ALERT BULLETIN

AB 2020:19/3-6
6/12/2020
1712954

TO: Embraer-Empressa Brasileira Aeronautic S/A

INFO: FAA (AVP-1, AVP-200, AFS-200, AFS-280, AFS-100, MKC-AEG, AFS-800, AFS -900), A4A, ALPA, ASAP, ATSG, CAPA, IAM, IBT, ICASS, IFALPA, IPA, NBAA, NTSB, PAMA, RAA, TWU

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

SUBJ: EMB-175 Aileron Anomalies

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 reports from an EMB-175 flight crew describing an inflight aileron anomaly. The flight crew reported they were advised that Maintenance had looked into an aileron write-up and could find nothing wrong. The crew reported the ailerons felt normal on the ground during pre-takeoff testing, but exhibited unusual stiffness in flight.

ASRS previously issued an alert on an EMB-175 flight control anomaly (2018-61/3 -6) and that report is attached.

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: 1712954

Time
Date: 201912

Place
Locale Reference.Airport: ZZZ.Airport
State Reference: US

Environment

Aircraft 1
ATC / Advisory.Tower: ZZZ
Make Model Name: EMB ERJ 170/175 ER/LR

Component 1
Aircraft Component: Aileron

Person 1
Function.Flight Crew: Pilot Not Flying
Function.Flight Crew: First Officer
ASRS Report Number: 1712954

Person 2
Function.Flight Crew: Pilot Flying
Function.Flight Crew: Captain
ASRS Report Number: 1712955

Events
Anomaly.Aircraft Equipment Problem: Less Severe
Anomaly.Deviation - Procedural: Published Material / Policy
Detector.Person: Flight Crew
Result.Flight Crew: Overcame Equipment Problem

Narrative 1
We arrived to the airplane in ZZZ at around XA:00 A.M. Maintenance was on board the aircraft. They informed us that the previous crew that flew the airplane in had stiffness with their aileron control and the feel was not what they were used to feeling. Maintenance was basically done with their procedures, so the Captain asked to do a check on the flight controls ourselves. The Captain and I went into the flight deck and tested the flight controls. There were no issues that the Captain [nor] I observed. Maintenance finished up and said everything was good on their end, and since everything felt good on our end, we accepted the aircraft for operation. Departing out of ZZZ Runway XX on the ZZZZZ climb, we made a left turn per our departure procedure. The Captain was the pilot flying. He stated that the previous crew was right, the ailerons do feel stiff. It wasn't until after we had aerodynamic loading on the aircraft that we felt the stiffness. He handed me the flight controls for a few seconds, so I could feel it. You had to put a pretty good amount of force to go from wings level to enter a turn. At no time was the plane uncontrollable, let alone did we feel the operational control of the aircraft was unsafe, but the ailerons were definitely stiff. This report is not for me to explain that we did something wrong, but merely to document multiple crews saying the same thing, and Maintenance saying the aircraft is good to return to service. If something like this were to happen again, the best thing for me to do is trust the previous crew, and refuse the aircraft until a more thorough check has been done, like a flight test.

Narrative 2

We arrived at the aircraft about an hour prior to scheduled departure to find Maintenance onboard. I entered the flight deck to ask the Maintenance Technician what the problem was. He explained to me that the previous crew had refused the airplane citing aileron stiffness. He then told me they had checked extensively and could find nothing wrong. I asked if I could sit in the seat and try the flight controls. I asked the FO to try as well, and we were all in agreement that there was nothing apparent wrong with the ailerons. I felt no binding, had full authority and travel, and the control column centered up without any difficulty. As such, we accepted the plane for service.

Upon departure, flying the ZZZZZ climb Runway XX, I immediately noticed stiffness once the controls were under aerodynamic loading. Out of about 10,000 feet I gave flight controls to the FO to see what he thought. We were both in agreement that while we were not having control difficulties, the aileron characteristics of the aircraft were definitely not what either of us were accustomed to. It seemed to take a little more force than normal to get the same input. We evaluated the nature of the discrepancy and saw no reason why we could not safely continue.

Upon arrival in ZZZ1, I contacted Maintenance Control and documented for a second time the aileron stiffness, and strongly recommended they look further into the matter. I also notified the outbound crew that the aircraft definitely needed to be inspected more closely. I have over 4,000 hours of flight experience on the E-170/175. It is normally a very responsive airplane and demands little effort from the pilot to enact a change of flight path and attitude. I am writing this report not because I feel we made an unsafe decision. All we can do as flight crew is trust our maintenance processes, take the information we are given, and make our decision to accept or reject an aircraft based off of that information. What makes this report important is the insidious nature of the event, given that the problem was not able to be noticed on the ground, but rather immediately in flight. My immediate safety recommendation is that going forward any squawks about flight control abnormalities be treated with more attention, removing the aircraft from service and flight testing it to catch what may not be visible on the ground.

Synopsis

EMB-175 flight crew reported that during pre-flight, Maintenance informed them the inbound crew had written up a stiff aileron issue, but had tested OK on the ground. Flight crew decided to take the aircraft and experienced aileron stiffness while turning on departure, but elected to continue to destination.

