

ALERT BULLETIN

AB 2010:24/3-13

7/2/10

878917, 879559

TO: Boeing Commercial Airplane Company

INFO: FAA (AFS-300, AFS-200, AFS-230, ANM-100, SEA-AEG, ASA-100), AASC, ALPA, IFALPA, AMFA, APA, ASAP, ATA, IATA, CAPA, IAM, ICASS, IPA, NTSB, PAMA, SWAPA, TWU, USAPA

FROM: Linda J. Connell, Director
NASA Aviation Safety Reporting System

SUBJ: B737 Uncommanded Pitch-Over

We recently received an ASRS report describing a safety concern which may involve your area of operational responsibility. We do not have sufficient details to assess either the factual accuracy or possible gravity of the report. It is our policy to relay the reported information to the appropriate authority for evaluation and any necessary follow-up. We feel you should be aware of the following:

ASRS received a report from an Air Carrier First Officer describing an uncommanded pitch-over in his B737-800. The reporter stated that while climbing through 19000 ft "...the pitch bar on the PFD disappeared and the aircraft pitched over hard from approximately seven degrees nose up to five degrees nose down..." resulting in an overspeed. The First Officer documented in his report that they were using a higher climb speed than normal because they were running late, and after the pitch-over they slowed to normal climb speed. Maintenance later reportedly found a right ADIRU fault.

ASRS received a report (ACN 879559) from a B737-800 flight crew describing an event that may be related.

(Keywords: B737-800 Uncommanded Pitch Over)

To properly assess the usefulness of our alert message service, we would appreciate it if you would take the time to give us your feedback on the value of the information that we have provided. Please contact Gary Brauch at (408) 541-2800 or email at gary.j.brauch@nasa.gov.



Aviation Safety Reporting System
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ACN: 878917

Time

Date: 201003

Local Time Of Day: 0001-0600

Place

Locale Reference.ATC Facility: ZZZ.ARTCC

State Reference: US

Altitude.MSL.Single Value: 19000

Environment

Flight Conditions: IMC

Aircraft 1

ATC / Advisory.Center: ZZZ

Make Model Name: B737-800

Component 1

Aircraft Component: INS / IRS / IRU

Person 1

Function.Flight Crew: First Officer

Function.Flight Crew: Pilot Flying

ASRS Report Number: 878917

Events

Anomaly.Aircraft Equipment Problem: Critical

Anomaly.Inflight Event / Encounter: Weather / Turbulence

Detector.Person: Flight Crew

Result.General: Maintenance Action

Result.Flight Crew: Overcame Equipment Problem

Result.Flight Crew: Regained Aircraft Control

Narrative 1

I, copilot, was flying aircraft. Thunderstorms and icing were active in the area. Radar was on and aircraft was on a clear flight path in smooth air. Flight was running late so a modified climb speed of 310 was being used and a final altitude of 24,000 FT was requested from ATC due to a short leg length. Climbing through 18,000 FT both altimeters were switched to STD, autopilot was engaged at this time and lights were secured. At approximately 19,000 FT in the climb the pitch bar on the PFD disappeared and the aircraft pitched over hard from approximately seven degrees nose up to five degrees nose down. I disengaged the autopilot and auto throttles and slowly brought the deck angle back into a climb attitude. No column entanglement was apparent. No warning lights or messages were present. Windshield, pitot heat and engine anti-ice were ON and icing was present on the wipers. Aircraft increased in speed very rapidly and mach clacker sounded at 325 KTS during pull and recovery. Aircraft was returned to flight path and a slower airspeed used. Flight Attendants were not injured, felt like a hard level off. Maintenance was informed of problem and met the aircraft on jet bridge. Long and descriptive log book entry was completed by Captain. Mechanic was debriefed and after an hour, called the Captain with preliminary information. Two faults were found. An altitude discrepancy was found as a hard fault and a right ADIRU fault was indicated. His opinion was icing of the right pitot. Again heat was ON and no fault was indicated. Issues: Deviation from ATC clearance during pitch over and subsequent recovery. Aircraft exceeded VMMO during recovery by about 5 KTS.

