

# As Boeing turbulence persists: A look at past crashes and safety issues involving the plane maker

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The Boeing logo is seen, Jan. 25, 2011, on the property in El Segundo, Calif. The American plane maker has been under intense pressure since early January, when a panel blew off a brand-new Alaska Airlines 737 Max midflight. That's spotlighted a lengthy series of safety and manufacturing problems that have piled up for Boeing over the years — including two devastating crashes that also involved Max jets. On Monday, March 25, 2024 Boeing announced that CEO David Calhoun would be stepping down from his post at the end of the year as part of broader management changes. Credit: AP Photo/Reed Saxon, File

Boeing keeps hitting more and more turbulence.

The American plane maker has been under intense pressure since early January, when a panel blew off a brand-new Alaska Airlines 737 Max midflight. That's spotlighted a lengthy [series of safety and manufacturing problems](#) that have piled up for Boeing over the years—including two devastating crashes that also involved Max jets.

Leadership shakeups have arrived amid this turmoil, too. On Monday, Boeing announced that CEO David Calhoun would be stepping down from his post at the end of the year as part of broader management changes.

"The eyes of the world are on us," Calhoun wrote to a note to employees, adding that the decision to leave was his and that he believed Boeing "will come through this moment a better company." Calhoun became CEO in 2020, after his predecessor was fired following the deadly 2018 and 2019 Max crashes.

Beyond newer Max jets, Boeing been in the news for mishaps arising from some its older models, including a Delta Air Lines-operated 757 jet [losing a nose wheel](#) during takeoff in January and a post-flight inspection that revealed a missing panel on a 737-800 flown by United Airlines earlier this month. Those incidents spotlight issues with the planes' maintenance, for which the airlines are responsible.

Here's a look at some of Arlington, Virginia-based Boeing's recent woes.

## THE CRASHES

The bulk of criticism and investigations swirling around Boeing today center on the company's Max jets. There are two versions of the aircraft in service: the Max 8 and the Max 9, which is the larger of the two.

Boeing began working on the Max in 2011 as an answer to a new, more fuel-efficient model from European rival Airbus. The company billed it as an updated 737 that wouldn't require much in the way of additional pilot training—a key selling point for what has become Boeing's best-selling airplane.

But the Max did include significant changes, some of which Boeing downplayed—most notably, the addition of an automated flight-control system designed to help account for the plane's larger engines. Boeing didn't mention the system, called MCAS, in airplane manuals, and most pilots didn't know about it.

That system was implicated in two crashes that killed 346 people. The first occurred when a Max 8 operated by Indonesia's Lion Air plunged into the Java Sea in October 2018—and the second in March 2019, when a Ethiopian Airlines 737 Max 8 crashed nearly straight down into a field six minutes after takeoff from Addis Ababa.

Boeing agreed to pay \$2.5 billion to settle a Justice Department investigation, admitting that employees misled regulators about the safety of the 737 Max. The amount included a \$500 million fund for victims' families, though lawsuits continue.

All Max jets were grounded worldwide for nearly two years while the company made changes to the flight-control system. Investigations revealed what a congressional panel called a "horrific culmination" of failed government oversight, [design flaws](#) and inaction at Boeing.

## **MORE MAX TROUBLES**

January's mid-air blowout on an Alaska Airlines flight over Oregon also involved a Max jet, which is still under multiple federal probes, including a criminal investigation from the FBI. Regulators say bolts that

help keep the door-plug panel in place were [missing after repair work](#) on the aircraft at a Boeing factory.

The Max suffered a series of production issues leading up to that incident. Just weeks prior, Boeing asked airlines to check the jets for [a potential loose bolt](#) in the rudder control system after an international operator found a bolt with a missing nut during routine maintenance. In a separate case, Boeing found that an undelivered aircraft had a nut that was not properly tightened.

The FAA also recently told pilots to [limit use](#) of an anti-ice system on the Max because the inlets around the engines could overheat and break away. Boeing in December asked the agency [for a safety waiver](#) while it develops a long-term fix. The company needs the exemption to begin delivering its new, smaller Max 7 to customers.

Last year, Boeing reported a problem with fittings on Max jets where the fuselage meets the vertical section of the tail. Boeing said its Wichita, Kansas-based supplier, Spirit AeroSystems, used a "non-standard manufacturing process" on some of the planes.

Boeing and Spirit also said they discovered improperly drilled fastener holes in the aft pressure bulkhead, which maintains pressure when planes are at cruising altitude, on the fuselages of some models of the 737 Max. Boeing said the flaws could delay the deliveries of some new jets but did not pose an immediate hazard in those already flying.

## **ENGINE FIRES AND FLAT TIRES**

Federal safety officials are still investigating an engine fire that was discovered on a United Airlines Boeing 737 Max after the plane landed in Newark, New Jersey, last June. The flight crew noticed a fire warning indication as the plane taxied in, shut down the engine and discharged a

fire suppressant. There was no visible smoke or fire, but maintenance crews found a fuel leak as well as soot and heat damage.

Also under investigation is what prompted the emergency landing in Wichita, Kansas, of a Denver-bound United Airlines flight in December. Passengers reported hearing a rumbling and an engine fire was discovered after it landed. No one was injured.

In 2021, a Boeing 777's right engine fan blade broke off shortly after takeoff from Denver with 239 people onboard. No one was injured. The National Transportation Safety Board [blamed inadequate inspection](#) of the fan blades as well as the "insufficient frequency" of the manufacturer's recommendation for inspections.

Earlier this month, a landing-gear tire fell off a United Airlines Boeing 777 leaving San Francisco, and an American Airlines 777 made an emergency landing in Los Angeles with a flat tire.

## PREVIOUS CABIN HOLES

In 2018, a woman died when a piece of engine housing ripped off a Southwest Airlines-operated Boeing 737 and shattered the window she was sitting next to. She was partially sucked out of the plane as it lost cabin pressure before other passengers pulled her back in—an example of the sort of tragedy that was avoided during January's incident over Oregon.

On a separate Southwest-operated flight back in 2011, passengers heard an explosion as a chunk of the plane's roof opened at nearly 35,000 feet (10,700 meters).

The plane made an [emergency landing](#) and no one was seriously hurt, though two people passed out from a lack of oxygen: a flight attendant

who fell and broke his nose, and a passenger who tried to help him.

The NTSB blamed "[extremely poor manufacturing technique](#)," saying many of the rivet holes on the plane's exterior skin had been badly drilled.

## 787 ISSUES

Boeing's two-aisle 787 has also been plagued by manufacturing problems that have sporadically held up deliveries.

In June, the company said it was inspecting fittings on part of the tail called the horizontal stabilizer "for a nonconforming condition."

Most recently, 787 deliveries were halted last year while federal regulators looked over documentation of work that was done on new planes.

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