

# Boeing 737 MAX flight controls

A European document shows aviation regulators were aware that certain flight conditions similar to those experienced in recent crashes could require pilots to manipulate a rarely used wheel in the aircraft's centre console to better control the nose position rather than the usual electronic thumb switch on the control yoke.

## STRUGGLE FOR CONTROL

Information retrieved from the flight data recorder of Lion Air Flight JT610 that crashed into the sea in October last year, showed the "stick shaker" was vibrating the captain's controls, warning of a stall throughout most of the 13 minutes aloft based on what investigators believe to have been erroneous data on its **angle of attack** to the oncoming air.

The airplane's **anti-stall system** repeatedly pushed its nose down, which is how pilots usually get air under the wings. The system reacted based on incorrect sensor reading, prompting an eight-minute battle between the captain pulling the nose back up and computers holding it down.



## ANGLE-OF-ATTACK (AOA) SENSOR

Acts like a windvane, measuring the direction of air to determine the aircraft's angle-of-attack.



## WHAT THE ANTI-STALL SYSTEM PREVENTS

The angle of attack (AOA) is a key flight parameter that must remain narrow enough to preserve lift and avoid a stall.

### Low AOA



For a wing to produce lift, the air flowing past an aircraft must be aligned to the airfoil in order to provide a smooth airflow. Lift overcomes the weight of the aircraft.

### High AOA



As a wing increases its angle of attack, smooth airflow over the wing diminishes and eddies of air form, decreasing lift and causing the wing to approach stall speed.

### Stalling AOA



When a wing stalls, lift will no longer be produced. As the aircraft's weight is unopposed, it will fall towards the ground. But with sufficient altitude, stall recovery is possible by decreasing the AOA.

# B737 Technical Guide

**A Gutmann**



## **B737 Technical Guide:**

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