



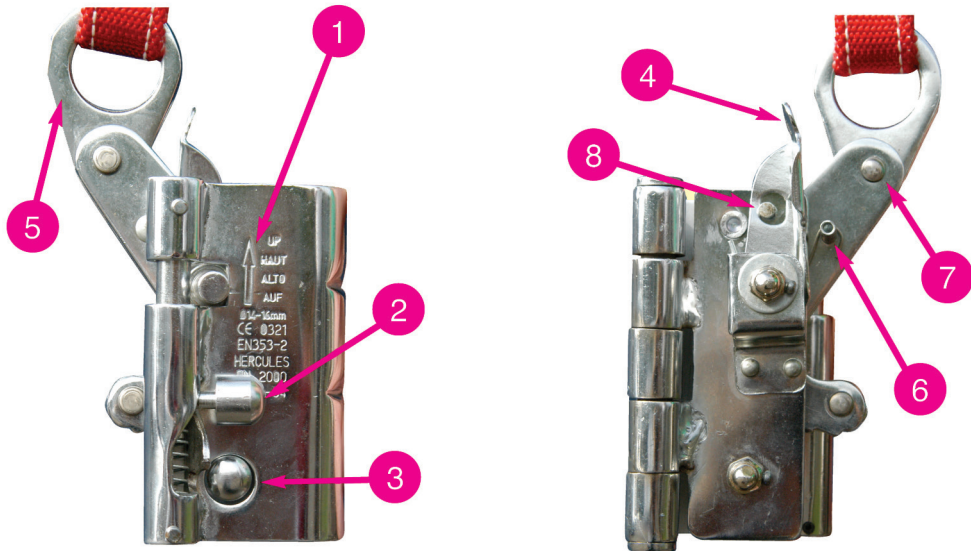
SAFETY AT THE HIGHEST LEVEL

# Rope Grab Operation & Maintenance Manual





# Rope Grab Operation (14mm)



The rope grab has to be opened to position the rope correctly. Open the rope grab device as follows:-

Pull lever 2 down and push fully into the opening to disengage the pressure pin 3. The device will now open. (See a, b & c)

Note: Ensure the rope grab is attached to the rope with arrow 1 pointing towards the anchorage point.

Place the rope in the device, ensuring arrow 1 is still pointing towards the anchorage point. Close the device and it will automatically lock. (The lever will return to the original position). Check that the device slides freely on the rope when the eyelet 5 is pulled downwards. (See d, e & f)

Attach the end of the rope to the anchorage point using an EN 362 connector. (See g)

The device can be used in either AUTOMATIC mode for vertical access use (Ladder) or MANUAL mode, when using along horizontal surfaces or inclined planes (roof).

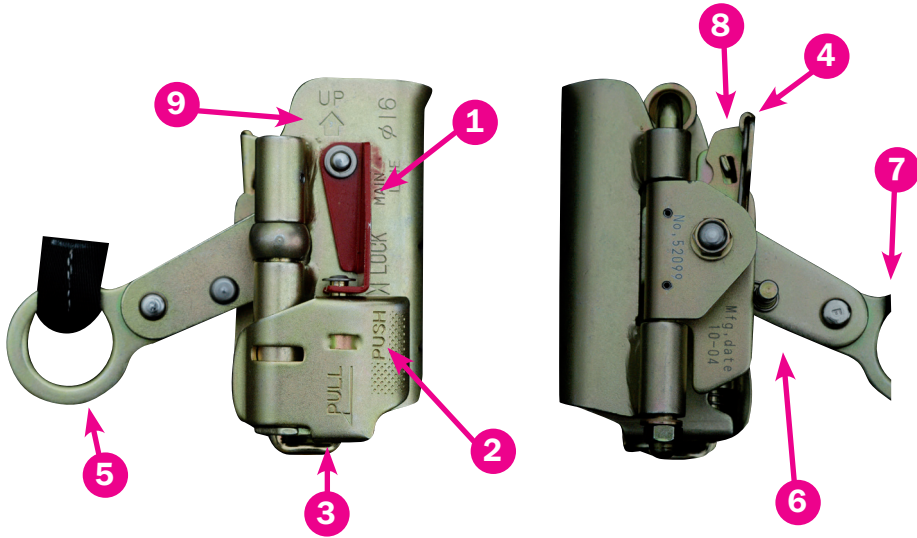
MANUAL mode is the recommended option when on flat or inclined roofs.

When using in MANUAL mode, the selector 4 is down. Remove selector 4 from the securing pin 8 and bring it to rest against the end stop 6. This will ensure that it can only slide along the rope by manually operating the pincher arm 7 (See h & i)

In AUTOMATIC mode, selector 4 is up. In this position the device follows the user as they move upwards or downwards and, in the case of a fall, instantly locks on the rope. ( See j).



# Rope Grab Operation (16mm)



The rope grab has to be opened to position the rope correctly. Open the rope grab device as follows:-

Holding the rope grab, move the Safety Catch **1** towards the up arrow (See a)

Push the lever marked "Push" **2** hold this down and slide the lever **3** in a downwards direction and engage it against the holding lug (See b & c). The device will now open. (See d top)

Note: Ensure the rope grab is attached to the rope with arrow **9** pointing towards the anchorage point.

Place the rope in the rope grab (See d bottom), ensuring arrow **9** is still pointing towards the anchorage point. Close the device and push the lever **2**. The rope grab will automatically close (See e). Re-engage the safety catch **1** (See f).

Check that the rope grab slides freely on the rope when the eyelet **5** is pulled upwards.

Attach the end of the rope to the anchorage point using an EN 362 connector. (See g)

The device can be used in either AUTOMATIC mode for vertical access use (Ladder) or MANUAL mode, when using along horizontal surfaces or inclined plane (roof).

When using in MANUAL mode, the selector **4** is down. Remove selector **4** from the securing lug **8** and bring it to rest against the end stop **6**. This will ensure that it can only slide along the rope by manually operating the pincher arm **7** (See h & i)

In AUTOMATIC mode, selector **4** is up and engaged against the lug. In this position the device follows the user as they move upwards and downwards (See j).





# Personal Fall Protection Systems

## PERSONAL FALL PROTECTION SYSTEMS

Personal fall protection systems are required when an operative is working at an elevated level with an unprotected side or edge, which can be at any height. The system must be designed in such a way to prevent the operative from free falling more than 2m (6'6") or striking a lower level. There are two ways that a company can accomplish this task: Fall Restraint or Fall Arrest.

