



Department of the Interior Lessons Learned

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Subject: 3DR Solo Master Air Screw Propellers

Area of Concern: Pilot preflight and assembly

Distribution: DOI UAS Managers and UAS Fleet Pilots

Discussion: A safety of flight issue has been identified in the SAFECOM system concerning the in-flight departure of Master Air Screw propellers on the 3DR Solo UAS. [SAFECOM 19-0123](#) first identified a potential propeller detachment from the UAS. A separate instance was reported via SAFECOM (not yet public) that resulted in a 3DR Solo departure from controlled flight and impact with the ground. The UAS was returning to land when, at approximately 150 feet AGL, the right front propeller detached from the UAS. The propeller was later recovered and determined to be undamaged.

A team was assembled to determine the root cause and develop a solution to this problem. After reviewing the flight logs, they discovered no inflight anomalies other than the propeller separating from the aircraft during flight.

A more expansive review uncovered that the propellers were not tightened all the way to the top of the motor bell. This caused the propellers to backspin off the motor bell in turning maneuvers. Simply spinning the propeller to a loosely snug condition will not result in the propeller self-tightening all the way to the motor bell. It requires the operator to tighten it all the way down to the motor bell.

After “spinning on” the propeller, there may be a noticeable gap between the propeller and the motor bell.



It is important to tighten the propeller to the top of the motor bell. It may take approximately one and a half additional turns to ensure the propeller is seated on the motor bell.



Please review the [IB 3DR Master Air Screw Propeller tightening video](#) to ensure the propellers are attached correctly.

For questions or additional information, please contact your Bureau UAS office or the OAS UAS Fleet Management Office at 208-433-5022 / 5079.

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