Turbomeca USA
SAFRAN Group

Accident Investigation and Safety

INVESTIGATION REPORT

TMUSA-2008-19124

ENGINE FAMILY	ENGINE S/N	DATE OF REPORT	WARRANTY CLAIM	COMMERCIAL FILE
Arriel 1D1	19124	07 March 2008		
OPERATOR	**DATE OF EXAM**	**REASON FOR ENGINE EXAM**		
Metro Aviation, Inc.	06 March 008	Accident Investigation		
ACCIDENT	**INCIDENT**			
YES ☒ NO ☐	YES ☐ NO ☒			
REFERENCE ACCIDENT				
FIRST INFO REPORT N°A-2008-003				

ENGINE MODULE	S / N	WORKS PERFORMED	TOTAL HOURS	TOTAL CYCLES	HOURS SINCE OH	CYCLES SINCE OH
Engine	19124	Examination, partial disassembly				
Module 1	13025					
Module 2	6024					
Module 3	20524					
Module 4	20626					
Module 5	20126	Removed				
FCU	ANR124TEC					

Circumstances Reported to Turbomeca:

The EMS aircraft was reportedly en route from Harlingen to South Padre Island Convention Center to pick up a patient. The aircraft made initial contact with Harlingen Tower and was handed over to Valley Approach Control. The pilot requested VFR flight following to destination and later reported landing zone in sight and terminated radar service. The aircraft subsequently crashed.

CONCLUSION

The engine experienced an over torque event due to the sudden stoppage of the main rotor system. This indicated the engine was delivering power to the main rotor system at the time of impact.

VALIDATION		APPROVAL	
Signature JM Gregoire	Date 07 Mar 2008	Signature	Date

1 TECHNICAL REPORT

1.1 FINDINGS ON ARRIVAL

The upper left side of the engine was crushed. The upper left side of the exhaust pipe was crushed and flattened. The fuel control unit (FCU) was crushed and enveloped by a metal structure. The air inlet cone exhibited rotational scarring and the blades of the axial wheel exhibited minor foreign object damage (FOD). The axial diffuser stator vanes did not appear to exhibit FOD. The axial compressor was unable to be rotated by hand. There were rub marks on the inside of the compressor casing around the axial rotor at two locations: between 6 and 7 o'clock and 12 and 1 o'clock. The bleed valve was in the open position; the oil filter by-pass indicator was popped; the magnetic plugs that were present and could be removed were clean. The containment shield was intact and the power turbine blades appeared undamaged. The power turbine was unable to be rotated by hand. The ears of the triangular flanges at the attach point of the tail rotor short shaft to the free wheel shaft were bent, and the tail rotor short shaft was lying about 45 degrees to the vertical axis of the engine. The ears of the flange on the opposite end of the tail rotor short shaft were missing. The front engine support was ruptured near the coupling tube attach point, and the coupling tube was lying inline with the vertical axis of the engine. The top of the slotted nut on the splined end of the free wheel shaft assembly appeared to have come in contact with a hard surface. The splined shaft was unremarkable. The bolt holes in the cover of the free wheel assembly were elongated or torn. Rotational scarring was noted on the interior and exterior circumferences of the forward-facing surface of the cover. The free wheel shaft was fractured; the fracture surface appeared to have a 45 degree lip.

1.2 FINDINGS ON TEST BENCH

Due to impact damage, the engine was unable to be run on the test cell.

1.3 FINDINGS ON DISASSEMBLY

1.3.1 MAIN FINDINGS

Examination of the marks engraved on the module 5 between the driving pinion and the splined nut were found misaligned by about 2mm, indicating an over torque event had occurred.

2 PICTURES

Figure 1. Arriel 1D1 SN 19124

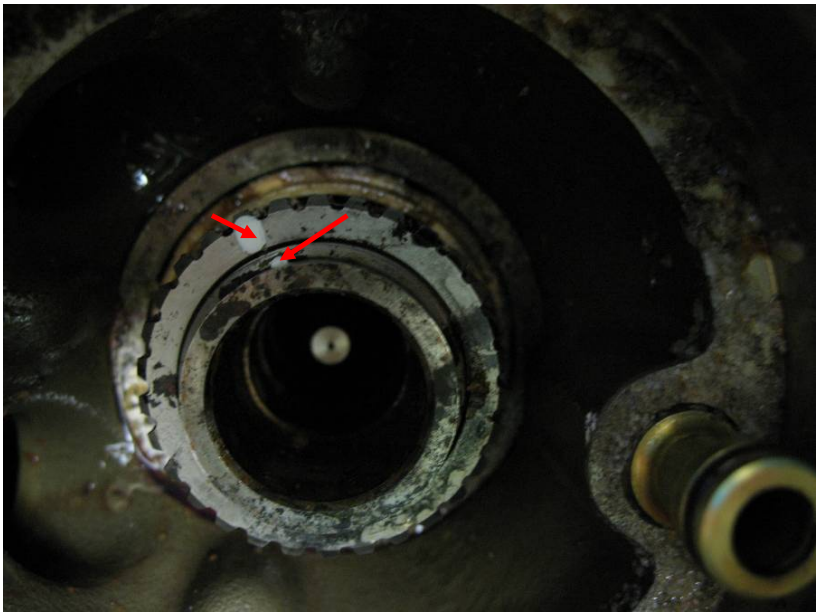

Figure 2. MO5 Alignment Marks