limits rope compression under heavy loads

- *EverFlex* technology provides great flexibility over time and under a variety of conditions (water, dust, mud), maintaining excellent handling and optimal performance with devices
- Low elongation provides superior efficiency and comfort when handling heavy loads
- Optimal precision when progressing on rope
- Available in six colours for easier identification of different kits (white, yellow, black, blue, red and orange)
- Standard lengths: 50, 100, 200, and 500 meters
- Custom rope length up to 500 meters on request
- Option to add one or two sewn terminations to rope ends
- Individual packaging in cardboard box or red BUCKET bag

DURALINE

Low stretch kernmantle rope offering better resistance and durability for work at height, rope access, and rescue:

- Sheath is made entirely from aramid fiber, providing excellent resistance to abrasion, wear, sharp edges, and heat
- Twice as resistant to abrasion than the *AXIS* 11 mm rope
- Two to three times more resistant to sharp edges than the AXIS 11 mm rope
- The rope can tolerate short exposure to a heat source, such as a hot pipe (1)
- Can tolerate accidental exposure to a flame (2)
- Easy to handle:
- Better control when lowering heavy loads
- Ideal for lowering repeatedly or at a consistent speed
- Markings at the end of the rope on a laser-marked rigid identification label, for better tracking and lasts longer
- Customizable length and packaging:
- Rope of a specified length can be ordered in one-meter increments, from 2 to 500 meters
- Individual packaging, in cardboard or black BUCKET bag

(1) Maximum 5 minutes at 200° C.
(2) Maximum of 3 seconds at 650° C.

Note: Details about tests carried out and results are available at Petzl.com

NEW WEBER SPREADER

Weber-Rescue has introduced a new rescue spreader, the *SP 60*. The Weber range is unusual in being able to swap the head between hose-fed and battery but the three base variants of the *SP60B* are - Hose-bound attaching to your hydraulic pump, *E-force* battery using a *Milwaukee* 28v battery and optional waterproof battery cover or the *Smart-Force* version using an 18v battery and on-board electronic button controls in a little dashboard and wifi connectivity for tool and battery management. The two battery models have on-board LED lighting and the Smart and Hose-fed versions can be used underwater (with the battery cover in place). The tool can then be used up to 3m deep for 60 minutes.

The Smart-Force version has an on-board dash that shows LED illumination for Training mode, Theft Mode (Tool-lock) Service and maintenance and maximum pressure reached.

The *SP 60 BS* is not just another spreader; it is the result of intensive development work, practical testing and feedback from emergency services worldwide. A powerful spreader for challenging technical rescue scenarios involving cars, trucks, rail vehicles or aircraft

The most important performance details at a glance:

- large spreading range and high spreading force for the most challenging operations
- tips with interior and exterior spikes for extra grip
- captive bolts on the spreader tips
- peripheral grip for simpler handling and holding Spreading width: 820 mm
- Spreading force: 60–638 kN
- Weight: 24.7 kg (ready for use with SMART-FORCE battery)
- This makes the *SP 60 BS* one of the most powerful and versatile tools in its class.

See our **USAR BUYERSGUIDE** for details of the full *Weber-Rescue* tool range.

SPECIFICATIONS	HOSE	E-FORCE3	SMART-FORCE
POWER SOURCE	Hydraulic Pump	28v M28 Battery	18v M18 Battery
NOMINAL PRESSURE		700BAR / 10.1K psi	
SPREAD FORCE		60-638kN 13488-143428 lbf	
SPREAD WIDTH		820mm / 32.2"	
PULL FORCE		74kN / 16635 lbf	
PULL WIDTH		702mm / 27.6"	
MAX SQUEEZE FORCE		114kN / 25628 lbf	
DETACHABLE TIPS	YES	YES	YES
LED LIGHTS	NO	YES	YES
BLUETOOTH APP	NO	NO	YES
EN CLASS	BS60/820-19.8	BS60/820-23.7	BS60/820-24.7
WEIGHT (operational)	19.8kg / 43.6lb	23.7kg / 52.1lb	24.7kg / 54.3lb
DIMENSIONS	879 x 307 x 210mm 34.6 x 12.1 x 8.3"	1040 x 307 x 241mm 41 x 12.1 x 9.5"	1080 x 307 x 228mm 42.5 x 12.1 x 9"
WEBSITE		www.weber-rescue.com	

Obelisk

for Technical Rescue teams

Designed and manufactured by Lyon Equipment specifically for emergency service work. Adjustable width cross-head with max height of 2200mm for a large, clear working area below the anchor points.

LYON®
WORK & RESCUE

Lyon Equipment Limited Tel: **+44 (0) 15396 24040** Email: **info@lyon.co.uk** Web: **www.lyon.co.uk**

HANDHELD SCOUT Pro II & III thermal imaging from FLIR

FLIR, a *Teledyne Technologies* company has introduced its *Scout Pro II* and *III* thermal monoculars: the latest Scout Pro models designed to help law enforcement and public safety professionals quickly survey vast urban or rural areas without losing focus on observed people or objects. Replacing the existing *Scout II/III, LS* and *Scion* series, the next-generation Scout Pro II and III simplify tasks that include surveillance, search and rescue, evidence gathering, and active pursuit and intervention. Exceptional situational awareness, wide coverage, and long detection ranges combine to provide the vital intelligence required to patrol areas safely or locate missing or injured people quickly. Developed in partnership with industry professionals, *FLIR's Scout Pro II* and *III* are built on a trio of key design principles: streamlined interaction, mission-critical reliability, and efficient human detection.

DIFFERENT BY DESIGN

Streamlined interaction allows users to focus time and attention on law enforcement and public safety, rather than buttons and controls. Key here is the simplified, intuitive, and efficient live image interface for continuous focus on observed objects and areas. The flat menu of *Scout Pro II/III* with toggle function provides efficient zoom, mode selection, and brightness adjustment. This monocular' s robust, compact design is drop-rated to 2 meters (6.7 feet) and has the waterproof IP67 rating needed to withstand harsh operational environments and deliver mission-critical reliability. *FLIR*'s robust design is built around a rugged cast metal body, rubber front and rubber keypad. Support comes from six-hour battery life with USB Type-C connector and power bank charging options..

FLIR Scout Pro series thermal monoculars feature image optimisation for highly efficient human and anomaly detection, thanks largely to *FLIR*'s Digital Detail Enhancement (DDE) and additional proprietary image-enhancing technologies. Like the existing, flagship *Scout Pro* model, the new *Scout Pro II&III* offer 640 x 480 thermal resolution for clear, high-quality imaging. However, the focal length extends to 35mm for the *Scout Pro II* and 50mm for the *Scout Pro III*. Longer focal lengths are better for capturing details at distance. The Scout II Pro also offers a narrower 18° horizontal FOV, which narrows further to 12° in the Scout Pro III. In contrast, the Scout Pro features a wide 32° field of view optimized for urban operations. Narrow horizontal FOVs enhance details in precision tasks like facial identification, whereas wider FOVs deliver maximum coverage, enabling quicker sweeps across large areas. Notably, the *Scout Pro II* and *III* can detect human targets at distances of 1,000 m and 1,500 m respectively manual-focus (500 m for *Scout Pro* fixed-focus). Four colour palettes help users identify objects in different environments.

REAL-TIME COLLABORATION

The *FLIR Scout Pro* APP provides users with the advantages of wireless camera management and video streaming functionality, enabling teams to collaborate in real time. Users can seamlessly update and add features to their thermal monocular via a mobile device or tablet, avoiding the need to connect the thermal monocular to a PC. In addition, users can stream videos in real time from camera to device, making the app ideal for covert surveillance. *FLIR Scout Pro II* and *III* thermal monoculars come with tactical pouch, eyecups, USB cable and Quick Start Guide. Optionally available is the new *Scout Pro* charging and docking station. A two-year warranty is standard, with a subsequent three years available free-of-charge upon registration. Cost of *Scout Pro II* in the US $3295

www.flir.com

FOR THOSE WHO EXPECT THE BEST,

EQUIPMENT THAT EXCEEDS

YOUR EXPECTATION.

CASCADE RESCUE
BY HARKEN

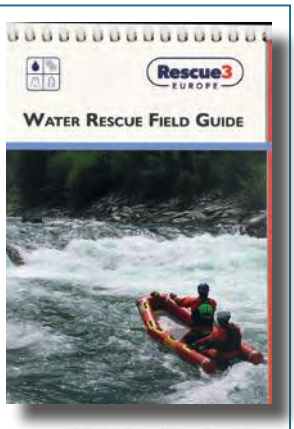
Cascade Rescue litters are purpose-built to function as a patient packaging and patient movement system that exceeds the expectations of rescue professionals. Our NFPA Steel Litters, CE Certified Titanium and Stainless Steel Professional Series Litters and UL Certified Litters are ideal for difficult access and confined space rescues. Built in the USA, competitively priced, and manufactured by a company that has been in business since 1962. Our Professional Series Litters are what rescue professionals require in demanding technical rescues.

Rescues can be dangerous. ***It's best to get gear from a company who understands that.***

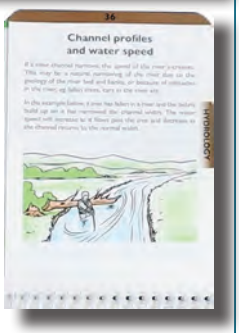
844.414.RESQ
CASCADE-RESCUE.COM

Rescue 3 Europe
Water Rescue Field Guide 2025

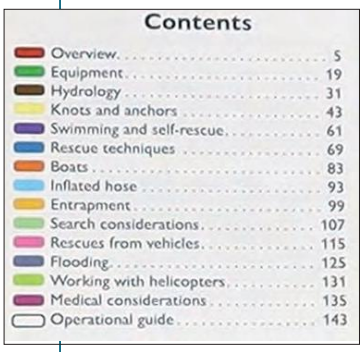
£26.50 (*$36/€32 exc duty, shipping etc)
Operational guide
ISBN-10: 1915623189
ISBN-13: 978-1915623188

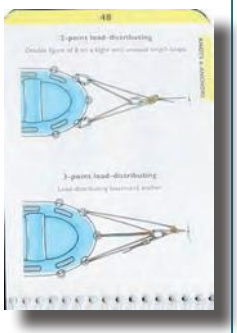


[ED: *Regular readers will recognise some of the excellent illustrations in this guide from Paul O'sullicvan and Chris Onion's previous and equally excellent series of articles in* TECHNICALRESCUE *and* WSAR]

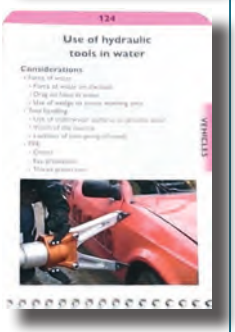


New for 2025! The latest edition of the *Rescue 3 Europe Water Rescue Field Guide* is new and improved, with new and updated content, including access to videos of some of the techniques within the guide.





The *Water Rescue Field Guide* is a quick field reference for team-based swiftwater and flood rescuers, such as standby safety teams, mountain rescue, whitewater professionals and the emergency services, as well as those managing them. It is also used within Rescue3 training courses. The field guide reflects core principles for safely operating and performing rescues in swiftwater and floods, drawn from Rescue 3's more than 40 years of experience training rescuers worldwide. Designed for water rescuers, it is printed in a handy pocket size, on high quality, water-resistant and tear-resistant paper – perfect for outdoor use. It fits nicely in most rescue buoyancy aid pockets.



The *Rescue 3 Europe Water Rescue Field Guide* has been carbon balanced via the World Land Trust's Carbon Balanced Paper project. See www.carbonbalancedpaper.com & www.worldlandtrust.org for details.
The *Water Rescue Field Guide* is also available in translated versions as:
Rescue 3 Europe Guide du Sauvetage en Eau Vive
Rescue 3 Europe Handbuch Fließwasserretter
Rescue 3 Europe Soccorso Fluviale Guida Pratica
Rescue 3 Europe Guía de Campo de Rescate Acuático
*Unfortunately, due to Brexit, customers from outside the UK may be charged import duty and other customs fees on their order, by their country's customs authority.

web: **rescue3europe.com**

Introducing the new BlueWater Ropes

11mm Tech-G

CUT/ABRASION RESISTANT

The newest addition to BlueWater' ArmorTech rope series! Tech-G features a Technora® Aramid sheath with a core rope of polyester and nylon for the ultimate ease and predictability of handling. Tech-G remains round in mechanical devices even under extreme circumstances.

Dual Sheath for the ultimate in safety

UL Classified Life Safety Rope, NFPA 2500 (1983) - General Use

Minimum Breaking Strength:	8,992 lbf. (40.0 kN)
Certified Diameter:	11.0mm
Elongation @ 300 lbf.	4.3%
Elongation @ 600 lbf.	7.1%
Elongation @ 1000 lbf.	9.3%

BlueWater Ropes
209 Lovvorn Road, Carrollton Georgia 30117
Tel: (770) 834-7515 > (800) 533-7673
www.BlueWaterRopes.com
email: info@BlueWaterRopes.com

Empowering Underwater Operations: The Impact of Advanced Diving Technology

At JW Fishers Manufacturing, we are passionately dedicated to empowering divers of all backgrounds—whether you belong to a public safety dive team, police or fire department, commercial diving operation, military unit, or are a devoted recreational diver. Our mission is to provide you with the essential tools that enable you to carry out your important tasks efficiently and safely. Many police dive teams trust our advanced video equipment, reliable metal detectors, and innovative sonar devices to locate crucial evidence, missing persons or valuable items lost underwater. With our cutting-edge technology, you can dive confidently, knowing you have the best support to tackle even the most challenging underwater missions.

The Washtenaw County Sheriff's Office recently purchased a Fisher's MC-2HD Mini camera. According to the dive team home page (https://www.washtenaw.org/2555/Underwater-Search-Recovery-Team-USRT), the Underwater Search and Recovery Team (USRT) is comprised of highly trained certified SCUBA divers from multiple divisions within the Sheriff's Office. It is responsible for all water recovery operations within the County, including, but not limited to, the recovery of drowned persons. The USRT is also crucial in recovering criminal evidence and/or property within County waterways and is active in community water safety events.

WCSO Sergeant Joel Gebauer, Team Commander, states that the unit is working out great for their team. He states, “Our team

utilizes a variety of electronics to aid in the search of evidence ranging from side scan sonar, sector scan sonar, ROVs, metal detectors, and now the MC-2 HD camera system. Since the camera was delivered, we've deployed it in multiple training operations and evidence searches alike. It's been beneficial not only for the topside support to monitor what the diver sees in real-time and to aid in searching for evidence but also for the diver to utilize the integrated dive light. The divers have reported that they like that the light is dimmable, so in areas of high silt or debris, it can be adjusted to prevent the search area from being over-saturated with light. Our team predominantly deploys surface supply diving equipment, and the camera cable is easily integrated into the diver's umbilical and hasn't had problems getting tangled. Overall, we're very pleased with the MC-2 HD camera."

Fishers provides an exceptional range of video equipment tailored for diverse applications, ensuring you have the right tools for the job. A standout product in the lineup is the MC-2HD camera. This innovative, compact device easily mounts on Kirby Morgan helmets or can be utilized with an optional handle and added LED light. This cutting-edge HD camera empowers divers to confidently navigate the depths while transmitting live video back to the surface team. Experience seamless, real-time communication between the diver and the topside crew, allowing for prompt guidance and support whenever needed.

www.jwfishers.com

by **Dr Steve Glassey**
PhD CEM® FInSTR
Public Safety Institute, New Zealand

Steve has been teaching swiftwater rescue for twenty years and is a registered assessor for the International Public Safety Qualifications Authority (IPSQA) for swiftwater rescue, a WorkSafe New Zealand Occupational Diver and is a PADI Public Safety Diver™

DEFCO BreachPen
Underwater Thermal Cutting

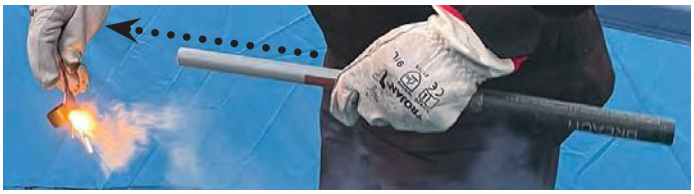
In the high-stakes world of water rescue, every second counts. As climate change increases flooding incidents and more vehicles adopt laminated glass for side windows, rescuers face a growing challenge: the 'Glass Coffin' effect. We discussed in the last issue how side-laminated glass was making vehicle submersion less survivable but what if there was a tool that could slice through submerged laminated glass like a hot knife through butter? Enter the ***DEFCO BreachPen Gen II***, a thermal breaching tool that's turning heads in the rescue community.

THE GLASS COFFIN DILEMMA

Imagine this scenario: a car plunges into deep water, trapping its occupants. In the past, rescuers could easily shatter tempered glass side windows. But with the rise of laminated glass in side windows, traditional window-breaking tools have become nearly useless. This shift has led to the ominous term 'Glass Coffins' for vehicles that become inescapable death traps in water.

A FIERY SOLUTION TO AN UNDERWATER PROBLEM

The ***DEFCO BreachPen Gen II*** might sound like something out of a spy movie, but it's a real tool with serious potential for water rescues.



Withdraw the igniter from the ***Breachpen*** housing and draw along the body like a match to ignite. Once alight apply to the end of the ***Breachpen*** and wait for that to ignite (similar to a sparkler). Apply the blazing end to the laminated glass under the water and draw along slowly from edge to edge.

This handheld thermal cutter can reach temperatures of 5000°F (2760°C), making it capable of slicing through laminated glass – even underwater once ignited.

In a groundbreaking experiment, researchers put the *BreachPen* to the underwater test. They submerged a laminated windshield in a pool of cold water and attempted to cut through it. The results? Impressive, to say the least.
The *BreachPen GenII* successfully made two cuts:

- Cut #1: 76 cm (30 inches) in about 35 seconds
- Cut #2: 62 cm (24 inches) in about 35 seconds

To put this in perspective, a manual cutting method using a rescue knife only managed 11 cm (4.3 inches) in the same amount of time. That makes the *BreachPen* six times faster than manual cutting using non-specialised equipment!

IS THE BREACHPEN THE ANSWER?

Like any tool, the *BreachPen* has its strengths and limitations. Here's what rescuers need to know:

Advantages:
- Lightweight (230g/8oz) and compact (33cm/13in)
- Easy to use and store
- No maintenance required (disposable, single-use)
- Works underwater
- Creates its own light source during cutting

Challenges:
- Limited cutting distance per unit (multiple BreachPens may be needed)

In this experiment, the ***Breachpen*** made it through the lamination but it did cause some of the plastic layering to fuse such that two sections of cut windscreen stay together until prised apart. Below: our serrated knife makes far easier work of separating the two halves than it did when having to make the cut all by itself!

- Must be ignited above water
- Potential burn hazard to vehicle occupants
- Unpredictable victim reactions
- Cost considerations for multiple uses

REAL-WORLD APPLICATIONS

So, how might this play out in an actual rescue? Let's consider a typical car window. Researchers estimated that creating a hinged section of glass large enough for extrication would take:
- **Thermal cutting (BreachPen)**: 1.5 to 1.7 minutes
- **Manual cutting using river knife**: 10 to 11.1 minutes

That's a significant time difference when every moment matters in a rescue operation.

BEYOND WINDOWS: THINKING OUTSIDE THE BOX

The BreachPen's potential goes beyond just cutting windows. Innovative rescuers are already considering other applications:

1. **The 'Umbrella Pull'**: Create a small hole with the *BreachPen*, insert a collapsible anchor, and use mechanical advantage to pull out the entire window panel.

2. **Roof Cutting**: The vehicle's roof, typically made of thinner steel, could be an easier target for the *BreachPen*.

3. **Creating Anchor Points**: The *BreachPen* could potentially cut holes around vehicle pillars for stabilisation or recovery operations.

THE BIGGER PICTURE: ADDRESSING THE ROOT CAUSE

While tools like the *BreachPen* are crucial for responding to emergencies, the rescue community emphasises the importance of prevention. Public education about the dangers of driving through floodwaters and advocating for automatic window opening systems (AWOS) in vehicles are critical steps in reducing these life-threatening situations.

LOOKING AHEAD: THE FUTURE OF UNDERWATER VEHICLE RESCUE

The *BreachPen* is just one piece of the puzzle. Other promising tools and techniques include:

- Submersible power tools like the *NEMO* angle grinder and reciprocating saw
- Specialised glass removal tools like the *Glas-Master* and

BREACHPEN GEN II	SPECIFICATIONS
COST:	US$119
WEIGHT	227g/8 oz
LENGTH (CLOSED)	33cm/13"
LENGTH (EXTENDED)	50.1cm/20"
DIAMETER	19mm/3/4 "
IGNITION TEMP	1440°C/2624 °F
OPERATING TEMP	2800°C/ 5072 °F
CUTTING DEPTH	3.8-5cm/1.5-2"
BURN TIME	30 SECONDS
WEBSITE:	www.breachpen.com

Beluga Glass Cutter

- Improved rescue knife designs optimised for laminated glass

The challenge now is to rigorously test these options in realistic conditions and develop comprehensive training programs for rescue personnel.

A CALL TO ACTION

As climate change increases the likelihood of flooding events and vehicle submersions, the rescue community must adapt. The *BreachPen* represents an innovative approach to a growing problem, but it's clear that no single tool is a silver bullet.

Fire and rescue services worldwide should:
1. Stay informed about emerging technologies and techniques
2. Advocate for vehicle safety improvements
3. Conduct regular training on various extrication methods
4. Collaborate and share best practices internationally

The 'Glass Coffin' problem is a stark reminder that as vehicle technology evolves, so too must our rescue capabilities. With tools like the *BreachPen* and a commitment to innovation, we can ensure that when the worst happens, hope isn't left drowning.

REFERENCES:

Note: This article was adapted from:
Glassey, S. (2024). Breaking the Glass Coffin: BreachPen's Effectiveness in
Underwater Vehicle Extrication. Preprints.
https://doi.org/10.20944/preprints202412.1255.v1
For further information including video, Photos and published article visit:
https://www.publicsafety.institute/breachpen

A 'New' TEAM APPROACH

Minimising time rather than movement

by Rich Denham & Nick Appleton

TECHNICALRESCUEmagazine
Extrication Editors:

Veteran London Firefighters and instructors, Rich is now consulting and training in Europe and Latin America and Nick is a lead instructor at Babcock PLC under contract to London Fire Brigade

CONTEXT

As avid TR readers may recall, way back in the dim-mists of 2017 this magazine reviewed the traditional Team Approach (TA), which was old even then, and subsequently so did Ian Dunbar in his excellent 'Vehicle Extrication' book. But since those works – and despite well-reasoned cases made by both parties to evolve the concept – nothing much had changed.

But now something has changed, with the recently released 'Extrication following a Motor Vehicle Collision' UK Consensus Statement (CS) by the Faculty of Pre-Hospital Care, of the Royal College of Surgeons (see the link in [1] below). Certainly if it is adopted by the UK Fire Service – and it hasn't been at the time of writing – its main points could be accommodated within the traditional Team Approach, see table below.

However, if it is adopted, then this article speculates on what a new and specifically tailored TA might look like.

WHAT THE OLD 'TEAM APPROACH' WAS BASED ON

The studies behind the CS found that there was no evidence for the nearly thirty years old Team Approach's foundation of Absolute Movement Minimisation (AMM) - which held that even minor post-collision spinal movement would increase

the frequency and severity of secondary spinal cord injury. The issue here is that the extensive space creation (roof off ?), necessary to facilitate AMM takes significant time and so it conflicts with the Consensus Statement, which says: *'... the longer an extrication takes, the longer a patient will remain trapped and the timeline between injury and clinical intervention will extend. Where there is time-critical injury, this may result in excess death and increased disability'*.

HOW A NEW TEAM APPROACH MIGHT LOOK

The speculative new TA which follows is about using an evidence-based approach[2] to improve patient outcomes by safely reducing the timeline between injury and clinical intervention, via a system based on minimising entrapment time (see Principles next and below) :
The first option if available would always be early (assisted ?) self-extrication, or a snatch rescue if indicated.
However, if self-extrication wasn't possible, then a combination of Minimum Safe Space creation and Gentle Patient Handling would still enable the earlier delivery of a (consequently more viable) patient to definitive medical care.
The full context of this approach is detailed in Fig.1 below.

