

Technical document

Engine examination

Document ID: **BEA n-jv120404_tec01**
Date of occurrence: 04/04/2012
Place of occurrence: USA
Aircraft type: SA315B
Registration number: **N929JV**
Equipment examined:

Engine Turbomeca Artouste IIIB1 S/N: 2418

Work performed:

On May 23 2012, the engine was investigated in Turbomeca Tarnos, in the presence of Turbomeca, Eurocopter and BEA representatives.
The findings are listed in the following report from Turbomeca (No. A-2012-007).

Additional examination was performed in Turbomeca laboratory on the turbine casing and the 3 turbine stages.
The findings are also listed in the same report from Turbomeca (No. A-2012-007).

Results:

BEA agrees with the findings and the conclusion from Turbomeca:

The investigation revealed a deep erosion of the turbine casing. It is the consequence of the circulation of erosive particles which accumulated in the bottom of the casing further to extended periods of engine operation in dusty environments.

Due to this erosion, the sheet-metal thickness decreased and a crack developed. Under the effect of engine internal pressures, this crack generated ripping of the sheet metal which then folded. Finally, the fold opened and a hole appeared allowing a significant air leakage through it.

The non-uniform overheat suffered by the engine led to the partial melting on the nozzle guide vanes and the rupture of the tips of all the blades of the three turbine stages.

In front of the 1st stage turbine, uncontained debris perforated the turbine casing and the turbine shroud (the shroud lost its mechanical properties due to the high temperatures).

As per the Artouste III Maintenance Manual procedure (72-40-01 Page 203), removal of sandy deposits is essential when the engine is operated in dusty environments. The section E of the Artouste IIIB S/N 2418 Log Book does not state the embodiment of this maintenance manual.