Aviation Investigation Preliminary Report

Location:	Polykastro, Greece	**Accident Number:**	DCA26FA274
Date & Time:	July 10, 2026, 06:21 Local	**Registration:**	9H-QEU
Aircraft:	Boeing 737	**Injuries:**	1 Serious, 154 None
Flight Conducted Under:	Non-U.S., commercial		

Malta Air, doing business as Ryanair flight 1879, a Boeing 737-8AS, registration 9H-QEU, experienced a No. 2 (right) engine fan-blade-out (FBO) failure during climb out from the Thessaloniki International Airport (SKG), Thessaloniki, Greece. Engine fragments breached the fuselage and the cabin depressurized. The crew elected to return to SKG where they made an uneventful landing. The flight was a scheduled international passenger flight from SKG to Memmingen Airport (FMM), Memmingen, Germany. There were 2 pilots, 4 flight attendants, and 149 passengers (including one lap child) on board. One passenger sustained serious injuries.

The NTSB traveled to the accident site. On July 16, 2026, the Greece Hellenic Air and Railway Safety Investigation Authority (HARSIA) delegated the investigation in full to the NTSB. As part of the investigative process, the NTSB invited qualified parties to participate in the investigation. These included the Federal Aviation Administration (FAA), The Boeing Company, and GE Aerospace. In accordance with the provisions of Annex 13 to the Convention on International Civil Aviation, the countries of Greece (State of Occurrence), Malta (State of the Operator and Registry), and France (State of Manufacture of the Engines, jointly with the United States) designated Accredited Representatives to the investigation, and Malta Air, Safran Aircraft Engines, and the European Union Aviation Safety Agency (EASA) were designated as technical advisors.

The parties were formed into specialized investigative groups led by NTSB group chairs in the areas of Powerplants, Structures and Survival Factors, and Materials Engineering. The Cockpit Voice Recorder (CVR) and Flight Data Recorder (FDR) were sent to NTSB headquarters for

download and specialists were assigned. The materials engineer traveled to France to lead the engine fan blade examination.

History of Flight

According to the flight crew, while climbing through an altitude of about 16,000 ft, near Polykastro, Greece, (about 4.5 nm south of the Greek border with Northern Macedonia) they received a No. 2 engine HIGH VIBRATION indication. They reduced the engine power and initiated the Engine High Vibration non-normal checklist. Shortly after, the engine vibration indication was reduced. The crew subsequently continued the climb on autopilot.

The engine vibrations then increased significantly, they heard a loud bang, and the autopilot was disengaged. While assessing the engine condition, the cabin altitude warning sounded. The flight crew donned their oxygen masks, declared an emergency, and began an immediate descent.

The flight attendants (FAs), who were preparing for cabin service, reported hearing and feeling a loud continuous vibration and seeing a small amount of fog/smoke before the oxygen masks dropped. One reported hearing an automated public address system announcement saying “emergency descent”. Another recalled manually making an additional decompression announcement.

The FAs recalled that passengers had donned their oxygen masks. FA2 and FA4 initially sat down in the forward jumpseats and donned their oxygen masks, however FA4 moved to the galley to use another mask after the one above the jumpseat detached from the overhead.

FA1 noticed some passengers were standing up and asking for help and responded to assist. The FA noticed that the passenger in seat 11F was partially lodged in a damaged cabin window, and that the entire window was missing. Other passengers were assisting and managed to pull the injured passenger back into the cabin. The FA then sat in seat 11B and donned an oxygen mask. That mask became detached and the FA used a different one.

A passenger went to the forward galley and asked the FA2 and FA4 for something heavy and metal to try and block the broken cabin window hole and retrieved a metal box to bring back to row 11.

The injured passenger was subsequently moved to row 12 and was attended to by a passenger who was a doctor throughout the remainder of the flight. The doctor asked for first aid equipment, and FA1 retrieved the forward first aid kit.

The FAs communicated with the flight deck, confirmed the flight crew were ok, and were informed of the engine failure, decompression, and the intent to return to SKG with an estimated time enroute of 20 minutes.

The FAs also received instructions to secure the cabin, which they did. The flight crew later informed them when the oxygen masks were no longer necessary. After descending below 10,000 ft, the flight crew secured the No. 2 engine and returned to SKG uneventfully. The airplane remained on the runway for an inspection and then proceeded to the gate, where first responders were waiting.

Figure 1: View of the row 11 passenger cabin window from the interior, right side of the cabin.