COMPARING THE PRINCIPLES OF BOTH TEAM APPROACHES

The following compares the equivalent principles of the old Team approach TA with a new alternative, first by using the table (Fig.1), followed by explanatory text and finally a flow-chart diagram (Fig.4 page 22), demonstrating how the speculative alternative could work in practice.

Fig.1 Direct Comparison of old and new TAs

THE EQUIVALENT PRINCIPLES	
The Traditional Team Approach	***A new Team Approach***
1) Safety & Scene Assessment	***i) Safety & Scene Assessment***
2) Stability & Initial Access	***ii) Stability & Initial Access***
3) Glass Management & Tool Preparation	***iii) Self Extrication (or Snatch-Rescue if indicated)***
4.a) Space Creation → **4.b) Full Access**	***iv) Minimum Space Creation***
5) Immobilisation & Extrication	***v) Gentle Patient Handling & Extrication***
6) Evaluation	***vi) Evaluation***

Note that while the table appears to show events 3/*III*,4/*IV* and 5/*V* as being simultaneous equivalents, the sections

below detail how the speculative new TA progresses a quicker extrication than the traditional one.

It is worth noting that the sequence of the new TA principles is necessarily fluid – for example, the ***Minimum Safe Space Creation*** in point *iV* will also occur in the opening of door(s) in ***Initial Access*** point 2/*ii*. Likewise, the ***Gentle Patient Handling*** of point*V* would also be used if a patient required assistance during ***Self Extrication*** in point 3/***iii***.

1/*i* Safety and Scene Assessment and
2/*ii* Stability and Initial Access
Notice that these first two points – dealing with safety and stability – would not change, as they are the necessary foundation of any MVC rescue. Once established, a safe and stable scene also enables early Initial Access, created by opening the door adjacent to the patient, plus perhaps one other for Rescuer entry. This will facilitate the gathering of the information necessary to facilitate a **Patient Centred Rescue**[3], which will allow rapid determination of the extrication that is best suited to the patient and their medical circumstance.

Incidentally, and whilst not directly mentioned, it is implicit that before this composite phase is complete, the initial plan would have been swiftly devised and initiated, all necessary additional resources would have been requested and also any (***Initial Access***) need for vehicle relocation would be dynamically assessed and implemented.

3 Glass Management & Tool Preparation /
iii Self Extrication [or snatch rescue]
While **Glass Management** as a specific activity was a relatively new concept when the original TA was introduced nearly three decades ago, it can now be seen as an overall part of space creation. With regard to the potentially protracted procedure of **Tool Preparation**, only if the door(s) couldn't manually be opened at the **Initial Access** stage, would the minimum tool inventory necessary for mechanical door opening have been taken from the fire truck and used.

So the first departure from the old TA – without the potential delay of setting up a traditional and extensive tool dump - is the undertaking of an earlier and swifter extrication. This would either be on gaining Initial Access, or be briefly deferred by the creation of additional and minimum safe space, again using a minimum tool inventory. See fig.2 ***Extrication Decision Tool*** (above) from the Consensus Statement, for the extrication

Fig.2

options.

As the Consensus Statement says that all patients with injury must be considered as time dependent, if they can self-extricate (see fig 3 'U-Step Out', below, from the CS) – and in so doing initiate their quickest possible delivery to definitive medical care - then they should do so at this early stage.

4 Space Creation and Full Access /
iv. Minimum Safe Space Creation
Significant (and time-consuming) structural ***Space Creation*** is necessary to provide full access to the patient. This large volume of space is required to facilitate repeated clinical observations, potentially excessive care interventions and subsequent and extensive packaging, as well as to facilitate the **Absolute Movement Minimisation (AAM)**

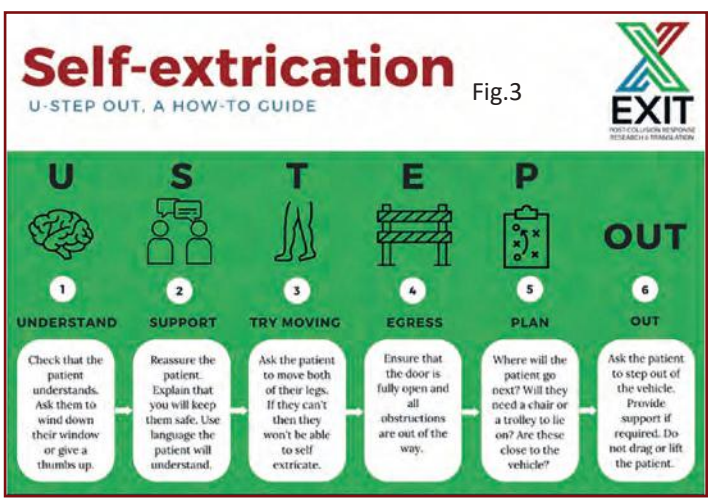


Fig.3

S120e POWER CUT

- Lightweight
- Compact Design
- Cordless
- Exceptional Cutting Power
- Proven Tool Head
  (from 120 Hydraulic Series)
- Star Grip Control
- 18 V Battery Powered
- Integrated LED Light

LUKAS.COM

A Trusted **IDEX**
Fire & Safety Brand

LUKAS

extrication requirements in themselves.

As a consequence this approach will extend entrapment time, resulting in a later extrication and so a delayed patient arrival at hospital. However, in the *new* ***Team Approach***, medical rescuers are required to limit interventions to only those necessary to expedite safe extrication.

Also, if self-extrication isn't possible, it may be that the space created earlier for **Initial Access** will be sufficient for extrication by rescuers, for example on a longboard and through an adjacent open doorway. But if space creation in addition to that would be required, it would only be the safe minimum required by the patient and their situation. In either case, timely rescuer access and patient extrication would be enabled.

5 Immobilisation and Extrication /
v Gentle Patient Handling and Extrication

Given that **AMM** was never proven, it follows that neither is any associated pre-extrication requirement to Immobilise the patient. The old **Team Approach** process of full Immobilisation and **AMM** extrication was an extended process, which inevitably extended the timeline between injury and clinical intervention at hospital. Because of this, rescuers would now extricate the patient with little or no packaging (the Consensus Statement can be seen to be ambivalent on spinal collars and advocates that if a pelvic splint is to be applied, it is done so after extrication), but using ***Gentle Patient Handling***. For clarity, the Consensus Statement defines this as '*… the careful and purposeful handling (or assistance) of patients, but with a focus on progressing patient care in a timely manner*'.
This new approach to the act of extrication will serve to further minimise entrapment time.

6/*vi* Evaluation

Evaluation – whilst not a part of the ***Team Approach*** in its original form – has nonetheless become an integral part of its structure, and so the old **Team Approach** (parts 1, 2 and 6) would rightly top and tail any *new* ***Team Approach*** elements. The time and effort spent in every extrication (in training as well as operationally) is time and effort spent in field research, with the lessons learnt being invaluable – as long as they are passed on ! So formal evaluation – however you undertake it and circulate its conclusions – is an essential tool with which to pay-forward the knowledge gained, to the benefit of patients in RTC's/MVA's that have yet to happen.

HOW A NEW TEAM APPROACH MIGHT WORK

Having compared the principles of the old and the speculative *new* ***Team Approach***'s, we can now look at how a *new* ***Team Approach*** might work in practice Fig4 Right :

PSYCHOLOGICAL ASPECTS

There is another important factor that needs to be considered, this is the psychological impact of entrapment to the patient alongside the physical complications.

Following the study conducted by Tim Nutbeam and his team exploring this topic the following results were observed:

- Extrication experience was improved by positive communication, companionship, explanations and planned post incident follow-up.
- Extrication experience was negatively affected by failures in communication, loss of autonomy, unmanaged pain, delayed communication with remote family and onlooker use of social media.

These are their recommendations for rescue teams performing an extrication:

1) Communication and companionship for entrapped patients should be designated to a specific staff member who if safe to do so and not an impediment for extrication should join the patient in the car and remain there was as long as practical.
2) An 'extrication buddy' should be assigned to explain the procedure, ensure companionship and provide reassurance to the patient while entrapped.
3) Communication with the patient should be clear and use

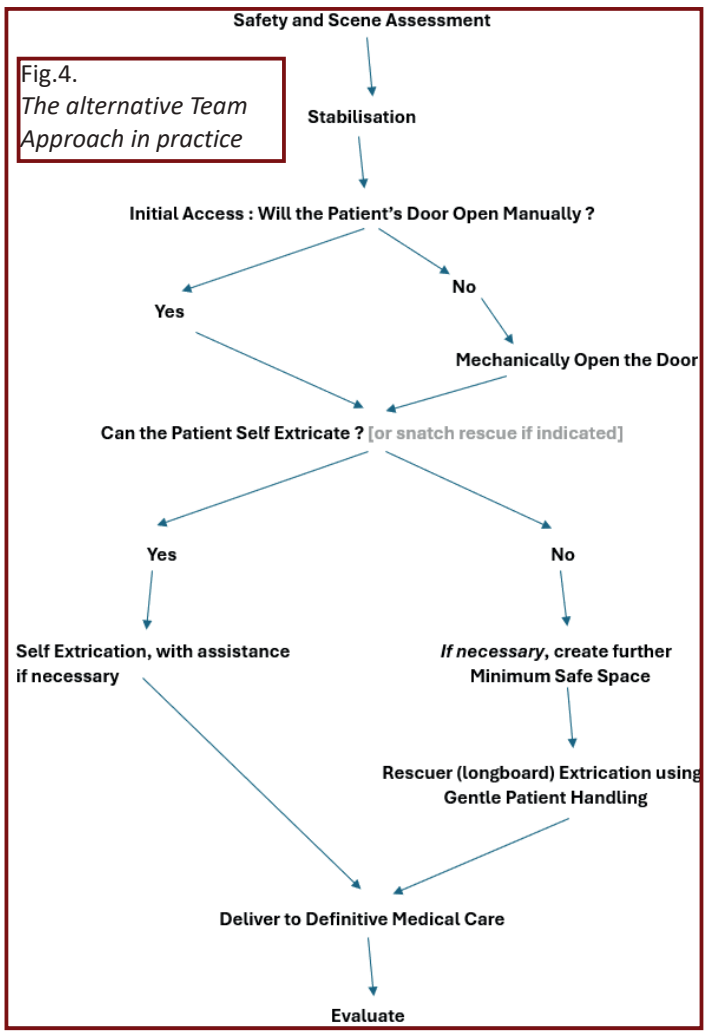


Fig.4.
The alternative Team Approach in practice

accessible lay language.
4) If co-occupants are safe, patients should be informed at the earliest opportunity for reassurance (this includes pets).
5) If conscious, patients should be allowed to communicate with their family members.
6) Where possible, the ability of the public to photograph the vehicle and the patient should be minimised.
7) Rescuers and their affiliated organisations should not post extrication-related photos on their social media channels or websites.
8) Where possible, planned follow-up should be offered to patients.
https://bmjopen.bmj.com/content/bmjopen/12/9/e063798.full.pdf

Also, it is important to emphasise the need for joint training and shared decision making between clinicians and firefighters. This is central to delivering safe patient centred extrication. In the UK the JESIP models and principles have become the standard for emergency services multi agency operations."The application of simple principles for joint working are particularly important in the early stages of an incident, when clear, robust decisions and actions need to be taken with minimum delay, often in a rapidly changing environment." https://www.jesip.org.uk/

Training together is key to safe efficient multi agency working and an example from our own team is the joint training carried out on a regular basis between all London Fire Brigade rescue firefighters and London HEMS clinicians. The benefits of this training especially in the field of vehicle extrication has been widely recognised by both agencies.

SUMMARY

The purpose of a *new* ***TA*** would be to meet the twin critical requirements of minimising time on scene and also maximising early arrival at definitive medical care, in this case through :

- (Assisted ?) ***Self extrication*** by the patient, or less likely, the snatch rescue of the patient by rescuers

OR a COMBINATION of.....

- The creation of ***Minimum Safe Extrication Space***, as against traditional and extended (roof off, etc) full space creation.

AND

- Extrication by ***Gentle Patient Handling***, in contrast to full in-car packaging, prior to **AMM** based patient removal.

Cumulatively, and as referenced in the title of this article, the evidence-based focus here is on the safe minimisation of time rather than movement. This is done in order to facilitate the earlier delivery of a (more) viable patient to definitive medical care, an occurrence which is associated with more positive patient outcomes.

6. CONCLUSION

If the information relating to a problem changes – and particularly where that information is evidence based - then the existing solution to that problem should also change with it. Given that fact, and further that the CS recommendations are still the subject of discussion, evaluating this article and especially its associated evidence base (below), will help you to make an informed contribution to that discussion, and in doing so, best serve the interests of future Motor Vehicle Collision patients everywhere.

REFERENCES:

[1] 'Extrication following a Motor Vehicle Collision' UK Consensus Statement (CS), published by the Faculty of Pre-Hospital Care (FPHC), of the Royal College of Surgeons, Edinburgh (see TR 85) -
https://fphc.rcsed.ac.uk/media/3649/extrication-following-a-motor-vehicle-collision.pdf
[2] For further context regarding the assertions in this article, also see : 'Evidence Based Extrication' (see **TECHNICALRESCUE**# 83)
[3] For further context on patient centred rescues, see : Patient Centred Rescue and the Hierarchy of Extrication' (see **TECHNICALRESCUE**# 84)
Fig 2 Extrication Decision Tool and Fig 3 U-Step Out self-extrication guide, are both from the CS, and are courtesy of the EXIT (Extrication in Trauma) Project : https://theexitprojectcouk.wordpress.com/

TRUSTED SAFETY FOR RESCUE

SKYLOTEC's rescue solutions empower responders with efficient, low-effort access in critical situations. The RCX Power Ascender revolutionizes vertical access, providing rapid, safe ascent capabilities even in the toughest environments. Designed for seamless integration in rescue scenarios, our equipment ensures that responders reach those in need with speed and reliability. Trust SKYLOTEC for advanced, easy-access solutions that save time – and lives.

skylotec.com

RCX POWER ASCENDER

RDD-KIT

MILAN 2.0 POWER

ultraBASKET STRETCHER SMALL


SKYLOTEC

A ~~PIRATE'S~~ YOUNG ~~PERSON'S~~ GUIDE TO....

ANCHORS & ANCHOR SYSTEMS..

part4

by Reed Thorne
Ropes that Rescue AZ, USA

Our resident rope genius, Capt'n 'GreyBeard' Thorne started a new and quite complex series in TR83 on anchoring so Refer to part 1 for definitions.

This series includes:

- ANCHOR LOADING
- BOMBPROOF ANCHORS
- FLOATING ANCHORS
- LINEAR ANCHORS
- MULTI-POINT ANCHORS

SUBSTANTIAL FOCUSED FLOATING ANCHORS

DEFINITION:
An object (such as a tree, hand rail, post) in a favorable position proximal to the edge which is secured by several pre-tensioned back ties. This object becomes a "bombproof focused" anchor and may be higher off the ground affording a better angle yet needs no opposition.

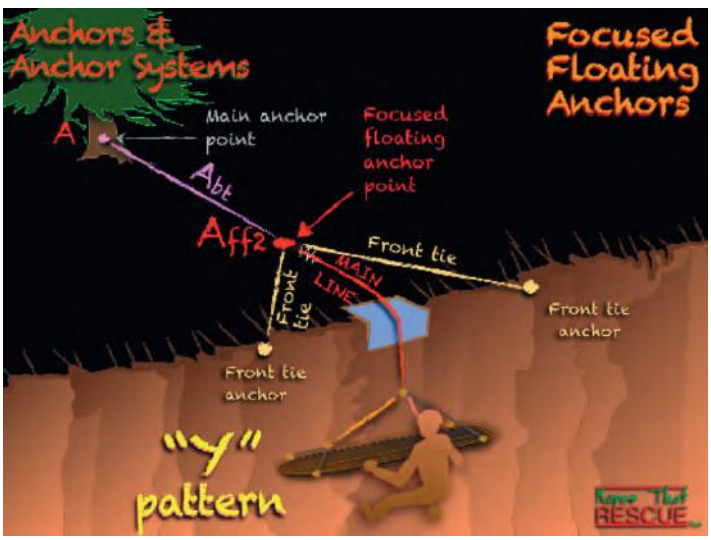
Focused floating anchors are very useful for creating anchors where currently none exist. Since you are not using an existing natural anchor but rather are creating the anchor from either a rigging plate of rigging pod (with or without a compression member underneath). In order to tension against the rigging plate/pod, you will need to build in some kind of restraint (opposition) made from just about any type of material (cordelette, webbing, etc.). This is called an opposition anchor or front tie (Ao), one of the two types of linear anchors. (Slang: "Gila Monster")

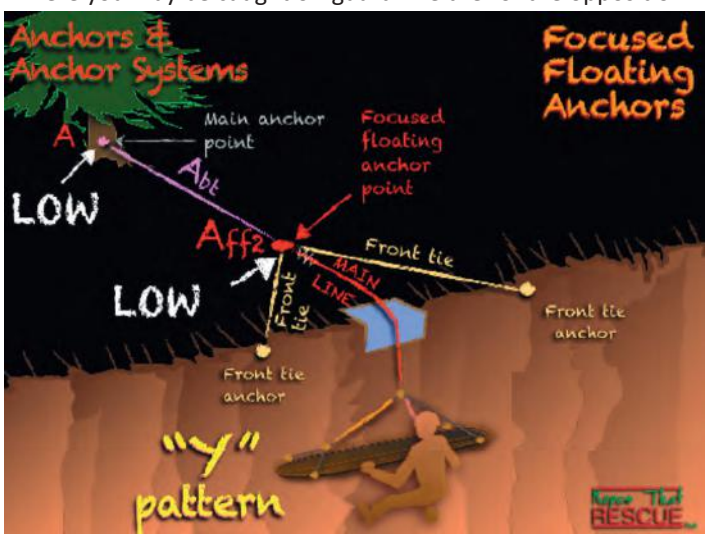
Back tie and front tie arrangements are as follows:

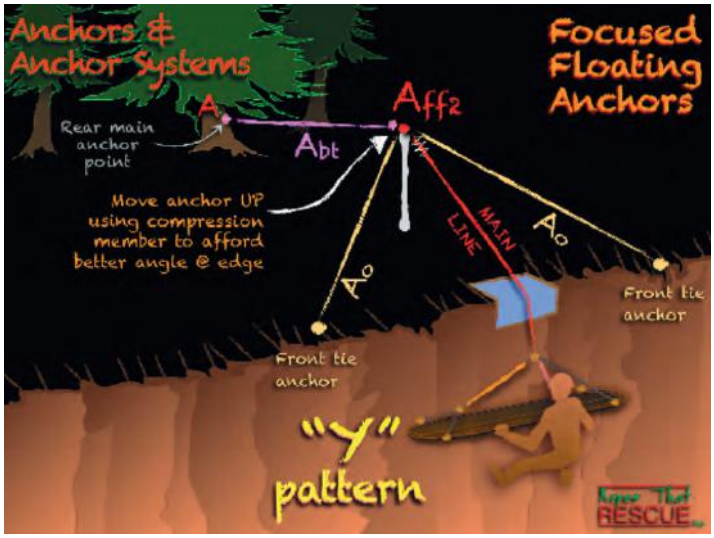
1. "Y" pattern
2. Reverse "Y" pattern
3. "X" pattern

1) The "Y" pattern is shaped like a Y when standing away from the edge and looking towards the edge.
2) The reverse "Y" pattern is like an upside down Y when standing away from the edge and looking towards the edge.
3) The "X" pattern is a cross of back ties and front ties

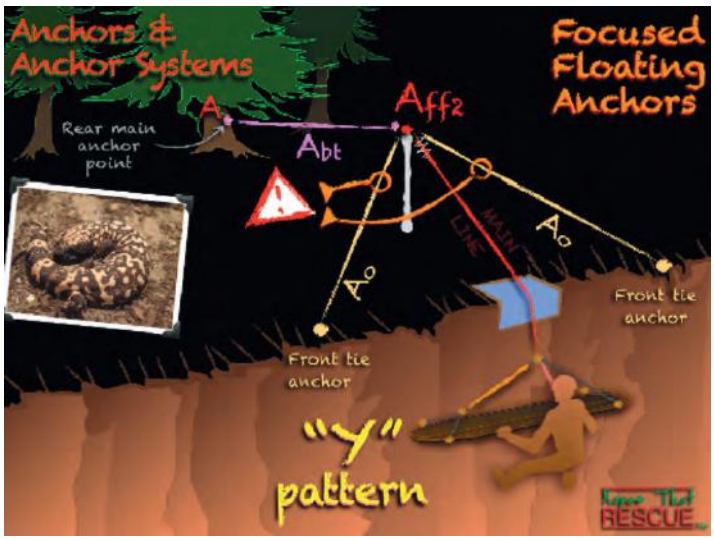
"Y" PATTERN:
All have distinct advantages and disadvantages in the amount of rigging involved. The "Y" pattern is very safe and easy if it is rigged low to the ground with no elevation to it at the focused floating anchor. But, in the "Y" pattern with an elevated focused floating anchor rigging pod ensure that the anchors in front are substantial and not merely rigged as strict opposition front ties where you may be caught off guard. If either of the opposition

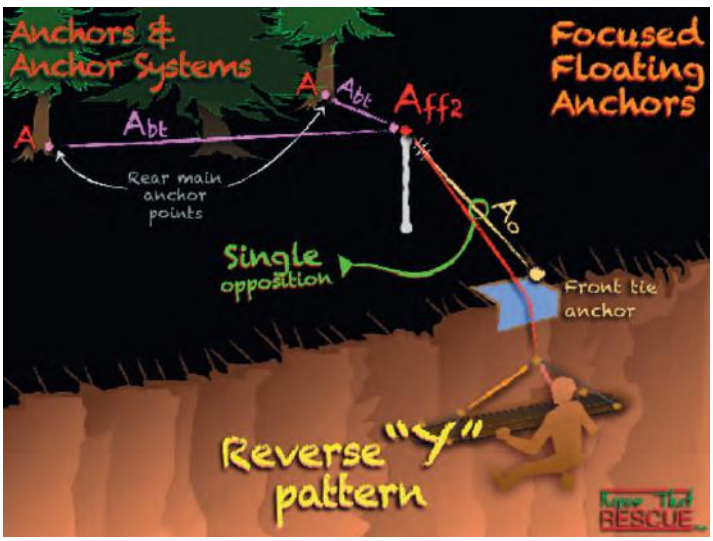




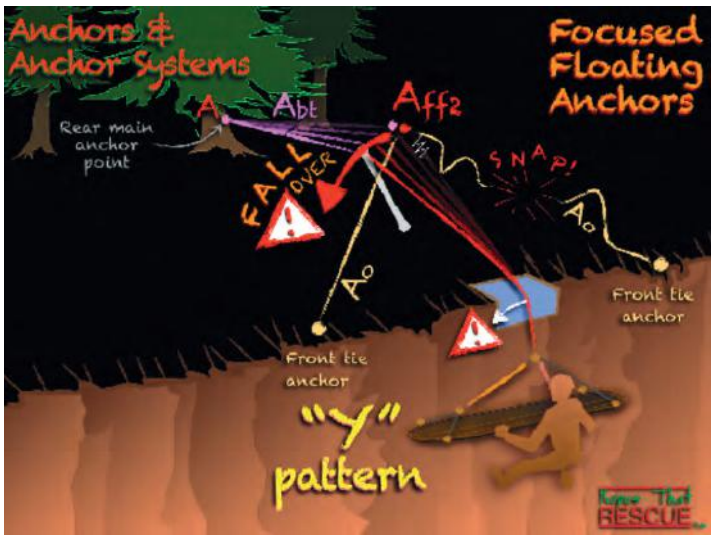


REVERSE "Y" PATTERN:
The reverse "Y" pattern has two rear back ties and a single opposition front tie (top) The beauty of the this is that the single front tie is not restricting your movement as much at the edge and it's easier to get your rescue package past it.

