FIELD SERVICE NEWS

FUJI HEAVY INDUSTRIES LTD.
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FA-200-180 SERIES AIRCRAFT

PROPELLER "BLADE SHAKE"

The intent of this field service news is to establish the definition and allowable limits of the "Blade Shake", concerning which numerous inquiries have been made by owners and maintenance personnel of the aircraft. The following information is based on McCauley's Service Letter 1969-9, dated September 15, 1969.

"Blade Shake is the tendency for the blade to wobble slightly when the tip is physically moved by hand. This tendency is natural. An assembly of parts to high limits of close tolerances would have little or no shake; while parts to low limits will result in comparatively high tip movement. While the accumulation of tolerances is measured in thousands of an inch, the parts causing shake, and the pivot point about which blade rotates, are both near the blade root. Very small differences at the blade root will be magnified many times when measured at the tip. Blade shake has no adverse affect on performance or operation, and in no way affects structural strength. It is no cause for concern since it disappears when propeller rotates. With the first turn, centrifugal force of blade seats it rigidly and positively against retention bearing. Blade shake does cause concern or psychological reaction with owners and operators. Every effort, therefore, is being made by the propeller manufacturer and repair station to reduce all noticeable shake."

McCauley's manuals specify that during assembly, corrective action should be taken when blade movement exceeds 1/32 inch.

NOTE

Exert force in a direction in line with blade width,

not against blade thickness to avoid bending blade.

This is an arbitrary figure and could easily have been 1/8 inch. Blade shake in the latter amount creates no more problem than the limit of 1/32 inch. To reduce the customers' psychological reaction toward this apparent looseness and to establish better quality control during assembly and overhaul, every attempt should be made by the repair station to reduce blade shake to 1/32 inch or less, without introducing objectionable blade turning friction. Occasionally, a new or serviced propeller will be encountered with blade shake, shortly after it has been put into service. This is generally caused by a final, slight additional seating of parts. If so, this is acceptable up to a blade tip, shake of 0.125 inches.

In conclusion, we assure that "Blade Shake" is NOT a matter of concern if your blade movement does not exceed 1/8 in.