Crew Experience

The captain was hired by Malta Air in May 2015. He had accrued a total of 8,270 flight hours, 7,683 of which were in the same make and model as the accident airplane. The first officer was hired by Malta Air in March 2023. He had accrued a total of 2,523 flight hours, 2,333 of which were in the same make and model as the accident airplane.

Airplane Examination

Examination of the airplane revealed that the No. 2 engine, an CFM International (a joint company between Safran Aircraft Engines and GE Aerospace) model CFM56-7B26, experienced a fan blade separation that resulted in engine fragments striking the fuselage and the right horizontal stabilizer. The pressurized section of the fuselage was penetrated 1) through the passenger cabin window located at row 11, as well as 2) lower lobe fuselage skin behind the right wing-to-body fairing, see figures 2 and 3. Additional impact damage was found on the right wing-to-body fairing, a dent with paint smearing on the fuselage window belt skin, a dent on a stringer common to the dented fuselage window belt skin, a gouge on the right horizontal stabilizer upper skin and a dent on the right horizontal stabilizer leading edge.

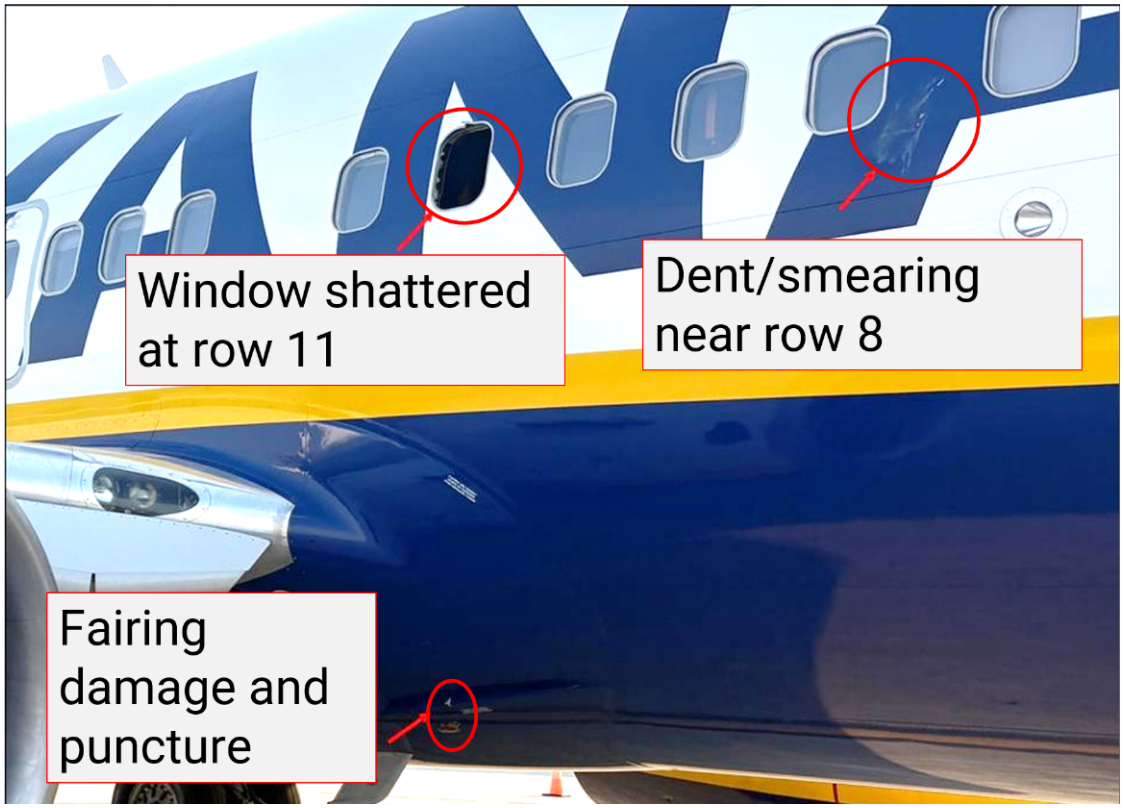

Figure 2: View of damage to right side of the fuselage.

