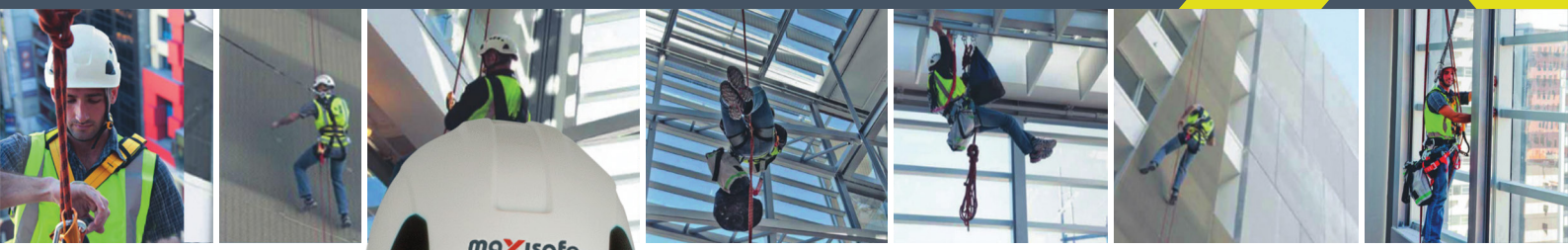
maXisafe®
height safety gear



Height Safety

Offering leading edge technology and design, Maxisafe's new height safety harnesses and kits raise the bar.

Why use fall protection?

Falls from heights are the single biggest cause of death or serious injury in the workplace. For businesses whose staff and maintenance teams need to work at height quickly and effectively, fall protection is increasingly important.

Health and Safety legislation and the controlling organisations are enforcing stricter rules and best practice for safe access and working at heights.

Hard hat is shown for photographic purposes only.

AS/NZS 1891.1 2007

there's safe and there's Maxisafe.

All Maxisafe's height safety products are independently tested and certified by BSI in accordance with Australian and New Zealand Standard AS/NZS 1891.1 2007.

Roofers Kit User Manual

ZRK903

AS/NZS1891.4 requires manufacturers to provide users with instructions on the correct use of products when part of a Fall Arrest System.

MAXISAFE WARNING

- The equipment provided in this kit are part of a fall protection system –
  - users must follow the manufacturer's instructions for each piece of equipment.
  - instructions must be provided to the user of the equipment.
  - users must read and understand these instructions before using the equipment.
  - equipment must be maintained in accordance with the instructions
  - Serious injury or death may result if equipment is altered or misused (including use not in accordance with manufacturers' instructions).

ZRK903 Roofers Kit Contents

- **JSPB004** - Multi pocketed back pack
- **ZBH901** - Basic Harness
- **ZRL-15** - Kernmantle Rope Assembly with HD Shock Absorber fitted to Adjuster
- **ZXXXX** - ANSI Screwgate Karabiners (3)
- **ZWS915** - 25mm x 2m Webbing Round Sling
- Easy to understand instructions

Maxisafe manufactures the above Roofers Kit – the kit is identified with a unique identifying number – this manual provides user information for that kit.

DESCRIPTION

Maxisafe Roofers kits when used as intended are a Fall Protection system for those working on roofs.
Used correctly a fall restraint system is created which can provide Fall Arrest protection in the event of unforeseen occurences.

RISK ASSESSMENTS WORKING ON ROOFS

Work on Roofs is a dangerous operation. As a result, it demands that anyone intending to Work on Roofs think deeply about it and conduct a Risk Assessment on their activity.

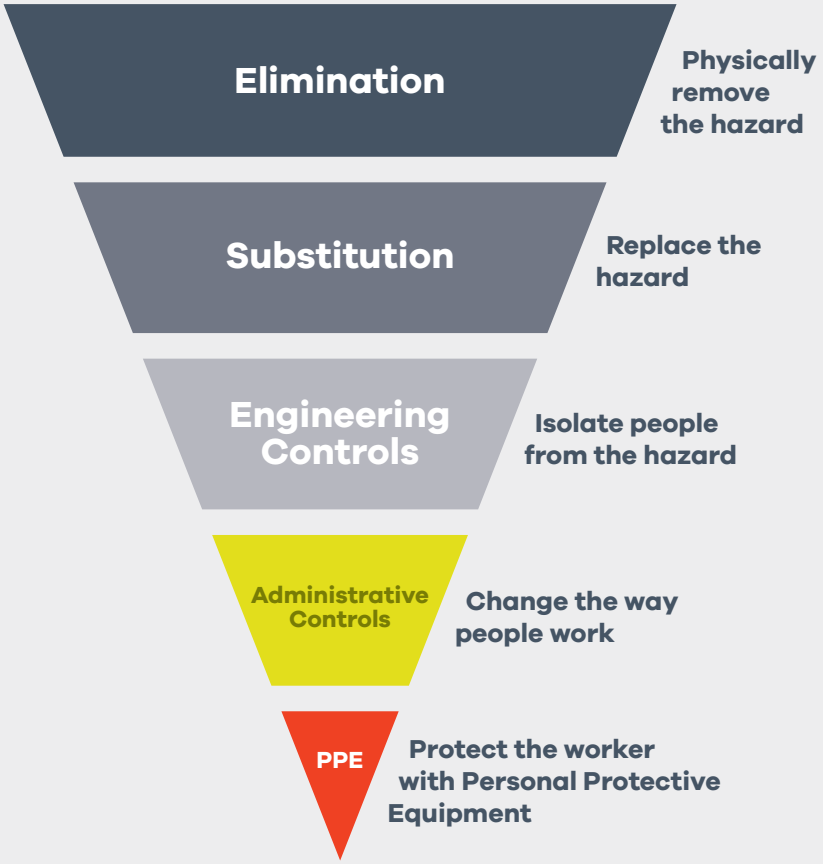
Risk Assessment Procedure

Risk Assessment in its simplest form –

1. Identifies the hazard whilst conducting the activity.
2. Addresses the hazard with an action.
3. Reviews the hazard after the action whilst again conducting the activity.

