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Attaching to the Rope by Karabiner?

Arabiners only have sufficient breaking strength if loaded longitudinally. If loaded transversally or due to other unfavourable loading of the gate a karabiner may break even at a fall length of one metre or less. In the worst situation this means falling to the Pit Schubert

by karabiner is commonplace, because it facilitates detaching from the rope and going to another rope. Screw gate or self-locking karabiners are used for attachment. But several accidents have happened due to inadvertent and unwanted detachment from the rope. The

> number of accidents has increased during the last few years, often enough with serious consequences: two cases of paraplegia became known by now. The rope detached itself both from karabiners with screwlocking gates and from karabiners with twist-locking gates. At first sight, there is no idea, how this could happen.

Fig. 1: Typical method for tying to the rope, frequently used for indoor toproping. Dangerous!

Fig. 2 / 3: ► Typical opening of a twistlock karabiner

In all cases where screw gate karabiners had been used, people stated that the screw gate had been closed originally. But the fact is that it was always found that at the decisive moment the karabiner's screwlocking sleeve was undone far enough for the gate to open.

In none of these cases could clarification be obtained as to how the closed screw-locking sleeve (if it really was closed!) had become undone. There are only speculations. With a fair probability the screw-locking sleeve may not have been closed to its stop and tightly fastened, but only loosely screwed up. By inadvertent rubbing of the loose screw-locking sleeve against clothing, the rope, or whatever, the partially unscrewed screw-locking sleeve might have been unscrewed further during climbing. Self-acting opening even by vibration or imbalance of the screwlocking sleeve can be imagined in such a case, also.

The opening of twist-lock karabiners may happen in a similar way: a textile filament of the rope sheath may cling to







ground and being killed. So the advice must be not to attach to the rope by a karabiner, or, if the use of karabiners is essential, as maybe while top-roping or on glaciers, the following text makes proposals on how to minimise the chance of such breaking of karabiners.

Top roping

In top-roping technique, especially at climbing walls or among students under instruction, attaching to the rope

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a sharp edge of the twist lock mechanism and open it when loaded (see figure); this has also been known to occur when at Fig. 4: Safe method using two karabiners

known to occur when abseiling using an HMS knot.

With the locking sleeve (screw- or twist-lock) once undone, as soon as the karabiner is loaded in an unfavourable direction, the attached loop of the rope or the belay loop of the climbing harness detaches from the karabiner in a self-acting manner (see figures).

So what can be done? There are several possibilities, but each has its disadvantages:

- Closing the screw-locking sleeve to its stop and fastening it tightly so that it cannot open inadvertently (cannot be guaranteed, and often the sleeve cannot be loosened after use).
- Using karabiners with a double-acting (twisting and sliding) self locking mechanism (very good, but not liked by many climbers because of the complicated action).

• Tying directly to the rope, as is standard practice at climbing walls in Britain, and as is required in UIAA climbing competitions (the best solution, but considered too slow by many climbers when moving from rope to rope, and disliked by inexperienced climbers because the knot becomes difficult to undo after falling).

Only one possibility remains: redundancy, i.e. using two karabiners (both with locking mechanisms) attached parallel and in opposite directions (see figure)*. If there is not a second karabiner with locking mechanism, use a normal karabiner. Attaching a second karabiner is not too much trouble with regard to weight and effort.

On glaciers

On glaciers attaching to the rope by karabiner is usual. Here, the redundancy using a second karabiner as described above is also recommended*. As far as is known at present, no accidents due to the use of only one karabiner have occurred. But this may only be because falls into crevasses fortunately happen far less frequently than loading of rope in top roping technique. Of course, such accidents could happen on glaciers as well. There simply would have to be a similar number of

falls into crevasses for practical evidence!



*) If a "ball-lock karabiner" manufactured by PETZEL or a "belay master" manufactured by DMM with their special locking mechanism is used, the second karabiner may be omitted. This locking system is designed in a manner that selfacting opening is excluded.