## FALL RESTRAINT SYSTEM

This system does exactly what it states. It is designed in such a way as to restrain the user from falling by not allowing the user to get to the leading edge. With this system the free fall distance is ZERO. Belts can be used with this type of system but a full body harness is recommended. If any possibility of a free fall exists then the user needs to use a Fall Arrest system.

## FALL ARREST SYSTEM

A fall arrest system consists of the following components: Anchor, Connector, Body support and Retrieval.

- Anchors need to have a minimum breaking strength of 10kN or be engineered for a specific system and have a safety factor of 2:1.
- Connectors can consist of one of several different means. A positioning lanyard, a deceleration lanyard, a self-retracting lanyard/life line or a climbing aid device.
- Body support is a full body harness. A full body harness

distributes the fall impact throughout the body and allows the user to better absorb a fall.

- When working in a fall arrest situation it is a legal requirement for the employer/building owner to have a rescue policy and plan in place and not to rely solely on the emergency services. Anyone responsible for or working at height must be trained fully on correct rescue procedures including how to use the rescue kit provided. Should an emergency occur, a competent first aider should be present to assist with the casualty and to follow the standard first aid guidance for the recovery of a person.

## KEY COMPONENTS OF A FALL ARREST SYSTEM

There are a number of issues that need to be addressed when considering using a fall arrest system.

## IMPACT FORCE (EUROPEAN)

The maximum impact force for a full body harness is 6kN and 10kN for the anchorage point. Calculating the impact force is difficult because there are so many variables. These variables include fall distance, person's weight, and attachment method (self retracting life line, shock-absorbing lanyards, etc.). (See [Table for North America Fall Protection Regulations](#))

## EQUIPMENT COMPATIBILITY

It is important that the equipment being used is compatible with one another. The entire system needs to be measured by its weakest link. Conventional locking snap hooks need to be used with compatible D-ring connectors. It is a general recommendation that a user does not mix fall protection equipment from various manufacturers in order to avoid a compatibility issue and to ensure maximum manufacturer guarantee of quality and use.

## FREE FALL DISTANCE

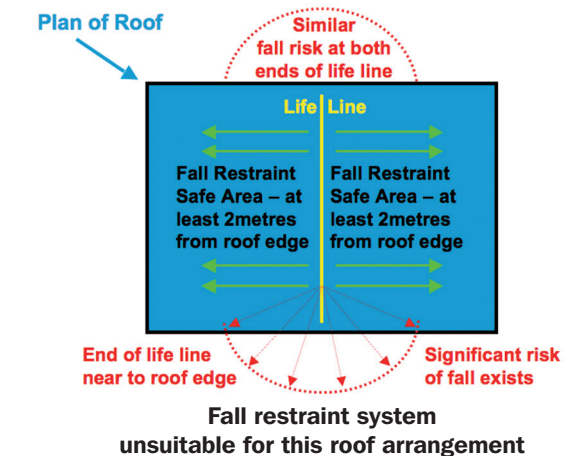
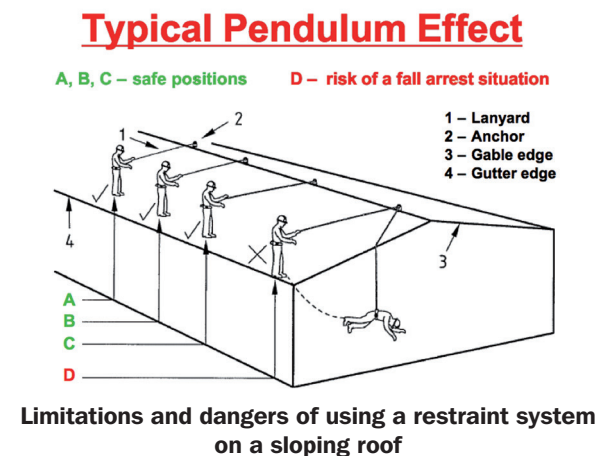
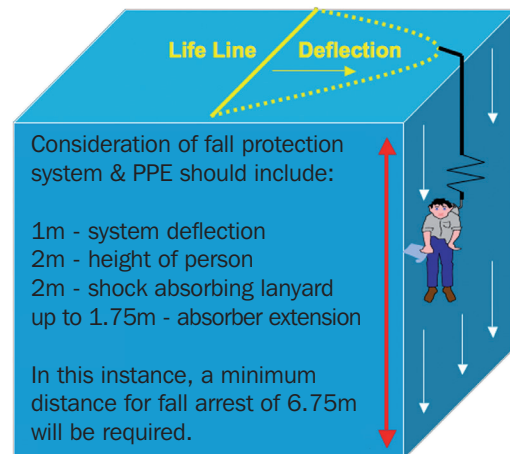
In layman's terms, it is the distance that a person falls before any part of the system starts to arrest the fall. Free fall is measured from the anchorage point to the point in which the system started to arrest the fall. This distance excludes deceleration distance and lanyard/harness elongation. Maximum free fall distance is 2m (6'6") or striking a lower level.

## TOTAL FALL DISTANCE

Is measured as the distance the operative fell from the point at which they were standing to the position of their feet after the fall. Free fall and deceleration distances are included in the measurement. [See falling distances diagram.](#)

## ANCHORAGE POINTS

Need to be rated at a minimum of 10kN (2248lbs) per person. If engineered, they need to have a 2:1 safety factor. (Minimum USA requirement is 5000lbs.). (See [Table for North America Fall Protection Regulations](#))

