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Safety Notice SN015 April 4, 2013

Titanium Spindles and Shock Loading

Several parts of the Safari are manufactured of Titanium. The material currently used is high quality, aerospace grade Titanium. The material is traceable and certified by the supplier to meet the specifications that we have required when purchasing the material.

The quality of Titanium used in the Safari and other aircraft is extremely expensive. It is difficult and time-consuming to machine properly, and must be handled correctly when fitting other parts to it.

Titanium is used in aviation because it is incredibly strong and light. It has an extremely high tensile strength, making it the perfect choice for the main transmission shaft, main rotor spindle, tail rotor spindle, and several other parts of the Safari.

The properties of the metal change when Titanium is subjected to shock loading or sudden impacts. The molecular structure of the metal is changed. The tensile strength is reduced as the material is made more brittle from the event.

While non-destructive testing can reveal a fracture at the molecular level, it can't reveal embrittlement from shock loading. Tail rotor strikes, main rotor blade strikes, and any other event that has caused sudden stress on a Titanium part should be considered reason to replace the Titanium part before next flight.