

# BRITISH MOUNTAINEERING COUNCIL

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## TECHNICAL COMMITTEE MEMORANDUM TCM 08/03

### Broken DMM Pro Wire

Incident ref: 08/07/C.ORG



### SUMMARY

The karabiner failed following a fall of approximately 5 feet (1.6 m) whilst the climber was leading a route at Harborough Rocks.

Examination of the karabiner and comparison to previous incidents suggest that the karabiner failed due to the wire of the protection chock becoming caught in the nose of the karabiner holding the gate open and loading the karabiner close to the nose. The force required for the karabiner to fail in this incidence is less than that likely to be generated in the fall described.

It is not known how the wire became caught in the nose of the karabiner.

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<b>Draft:</b>	<b>A</b>
<b>Date:</b>	<b>18<sup>th</sup> May 2009</b>

## 1. INTRODUCTION

A climber leading a route at Harborough Rocks, Crinkle Crack (VS), fell whilst about to clip the third piece of protection that he had placed on the route. The climber estimates that he fell approximately five feet (1.5 metres) to his next piece of protection. The karabiner fixing the rope to this piece of protection failed and the climber continued to fall until hitting the ground.

The climber suffered a severe fracture to his right ankle and fibular as a result of this incident.

## 2. EXAMINATION

The karabiner is a DMM Pro Wire and has the letters *0120 CE AAD* stamped into the back of its spine. The karabiner shows signs of only light use. The karabiner was paired in a sling with a second similar karabiner to make a quickdraw. The sling and paired karabiner again show only signs of light use.

The broken karabiner has fractured in the curved section joining the spine to the top of the karabiner. There is considerable plastic deformation of the karabiner in this region such that if the two halves of the karabiner are placed together the nose of the karabiner is approximately 30 mm from the gate that would normally rest in it.

The fracture surfaces of the two broken halves of the karabiner exhibit a rough texture and show no indication of pre-existing cracks or corrosion.

The wired chock that the karabiner was clipped to before failure was also submitted for examination. The wire stop shows a slightly flattened surface with squared edges in the end of the wire stop that the karabiner would have been clipped into.

## 3. ANALYSIS

The shape of the two halves of the broken karabiner are very similar to those observed from a broken Pro Wire karabiner previously investigated<sup>1</sup>.

The shapes of the broken halves are also similar to those observed on a broken Wild Wire karabiner that was investigated<sup>2</sup>. The indentation in the wire stop was also similar to that observed after testing Wild Wire karabiners as part of this investigation.

In both the above incidents it was concluded that the karabiner had failed with the gate held open and the load applied close to the nose of the karabiner. Testing showed the loads required to cause failure of either type of karabiner when loaded close to the nose and the gate held open was less than 4 kN.

The marks in the wire stop of the chock into which the karabiner was clipped indicate that it was located in the nose of the karabiner when loaded. This would hold the gate of the karabiner open and result in a low failure load, less than 4 kN. A force exceeding this would easily be generated in a fall similar to that described in the climber's report<sup>3,4</sup>.

## 5. CONCLUSIONS

The karabiner failed due to being loaded close to its nose with the gate being held open. This was most likely caused by the wire stop of the protection chock being caught in the nose of the karabiner holding the gate of the open and loading the nose when the climber fell.

It is not known how the wire stop became caught in the nose of the karabiner.

## **6. RECOMMENDATIONS**

Climbers should be reminded to check that their protection is properly clipped when climbing to prevent this type of incident occurring. It is not known whether the wire could become lodged in the nose of the karabiner after being clipped.

## **7. REFERENCES**

1. TCM 02/05, DMM Prowire Karabiner, M. Taylor, BMC Technical Committee Memorandum
2. TCM 04/03, Failed Wild Wire Karabiner, O. Milling, BMC Technical Committee Memorandum
3. TCM 03/03, DMM Walnut 0 with Broken Wire, N. McMillan, BMC Technical Committee Memorandum
4. How Strong Does Your Climbing Gear Need to Be?, N. McMillan, BMC Technical Conference, Plas y Brenin, November 2003.