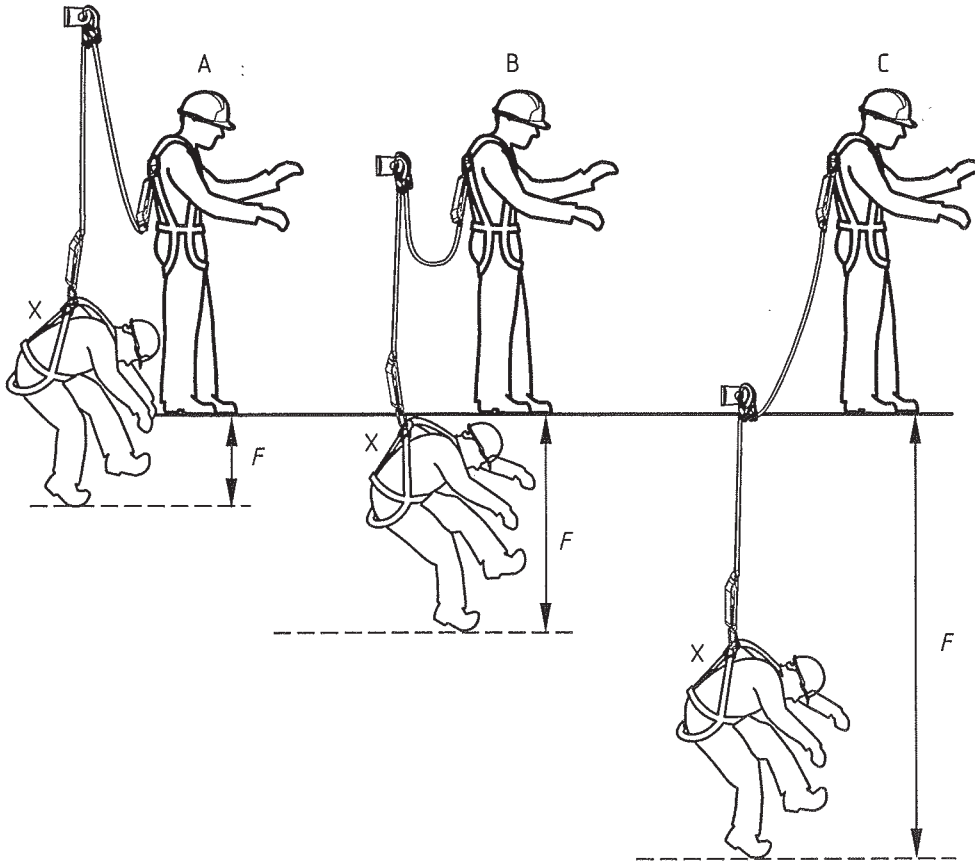






North American Fall Protection Regulations	Canadian Federal	British Columbia	Alberta	Saskatchewan	Manitoba	Ontario Industrial	Ontario Construction Industry	Quebec	New Brunswick	PEI	Nova Scotia	Newfoundland & Labrador	Northwest Territories & Nunavut	Yukon	US Fed OSHA General Industry	US Fed Construction Industry
	COSH S2.5, 2.9, 12.10	Reg 420/2004 Parts 4 & 11	Part 9	OH&S Reg. 1996 S102 & 116	Reg 217/2006	ON Reg 851-90	Reg 213/91	LSST C.S-2.1 r.19.01 S346	Act O.C. 91-1035 Reg 1-191	EC633/04	OIC 96-14 Reg 2/96	OC 96-478	Reg C.S-1	O.I.C. 1986/164	CFR 1910.23 & 1910.66	CFR 1926.502
Year of Last Amendment	1994	2007	2009	2007	2006	2006	2005	2006	1991	2004	1996	1996	2000	1986	1994	1994
Threshold of Height for Fall Arrest	8ft	10ft	10ft	10ft	8ft	10ft	10ft	10ft	10ft	10ft	10ft	10ft	10ft	10ft	6ft	6ft
Threshold of Height for Guard Rails (Premanent Work Locations)	4ft	4ft	4ft	4ft	-	3.5ft	8ft	-	4ft	10ft	10ft	-	-	8ft	4ft	-
Maximum Free Fall (* = when no Personal Energy Absorber)	4ft	-	-	4ft	4ft	5ft	-	4ft	4ft	4ft	4ft	4ft	4ft	4ft	6ft	6ft
Maximum Deaccelartion Distance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.5ft	3.5ft
Maximum Arretsing Force	1800 lb	-	8 kN	8 kN	8 kN	8 kN	8 kN	-	-	-	-	-	-	-	1800 lb 900 lb	1800 lb 900 lb
<b>Adopted Z259.16</b>	-	Y	Y	-	Y	-	-	-	Y	Y	-	Y	-	-	-	-
Minimum FAS Anchor Strength	4000 lb	5000 lb 2xMAF	3600, Z259.16	5000 lb	(3600 lb) FOS x8 kN	5000 lb	4000 lb	4000 lb	4000 lb	4000 lb	4000 lb	-	-	-	5000 lb 2 x MAF	5000 lb 2 x MAF
Minimum Travel Restraint Anchor Strength	-	800 lb	800 / 3600 lb	800 / 3600 lb	900 lb = FOS x 400 lb	-	900 lb = FOS x 400 lb	-	-	-	-	-	-	-	-	-
Written Fall Protection Plans/Procedures	Y	> 25 ft	> 10 ft	> 10 ft	-	-	Y	-	-	-	-	-	-	-	-	-
Procedures Based Fall Protection	-	Limited	Limited	-	Roofing	-	-	-	-	-	-	-	-	-	-	Limited
Written Rescue Plans/Procedures	-	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-
Training of Workers (F = Fall Protetcion, R = Rescue)	F.R.	F.R.	F.R.	F.R.	-	-	F	-	-	-	-	-	-	-	-	-
Control Zones/Warning Lines	-	-	Y	Y	-	-	-	-	-	-	-	-	-	-	-	Y
Swing Falls/Swing Drop Distance	-	-	4 ft	-	-	-	-	-	-	-	-	-	-	-	-	-
Horizontal Lifelines to Z259 13 or Z259 18	-	Z259.13 Z259.16	Z259.13 Z259.16	-	Z259.13 Z259.16	-	Engineered	-	-	Z259.13 Z259.16	-	Z259.13 Z259.16	-	-	2 FOS	2 FOS
Fall Protection Equipment (CSA Z259 Series, ANSI Z359.1, EN Series)	CSA	CSA/ANSI	CSA/ANSI EN	CSA	CSA	CSA	CSA	CSA	CSA	CSA	CSA	CSA	CSA	CSA	-	-

# Minimum Height Requirements



## DIAGRAM A

Anchor point above user. (In this case 1m (3.28') above user's harness attachment point)  
(Preferred Option)

Free fall distance: 0.5m (1.64')

Fall factor =  $0.5/1.5 = 0.3$  ( $1.64/4.92 = 0.3$ )

## DIAGRAM B

Anchor point at shoulder level.  
(Non-preferred option)

Free fall distance: 1.5m (4.92')

Fall factor =  $1.5/1.5 = 1.0$  ( $4.92/4.92 = 1.0$ )

## DIAGRAM C

Anchor point at foot level.  
(To be avoided)

Free fall distance: 3.0m (9.84')

Fall factor =  $3.0/1.5 = 2.0$  ( $9.84/4.92 = 2.0$ )

**NOTE:** The lower human figure in each diagram indicates the position of the user at the end of the free fall. This is the point at which the energy absorber begins to deploy and should not be confused with the position the user would be in at the end of the arrest of the fall.

