ALERT BULLETIN

AB 2023:21/3-8
10/19/2023
2016500, 1965163, 1897131

TO: Boeing Commercial Airplane Company

INFO: FAA (AVP-1, AVP-200, AFS-200, AFS-900, AFS-260, AFS-100, AIR-720, AIR -780, AIR-360, SEA-AEG), A4A, ALPA, AMFA, ASAP, ATSG, CAPA, IAM, IBT, ICAO, ICASS, IFALPA, IPA, NTSB, PAMA, RAA, SWAPA, TWU

FROM: Becky L. Hooey, Director
NASA Aviation Safety Reporting System

SUBJ: B737 NG Auto Slat Fail Issue

We recently received ASRS reports describing a safety concern that 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 a B737 NG Captain describing an inflight issue involving annunciated failures AUTO SLAT FAIL and SPD LIM. Reporter stated the failures were initially intermittent but then became steady and moments later they "... experienced a very brief (less than two seconds) 'stick shaker', and very soon thereafter the Captain's PFD intermittently displayed brief over speed indications." The flight crew decided to divert to a suitable alternate airport.

ASRS has received other reports describing similar issues. Reports 1965163 and 1897131 are also enclosed.

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 Dr. Becky Hooey at (408) 541-2854 or email at becky.l.hooey@nasa.gov.

Aviation Safety Reporting System
P.O. Box 189 | Moffett Field, CA | 94035-0189

ACN 2016500	
DATE / TIME	
Date of Occurrence	202307
Local Time Of Day	1201 to 1800
PLACE	
Locale	ZZZ.ARTCC
State	US
Altitude - MSL	34000
ENVIRONMENT	
Flight Conditions	VMC
AIRCRAFT / EQUIPMENT X	
ATC / Advisory - Center	ZZZ
Make Model Name	B737 Undifferentiated or Other Model
Operating Under FAR Part	121
COMPONENT 1	
Aircraft Component	Leading Edge Flap
COMPONENT 2	
Aircraft Component	Air Data Computer
PERSON 1	
Function - Flight Crew	Captain
Function - Flight Crew	Pilot Not Flying
ASRS Report Number	2016500
EVENTS	
Anomaly	Aircraft Equipment Problem - Critical
Anomaly	ATC Issue - All Types
Detector - Automation	Aircraft Other Automation
Detector - Person	Flight Crew
Result - Flight Crew	Diverted
Result - Flight Crew	Landed in Emergency Condition
Result - Flight Crew	Requested ATC Assistance / Clarification
Result - Air Traffic Control	Provided Assistance

NARRATIVE 1

Just before taxiing onto the runway to depart ZZZZ, the AUTO SLAT FAIL light illuminated. We taxied back to an available apron area to contact Dispatch and Maintenance Control to work on the issue. After conferring with Maintenance Control we cycled the circuit breakers that Maintenance Control instructed us to cycle. This did not fix the problem. Upon further research Maintenance Control informed us that the issue could be deferred. A deferral [was] made and a new release was sent to the aircraft.

An uneventful takeoff and initial departure was made.

Just prior to level off, the SPD LIM indication in the Captain's PFD was noticed to illuminate occasionally but only for a brief period of a couple-of-seconds.

Level off at cruise altitude of 34,000 feet was uneventful. All other indications and instruments were working properly, including all primary and secondary airspeed instruments. As a precaution, we reviewed immediate action items, and follow on procedures of "AIRSPEED UNRELIABLE" checklist. At this time the only non-normal indications were a single channel AUTO SLAT FAIL light when the Master Caution recall was checked, and a very seldom intermittent SPD LIM flag only on the Captain's PFD. The First Officer was already the pilot flying so we continued with these flying positions.

Once we were over the X area, the SPD LIM light illuminated more often and for longer periods of time. It was more steady on, than off. Soon thereafter we experienced a very brief (less than two seconds) "stick shaker", and very soon thereafter the Captain's PFD intermittently displayed brief over speed indications. We again reviewed the Flight Manual and checklist for "Unreliable Airspeed." At this point all of the First Officer's instruments were normal, all airspeed indicators agreed.

