EXTEX Engineered Products
A KAMAN Company

T-651 Service Information Letter

Service Information

P/N(s): E3604912-6

Rev: A **Issued:** 2/10/16

Subject:	High Pressure Turbine Blades – Recent Service Issues
EXTEX Engineered Products Part Numbers:	E3604912-6
Installation(s):	Honeywell Auxiliary Power Units Models: TSCP700-4B; -4E; -5
Revision History:	Rev IR – Dated 5/15/15 Rev A – Dated 2/10/16
Reason:	Inform customers of recent blade separation incidents of attributable to High Cycle Fatigue (HCF) and provide recommendations for preventive actions.
Description:	There have been recent blade separation incidents attributable to HCF. Independent damage analyses have not been able to identify a causal/contributing defect in blade material or workmanship. It is therefore surmised that the blade is being excited beyond its normal fatigue limit by other abnormalities within the APU. Turbine blade HCF drivers generally take the form of gas velocity (or pressure) peaks and troughs at or near one of the blade(s) natural frequencies. Relative velocity differences can cause the blade to resonate, usually at a 1st cantilever mode. At a resonant frequency, the blade vibratory motion and the resultant stress are at levels well above the normal operating conditions. Operating at a resonant condition may rapidly result in HCF separation, often within only a few minutes time. In a high pressure (1st stage) turbine, the most direct influencing factors for HCF are the upstream 1st stage stator, the next downstream stator, or the fuel injectors. In the case of the 1st stage vane assembly, while there are always variations in the exiting gas velocity, the degree of the peaks and troughs depends primarily upon the uniformity of the nozzle vanes. EXTEX Engineered Products has not had reports of blade separation occurrences when using new or lightly used HP Turbine Stator Vanes. It is surmised that overhauled vanes are more susceptible to producing airflow variations.
Applicability:	Honeywell Auxiliary Power Units (APU) Models: TSCP700-4B, -4E, or -5 with EXTEX Engineered Products PN E3604912-6 High Pressure Turbine Blades installed.
Accomplishment Instructions:	EXTEX Engineered Products recommends the use of new or lightly used HP turbine stator vanes versus overhauled vane segments. Use care if combining new and used vane segments into the same stator assembly because used vane flow characteristics may differ from new. EXTEX Engineered Products also recommends extra care when adhering to the OEM instructions for continued airworthiness for installing and/or servicing the low pressure turbine variable vanes and for the fuel injectors.
Approval:	n/a
Notes:	Please contact your EXTEX Engineered Products Customer Service Representative with any questions.