Using Hierarchy of Controls assists –

Hazard Whilst Working On Roofs - Falls from Height
Actions Using Hierarchy of Controls



Elimination – Physically remove the hazard

Eliminating the risk involves things like re-locating the work to ground level removing the Fall Hazard
= NO RISK OF FALL

Substitution – Replace the hazard

Substituting working from roof with Elevated Work Platform or Scissor Lift (used correctly) removes the Fall Hazard
= MINIMAL RISK OF FALL

Engineering Controls – Isolate people from the hazard

Isolating the work activity by erecting perimeter protection (scaffolding or edge protection) stops the Fall
= MINIMAL RISK OF FALL

Administrative Controls – Change the way people work

Changing the way and when work activity is preformed involves formal activity for change resulting in removal of Fall Hazard
= MINIMAL RISK OF FALL

PPE – Protect the worker with Personal Protective Equipment

PPE (Roofers Kit) used correctly provides Fall Protection which can be in the form of

- Fall Restraint System which prevents Fall Hazard
  = LIMITED RISK OF FALL
- Fall Arrest System which acknowledges the possibility of Fall Hazard
  = RISK OF FALL

FALL ARREST SYSTEMS

In acknowledging the possibility of a Fall Hazard Fall Arrest Systems direct attention to

1. Safe Work Methods resulting in comprehensive documentation of
   - Work Activity
   - Hazard Identification
   - Controlling Action
   - Revised and Reduced Hazard Identification

AND

2. Rescue Plan Identifying –
   - Who (Emergency Services excluded)
   - How – Peer Rescue - requires training
   - Equipment Requirements
     Reference to AS/NZS1891.4 will always assist

RESTRICTIONS

- Roofers' kits are for **one person use** - only one person MUST be attached to anchor point through this kit (life lines, adjusters or rope grabs, shock absorbers or lanyards included).
- System must be setup in a total fall restraint - where when used correctly there is no risk of any free fall.
  a. Where a free fall is possible - ie. brittle roofing material or roof edge work sufficient fall clearance below must be ascertained. (refer fall clearances)
  b. The equipment within Roofers' Kits can be damaged by a number of external things – checking for the absence of these will give improved surety to its safe operation. Check for:-
     i. Sharp edges which can cut attaching member (webbing or rope).
     ii. Detrimental substances - painting materials, solvents, hot surfaces, chemicals, corrosives, moving machinery, sharp edges.
     iii. Hazards such as high voltage equipment, welding or heated equipment will cause damage to the system.
- Foreign Components (components not included in testing regime) – Maxisafe Roofers' Kits are a system tested in combination. Changing components could have a detrimental effect on the operation of the system – please consult Maxisafe prior to doing so.
- Equipment within Maxisafe Roofers' Kits form a system and should be used as such. Training in safe access to Roofs and correct use of these kits will maximise the safety of operatives.
- Pendulum effect when working at height may occur and it is extremely important to ensure that this factor is taken into consideration when systems are set up and employed. (See pendulum effect section)

