



Interagency Aviation Lessons Learned



No. IA LL 14-02

July 7, 2014

Page 1 of 2

Subject: Eurocopter AS350/AS355 Sliding Doors

Area of Concern: All Operations with AS350 or AS355 Helicopters

Distribution: All Aviation Activities

Discussion: Last year, Eurocopter issued an Airworthiness Directive, AD 2013-23-9, for AS350 and AS355 model helicopters to modify the sliding door assembly. An operator discovered a missing nut on the lower ball-joint assembly that caused the door to come loose and fall off in flight. They also found the nut on the opposite door was only hand tight. Eurocopter issued the modification to add a new lock-washer and nut to prevent the retaining nut from backing off.

Well, it happened again

On June 12, 2014, a contractor flying an AS350 on a BLM Exclusive Use contract lost the left rear door in flight ([SAFECON 14-270](#)). The crew heard a loud sound and the pilot immediately performed a precautionary landing where they discovered that their left rear door was gone. Fortunately, the door did only minor damage to the aircraft and nobody was injured.

This particular helicopter had complied with the sliding door AD.

In fact, this helicopter had been modified with the lock-washer and nut at the factory. There are two possibilities as to why it failed to remain in place: the nut was not tightened properly or lost its self-locking capability. The helicopter underwent an inspection where the door was removed and replaced approximately 25 hours before the incident flight.

Figure 1 Right Hand Door Lower retention nut and lock-washer



One Door, One Nut.

The design of the lower attachment point on this helicopter door depends on one bolt and nut. The removal of this single nut will allow the entire door to come off. Maintainers must install and tighten the nut in accordance with the manufacturer's guidelines using the proper torque value. This nut is visible when the sliding door is open and it should be checked on daily and periodic inspections to ensure that it remains secure.

Maintainers should only reuse nuts in accordance with the manufacturer's guidelines. Locking nuts that can be threaded on by hand should be discarded and replaced with new ones. The manufacturer specifies a minimum thread protrusion on the bolt to ensure the nut is capable of locking. This also provides an additional method of visual inspection.








Door Configurations and Airspeeds

Although this was not a factor in this incident, it was discovered that the door configuration and speeds specified in AS350 flight manual can be confusing. The flight manual lists airspeeds for sliding doors in an approved supplement to the flight manual. Pilots should review the flight manual to ensure they possess a current version and that they know the allowable door configurations and related airspeed limitations.

CRM is a powerful tool to ensure doors are in the correct configuration/position and that any door movement is performed after communicating it with the pilot(s). Keep in mind that most helicopters have a "moving door in flight" airspeed limitation. Crews should conduct every "Before Takeoff" inspection that includes a check on all doors to either be closed or in the open and locked position.

Figure 2 Sliding Door Supplement from AS350B3e flight manual

• Aircraft fitted with RH and LH sliding doors (optional)

RH \ LH					
					
	VNE	110 kt (204 km/h) or VNE*	100 kt (185 km/h) or VNE*	opening : 60 kt (111 km/h) or VNE*	
	135 kt (250 km/h) or VNE*	110 kt (204 km/h) or VNE*	110 kt (204 km/h) or VNE*	closing : 60 kt (111 km/h) or VNE*	
	100 kt (185 km/h) or VNE*	110 kt (204 km/h) or VNE*	110 kt (204 km/h) or VNE*		
		opening : 60 kt (111 km/h) or VNE*			
		Closing : 60 kt (111 km/h) or VNE*			
		(*) lowest value		 FLIGHT PROHIBITED  FLIGHT PROHIBITED	

/s/ Keith Raley

Keith Raley
Chief, Aviation Safety &
Program Evaluations
DOI, Office of Aviation Services

/s/ John Kent Hamilton

John Kent Hamilton
Acting Branch Chief, Aviation
Safety Management Systems
USDA, Forest Service