CMC RESCUE

MPD™

USER'S MANUAL

MULTI-PURPOSE DEVICE

Pulley – Rescue Belay – Descent Control

MPD™

MULTI-PURPOSE DEVICE
Pulley–Rescue Belay–Descent Control

Thank you for selecting the CMC Rescue MPD™ for your technical rope rescue systems. Truly a multi-purpose device, the flexibility and versatility of the MPD reduces the number of components in a rescue system and simplifies system rigging. The result is a safer and more efficient rescue. As with other CMC Rescue equipment, please contact us if you have any questions.

WARNING

- Serious injury or death may result from the improper use of this equipment.
- This equipment has been designed and manufactured for use by experienced professionals only.
- Do not attempt to use this equipment without proper training.
- Failure to follow these instructions could result in serious injury or death.

CLASSIFIED UL 5F04

THIS DEVICE MEETS THE AUXILIARY EQUIPMENT (DESCENT CONTROL AND PULLEY) REQUIREMENTS OF NFPA 1983, STANDARD ON LIFE SAFETY ROPE AND EQUIPMENT FOR EMERGENCY SERVICES, 2006 EDITION.

EMERGENCY SERVICES AUXILIARY EQUIPMENT. IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION STANDARD ON LIFE SAFETY ROPE AND EQUIPMENT FOR EMERGENCY SERVICES.

The MPD User's Manual is also available as a download at www.cmcrescue.com/mpd and is included in the CMC Rescue Field Guide App.

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ISO 9001: 2008 Certified

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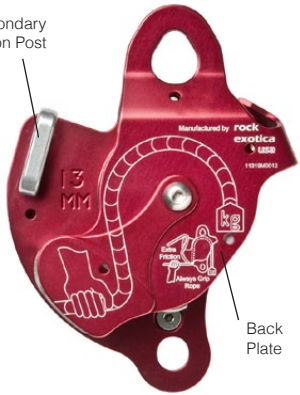
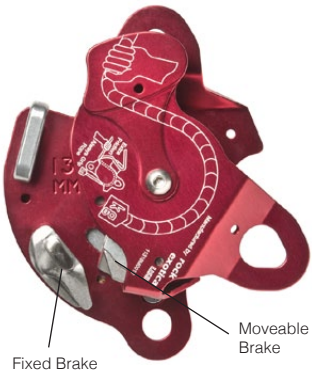
PRIOR TO USE

As with any new piece of rescue equipment, the MPD should be thoroughly inspected before being placed in service. The MPD is a robust unit but still should be inspected after each use to ensure that damage did not occur. When inspecting, look for any damaged, dirty or sticking components, excessive wear, or any other factor that may prevent proper function.





RIGGING
THE MPD

The MPD is designed for use with static or low stretch kernmantle life safety rope. Use only rope that has been inspected, is of proper size, and is in good condition. The user should be aware that environmental conditions may have an effect on the rope's interaction with the MPD. For example, water saturated ropes, icy ropes or ropes otherwise covered with substances such as clay, tar or oil will, to varying extents, affect the rope's interaction with the MPD. The user should be aware of these conditions and make necessary adjustments such as adding additional friction or by acknowledging that saturated ropes or ropes covered with foreign material may not progress smoothly through the MPD, possibly resulting in a ratcheting type of progression as the rope moves through the device. Additionally, rope that is dirty, sandy or muddy may cause increased wear to the fixed and moving brakes, which may reduce the device's ability to arrest and hold a load.

To rig the MPD, first ensure that the **PARKING BRAKE** is unlocked. Hold the MPD so that the back plate faces up. Take note of the laser etched diagram showing the proper rope orientation, then open the MPD by rotating the back plate clockwise until there is space to insert the rope between the fixed and moving friction brakes.

Insert the rope with the running end between the friction brakes and wrap the rope around the pulley in a clockwise direction. The load end of the rope exits the pulley opposite the friction brakes.

Close the MPD by rotating the back plate completely counter-clockwise and making sure that the rope properly enters and exits the MPD as shown in the diagram on the back plate. Attach an appropriate locking carabiner or screw link through both the front and back plates.

RIGGING
THE MPD

1 OPEN BACK PLATE

(PARKING BRAKE MUST BE UNLOCKED)

2 INSERT ROPE

3 CLOSE & SECURE BACK PLATE

RIGGING
THE MPD

ALWAYS PERFORM A SAFETY CHECK BY DISENGAGING THE PARKING BRAKE AND GIVING A QUICK TUG ON THE LOAD END TO ENSURE PROPER RIGGING PRIOR TO COMMITTING A LIVE LOAD OVER AN EDGE. WHEN RIGGED PROPERLY THE MPD WILL LOCK UP. THE MPD MUST BE RIGGED CORRECTLY PRIOR TO USE.

