The Max

Features and function

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Prepared by — John Bayley
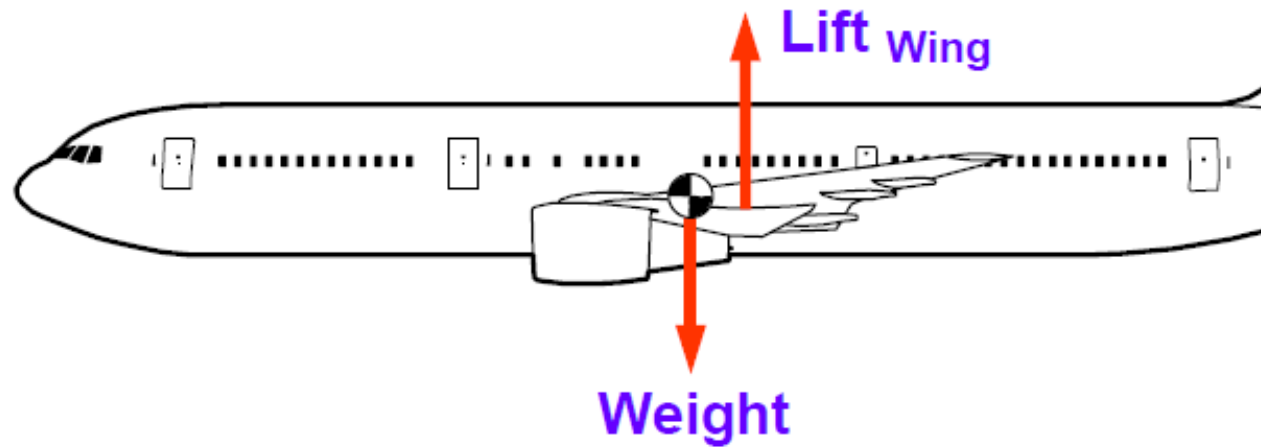Date — 20 February 2020

What is the 737

- Boeing 737 variant.