## KEY

F = Free fall distance

(Source BS 8437:2005)

The above diagram shows three fall arrest situations. In each case the fall arrest system is based on a 1.5m (4.92') long energy absorbing lanyard and a distance between the attachment point on the user's harness and their feet of 1.5m (4'92"). The free fall distance is the vertical distance between the position of the user's feet immediately before the fall, and the position of the user's feet at the point at which the lanyard has become taut and started to arrest the fall. (Figure F in the diagram)



# Work at Height Rescue

Before commencing any work at height activity please ensure you are adequately trained and competent to carry out the task and able to use the safety equipment provided by your employer/building owner.

In situations where a work at height activity involves a “fall arrest” situation, it is a legal requirement for your employer/building owner to provide the anchorage point, rescue plan, policy, training and equipment to complete a rescue. It is not the responsibility of the emergency services to conduct such a rescue.

Should a rescue become necessary it is extremely important that the procedures detailed in the “roof permit to work,” rescue policy and plan are followed. Try to make contact with the casualty to establish if they are conscious or unconscious. If they are unconscious then time is of the essence.

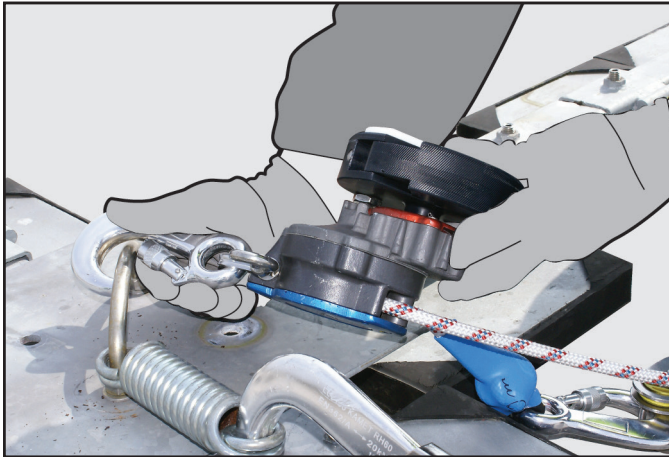
Contact the emergency services and request an ambulance and fire/rescue support. Inform them of the exact address, location and site contact details of where you are working (This should be contained within the “permit to work”). Confirm that you are trained and competent to commence the rescue procedure.

Call your site contact and inform them of the situation and that you have already contacted the emergency services. Request they bring a competent First Aider to assist you at ground level by receiving the casualty. Before commencing the actual rescue, ensure that you are safely connected to an alternative suitable anchorage point (where possible). Ensure you work in “fall restraint” at all times whilst conducting the rescue procedure. Check you have all the Rescue Kit components as shown in the diagram below.

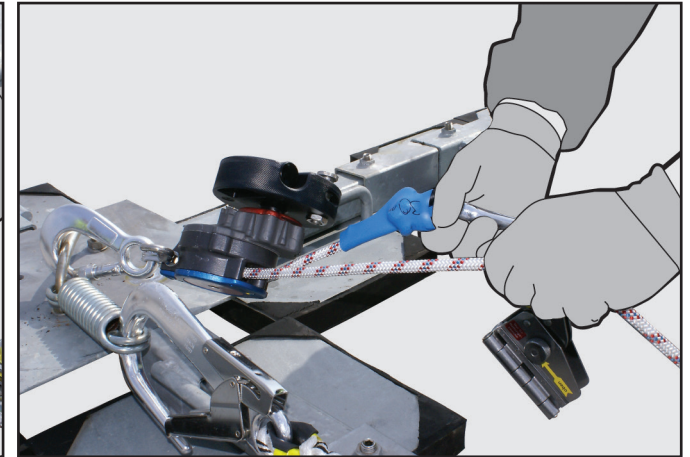
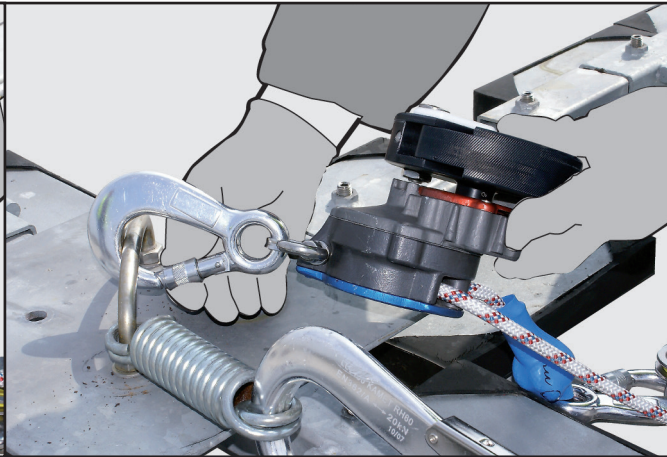


Before commencing the actual rescue, ensure that you are safely connected to an alternative suitable anchorage point (where possible). Ensure you work in “fall restraint” at all times whilst conducting the rescue procedure. **Check you have all the Rescue Kit components as shown in the diagram above.**