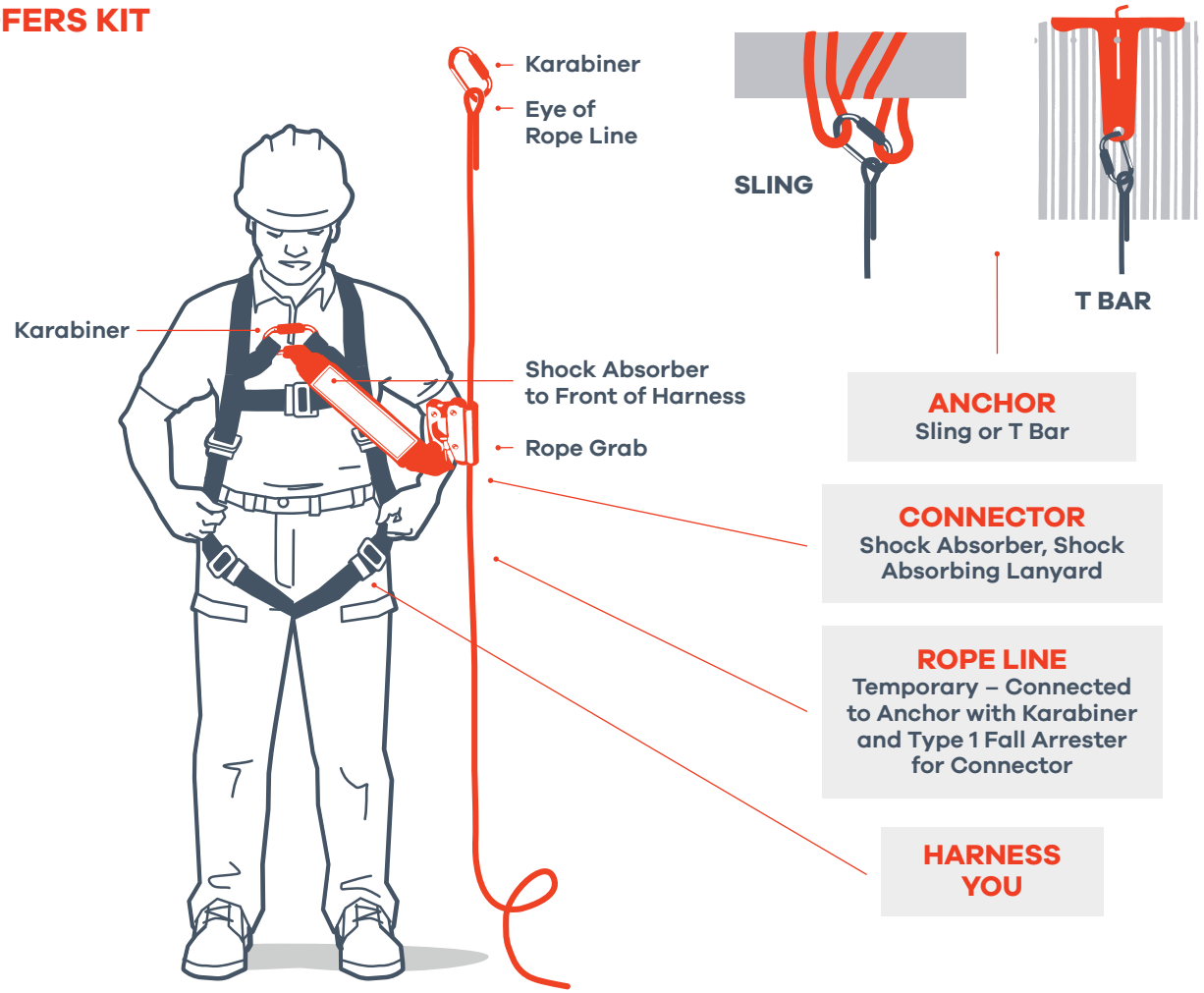
DEFINITIONS

(Courtesy AZ/NZS1891.1-4 and AS/NZS5532)

Anchor: *"Device or system attached to a structure, ready for the attachment of personnel for protection against falls from a height."*

Anchors (the structure included) form the basis from which our Fall Arrest System starts.

ROOFERS KIT

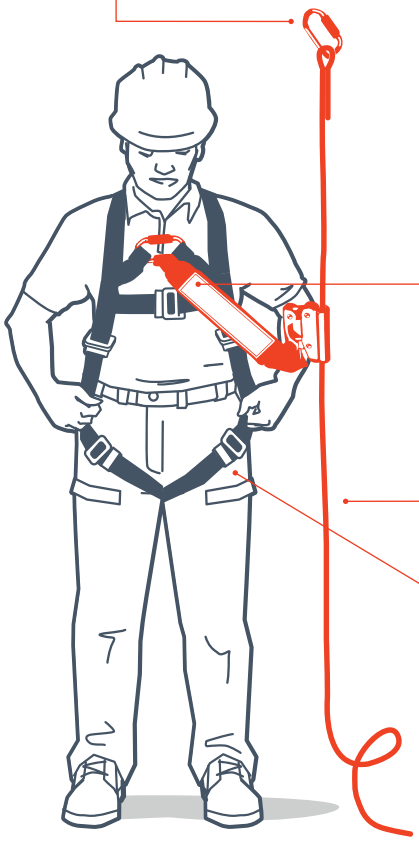


ANCHORS according to AS/NZS1891.4 2009 have varying applications and capacity requirements –

Application	Capacity (UTS in KN)
Single Point Anchorages	
- Fall Arrest (one person)	15Kn
- Fall Arrest (two persons)	21Kn
- Limited Free- fall arrest	12Kn (includes rope access anchorages)
- Restraint Technique Anchor	12Kn or 15Kn (subject to risk – if Fall Arrest then 15Kn
Horizontal Lifelines	
- End Anchorages	Refer to Manufacturer's calculations
- Intermediate Anchorages	
Diversion less than 15°	12Kn
Diversion 15° or more	12+Kn – Refer AS/NZS1891.4 2009 Cl6.2.5
• Where Practicable one person Single Point Anchorages should be rated at 15Kn regardless of application • UTS means that anchorage may deflect / yield but must not fail – ie some anchorages deform to absorb energy.	

ANCHORAGES

Metal Karabiner linking sling / T Bar Anchor and safety rope, the round sling has no loose ends, all ends are contained within the Karabiner



ANCHOR
Temporary or Fixed

CONNECTOR
Shock Absorber, Shock Absorbing Lanyard

ROPE LINE
Temporary – Connected to Anchor with Karabiner and Type 1 Fall Arrester for Connector

HARNESS YOU

Alternate Anchorages should be approved by local authority.

SLING

Sling around anchor point, with protection of the sling at sharp edges. Wrap twice. Angle where sling takes load must be less than 120 degrees.

T BAR

Use of T Bar Anchor locked on to gutter end of roof sheeting.

Anchorage line: a rigid rail or flexible line secured to an anchorage point along which a Type1 fall-arrest device travels, or a flexible line which unreels from a fall-arrest device.

Attachment Hardware: any ring, hook, karabiner, or other connecting device located in such a position that it must sustain by itself the full loading of a fall arrest.

Energy (Shock) Absorber: an attachment which by design reduces the deceleration force imposed by a sudden arrested fall, used in series with a fall arrest harness and lanyard.

Fall-arrest device: a self-locking device attached to a harness which either travels along or pays out an anchorage line.

Full Body (Fall Arrest) Harness: an assembly of interconnected shoulder and leg straps, with or without a waist belt, designed for attachment to a lanyard, pole strap, or fall arrest lanyard, and used where there is likelihood of free or restrained falls.

