# 540º™ Small Rescue Belay

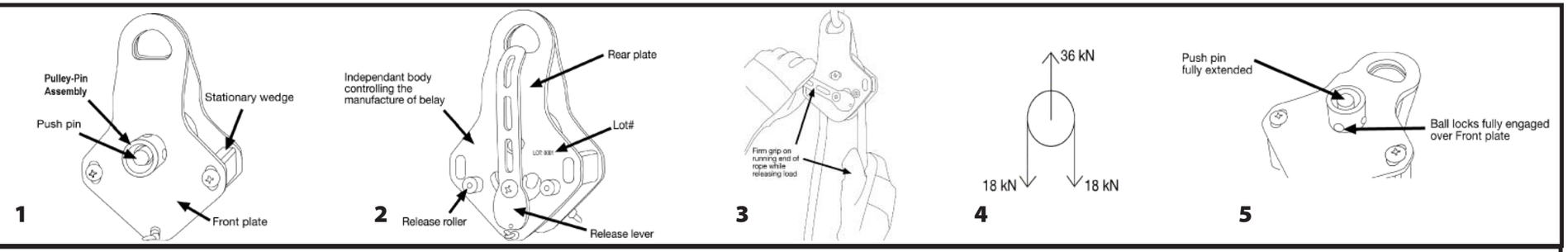
CLASSIFIED UL 77SF IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION STANDARD ON LIFE SAFETY ROPE AND EQUIPMENT FOR EMERGENCY SERVICES, 2012 EDITION.

**User Information:**

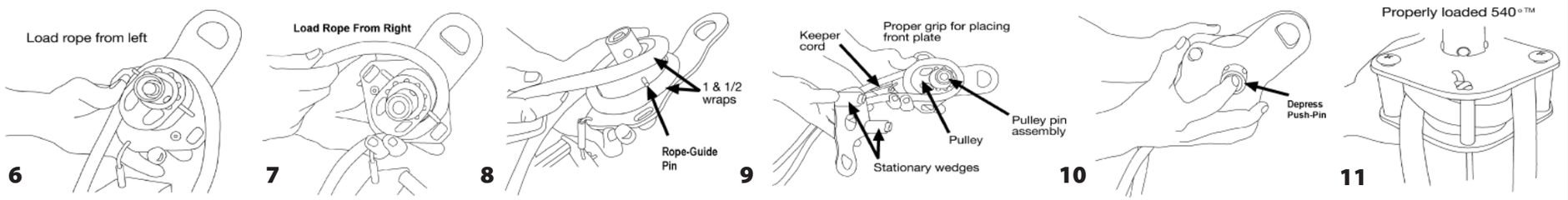
Key Features:

- Designed to limit the "relative worst-case" fall[1] of a rescue-sized load (e.g. 200 kg) to a peak force of approximately 15 kN or less, and with no more than about 1m stopping distance
- Accepts 11-11.5 mm diameter Kernmantle rescue ropes; not for use with wire rope
- Unique bi-directional rope loading and locking capability allows either end of the rope exiting the 540º™ to be used as the load rope
- This 540º™ Small Rescue Belay meets the auxiliary equipment requirements of NFPA 1983, standard on life safety rope and equipment for emergency services, 2012 Edition.
- A built-in release lever eliminates the need for a separate release hitch
- Self-locking with sudden falls
- Only 624 grams
- Very simple and easy to use