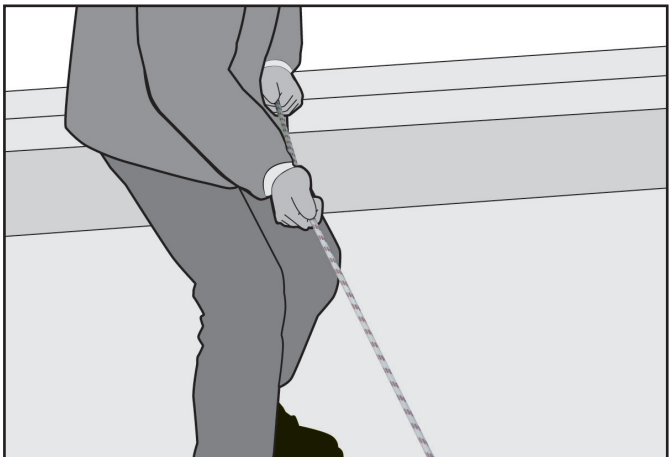
# Rescue Kit Operation



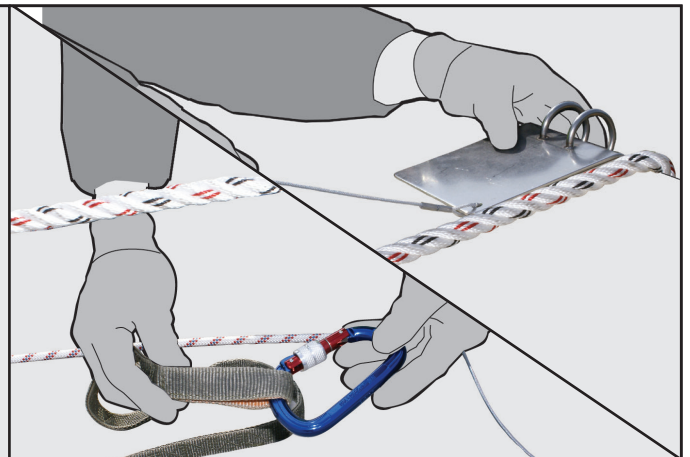
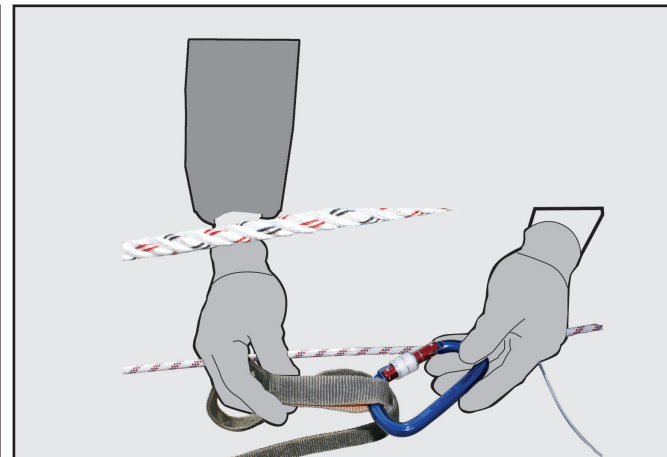
**a.** Connecting to the same or an alternative suitable anchorage point. Connect the Rescue Hub device using the Screw Gate Karabiner fitted directly to the Rescue Hub. Ensure the Screw Gate is tightened once connected to the anchorage point.



**b.** Pull the end of the Kernmantel Rope which has the Rescue Rope Grab attached. The Kernmantel Rope will start to feed out of the rescue bag and run through the Rescue Hub.



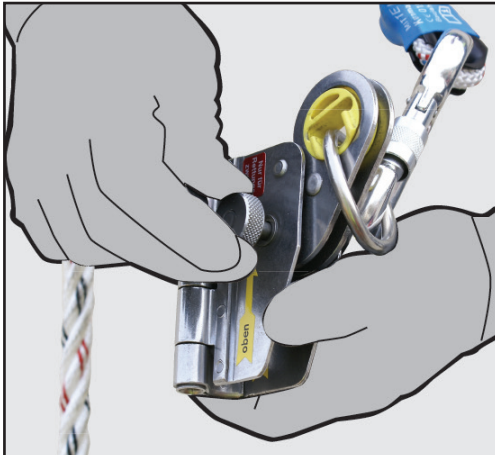
**c.** Start walking towards the area where the casualty has fallen whilst still holding the Rescue Rope Grab. When you reach this area, kneel down and continue to pull out sufficient rope to reach the “D” ring on the casualty’s harness.



**d.** Ensure the Edge Protector is connected to the anchorage point, this may need to be extended in some cases via a webbing or rope sling. Place the Edge Protector over the edge ready for the rescue operation.



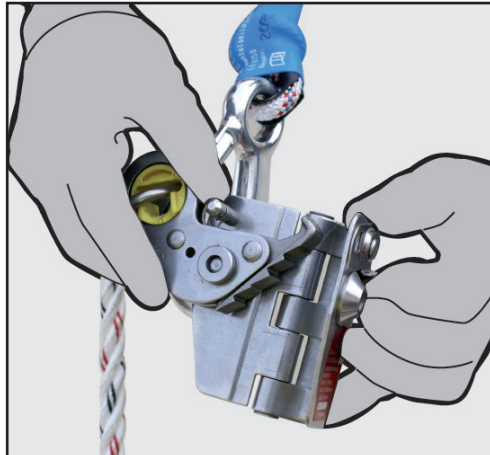
# Rescue Kit Operation



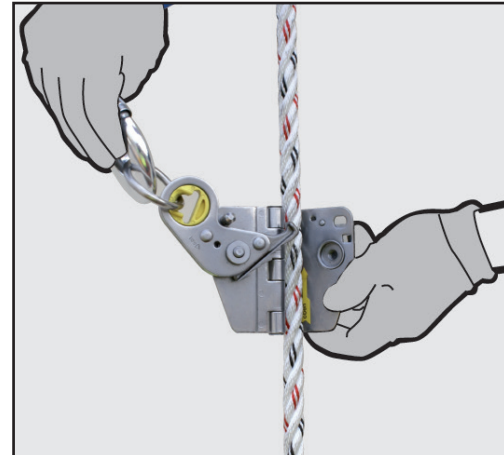
**e.** Whilst holding the Rescue Rope Grab unscrew the Screw Gate as shown above.



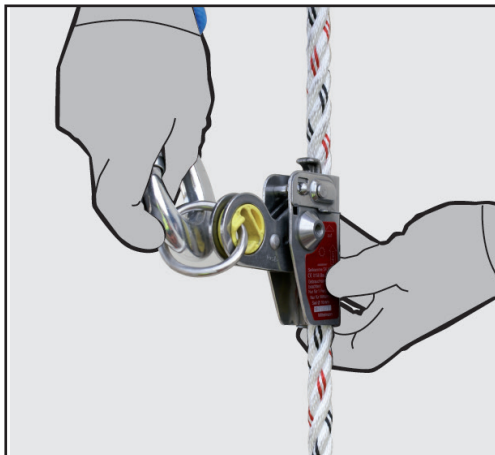
**f.** Turn the Rescue Rope Grab over and push the lever in an upwards direction.



