



SUCCESSFUL STEPS TO SELECTING A FULL BODY HARNESS

By Jeremy Dugan, Training Leader, Safety at Height EMEAI, Honeywell

Working at height is a risky business, which is why falls from height are a major concern of safety managers. The best way to prevent falls would be to avoid having people work at height altogether; however, that's not always practical.

Because getting it wrong when working at height can have serious consequences, safety managers should give careful consideration to how they select, maintain and replace workers' fall protection equipment.

Here, Jeremy Dugan, Training Leader Safety at Height EMEAI for Honeywell Safety Products, the world's largest provider of personal protective equipment (PPE) suggests some key steps to take when choosing and caring for a full body harness.

Whether you're looking for a full body harness or other type of fall protection equipment, selecting something that is complicated to put on or uncomfortable to wear or adjust will decrease the likelihood that your workers will wear their PPE.

Before purchasing a harness, you should be aware that not all are the same. Everything from harness construction to strap placement can be compared and contrasted. All of these elements make a difference in the comfort and safety the harness offers the user.

Harness buyers and users should also remember that harnesses don't last forever, and that the environments and conditions in which they're used impact their lifespan.

Choosing a Harness

A harness is the main component of the fall arrest system. It is designed to hold the body when the fall is halted (arrests), to distribute the forces generated by the fall and to suspend the worker 'head up' (post fall).

A harness should first and foremost be selected based on the work that will be done at height, and how the user will access that height safely.

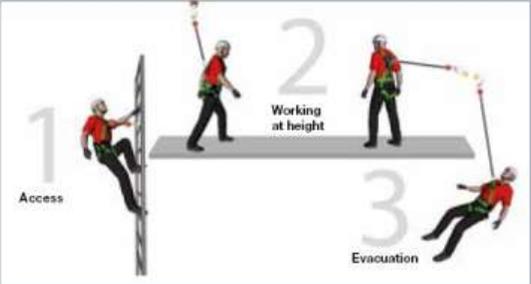
- If the work application only requires a person to be attached to protect against a fall, a 1 or 2-point harness will be sufficient. 1-point means with an attachment in between the shoulder blades (dorsal) of the harness. 2-points means with a dorsal attachment and another attachment on the front of the harness (sternal). The attachment point needs to be used with a connecting device. The dorsal attachment is recommended for general use, but

in some cases, a connection to the sternal point is more appropriate (for example, when climbing up a ladder while connected to an anchor rail installed on that ladder).

- In some cases, an application requires a worker to be positioned so he or she can work hands-free. In this case, a work positioning harness is most appropriate. This type of harness can either have dorsal only, or dorsal with sternal attachments for fall arrest, but additionally has two side attachments at waist level for use with a work positioning lanyard.
- A specific application like work in suspension requires technical attachments that maintain the body position. This attachment is often associated with rope descending equipment, which is connected in the middle of the waist belt (ventral).

■ 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?





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 straps, 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

Next, a harness should be selected based on the duration and frequency of use. If a harness is intended to be worn 8 hours per day, every day of the week, it should be comfortable (e.g. with stretchable webbing, an ergonomic fit, and the ability to make adjustments easily). High quality harnesses are not only more comfortable, but also last longer in these frequent-use situations.

Harness Sizing

Many manufacturers rely on universal sizing – which means a harness should fit the average person. While universal sizing fits most workers, however, it does not fit them all. For example, some harnesses have a minimum adjustment on the chest strap that is unusable by shorter workers. The ability to adjust the harness correctly so that it fits properly and comfortably is important.

How Safe is the Safety Harness?

Before purchasing fall protection products, ask these questions:

- Does the manufacturer have ISO 9001? ISO certification proves facilities meet strict international standards in quality assurance for design, development, production installation and service.
- Do the products meet EN 361: 2002 standard for a full body harness?

- Does the manufacturer have qualified engineers designing/testing products in an in-house testing facility?

