



WAHSA TGN08

Technical Guidance Note 8

GUIDANCE ON CONNECTOR SAFETY

A series of informative notes for all industries involved with work at height or rescue.

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INTRODUCTION

An industrial near miss occurred in which a double action snap hook disconnected from the safety system. The gate locking mechanism was depressed against the users body, allowing the main gate to open and release the rope.

This is not a common occurrence and thankfully no one was injured, but it highlights the need for users to be vigilant with their equipment and practices at all times. This Guidance Note aims to highlight some of the issues with connectors and aid you in deciding which type of connector is best suited to you and your application.

WAHSA strongly recommends that a thorough risk assessment is conducted to ensure that the connectors in use are appropriate for the environment/activity and compatible with the other equipment in use, i.e. fit for purpose.

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1 REQUIREMENTS OF CONNECTORS

All industrial connectors in the U.K. and Europe must conform to BS EN 362: 2004 *Personal protective equipment against falls from a height*. This standard stipulates minimum design, strength and safety requirements a connector must meet to be suitable for use but it does not guarantee that all connectors are inherently safe as they are not immune from accidental opening or misuse.

BS EN 362: 2004 has two Clauses which define the acceptable types of gate mechanism. Clause 4.1.3 states *“All connectors with a gate shall have a gate locking feature whether manual or self locking”* (BSI, 2004) and Clause 4.1.4 states *“Connectors with a self-locking gate shall lock the gate automatically when the gate shuts and shall require at least two different deliberate manual actions to open the gate”* (BSI, 2004)

Most manufacturers are striving to improve upon the safety of all connectors, but there is still a strong demand for simple, cost effective connectors which are prevalent in the market place. This Guidance Note aims to highlight some of the issues with some of the designs and aid you in deciding which type of connector is best suited to you and your application.

2 KARABINERS

There are four types of locking gate karabiner available on the market. One of these is manual-locking and the other three are self-locking. Non-locking karabiners are also available, but as they do not meet the requirements of BS EN 362: 2004, they are not suitable for industrial use and are not discussed in this Guidance Note.

2.1 SCREW GATE KARABINER

Probably the most common connector on the market, the screw gate karabiner has been a cost-effective solution for many years. They rely on the user manually screwing the gate locked when in use. They are susceptible to the gates “rolling over” other equipment which can inadvertently unlock the barrel, leaving the user at risk of the gate opening. Vibration can also cause the barrel to unwind and leave the gate unlocked. To reduce the risk of a screw gate opening, always screw downwards allowing gravity to help keep the gate locked.

2.2 DOUBLE ACTION KARABINER

Improving on the safety features of the Screw Gate Karabiner, the double action has a spring-loaded auto-locking mechanism which locks the gate as soon as it closes. The gate is then opened by twisting the barrel and pushing the gate. It is possible that ropes or equipment can rotate the barrel, allowing the gate to open inadvertently.

2.3 TRIPLE ACTION KARABINER

The next generation of a Double Action Karabiner requires three distinct motions to open the gate. The user must lift and twist the barrel before opening the gate. In all but the most unusual of circumstances, the additional level of safety prevent the barrel and gate inadvertently opening.

2.4 QUADROUPLE ACTION KARABINER

The Quadruple Action Karabiner requires four distinct motions to open the gate. The user must twist push the barrel down, twist again then open. This extra level of safety may be used in the more testing of work environments.

3 SNAP HOOKS

Clause 4.1.4 of BS EN 362: 2004 requires all snap hooks to be of the self-locking gate type with a minimum of two deliberate manual actions to open the gate.

3.1 DOUBLE ACTION SNAP HOOK

To make the Snap Hooks user friendly, the gate lock is usually on the back of the connector which allows the user to depress it with the palm of their hand whilst using their fingers to open the gate. This does however leave the connector susceptible to inadvertent opening when pressed against a flat surface, the body of the user, structures etc.

Some manufacturers have attempted to overcome this by the addition of a profiled “fin” which can protect the gate lock from opening when pressed against a flat surface, as shown in Figure 1.

3.2 TRIPLE ACTION

Triple Action Snap Hooks are now available which aim to avoid accidental opening. They feature a further locking mechanism to the gate lock, shown in Figure 2, meaning a third action is required in order to open the gate. It almost completely eliminates the chance of accidental opening.



Figure 1. Double Action Snap Hook



Figure 2. Triple Action Snap Hook.

4 REFERENCES

BSI (British Standards Institution). 2004. *BS EN 362: 2004 Personal protective equipment against falls from a height*. London: BSI.