We again contacted Dispatch and Maintenance Control and discussed the malfunction. No resolution or fix was offered by Maintenance Control so the flight crew conferred and decided to divert. After conferring with Dispatch and Maintenance Control on the best divert options, ZZZ1 chosen. As the flight continued to ZZZ1, all intermittent issues became more frequent.

An uneventful visual approach and landing was made on Runway XXL at ZZZ1, followed by taxi to an available gate. After maintenance made an initial assessment of the issues, it was decided by Customer Service, Maintenance, and Ramp to deplane the passengers and accommodate them all on a later flight to ZZZ.

The only frustrating issue during the entire event was the fact that multiple ATC agencies (multiple Center controls as well as Approach Control) did not pass on to each other that we had [priority handling] and were an "[priority handling] aircraft!" Center even tried to vector us north of ZZZ1 for "at least 4 minutes!"

I may not have initially checked onto the frequency as a [priority handling] aircraft, and not until I told Center that the vectors were unacceptable and that we were a [priority handling] did we receive priority handling. Center apologized and said they had not been informed. The same thing happened with Approach Control.

The only thing I would have changed in this scenario was to ensure I used the label [priority handling] to ensure priority each and every transmission to ATC.

SYNOPSIS

B737 NG Captain reported they received intermittent SPD LIM and AUTO SLAT FAIL warnings at cruise altitude. The warnings became steady and soon after the crew experienced a stick shaker and an over speed indication displayed on the Captain's side. The flight crew decided to divert to the nearest suitable airport.

ACN 1965163	
DATE / TIME	
Date of Occurrence	202301
Local Time Of Day	1801 to 2400
PLACE	
Locale	ZZZ.Airport
State	US
Altitude - MSL	20000
ENVIRONMENT	
Flight Conditions	VMC
AIRCRAFT / EQUIPMENT X	
Make Model Name	B737 Next Generation Undifferentiated
Operating Under FAR Part	121
COMPONENT 1	
Aircraft Component	Leading Edge Flap
COMPONENT 2	
Aircraft Component	Air Data Computer
PERSON 1	
Function - Flight Crew	Captain
Function - Flight Crew	Pilot Flying
ASRS Report Number	1965163
EVENTS	
Anomaly	Aircraft Equipment Problem - Critical
Anomaly	Deviation / Discrepancy - Procedural - Clearance
Anomaly	Deviation / Discrepancy - Procedural - Published Material / Policy
Anomaly	Deviation / Discrepancy - Procedural - Weight and Balance
Detector - Person	Flight Crew
Result - General	Flight Cancelled / Delayed
Result - General	Maintenance Action
Result - Flight Crew	Landed As Precaution
Result - Flight Crew	Overcame Equipment Problem
Result - Flight Crew	Requested ATC Assistance / Clarification
Result - Flight Crew	Returned To Departure Airport
Result - Flight Crew	Returned To Gate
Result - Air Traffic Control	Provided Assistance

NARRATIVE 1

We were dispatched in an aircraft with multiple MEL items like the Captain's side PTT (Press To Transmit) Inop, LOGO lights Inop, and several other cabin items. After the initial push back from the gate, the tow truck was disconnected and during the after engines start checklist flow, the Six Pack was pushed to test to discover that the Overhead AUTO SLAT FAIL Amber Light was ON. QRH was complied with, and it showed that one of the dual channeled systems had failed. We contacted Maintenance Control via DISPATCH to notify them of our

status. Maintenance Control recommended that we return to gate to have Maintenance Technicians trouble shoot which channel or system failed. We coordinated with Operations for a gate return. The AUTO SLAT FAIL failed system was deferred and MEL with the back up or secondary system operating normal.