Free fall: any fall or part of a fall where the person suffering the fall is under the unrestrained influence of gravity over any fall distance either vertically or on a slope on which it is not possible to walk without the assistance of a hand rail or hand line.

Shock Absorbing Lanyard: a line including Shock Absorber used, usually as part of a lanyard assembly to connect a fall arrest harness to an anchorage point or static line in situations where there is risk of free fall.

Restrained fall: any fall where the person suffering the fall is under less than the full influence of gravity due to the action of a restraining device such as a pole strap, or restraint line or is sliding down a slope less steep than is required to have the assistance of a hand rail or hand line.

Restraint Line: a line used to restrict the horizontal movement of the user to prevent a fall. *(To be used in restraint technique only, should include an energy absorber in the event of a fall)*

Total Fall Distance: the total distance a person is likely to fall during both the free and restraint parts of a fall, including the maximum dynamic extension of all supporting equipment.

REFERENCE MATERIAL

- AS/NZS 1891.1:2007 Industrial fall-arrest systems and devices Part 1: Harnesses and ancillary equipment
- AS/NZS 1891.3:1997 Industrial fall-arrest systems and devices Part 3:
- AS/NZS 1891.4:2009 Industrial fall-arrest systems and devices Part 4:
- Local State Codes of Practice regarding working at heights

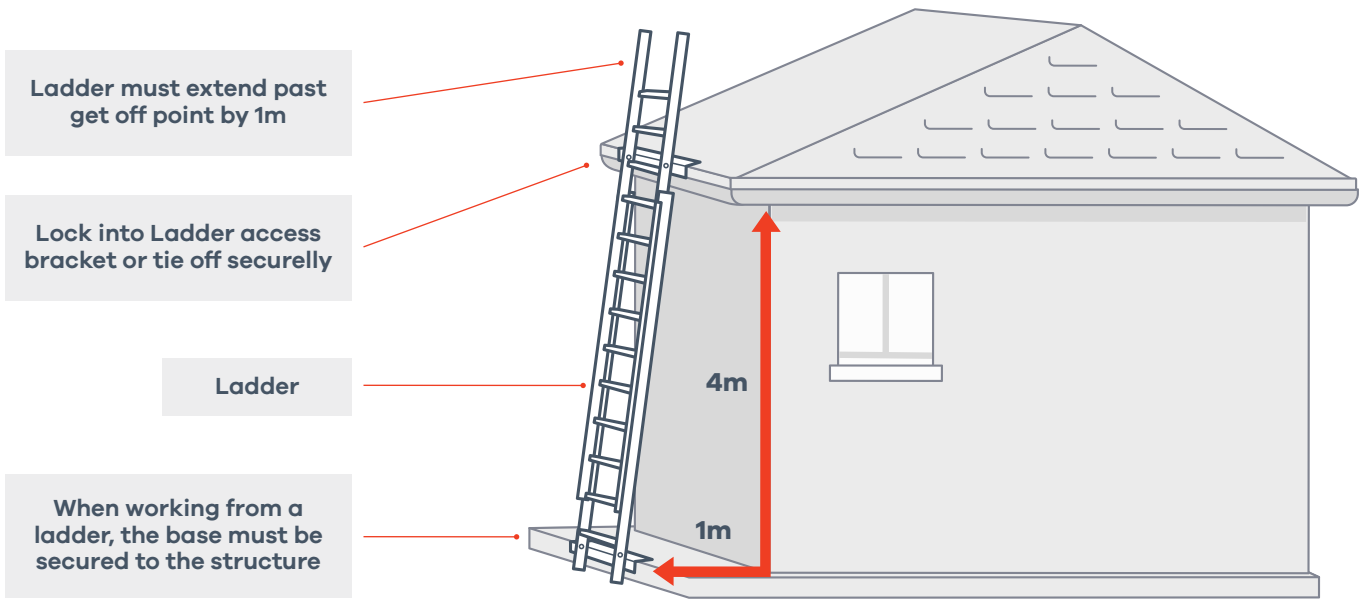
ROOFERS KIT SYSTEM SET UP

All components of Height Safety Systems musted be checked for adequacy prior to use.

(Note difference between checked and inspected although they are near identical –
"Inspected" = detailed formal look by accredited person at component checking item against established requirements – results are recorded for review.
"Checked" = informal look at component by user to confirm "Inspection" has been carried out appropriately, timely and that item is fit/safe for them to use in the current application.)

Setting up Maxisafe Roofers' Kit is a simple but critically important process –

- Establish Anchorage on opposite side of roof to where work is to be done -
    - Set ladder at midpoint along roof of work area – remember 4:1 for angle and tie off.



- Climb and establish Anchorage -
  - T Bar if Metal Roof (see ANCHORAGES)
  - Round Sling if Tiled (see ANCHORAGES)
- Connect Anchor End of Safety Line using Screwgate Karabiner

- Use throw line to get free end (with Rope Grab) of Safety Line to opposite side of roof
  - Throw line usually a light weight cord with old sock filled with sand (no holes in sock) – this establishes contact with opposite side of roof – tie throw line to free end of safety line first.
- Re-establish Ladder setup on opposite of side of roof at centre of work area along roof (side where work is to be done)
  - Don't forget 4:1 and tie off
  - Find sock and throw line and pull slowly across roof (a little care required here to avoid damaging woof with Adjuster (Rope Grab) – in some instances Adjuster (Rope Grab) may need to be covered)
  - Rope lines are usually 15-20m long and should easily reach worker standing on ground - once pulled across roof tie off end to base of ladder.
  - Don Harness and connect to Shock Absorber on Safety Line

DONING THE FULL BODY HARNESS

Step 1: Hold the harness by the dorsal D ring as shown in **Fig. 1.**

Step 2: Insert your arms into the shoulder straps and close. The buckle on the chest strap as shown in **Fig.2.**

Step 3: Pull the leg straps one by one around your thighs. Outwards to your front as shown in **Fig. 3.**

Step 4: Close the buckles of the leg straps one by one as. Shown in **Fig. 4-5.**

Step 5: Tighten the leg straps by pulling the free ends of the straps until the harness fits perfectly to the body as shown in **Fig. 5.**

Step 6: Use the back D-ring or the front as anchor point for fall arrest systems. To locate the anchor points on the harness, check for the "A" marking near them.