Callback 1

The reporter described very clearly the sequence of events before and during the pitch over. He has a set pattern of actions at FL180 that include stating "29.92", setting the altimeter, engaging the number two autopilot, turning the landing lights off and checking the pressurization. The reporter typically hand flies the aircraft to FL180 in order to maintain flying proficiency. During this flight the aircraft was in VNAV SPD at 300 KTS. At FL190 the aircraft began a firm but not violent pitch over to five degrees nose down. The total altitude loss was 4,000'. Upon arrival at the next airport the crew talked with Maintenance about the event and put the detailed report in the maintenance log. The Mechanic found two faults listed on the E and E Compartment boxes but neither explained the aircraft's action. Both the crew and aircraft overnights. The aircraft was released for an on time departure the next morning. Days later the crew was told that it was determined that the crew did not set their altimeters within five seconds of each other and therefore the autopilot was attempting to resolve the discrepancy between them. The Reporter questioned this statement because he has never heard nor seen anything in writing which would verify that assertion. The flight conditions at the time were smooth although earlier in the climb the aircraft transited some rough air with icing. The reporter questioned if possibly ice had accumulated on the tail causing loss of tail airflow. The other ice related question he had was if the aircraft's pitot system was iced over by the earlier icing and just momentarily responded as the ice melted. The air data computer could also be called into question.

Synopsis

A B737-800 pilot reported a pitch over climbing to FL190 resulting in a 4,000' altitude loss. Maintenance reported an ADIRU fault with an altitude fault.

ACN: 879559

Time

Date: 201003

Local Time Of Day: 0601-1200

Place

Locale Reference.Airport: ZZZZ.Airport

State Reference: FO

Altitude.MSL.Single Value: 38000

Environment

Flight Conditions: VMC

Aircraft 1

ATC / Advisory.Center: ZZZZ

Make Model Name: B737-800

Component 1

Aircraft Component: Altitude Hold/Capture

Person 1

Function.Flight Crew: First Officer

Function.Flight Crew: Pilot Flying

ASRS Report Number: 879559

Person 2

Function.Flight Crew: Captain

Function.Flight Crew: Pilot Not Flying

ASRS Report Number: 879560

Events

Anomaly.Aircraft Equipment Problem: Critical

Anomaly.Deviation - Altitude: Excursion From Assigned Altitude

Anomaly.Deviation - Procedural: Clearance

Detector.Person: Flight Crew

Result.Flight Crew: FLC Overrode Automation

Result.Flight Crew: Returned To Clearance

Result.Flight Crew: Took Evasive Action

Result.Aircraft: Equipment Problem Dissipated

Narrative 1

Upon reaching initial cruise altitude, FL380, VNAV and autopilot B were engaged. The aircraft was in VNAV PTH for approximately 1 minute when it started an uncommanded descent in VNAV PTH. Several seconds later, VNAV disengaged and CWS P engaged. I disconnected the autopilot and manually flew the aircraft back to FL380 from FL375. Center called and asked if we had switched our altimeter to 29.92 since there was a 250 FT altitude difference. I explained the problem and stated that we were climbing back to FL380. Our gross weight was approximately 138,000 LBS. The optimum altitude on the ACT ECON CRZ page was FL380 and maximum was FL400 so we were unable to determine the reason for the uncommanded descent. There were no further problems with the VNAV during the flight.

Callback 1

The Reporter stated that the autopilot disconnect warning did not alert and the autopilot

remained engaged. It responded as if it were commanded to begin a descent and transition to CWP P. The FMC software version was U 10.6 the reporter believed to best of his recollection. He has been on this aircraft five years and not seen anything like it. The old FMC software, 10.8 was causing database issues and allowed dual FMC failures to occur and not permit resets. The anomaly reported here is not something that was seen when U 10.8 was installed.

Narrative 2

Shortly after level off at FL380, autopilot on, VNAV engaged and 38000 FT set in MCP altitude window, aircraft reduced power and began to descend. We stopped the descent after 250 FT and returned to assigned altitude.

Synopsis

A B737-800 crew reported that in level flight at FL380 with the autopilot in VNAV Path the aircraft began an uncommanded descent. The autopilot disconnected and transitioned to CWP P. The crew recovered with a 250' altitude loss.