So, we pushed back the second time, started both engines, ran all the appropriate checklists, Operations check normal. Now on the runway, cleared for takeoff, thrust applied, TOGA button pushed, I as the Pilot Flying (PF) crossed check as always my PFD indicated airspeed with the Standby Indicator's airspeed as the First Officer who was the Monitoring Pilot (PM) called out 100. Air Speeds checked correct all around. However, right at rotation, I lost the vertical guidance of the Flight Director but I continued the rotation and takeoff as I called out vertical guidance lost. As I continued the climbout passing through 10,000 ft. and hand flying, I confirmed several times to making sure the airspeeds and aircraft attitude information matches that of the standby instrument and the FO's (First Officer). Confirming that the FO's flight director is intact and correct. I transferred control of the aircraft to the First Officer with his Flight Director as the MASTER and B autopilot switched ON as I resumed communications albeit my fumbling with an inop PTT and hand mike and running of the checklists. Just then I noticed the amber SPD LIM indication on my PFD. All the while the airspeed indicators were all reading the same. SPD LIM QRH could not be found but I knew the common denominator of what failed had to do with airspeed like minimum speed reversion. With the situation at hand, it did not occur to me to run the memory items for airspeed disagree because all the indicated airspeeds agreed. Not long after passing through FL200, we started to get intermittent short bursts of left stick shaker with minimum speed limit indicator popping out but the airspeed matches the rest. So, I took out the QRH and ran the Airspeed Disagree checklist.

I decided in collaboration with the FO to return to ZZZ. Briefing was given to the Cabin Crew, Dispatch was notified, and priority handling was requested from ATC with a return to ZZZ. The FO did a very beautiful landing especially in an overweight status. We asked the fire truck to check our wheel wells including temperature checking our main wheels. The fire truck advised us that the temps are safe to continue taxi to the gate. For some reason I cannot recollect, I ran the Brakes Cooling Chart forgetting that it is for RTO only because I just wanted to make sure we are always in a safe operating mode.

We taxied safely back to the gate with the fire trucks right behind us. Engines shut down, all checklists complied with, Dispatch, Maintenance Control and Operations were contacted.

SYNOPSIS

B737 NG Captain reported a gate return for AUTO SLAT Fail. On takeoff, the Captain reported vertical guidance was lost along with unreliable air speed and the flight crew returned to land at departure airport.

ACN 1897131	
DATE / TIME	
Date of Occurrence	202204
Local Time Of Day	1801 to 2400
PLACE	
Locale	ZZZ.ARTCC
State	US
Altitude - MSL	33500
ENVIRONMENT	
Flight Conditions	VMC
AIRCRAFT / EQUIPMENT X	
ATC / Advisory - Center	ZZZ
Make Model Name	B737 Next Generation Undifferentiated
Operating Under FAR Part	121
COMPONENT 1	
Aircraft Component	Autoflight Yaw Damper
COMPONENT 2	
Aircraft Component	Indicating and Warning - Flight & Navigation Systems
PERSON 1	
Function - Flight Crew	Captain
Function - Flight Crew	Pilot Not Flying
ASRS Report Number	1897131
PERSON 2	
Function - Flight Crew	First Officer
Function - Flight Crew	Pilot Flying
ASRS Report Number	1897409
EVENTS	
Anomaly	Aircraft Equipment Problem - Critical
Anomaly	Deviation / Discrepancy - Procedural - Clearance
Anomaly	Deviation / Discrepancy - Procedural - Published Material / Policy
Detector - Automation	Aircraft Other Automation
Detector - Person	Flight Crew
Result - General	Flight Cancelled / Delayed
Result - General	Maintenance Action
Result - Flight Crew	Overcame Equipment Problem
Result - Flight Crew	Requested ATC Assistance / Clarification
Result - Flight Crew	Returned To Departure Airport
Result - Air Traffic Control	Provided Assistance
NARRATIVE 1	

On takeoff roll everything appeared to be working normally. CA's (PM) FD (Flight Director) pitch bar did not work from the beginning of climbout (simply was not there most of the time). Everything on FO's side seemed to be working normally and FO was PF (Pilot Flying). Also for about 95% of the flight the CA's speed tape had a

"SPD LIM" amber flag in the top left corner of the MFD (Multi-Function Flight Display). The CA's airspeed indicator closely matched the FO's and standby's airspeed the entire flight. During climbout we ran the Airspeed Unreadable checklist because we had SPD LIM failure flag on CA's side. We opted to not run the immediate action items because we determined that all airspeed indications on FO and standby were reliable and CA's airspeed exactly matched FO's side and the autopilot and autothrottles and FMS were all working normally.