Fig. 1

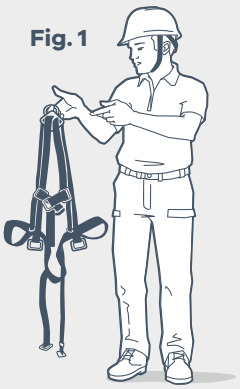


Fig. 2

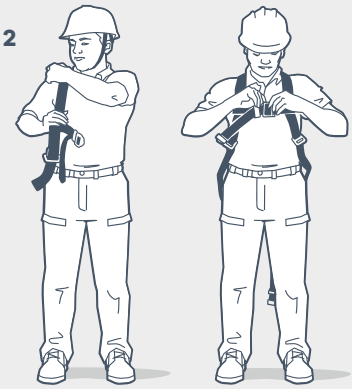


Fig. 3

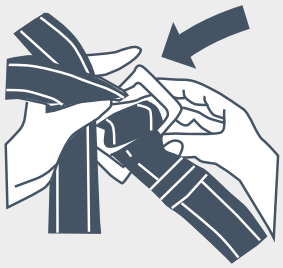


Fig. 4

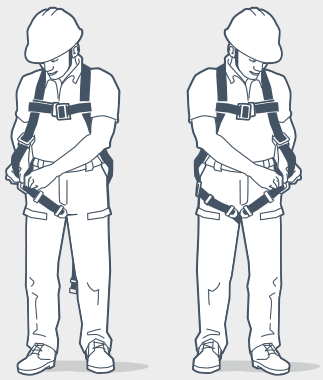


Fig. 5

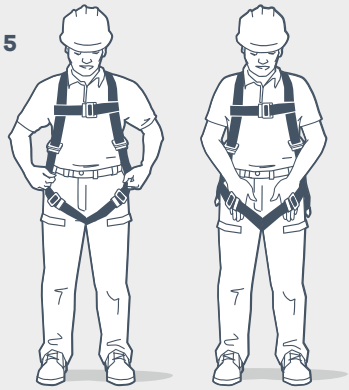
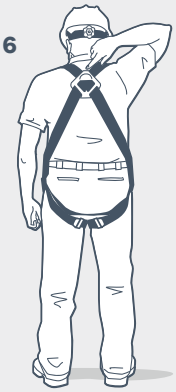


Fig. 6



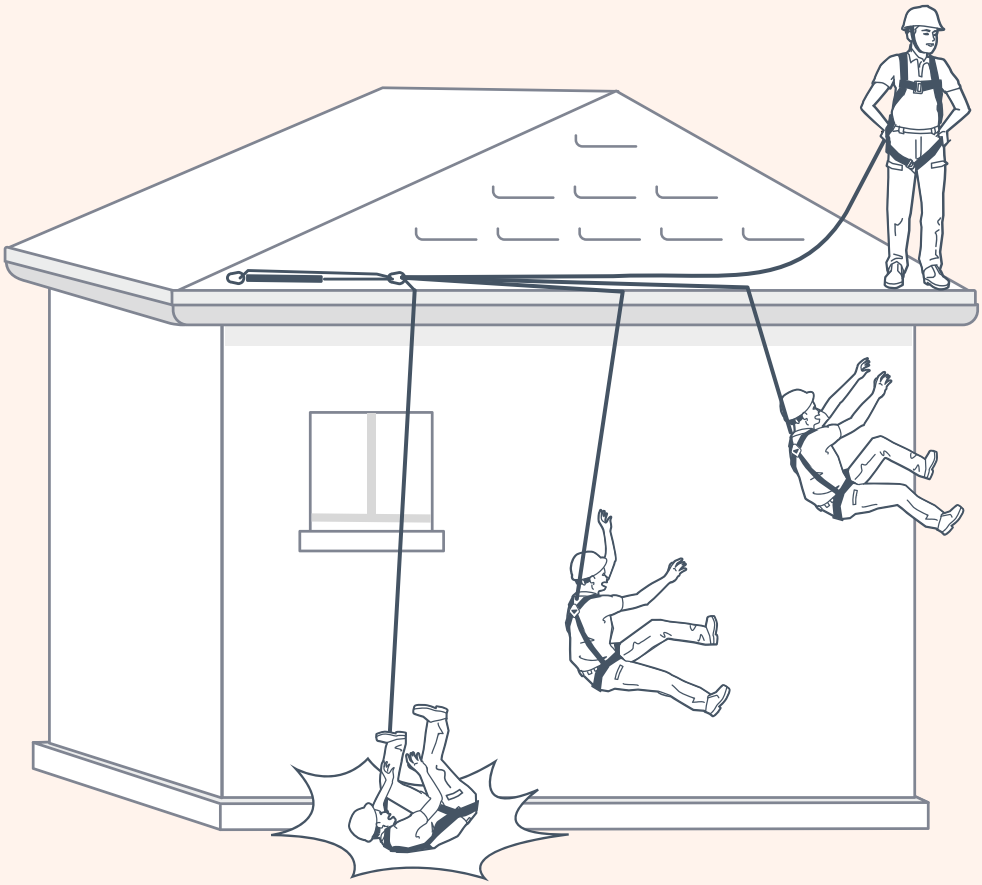
- Squeeze Rope Grab (understand how it works – a dead man's lock arrangement) to disengage it and ascend Ladder to Roof –

- In all instances keep rope taut with your connection while moving up and around - observe the safe zones that follow.