**g.** The Rescue Rope Grab will now open.



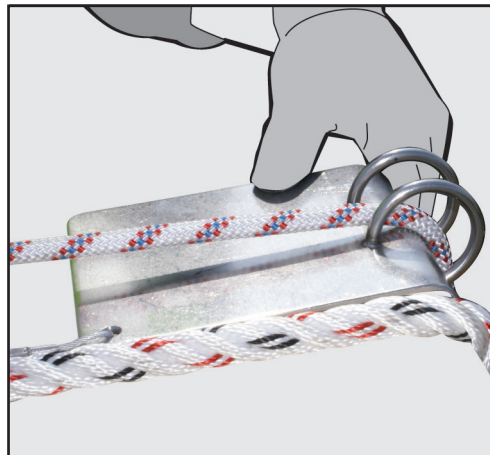
**h.** Ensure you have adopted a “fall restraint” position. Carefully lean over the leading edge and pass the open Rescue Rope Grab (with the arrow in the up direction) around the back of the casualty’s rope. (cont)



**i.** (cont) Ensure the casualty’s rope is correctly positioned inside the Rescue Rope Grab. Close the Rescue Rope Grab.



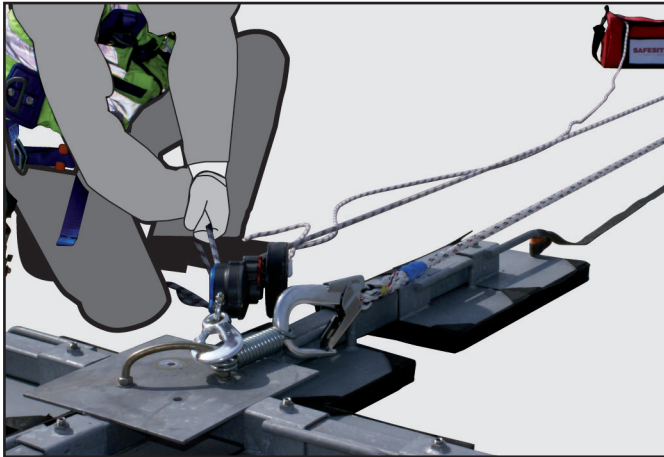
**j.** Once the Rescue Rope Grab is closed ensure the Screw Gate is then tightened into position.



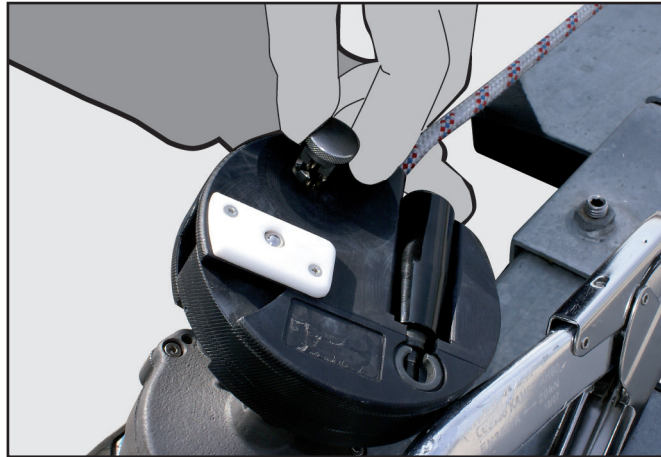
**k.** Position the Rescue Kernmantel Rope over the Edge Protector. Now carefully lower the Rescue Rope Grab down towards the casualty. The Rescue Rope Grab device will descend easily under gravity to the “D” ring of the casualty’s harness.



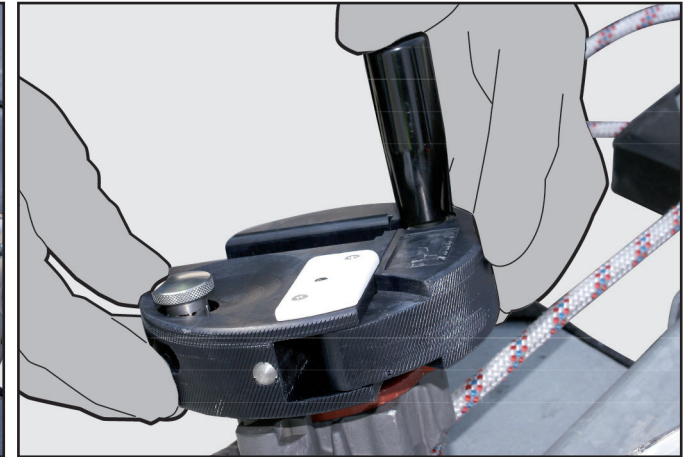
# Rescue Kit Operation



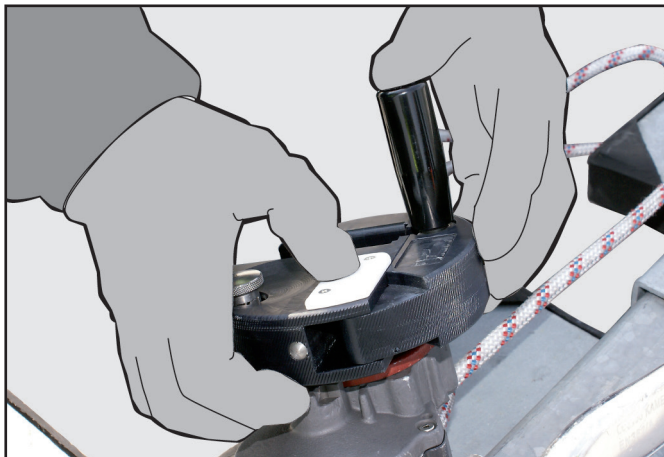
**l.** Return to the anchorage point where the Rescue Hub is connected. Pull any excess Kernmantel Rope through the Rescue Hub by pulling the free end of the rope which is stored in the bag.



**m.** Once the Rescue Hub Kernmantel Rope is taught, rotate & lower the locking pin so that it engages with the body of the hub. When in place correctly, the hub cannot turn.



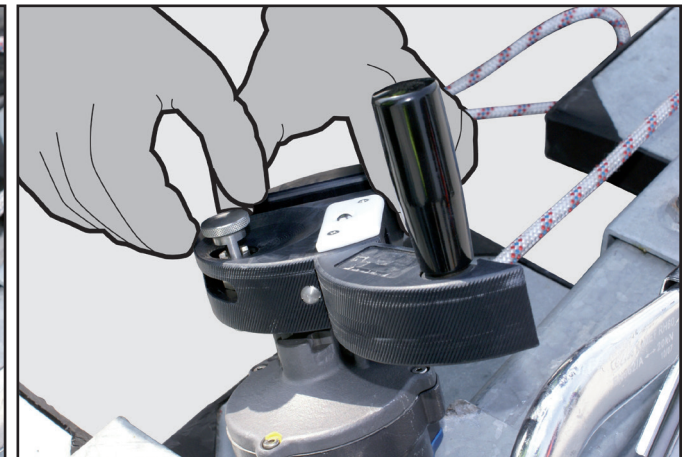
**n.** Lift up the black handle as shown above.