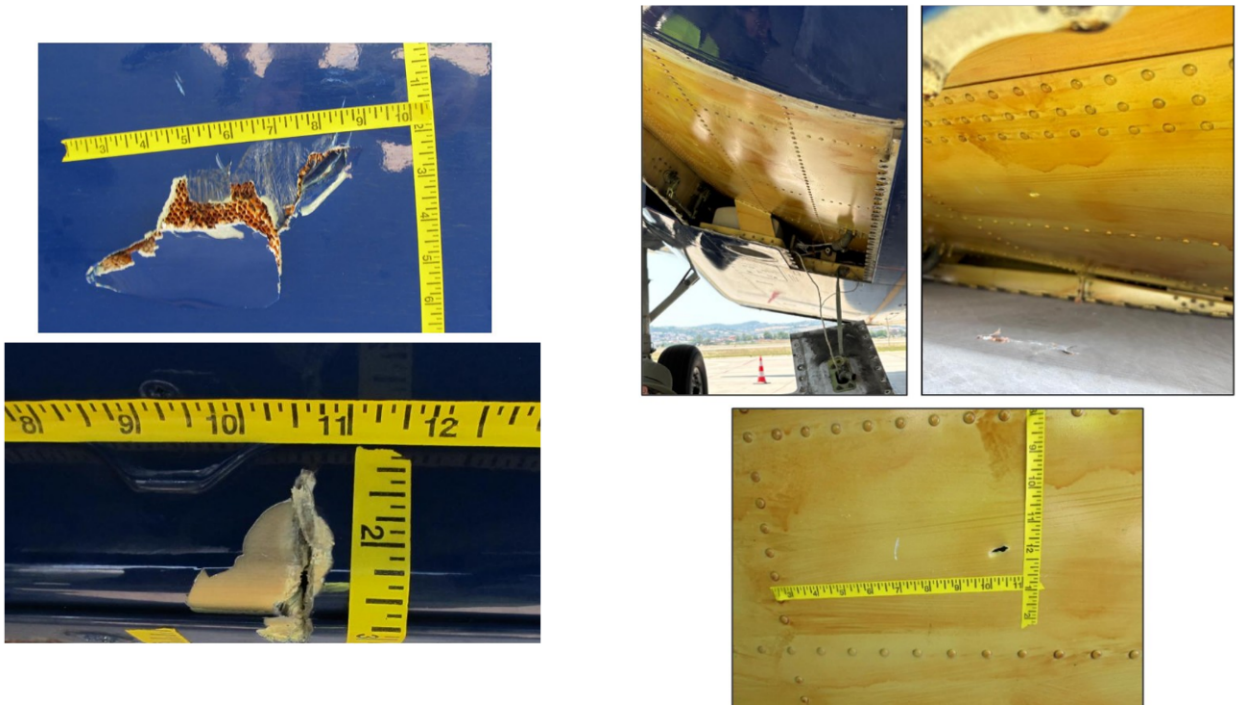

Figure 3: Fairing damage (left) and fuselage puncture behind fairing (right).

Examination of the engine and nacelle revealed that one fan blade (No.10) had fractured and separated below the blade platform. The outer blade tips were fractured and separated on two additional fan blades (Nos. 16 and 21). All remaining blades were full length but exhibited varying levels of impact deformation. Three loose fan blade fragments were recovered from the engine. A visual examination of the core was performed and there was no evidence of radial uncontainment though the engine cases, or any undercowl fire. The engine inlet cowl, which is forward of the fan case, exhibited evidence of punctures as described below.

The inlet and fan cowling remained attached to the engine. The inlet cowl inner barrel exhibited impact damage, tearing, and/or missing material from the 3 to 9 o'clock (as viewed from the rear) positions, see figure 4. The inlet lip skin had a scrape mark at approximately the 7 o'clock position.