Previous Alert(s)

4/4/2018 **FOR YOUR INFORMATION** 2018-61/3-6

1508078

To: Embraer-Empressa Brasileira Aeronautic S/A

Info: FAA (AVP-1, AVP-200, AFS-200, AFS-280, AFS-100, MKC-AEG, AFS-800, AFS-900), A4A, ALPA, ASAP, ATSG, CAPA, IAM, IBT, ICASS, IFALPA, IPA, NBAA, NTSB, PAMA, RAA, TWU

From: Becky L. Hooey, Director (Acting)
NASA Aviation Safety Reporting System

Re: EMB-175 Jammed Ailerons

We recently received an ASRS report 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 enclosed deidentified report.

ASRS received reports from an EMB-175 flight crew describing an inflight aileron anomaly. Reporter stated that during descent when the aircraft made a right turn the yoke stuttered and then made a snapping noise. The anomaly was repeated any time the ailerons were used in a turn in either direction. Reporter stated the ailerons appeared to respond normally at slower speeds in the final stages of the approach.

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 Dennis Doyle at (408) 541-2831 or email at dennis.j.doyle@nasa.gov

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

ACN: 1508078

Time
Date: 201801
Local Time Of Day: 1201-1800

Place
Locale Reference.Airport: ZZZ.Airport
State Reference: US
Altitude.MSL.Single Value: 25000

Environment

Aircraft 1
ATC / Advisory.Center: ZZZ
Make Model Name: EMB ERJ 170/175 ER/LR

Component 1
Aircraft Component: Aileron Control System

Person 1
Function.Flight Crew: Pilot Not Flying
Function.Flight Crew: Captain
ASRS Report Number: 1508078

Person 2
Function.Flight Crew: Pilot Flying
Function.Flight Crew: First Officer
ASRS Report Number: 1508490

Events
Anomaly.Aircraft Equipment Problem: Critical
Detector.Person: Flight Crew
Result.General: Maintenance Action
Result.Flight Crew: Overcame Equipment Problem

Narrative 1

Dual partially jammed control columns. Not sure what caused this event, Maintenance is currently still working on the aircraft.

During descent, FO flying, passing through the mid FL200s, I noticed as the plane made a right turn that yoke was stuttering, then made a snap noise, then turned right, as the plane rolled back to wings level the same happened in opposite direction. I watched this happen within a couple seconds again and we agreed something wasn't right. I took the controls, turned off the autopilot, and tried a turn and had the same thing happen. The yoke would stop which ever direction I tried to turn. I asked the FO to see if he had smooth controls and he had the same results. I retook the controls and quickly realized if enough pressure was applied we could snap past the jam (not very desirable, to get past the jam took good pressure and once past, the plane would snap into a turn). At this point I gave the controls back to the FO. Took a look through the QRH to see if maybe there was something in there. We [advised ATC], notified Dispatch via ACARS and landing at the [scheduled destination]. I informed the flight attendants of the situation and to prepare for an emergency landing. We asked center for a heading that would give us a straight line to [destination] to avoid turns. I then contacted Maintenance over the radio to see if they maybe had an idea of what we could do to resolve this, they could not

come up with a solution either.

When we got to [destination] we asked for an extended downwind, so we could assess the situation at slower speeds. At this point we were doing 250 kts and still had the same control problems, and any turn jerked the plane. Slowing down on the downwind somewhere between 220 and 230 we tried the controls again and the jam was not there (was still there when we turned downwind, roughly at 240 250 kts). Since the jam was not present at this time, we asked to turn in for the airport and landed safely, turned off the runway, CFR inspected the plane and cleared us to continue to the gate, and they would follow us. Called ramp for our gate and they turned us away. Called ops to tell them we needed a gate, and were told 30 minutes. I informed ops we had the fire department waiting behind us and needed a gate (got no response). 5 minutes later we received a new gate.

If the jam would have remained, landing would have been interesting, as to keep wings level, we would have had to snap the yoke past the jam, which would have put the wing well into a bank causing it to strike the ground. The FO and flight attendants did an excellent job of remaining calm and continuing to do their jobs.

Callback 1
Reporter stated he checked back with Maintenance and the aircraft is still grounded while troubleshooting continues.

Narrative 2
During our initial descent from FL360 to FL240, the CA (PM) noticed that his yoke was reacting strangely during course change with the AP engaged. During a turn to the left and right the yoke would turn to a certain point then abruptly snap beyond the initial point. The CA requested the controls and made several small turns to the left and right and the yoke seem to get stuck at a point then required more abrupt force in the direction of the turn to get pass the point of friction. The CA then instructed the FO (PF) to try several turns in both directions and the same thing occurred. The CA then checked the QRH for an emergency procedure and after not finding one discussed with the FO his concerns and developed a course of action that included declaring an emergency via ATC, dispatch, and contacting [Maintenance] via ACARS. While slowing down through 230 kts, the crew noticed that the sticking was not present. The crew requested and received an extended downwind then vectors to the final approach and landed without further incident. Upon landing the aircraft was met by CFR vehicles, inspected, and escorted to the gate after an initial delay due to the original inbound gate being occupied.

Determine the cause of the sticking controls and develop a maintenance procedure to prevent future occurrences and develop procedures for flight crews if similar incidents occur in flight.

Synopsis
EMB-175 flight crew reported partially jammed ailerons on descent. The anomaly cleared itself for unknown reasons during final stages of approach.