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**Date:** December 15, 2021  
**Subject:** ERA21LA287 - Propeller Examination Summary  
**Contact:** Les Doud  
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Hartzell Propeller

Propeller Model: HC-E4N03Q/E8501B-3.5 82.5" diameter 4-blade

Assembly S/N: HH2173

Overhauled 6/13/2019 by East Coast Propeller Service

Estimated TTSN 1514, TSO 194

### Examination Summary

The propeller was removed from the engine by on-scene investigators and presented for examination as shown in Photo #1. Two beta rods were pulled forward by spacers under the beta sleeves to facilitate propeller removal. All four blades were cut approximately 9.5-10" from the blade aperture to facilitate shipment. The pitch change rod was extended approximately 0.6" from the feather stop sleeve. The blades were numbers 1-2-3-4- with the assembly S/N between the number 1 and 2 blades. Blades 1, 2 and 4 were in a high pitch position near feather. Blade 3 was in a position lower than the reverse stop and could be rotated by hand indicating a fractured pitch change bracket. The blade 3 counterweight was jammed into blade 2 counterweight and prevented propeller actuation after aircraft recovery. The blade 3 counterweight was loosened by on-scene investigators to allow propeller actuation. There were no indications of any oil leaks on the propeller assembly.

Photo #1 - Propeller as-presented



All four blades were bent aft, bent opposite rotation and twisted towards low pitch. All four blades exhibited chordwise/rotational scoring in the tip region as shown Photo #2. The leading edge of blade 3 and trailing edge of blade 2 exhibited grinding erosion suggesting rotation stopped with these two blades underneath the nose of the aircraft.

Photo #2 - Blade damage



The propeller was cycled with shop air pressure and blades 1, 2 and 4 actuated normally. The propeller did not fully return to the feathered position indicating some portion of the blade 3 pitch change bracket or knob bearing remained underneath the pitch change fork.

### Conclusions

All four blades were bent aft, opposite rotation and twisted toward low pitch with chordwise/rotational scoring in the tip region. The blade #3 pitch change bracket was fractured but blades #1, #2 and #4 actuated normally with shop air pressure. There were no visible discrepancies noted that would prevent or degrade normal propeller operation prior to impact. All visible damage was consistent with high impact forces while rotating at low power.