  This will keep you working safely using restraint technique (as required by authorities).

IMPORTANT NOTE

WORK ZONES – safe with caution are noted to ensure you take extra care to adjust or tie off again when working in these zones – this is to protect againgst pendulum or swing falls as illustrated below.



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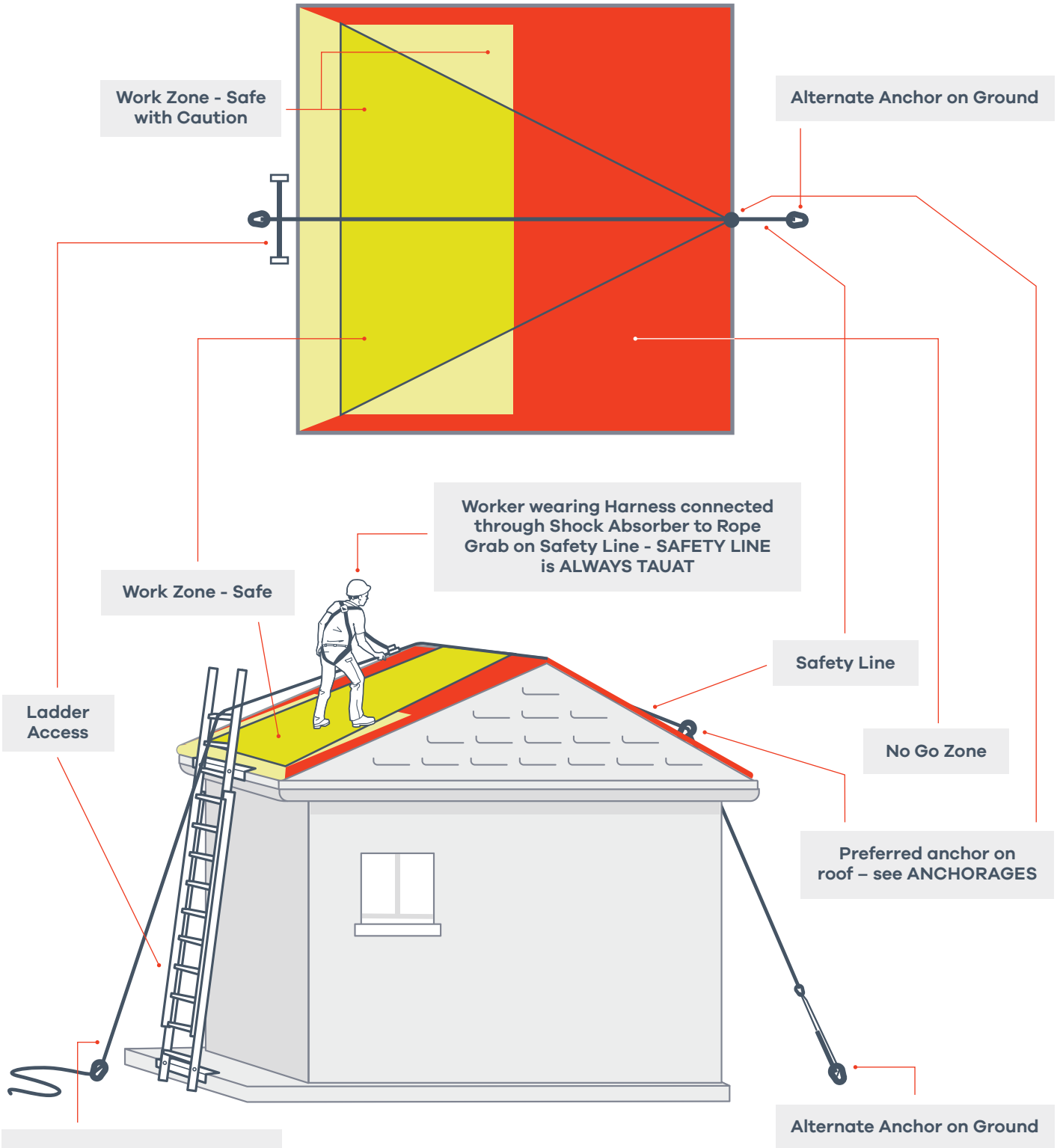
TYPICAL ROOF ACCESS LAYOUT



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IMPORTANT NOTES

- When accessing roof a full body harness is used as a best practice with front connection points for the adjuster (rope grab) to be attached with a karabiner via shock absorber.
- Maintain taut shock absorber connection while climbing onto roof.
- Remember the rope is anchored to opposite side of roof and is tied off to base of ladder on access side. The ladder is tied off as well.
- Using the rope grab connected to front loops of the full body harness will provide best mobility for movement - when face down roof as the safety line will run under arm.
- A Shock Absorbing Lanyard can be connected to rear D Ring (remember connect shock end to harness D Ring and free end to rope grab) to be used for face down roof line work if required – secure free end from dangling dangerously.