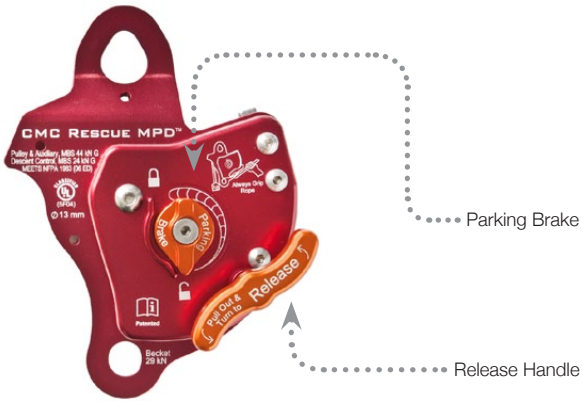
RIGGING
THE MPD

PARKING BRAKE

A unique feature of the MPD is the **PARKING BRAKE** which when engaged prevents inadvertent letting out of the rope. The design of the **PARKING BRAKE** allows for rope to be taken-in if required without having to disengage it, although increased rope friction will be encountered.

Engage the **PARKING BRAKE** whenever you need to release your grip from the running end of the rope except when the MPD is rigged as a ratchet or progress capture in a pulley system. For example, once the rigged MPD is clipped to the anchor, for safety, engage the **PARKING BRAKE** until it is time to use the device.

With oversize diameter rope or if the rope is un-tensioned, icy or saturated, to fully engage the **PARKING BRAKE** it may first be necessary to pull out on the **RELEASE HANDLE** and rotate it clockwise to further force the brake against the rope.



RIGGING
THE MPD

NOTE: The **PARKING BRAKE** is intended to be used to temporarily secure the MPD when it is necessary for the operator to release their grip on the running end of the rope. If the MPD is to be left unattended or if you need to release your grip on the running end of the rope for more than a short time, engage the **PARKING BRAKE** and then secure the MPD by tying off the running end of the rope around the load end with an appropriate tie-off method.

USING THE MPD
AS A DESCENT CONTROL DEVICE

When used to control a descent, the MPD design allows easy adjustment of the friction for the size of the load, rope type, and environmental and terrain conditions. The speed of the descent is controlled by the friction of the rope applied against the Fixed Brake V-groove. Always start with the running end held firmly back toward the anchor, parallel to the load end. Reduce the friction by varying the angle at which the running end enters the MPD. Maximum friction is applied when the Secondary Friction Post is used.

AT NO POINT SHOULD THE RUNNING END OF THE ROPE HAVE AN ANGLE OF LESS THAN 90 DEGREES TO THE LOAD END OF THE ROPE.

Edge transitions can be the most challenging part of an operation. Using the MPD as a descent control device allows for a high degree of responsiveness and control. As the rescuer or rescuer and patient approach the edge, it is very easy to take-in rope through the MPD to prepare for the edge transition. Pre-tensioning of the Main Line is also simplified because of this.

USING THE MPD
AS A DESCENT CONTROL DEVICE

TO LOWER

To lower, firmly grip the running end of the rope and tightly hold it against the Fixed Brake V-groove, bringing it back toward the anchor and parallel to the load end, creating an S-shaped bend in the rope as it passes through the MPD. Pass the rope over the Secondary Friction Post for heavier loads if needed. Disengage the **PARKING BRAKE** and then firmly grip the **RELEASE HANDLE**. For the most comfortable hand operating position, before pulling outwards on the handle, give a slight clockwise turn of the wrist, then pull out to engage the release mechanism. Begin lowering by rotating the handle slowly counterclockwise to disengage the Moving Brake from the rope, controlling the rate primarily with friction on the Fixed Brake V-Groove. Maintaining the S bend in the rope will improve the function of the braking mechanism in the event it is needed, and will increase the service life of the Moving Brake, reducing the potential for rope creep through the device.

