



Interagency Aviation Safety Alert



No. IA 08-03

May 9, 2008

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Subject: Esmet 3000 Pound Swivel
Area of Concern: All Helicopter Operations
Distribution: All Fire and Aviation Personnel

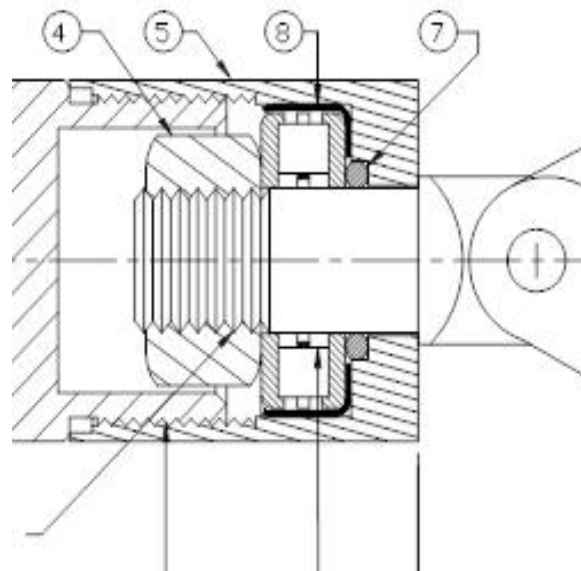
Discussion: SAFECOM 07-0956: “While transporting a cargo net with 9 pieces of roofing material, a box of roofing screws and a box of roofing gaskets to a remote cabin, the hook of the swivel separated from its body resulting in the load falling approximately 150-200 feet. The load weighed 332 pounds including the weight of the net and swivel...Maintenance staff retrieved the hook part of the swivel from the dropped load...” The swivel had a manufacturing date of “3-04” and had been used extensively since its purchase without any problem. Below is a photo of the swivel that failed.



Prior to use, the swivel was inspected in accordance with National Fire Equipment System Cache Memorandum No. 05-02. No discrepancies were found and the swivel turned freely. According to an Esmet Design Engineer, corrections for the issues involved with the swivels identified in the Cache Memo 05-02 were supposed to be corrected with the installation of a locking nut in those units manufactured after March 2004. During a follow up investigation, the manufacturer recommended that any swivel with a gap of 1/8 inch between the hook and the housing be taken out of service.

Corrosion may be reduced by storing the swivel so that the hook hangs beneath the swivel and using WD-40 to displace any water that may have accumulated in the shaft area. The Design Engineer at Esmet has confirmed that this will not affect the o-ring installed at the base of the bearings within the housing body. The bearings on these swivel units are sealed so lubrication of the bearings is not possible.

In the design view below, (4=locking nut, 5= swivel body tube, 7=o-ring, 8= bearing), little clearance is shown for the hook shaft indicating that any asymmetric (uneven) lateral movement would be abnormal indicating deformation of the bearing or housing.



Although Cache Memorandum 05-02 allows lateral movement and some restricted turning of the hook, it is recommended that any swivel with either asymmetric (uneven) lateral movement or that has any type of restriction to rotation be taken out of service. According to the Esmet Design Engineer, side loading can cause internal damage and may be the cause of this hook failure as well as the corrosion at the base of the threads. A visual inspection should be performed prior to and after each use, looking for any gap distance from the hook to the body or the hook no longer being in line with the overall assembly. Operations in high humidity or salt water environment will increase corrosion in the swivel assembly.

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