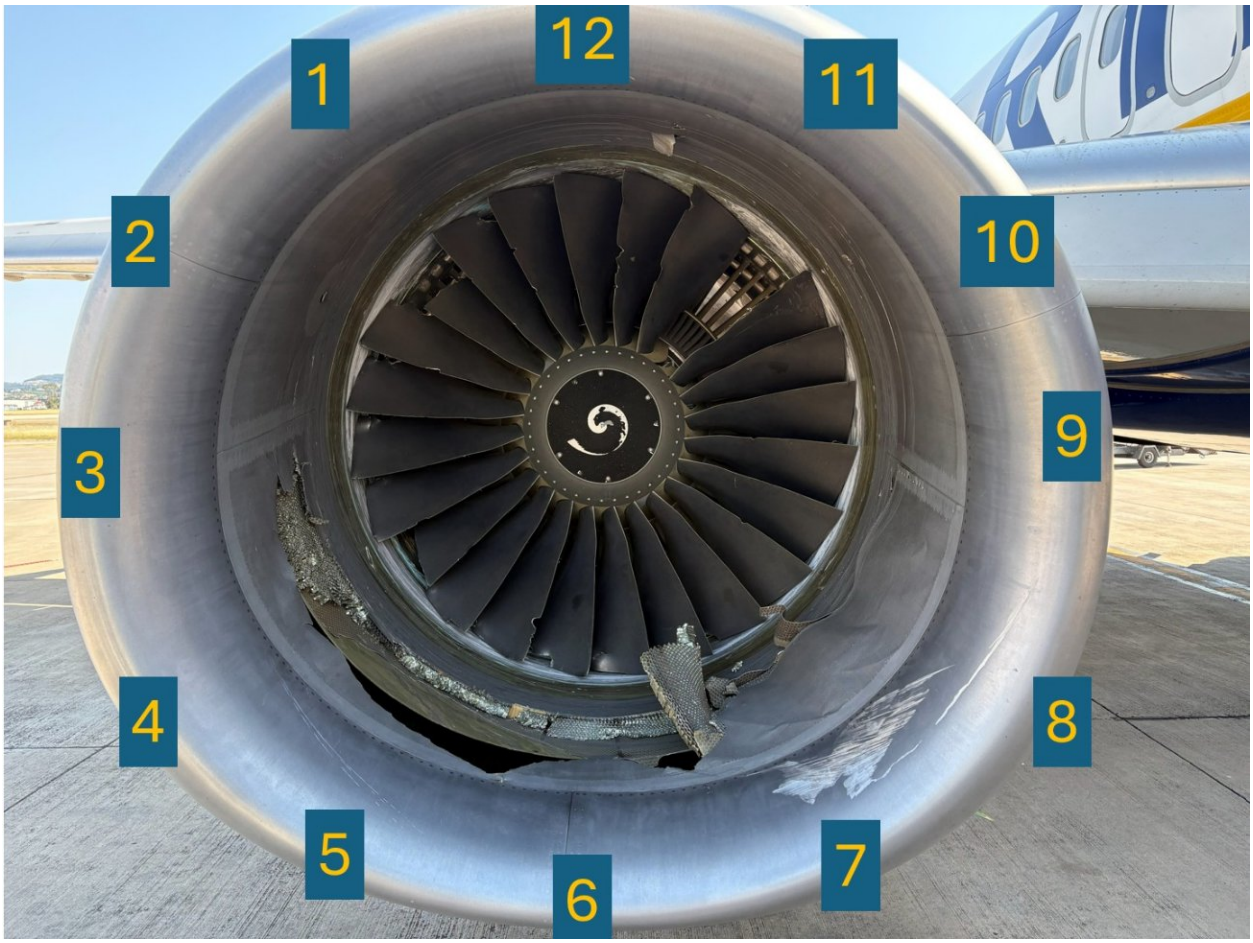

Figure 4: View of the No.2 (right) engine inlet. View is looking aft.

The inlet cowl outer barrel had a radial penetration, forward of the fan plane of rotation at the 9:30 position that measured approximately 14 inches circumferentially by 10 inches axially. A second inlet cowl tear and puncture was present forward of the fan plane of rotation at the 7 o'clock position that measured approximately 13 inches circumferentially by 10 inches axially, see figure 5.

Figure 5: No. 2 (right) engine inlet cowl outer barrel punctures.

Several of the aft bulkhead splice fasteners failed at the 9:00, 6:00, and 3:00 o'clock positions. The attach ring to aft bulkhead fasteners failed 360 degrees circumferentially and loose rivet tails were observed along the bottom of the inner barrel. Enhancements for fasteners, defined in Federal Aviation Administration airworthiness directive (AD) 2025-04-01, had not been incorporated on this inlet cowl hardware.

The inboard fan cowl sustained skin damage near the integrated drive generator (IDG) oil access door, and the No. 1 forward fan cowl latch was found disengaged after the event. The gap between the inboard fan cowl and thrust reverser was reduced at the bottom of the interface with contact observed at the forward edge of the thrust reverser. Enhancements for fasteners and an external doubler, defined in AD 2025-04-02, had not been incorporated on this fan cowl hardware.