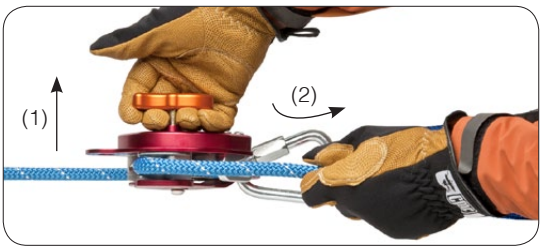
ALWAYS HOLD THE RUNNING END OF THE ROPE FIRMLY BACK OVER THE FIXED BRAKE V-GROOVE, PARALLEL TO THE LOAD END, BEFORE GRIPPING THE RELEASE HANDLE TO BEGIN LOWERING.

USING THE MPD
AS A DESCENT CONTROL DEVICE

Preparing to Lower:
Firmly grip the running-end rope and apply friction over the Fixed Brake V-groove, bringing the rope back towards the anchor and parallel to the load end, creating an S-shaped bend in the rope.

ALWAYS MAINTAIN AN S-SHAPED BEND IN ROPE.

To Lower:
Disengage the **PARKING BRAKE**, grasp the **RELEASE HANDLE**, pull out to engage the release mechanism (1), and then rotate counterclockwise to initiate lower (2). By rotating the moving brake off the rope, it may significantly increase the service life of the MPD.



USING THE MPD
AS A DESCENT CONTROL DEVICE

For Heavy Loads:
Add additional friction by threading the rope over the Secondary Friction Post.

TO STOP LOWERING

To stop lowering and lock the rope, disengage the **RELEASE HANDLE**. **NOTE:** Although there is a return spring to assist in disengaging the **RELEASE HANDLE,** it is the user's responsibility to ensure that the handle is fully pushed in when not actively lowering.

ALWAYS MAINTAIN A FIRM GRIP ON THE RUNNING END OF THE ROPE WHEN THE PARKING BRAKE IS NOT ENGAGED.

USING THE MPD AS A BELAY DEVICE

The MPD is designed to be used as a belay device to arrest a falling load should the Main Line fail. It is recommended that during edge transitions while either lowering or raising loads that the Belay Line tension be kept hand-tight and without slack in the line. Stumbles by the rescuer or litter tender(s) are most likely to occur during edge transitions which may result in the ropes being run across edges which can potentially damage or cut the ropes. It is less likely to damage both ropes if the Belay Line remains un-tensioned during these transitions. Additionally, greater descent control can be achieved if only one rope manages the rate of descent during edge transitions.

If the Main Line completely fails during an edge transition (e.g. anchor failure or improper system connection), and if both ropes are suspended above the terrain, then a dynamic fall onto the Belay Line is likely. Among rescuers, this is widely recognized as potentially the worst-case dynamic event in rescue work. While every effort should be made to rig and operate systems to minimize the potential for such dynamic events, the MPD is designed and has been tested to arrest a 1 m fall onto 3 m of static rope with a rescue-sized load and limit the peak force below 15 kN (3,372 lbf.) with no more than 1 m (3.3 ft.) stopping distance (as advocated by the British Columbia Council of Technical Rescue Belay Competency Drop Test Criteria). Such a dynamic event is severe and warrants that all involved equipment be retired and properly disposed of after the operation is safely completed.

BELAYING A LOWERING SYSTEM

When belaying a lowering system, once the rescuer has good control of the load and is in the correct descent path (this often occurs within the first 10 m (33 ft.) of the descent) it is recommended to convert

USING THE MPD
AS A BELAY DEVICE

from hand-tight Belay Line tension to shared tension between the Main Line and Belay Line. Should the Main Line system fail from this point on, a Shared Tension system will minimize rope stretch and provide a considerably reduced arresting distance as compared to a conventional un-tensioned belay. It will also help mitigate other hazards such as an inadvertently slack Belay Line, or rope-induced rockfall since the now tensioned Belay Line will be suspended above the terrain between contact points, just like the Main Line.

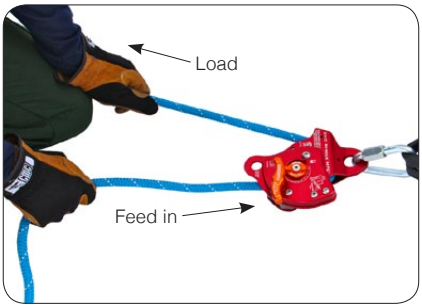
IMPORTANT NOTE: Shared tension systems are essentially two lowering systems in place of one lowering system and a belay, with each line supporting approximately half the load. If either system should fail, the increased load on the other descent control device will cause an increase in rate of descent. While the MPD is an effective belay device capable of safely arresting a falling load, when used as a descent control device you are manually overriding the belay function. This could result in increased stopping distances if not using proper technique. Therefore, in a shared tension lower it is imperative that the running end rope of the Belay Line be held back toward the anchor, maintaining the S-shaped bend as the rope runs through the MPD. This will ensure the braking mechanism activates and arrests the load in the shortest distance possible.