Transitioning from Ladder to Roof requires attention -

Frontal Connection via shock absorber / (adjuster) rope grab is comfortable – keep connection taut.

Transferring to rear connection requires extreme attention –

- Once on roof with frontal connection taut move up roof well away (3m) from transition point. Ensure Shock Absorber of Lanyard is connected to harness D Ring.
- Take snap hook on free end of Shock Absorbing Lanyard and connect to eye (hole) in (Adjuster) Rope Grab being careful not to pinch webbing of Shock Absorber already connected.
- Disconnect Shock Absorber from Karabiner on Frontal Loops maintaining Karabiner on Frontal Loops. Shock Absorber will still be connected to Rope Grab but will be redundant whilst using Shock Absorbing Lanyard.
- Adjust Rope Grab so that line is taut again.
- Movement down roof needs to be done cautiously remembering that the Shock Absorbing Lanyard is now in the system.
- You will find it difficult to continue reaching Rope Grab whilst Shock Absorbing Lanyard is kept taut – always allow for Shock Absorbing Lanyard to keep connection taut.

NOTE :- USE OF SHOCK ABSORBING LANYARD IN THIS MANNER HAS POTENTIAL TO DAMAGE SHOCK ABSORBER ALREADY CONNECTED TO ROPE GRAB.

SHOCK ABSORBER CONNECTION TO ROPE GRAB MUST BE INSPECTED BEFORE AND AFTER USE.

Transferring to frontal connection requires extreme attention –

- Review above procedure for Transfer to rear connection.
- Reverse steps advised above maintaining connection.
- Always maintain connection of one or the other.

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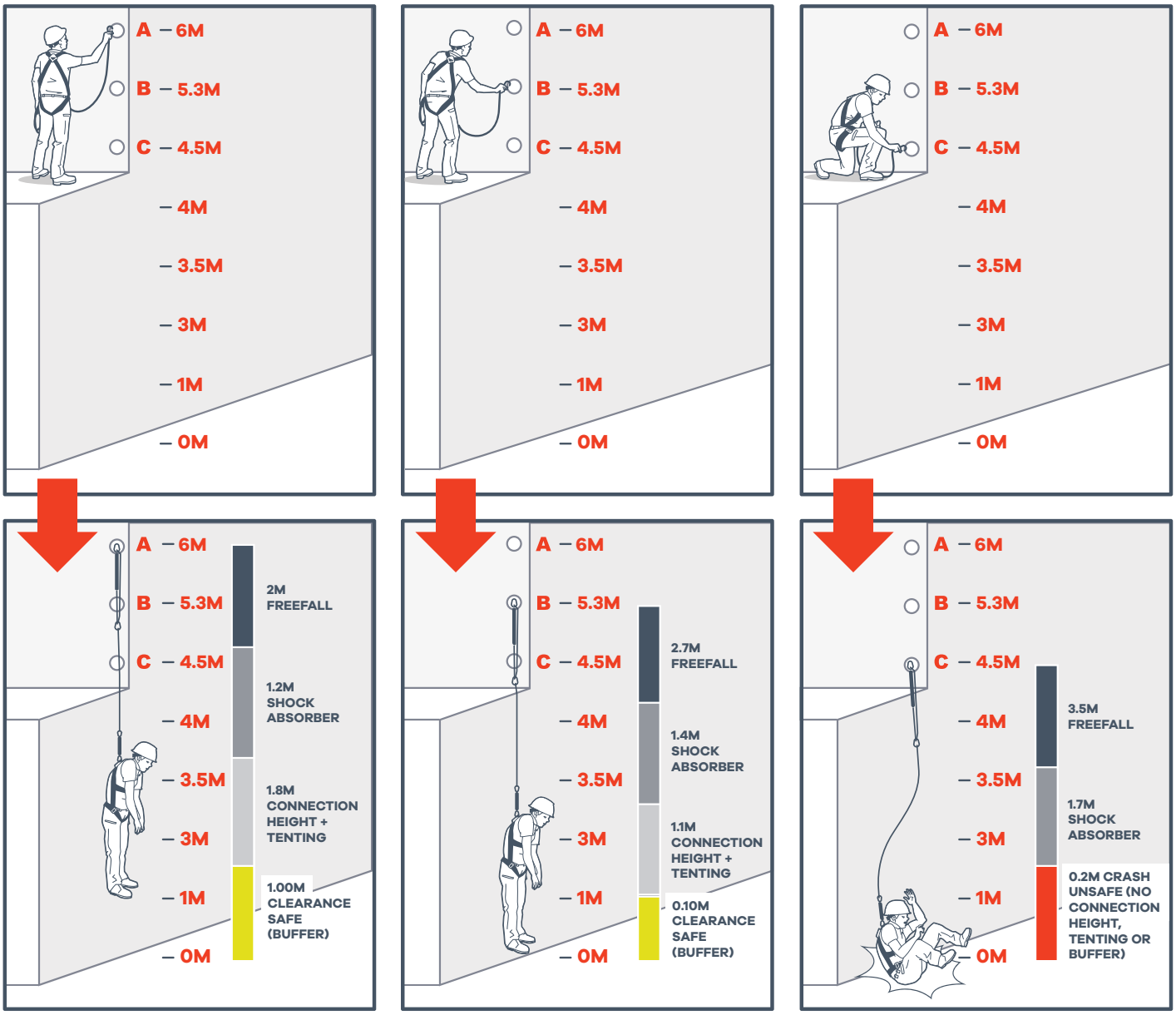
MAXISAFE AND FALL CLEARANCE – SHOCK ABSORBING LANYARDS