Bird remains, including feathers, were recovered from the forward face of IDG oil cooler, one of the thrust reverser blocker door drag links, and the lower (6 o'clock position) of the engine fan case near the thrust reverser split flange. The remains, along with the samples from the fan

blades described below, were hand carried to the Smithsonian Institution Feather Identification Lab in Washington, DC, for examination.

The exhaust nozzle remained attached to the engine. There was cracking and 360° shear buckling on the exhaust case immediately aft of the engine turbine rear frame. Enhancements for installing additional brackets for the exhaust nozzle, defined in AD 2025-04-03, had not been incorporated on this exhaust nozzle hardware.

The FAA compliance date for all three of these ADs is July 2028.

Fan Blades Examination

Pieces from the fractured No.10 fan blade, the remaining 23 fan blades, and associated shims, spacers, and platforms were sent to Safran Aircraft Engines in Moissy-Cramayel, France for a group examination led by the Chief Technical Advisor for the NTSB Materials Laboratory, see figure 6 for relative location of shims, spacers and platforms to blades.

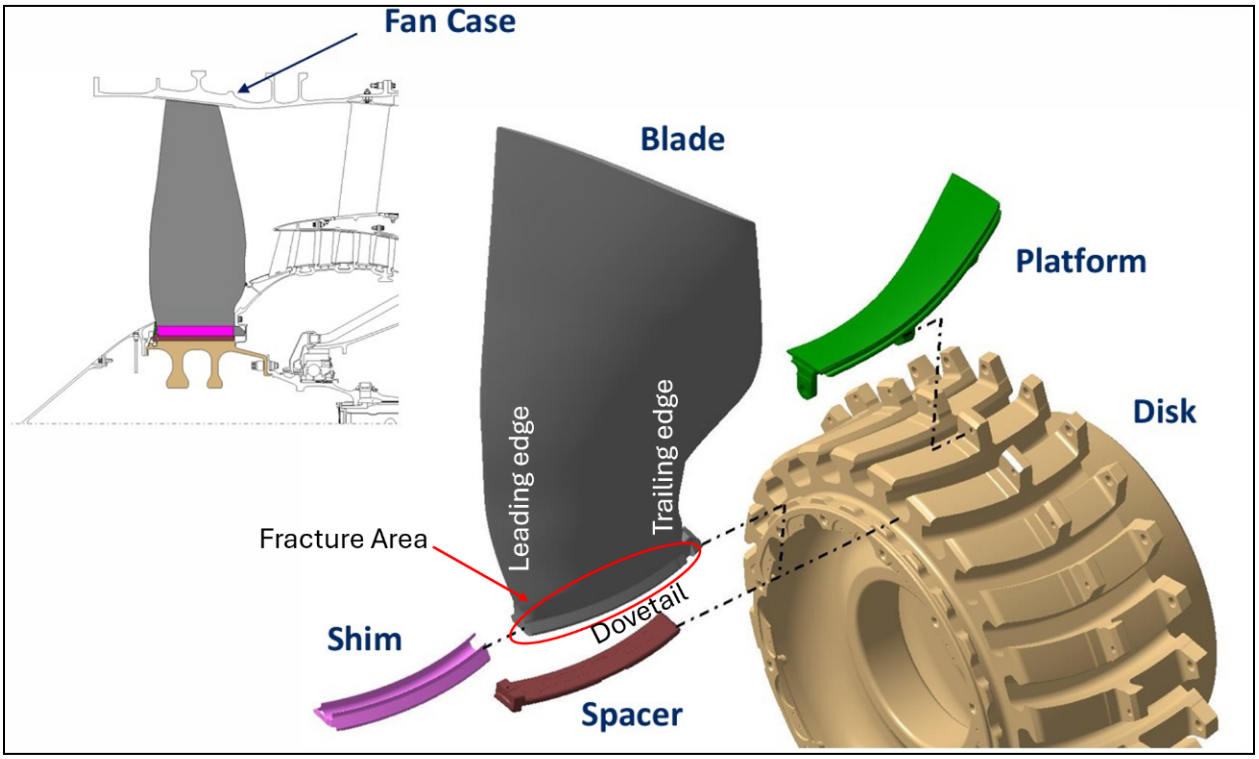

Figure 6. Graphic showing location of blades, shims, spacers, and platforms. The red circle denotes location of the fracture on blade No. 10. (Source Safran Aircraft Engines, fracture area annotated by NTSB).