- For the greatest system redundancy and therefore safety, ensure the Belay Line system is anchored and operated independently of the Main Line system.
- As with the Main Line, it is recommended that someone assist the Belay Line operator by feeding rope to ensure there are no tangles or snags that would cause the operator to unnecessarily stop the operation.

USING THE MPD AS A BELAY DEVICE

- To ensure proper hand-tight tension of the Belay Line (such as during edge transitions), firmly grip the load end of the rope with one hand and apply friction such that there is no slack in the rope between the load and your hand. The other hand feeds the running end into the MPD at a pace which is slightly ahead of the rate of descent such that the rope is unseated from the sheave tread. This will reduce rope drag on the sheave and keep the MPD from inadvertently locking up. Importantly, this technique allows the operator to match the speed of the Main Line. In contrast, the technique of trying to simultaneously shuffle rope into and out of the MPD will result in a repetitious 'start-stop' motion of the belay rope and will likely result in frequent unwanted lockups.

Applying Hand-Tight Tension to the Belay Line:
The operator is bracing his arm on his leg to help maintain a fixed position of the friction hand while the other hand feeds rope into the MPD at a rate slightly ahead of the descent rate.



USING THE MPD
AS A BELAY DEVICE

BELAYING A RAISING SYSTEM

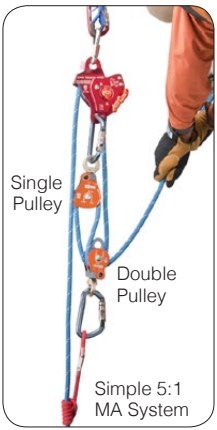
If the load is being raised, then the Belay Line can simply be pulled hand-over-hand through the MPD. However, if the distance the load has to be raised is greater than approximately 30 m (100 ft.), it is recommended to convert the Belay Line system into a simple 3:1 mechanical advantage pulley system and assist with the raising of the load. The load can be raised more efficiently if the Belay Line assists with the raising since it is possible that a lower mechanical advantage will be required by the Main Line. The MPD will function as a 'ratchet' or 'progress capture device'. This will also take the stretch out of the line. For the final edge transition, convert back to a 1:1 system using only hand-tight tension on the Belay Line by pulling it hand-over-hand through the MPD.

MIRRORED SYSTEMS

Rope rescue systems whereby each rope is both competent and capable of simultaneously being able to perform as a Main Line and a back-up/Belay Line are referred to as Mirrored Systems. Ideally, a true independent mirrored system is achieved with maximum flexibility and versatility when both the Main Line and Belay Line are each managed with an MPD. This way either rope system can perform either function, similarly, without the need for complex changeovers or function-specific equipment. Additionally, if an MPD is used for both the Main Line and Belay Line in a shared tension system, then should either of these systems fail, the other rope system can serve as a belay and the potential arresting distance is minimized since both ropes will be pre-stretched.

USING THE MPD IN A MECHANICAL ADVANTAGE SYSTEM

The MPD is designed to function both as a pulley and as a 'ratchet' or 'progress capture device' in a MA system. After lowering, there is no need for a complex changeover between a lowering system and a raising system. The one-way pulley inside the MPD applies friction during descent control but serves as a fully functional and highly efficient pulley while raising the load and it effectively locks the rope during pulley system resets with minimal settling-in distance. To convert to a MA system, simply attach a rope grab and traveling pulley to the Main Line and a simple 3:1 mechanical advantage is created. The MPD has a built-in Becket which can be used to attach a change-of-direction pulley to allow higher mechanical advantage systems to be built (e.g. simple 5:1 or compound 9:1) thereby eliminating the need for a rigging plate. This keeps the pulley system neat and clean, with minimal loss of efficiency.



ADDITIONAL INFORMATION

HIGHLINES AND GUIDING LINES

The MPD has been specifically designed to meet all the required functions of a descent control device, pulley and belay device. As such, the MPD is highly versatile for use in many aspects of highline rigging, such as:

- Guiding line or Highline track rope tensioning
- Tag line management
- Operating the hoist or reeving lines

The CMC Rescue School can provide you with training on all of these advanced techniques. For questions or more information on training with the MPD, or any other CMC Rescue products, please contact us at **1-800-235-5741** or email **info@cmcrescue.com**.

