

# Anti-stall feature in new Boeing planes may have contributed to Indonesian aviation disaster

By Oscar Grenfell  
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Last week, three US pilots unions, aviation experts and a number of airlines, including Indonesia's Lion Air, stated that a feature of Boeing's new 737 Max 8 aircraft may have contributed to a plane crash in the Java Sea on October 29 which killed 189 people. They have claimed that an automated system not present in previous Boeing models or mentioned in any of the company's safety manuals may have triggered a catastrophic nosedive.

The Lion Air plane lost contact with air traffic control around 13 minutes after departing from Java for a routine commercial trip to Pangkal Pinang, the capital of the Bangka Belitung Islands province. Eyewitnesses reported that the plane plunged at an almost vertical angle into the Java Sea. There were no survivors.

While the report from an initial investigation by Indonesia's National Transportation Safety Committee (NTSC) has yet to be released, statements by the country's aviation officials have made clear that the plane had experienced mechanical issues during its previous four flights, with key pieces of equipment reportedly feeding false data to the cockpit.

Allegations aired last week, however, have indicated that the safety issue may be far broader than the ill-fated Lion Air Flight, potentially affecting the entire fleet of 737 Max 8 aircraft. There are currently 246 of the new model in operation around the world, while airlines in Australia, the US, Europe and internationally have orders for another 4,542 of the aircraft.

It has emerged that the 737 Max 8 model contains an automated mechanism, known as the Maneuvering Characteristics Augmentation System, aimed at preventing it from stalling. If flight data indicates that there is an imminent risk of stalling, this mechanism

sometimes forces down the plane's nose without any action on the part of the pilots.

The mechanism is directed against a common cause of stalling incidents, which is a plane's nose being pitched higher than it should be for the speed that it is travelling. The ability of such a mechanism to work effectively, however, is dependent on it being supplied accurate information by a complex network of sensors.

According to statements by the NTSC on November 5, the Lion Air plane's Angle of Attack (AOA) sensors had repeatedly provided inaccurate information in the flights preceding the crash. AOA sensors feed information about the angle of wind passing over the wings of a plane, and how much lift it is getting.

Black box data indicated that on the last flight before the disaster, the right and left AOA sensors had given indications that diverged by about 20 degrees from one another. This resulted in a sudden nosedive, which the pilots were able to correct. After that flight, and before the crash, the plane's AOA sensors were replaced.

The plane, however, had also experienced issues with its airspeed indicators. According to some aviation experts, this could have indicated a broader problem with the air data reference system, a key component which provides data from indicators for temperature, AOA, airspeed and altitude to the pilots' electronic flight instrument system. If data falsely indicated that the plane's nose was pitching up, it could have activated the anti-stall mechanism, triggering the catastrophic nosedive that led to the crash.

Most explosively, pilot unions, airlines and aviation experts have indicated there was no information about the model's "auto-dive" in any of the handbooks or safety guidelines provided to pilots by Boeing.

On November 13, Jon Weeks, president of the Southwest Airlines Pilots Association in the US, told the *Wall Street Journal*: “We did not know this was on the [Boeing 737] MAX models.”

Weeks disputed claims that a safety bulletin issued by Boeing on November 8, in the wake of the crash, had merely reminded pilots of existing safety procedures. He said the bulletin’s reference to the anti-stalling mechanism was the first in any material from Boeing. Pilots were previously unaware of the means to disable the mechanism.

Dennis Tager, communications committee chairman at the Allied Pilots Association, stated: “This was clearly a sign that the safety culture [at Boeing] was missing on a cylinder or two. We’re all on the same side looking at Boeing, saying, ‘What else you got?’”

On November 15, the Air Line Pilots Association, which represents United Continental Holdings Inc.’s flight crews, issued an open letter to the US Federal Aviation Administration, warning that it was “concerned that a potential, significant aviation system safety deficiency exists.”

The letter stated: “There appears to be a significant information gap, and we want to ensure that pilots operating these aircraft have all of the information they need to do so safely.”

Southwest, American Airlines and Lion Air all confirmed that the anti-stall mechanism was not included in any operating manual or safety guidelines for the Boeing 737 Max aircraft. Because the aircraft was presented as merely an improved version of previous 737 models, with few new features, pilots were provided with just three hours of computer-based training and a familiarisation flight before being certified.

The family of Doctor Rio Nanda Pratama, one of the victims of the Lion Air disaster, has responded to the revelations by filing a lawsuit alleging that Boeing is culpable because “it failed to inform its customers and pilots” of the new anti-stall mechanism.

The lawsuit has also claimed that under certain conditions, the auto-dive feature “can push the nose down unexpectedly and so strongly that the pilot cannot pull it back up in time to avoid a crash.”

Boeing has rejected claims that not enough information was provided to pilots, or that there are any potential safety issues with the new model.

Boeing is one of the largest aircraft manufacturers in the world and the biggest US exporter by dollar value. It had a net income of over \$8 billion in 2017.

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