SUCCESSFUL STEPS TO SELECTING A FULL BODY HARNESS

Honeywell

MILLER®

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INTRODUCTION

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Working at height is inherently dangerous, and planning to mitigate the effect of falls can be problematic for safety managers. Avoidance of working at height, the first control measure, and although sensible is rarely practical and alternative controls therefore, need to be identified.

FALLS FROM HEIGHT ARE SERIOUS, AND THE SELECTION AND MAINTENANCE OF FALL PROTECTION EQUIPMENT IS CRITICAL

Falls from height are serious and safety managers need to give careful consideration to how they select, maintain and replace workers' personal fall protection equipment.

Below, key steps in the selection and maintenance of full body harnesses are discussed.

Whether you are looking for a full body harness or other type of fall protection equipment, selecting products that are complicated to put on or are uncomfortable to wear will reduce the likelihood that your workers will wear their PPE.

Before purchasing a harness, buyers should be aware that not all harnesses are the same. Everything from harness construction to webbing type and position can be compared and contrasted. All of these elements affect the comfort and performance that the harness offers to the user.

LIFESPAN

Harnesses and webbing products do not last forever, so these products (referred to as 'soft goods') will have a reduced lifespan when exposed to harsh working and environmental conditions. Out-of-use storage conditions can also affect their lifespan.

EQUIPMENT SELECTION

2

A harness is the main component of a personal fall arrest system. It is designed to support the body when a fall is arrested by distributing the forces generated by the fall and suspending the worker 'head up' while awaiting recovery or rescue. It is a critical safety component.

THE ABC'S OF OUR PERSONAL FALL ARREST SYSTEM

There are three key components of the Personal Fall Arrest System (PFAS) that must be in place and properly used to provide maximum worker protection. Individually, these components will not provide protection from a fall. However, when used properly and in conjunction with each other, they form a Personal Fall Arrest System that becomes vitally important to safety on the job site.

A ANCHOR DEVICE

Definition:

Used to join the connecting device (work restraint, fall arrester) to the anchorage, commonly referred to as the 'tie-off point'
(I-beam, scaffolding or other structural point)

Anchor device may be one of 2 types:

1 • **Permanent anchor device**
(e.g. horizontal cable lifeline, horizontal rail systems...)

2 • **Temporary anchor device**
(e.g. steel strops, scaffold hooks, webbing anchorage slings, beam grips and dead-weight anchor...)

B FULL BODY HARNESS

Definition:

Used to hold a worker after a fall

- Full body harness must be worn for Fall Arrest situations
- Work restraint belts cannot be used for Fall Arrest

C CONNECTING DEVICE

Definition:

Used as intermediate attachment to connect the worker's harness to the anchor device
(e.g. shock absorbing lanyard, self retracting lifeline, fall limiter, rope grab...)

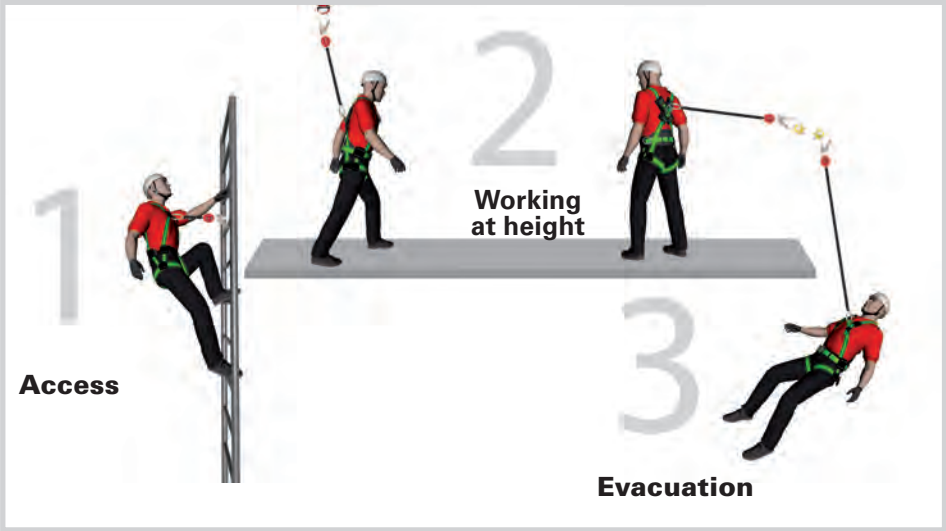
Connecting device may be one of 2 types :