CARE AND MAINTENANCE

Clean and dry the MPD after each use to remove any dust, debris, or moisture. Do not store where the equipment may be exposed to moist air, particularly where dissimilar metals are stored together.

User Information shall be provided to the user of the product. Industry equipment standards recommend separating the user information from the equipment and retaining it in permanent record. The standard also recommends making a copy of the user information to keep with the equipment and that the information should be referred to before and after each use. A PDF version of this MPD User's Manual is also available for download on our website at **www.cmcrescue.com/mpd**.

Additional information regarding life safety equipment can be found in NFPA 1500, Standard on Fire Department Occupational Safety and Health Programs, and NFPA 1983, Standard on Fire Service Life Safety Rope and Equipment for Emergency Services.

ADDITIONAL INFORMATION

INSPECTION

Inspect the MPD according to your department's policy for inspecting life safety equipment. Equipment should be inspected after each use by an inspector that meets your department's training standard for inspection of life safety equipment. Record the date of the inspection and the results in the equipment log. Each user should be trained in equipment inspection and should do a cursory inspection before each use.

Inspect the MPD for damage after each use. If any significant damage is observed, the equipment should be removed from service. The MPD should be inspected after each use to ensure that damage did not occur. When inspecting, look for any damaged, dirty, or sticking components, excessive wear or any other factor that may prevent proper function.

If the MPD is dropped or impact loaded, it should be inspected by a qualified inspector prior to being returned to service. In most cases, a visual inspection will not be able to determine if the equipment has been damaged. Based on the history of the incident, if there is any doubt regarding the safety of the equipment, it should be removed from service and retired.

REPAIR

All repair work must be performed by the manufacturer. Any other repair work or modifications may void the warranty. For service or repairs, please contact:

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SPECIFICATIONS

PRODUCT SPECIFICATIONS

Model 333000, 13mm rope model
UL Classified to NFPA 1983 - 2006 ed.
- Pulley: General Use
- Auxiliary equipment: General Use
- Descent control device: General Use

Rope Diameter: 13 mm* (1/2-inch)
Weight: 1.1 kg (2 lbs. 8 oz.)
Rated Strength:
Pulley & Auxiliary – 44 kN (9,891 lbf.)
Descent Control – 24 kN (5,395 lbf.)
Becket – 29 kN (6,519 lbf.)
*Designed for use with 12.5–13mm rope. Rope used for certification rounded up to 13mm per NFPA 1983.

(13 mm)

Model 333010, 11mm rope model
UL Classified to NFPA 1983 - 2006 ed.
- Pulley: General Use
- Auxiliary equipment: General Use
- Descent control device: Light Use

Rope Diameter: 11 mm (7/16-inch)
Weight: 1.1 kg (2 lbs. 8 oz.)
Rated Strength:
Pulley & Auxiliary – 44 kN (9,891 lbf.)
Descent Control – 21 kN (4,721 lbf.)
Becket – 29 kN (6,519 lbf.)

(11 mm)

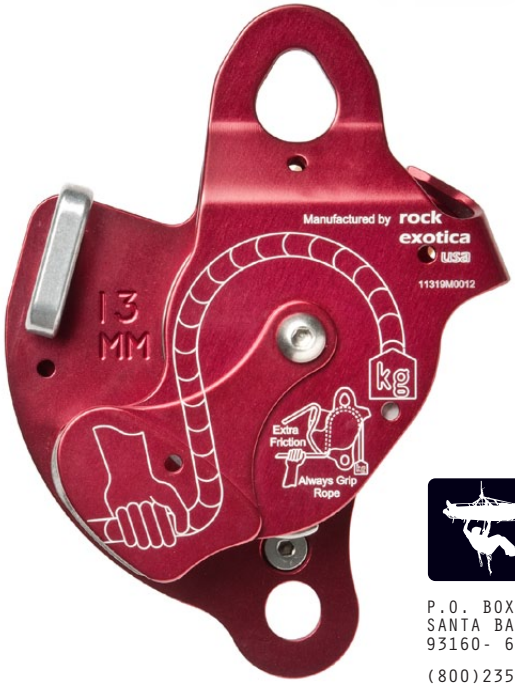
Photos used throughout this User's Manual are of the MPD 13mm (model 333000) for simplicity.

NOTES

NOTES

CMC RESCUE

MPD™



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