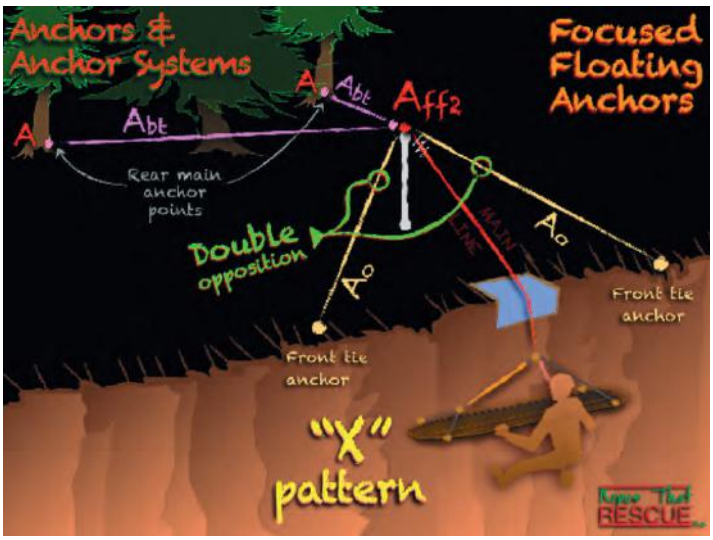




"X" PATTERN:
Very stable for the focused floating anchor, but a lot of rigging and more complicated.



front ties fails, the elevated focused floating anchor will violently fall over, left or right. This could lead to a pendulum swing in the rope which could come off any edge padding or protectors and damage/cut the rope.



The acronym for a focused floating anchor is:

"A sub ff "
or
"A_{ff}"

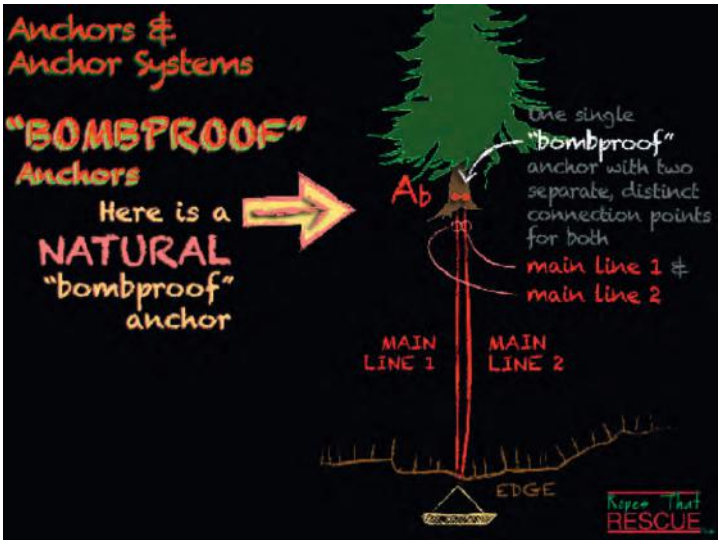
The acronym for a front tie or opposition anchor is:

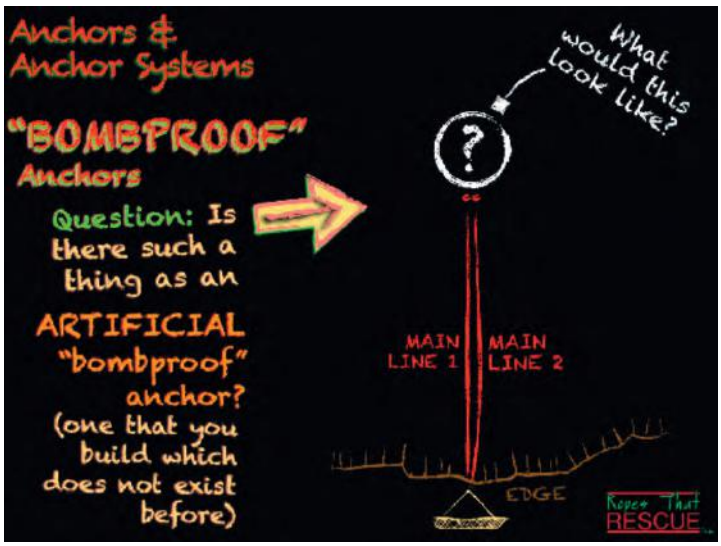
"A sub o "
or
"A_{o}"

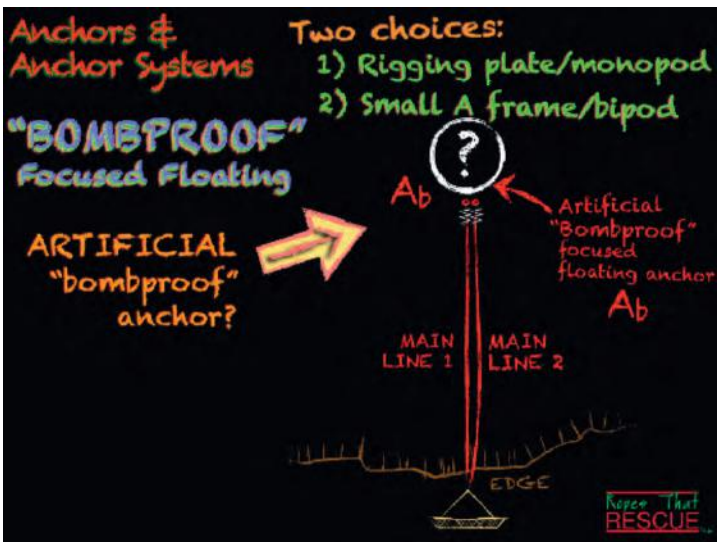
The front tie or opposition anchor (A_o) does not have any of the operation force on it as it is actually pulling in generally the same direction (towards the edge). It still has force though from
the rear back tie(s) so do not discount this..However, it is not considered a critical part of the whole system and many times this is seen when the opposition anchor comes slightly loose when the operations over the edge begins.
DEFINITION:

"BOMBPROOF" FOCUSED FLOATING ANCHORS

1) A rigging plate/pod in a favorable position proximal to the edge which is secured by a minimum of three pre-tensioned back ties. This object becomes a "bombproof focused floating" anchor and may be higher off the ground affording a better angle and requiring opposition
2) 2) A "bombproof" focused floating anchor may be used as the attachment for both ropes in a two rope system (main and belay or both main lines in a TTRS). To reiterate the differences between a regular anchor and one that is bombproof, it is the ability to put both halves of a two rope system onto the same anchorage. We have already seen this term "bombproof" on standard natural anchors (ones that exist when you arrive) in both the "bombproof" anchor (A_b) and also the "bombproof" focused anchor (A_{bf}). Both of these so far have been considered "natural" anchors (see top illustration).
Now, given this, we need to turn our attention to an "artificial" bombproof anchor that does not exist when you arrive but, rather you are going to construct from ropes and materials you bring along. There would possibly be many reasons why you would desire to do this for instance. Your team may want to run a two-tensioned rope system (TTRS) from a particular location for logistical reasons as one example. With the popularity of TTRS today, it only makes sense that this important issue is addressed with constructed artificial anchors.
The acronym for the artificial "bombproof"
focused floating anchor is"







"A sub bff"
or
"A_{bff}"

The bombproof focused floating anchor (A_{bff}) is being relied upon to hold BOTH the main and belay or both ropes in a TTRS. It is similar to the bombproof focused anchor (Abf) in that it

ORIGIN TT SYNCHRONIZES TTRS DEVICES SO COMPLETELY,

THEY FEEL CONJOINED.

The first time you rig an Origin TT rigging plate in a rope rescue system you will be reminded exactly why the first letter in TTRS is twin. This plate's two independent locking pins allow both multi-purpose devices to mount directly–without an interloping carabiner. This links and coordinates their operation for a safer, more efficient system and a smoother ride for the person at the end of the line.

Most of us aren't called upon to do a high-angle rope rescue every week—or even every month. But the day will come. Why not be ready to rig the most fully-controlled, fully-redundant system when it does?

WATCH THE ORIGIN TT AT WORK.

HARKEN™

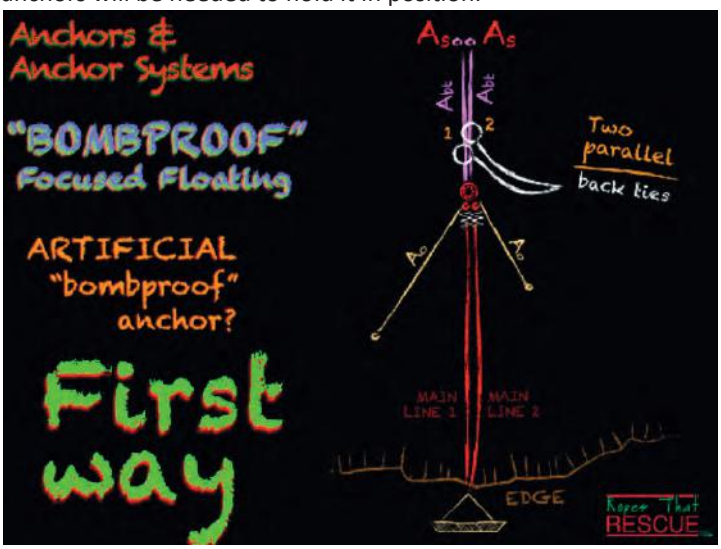
harken.com

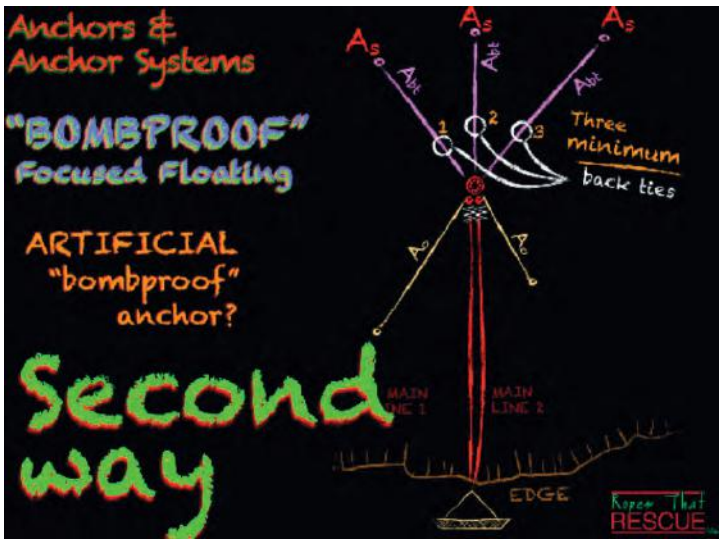
will also need an arrangement of properly positioned back ties to insure that if one fails, it will NOT adversely affect the anchor in any way.

FOUR WAYS to establish an A_{bff}:

There are four different ways to construct them depending on the arrangement of substantial anchors at the rear (proximal location).

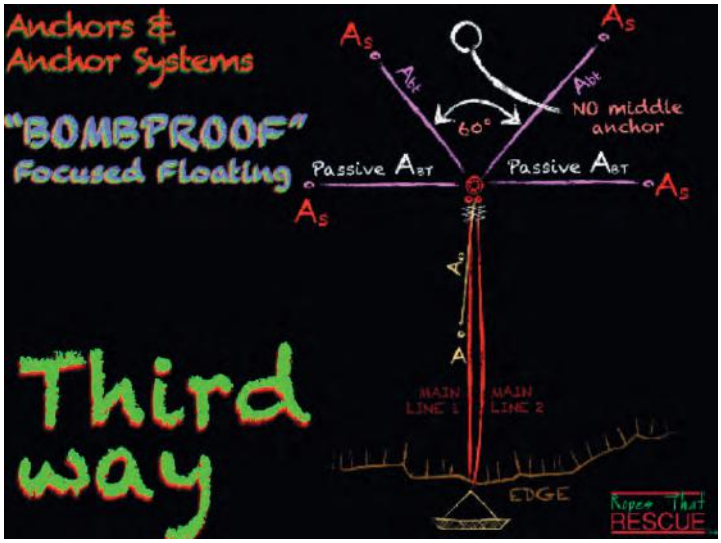
1st- PARALLEL BACK TIES - The first way is to simply install two independent back ties from the A_{bff} to either another bombproof anchor or two separate substantial anchors (shown). With all of these focused anchors, you will need to install good opposition to hold the A_{bff} in place. If the A_{bff} is a bipod, (pic bottom), then one opposition front tie is needed. In this case, we show a tree-lashed bipod bombproof focused floating anchor with two parallel back ties and one opposition front tie (green rope arrowed) using an AZ Vortex® A-Frame. If the A_{bff} is a monopod or simple rigging plate, two opposition anchors will be needed to hold it in position.

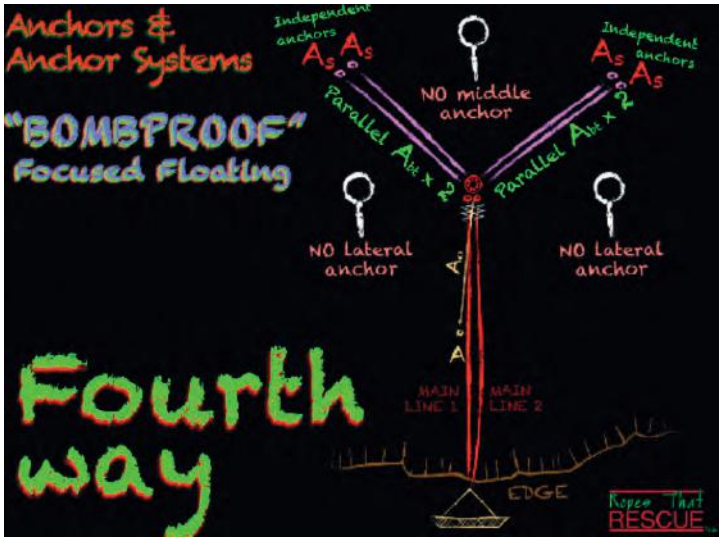




2nd- THREE (or more) BACK TIES - We start in an ideal setting with these three good back ties to good substantial anchors. The central back tie needs to be in line with the direction of pull as much as possible (on the center line). The substantial anchors must be good quality like you would build for your separate belay or you main line.

In the pics below we show the *AZ Vortex* system's *AZORP* multi-point rigging flanges joined in their 'cotton-reel' mode as "Bombproof" focused floating anchors with three back ties and one opposition front tie (arrowed). In the bottom image the additional monopod head with short leg helps keep the whole anchor system stable and 'floating' .

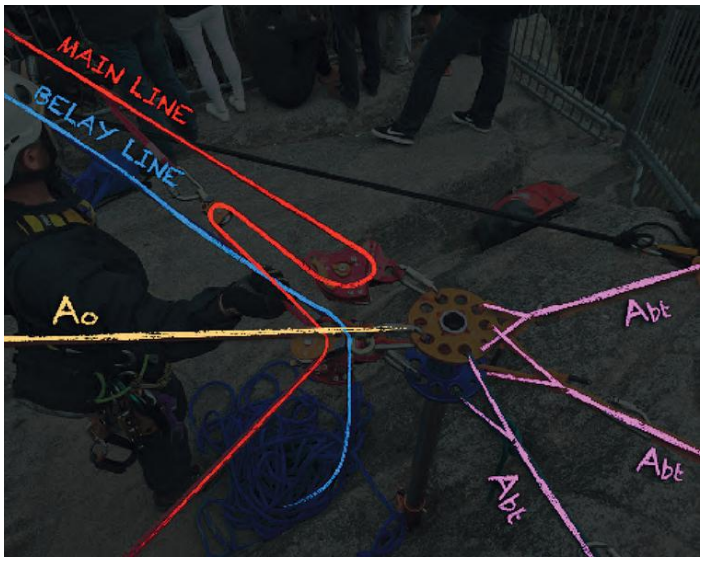


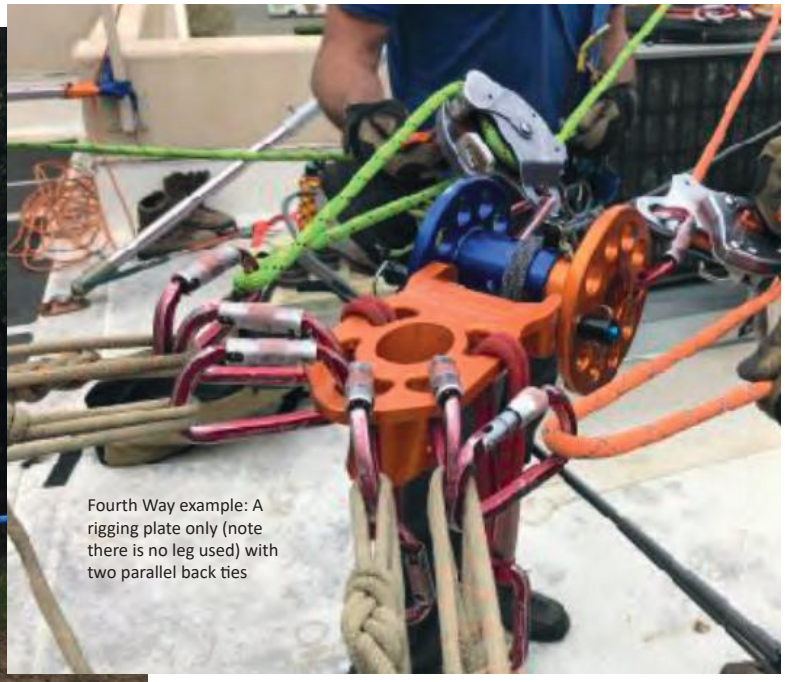


3rd- TWO BACK TIES with PASSIVE LATERAL BACK TIES - (top of next page) When the center line substantial anchor is missing as in this illustration, the two substantial anchors to the left and right of center line are taking the load. If one of these fails, the focused anchor will move significantly. By adding "passive" lateral back ties to the left and right, we can check this unanticipated movement. Again, this will render the focused anchor bombproof because any failure consequence is eliminated.

4th- TWO PARALLEL BACK TIES EITHER SIDE OF CENTER LINE- When the center line substantial anchor is missing as in this illustration, the two substantial anchors to the left and right of center line are taking the load. If one of these fails, the focused anchor will move significantly. By adding a second parallel back tie to the left and right to separate substantial anchors (or one bombproof) we can check this unanticipated movement. Again, this will render the focused anchor bombproof because any failure consequence is eliminated.

Sometimes, a good compression member can be added under the bombproof focused floating anchor as in the photo on page 38 and in this photo from New Zealand. In the overlay on the right, you can still see the three back ties using the Portuguese bowline to support both flanges of the AZORP®.





Fourth Way example: A rigging plate only (note there is no leg used) with two parallel back ties

LEFT: this is a two-tensioned rope steep angle operation with two parallel 3:1cd pulley systems off to each side of the bombproof focused floating anchor. Here the team in New Zealand used four total back ties from 8mm canyoneering lines. The two opposition front ties can also be seen with a slack jumper in between each at the anchor.

PIGEON MOUNTAIN INDUSTRIES
EST. 1976

ROPE & EQUIPMENT

FOR YOUR VERTICAL WORLD

11 MM EXTREME PRO™ (G) ROPE MBS = 42.9 KN

UNICORE® TECHNOLOGY

SHEATH – 100% POLYESTER

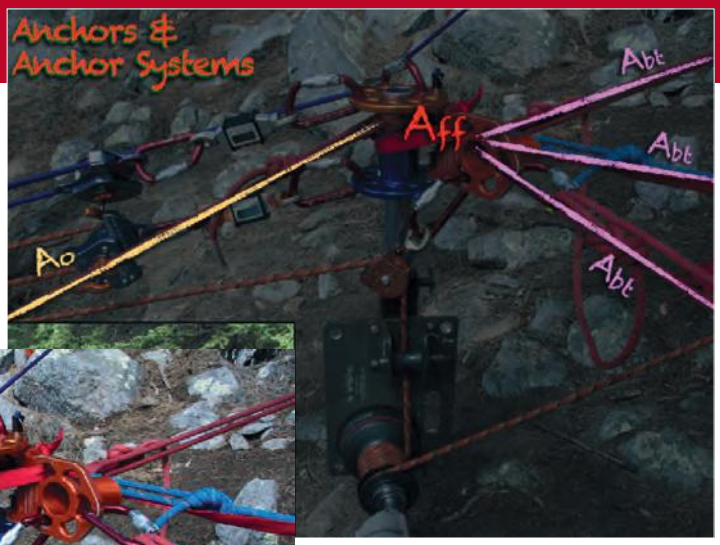
CORE - 100% NYLON 6

NFPA 1983: 2017 (G)

MADE IN THE USA

UNICORE® TECHNOLOGY FOR YOUR SECURITY

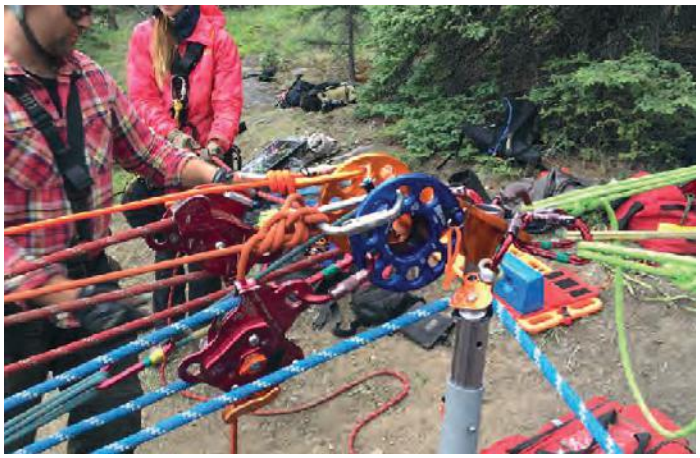
PMIROPE.COM

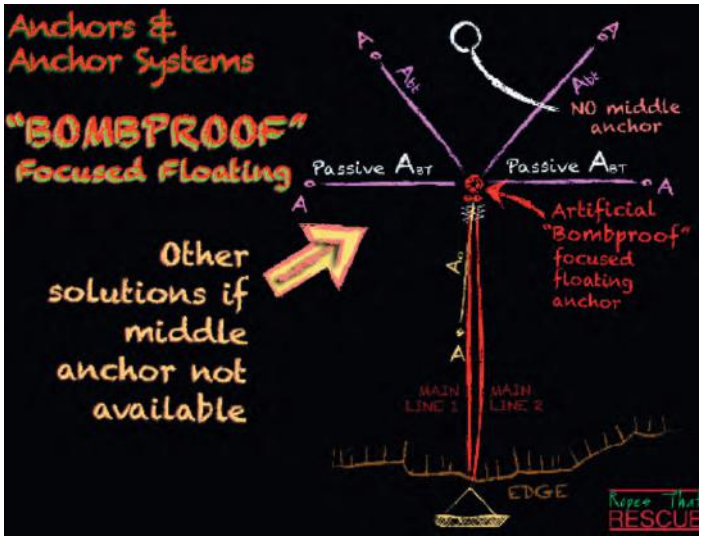


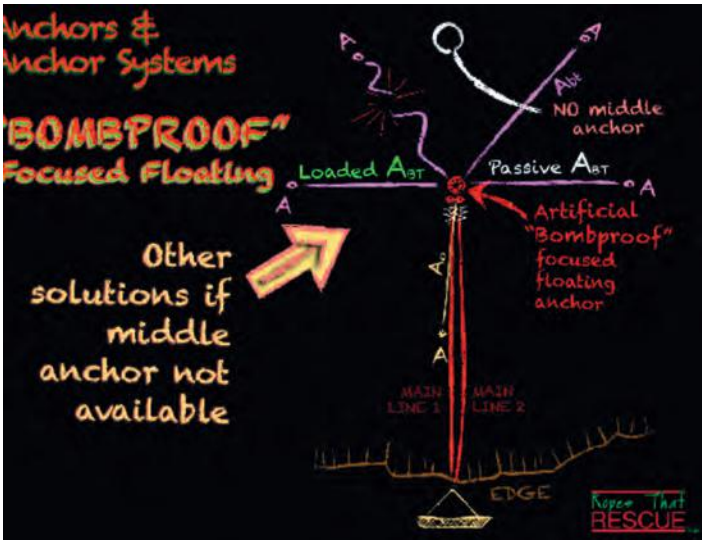
Here we show a rigging pod bombproof focused floating anchor with compression member and *SkyHook*® Capstan Winch in Tasmania, Australia. Note the minimum three back ties to the right with single opposition front tie off to the left.

[*Author's note: In this application, the students tied a separate webbing connection between the AZORP® head and the AZ Vortex® monopod head where the two pins were seen to be a critical point. See also page 38.*]

Below, Canadian students built a bombproof focused floating anchor for a two- tensioned rope system. Notice the AZORP® head is turned sideways (or 90° from left photo) called the "St. Bernard" (slang) orientation of the head due to its appearance.