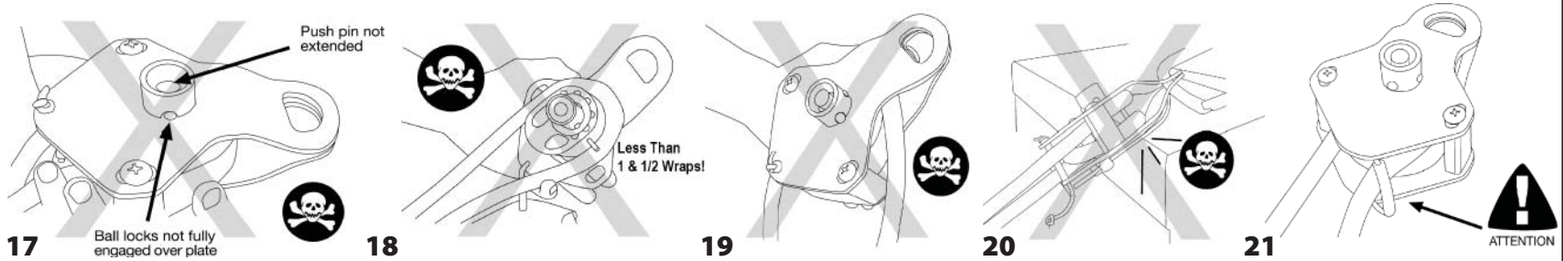
[1]For example, using a 1m drop onto 3m of rope, to represent a 'relative worst case' fall of a rescue-sized load, a sample test using new 11mm DGR Rope, Blue Water Ropes Inc. and a 200kg mass, resulted in a peak force of 8.1 kN, a total stopping distance (including knots tightening, rope stretch and slide distance) of 85.5 cm, and with actual rope-slide distance of 36 cm. Results will vary between drop tests and between rope types. Note: due to the distribution of forces between the components that comprise a rescuesized load, the patient and attendant are subjected to much less (e.g. less than half for two people of equal mass) of the peak force applied to the rope and belay device. It is a misconception that the patient and attendant each experience the same peak force as that applied to the belay rope. MBS was calculated for this device using the control descent device procedure. This 540º™ Small Rescue Belay has passed the minimum breaking strength and holding load test using the following rope: [Blue Water Ropes Inc., Spec Static, 540700, 11.5mm], [Blue Water Ropes Inc., DGR, 517700, 11mm].



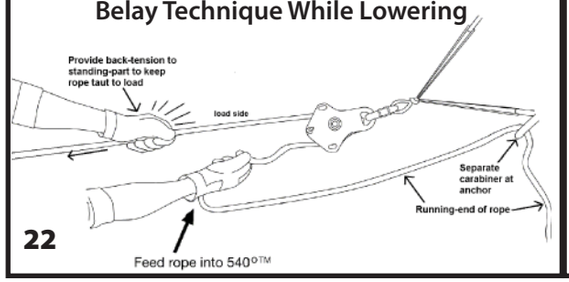

## Proper Loading Sequence



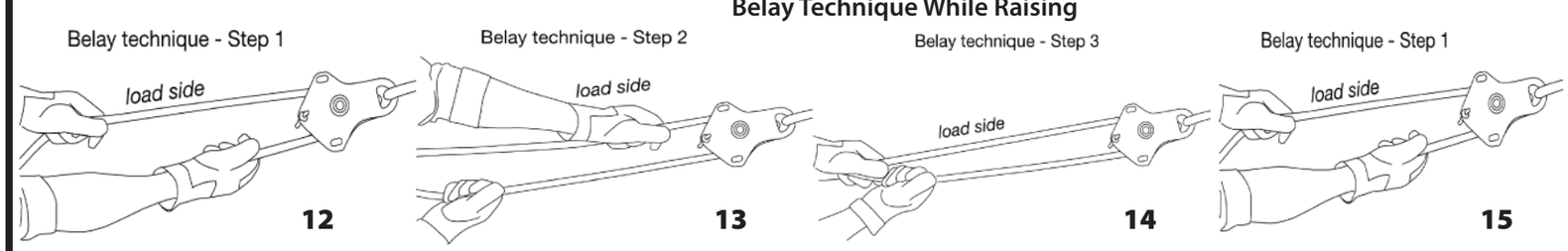

| Rope Type | Rope Size |
|---|---|
| Lower-Stretch Kernmantle Rescue Rope | 11mm to 11.6mm |
| **No Cable!** | |




## Belay Technique While Lowering




## Belay Technique While Raising




**Instructions for Use:**

**Loading the Rope:**

Remove the front plate by depressing the push-pin (fig.10). Wrap the rope around the obround (oval) pulley one-and-a-half (1½) times, or 540 degrees. Since the 540º™ is symmetrical and bi-directional in design, the wraps may start from either side of the pulley (fig. 6 & 7). Ensure that the 1½ wraps are divided by the rope guide pins, located on each side of the pulley (fig. 8). The device will not work if only half of a wrap is placed over the pulley (fig. 18). Replace the front plate (fig. 10) and confirm that the push-pin balls have completely returned to their locked position (fig. 5). Also ensure that both the running end (free or loose end) and standing part (load-side rope) are in between the two stationary wedges and exiting below the pulley. The keeper cord connecting the front and back plates must be in between the two ropes exiting the device (fig. 11). Use a suitable locking carabiner to attach the 540º™ to the belay anchor system.