At roughly FL335 the stick shaker went off only on the captain's control column for 1-2 seconds. This was an erroneous warning. The CA's red barber pole would fill the entire visible airspeed range shown on the MFD momentarily while the stick shaker on CA's side (this is what happens every time we had the stick shaker on CA's side activate). The instruments on the FO side worked normally at this time and for the entire flight. We asked for a level off at FL350 (we had been cleared to FL370 at a final altitude). We slowed to Mach.74 to give us more buffer between both stall and overspeed. We then asked for a decent to FL330 to give us even more buffer. The sticker shaker went off for 1-2 seconds roughly 6 times during our cruise phase. FO continued to be PF and we decided to keep the autopilot and auto throttles engaged while CA tried to communicate with company but that did not work. ATC tried several VHF and HF frequencies to help us talk to M/C (Maintenance Control). I was thinking we had plenty of gas and there was a small chance M/C could help me fix the problem. After finally communicating with M/C after a few minutes of trying to reach them with static and bad connections we had no way to fix the problem in the air so we requested priority handling and decided to return to ZZZ. Our only really concern was getting a stick shaker during the decent and approach but neither happened and the decent approach seemed perfectly normal other than CA's FD pitch bar was missing most of the decent and SPD LIM warning flag was there most of the time on only the CA's side.

Prior to decent we had a master caution during recall that indicated we also had an Auto Slat Fail. We ran the checklist and determined it was a single stall management/yaw damper computer that had failed. The decent and approach was uneventful other than CA's FD pitch bar was missing most of the decent and SPD LIM warning flag was there most of the time on only the CA's side. FO was the PF and we had vectors to a 10 mile final. We landed at normal landing weight with plenty of fuel to spare. Fire crash and rescue was ready but we did not need assistance. Overall, the plane flew completely normal and this was almost a non event. We never came even close to stalling or overspending. Every stick shaker activation was erroneous. The problem was that the stick shaker activating randomly on the CA control column was a nuisance and we decided the safer, more conservative, choice was to return to ZZZ1 which is a familiar field with no mountains and Company Maintenance. I was concerned that if the problem degraded or we experienced another malfunction we would be putting ourselves in a more difficult situation so I decided that returning to ZZZ1 was the appropriate action. We wrote an ELB reports for the appropriate discrepancies. We went to a new airplane in ZZZ1 and got our passengers to ZZZ2 3 hours and 50 minutes late.

NARRATIVE 2

On Takeoff as the pilot flying we departed using gusty takeoff procedures. On climb out due to busy ATC instructions and the work load of both pilots I put the autopilot on early at around 5,000-6,000 feet. Unknown to me the Captain then informed me that his flight director was not functioning correctly by not showing the horizontal bar. The FO's side flight director was functioning correctly. We continued our climb out at this point as there were no other adverse indications. We also noticed above the CA's speed tape, a SPD LIM amber flag appeared above the speed awareness tape on the left corner of the PFD (Primary Flight Display). At this point the CA started to trouble shoot the problem while I took the radios and continued flying. We noted that the FO's PFD and airspeed indications were functioning correctly and also the CA's airspeed matched the FO's. We

discussed returning to ZZZ at this point also, but the CA, after running the appropriate checklist wanted to check with Maintenance Control to determine if there was a fix that he was not seeing before diverting back to ZZZ. Passing through FL335 the stick shaker went off on the CA's control column for a couple of seconds. The FO's side did not get the shaker. Were then asked ATC to descend back down to FL330.

It was noted again that the airspeed on both sides was exactly the same through that event and the only reason the shaker went off on the CA's side was because of erroneous speed awareness tape with the red barber pole filling the entire airspeed range on the PFD momentarily, leading to the shaker. We again both noted that the actual airspeed on both sides was the same and the FO's side was completely normal and therefore, although distracting, a completely erroneous stick shaker. However, at this point, we made the decision to divert back to ZZZ. The stick shaker went off erroneously maybe 5-6 times on the CA's side during this time. The CA during this time was also trying to get a hold of M/C but without effective communications. We then turned back towards ZZZ and request priority. We asked to be cleared direct to ZZZ and to set up for about a 15 mile final for Runway XR. The rest of the flight was uneventful. After swapping aircraft we continued onto Honduras a few hours later.

SYNOPSIS

B737 flight crew reported a SPD LIM flap on The Captain's PFD in flight. The stick shaker on the Captain's control yoke began to activate repeatedly for 1 to 2 seconds at a time. The flight crew elected to perform an air turn back and precautionary landing at departure airport.