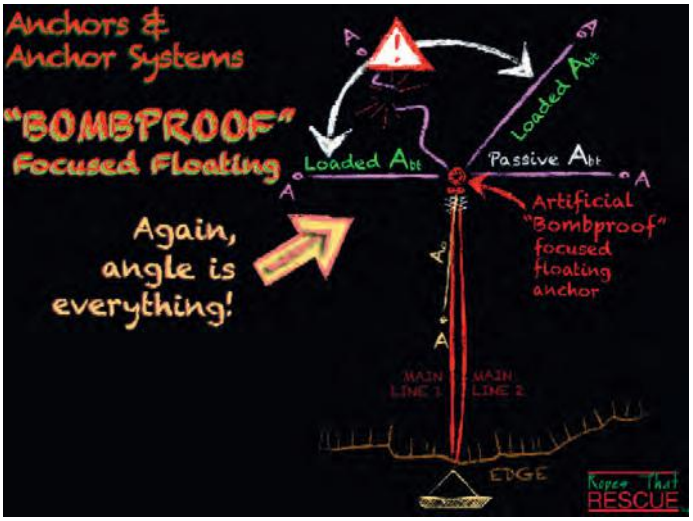


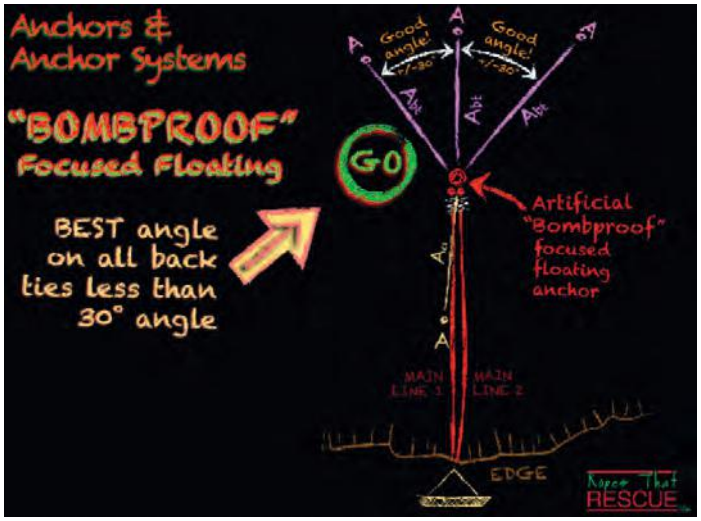


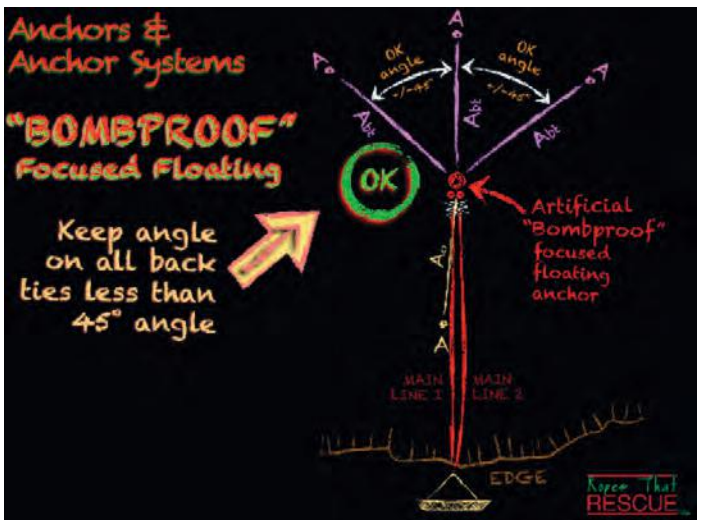


What do we do when we do not have a middle anchor (above)? Same thing we did with the bombproof focused anchor which was not strong enough for lateral movement if one of the back ties failed. Adding lateral "passive" back ties on either side of the focused anchor will do the trick.

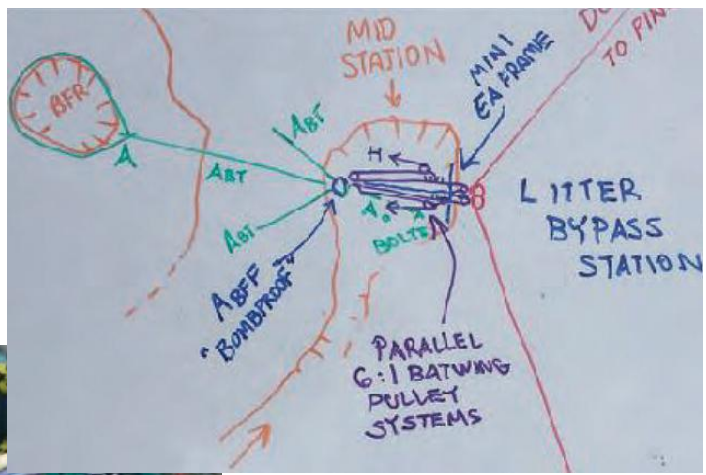
The angle between the remaining good rear back tie and the opposite lateral passive back tie is important. The angle should not exceed roughly 120° (see over the page). If you have your rear outside back ties at about 30° from centerline (60° between the two) as mentioned earlier, you will be exactly at 120° which is another good reason to keep that initial spread between these back ties so small (see highline anchor in photo over the page).

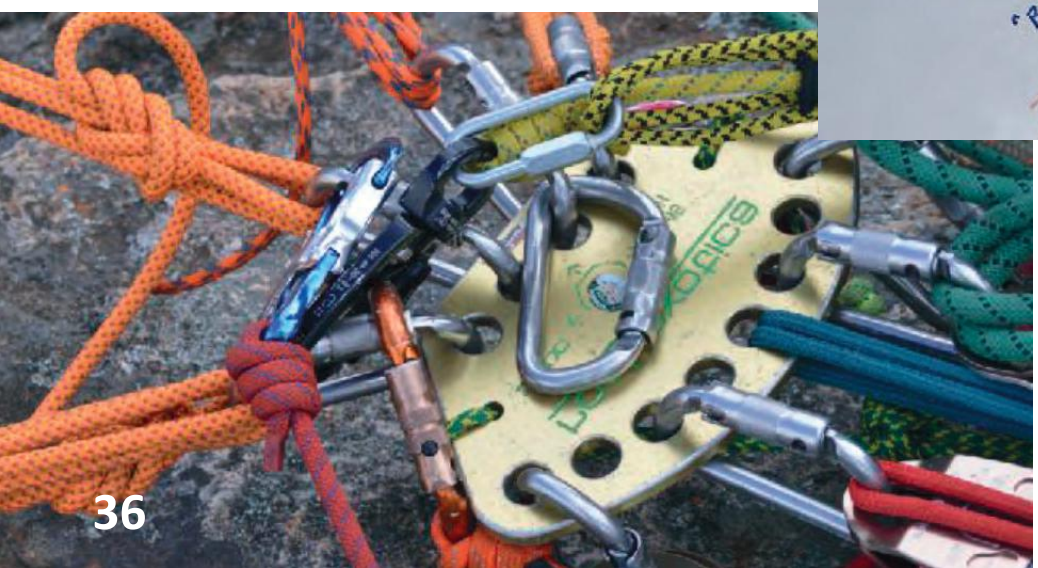






Keep the angle as close as possible to 30° off of centerline. Below photo is the from RTR 2016 Advanced Skills Rescue Workshop in Victoria, Australia where the rigging plate shown is the bombproof focused floating anchor for a mid station litter bypass station (pic right, Reed's whiteboard drawing). Note that we put four back ties on this anchor (because we could easily). *[Author's note: The Kootenay style highline was a record for Australia at 1,280' (390 meters) in length]*.

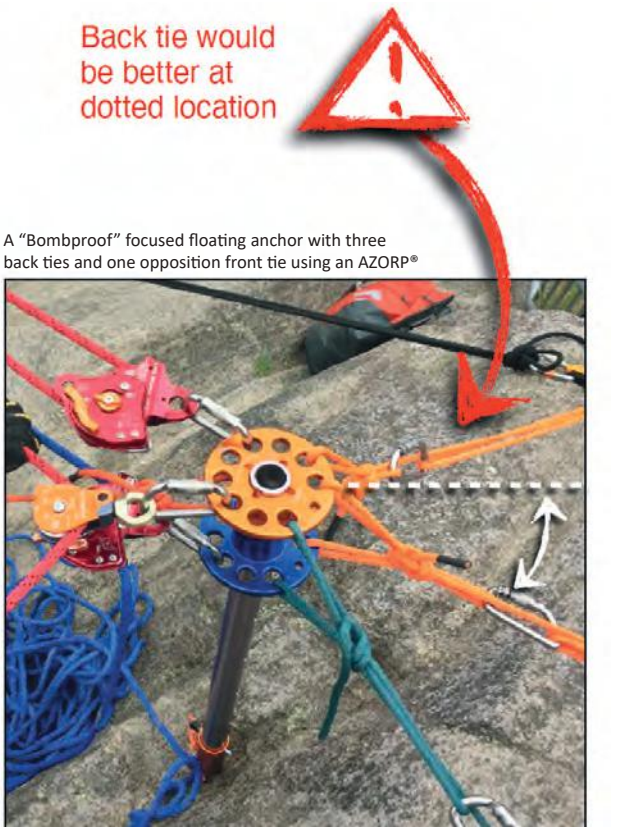




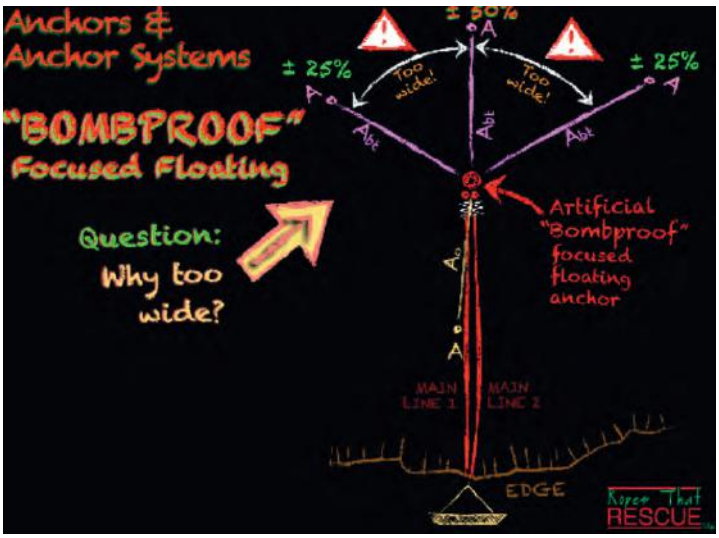
Width of back ties for anchor:

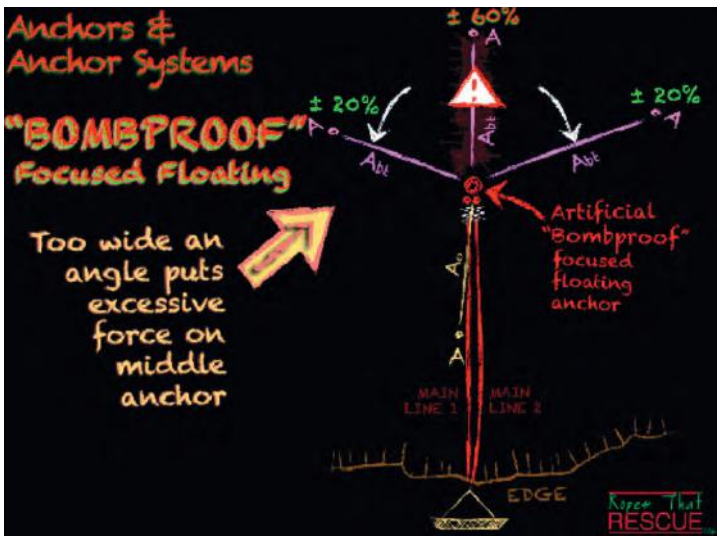
As a general rule, the wider the outside back ties get to each other and the centerline, the less they hold comparatively to the center back tie.

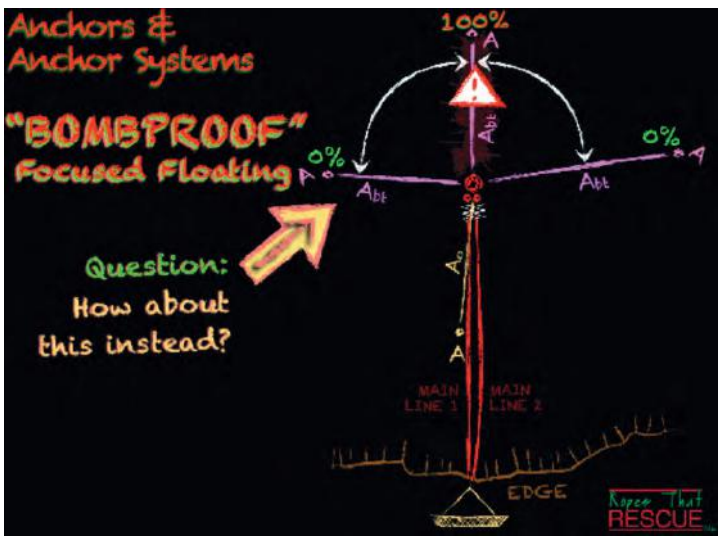
We have always noticed that the center anchor in 3x1 system anchor always takes the bulk of the loading. The outsides take a percentage of that but still less than the middle. A little trick that works well for remedying this is to tighten up the middle as much as possible first, then go to the outside two back ties and tighten them as much as possible. This usually will overpower the middle backtie and it will go slightly loose. Leave it alone and go with the anchor as it. When the force comes on the system, all three will be roughly the same tension.



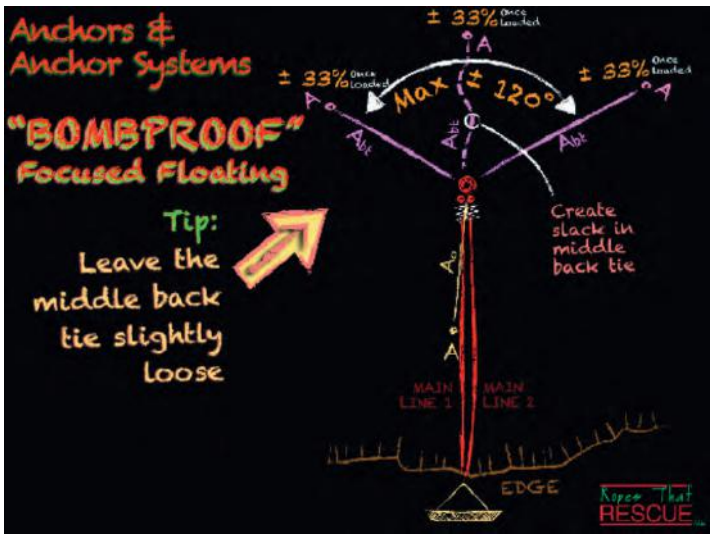
A "Bombproof" focused floating anchor with three back ties and one opposition front tie using an AZORP®

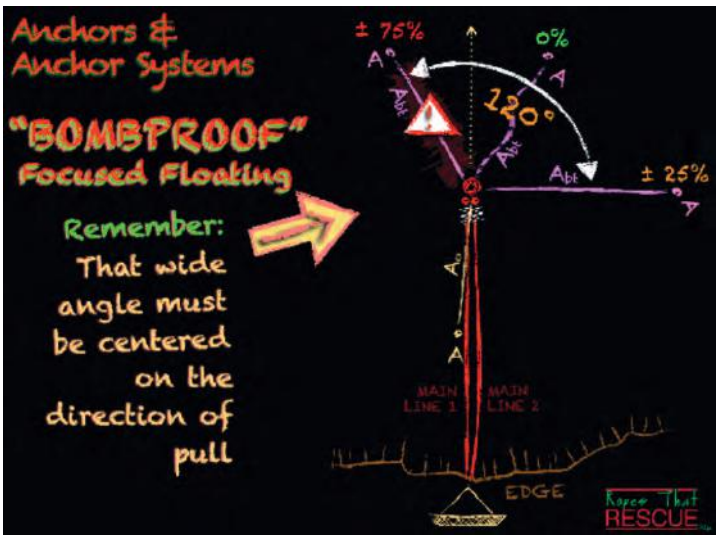


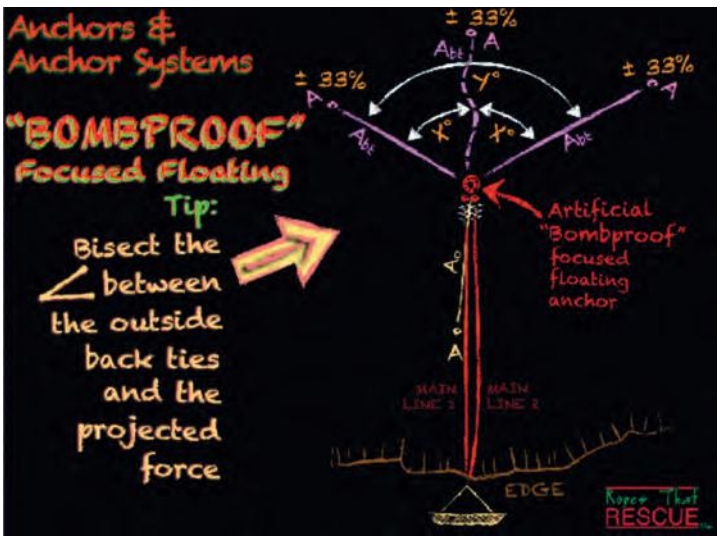




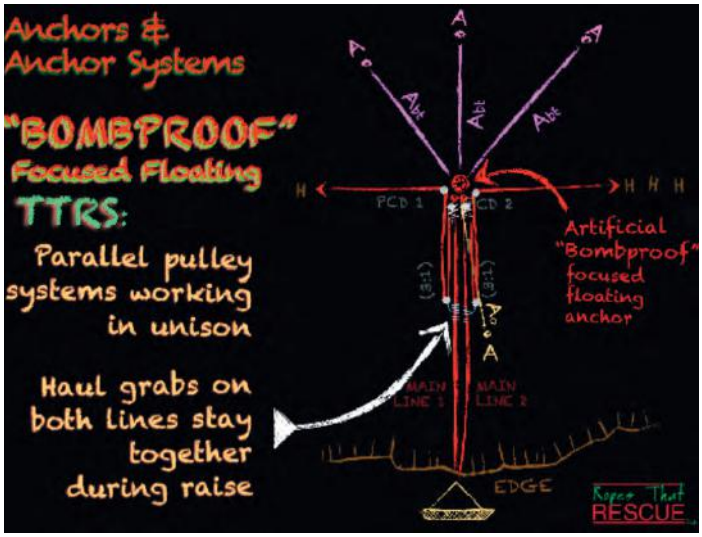
Width of back ties for anchor....cont....



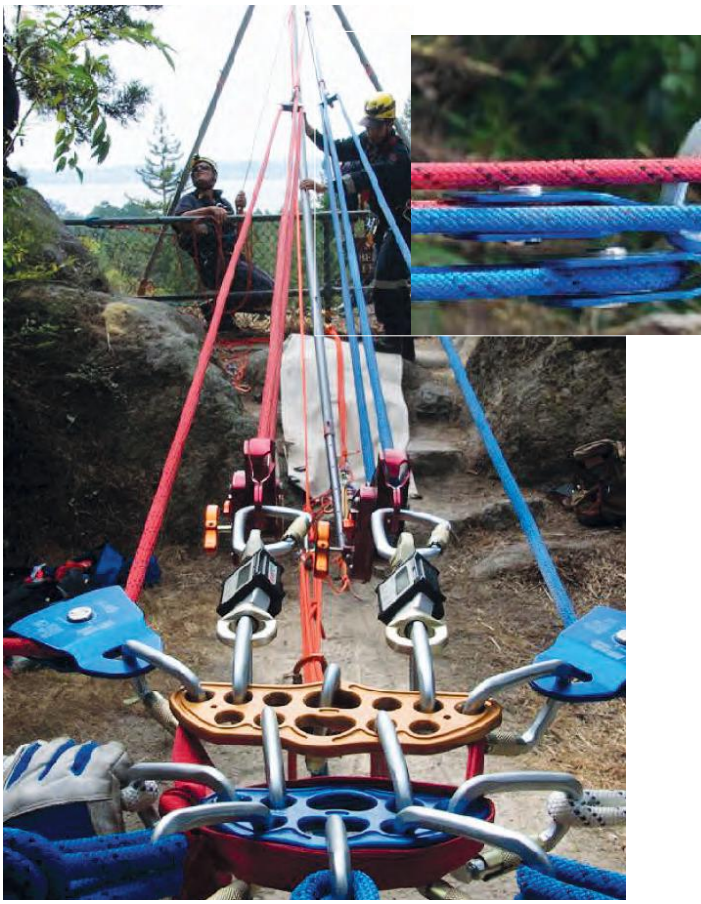




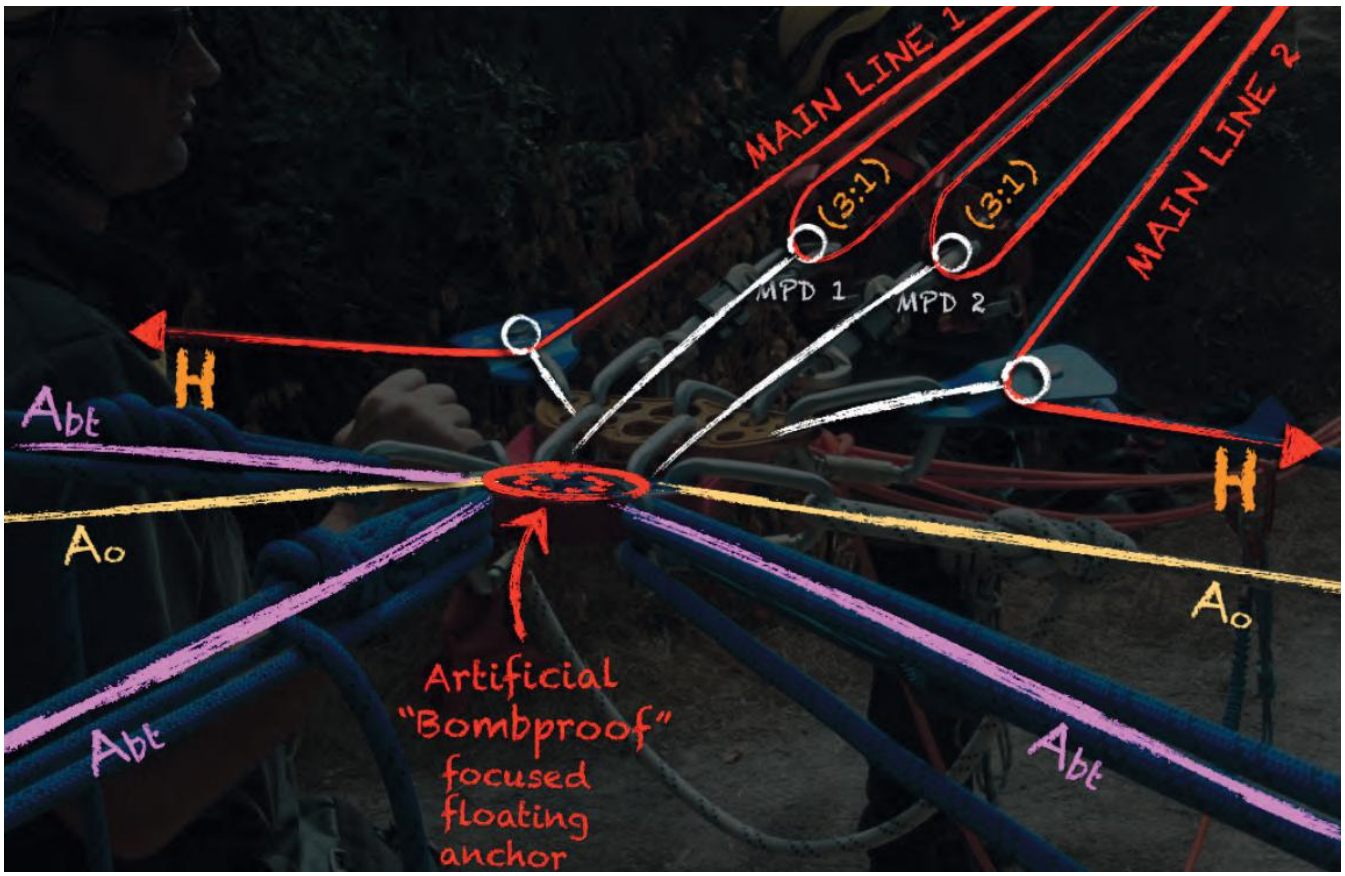
On any two-tensioned rope system (TTRS) employing a bombproof focused floating anchor, keeping things in balance is always desirable. This means that if you are using parallel pulley systems to do you raising try and balance them identically so that each side is a mirror image of the opposite side (see diag below).