**o.** With the black handle in position push the silver ball bearing positioned in the centre of the white plate as shown above.



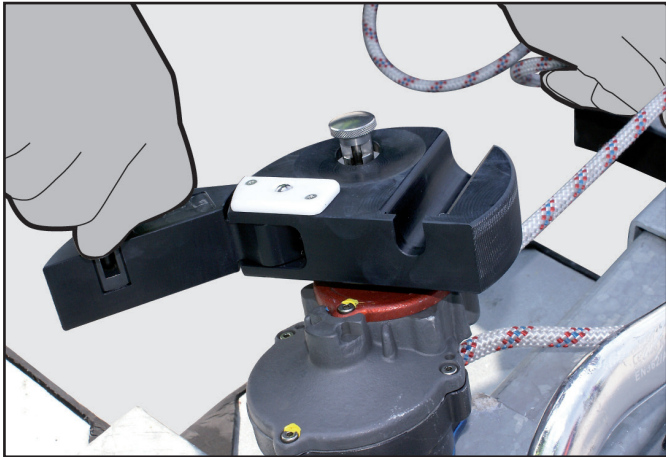
**p.** Now open the top third of the Rescue Hub and it will automatically lock into place.



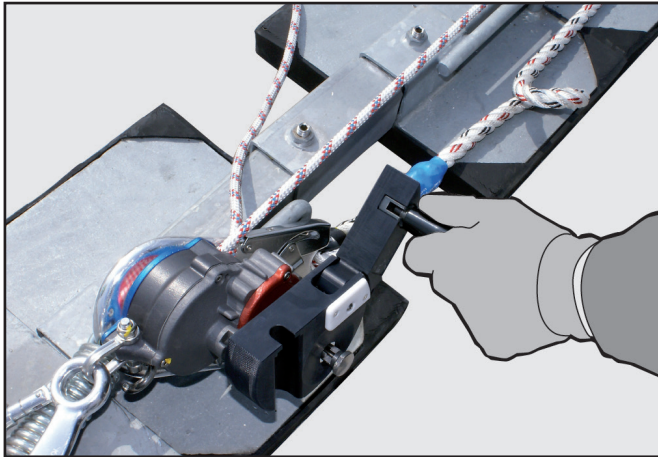
**q.** Detach the pin.



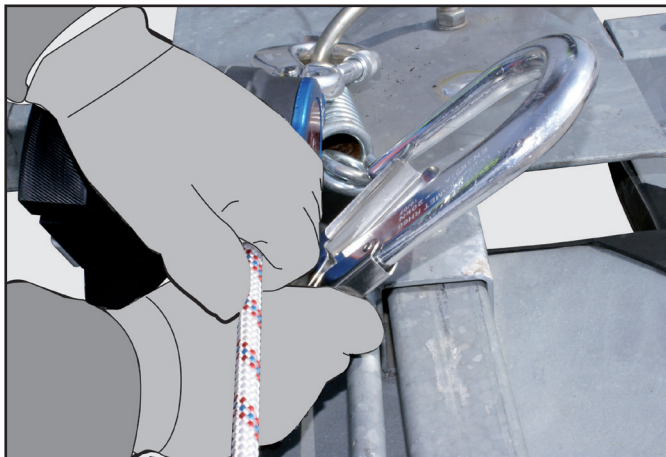
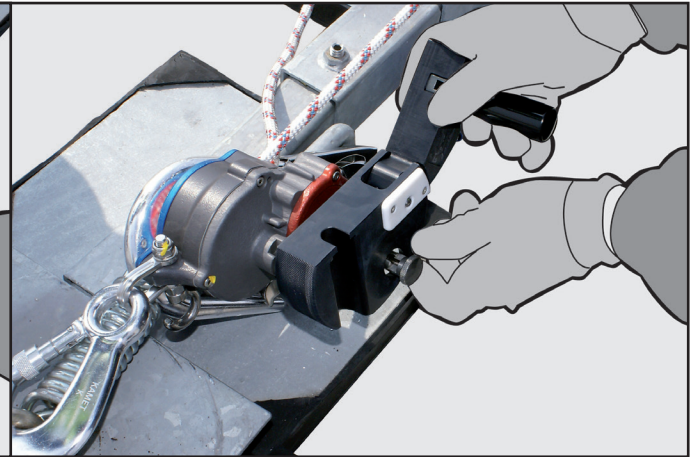
# Rescue Kit Operation



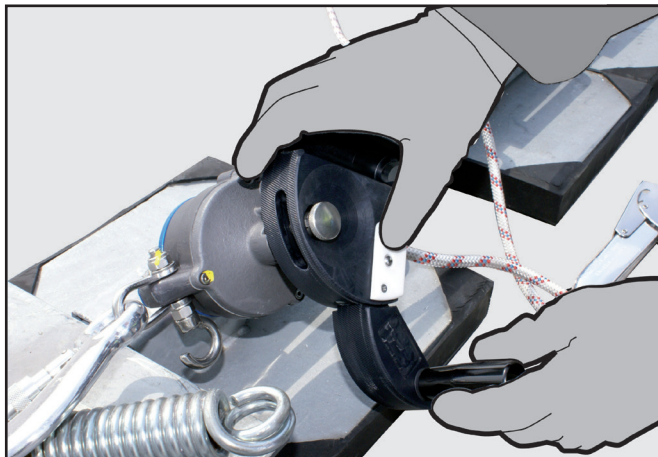
**r.** Start winding the Rescue Hub in a clockwise direction so that the Kernmantel Rope passes through the hub. If the rope does not move through the hub, pull on the free end of the rope. Continue to wind until the casualty's primary rope becomes slack.