The No. 10 fan blade was fractured through the dovetail in the blade root as shown in figure 7. A portion of the fracture surface covering approximately 37 percent of the total fracture surface had relatively smooth features with a curving boundary, features consistent with fatigue. The fracture features were traced back to an origin area on the concave side of the blade near the trailing edge.

At the fatigue origin area located about 0.559 inch (14.2 mm) radially away from the root end face, ratchet marks were observed, consistent with multiple origins along an axial length of about 0.650 inch (16.5 mm). Heavy fretting damage was observed locally on the dovetail contact face adjacent to the origin area and in the same area on both sides of the associated shim.

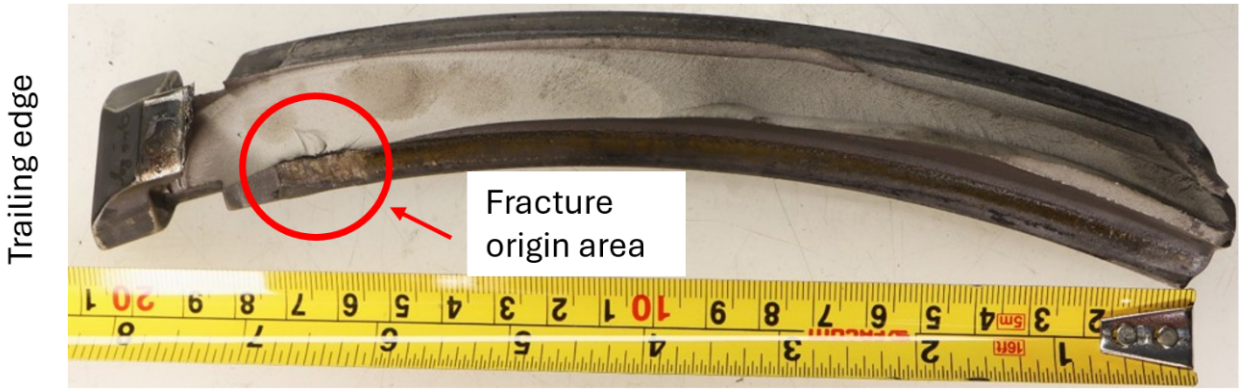

Figure 7. Fracture surface on the No. 10 fan blade dovetail piece (Source Safran Aircraft Engines).

The fracture surface on the No. 10 fan blade dovetail piece was examined using a scanning electron microscope. The origin areas were damaged from fracture surface recontact and rubbing. However, fatigue striations were observed across the fatigue region from 0.008 inch (0.2 mm) deep to the boundary at a depth of 0.626 inch (15.9 mm).

Striation spacing was relatively coarse and unchanged across the fatigue region, consistent with fracture due to high amplitude fatigue (HAF). In aircraft engine fan blade fractures, HAF is associated with cyclic loading that occurs at frequencies greater than a flight cycle and at stress amplitudes that are larger than those typically associated with high-cycle fatigue (HCF).

The No. 10 spacer exhibited an area of elastomer deterioration near the trailing edge end, see figure 8.

Figure 8. No. 10 spacer damage (Source Safran Aircraft Engines).

Visual examinations were completed on the remaining 23 fan blades. Fan blade Nos. 8, 9, 12, and 21 had rounded deformation of the leading edges. The blades were further examined for evidence of organic material transfer using black light. Samples of fluorescing material were collected from blade Nos. 9, 11, 12, 20, 21, and an airfoil fragment from blade 10.

Recorders

An initial review of quick access recorder data revealed several evolutions of vibrations were detected by two sensors (one located at bearing No. 1, the other on the fan frame compressor case (FFCC)) for the No. 2 engine during take-off and climb. Vibration values for the FFCC sensor were higher than the bearing No.1 sensor during these phases and are provided below.

The first was a sudden increase simultaneously from both sensors near the end of the take-off roll. The FFCC value increased from about 0.2 cockpit units (CU) to 1.7 CU before the airplane lifted off. The vibration value then rose from 1.7 to about 2.0 CU over the next 175 seconds. The rate of vibration change then increased, and the values rose from 2.0 CU to 4.3 CU over the next 250 seconds, until the engine power was reduced. As the power reduced, the vibration value decreased to about 1.2 CU. As the power was subsequently increased, the level rose first from 1.2 CU to 2.2 CU, then from 2.2 CU to the maximum recording limit of 5 CU within 19 seconds.

The Honeywell solid state FDR readout is in progress at the NTSB Vehicle Recorder Laboratory.