As you can see in the photo below, the halves of this system are both identical pulley systems with a final change of direction at the anchor. Both haul grabs stay in close proximity during the raising process (inset photo). *[Author's note: Also, the riggers have used a multi-wrapped piece of*



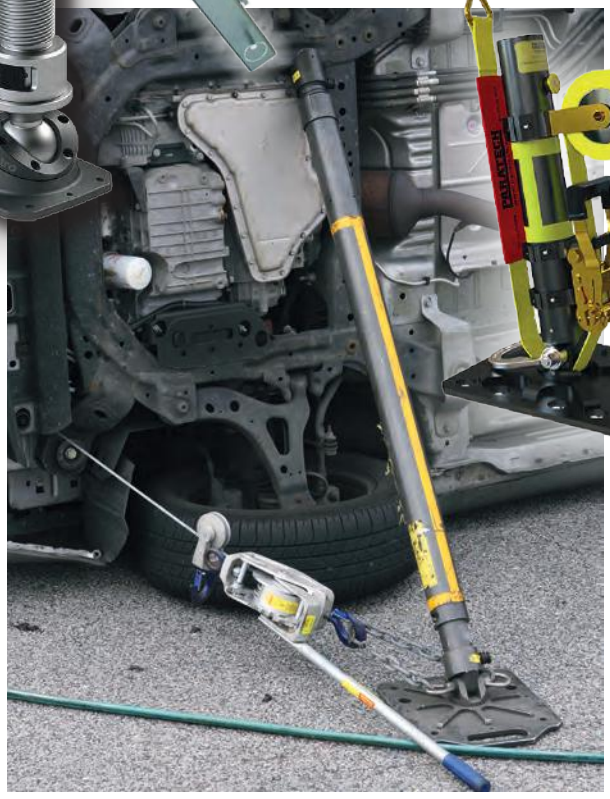
webbing around and through all the carabiners on the two (2) bombproof focused floating anchor plates linked together with two steel carabiners. This was felt necessary by the riggers to back up these two critical carabiners. There is sometimes much debate as to what constitutes a true critical point and some feel it mandatory to back these points up whereas other do not.]



NEXT ISSUE....LINEAR ANCHORS

STRUCTURAL SHORING

STRUTS



We've used the term 'structural' to differentiate these heavy duty struts intended to support quite massive loads from the lighter duty vehicle extrication struts. There is crossover of course and many vehicle stabilisation struts are easily tough enough to help shore a timber-structured house but they are 'light-duty' in terms of load support and instead designed for the relatively small weight of a leaning vehicle. In the image on the right you can see a *Paratech* shoring strut capable of supporting a 22ton load being used as a vehicle stabilisation strut requiring a fraction of that load capacity. Shoring struts are great universal tools for everything from vehicle accidents, to downed trees, collapsed/ing buildings and trench walls as well as tripods/bipods/monopods for rope rescue and 'crane' style load support or lifting and shifting - this aspect is covered in the ***Tripods/High Directional Guide***.

We can divide shoring strut capabilities into four categories:

1) **STABILISATION**: The load is primarily downwards into the ground rather than directly onto the strut which is instead resisting lateral movement. Examples of this would be a brick wall being shored/stabilised using raker rails (title pic) or a vehicle on its side as shown on the left where a standard strut is being used in conjunction with a 'Come-Along' winch to triangulate the forces and prevent the vehicle 'submarining'. The inset picture shows a more bespoke version of the Paratech shoring strut set up specifically for vehicle stabilisation with integral ratchet strap.

IMAGES NOT TO SCALE

SHORI

2) **TOP LOAD SUPPORT**: Which can be the same thing as stabilisation except that the full or part-weight of a shored 'medium', which may be many tons over a protracted period, is applied to the strut either transversely as in columnar/ vertical support or laterally as with a trench wall in the *SuperX* pic below left.

In the case of vertical load support, a significant weight may be applied to the strut at the outset of installation or shortly afterwards and remain on that strut until the end of the incident or replacement by traditional timber or masonry shores.

Lateral load support may change from locational input forces only (the forces applied to engage the strut and keep it in position), to very significant loads if there is a shift in the substrate like further collapse of a trench wall. *Paratech*'s tripod head allows an additional single strut to be used on top of the tripod legs to extend the support height (pic right)

3) **UNDERSLUNG LOAD SUPPORT**: As a tripod, bipod/ A-frame, monopod or davit arm, with the use of specialised head and foot attachments struts can be used for regular rope rescue operations and lifting and shifting of very heavy loads like blocks of concrete, tree trunks or large animals. Load vectors are quite complex and rigging of high loads from an A-frame, monopod or off-centre tripod is an advanced procedure.

4) **LIFTING**: Hydraulic struts have very high lifting/pushing force but pneumatically pressurised struts (intended mainly for trench rescue) can also impart such a high force that they not only extend into position without the need to manually extend them but can go on to lift/push the medium in the same way as an airbag. As a stabilisation strut, the ability to exert ***a lifting force rather than simply provide firm initial placement, can be very dangerous in the hands of an inexperienced operator.*** A delicately balanced, unstable load requires a very intricate and delicate placement to ensure that the situation is not made worse. So, although we have included some struts with a full 'structural' lifting capability like the *Holmatro H20*, *Paratech Hydrastut*

and *Resqtec* model, some are intended more for vehicle stabilisation like the *Genesis Kodiak* lifting struts and power-drill lifting option versus their *Tornado* structural struts (left).

Structural shoring struts are almost all alloy/aluminium tubes around 100mm/4" in diameter. Adjustable struts, indeed all struts, are strongest at their shortest and with the least amount of extension. As the secondary cylinder extends out of the main tube the load support capability reduces. The load capability is actually a lot higher than the specifications suggest because they are always a ratio of the total load. We have listed a minimum of 2:1 normally applied to struts applying a direct lift and therefore a precise load from the outset but for stabilisation, the load variance can be enormous so you would normally apply a safety ratio of around 4:1. There are still some old-school struts requiring manual extension and a large pin inserted into one of 4 or 6 correctly aligned holes in the telescoping tubes -primarily *ProSpan* (and *Genesis Rescue* and *Scorpe*) now that *Idex* have discontinued the *Airshore,* and these remain pretty bombproof and affordable but these have largely transitioned into push-fit connections, sprung plunge-pin or push-button release. The *Holmatro Omnishore* is, at the time of writing, the newest bespoke shoring system and they have opted to use a total of 6 telescoping struts with no fixed-length extensions. Instead each sized strut can be coupled to ONE other strut via their '*Trident*' interlocking coupling on one end (pic right) with angled, interlocking fingers that don't allow any rotation or misalignment. . With any two struts you can pretty much span any distance you need without having to make calculations for a fixed-length extension. With two struts providing a telescoping section top and bottom the *Omnishore* can span from 30cm/1ft to 5.2m/17ft. Remember that the longer a shore and its extensions are, the smaller the load that it can take; *Paratech* recommend a maximum of 36" of extensions if joining more than one but for most ***do not use more than one extension per strut.***

IMAGES NOT TO SCALE

Above: Holmatro Load Indicator

Holmatro remote controller and multi-strut load sensor.
Above-left: Holmatro single strut powered extender

Paratech Rescue Guardian - Load-shift sensor & alarm.
Left: Paratech anaolgue single strut load monitor

BASIC STRUT DESIGN

The telescoping aluminium tube we mentioned earlier will either have a series of holes with which to adjust height to specific distances or a full length screw thread which allows finite length adjustment. Even the struts with holes spaced an inch or two inches apart like the *Prospan, Scorpe** and original *Airshore* (left) have additional adjustment on the collar via an angled top on which a pin will ride while you rotate using the keyhole-shaped extensions and then lock into position with that x-shaped screw. This allows an inch or two of more precise adjustment which can make the difference when trying to get a firm fit. The length of adjustment on the *Paratech*-style screw threaded tubes you can see on the right is 'captured' by a collar which will either be wound into place manually or may automatically follow the length of adjustment by pressurising pneumatically and then locking it at the approximate or in some cases, the exact point to which you raise it. Raising of the telescoping section can be manual or use compressed air cylinders, CO2 or even Nitrogen which is particularly useful when setting the struts remotely in dangerous situations like trench or structural collapse. The most dangerous time in shoring is on entry to the scene and setting the struts ***especially if the pressure settings enable your strut to impart a lift rather than simply engaging firmly - that's when your 'Jacks-Straws' of interlocking support members can come tumbling down!*** The old *Airshore* strut below left, (in its *Idex* blue livery rather than original red) best displays the traditional features still present on *Prospan, Genesis* and *Scorpe** ranges; the round red buttons are plunge pins for connecting foot and head attachments - this replaced simpler pins that you see on the adjustment collar. At the bottom is a valve for compressed air pressurisation of the strut and a pressure release 'screw' that allows you to release the strut from its fully loaded position or to set a pressure release level that doesn't allow the strut to impart a lift, just firm engagement. The original *Airshore* struts ultimately disappeared after being dropped from the *IDEX (Lukas/Hurst/Vetter)* ranges which would have left the field open for *Prospan* and the undisputed leader in this field, *Paratech*, had companies like *Holmatro, Resqtec* and *ResqJack* not stepped up with their own designs. *Holmatro* in particular were in the game early on with their *Powershore* range which was subsequently updated and improved with the *OmniShore* which has one strut in its array of 6 interconnecting pneumatic struts that can impart lift hydraulically if required. These are very slick and at the '*Rolls-Royce*' end of shoring with accessories like multiple strut load-monitoring, remote raising via electric pump and handheld controller plus a smaller single strut remote raising unit (pic top-left) and a single strut analogue load monitor which both *Holmatro* and *Paratech* have a version of. *ResQtec* grew out of lifting airbag pioneer *Zumro* and also have a slick, push-button range with precisely locking heads while *Paratech* didn't rest on their laurels coming up with

* Scorpe has not been included in this GUIDE due to lack of data and images but the Air Stabilzer range is included in our USAR BUYERS GUIDE

Shoring reinvented.

First responders need shoring equipment that is as intuitive, versatile and smart as they are. That is why we have developed OmniShore, a shoring system reimagined from the ground up and designed in accordance with unparalleled standards of quality and safety.

Patented innovations such as the Trident Coupler and OmniLock system allow you to build unlimited applications with less parts, experience a seamless setup with less handling and take full control with less manpower.

Learn more at holmatro.com/omnishore

holmatro
mastering power

upgraded locking systems and accessories which still sees them as having the largest range of struts and options. This includes their load monitoring and alarm module *Rescue Guardian* (pic p42) which can monitor up to 10 struts simultaneously and alarm audibly and via blue tooth to connected devices should there be an overload or change in load which is particularly useful in trench rescue and earthquake situations. After each family of struts in our tables is a visual list of all of the foot and head accessories that fit that range of shores. This includes raker rails and walers for structural and trench shoring to spread the load and support across much larger areas. Spot-shoring, where the relatively small area of strut head/foot engages directly with the load is not recommended for particulate structures like brick/breeze block and unstable trench walls - these require much broader load support using boards and walers or the smaller 'spot-walers' shown on the *ProSpan* shore above which can be used without boards on more stable trench walls. Some of the tripod heads and larger feet require an angled clevis to be connected between the plate and the strut but the newest models from *Holmatro, Reqtec, Paratech* etc. will connect directly into the accessory as a locking, push-fit rather than needing to be manually pinned. However, do bear in mind that, excellent though these newer, easier and quicker to use struts are, the older style manual shores using pins are very forgiving of rough handling and neglect, we can attest to the fact that the *Prospan TASS* models for instance will continue to function decades after they've been decommissioned and left to corrode behind the workshop! There are too many accessories to provide details in this particular article but we have listed all of the available spec for each accessory in the **USAR BUYERSGUIDE** available now on this link and due to be fully complete in late Summer.

IN THE FOLLOWING TABLES..... See our comprehensive Guide to shoring struts in the **USAR BUYERSGUIDE** for regular updates to this article and for a list of specs for each of the accessories (head, feet etc) shown in this article.
All load figures are in **metric tons/tonnes** equivalent to 1000kg and **US (short) tons** equivalent to 2000lbs or 0.9 of a metric ton NB: the use of the word 'ton' without defining short, long, US, UK or metric is best differentiated using 'tonne' for a metric ton. Any use, feature, accessory or component that is inherent in the tool is shown as a solid coloured square ■■■■ If it's an option it is shown as an outline square □□□□
USES ■Vehicle stabilisation ■Light Structural(timber building etc)■ Heavy concrete Structural & Trench●●● USE or FEATURE is only partially present and/or is **OK but not ideal.**
A model variant is shown in cyan blue and any features or specifications that differ from the standard version are also in cyan or will have a cyan outline to a black or orange square ■■ .**ORIGIN:** The company's home country, not necessarily the country of manufacture which is indicated by an inset flag or two equally sized flags if the tool is made in both countries.
COST: rarely quoted because these are usually bulk agency purchases. We usually round up to the nearest Pound£/ US Dollar$/Euro€. Cost is for a basic strut excluding any accessories. Our **USAR/Extrication BUYERS GUIDE** may be able to include prices as we find them but don't hold your breath.
WEIGHT: weight minus any accessories
ADJUSTMENT INCREMENTS: The distance between locked positions, may be half an inch or FINITE where the strut will lock in the exact position of the load **STROKE:**The total length the strut will adjust from minimum to maximum extension.**PNEUMATIC**: Pneumatically extended with compressed air, CO2, Nitrogen etc **MANUAL**: extended by hand and either pinned or a screw collar may be spun up to meet the extension point. **HYD**: Hydraulically extended either by hand pump or we will see electric/battery power becoming more prevalent. Both hydraulic and pneumatic pressurisation have the advantage of being able to place the strut remotely without placing rescuers into the danger zone.
CONNECT: PUSH-FIT = No tools or pins are needed to lock together a strut and and accessory head/foot or extension or even two struts - they will either click into place automatically or an integral sprung plunge-pin does the job. **PIN:** a metal pin is manually placed to maintain the head/foot/extension in position.

AUTO LOCKING COLLAR: AUTO indicates that the strut will automatically default to a locked position during or after inflation/extension. A **LOCKING COLLAR** is manually locked either by being screwed on a thread or by placement of metal pins through the tube and collar. **LIFT** ■ the strut can either impart lift/raising (via pneumatics or a manual crank handle) or can have an optional lift attachment added □ A **RATCHET ATTACHMENT** is used to convert a shoring strut into an All-in-One strut for vehicle extrication where the cranked raising of the strut creates a triangulation (vectoring) of forces via webbing attached to the target load and the strut's base-plate.

(LOAD) MONITOR = A load cell indicating load on the strut or an alarm to indicate over-load or load shift. **ELECTRIC RAISE**: an electric module to raise the strut (or coordinated struts) remotely without imparting the high lift forces.

It is vital that your load is in-line with the orientation of the strut usually at 90 degrees-unless it is an angled spot-load or distributed load using appropriately angled clevis and Raker-Rail/Waler combinations. if your target load starts to stray off-centre as it moves, the strut arrangement may become loose and collapse - this is why many larger strut heads have screw/nail holes to maintain their orientation. Load Capacities are for that strut/ext only. **Joining struts & an extension=weaker.**

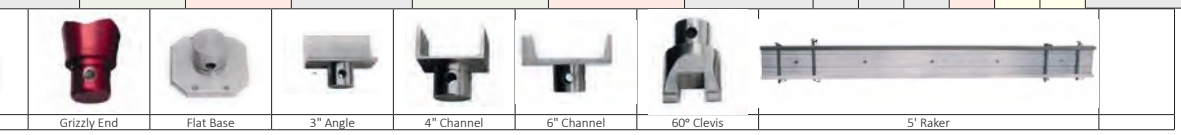
IMAGES NOT to SCALE ■Vehicle ■Light Structural ■ Heavy Structural ●●● OK but ideal
□□□□ = OPTION item - can be purchased separately from the strut. ~ = Approximate
ADJUSTMENT INCREMENTS: The distance between each locking point. FINITE will lock at any point
PNEUMATIC = Pneumatically extended with compressed air, CO2, Nitrogen etc
MANUAL= extended by hand HYD = Hydraulically extended-NB: will impart high lift/push force
CONNECT: PUSH-FIT = No tools or pins needed to connect extensions or accessories.
PIN = a metal pin is manually placed to maintain the head/ext in position
AUTO = the strut will automatically follow & lock in the extended position MANUAL= Locks with pins or may be a screw-thread collar wound up manually to lock the strut in the extended position
LIFT= The strut will impart a pressurised lift RATCHET ATTACHMENT= Add-on strut-raising 'ratchet'
MONITOR: Load cell or load-shift alarm ELECTRIC RAISE Extends the strut remotely -No high lift force

	SERIES MODEL VARIANT	COMPANY	ORIGIN	USES	COST (each) £$€ = Currency conversion only- no duty or shipping etc.
	Tornado Airstrut B ART.AS.B	GENESIS RESCUE		●■■	N/A
	Tornado Airstrut E ART.AS.E547	GENESIS RESCUE		●■■	N/A
	Tornado Extension ART.AS.18EXT	GENESIS RESCUE		■■■	N/A
	Kodiak Lifting Device 500.600.KLD	GENESIS RESCUE		■■●	N/A
	Kodiak ShortExtension 15	GENESIS RESCUE		■■●	N/A
	Kodiak LongExtension 30	GENESIS RESCUE		■■●	N/A
	ACCESSORIES	GENESIS RESCUE	 M foot		 23° foot

See USAR BUYERSGUIDE for full spec on accessories

SHORING STRUTS

VEIGHT	MIN RETRACTED LENGTH	MAX EXTENDED LENGTH	ADJUSTMENT INCREMENTS /STROKE	MAX WORK LOAD @min2:1 RETRACTED t=metric tonnes	MAX WORK LOAD @min2:1 EXTENDED t=metric tonnes	STRUT MATERIAL / OPERATING PRESSURE	OPTIONS: PNEUMATIC MANUAL HYD	OPTIONS: CONNECT: PIN / PUSH-FIT	OPTIONS: AUTO MANUAL LOCKING	OPTIONS: LIFT RATCHET ATTACHMENT	OPTIONS: MONITOR ELECTRIC RAISE	OPTIONS: TRIPOD BIPOD MONOPOD	NOTES	WWW.
7.7kg 17lb	66cm 26"	94cm 37"	50mm/2" 28cm 11"	14.5t 16USton	7.25t 8USton	6061-T6 Alu Alloy 300 BAR 20.4psi	■ ■	■ ■	■	□ □	- -	- - -	oo	genesisrescue.com
16.3kg 36lb	137cm 54"	213cm 84"	50mm/2" 76.2cm 30"	11.3t 12.5USton	6.5t 7.25USton	6061-T6 Alu Alloy 300 BAR 20.4psi	■ ■	■ ■	■	□ □	- -	- - -	oo	genesisrescue.com
2.9kg 6.5lb	45.7cm 18"	-	-	14.5t 16USton	-	6061-T6 Alu Alloy -	■ ■	■ ■	■	□ □	- -	- - -	oo	genesisrescue.com
7kg 15.5lb	77.5cm 30.5"	113cm 44.5"	Finite 35.6cm 14"	2.26t 2.5USton	2.26t 2.5USton	6061-T6 Alu Alloy -		- -	□	■ ■	- -	- - -	Can also use a power drill to rais. CAUTION-exerts lift - primarily for vehicle stabilisation	genesisrescue.com
3.9kg 8.5lb	38cm 15"	-	-	18.1t 20USton	-	6061-T6 Alu Alloy -	- - -	■		□ □	- -	- - -		genesisrescue.com
~7kg 15.5lb	76cm 30"	-	-	18.1t 20USton	-	6061-T6 Alu Alloy -i	- - -	■		□ □	- -	- - -		genesisrescue.com



Grizzly End | Flat Base | 3" Angle | 4" Channel | 6" Channel | 60° Clevis | 5' Raker

IMAGES NOT to SCALE ■Vehicle ■Light Structural ■ Heavy Structural ●●● OK but ideal
□□□□ = OPTION item - can be purchased separately from the strut. ~ = Approximate
ADJUSTMENT INCREMENTS: The distance between each locking point. FINITE will lock at any point
PNEUMATIC = Pneumatically extended with compressed air, CO2, Nitrogen etc
MANUAL= extended by hand HYD = Hydraulically extended-NB: will impart high lift/push force
CONNECT: PUSH-FIT = No tools or pins needed to connect extensions or accessories.
PIN = a metal pin is manually placed to maintain the head/ext in position
AUTO = the strut will automatically follow & lock in the extended position MANUAL= Locks with pins or may be a screw-thread collar wound up manually to lock the strut in the extended position
LIFT= The strut will impart a pressurised lift RATCHET ATTACHMENT= Add-on strut-raising 'ratchet'
MONITOR: Load cell or load-shift alarm ELECTRIC RAISE Extends the strut remotely -No high lift force

	SERIES MODEL VARIANT	COMPANY	ORIGIN	USES	COST (each) £$€ = Currency conversion only- no duty or shipping etc.	WE
	Omnishore M10 151.001.601	HOLMATRO			N/A	3 7
	Omnishore H20 151.002.166	HOLMATRO			N/A	11 25
	Omnishore P20-OL 151.001.606 151.004.141	HOLMATRO			N/A	6 14
	Omnishore P30-OL 151.002.159 151.004142	HOLMATRO			N/A	8 19
	Omnishore P40-OL 151.002.023 151.004143	HOLMATRO			N/A	11 20
	Omnishore P60-OL 151.002.160 151.004144	HOLMATRO			N/A	1 39

Omnishore ACCESSORIES

Auto-Locking Collar | Ratchet Base | Head/Foot | Beam Support | Strut Clamp | Column Clamp | BiPod Head | Mono/Tripod Head | Multi Head | Swivel Foot/Head | Anchor Hinge Base

the most comprehensive guide to USAR & Extrication Equipment ever produced

Available now during compilation which is expected to be completed in Summer 2025, after which new products and new product categories will be added continually.
Our BUYERS GUIDES are **FREE TO ALL** as digital, page-turning publications and always on the same link so you can keep checking back for updates. You can download and print a pdf version if you have a lot of printer ink but the most up-to-date version will always be available on this link and/or via our website: **www.rescuemagazines.com**
https://accessandrescue.hflip.co/BuyersGuidetoUSARextrication.html

CONTENTS

GREY= To Be Added

SHORING STRUTS

EIGHT	MIN RETRACTED LENGTH	MAX EXTENDED LENGTH	ADJUSTMENT INCREMENTS /STROKE	MAX WORK LOAD @min2:1 RETRACTED t=metric tonnes	MAX WORK LOAD @min2:1 EXTENDED t=metric tonnes	STRUT MATERIAL OPERATING PRESSURE	OPTIONS: PNEUMATIC MANUAL HYD	OPTIONS: CONNECT: PUSH-FIT PIN	OPTIONS: AUTO MANUAL LOCKING	OPTIONS: LIFT RATCHET ATTACHMENT	OPTIONS: MONITOR ELECTRIC RAISE	OPTIONS: TRIPOD BIPOD MONOPOD	NOTES	WWW.
.6kg 7.9lb	28.5cm 11.2"	47cm 18.5"	finite 18.5cm 7.3"	22.9t 25.2UStons	22.9t 25.2UStons	Alu Alloy 12BAR 174 psi	- ■ ■	■	■ -	□ -	□ □	- □ □		holmatro.com
1.4kg 5.1lb	61.3cm 24.1"	115.3cm 45.4"	finite 54cm 21.3"	22.9t 25.2UStons	22.9t 25.2UStons	Alu Alloy 720 BAR 10443 psi	■ ■ -	■	- ■	■	□ □	- □ □	2-stage telescoping, hydraulic strut can be attached to any other strut in this range	holmatro.com
.7kg 4.8lb	56cm 22"	77.5cm 30.5"	finite 21.5cm 8.5"	22.9t 25.2UStons	22.9t 25.2UStons	Alu Alloy 12BAR 174 psi	- ■ ■	■	■ □	□ -	□ □	- □ □	OL= add-on Auto-Locking collar	holmatro.com
.8kg 9.4lb	76cm 29.9"	111.5cm 45.5"	finite 39.5cm 15.6"	22.9t 25.2UStons	22.9t 25.2UStons	Alu Alloy 12 BAR 174 psi	- ■ ■	■	■ □	□ -	□ □	- □ □	Shown with optional LockNut. OL= add-on Auto-Locking collar	holmatro.com
1.9kg 6.2lb	105.5cm 41.5"	165cm 65"	finite 59.5cm 23.4"	22.9t 25.2UStons	22.7t 25UStons	Alu Alloy 12 BAR 174 psi	- ■ ■	■	■ □	□ -	□ □	- □ □	OL= add-on Auto-Locking collar	holmatro.com
18kg 9.7lb	162cm 63.8"	265cm 104.3"	finite 103cm 40.6"	22.9t 25.2UStons	17t 18.7UStons	Alu Alloy 12 BAR 174 psi	- ■ ■	■	■ □	□ -	□ □	- □ □	OL= add-on Auto-Locking collar	holmatro.com