Note: Because the 540º™ is symmetrical, you can load it from the left or right side, as well as use either rope exiting the 540º™ as the load rope.

Note: it is an advantage to use a "static" kernmantle rescue belay rope with 'low' stretch properties.

Since the 540º™ is already designed to limit the peak force of a 'relative worst-case' fall to no more than 15 kN for 'new' 11 mm kernmantle rescue rope, the additional

stopping distance resulting from the use of a rope with more stretch may only add to the risk of the patient and/or attendant striking an obstruction, resulting in severe injury or death.

Ensure that all ropes are protected from potential damage due to rubbing or cutting against abrasive surfaces or sharp edges.

**Belaying while Lowering or Raising:**
All parts of the 540º™, including the releaselever, must be completely unimpeded by any obstructions or obstacles that could interfere with proper belay technique, device locking, or release capability (fig. 20). Wear gloves to protect hands; maintain a sufficient distance from the 540º™ to keep hands free of moving parts. Always maintain a firm grip on the running end of the belay rope; this will ensure rope-locking if the load were to suddenly drop.

**IMPORTANT:** Self-Locking will occur with sudden drops. However, a "slow" fall and/or a supple/smaller diameter rope will require resistance applied to the running end of the rope to ensure rope-locking. Self-locking for "slow-falls" can be improved by clipping the running end of the belay rope through a separate carabiner attached to the anchor, behind the 540º™ (fig. 22). **Never** belay the load using the Release Lever to manage the feed, as this may prevent rope-locking if the load were to suddenly drop.

To prevent accidental rope-locking while lowering or raising, feed rope straight into the 540º™. This is especially important with wet, dirty, muddy, fuzzy or stiff ropes. While lowering, with a gloved hand, provide resistance to the standing part (load-side and with the other hand, simultaneously feed running-end rope into device (fig. 22). While raising, pull up on the standing part and feed it into the device, and then pull on the running end (fig. 12—16).

**Manually Locking Off the Belay Rope**
To lock-off the belay, manually trigger the 540º™ by firmly holding the running end of the rope and sharply tugging the standing part. Additional security can be gained by tying the running end of the belay rope around the standing part with an overhand-on-a-bight knot. If the belay must be left unattended, the 540º™ must first be locked off.

**Releasing a Locked Belay Rope:**
The 540º™ is NOT to be used as a general descent-control device. If the belay rope is only lightly locked, then quickly reversing the direction of feed can return the pulley to its neutral, or centered position. If this cannot be done, then ensure the mainline is locked-off, and then use the release lever to slowly transfer the tension back to the mainline, maintaining a firm grip on the running end of the rope (fig. 3); ensure that the pulley is returned to its neutral position before continuing.

If the 540º™ receives a significant shock-force (e.g., catches a rescue-sized load), then the rope in the device may 'stiffen' during fall arrest; thus, it may be more difficult to initially release the load until that portion of the rope has passed through the device. If releasing the load is difficult, you may temporarily thread a webbing sling through the top of the Release Lever to make the pulling easier; remove the webbing directly after releasing the load.

**General Information:**

1. Important Notice: Working at heights has inherent risk, and the risk of injury/death can not be eliminated. Do not use this device unless you have read all the instructions, have received proper training, inspected the device before and after each use, and have accepted total responsibility for your safety and the suitability of the application of this device. Do not use this device if you are unable to, or not in a position to assume these risks and responsibilities. Not following the instructions and information can lead to serious injury or death. While some examples of mis-use are identified in the instructions with a "skull & crossbones" symbol, it is impossible to list or imagine all the possible mis-uses. If there is any doubt or difficulty in understanding the provided information, contact Traverse Rescue®. Additional information regardingNFPA General Use Auxiliary Equipment can be found in NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, and NFPA 1983, Standard on Fire Service Life Safety Rope and System Components.
2. Inspection: If there are any signs of wear, damage or corrosion which might affect the 540º™ Rescue Belay's operation, strength or safety, do no hesitate to retire and scrap it, or send it to Traverse Rescue® to have it repaired or replaced at our option. It is imperative that the 540º™ is in good working order prior to use. In addition to the user protocols previously listed (e.g., rope selection, anchor and carabiner suitability, proper loading of the rope, clear of obstructions, belay technique, rope protection, etc.), also check for any device d a m a g e , w e a r , co r r o s i o n , deformation, foreign materials or lack of cleanliness.