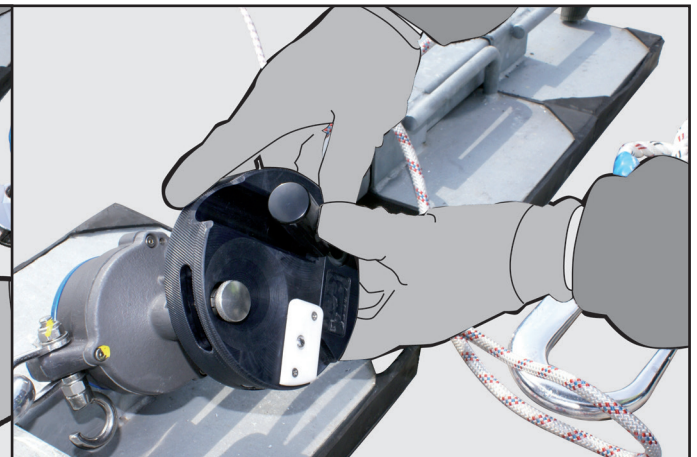
**s.** Once the casualty's primary rope is slack enough to detach their primary hook/karabiner from the anchorage point, stop winding and engage the locking pin by lifting, rotating & then lowering it. Ensure the pin is engaged against the body of the Rescue Hub. When in place correctly the Hub cannot turn.



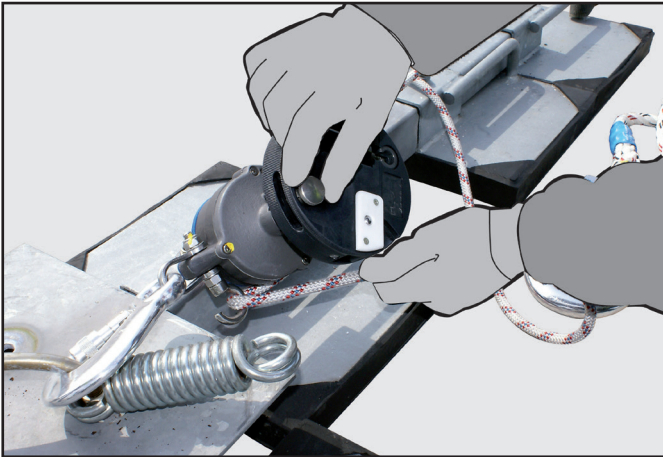
**t.** You can now remove the casualty's slack primary rope from the anchorage point as shown above.



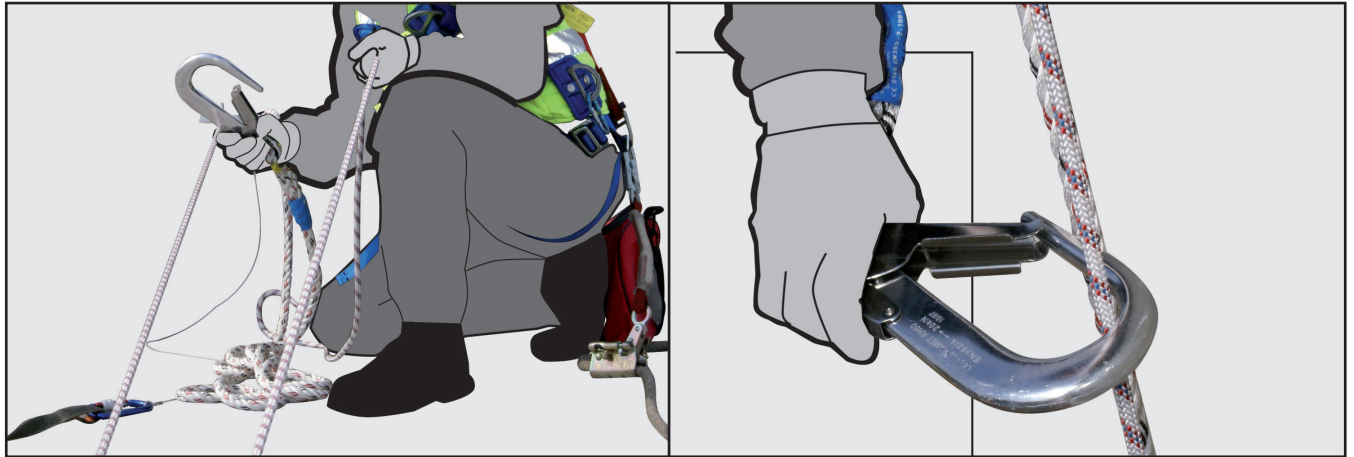
**u.** Close the Rescue Hub by pressing in the silver ball bearing in the centre of the white plate. Once closed fold down the plastic handle.



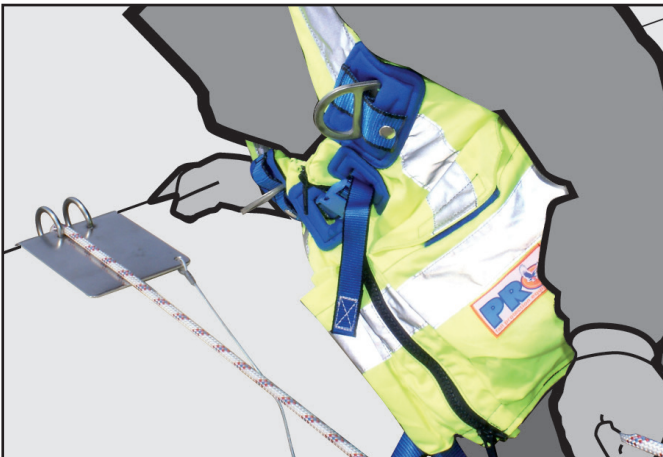
# Rescue Kit Operation



**V.** Pass the loose end of the Kernmantel Rope around the pig tail of the Rescue Hub. Hold the rope firmly in one hand. To take the load off the casualty, simply rotate and pull the Locking Pin upwards and rotate sufficiently so that the pin is disengaged from the Rescue Hub. Whilst holding the Kernmantel Rope you can move back towards the area where the casualty fell.



**W.** Once you are in a comfortable position and able to hold the casualty with one hand, take the casualty's primary rope which you previously disconnected from the anchorage point. When ready, carefully position yourself so you are able to attach this primary rope to the Rescue Hub Rope (Kernmantel Rope) as shown above. Ensure that you keep holding the Rescue Hub Kernmantel Rope at all times. Gradually lower the casualty's primary rope until the hook reaches the casualty's "D" ring. Ensure you are still holding the Rescue Hub Kernmantel Rope. You can now let the casualty's primary rope fall to the ground so that it can be used as a guy rope by those at ground level who are ready to assist/receive the casualty.



**X.** Begin to lower the casualty gradually, continually observing them and communicating with both the casualty and those at ground level who are receiving/assisting the casualty. The competent first aider must then follow the standard UK first aid guidance for the recovery of a person. The casualty must then be seen by the ambulance crew, even if they appear to have recovered.





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