U.S. Department
of Transportation
Federal Aviation
Administration

SAFO

Safety Alert for Operators

SAFO 16015
DATE: 11/9/16

Flight Standards Service
Washington, DC

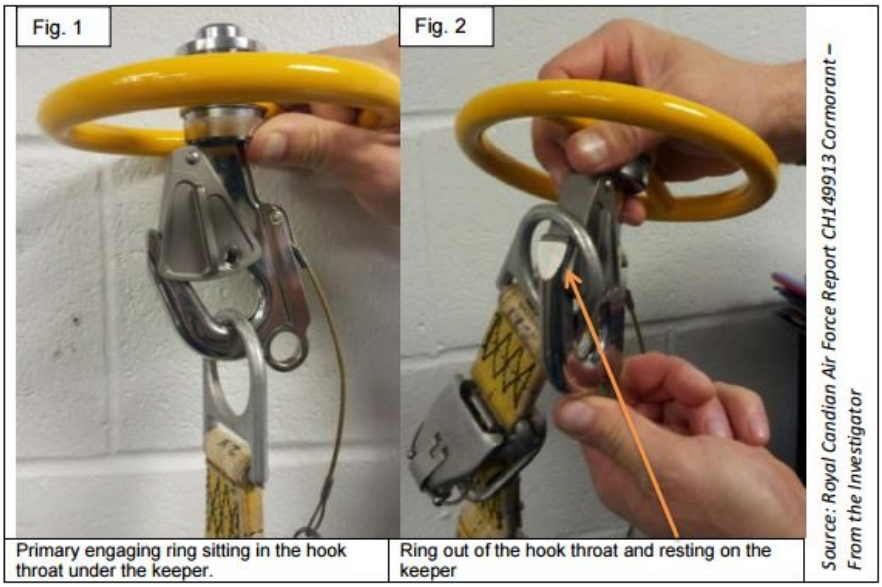
http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo

A SAFO contains important safety information and may include recommended action. SAFO content should be especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO.

Subject: Possibility of D-ring Reversal or Dynamic Rollout During Winching and Longline Operations

Purpose: This SAFO serves to alert rotorcraft operators operating in accordance with Title 14 of the Code of Federal Regulations Part 91 or 133, public aircraft operators and government agencies of the possibility of an inadvertent load release caused by the phenomenon of D-Ring reversal resulting in an accident.

Discussion: D-Ring reversal has directly contributed to several fatal accidents. This phenomenon can be described as the unintended release of the primary engaging ring from the winch hook that may occur subsequent to a pause in the winching sequence. When the ring in the rescue strap and the hook are temporarily relieved of the load, a dynamic condition exists allowing the ring to travel up and flip over the tip of the hook and come to rest on the spring–loaded keeper. The ring is now only supported by the spring-loaded keeper (Figures 1 & 2). When the load is re-applied, the ring is forced open and the spring-loaded keeper allows the ring to fall free from the hook, thereby inadvertently releasing the occupant or load.



Human External Cargo (HEC) rescue winch hooks with exposed hook tips, such as those shown in figure 3, do not prevent D-ring reversal or deflect the primary engaging ring safely back into the throat of the hook. HEC rescue winch hooks with manually locking keepers or guards have a hand-operated

mechanical latch or keeper lock, in addition to spring pressure used to initially close the keeper. Such designs are intended to prevent partial hook engagement and deflect the primary engaging ring safely back into the throat of the hook thus preventing D-ring reversal (Figures 4 & 5).

Fig 3. MS 18027-2A Hook with simple spring-loaded safety catches. Note the exposed hook tips.

Fig 4. One type of hook which incorporates a mechanical lock latch gate design. The keeper also guards the tip of the hook.

Fig 5. Hook used in a popular winch system which uses a simple spring-loaded safety latch or keeper.

Recommended Action: Winching and longline operators should:

- Develop procedures which list the specific D-Rings or equipment which may be attached to a specific rescue hook wherein the possibility of D-Ring reversal is physically impossible.
- Use only rescue hooks which have a mechanical locking keeper or guards to prevent D-ring reversal or dynamic roll-out.
- Ensure initial and recurrent winch operational training is tailored for each helicopter type and winch combination and is conducted on a regular basis.
- Operate and maintain winches, hooks, and harnesses in accordance with approved data.

Contact: Questions or comments regarding this SAFO should be directed to the General Aviation and Commercial Division, AFS-800 at (202) 267-1100.