Note: If the stationary wedge grooves and/or the pulley is worn more than 0.5 mm, then return your 540º™ to Traverse Rescue® for parts replacement. Call for cost details.

For safety, a 3-level inspection by a competent inspector is required for the 540º™:

- Before and after each use
- Monitor the condition during use, and
- On an annual basis. Maintain an up-to-date inspection record. Keep these instructions for your permanent record; copies should be made and kept with the device for users to reference.

Refer to "Sample Inspection Log" in these instructions for more detail.

3. Cleaning, Maintenance and Storage: Store the 540º™ away from direct sunlight, extreme temperatures, and deleterious substances or environments. If the 540º™ becomes soiled or subjected to corrosive environments, then thoroughly wash and rinse it in water. A mild soap may be used. Do not wash with a pressure hose. Wipe off excess water with a clean cloth and allow the 540º™ to dry in a well ventilated area away from any direct heat source. After washing, lubrication (e.g. Pedro's Ice Wax, Triflow™ or other "dry" bycicle chain lubricant) of moving mechanisms (e.g. release lever and push-pin assembly) may be required for reliable operation. If replacing the "keeper" cord, ensure the flexible tube is also re-installed. For any other repairs on the 540º™, send the unit to Traverse Rescue®.
4. Major Impacts or Falls: While the 540º™ has been engineered to catch falling rescuesized loads, if there is any sign of deformation, wear, or any doubt about the safety of the device after a fall, return it for inspection to Traverse Rescue®.
5. Do not expose the 540º™ Rescue Belay to any flame or high temperature and carry the device where it will be protected as the Keeper Cord or other parts could melt, burn or otherwise fail.
6. Take care to keep and store in a safe place, all User Instructions and information for your new 540º™ Rescue Belay. Copy the User Instructions and other information to keep with the device for easy reference.
7. Refer to the User Instructions and other information before and after each use.

The 540º™ has been designed to limit peak force and stopping distance, which are two diametrically opposed needs. For example, for a 1m drop on 3m of 12.5mm Kernmantle Rescue Rope with a 280kg mass (slightly heavier than a NFPA 2 person load), the 540º™ Large is designed to limit the peak force to below 15 kN and arrest the falling load in less than 1m of stopping distance, including rope stretch, knots tightening up, and any slippage through the belay device; it must be noted that at the upper and lower limits of allowable rope diameters, small diameter ropes (e.g. 11.5 mm) may result in greater stopping distances, and larger rope diameters (e.g. 13mm) may result in greater peak forces than target levels.
*Results will vary with different rope diameters, brands, or other environmental influences such as wet, muddy or iced ropes.*

**Traverse Rescue, LLC Guarantee**
The 540º™ Rescue Belay is guaranteed for a period of one year against any manufacturing or material defects and/or faults. Limitations to this guarantee are: wear and tear through normal use, unauthorized alterations or modifications of any kind, improper storage, misuse, negligence, improper cleaning, contact with chemicals as well as damage due to accidents etc. It also excludes damage due to use for which it was not expressly designed.

***For your training needs visit:***
***www.TraverseRescue.com***

***The following space was left open intentionally.***

Sample Inspection Log
Keep these instructions for yourpermanent record; copies of the following tables should be made and kept with the device for users to reference.

| 540º™ Rescue Belay | |
|---|---|
| Batch Number: | |
| Purchase Date: | |
| Date of First Use: | |
| Owner: | |

| Annual Inspection of 540º™ Rescue Belay | | | |
|---|---|---|---|
| Date: | OK | Inspected By: | Comments: |
| | | | |
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TRAVERSE® rescue
A FERNO GROUP COMPANY

**CONTACT INFORMATION:**
Traverse Rescue®
2460 Tedlo St.
Mississauga, ON
L5A 3v3 Canada

Website: www.TraverseRescue.com
Email: info@traverserescue.com
Phone: (905) 279-7866
Fax: (905) 615-1367
Toll Free: 1-866-998-7866

EC REP
Ferno (UK) Limited
Stubs Beck Lane, Cleakheaton
West Yorkshire BD19 4TZ, United Kingdom
44 (0) 1274 851999



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