1 • **Fall Restraint:** a fall restraint system prevents workers from reaching a hazard

2 • **Fall Arrest:** a fall arrest system allows workers to reach a hazard and then protects them if they should fall

BEFORE ANY WORK AT HEIGHT, IT IS ABSOLUTELY NECESSARY TO ANSWER THE FOLLOWING 3 QUESTIONS:

1. **How to access a high area safely?**
2. **How to move and work at height safely?**
3. **In case of problems, how to evacuate safely?**



FRONT OR REAR ATTACHMENT POINT?

Basic

The basic full body harness is designed with a single attachment point, positioned between the shoulder blades (dorsal).

Single attachment point

This would typically be used with a retractable fall arrest device or lanyard to provide fall arrest protection. It is ideal for the worker who needs to operate with equipment in front of them, or who is using cutting tools that could compromise the safety of the intermediate connection. It is not ideal when using personal fall arrest systems to protect workers climbing ladders. Harness adjustment is generally via leg straps only, meaning a limited fitting range which may not be suitable for all body shapes and sizes.

Advanced

A more advanced option involves the inclusion of front attachment points.

Front attachment points

These are often designed to be used in pairs (check the user instructions), or sometimes as a single connection point in the middle of the chest (positioned at the sternum and referred to as a 'sternal' point). This connection point is better suited for use with ladder climbing systems, allowing for a short, direct connection to the harness. The harness adjustment function now expands to include chest or shoulder points that enable a greater morphology range for users.

Further evolution

A further evolution to this is possible, adding more technical access equipment and techniques to be used by the climber or worker.

Up to now, the focus has been on protecting a worker from falls. More advanced harnesses allow a worker to position themselves at a work station with hands-free support and include comfort features, such as a waist pad.

The waist pad is attached to the harness and incorporates side-D rings and equipment storage points. The worker would typically use a work positioning lanyard for this function. Note: that the worker must still retain a fall arrest connection when using the work positioning equipment.

DURATION OF USE

It is recommended you select equipment that affords a high degree of comfort in use. Equipment chosen on price alone will limit on-site usage compliance, ultimately leading to safety process breakdown. Textile options are available, for example, polyamide (nylon), polyester (or both together in the same material) and the addition of elastic woven into the webbing to provide 'stretch'. Kevlar is very heat resistant (> 500°C) but has virtually no elasticity and provides a fantastic solution for contact with hot materials up to 177°C (351°F). This is an ideal solution for workers involved in cutting operations where sparks regularly fly and land, melting standard webbing, typically on the leg loops. Harnesses affected by this type of damage would be rendered unserviceable.

Good quality harnesses worn for extended periods, i.e. all day, every day, used correctly, and maintained well will last much longer in 'normal' conditions than a budget, compliance harness.

HARNESS SIZING

Correct fitting is vital as loose leg loops may be comfortable while walking around on the ground, but dangerous in a fall. Dorsal connections must not be lower than the centre of the shoulder blades to prevent excessive slippage in 'fall arrest' and sternal connections should be level with the sternum. EN361 testing requires a harness to hold a suspended worker in a head-up position at a maximum angle of 50° from vertical. A badly adjusted attachment point could prevent this and increase the chance of medical complications such as an occluded airway.

Ensure that all users of the equipment have the correct size for their body shape and have been trained to use it effectively.

HARNESS HARDWARE

All harnesses require an element of hardware in the form of buckles and D-rings. The buckles need to be easy to connect together and not become damaged or unusable in normal working conditions. Mating buckles are simple in operation; however, they lack ease of fastening and adjustment, whereas automatic buckles are more expensive, but provide excellent functionality and assist with compliance.