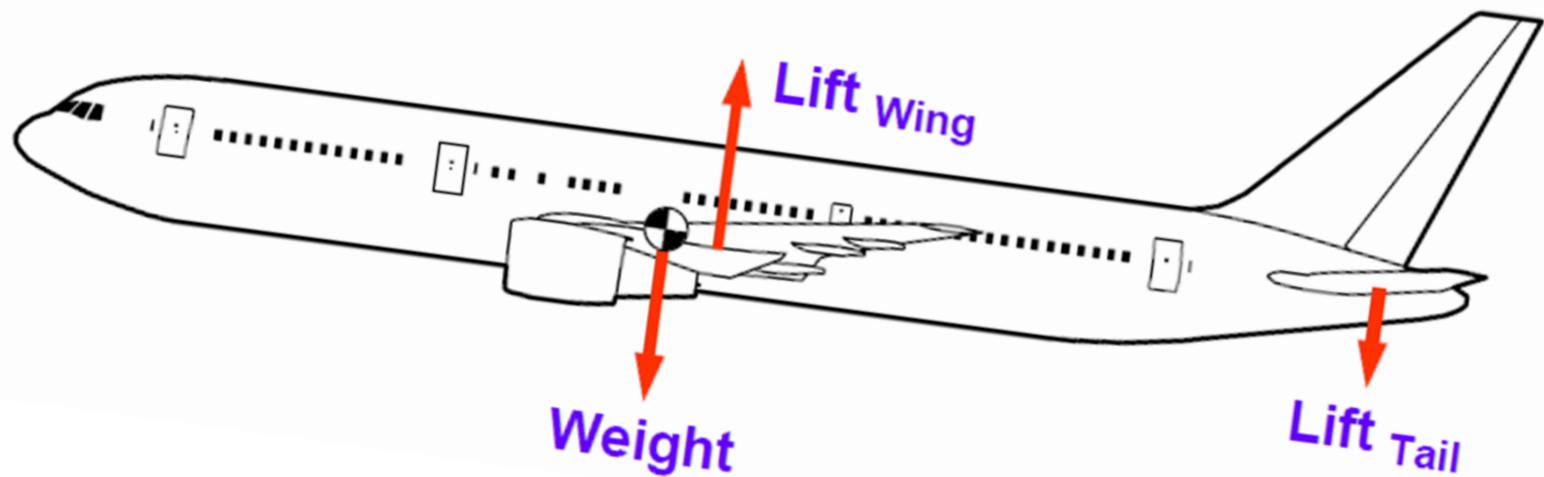- Engines under the wing

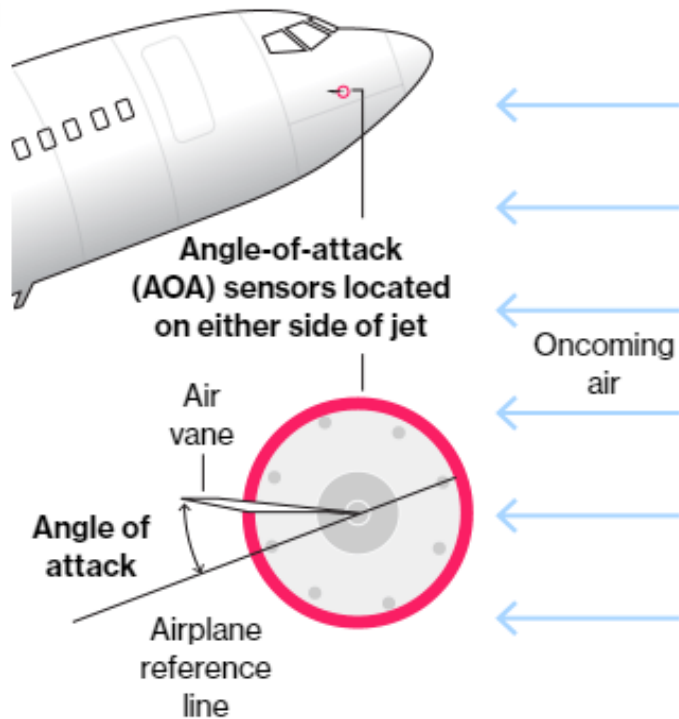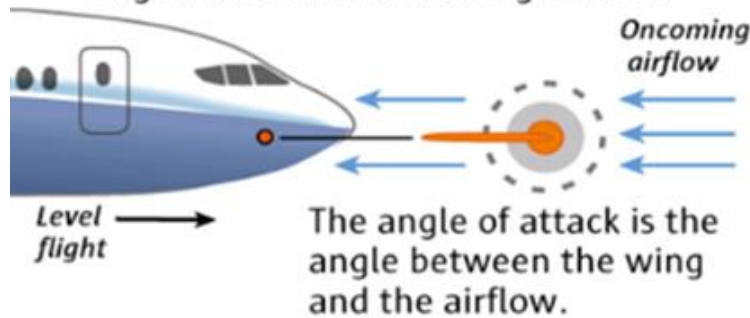# The Max developed

Pitch control

Pitch control

MCAS

- Maneuvering Characteristics Augmentation System

How it works

1. The angle-of-attack sensor
aligns itself with oncoming airflow.

Oncoming airflow

Level flight

The angle of attack is the angle between the wing and the airflow.

2. Data from the sensor
is sent to the flight computer.

Nose-up flight

If the angle rises too high, suggesting an approaching stall ...
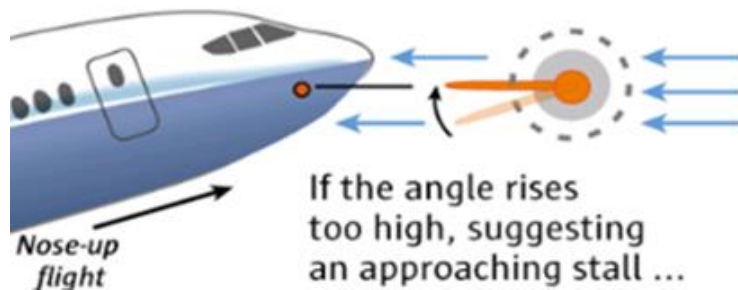
... the **MCAS** activates.

3. MCAS automatically swivels the **horizontal tail** to lift the plane's tail while moving the nose down.

Nose down

Horizontal tail

In the Lion Air crash, the angle-of-attack sensor fed false information to the flight computer.

Sources: Boeing, FAA, Indonesia National Transportation Safety Committee, Leeham.net, and The Air Current

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The sensor

- MCAS relied on data from a single angle of attack sensor
- The aircraft has two of them
- A Sensor failure causes a false input to MCAS

- Back up systems
- Power loss
- Direct law
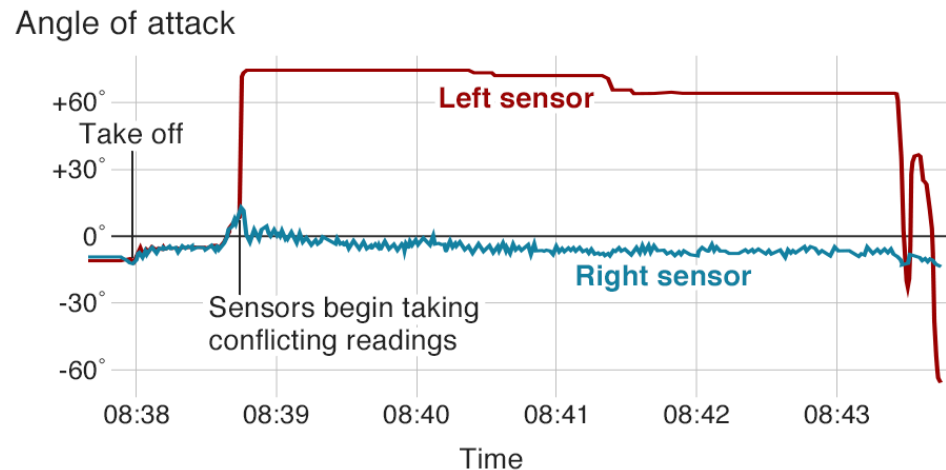
Source: Ethiopian Aircraft Accident Investigation Bureau

Certification

- Type certificate – Boeing 737

- Crew training
- MCAS training

Manufacturer / Regulator

- Who knows best

- What do they know

- Who monitors

- Is the relationship too comfortable

McLarens
AVIATION

The Max

Any Questions?

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