Bipod Base | Static Base | Raker Thrust Block | Raker Edge Union | Load Cell Monitor | Hand Controller | OmniLock Drive | Power Station | Raker & Waler Rails | Raker & Waler Pins | Nailing Pad | Hydraulic Pump

IMAGES NOT to SCALE ■Vehicle ■Light Structural ■ Heavy Structural ●●● OK but ideal
□□□□ = OPTION item - can be purchased separately from the strut. ~ = Approximate
ADJUSTMENT INCREMENTS: The distance between each locking point. FINITE will lock at any point
PNEUMATIC = Pneumatically extended with compressed air, CO2, Nitrogen etc
MANUAL= extended by hand HYD = Hydraulically extended-NB: will impart high lift/push force
CONNECT: PUSH-FIT = No tools or pins needed to connect extensions or accessories.
PIN = a metal pin is manually placed to maintain the head/ext in position
AUTO = the strut will automatically follow & lock in the extended position MANUAL= Locks with pins or may be a screw-thread collar wound up manually to lock the strut in the extended position
LIFT= The strut will impart a pressurised lift RATCHET ATTACHMENT= Add-on strut-raising 'ratchet'
MONITOR: Load cell or load-shift alarm ELECTRIC RAISE Extends the strut remotely -No high lift force

	SERIES MODEL VARIANT	COMPANY	ORIGIN	USES	COST (each) £$€ = Currency conversion only- no duty or shipping etc.	WL
	Acme Thread 12-15" 22-796212	PARATECH		■ ■ ■	£340 $460 €404	6
	Acme Thread 19-25" 22-796206	PARATECH		■ ■ ■	£496 $670 €589	5 1
	Acme Thread 25-36" 22-796200	PARATECH		■ ■ ■	£571 $772 €678	6 1
	Acme Thread 37-58" 22-796202	PARATECH		■ ■ ■	£714 $965 €848	1 2
	Acme Thread 56-88" 22-796204	PARATECH		■ ■ ■	£962 $1300 €1142	1 3
	LockStroke 19-25" 22-796006	PARATECH		■ ■ ■	£744 $1005 €883	5 1
	LockStroke 25-36" 22-796000	PARATECH		■ ■ ■	£880 $1190 €1046	7 1
	LockStroke 36-57" 22-796002	PARATECH		■ ■ ■	£932 $1260 €1107	1
	LockStroke 55-89" 22-796004	PARATECH		■ ■ ■	£1242 $1680 €1475	1 3
	Lock/Acme Extension 6" 22-796017	PARATECH		■ ■ ■	£193 $260 €229	1 3
	Lock/Acme Extension 12" 22-796012	PARATECH		■ ■ ■	£204 $275 €242	2 4
	Lock/Acme Extension 24" 22-796024	PARATECH		■ ■ ■	£261 $352 €309	3 7
	Lock/Acme Extension 36" 22-796036	PARATECH		■ ■ ■	£341 $461 €405	4 9

SHORING STRUTS

EIGHT	MIN RETRACTED LENGTH	MAX EXTENDED LENGTH	ADJUSTMENT INCREMENTS /STROKE	MAX WORK LOAD @min2:1 RETRACTED t=metric tonnes	MAX WORK LOAD @min2:1 EXTENDED t=metric tonnes	STRUT MATERIAL OPERATING PRESSURE	OPTIONS: PNEUMATIC MANUAL HYD	CONNECT: PUSH-FIT PIN	AUTO MANUAL LOCKING	LIFT RATCHET ATTACHMENT	MONITOR ELECTRIC RAISE	TRIPOD BIPOD MONOPOD	NOTES	WWW.
3kg 6.6lb	31cm 12"	38cm 15"	Finite 7.6cm 3"	19.95t 22USton	19.95t 22USton	Alu Alloy 8.1-14.8 BAR 116-215 psi	- ■ -	■	■	- -	- □	□ □ □	Threaded shaft allows infinite and finite locking positions	paratech.com
5.1kg 11.2lb	48cm 19"	64cm 25"	Finite 15.2cm 6"	19.95t 22USton	19.95t 22USton	Alu Alloy 8.1-14.8 BAR 116-215 psi	- ■ ■	■	■	- -	- □	□ □ □	Threaded shaft allows infinite and finite locking positions	paratech.com
6.8kg 14.9lb	64cm 25"	91cm 36"	Finite 28cm 11"	19.95t 22USton	18t 19.8USton	Alu Alloy 8.1-14.8 BAR 116-215 psi	- ■ ■	■	■	□ □	- □	□ □ □	Threaded shaft allows infinite and finite locking positions	paratech.com
10.2kg 22.4lb	94cm 37"	147cm 58"	Finite 53.3cm 21"	18t 19.8USton	15.35t 16.9USton	Alu Alloy 8.1-14.8 BAR 116-215 psi	- ■ ■	■	■	□ □	- □	□ □ □	Threaded shaft allows infinite and finite locking positions	paratech.com
14.8kg 32.6lb	142cm 56"	224cm 88"	Finite 81.3cm 32"	15.35t 16.9USton	11t 12USton	Alu Alloy 8.1-14.8 BAR 116-215 psi	- ■ ■	■	■	- -	- □	□ □ □	Threaded shaft allows infinite and finite locking positions	paratech.com
8.8kg 12.7lb	00cm 19"	63.5cm 25"	1cm 0.4" 15.2cm 6"	19.95t 22USton	19.95t 22USton	Alu Alloy 8.1-14.8 BAR 116-215 psi	- ■ ■	■	■	- -	- □	□ □ □	Auto-locking collar in 1cm/0.4" increments	paratech.com
17.5kg 26.5lb	64cm 25"	91cm 36"	1cm 0.4" 28cm 11"	19.95t 22USton	18t 19.8USton	Alu Alloy 8.1-14.8 BAR 116-215 psi	- ■ ■	■	■	- -	- □	□ □ □	Auto-locking collar in 1cm/0.4" increments	paratech.com
20.9kg 46lb	91cm 36"	144.8cm 57"	1cm 0.4" 53.3cm 21"	18t 19.8USton	15.35t 16.9USton	Alu Alloy 8.1-14.8 BAR 116-215 psi	- ■ ■	■	■	- -	- □	□ □ □	Auto-locking collar in 1cm/0.4" increments	paratech.com
26.2kg 55.7lb	139.7cm 55"	226cm 89"	1cm 0.4" 86.4cm 34"	15.35t 16.9USton	11t 12USton	Alu Alloy 8.1-14.8 BAR 116-215 psi	- ■ ■	■	■	- -	- □	□ □ □	Auto-locking collar in 1cm/0.4" increments	paratech.com
7.7kg 16.8lb	15cm 6"	-	-	20t 22USton	-	Alu Alloy -	- - -	■	-	- -	- □	□ □ □	To fit Acme Thread AND/ OR LockStroke Struts	paratech.com
12.1kg 24.6lb	30cm 12"	-	-	20t 22USton	-	Alu Alloy -	- - -	■	-	- -	- □	□ □ □	To fit Acme Thread AND/ OR LockStroke Struts	paratech.com
13.2kg 27.1lb	61cm 24"	-	-	20t 22USton	-	Alu Alloy -	- - -	■	-	- -	- □	□ □ □	To fit Acme Thread AND/ OR LockStroke Struts	paratech.com
14.4kg 29.7lb	91cm 36"	-	-	18t 19.8USton	-	Alu Alloy -	- - -	■	-	- -	- □	□ □ □	To fit Acme Thread AND/ OR LockStroke Struts	paratech.com

IMAGES NOT to SCALE ■Vehicle ■Light Structural ■ Heavy Structural ●●● OK but ideal
□□□□ = OPTION item - can be purchased separately from the strut. ~ = Approximate
ADJUSTMENT INCREMENTS: The distance between each locking point. FINITE will lock at any point
PNEUMATIC = Pneumatically extended with compressed air, CO2, Nitrogen etc
MANUAL= extended by hand HYD = Hydraulically extended-NB: will impart high lift/push force
CONNECT: PUSH-FIT = No tools or pins needed to connect extensions or accessories.
PIN = a metal pin is manually placed to maintain the head/ext in position
AUTO = the strut will automatically follow & lock in the extended position MANUAL= Locks with pins or may be a screw-thread collar wound up manually to lock the strut in the extended position
LIFT= The strut will impart a pressurised lift RATCHET ATTACHMENT= Add-on strut-raising 'ratchet'
MONITOR: Load cell or load-shift alarm ELECTRIC RAISE Extends the strut remotely -No high lift force

	SERIES MODEL VARIANT	COMPANY	ORIGIN	USES	COST (each) £$€ = Currency conversion only- no duty or shipping etc.	WE
	AcmeThread Strut Driver 22-796200SD	PARATECH		■ ●	£3698 $5002 €4394	10 22
	AcmeThread Strut Driver 22-796202SD	PARATECH		■ ●	£4121 $5574 €4897	13 29
	LongShore 203 22-796710	PARATECH		■ ■ ■	£978 $1322 €1162	7 1
	LongShore 304 22-796720	PARATECH		■ ■ ■	£1237 $1673 €1470	1 2
	LongShore 406 22-796730	PARATECH		■ ■ ■	£1480 $2001 €1758	12 2
	LongShore 610 22-796360	PARATECH		■ ■ ■	£1752 $2360 €2073	18 4
	LongShore 1016 22-796390	PARATECH		■ ■ ■	£2675 $3618 €3178	30 6
	LongShore Ext 135 22-796341	PARATECH		■ ■ ■	£407 $550 €483	0 0
	LongShore Ext 235 22-796342	PARATECH		■ ■ ■	£510 $690 €606	4
	LongShore Ext 435 22-796356	PARATECH		■ ■ ■	£715 $966 €849	6 1
	LongShore Ext 635 22-796376	PARATECH		■ ■ ■	£923 $1240 €1090	9 2
	LongShore Adjustable Brace B23 22-796348	PARATECH		■ ■ ■	£747 $1011 €888	6 1
	LongShore Adjustable Brace B57 22-796350	PARATECH		■ ■ ■	£1020 $1377 €1210	14 32

SHORING STRUTS

EIGHT	MIN RETRACTED LENGTH	MAX EXTENDED LENGTH	ADJUSTMENT INCREMENTS /STROKE	MAX WORK LOAD @min2:1 RETRACTED t=metric tonnes	MAX WORK LOAD @min2:1 EXTENDED t=metric tonnes	STRUT MATERIAL / OPERATING PRESSURE	OPTIONS: PNEUMATIC MANUAL HYD	CONNECT: PUSH-FIT PIN	AUTO MANUAL LOCKING	LIFT RATCHET ATTACHMENT	MONITOR ELECTRIC RAISE	TRIPOD BIPOD MONOPOD	NOTES	WWW.
0.2kg 2.6lb	64cm 25"	91cm 36"	1cm 0.4" 28cm 11"	2.7t 3UStON	2.7t 3UStON	Alu Alloy -	■		■	- -	- ☐	☐ ☐ ☐	Geared Driver uses manual handle to raise the strut	paratech.com
3.4kg 9.6lb	94cm 37"	147cm 58"	1cm 0.4" 53.3cm 21"	2.7t 3UStON	2.7t 3UStON	Alu Alloy -	■		■	- -	- ☐	☐ ☐ ☐	Geared Driver uses manual handle to raise the strut	paratech.com
.3kg 6lb	66cm 26"	91cm 36"	finite 25cm 10"	19.95t 22UStON	18t 19.8UStON	Alu Alloy 8.1-14.8 BAR 116-215 psi	- ■ ■	■	■	- -	- ☐	☐ ☐ ☐	Always default to a locked position during/after inflation via air, CO2 or Nitrogen	paratech.com
0kg 2lb	91cm 36"	127cm 50"	finite 36cm 14"	18t 19.8UStON	16.2t 17.9UStON	Alu Alloy 8.1-14.8 BAR 116-215 psi	- ■ ■	■	■	- -	- ☐	☐ ☐ ☐	Always default to a locked position during/after inflation via air, CO2 or Nitrogen	paratech.com
2.7kg 8lb	122cm 48"	185cm 73"	finite 63cm 25"	19.95t 22UStON	12.8t 14.1UStON	Alu Alloy 8.1-14.8 BAR 116-215 psi	- ■ ■	■	■	- -	- ☐	☐ ☐ ☐	Always default to a locked position during/after inflation via air, CO2 or Nitrogen	paratech.com
3.6kg 1lb	183cm 72"	295cm 116"	finite 112cm 44"	12.8t 14.1UStON	16.3t 18UStON	Alu Alloy 8.1-14.8 BAR 116-215 psi	- ■ ■	■	■	- -	- ☐	☐ ☐ ☐	Always default to a locked position during/after inflation via air, CO2 or Nitrogen	paratech.com
0.2kg 7lb	290cm 114"	503cm 198"	finite 213cm 84"	7.7t 8.45UStON	1.8t 2UStON	Alu Alloy 8.1-14.8 BAR 116-215 psi	- ■ ■	■	■	- -	- ☐	☐ ☐ ☐	Always default to a locked position during/ after inflation via air, CO2 or Nitrogen. 812 Discontinued	paratech.com
0kg 0lb	30.5cm 12"	-	-	19.95t 22UStON	-	Alu Alloy -	- - -	■	-	- -	- ☐	☐ ☐ ☐	oo	paratech.com
.1kg 9lb	61cm 24"	-	-	19.95t 22UStON	-	Alu Alloy -	- - -	■	-	- -	- ☐	☐ ☐ ☐	oo	paratech.com
.8kg 5lb	122cm 48"	-	-	16.2t 17.9UStON	-	Alu Alloy -	- - -	■	-	- -	- ☐	☐ ☐ ☐	oo	paratech.com
.1kg 0lb	170cm 67"	-	-	12.8t 14.1UStON	-	Alu Alloy -	- - -	■	-	- -	- ☐	☐ ☐ ☐	oo	paratech.com
.8kg 5lb	66cm 26"	91cm 36"	finite 24.5cm 10"	00t 00UStON	-	Alu Alloy -	- ■ -	■	■	- -	- ☐	☐ ☐ ☐	Threaded shaft for length adjustment on raker and support bracing	paratech.com
4.5kg 2.7lb	152cm 60"	216cm 85"	finite 63.5cm 25"	00t 00UStON	-	Alu Alloy -	- ■ -	■	■	- -	- ☐	☐ ☐ ☐	Threaded shaft for length adjustment on raker and support bracing	paratech.com

IMAGES NOT to SCALE ■Vehicle ■Light Structural ■ Heavy Structural ●●● OK but ideal
□□□□ = OPTION item - can be purchased separately from the strut. ~ = Approximate
ADJUSTMENT INCREMENTS: The distance between each locking point. FINITE will lock at any point
PNEUMATIC = Pneumatically extended with compressed air, CO2, Nitrogen etc
MANUAL= extended by hand HYD = Hydraulically extended-NB: will impart high lift/push force
CONNECT: PUSH-FIT = No tools or pins needed to connect extensions or accessories.
PIN = a metal pin is manually placed to maintain the head/ext in position
AUTO = the strut will automatically follow & lock in the extended position MANUAL= Locks with pins or may be a screw-thread collar wound up manually to lock the strut in the extended position
LIFT= The strut will impart a pressurised lift RATCHET ATTACHMENT= Add-on strut-raising 'ratchet'
MONITOR: Load cell or load-shift alarm ELECTRIC RAISE Extends the strut remotely -No high lift force

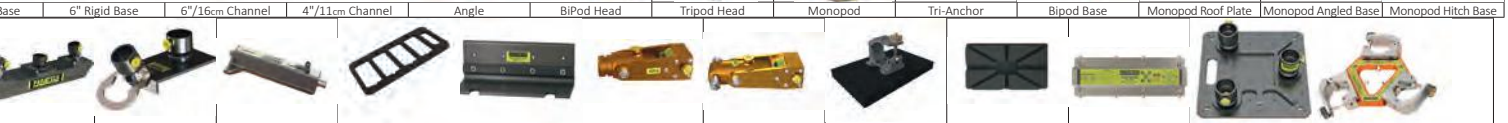
	SERIES MODEL VARIANT	COMPANY	ORIGIN	USES	COST (each) £$€ = Currency conversion only- no duty or shipping etc.	WE
	Damage Control Shore 03 22-798S03	PARATECH		● ■ ●	£1508 $2040 €1789	6 1
	Damage Control Shore 06 22-798S06	PARATECH		● ■ ●	£2070 $2800 €2456	1 2
	Damage Control Shore 10 22-798S10	PARATECH		● ■ ●	£2440 $3300 €2902	1 3
	Damage Control Ext 01 22-798X01	PARATECH		● ■ ●	£544 $735 €645	2 6
	Damage Control Ext 02 22-798X02	PARATECH		● ■ ●	£673 $910 €798	4 9
	Damage Control Ext 04 22-798X04	PARATECH		● ■ ●	£927 $1254 €1100	1
	Damage Control Brace 22-798B01	PARATECH		● ■ ●	£979 $1324 €1161	
	HydraFusion Strut 04 22-79HA04K	PARATECH		■ ■ ●	£2850 $3854 €3385	8 1
	HydraFusion Strut 10 22-79HA10K	PARATECH		■ ■ ●	£3310 $4474 €3930	1 2
	HydraFusion Strut 16 22-79HA16K	PARATECH		■ ■ ●	£3770 $5095 €4475	1 3

ALL Paratech Series ACCESSORIES
IMAGES NOT TO SCALE

SHORING STRUTS

EIGHT	MIN RETRACTED LENGTH	MAX EXTENDED LENGTH	ADJUSTMENT INCREMENTS /STROKE	MAX WORK LOAD @min2:1 RETRACTED t=metric tonnes	MAX WORK LOAD @min2:1 EXTENDED t=metric tonnes	STRUT MATERIAL OPERATING PRESSURE	OPTIONS: PNEUMATIC MANUAL HYD	CONNECT: PUSH-FIT PIN	AUTO MANUAL LOCKING	LIFT RATCHET ATTACHMENT	MONITOR ELECTRIC RAISE	TRIPOD BIPOD MONOPOD	NOTES	WWW.
.2kg 3.7lb	66cm 25"	91cm 36"	28cm 11"	20t 22USton	20t 22USton	Anodized Aircraft Alu -	- ■ -	■	■	- -	- -	- - -	corrosion proof for marine environments. For sealing of hull ruptures on ships	paratech.com
1.8kg 26lb	122cm 47"	185cm 73"	66cm 26"	20t 22USton	20t 22USton	Anodized Aircraft Alu -	- ■ -	■	■	- -	- -	- - -	corrosion proof for marine environments. For sealing of hull ruptures on ships	paratech.com
7.8kg 9.3lb	183cm 71"	295cm 116"	114cm 45"	20t 22USton	14.5t 16USton	Anodized Aircraft Alu -	- ■ -	■	■	- -	- -	- - -	corrosion proof for marine environments. For sealing of hull ruptures on ships	paratech.com
.9kg 6.3lb	30.5cm 12"	-	-	20t 22USton	20t 22USton	Anodized Aircraft Alu -	- - -	■	-	- -	- -	- - -	corrosion proof for marine environments. For sealing of hull ruptures on ships	paratech.com
.3kg 9.4lb	61cm 24"	-	-	20t 22USton	20t 22USton	Anodized Aircraft Alu -	- - -	■	-	- -	- -	- - -	corrosion proof for marine environments. For sealing of hull ruptures on ships	paratech.com
7kg 5.4lb	122cm 48"	-	-	20t 22USton	20t 22USton	Anodized Aircraft Alu -	-	■	-	- -	- -	- - -	corrosion proof for marine environments. For sealing of hull ruptures on ships	ooo.com
00kg 00lb	45.7cm 18"	55.8cm 22"	-	20t 22USton	20t 22USton	Anodized Aircraft Alu -	- ■ -	■		- -	- -	- - -	Add 4" for head and foot plates. For sealing of hull ruptures on ships	ooo.com
.5kg 8.7lb	46.2cm 18.2"	55.8cm 22"	finite 10.2cm 4"	9t 10USton	9t 10USton	Anodized Aircraft Alu 690 BAR 10000 psi	■ - -	■	■	- ■	- -	- - -	hydraulic lifting strut can be attached to any *Para* strut via converter can lift 10USt or stabilise 20USst	paratech.com
2.8kg 8.3lb	64cm 25.2"	88.9cm 35"	finite 25.4cm 10"	9t 10USton	9t 10USton	Anodized Aircraft Alu 690 BAR 10000 psi	■ - -	■	■	- ■	- -	- - -	hydraulic lifting strut can be attached to any *Para* strut via converter can lift 10USt or stabilise 20USst	paratech.com
6.9kg 7.2lb	81.3cm 32"	121.2cm 47.7"	finite 40.4cm 15.9"	9t 10USton	9t 10USton	Anodized Aircraft Alu 690 BAR 10000 psi	■ - -	■	■	- ■	- -	- - -	hydraulic lifting strut can be attached to any *Para* strut via converter can lift 10USt or stabilise 20USst	paratech.com

Base | 6" Rigid Base | 6"/16cm Channel | 4"/11cm Channel | Angle | BiPod Head | Tripod Head | Monopod | Tri-Anchor | Bipod Base | Monopod Roof Plate | Monopod Angled Base | Monopod Hitch Base



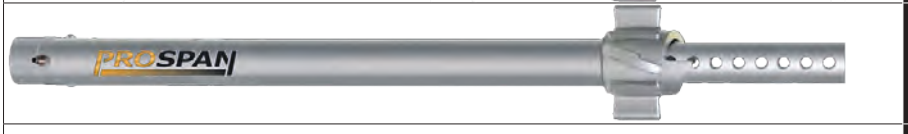
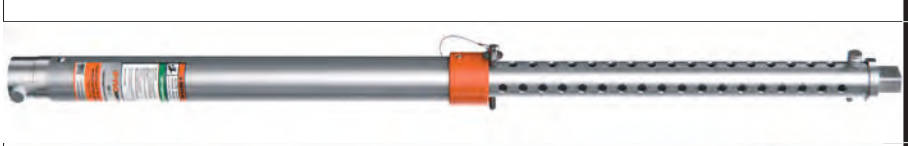
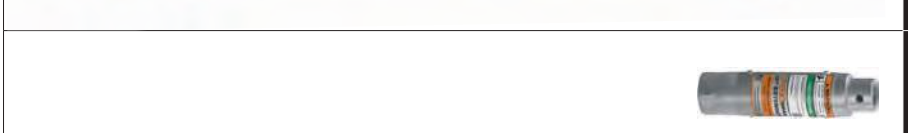
side Thrust Block | Inside Thrust Block | Waler Stop Block | Latch Holder | Raker Angle Base | Raker Junction | Rail Junction | Nailing Pad & Clamp | Rubber Pad | Waler Connector | Column head/base | Column tie

itor | Angel Load Alarm | Driver handle | Acmethread strut driver kit | 1.5 Spot Waler, 6 & 8ft Waler Rails

HydraFusion ACCESSORIES in addition to any converted accessory

Hydraulic pump with gauge | Longshore converter | Lock/acme converter

IMAGES NOT to SCALE ■Vehicle ■Light Structural ■ Heavy Structural ●●● OK but ideal
□□□□ = OPTION item - can be purchased separately from the strut. ~ = Approximate
ADJUSTMENT INCREMENTS: The distance between each locking point. FINITE will lock at any point
PNEUMATIC = Pneumatically extended with compressed air, CO2, Nitrogen etc
MANUAL= extended by hand HYD = Hydraulically extended-NB: will impart high lift/push force
CONNECT: PUSH-FIT = No tools or pins needed to connect extensions or accessories.
PIN = a metal pin is manually placed to maintain the head/ext in position
AUTO = the strut will automatically follow & lock in the extended position MANUAL= Locks with pins or may be a screw-thread collar wound up manually to lock the strut in the extended position
LIFT= The strut will impart a pressurised lift RATCHET ATTACHMENT= Add-on strut-raising 'ratchet'
MONITOR: Load cell or load-shift alarm ELECTRIC RAISE Extends the strut remotely -No high lift force

