

First Officer Statement

UAL3872

Feb. 27, 2024

Dept. SFO 0245Z/2045L B757-200

Position: Pilot Monitoring

I was the pilot monitoring on a last-minute reserve assignment added to my schedule after a transcontinental flight from EWR to SFO. This flight was scheduled as a "validation flight" for aircraft tail number 138, which was coming out of maintenance after a write-up for abnormal flight deck noises. The intent of this flight was to depart SFO, accelerate to Mach 0.82 at FL360 and try to recreate the abnormality the aircraft had previously been written up for, then immediately return to SFO. Total flight time was scheduled to be blocked at 1.5 hours; however, actual flight time would be closer to 45 minutes pending ATC sequencing in and out of the San Francisco International Airport. My inbound flight from EWR to SFO that day had blocked in at roughly 6h27m; however, I accepted the late assignment due to not feeling fatigued, having had a good rest before my original pairing, and understanding that I was the last pilot available to fly the maintenance test flight for the evening. Operational pressures were present to get the plane back into service, pending no subsequent issues, as it was scheduled to operate a delayed flight from SFO to BOS after the maintenance flight I was flying.

I met the captain in the annex flight planning section of the F concourse., We exchanged introductions as this was our first time flying together, and then discussed the flight plan, fuel, intent of the flight, and expectations for the overall flight. We were met by a member of the United Maintenance team and driven out to MOC spot 7, where the Boeing 757-200 was parked. The captain asked if I minded if he would be the pilot flying. I did not object as I told him I had just taken the leg from EWR to SFO earlier in the day. We arrived at the plane and divided up the preflight duties between the two of us. I conducted the walk-around and cabin preparations while he started programming the FMC with the flight plan and preliminary takeoff data.

We ran through the pre-flight brief using the United Airlines briefing card covering all items. We included the additional threats of having a low altitude level-off of 3,000 feet per our PDC. The CA stated that the aircraft would be very light due to zero passengers and only having 18,800 lbs of fuel on board. He then covered the takeoff data and the slower-than-normal rotational speeds. Our "V speeds" were approximately 115 for V1, 127 for Vr, and 129 for V2. We agreed this was an additional threat due to the callouts from "100 knots" to "rotate" would happen quickly as well as the aircraft accelerating past V2 plus 20. Our mitigation techniques would be having a plan of making the rotate call 5 knots prior and planning to pitch the aircraft relatively quickly into the flight director pitch command bars to obtain the desired climb-out attitude and speed followed by fairly fast-paced calls for "FLCH, set clean maneuvering speed" in anticipation of the low altitude level off. I agreed and stated I had no questions or comments to add to the initial brief.

Calling ground, we obtained our initial taxi clearance after starting the #2 engine to taxi "Zulu, Uniform, Short of Charlie." We complied and began our taxi out having agreed on a single engine taxi prior to moving the aircraft. Upon reaching Uniform taxiway I had an FMC timeout error message and told the CA to either hold at taxiway Uniform, short of taxiway Charlie for a delay or to taxi slowly once we were told to continue due to the FMC error. We were cleared to continue on taxiway Charlie. I informed the CA I would be heads down while fixing the issue which required me to re-select FMC on the FMGC and re-initializing our data that we had already received. I complied with the FMC prompts to re-load the take-off data. After verifying all current data in the "box" matched all parameters for the flight I told the CA we were good to go and went over the departure, take off numbers, CG, and stated winds were still loaded.

We were holding short of Runway 1L on taxiway Charlie behind a United heavy 777. We started the second engine and ran the "Before Takeoff Checklist." Tower then told us to "be ready to go, traffic on a 4-mile final". We complied and as we turned into position, tower cleared us for takeoff stating: "United 3872 28R cleared for takeoff, traffic on 3 mile final." I replied to tower "28 right cleared for takeoff, United 3872".

The CA pushed the throttles up to approximately 1.13 EPR and asked for autothrottles. I pushed the autothrottle button and stated, "autothrottles". The CA tracked the centerline down the runway. At Vr, he pulled back on the yoke, rotating the aircraft at roughly 3 degrees per second, initially. The plane tracked upward, and the main landing gear became light, then came off the ground. Immediately following the gear coming off the ground, the CA and I both referenced the vertical speed tape and saw a positive trend representing a climb. As I began to say "Positive rate" I felt a moderately dramatic "thud" followed by the aircraft continuing to track upward. I immediately referenced the attitude indicator and noticed we were still roughly 10 degrees below the pitch command bars on the flight director. I referenced the EICAS and did not see any messages, or any Warning/Caution indicator lights illuminated.

At this time, my primary thought process concerned the overall control-ability of the plane after having felt the thud, and maintaining control as we tracked runway heading. The initial level off altitude was 3,000 feet which would put us at roughly 3,000 feet below the highest terrain in front of us. Acknowledging something abnormal had happened, I remained focused on the biggest threat ahead of us was my primary concern. We both verified the aircraft was controllable, flying, and we would be returning to the field regardless. Not knowing for certain what the "thud" was, we decided to focus only on maintaining aircraft control-ability as we climbed out and away from the airport until we were in a lower threat level regime of flight. Once above FL180, we continued to discuss what the possible cause of the abnormality could have been. I stated that a tail strike seemed likely now that I have had time to process it, the CA thought that the gear unloading could have been a possibility. We looked for the pitch report option via ACARS and did not find any. As a precaution we ran the Tail Strike Checklist confirming no abnormal flight characteristics. We continued the climb and informed ATC we were on a maintenance test flight and needed to return to SFO, expecting direct to PIRAT then OSI and vectors for the ILS 28R. We focused on the rest of the flight and would deal with the potential of a tailstrike on the ground since we have determined there to not be any abnormal flight characteristics, no control-ability issues, and we were supposed to be conducting a test flight to look for other parameters.

The test flight proved to be normal, and we could not recreate the issues initially written up for the test flight. The descent, approach, and landing into the SFO was uneventful. We taxied to gate F16, parked, completed necessary checklists, and discussed conducting a post flight walk around to determine if there was a tail strike or any other abnormalities associated with what we felt on takeoff.

Prior to leaving the flight deck, I received the pitch report for the takeoff and landing and told the CA that contact with the tail occurs at approximately 12.2 degrees on departure as written on the pitch report. Our pitch report indicated that we were at roughly 15.3 degrees. Outside the plane, with the CA and maintenance personnel also present, we walked around the aircraft looking at the "crush plate" in the tail section of the plane. Maintenance said there was some paint missing from the crush plate however the plate was still intact. I noted the APU maintenance access doors were missing some paint. The maintenance personnel said that the damage "didn't seem very extensive".

Prior to returning to the jet bridge, we told the maintenance personnel we will write up the tailstrike potential in Electronic Logbook (ELB). The CA and I returned to the flight deck and completed the maintenance write up and exited the aircraft.