Buckles are often also the webbing adjustment point, which means the webbing will need to be tensioned through the buckle during fitting. A damaged metal buckle can lead to damaged webbing making the harness unsuitable for use.

EMERGENCY EQUIPMENT COMPATIBILITY

Ensure the new harness and any ancillary equipment can be used with the on-site rescue system and confirm a method of attaching a fallen climber is available. This would also be a good opportunity to practice the site rescue plan(s) and confirm all workers know exactly what to do in an emergency.

INSTRUCTIONS, INSPECTIONS & MAINTENANCE

Manufacturers must supply instructions detailing how to fit and use the equipment, plus care and maintenance information in a language that can be clearly understood by the user.

All equipment must be inspected prior to use by the user, and, as specified in EN365:2004 4.4(b), at least once every 12 months by a competent person. The frequency of competent inspection can be increased based on risk assessment and conditions of use. If the harness has been used to lift or suspend workers it must be inspected every six months (LOLER section 9). The results of this inspection must be recorded and kept until the next inspection.

Manufacturers deliver their own equipment inspection courses and the respective sales representatives can support your needs in this area.

ERGONOMICS

The ergonomics[1] of a worker at height will help decide the required connection points. This means an assessment of access methods and work processes should be carried out to assist with the equipment selection task.

1. Ergonomics
The adaptation of equipment and general conditions to fit the individual so that they may work at maximum efficiency.

EN STANDARDS FOR FALL ARREST EQUIPMENT

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ASSOCIATED EN STANDARDS FOR FALL ARREST EQUIPMENT

Whilst the EN 361: 2002 standard relates to a full body harness, there are other EN standards to consider for wider fall arrest equipment including those listed below.

OTHER EN STANDARDS RELATING TO FALL ARREST EQUIPMENT

Whilst the EN 361: 2002 standard relates to a full body harness, there are other EN standards to consider for wider fall arrest equipment including:

EN STANDARDS FOR FALL ARREST EQUIPMENT		
EN 341:2011	Descender devices for rescue	Escape or rescue device, for controlled descent at a limited velocity
EN 353-2:2002	Guided type fall arresters including a flexible anchor line.	Vertical travelling device working on a wire cable or a textile rope for arresting falls
EN 354:2010	Lanyards	Portable connection device
EN 355:2002	Energy absorbers	Shock absorber for dissipating impact force
EN 358:2000	Work positioning systems	A combination of components to make up a system e.g. pole strap, NOT to be used for fall arrest
EN 360: 2002	Retractable type fall arresters	Retractable fall arrest devices which lock when exposed to impact force
EN 362:2004	Connectors	Karabiners / Carabiners, hooks and other connectors
EN 363: 2008	Personal fall protection systems	A system combination e.g. a harness together with a lanyard and an energy absorber
EN 364:1993	PPE - Test methods	Detail of test methods to be carried out in the laboratories of an accredited test house, to confirm the products compliance with the requirements of the standard
EN 365: 2004	General requirements for instructions for use.	Includes information pertaining to the maintenance, periodic examination, repair, marking and packaging of fall protection productions
EN 795: 2012	Personal fall protection equipment - Anchor devices	Requirements and test methods for anchor devices used in personal fall protection systems

CONCLUSION

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Safe workers depend on safe equipment that is used correctly.

Remember, not all harnesses are the same - carefully consider all workers needs, environments and the other factors described in this paper when choosing the right harnesses for different applications. The service life of a harness can vary greatly depending on factors, such as how often the harness is worn and the working conditions, so be sure to perform inspections prior to each use. Robust safe systems of work rely on good equipment that is used correctly. A positive safety programme will encourage workers to wear their PPE and help safety managers create an enduring culture of safety with comfortable, high-performance personal protection that they will want to wear – day in and day out.

Visit www.honeywellsafety.com to learn more.

For More Information
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