	SERIES MODEL VARIANT	COMPANY	ORIGIN	USES	COST (each) £$€ = Currency conversion only- no duty or shipping etc.	W
	Prospan PR01	PROSPAN MANUFACTURING		■ ■ ■	£370 $500 €440	6
	Prospan PR02	PROSPAN MANUFACTURING		■ ■ ■	£463 $625 €550	8
	Prospan PR03	PROSPAN MANUFACTURING		■ ■ ■	£518 $700 €615	1
	Prospan PR04	PROSPAN MANUFACTURING		■ ■ ■	£640 $865 €760	1
	Prospan Ext 12"	PROSPAN MANUFACTURING		■ ■ ■	N/A	2
	Prospan Ext 24"	PROSPAN MANUFACTURING		■ ■ ■	N/A	3
	Prospan Ext 36"	PROSPAN MANUFACTURING		■ ■ ■	N/A	5
	TASS Shore 1	PROSPAN MANUFACTURING		■ ■	N/A	5
	TASS Shore 2	PROSPAN MANUFACTURING		■ ■	N/A	7
	TASS Shore 3	PROSPAN MANUFACTURING		■ ■	N/A	
	TASS Shore 4	PROSPAN MANUFACTURING		■ ■	N/A	1
	TASS 12" Ext	PROSPAN MANUFACTURING		■ ■	N/A	5

Prospan & TASS ACCESSORIES

SHORING STRUTS

WEIGHT	MIN RETRACTED LENGTH	MAX EXTENDED LENGTH	ADJUSTMENT INCREMENTS /STROKE	MAX WORK LOAD @min2:1 RETRACTED t=metric tonnes	MAX WORK LOAD @min2:1 EXTENDED t=metric tonnes	STRUT MATERIAL / OPERATING PRESSURE	OPTIONS: PNEUMATIC MANUAL HYD	CONNECT: PUSH-FIT PIN	AUTO MANUAL LOCKING	LIFT RATCHET ATTACHMENT	MONITOR ELECTRIC RAISE	TRIPOD BIPOD MONOPOD	NOTES	WWW.
5.8kg 15lb	54.6cm 21.5"	67.3cm 26.5"	50mm/2" 12.7cm 5"	9t 10USton	9t 10USton	6061-T6 aluminum 7.9-15 BAR 115-220 psi	- ■ ■	■ -	■ □*	- -	- -	- - □	Add 4" for head and foot plates. *Spring-loaded inner collar available for auto-locking at fixed increments	prospanshoring.com
3.2kg 18lb	74.9cm 29.5"	104cm 41"	50mm/2" 31.7cm 11.5"	9t 10USton	9t 10USton	6061-T6 aluminum 7.9-15 BAR 115-220 ps	- ■ ■	■ -	■ □*	- -	- -	- - □	Add 4" for head and foot plates. *Spring-loaded inner collar available for auto-locking at fixed increments	prospanshoring.com
10.9kg 24lb	107.9cm 42.5"	170cm 67"	50mm/2" 62.1cm 24.5"	9t 10USton	9t 10USton	6061-T6 aluminum 7.9-15 BAR 115-220 psi	- ■ ■	■ -	■ □*	- -	- -	- - □	Add 4" for head and foot plates. *Spring-loaded inner collar available for auto-locking at fixed increments	prospanshoring.com
14.5kg 32lb	170cm 67"	266.7cm 105"	50mm/2" 96.7cm 38"	9t 10USton	9t 10USton	6061-T6 aluminum 7.9-15 BAR 115-220 ps	- ■ ■	■ -	■ □*	- -	- -	- - □	Add 4" for head and foot plates. *Spring-loaded inner collar available for auto-locking at fixed increments	prospanshoring.com
2.3kg 5lb	30cm 12"	-	-	9t 10USton	-	6061-T6 aluminum -	- - -	■ -	-	- -	- -	- - □	Add 4" for head and foot plates	prospanshoring.com
3.6kg 8lb	61cm 248"	-	-	9t 10USton	-	6061-T6 aluminum -	- - -	■ -	-	- -	- -	- - □	Add 4" for head and foot plates	prospanshoring.com
5,4kg 12lb	91.4cm 36"	-	-	9t 10USton	-	6061-T6 aluminum -	-	■ -	-	- -	- -	- - □	Add 4" for head and foot plates. 48 & 60" Extensions discontinued.	prospanshoring.com
5.9kg 13lb	58.4cm 23"	70cm 27.5"	12.7mm ½" 12cm 4.5"	9.5t 10.5USton	3.2t 3.5USton	6005 aluminum -	- ■ -	■	■	- -	- -	- - -	Telescoping Aluminum Support System for vehicles and light structural shoring	prospanshoring.com
7.25kg 16lb	66cm 26"	109cm 43"	12.7mm ½" 30cm 12"	9.5t 10.5USton	3.2t 3.5USton	6005 aluminum -	- ■ -	■	■	- -	- -	- - -	Telescoping Aluminum Support System for vehicles and light structural shoring	prospanshoring.com
9kg 20lb	78.75cm 31"	121.9cm 48"	12.7mm ½" 56cm 22"	9.5t 10.5USton	3.2t 3.5USton	6005 aluminum -	- ■ -	■	■	- -	- -	- - -	Telescoping Aluminum Support System for vehicles and light structural shoring	prospanshoring.com
13.6kg 30lb	109cm 43"	259cm 102"	12.7mm ½" 150cm 59"	9.5t 10.5USton	3.2t 3.5USton	6005 aluminum -	- ■ -	■	■	- -	- -	- - -	Telescoping Aluminum Support System for vehicles and light structural shoring	prospanshoring.com
5.4kg 12lb	30cm 12"	-	-	3.6t 4USton	-	6005 aluminum -	- ■ -	■	■	- -	- -	- - -	Telescoping Aluminum Support System for vehicles and light structural shoring	prospanshoring.com

IMAGES NOT to SCALE ■Vehicle ■Light Structural ■ Heavy Structural ●●● OK but ideal
□□□□ = OPTION item - can be purchased separately from the strut. ~ = Approximate
ADJUSTMENT INCREMENTS: The distance between each locking point. FINITE will lock at any point
PNEUMATIC = Pneumatically extended with compressed air, CO2, Nitrogen etc
MANUAL= extended by hand HYD = Hydraulically extended-NB: will impart high lift/push force
CONNECT: PUSH-FIT = No tools or pins needed to connect extensions or accessories.
PIN = a metal pin is manually placed to maintain the head/ext in position
AUTO = the strut will automatically follow & lock in the extended position MANUAL= Locks with pins or may be a screw-thread collar wound up manually to lock the strut in the extended position
LIFT= The strut will impart a pressurised lift RATCHET ATTACHMENT= Add-on strut-raising 'ratchet'
MONITOR: Load cell or load-shift alarm ELECTRIC RAISE Extends the strut remotely -No high lift force

	SERIES MODEL VARIANT	COMPANY	ORIGIN	USES	COST (each) £$€ = Currency conversion only- no duty or shipping etc.	W
	Super X Short SPX-EX41	RES-Q-JACK		■ ■	N/A	1
	Super X Short SPX-EX41-S	RES-Q-JACK		■ ■ ●	N/A	1
	Super X Long SPX-EX56	RES-Q-JACK		■ ■	N/A	1 3
	Super X Long SPX-EX56-S	RES-Q-JACK		■ ■ ●	N/A	1
	Super X Trench 18 SPX-TS22	RES-Q-JACK		● ■ ■	N/A	
	Super X Trench 28 SPX-TS32	RES-Q-JACK		● ■ ■	N/A	1
	Super X Trench 38 SPX-TS42	RES-Q-JACK		● ■ ■	N/A	
	Super X 12"Extension SPX-12EX	RES-Q-JACK		■ ■ ■	N/A	
	Super X 24"Extension SPX-24EX	RES-Q-JACK		■ ■ ■	N/A	
	Super X 36"Extension SPX-36EX	RES-Q-JACK		■ ■ ■	N/A	
	Super X ACCESSORIES	RES-Q-JACK	 Static Foot		 Swivel Foot	

See USAR BUYERSGUIDE for full spec on accessories

SHORING STRUTS

WEIGHT	MIN RETRACTED LENGTH	MAX EXTENDED LENGTH	ADJUSTMENT INCREMENTS /STROKE	MAX WORK LOAD @min2:1 RETRACTED t=metric tonnes	MAX WORK LOAD @min2:1 EXTENDED t=metric tonnes	STRUT MATERIAL OPERATING PRESSURE	OPTIONS: PNEUMATIC MANUAL HYD	CONNECT: PUSH-FIT PIN	AUTO MANUAL LOCKING	LIFT RATCHET ATTACHMENT	MONITOR ELECTRIC RAISE	TRIPOD BIPOD MONOPOD	NOTES	WWW.
10.9kg 24lb	131cm 51.6"	175cm 69"	Finite 44cm 17.3"	12.2t 13.4USton	8.1t 8.9USton	6061-T6 aluminum 13.8 BAR 200 psi	- ■ □	■	■	- -	- -	- - □	Red inner tube is lighter & lower strength	resqjack.com
13.15kg 29lb	131cm 51.6"	175cm 69"	Finite 44cm 17.3"	16.2t 17.8USton	10.9t 12USton	6061-T6 aluminum 13.8 BAR 200 psi	- ■ □	■	■	- -	- -	- - □	Black inner tube is heavier & higher strength. Can be supplied as pneumatic.	resqjack.com
14.9kg 32.8lb	172cm 67.7"	255cm 100.4"	Finite 82cm 32.3"	9.6t 10.6USton	8.2t 9USton	6061-T6 aluminum 13.8 BAR 200 psi	- ■ □	■	■	- -	- -	- - □	Red inner tube is lighter & lower strength	resqjack.com
17.7kg 39lb	172cm 67.7"	255cm 100.4"	Finite 82cm 32.3"	16.2t 17.8USton	10.9t 12USton	6061-T6 aluminum 13.8 BAR 200 psi	- ■ □	■	■	- -	- -	- - □	Black inner tube is heavier & higher strength	resqjack.com
4.1kg 9lb	56cm 22"	66cm 26"	Finite 10.1cm 4"	17.9t 19.7USton	17.5t 19.25USton	6061-T6 aluminum 13.8 BAR 200 psi	- ■ ■	■	■	- -	- -	- - □		resqjack.com
6.4kg 14.1lb	81.2cm 32"	116cm 46"	Finite 35.5cm 14"	16.5t 18.2USton	14.5t 15.95USton	6061-T6 aluminum 13.8 BAR 200 psi	- ■ ■	■	■	- -	- -	- - □		resqjack.com
8.2kg 18lb	107cm 42.1"	162.5cm 64"	Finite 56cm 22"	15t 16.6USton	12.4t 13.7USton	6061-T6 aluminum 13.8 BAR 200 psi	- ■ ■	■	■	- -	- -	- - □		resqjack.com
2.7kg 6lb	31cm 12.2"	-	-	17.9t 19.7USton	-	6061-T6 aluminum -	- - -	■	-	- -	- -	- - □		resqjack.com
3.6kg 8lb	61cm 24"	-	-	17.9t 19.7USton	-	6061-T6 aluminum -	- - -	■	-	- -	- -	- - □		resqjack.com
5kg 11lb	92cm 36"	-	-	17.9t 19.7USton	-	6061-T6 aluminum -	- - -	■	-	- -	- -	- - □		resqjack.com

Small Base Plate | Large Anchor Base Plate | Multi-Head | Tripod Head

IMAGES NOT to SCALE ■Vehicle ■Light Structural ■ Heavy Structural ●●● OK but ideal
□□□□ = OPTION item - can be purchased separately from the strut. ~ = Approximate
ADJUSTMENT INCREMENTS: The distance between each locking point. FINITE will lock at any point
PNEUMATIC = Pneumatically extended with compressed air, CO2, Nitrogen etc
MANUAL= extended by hand HYD = Hydraulically extended-NB: will impart high lift/push force
CONNECT: PUSH-FIT = No tools or pins needed to connect extensions or accessories.
PIN = a metal pin is manually placed to maintain the head/ext in position
AUTO = the strut will automatically follow & lock in the extended position MANUAL= Locks with pins or may be a screw-thread collar wound up manually to lock the strut in the extended position
LIFT= The strut will impart a pressurised lift RATCHET ATTACHMENT= Add-on strut-raising 'ratchet'
MONITOR: Load cell or load-shift alarm ELECTRIC RAISE Extends the strut remotely -No high lift force

	SERIES MODEL VARIANT	COMPANY	ORIGIN	USES	COST (each) £$€ = Currency conversion only- no duty or shipping etc.	W
	ProFix PMX470	RESQTEC			N/A	7 10
	ProFix PMX600	RESQTEC			N/A	8 1
	ProFix PMX880	RESQTEC			N/A	1 2
	ProFix PMX1400	RESQTEC			N/A	3
	ProFix PMX2300	RESQTEC			N/A	5
	ProFix Hyam250	RESQTEC			N/A	9 2
	ProFix 15cm Ext EX150	RESQTEC			N/A	1
	ProFix 30cm Ext EX300	RESQTEC			N/A	2 5
	ProFix 60cm Ext EX600	RESQTEC			N/A	
	ProFix 90cm Ext EX900	RESQTEC			N/A	5 1
	ProFix 120cm Ext EX1200	RESQTEC			N/A	7 1

ProFix ACCESSORIES


Tripod Head


Bipod Head


Monopod Head


Column Gantry


Powerplate


Crown


Beam Support


Edge Support


Fixed Base


Multi-Swivels

NB: As with all of our data tables in these GUIDES, corrections made by the manufacturers are often at odds with their own data listed in brochures or on their web pages. This can make it seem as though our figures are incorrect but we can only list details as they are provided/ corrected by the manufacturer. If in doubt, check directly with the manufacturer.

SHORING STRUTS

EIGHT	MIN RETRACTED LENGTH	MAX EXTENDED LENGTH	ADJUSTMENT INCREMENTS /STROKE	MAX WORK LOAD @min2:1 RETRACTED t=metric tonnes	MAX WORK LOAD @min2:1 EXTENDED t=metric tonnes	STRUT MATERIAL / OPERATING PRESSURE	OPTIONS: PNEUMATIC MANUAL HYD	OPTIONS: CONNECT: PUSH-FIT PIN	OPTIONS: AUTO MANUAL LOCKING	OPTIONS: LIFT RATCHET ATTACHMENT	OPTIONS: MONITOR ELECTRIC RAISE	OPTIONS: TRIPOD BIPOD MONOPOD	NOTES	WWW.
7.6kg 6.75lb	47cm 18.5"	66.3cm 26.1"	Finite 14.4cm 5.7"	30t 33USton	30t 33USton	Alu 12 BAR 174 psi	- ■ ■	■	■	- -	- -	□ □ □		resqtec.com
3.8kg 9.4lb	60cm 23.6"	91.4cm 36"	Finite 26.5cm 10.4"	30t 33USton	30t 33USton	Alu 12 BAR 174 psi	- ■ ■	■	■	- -	- -	□ □ □		resqtec.com
1.7kg 5.8lb	88cm 34.6"	142.9cm 56.25"	Finite 50cm 19.7"	30t 33USton	30t 33USton	Alu 12 BAR 174 psi	- ■ ■	■	■	- -	- -	□ □ □		resqtec.com
17kg 37.5lb	140cm 55.1"	238.6cm 94"	Finite 93.7cm 36.9"	30t 33USton	30t 33USton	Alu 12 BAR 174 psi	- ■ ■	■	■	- -	- -	□ □ □		resqtec.com
26kg 57.3lb	230cm 90.5"	404.2cm 159"	Finite 169.3cm 66.65"	30t 33USton	17.9t 19.8USton	Alu Alloy 12 BAR 174 psi	- ■ ■	■	■	- -	- -	□ □ □		resqtec.com
9.7kg 21.3lb	44.8cm 17.6"	70.2cm 27.6"	Finite 25.4cm 10"	22.6t 24.9USton	22.6t 24.9USton	Alu Alloy 700 BAR 10152 psi	■ - -	■	■	- -	- -	□ □ □		resqtec.com
.76kg 3.9lb	15cm 6"	-	-	30t 33USton	-	Alu Alloy -	- - -	■	■	- -	- -	□ □ □		resqtec.com
2.5kg 5.5lb	30cm 12"	-	-	30t 33USton	-	Alu Alloy -	- - -	■	■	- -	- -	□ □ □		resqtec.com
4kg 9lb	60cm 23.7"	-	-	30t 33USton	-	Alu Alloy -	- - -	■	■	- -	- -	□ □ □		resqtec.com
5.5kg 12.2lb	90cm 35.6"	-	-	30t 33USton	-	Alu Alloy -	- - -	■	■	- -	- -	□ □ □		resqtec.com
7.2kg 15.9lb	120cm 47.4"	-	-	30t 33USton	-	Alu Alloy -	- - -	■	■	- -	- -	□ □ □		resqtec.com

Rhino | Chain Head | Junction | Multi-Connector | Anchor Base Plate | Raker Rail | Raker Rail Connector | Raker Rail Hinge | Nailing Block | Load Monitor | Remote Controller

ALSO There is an extensive range of more traditional 'Airshore' style struts from French manufacturer **SCORPE** but we have been unable to get sufficient information or images to include them here. Likewise **Hydram**, have also been omitted - their three hybrid struts are more akin to rams in function but we have again been unable to confirm certain data so have left them out of this article but will include both ranges in the **USAR BUYERSGUIDE** with incomplete data/images that we will update as soon as we get it.

SENCEIVE Rockfall/Landslip monitor

by Charlotte Ina-Sterland

Using Sensors to Monitor Rockfalls & prevent Disasters

The Senceive monitoring system includes a solar-powered base station with high def camera providing real time images to a smart-device. Tilt & proximity sensors on top of posts and draw-wire sensors mid-post (see page 64) are drawn tight by impacting rocks/debris.

[ED: We have to say at the outset, that this system is not yet used in 'local' emergency/disaster response but it could be and hopefully this showcase will highlight a potential that others may be able to run with. This article probably should have been in WILDERNESS SAR but with landslides in (or adjacent) urban areas USAR may well prove to be the financial catalyst for its use by rescue services rather than engineers in remote parks]

Using Sensors to Monitor Rockfalls to Prevent Disasters

Landslides are becoming more frequent in both natural mountainous areas and mines. Around $300 billions in damage was caused by geo-hazards in 2024. This is 30% more, on average, than the last 10 years. While this is a concern for governments, landowners, mine owners and local councils, it can soon becomes a search and rescue problem. Having rockfall monitoring systems in place in hazard zones could be one way to understand and predict landslides more effectively; both before a landslide and when a rescue operation is active.

Heavy rainfall triggered a landslide in Indonesia in January 2025, in which 25 people died, with many injured. 200 rescue personnel were sent to the site. Search and rescue teams had to walk for miles to reach the site where the victims were, due to damaged access roads. Machinery was deployed to clear the roads. Further rain was predicted meaning rescuers had considerable risk from further landslides.

In February 2025, in Sichuan province in China, a large landslide was caused by rainfall in a geologically fragile area. While hundreds of people were successfully evacuated, the Chinese President Xi Jinping, 'urged efforts to properly handle the aftermath. He stressed the need to strengthen monitoring and early warning systems; ensuring rescue work is carried out scientifically; preventing the occurrence of secondary disasters.' This could mean uphill monitoring, or using drones.

Understanding How Natural Landslides Occur

A combination of geological conditions and often, heavy rainfall, lead to landslides. The most common kind of hazardous landslide is a 'debris flow.' This means it is occurring in the regolith (rock and soil debris). Generally on slopes of more than 20 degrees, debris can flow on slopes at less than ten degrees.

Commercial and forest fire Deforestation is a contributing factor for landslides, as it leads to more exposed soil. Seasonal changes in rain and snowfall can cause landslides and they can

often occur in the same place due to the particular nature of the area. Debris flows can be kilometres wide, with depth of tens of metres.

Teams coordinating rescues in landslides tend to combine expertise in geology, monitoring and information technology with some preferring to use drones. The technology needed for these operations is often with a view to clearing a site after an incident, rather than ongoing monitoring before something happens.

Monitoring Landslides in Mountainous Areas

Rockfall monitoring over time is key for predicting future hazardous events. Understanding the rock movements in national parks is a long term process and involves understanding the underlying geology. Technology for monitoring places where one-off rockfalls occur can lead to a better knowledge of the area and understanding where to place further preventative sensors.

Hazard areas or rockfall danger zones can then be more closely monitored during operations in the area. In mountainous areas, rocks tend to fall from high up and only be a real hazard when they reach the lower parts of the mountain, so high up monitoring set ups can lead to further understanding of the mountain and how rockfalls occur, as well as preventing serious accidents in a known danger zone.

At the base of a slope, where there is often already debris and large rockfalls have occurred, teams can identify areas which are likely to receive rockfalls and monitor them.

In areas like Yosemite, where visitors go in huge numbers each year, monitoring rock falls is really important. Visitor numbers are even partly responsible for some rockfalls. In depth monitoring might lead to a better understanding of rockfall patterns.

Building rockfall data could also help in the long term understanding of how and why rockfalls happen in mountainous areas as well as mines.

Mining Landslides: Rescue Operations in Mines

Mines often contain unstable land areas and slopes, since material is being removed from the site or sites are more bare than they were originally, and thus highly prone to land movements. Piles of waste material can also fall downhill in the case of rainfall or additional pressure on the slope area from falling material.

Rockfall incidents in mines often lead to an immediate decline in company share prices; this is partly because rescue operations can be challenging for rescue teams. There are a huge number of incidents each year in which miners become trapped due to rockfall incidents.

In Turkey, in February 2024; of nine people missing in an active gold mine; five people were believed to be in a container hut, three in a vehicle and one in a truck, at the disaster site. Some 1,700 personnel were involved in the emergency operation, including 339 search and rescue workers.

Many of the most perilous situations for search and rescue teams occur in scenarios where illegal mining has been ongoing. In countries such as Myanmar, mining is not hugely operational in rainy season, as landslides are frequent at this time, but illegal mining continues and often results in incidents where search and rescue professionals are called out.

In February 2025, hundreds of people were trapped in a South African mine, while government refused to send search and rescue to save people, or even let in supplies. According to the Guardian, 'Illegal mining has flourished in South Africa in recent decades as many industrial mines have been exhausted. Analysts estimate there are about 30,000 "zama zama" illegal miners producing 10% of South Africa's gold output in 6,000 abandoned mineshafts, often controlled by violent criminal syndicates.'

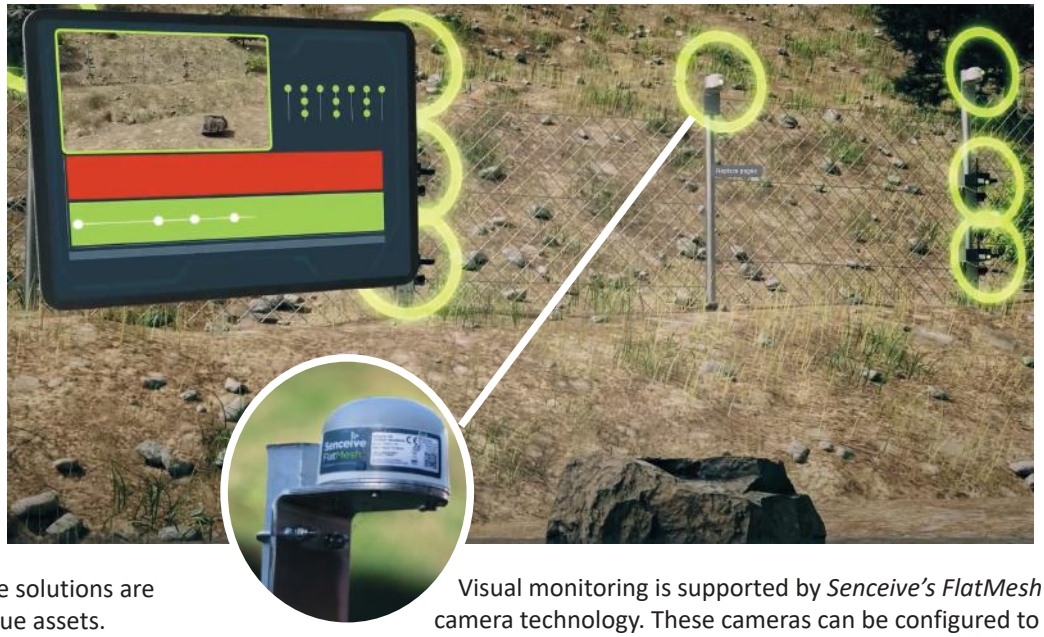
The provision and delivery of supplies of food to people trapped implies hazards also, again a situation which can be helped by the monitoring of rockfall hazards. Where a mine has collapsed or rockfall has trapped people; the situation does not 'subside' after the rockfall incident. The danger continues afterwards; as rockfalls and landslides often happen repeatedly.