In practice there are many possibilities when connecting a 2m MAXISAFE Lanyard. Let's look at three examples which summarize these –

- **A.** Connection to anchor at shoulder level
- **B.** Connection to anchor at waist level
- **C.** Connection to anchor at foot level

The results of the above graphics are explained below-

A. In the event of a fall when a MAXISAFE 2m Shock Absorbing Lanyard is connected at shoulder level - say 1.5m above standing level while working at height (this is same height as connection to harness) –

o Freefall	2000mm
o Shock Absorber Deployment	1200mm (maximum permissible 1750mm)
o Harness tenting	300mm (tenting is where D Ring moves away from body while suspended)
o Safe Clearance	1000mm
o **TOTAL**	**4500mm**

To be safe when connecting a MAXISAFE 2m Shock Absorbing Lanyard at Shoulder Level the user's feet must be 4500mm above the nearest object below

B. In the event of a fall when a **MAXISAFE 2m Shock Absorbing Lanyard** is connected at waist level - say 0.8m above standing level while working at height (this is 0.7m below connection point on harness) –

- Freefall 2700mm
- Shock Absorber Deployment 1400mm (maximum permissible 1750mm)
- Harness tenting 300mm (tenting is where D Ring move away from body while suspended)
- Safe Clearance 1000mm
- **TOTAL 5400mm**

To be safe when connecting a **MAXISAFE 2m Shock Absorbing Lanyard** at waist level the user's feet must be 5400mm above the nearest object below

C. In the event of a fall when a **MAXISAFE 2m Shock Absorbing Lanyard** is connected at foot level - say 0m above standing level while working at height (this is 1.5m below connection point on harness) –

- Freefall 3500mm
- Shock Absorber Deployment 1700mm (maximum permissible 1750mm)
- Harness tenting 300mm (tenting is where D Ring move away from body while suspended)
- Safe Clearance 1000mm
- **TOTAL 6500mm**

To be safe when connecting a **MAXISAFE 2m Shock Absorbing Lanyard** at foot level the user's feet must be 6500mm above the nearest object below

A quick review of the above reveals that the smaller the freefall the smaller the distance from foot level to nearest obstacle can be (closer to ground). Smaller freefalls can also be achieved by –

- Raising the anchor point to reduce the freefall distance
  or
- Shorten the lanyard to reduce the freefall distance

IMPORTANT NOTE :- Shock absorbing lanyards are tested by dropping mass through 3800mm (freefall) so whilst fall arrest systems should be set up so that there is no more than 2000mm freefall in the instances where it is greater the shock absorbing lanyard will not fail up to freefall of 3800mm.

MAINTENANCE REQUIREMENTS FOR KIT

Item	Inspection Frequency	Service Life
• Harness • Shock Absorbing Lanyard • Shock Absorber • Rope • Sling • Type 1 Fall Arrest Device (Rope Grab) • PPE	Check before and after use by user And 6 monthly inspection by height safety equipment inspector	10 years subject to acceptable inspection by height safety inspector
Anchorages – drilled in type or attached to timber frame. Others	12 monthly inspection by height safety equipment inspector or as recommended by manufacturer to maximum of 5 yearly.	Subject to ongoing satisfactory inspection by height safety equipment inspector
Fall-Arrest devices Type 2 and 3 – full service	Maxisafe products • Check and record device check before and after each use. And • Inspect 12 monthly by height safety inspector	

Item	Inspection Frequency	Service Life
	And • Full service by accredited service agent 24 monthly OR • 12 monthly inspection and full service in absence of the above.	
Horizontal Lifelines and Vertical Lifelines – steel or Rail	As recommended by manufacturer to maximum of 5 yearly – 12 monthly in absence of this.	
All items of personal and common use equipment. (All above)	Inspection by height safety equipment inspector on entry or re-entry into service	
	Inspection by height safety equipment inspector before further use	Note: All soft goods (as listed in first line above) **MUST** be taken out of service and destroyed if subjected to a fall.

CARE FOR PRODUCTS

- Soft Goods subjected to forces of fall arrest should be immediately removed from service and destroyed. These products when involved in a fall arrest load cannot be recertified due to the high possible loadings that have occurred.
- When cleaning Soft Goods use mild natural soap and warm water to clean - ie lanyards, harnesses or ropes.

DO NOT dry clean or wash in hot water or use harsh cleaning agents

- All Products should be naturally air dried.

Use of artificial dryers (tumble dryers) may damage Soft Goods. Controlled use of heat guns or compressed air to dry any fall protection equipment is acceptable.

LIFESPAN

The estimated product Lifespan is 10 years from the date of manufacture. The following factors can reduce the Lifespan of the product: intense use, contact with chemical substances, specially aggressive environments, extreme temperature exposure, UV exposure, abrasions, cuts, violent impacts, bad use or maintenance.

DISCLAIMER

Prior to use, the end user must read and understand the manufacturer's instructions supplied with this product at the time of shipment and seek training from their employer's trained personnel on the proper usage of the product. Manufacturer is not liable or responsible for any loss, damage or injury caused or incurred by any person on grounds of improper usage or installation of this product.

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EQUIPMENT RECORD

Product		
Model & Type/Identification	Trade Name	Identification Number
Manufacturer		
Address		
Telephone	Email	
Year of Manufacture	Purchase Date	Date first put into use
Other relevant information (e.g. document number)		

PERIODIC EXAMINATION AND REPAIR HISTORY

Date	Reason for Entry (Periodic examination or repair)	Defects noted, repairs carried out and other relevant information	Defects noted, repairs carried out and other relevant information	Periodic examination next due date

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