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 341:2011	PPE - Descender devices	Escape or rescue device, for controlled descent at a limited velocity
EN 353-1:2002	PPE - Guided type fall arresters (on a rail)	Vertical travelling device locking onto a rail as result of a fall
EN 353-2:2002	PPE - Guided type fall arresters (on a rope/cable)	Vertical travelling device working on a wire cable or a rope, locking in a fall
EN 354:2002	PPE - Lanyards	Fall arrest lanyards
EN 355:2002	PPE - energy absorbers	Lanyard shock absorbers and tear web sections
EN 358:2000	PPE - Work positioning systems	A combination of components to make up a system e.g. pole strap, NOT to be used for fall arrest
EN 362:2004	PPE - Connectors	Karabiners / Carabiners, hooks and other connectors
EN 363: 2002	PPE - Fall arrest 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

Comfortable Hardware

A harness should have hardware that's sturdy, but not oversized and awkward. At the same time, the hardware should easily attach to connecting devices. For example, the D-Rings on some harnesses are so small that hooking a lanyard can be a tricky process.

Harness hardware also poses a hazard if it has any sharp edges. The edges can cut into harness webbing, or can be positioned in such a way that they dig into the skin in the event of a fall.

To protect workers from hardware injuries, the components must be appropriately manufactured and assembled. Hardware with exposed springs should be avoided. Exposed springs, especially on friction buckles, can be easily disabled or removed.

Reliable hardware construction is an important feature because friction buckles that are not spring loaded can easily begin to loosen once the harness has been adjusted to fit.

Avoid Complex Webbing Designs

Webbing may seem like an innocuous item that would be similar in all cases, but it varies greatly from brand to brand. Some harnesses use webbing that folds over and tangles, which can be frustrating for the wearer.

Harness webbing should be sturdy, and the warp and weft should be tightly woven so the webbing can slide easily through the hardware.

If webbing snags when it slides through the hardware, it can result in cuts to the webbing. Once cut, the harness must be taken out of service.

Examining the tensile strength of webbing is also important. After abrasion tests, some webbing begins to fray and pucker, which brings the harness to the end of service. Stitching is just as important as the structure of the webbing. The stitching must not rip away during a fall.

Instructions, Inspections & Maintenance

While it may sound too simple to even address – clear, easy to read instructions should accompany every harness. Ideally, instructions should be available in multiple languages. All harness instructions should include explicit guidelines for usage, maintenance and inspection.

To ensure service life and high performance, harnesses should be visually inspected before each use. Regular inspection by a competent person for wear, damage or corrosion should be part of any quality management programme and the harness should be replaced if any defective conditions are found. The inspection should be done at least once every 12 months according to EN365:2004 4.4(b), but it is recommended that a detailed inspection should be undertaken at least every six months and more frequently when a harness is used in certain conditions, such as in harsh or arduous environments where equipment damage is relatively common. The results of this inspection must be recorded and kept until the next inspection.

Always refer to the manufacturer's instructions and maintenance procedures.

- 1) **Webbing:** Hold the webbing with your hands 15-20cm apart. Bend the webbing in an inverted U. The resulting surface tension makes damaged fibres or cuts easier to see. Follow this procedure with the entire length of the webbing, inspecting both sides of each strap. Watch out for frayed edges, broken stitches, cut fibres, burns and chemical damage.
- 2) **D-Rings/Back Pads:** Check D-Rings for distortion, cracks, breaks, and rough or sharp edges. The D-ring should pivot freely. D-ring back pads should also be inspected for damage.
- 3) **Fall indicator:** If a fall indicator is present on the harness, check if it has been activated
- 4) **Attachment of buckles:** Attachments of buckles and D-rings should be given special attention. Note any unusual wear, frayed or cut fibres, or distortion of the buckles or D-rings.
- 5) **Friction and Mating Buckles:** Inspect the buckle for distortion. The outer bars and centre bars must be straight. Pay special attention to corners and attachment points of the centre bar.

CONCLUSION

Remember, not all harnesses are the same – so be sure to consider your workers, their environments, and other factors described in this article when choosing the right harnesses for different applications. The service life of a harness can vary greatly depending on factors like frequency and conditions of usage, so be sure to perform inspections prior to each use. In the end, however, even the highest quality fall protection cannot be effective if it is not properly worn. One of the best ways to encourage workers to wear their PPE and build an enduring culture of safety is by providing them with comfortable, stylish, high-performance personal protection that they'll want to wear – day in, and day out.

About the Author

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