In these scenarios, while it might be great to have a prior awareness of rock movement; it's also good to have a system to monitor further rockfalls during the rescue. Putting monitoring systems in place could be seen as akin to legalising mining in dangerous season, but the problem remains; illegal miners continue to go on the hunt and rescue professionals are there to help when something goes wrong; inevitably taking risk and needing tools which can be deployed easily. Many of the systems available use LiDAR or radar.

Monitoring could be key to understanding landslides, giving rescuers more knowledge about the situation. While drones can be useful, rockfall detection systems can be put in place higher up a hill or mountain or mine slope and can detect even small stones, which some drone cameras might struggle to pick up on. They can also remain in place for days, without needing constant monitoring; or a battery recharge; as sensors can be solar powered, rather than battery powered as drones often are.

Could Monitoring Technology Enhance Rockfall Response and Understanding?

Senceive provides advanced in-situ monitoring systems designed to deliver near real-time detection of rockfall activity – and is used for protecting critical infrastructure such as railways, roads, tunnels, and slopes. While not currently used by search and rescue teams, the system can be deployed within just a few hours, offering rapid insight into rock and slope movement and enabling quicker response and better-informed decision-making. UK-based *Senceive* provides



services to companies such as railway, highway and mining asset owners. Their monitoring systems are designed for long-term installation in areas where rockfalls pose a serious risk. These solutions are currently used to protect high-value assets.

What Is Senceive's Wireless Monitoring Technology? How Does it Work?

At the heart of *Senceive*'s system are tilt sensors installed directly on rockfall fences. These may be either pre-existing fences or newly installed barriers supplied by external providers. While *Senceive* doesn't supply fencing directly, the company can advise on key considerations. The setup typically includes a combination of tilt sensors, draw wire (crack) sensors, and remote cameras, all working together through *Senceive's FlatMesh* communication platform.

The tilt sensors (pic right and atop the posts) are triaxial, micro-electro-mechanical (MEMS)-based devices that detect subtle rotational movement and sudden impacts caused by falling rocks. If a rock hits the fence or causes a fencepost to shift, the sensors capture the change in angle and send alerts. These sensors have a resolution of 0.0001 degrees and battery life of 12-15 years depending on the reporting schedule and are capable of "waking up" to transmit data immediately when triggered by unusual motion, rather than waiting for the next scheduled reading.

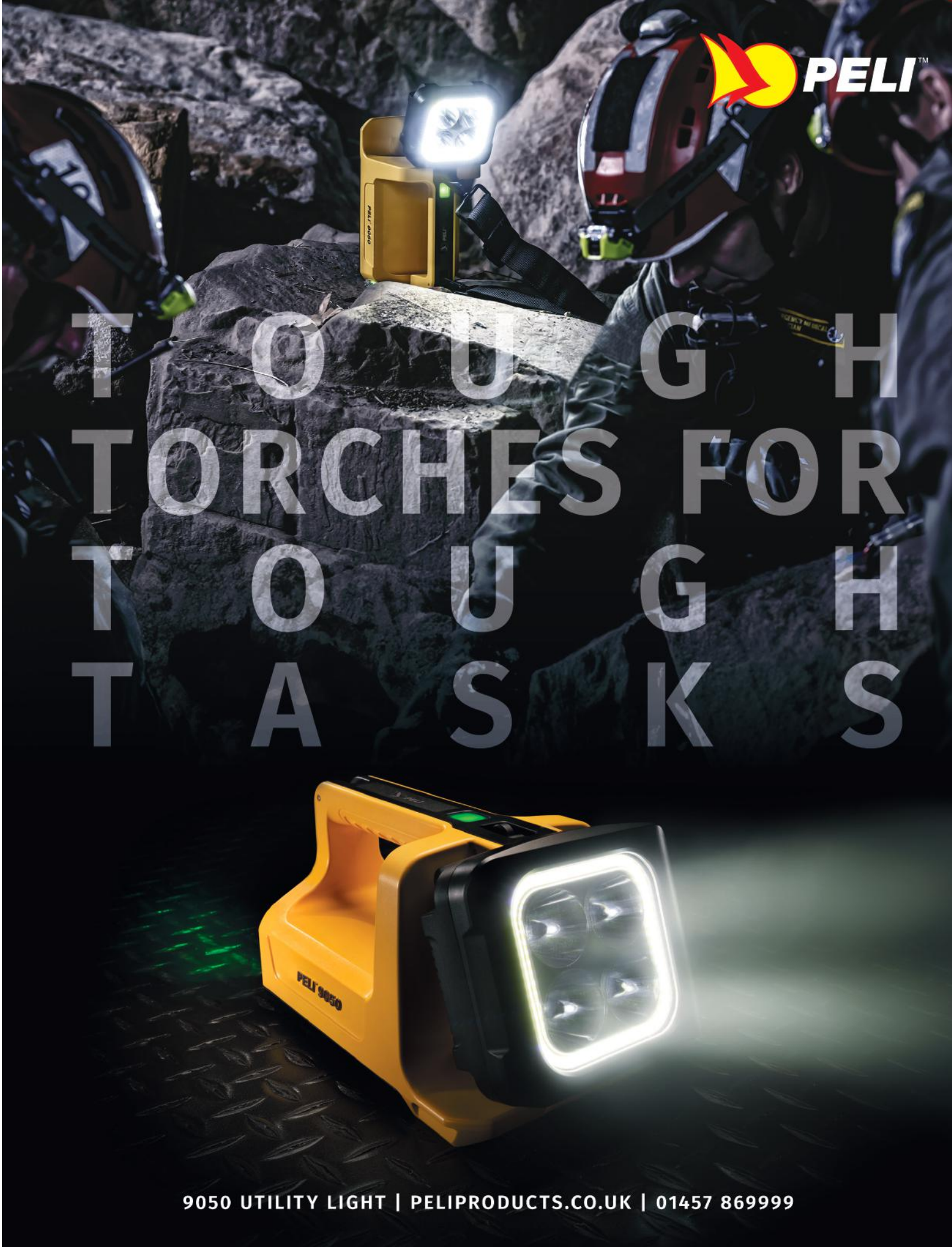
Draw wire sensors (pic top left) , referred to by *Senceive* as crack sensor nodes, are used to detect when the wire is pulled or extended. This typically indicates an accumulation of smaller debris pressing against the fence. Together, the tilt and draw wire sensors provide complementary data that helps identify both sudden, high-energy rockfall events and more gradual build-ups of material.

Visual monitoring is supported by *Senceive's FlatMesh* camera technology. These cameras can be configured to take images on a set schedule or can be triggered in near real-time by movement detected by the nearby sensors (up to 300 metres away). The *CameraHub* includes a 4G-enabled, low-light monochrome camera with a high-capacity rechargeable battery and a fixed-focus lens featuring advanced self-cleaning. The user can login to the system to see the gallery of photos.

A 4G Gateway (usually with solar panel - see title picture) must be installed as part of the system to transmit data. If a solar panel is in use, a power source is not needed. This setup is especially useful in remote areas where wired power isn't available. The system's smart configuration also allows for strategic placement of sensors across different elevations on a slope. If a sensor located near the base is triggered, the system can continue monitoring higher-up sensors to determine if further movement is likely. Anchors can also be embedded directly into visible cracks in the rock, with displacement captured as rods shift in response to widening gaps - providing early warning of instability.

Importantly, the platform is designed to minimise false alarms. When a sensor detects activity, the wider system automatically checks neighbouring nodes to determine whether the event is isolated -such as an animal brushing past – or part of a broader, more serious incident. This intelligent correlation, combined with minimal latency in data delivery, ensures that real threats can be identified and acted upon quickly.

Although *Senceive*'s monitoring systems are currently designed for long-term infrastructure protection, there could be potential for future use in emergency response scenarios. While the technology has not yet been deployed in active search and rescue or emergency operations, its ability to be installed quickly and provide real-time data could, with further testing, offer support to teams operating in rockfall-prone areas. In such settings, timely information could help assess ongoing risks and improve understanding of slope behaviour following an event. More info on **www.senceive.com**


PELI™
TOUGH
TORCHES FOR
TOUGH
TASKS
PELI 9050
9050 UTILITY LIGHT | PELIPRODUCTS.CO.UK | 01457 869999

EDELRID Descender MEGAWATT & Mobile Fall Arrester FUSE

by Adam Jones

Adam is a veteran wholetime firefighter having also served in USAR and Technical Rescue capacities for decades. Adam is also a qualified arborist with his own company

ADAM-BEFORE & AFTER proving what we already knew, take off the beard and a decade comes with it!

There's been a fair bit of chatter around *Edelrid*'s *Megawatt* and *Fuse* setup lately, especially among those bouncing between rope access, rescue, and arboriculture. And rightly so—it's a bold offering from a manufacturer we've been using since before rope access was a thing, it has climbing in its blood and a growing footprint in the tree world. As with all of *Edelrid*'s hardware, post, about 2015, both the *Megawatt* and *Fuse* have quite angular lines rather than curves (apart from the cam which is gently curved), the carabiner eyes are hexagonal and there's a *Transformer k*ind of vibe to everything.

So we've had this combo in use for several months now, putting it through its paces from tower rescues to a few knotty canopy jobs. Here's what stood out—and what didn't.

BUILD & FIRST IMPRESSIONS

The *Megawatt* is Edelrid's flagship descender, and it shows. Solid aluminium build with those *Edelrid* trademark green plastic handle , quality stainless internals and reinforced wear points all around the entry point, and a reassuring weight that tells you it's built to do serious work. There's nothing cheap or over-designed here—just a confidence-inspiring bit of kit with excellent machining and thoughtful detailing. It's very compact but larger than we thought when the first images appeared, it gave the impression of being a *GriGri*-sized device but it actually occupies most of your palm. It has a two-stage push button release as we first saw with *Rock Exotica's Omni-Pulleys*- you push the button once to release the front plate which then rotates an few centimetres before the carabiner eye/hook catches on that same button and you have to press again to release. A red flash lets you know that you have properly engaged the front swivel plate. With the rope loaded the top of the cam is visible and accessible thus allowing us to partake of our favourite fondling technique - 'thumbing the cam' to ensure smooth rope flow when taking in slack - something the *Megwatt* excels at.

The fuse in 'deployed' mode

The *Fuse* is *Edelrid*'s rope fall-arrest device and pairs naturally. Stainless cams, a clever little arm for mid-line attachment, and smooth tracking with minimal drag. Together, they're certified for EN 12841 A and C, ANSI Z359, and even EN 341 for rescue—so you're covered whether you're hanging off a rope in the city or the canopy.

IN USE: ROPE ACCESS & RESCUE

The *Megawatt* is a joy to use. Most of the features that companies like *Petzl* and *Rock Exotica* pioneered - on-device orientation diagrams, push-button plate release, easy rope loading, load while attached to harness etc. are on all modern devices and we now expect that as a minimum. So *Megawatt* is no different, possessing all of those features and in fact, *Edelrid* has obviously learnt from some minor shortcomings of others and improved a few bits. The whole device is compact with easy access to the cam allowing you to push down on it to relieve pressure on the rope and ease the feed or shorten your distance to the anchor (or indeed, ascend) which is excellent. The lever action is dialled in nicely—more responsive than the *Petzl I'D*, with none of the squishy vagueness you sometimes get under light loads. You get a broad range of control, from feathering a slow descent to managing a fast lower. No option to disengage the double-brake/anti-panic function but it is well-balanced, not too twitchy, not too dull and, as we'll see, has other advantages.

The *Fuse* is one of the best backup devices I've used in access work. It tracks cleanly up and down without needing to be coaxed, and it'll catch a fall without eating the rope. Crucially, it can be popped on and off mid-line without wrestling with the thing, which makes re-rigging mid-job far less of a faff.

ARBORICULTURAL USE

Apart from heavy rescue i.e. a high-load pick-off of an injured casualty, the real test of a device's competence is in arboriculture—how does this industrial rope access setup translate to the rigours, tree sap, debris and sawdust of tree work? Short answer: very well in some ways including a handle you can use left or right handed and the ability to make one-handed positional changes (but don't tell *Edelrid* we said that) more on this shortly.

EDELRID MEGAWATT & FUSE COMBINATION

With *Edelrid*'s climbing pedigree and increasing interest in our vertical playgrounds, it was only a matter of time before something beefy like this dropped into our kit bags. The *Megawatt* is *Edelrid*'s top-tier descender, and it doesn't hide it. Full metal construction with chunky bits of aluminium, slick stainless internals, and properly solid in-hand, making it feel like it could survive a building collapse and still lower you down after. No gimmicks, no weird flourishes—just clean, solid engineering that both looks and feels reliable and dependable. Rated to rescue loads of up to 230kg, The *Megawatt* does actually have a mega capacity.

Its partner in crime, the *Fuse*, is *Edelrid*'s take on a rope access backup, similar in principal to the market leading *ASAP* from *Petzl*. Stainless steel where it matters, a smart mid-line attachment arm that's way less fiddly than it looks, and tracking that's smooth enough not to swear at. Both devices are certified for basically everything—rope access, rescue, arboriculture, so compliance is sorted. Connection to your *Fuse* is completed via the *Edelrid Diffuser*, a proprietary shock absorbing lanyard which is rated for loads up to 220kg, available in either 210mm length or the *Rescue* which is 400mm. Both deploy at 30% lower energy inputs than the required minimum. Clearly with a nod to comfort in time of crisis!! The *Fuse* has a mm less rope-diameter range, but we found that 11 – 11.7mm functioned best for the *Megawatt* so that there was seamless self-tending and no slippage with the *Fuse* in tow. The feel good together and when you're dangling off a rope and your life's hanging on a descender, 'feel' matters. The *Megawatt* handle is smooth, predictable, and gives you fine control without the vagueness you sometimes get from more rescue-leaning devices. Compared to the *Petzl I'D,* it's perhaps *a* bit more responsive, a bit more refined but there's not a lot in it. The real difference is the positioning and function of the handle.....

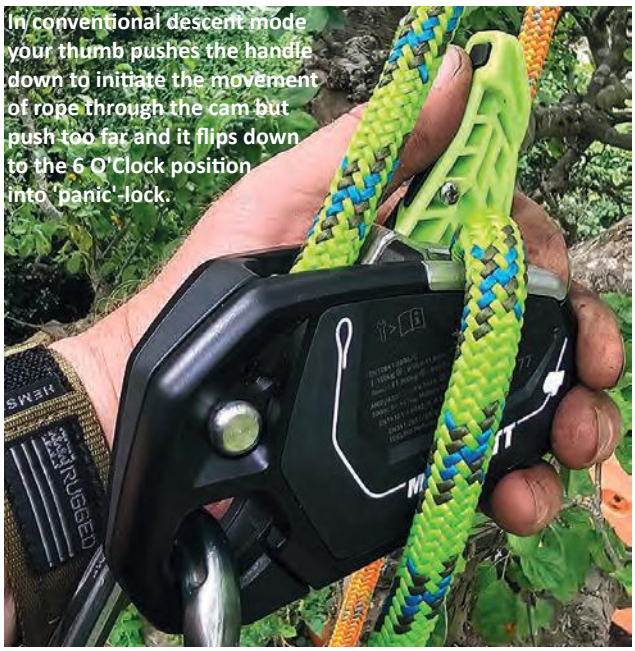
EDELRID MEGAWATT & FUSE

SPECIFICATIONS

EDELRID	MEGAWATT	FUSE
COST:	£167 $225 €190	£195 $250 <€215
WEIGHT	495g/17.5oz	420g/14.8oz
DIMENSIONS metric	123 x 75 x 55mm	97 x 88 x 37mm
DIMENSIONS imperial	4.8 x 3 x 2.1"	3.7 x 3.5 x 1.45"
ROPE CAPACITY	8.9-11.8mm	10-12mm
MBS WLL	230kg / 506lb	140kg / 308lb
STANDARDS	EN 12841-C EN 341-2A EN 15151-1/8	EN 353-2, EN 12841-A, RfU 11.075, ANSI Z359.15
WEBSITE:	www.edelrid.com	

OUR FAVOURITE BIT

The handle location and narrow body (similar to the *Anthron* (now *Skylotec) Lory*) means you can use it with the left or right hand. The anti-panic function, whether by luck or by design, enables us to use its resetting action for one-handed control of both the rope tail and the handle during a pick-off approach, freeing up the other hand for a quick clip-in or wrapping of a sling in dire circumstances. This is presumably not a prescribed method or intention but it works incredibly well. When the handle clicks into its panic lock, it flicks all the way round to the 6-oclock position pointing downwards instead of its usual pre-activation/descending position in the pic below. When you pull back on it to get it back to reset, you can either do so quickly, as a (sprung) flick to the reset position or, if you grab it firmly, along with the tail of the rope and start to pull it back a few mm, it works just as it does in regular descent mode but the other way up - genius, or accidental genius. In fact, this means that you can also use it in this mode (not the one-handed bit) for lowering with the *Megawatt* fixed to the anchor. You can either lower with the handle in its prescribed position or flicked round to panic-braked and pull down on that instead. This ability plus the very smooth take in of slack (and ability to thumb the cam) are our very favourite features of the *Megawatt* setting it apart from most other devices. The *Megawatt* is supplied with a screw, always available embedded in the handle which will lock the side cover if you need a permanent installation. NB: there was talk, when the *Megawatt* first came out, that the reverse capability we're enthusing about, meant you could find a mid-point where the handle could stay in a slow go-position by itself that wasn't fast enough to activate the back-up. We haven't managed it any normal use so it must be a very precise position and literally any contact with that handle will knock it back into a lock mode. You would need to have found that precise position and then become unconscious for it to be a significant problem - oh, and your back up (or bottom belayer) would need to fail as well- which it can at slow speed. Maybe it's Darwinian selection.


In conventional descent mode your thumb pushes the handle down to initiate the movement of rope through the cam but push too far and it flips down to the 6 O'Clock position into 'panic'-lock.

MEANWHILE, BACK AT THE FUSE

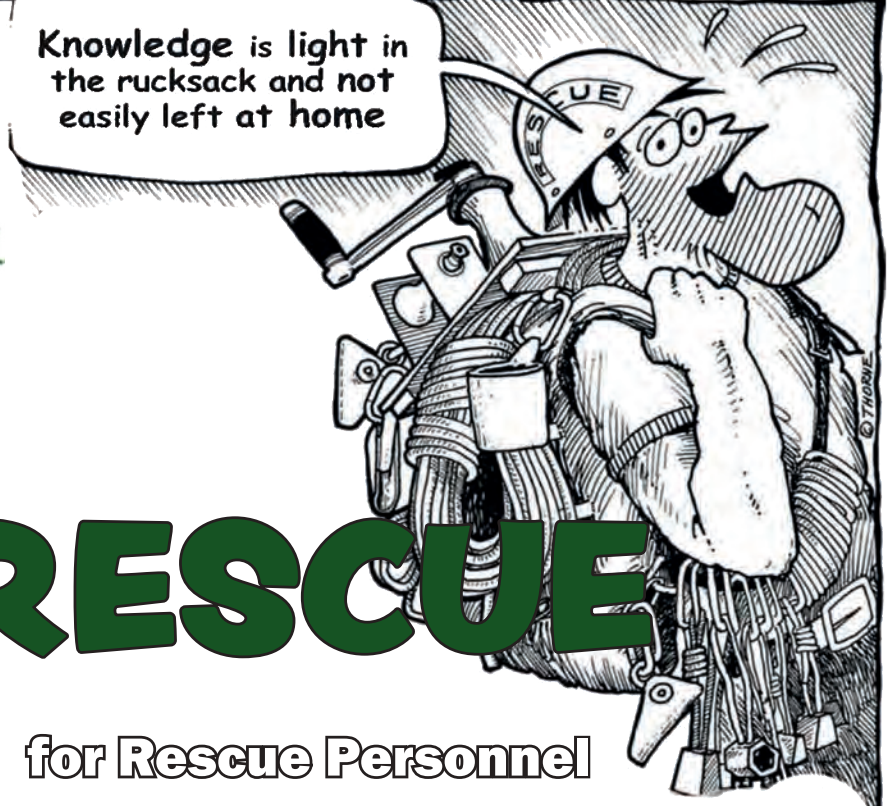
The *Fuse* is a proper workhorse. It follows you up and down without needing to be babysat, which is exactly what you want from a backup. Mid-line installs? Dead easy. No arm-wrestling the rope, no tantrums mid-rig. For access work or rescue set-ups, it just does the job well in conjunction with the *Megawatt*. The option of a longer lanyard is great, giving the operator a little more space and latitude to work with less clutter in front of them. The *Fuse* behaves nicely even when the rope tension gets squirrelly—no surprise lock-ups, just clean catches when it counts. But if your rope's a bit crusty or too stiff, the *Fuse* can get a bit draggy, which is an issue with a wide range of other devices too. If you need dual certification and rescue-ready reliability in your team's gear locker, this combo makes serious sense.

CONCLUSIONS

When it comes to rescue, this set up's in its element. The *Megawatt* is rated for two-person loads (230kg) and feels composed even when you're shifting serious weight. We've already mentioned the incredibly useful ability to use the handle from either direction (including one-handed for the advanced users) so whether you're raising a casualty or lowering a loaded stretcher, it stays smooth and controlled, and the *Fuse* keeps things safe above, giving you a redundant system that doesn't feel like it's getting in the way. The *Megawatt* isn't an MRS/DdRT, tree-specific descender in the way that a *Spiderjack* or *Zigzag* is, and even as an SRS/SRT device, if you're used to bounding around the canopy with minimal resistance and featherlight modulation, this will feel a bit industrial. But that's not what it's for. Does it belong in the canopy? In terms of speed and flight (which is also true of tactical and suicide intervention use) it's less 'fluid canopy dance' and more rescue-industrial. But if you're doing rescue from height, bombproof rigging, or SRT pick-offs from a compromised anchor, the *Megawatt* and *Fuse* come into their own. This isn't just finesse gear, it's get-it-done, move-big-weight, trust-it-with-your-life gear. It also fulfils compliance with the likes of the *Working at Height* regulations, within the UK's legal framework at any rate. On this note, both the *MegaWatt* and *Fuse* have RFID chips inbuilt, for ease of kit record keeping.

Built like something *NASA* might approve of the *Megawatt* and *Fuse* provide a great combination with smooth rope management and control with either hand which is not something you can say of many rescue descenders. Pulling the tail through the cam for height adjustment is as easy as a belay device (which this is not) but it means that it also works very well as a progress-capture-cam in pulley systems and as a makeshift ascender. The anti-panic feature is often considered to be a hindrance by experienced uses or by rescuers/tac-operators on faster, longer drops. But with its ability to function in reverse from that locked-out position and even one-handed, it is far more of an asset than a hindrance and could be what sways experienced users to the *Megawatt* bearing mind of course, that one-handed use (i.e. the trail rope and handle are held in the same hand rather than a hand on each) is NOT a prescribed or recommended technique but it does have its uses!

Ropes That RESCUE ®Ltd.



COMPREHENSIVE

BOTTOM-UP TREE RESCUE workshops

for Rescue Personnel

This rescue class is for fire and emergency services, not for arborists although many firefighters are also arborists. We employ techniques, rope and equipment that would be found on a special operations rescue truck in addition to regular tree access techniques and equipment.

www.ropesthatrescue.com

rock exotica
GEAR FOR THE Z AXIS

ENFORCER

Take the guesswork out of your rigging with the lightweight and compact load cell designed for use in both training and the real world.

Monitor and record forces up to 20kN. Rated to 36kN MBS.

For detailed information, visit **www.rockexotica.com/enforcer**

MONITOR WIRELESSLY VIA BLUETOOTH

The Enforcer 2.0 Android and iOS app* lets you monitor forces in your rigging remotely in real-time, and download for later analysis. Now connects to multiple Enforcer load cells.

*App sold separately Coming soon.

Weighs just 14oz. (397 gm) with batteries!

rock exotica