The airplane was equipped with a Honeywell solid state CVR that recorded the last two hours of aircraft operation across four channels. The event flight was about 57 minutes in duration and was captured in its entirety. Both English and Greek were spoken by the flight crew during the flight. Some cockpit discussions were not discernable because they were obscured by simultaneous radio transmissions.

About seven and a half minutes after the start of the takeoff roll, the crew called for the high engine vibration non-normal checklist, noting that the vibration level was 4.3. No aural alert was audible on the CVR. A loud bang sound was recorded about nine minutes and twenty seconds after the start of the takeoff roll.

The No.2 electronic engine control (EEC) unit and the airborne vibration monitor (AVM) unit were retained for data downloads at their respective manufacturers at a later date.

Maintenance Records

A review of maintenance records for the engine revealed that the fan blades had undergone ultrasonic inspections in accordance with CFM service bulletin (SB) 72-1033 revision 3, on November 11, 2025, and most recently on May 24, 2026, 253 cycles before the accident flight with no findings. It prescribes initial and recurring ultrasonic inspections of the concave and convex side of the fan blade dovetail, for any indications of crack development. The service bulletin was originally issued in 2018 following an FBO event in which a passenger was fatally injured.

Four suspected bird strikes to the accident airplane's No. 2 engine were reported by flight crews in the 12 months preceding the accident. No damage was found in the subsequent maintenance actions. Bird remains were reportedly found in two of the cases.

Cabin Examination

Examination of the airplane cabin revealed that the only emergency equipment found opened and used was a first aid kit found on seat 12F. All oxygen masks were found to be deployed.

The forward flight attendant seat restraints were found all buckled, and aft flight attendant seat restraints were found unbuckled. All galley bins located in the forward and aft R1 were found stowed. Some of the locks and latches on the galley carts and bins were found in the unlatched position. The metal box mentioned in the flight attendant statement was found in the R1 aft galley, inboard second to the top compartment with no notable damages.

Middle and outer passenger windowpane shards were found in the cabin area longitudinally between passenger rows 8 and 15. The interior sidewall panel surrounding the damaged passenger window at row 11, had a fracture at the lower aft vertical edge of the window that extended aft, to the nearest fuselage frame aft of the window edge.

Additional Investigation Notes

The No. 2 engine, along with its inlet, the No. 1 engine fan blades, shims and spacers, and the row 11 passenger window forging were retained for the investigation.

The investigative team is aware of previous FBO events with similar engine models that resulted in damage to engine inlets or cowlings and fuselage structures. Determination of any relevant similarities or details between this accident and previous events remains under investigation.

This investigation is ongoing.

Aircraft and Owner/Operator Information

Aircraft Make:	Boeing	**Registration:**	9H-QEU
Model/Series:	737 8AS	**Aircraft Category:**	Airplane
Amateur Built:			
Operator:	Malta Air	**Operating Certificate(s) Held:**	Other operator of large aircraft
Operator Designator Code:			

Meteorological Information and Flight Plan

Conditions at Accident Site:	VMC	**Condition of Light:**	Day
Observation Facility, Elevation:	SKG,22 ft msl	**Observation Time:**	06:20 Local
Distance from Accident Site:	35 Nautical Miles	**Temperature/Dew Point:**	25°C /8°C
Lowest Cloud Condition:	Few / 2000 ft AGL	**Wind Speed/Gusts, Direction:**	11 knots / None, 320°
Lowest Ceiling:		**Visibility:**	10 miles
Altimeter Setting:		**Type of Flight Plan Filed:**	IFR
Departure Point:	Thessaloniki, Greece (SKG)	**Destination:**	Memmingen, Germany (FMM)

Wreckage and Impact Information

Crew Injuries:	6 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious, 148 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 154 None	**Latitude, Longitude:**	41.055446,22.643974 (est)

Administrative Information

Investigator In Charge (IIC):	Brazy, Douglass
Additional Participating Persons:	Pierre Scarfo; GE Aerospace; Evendale, OH Eric East; The Boeing Company; Arlington, VA Christos Koutsavdis; Accrep - HARSIA; Athens, OF Vincent ECALLE; Accrep - BEA France; Paris, OF Vincent Percesepe; FAA AVP 110; Washington, DC Captain Emvic Debono; Accrep - BAAI Malta; Birkirkara, OF
Investigation Class:	Class 3
Note:	