WHY AIRPLANE WINGS ANGLE BACKWARDS, EXPLAINED IN 4 MINUTES

News / Airlines

In the 1940s, most planes had straight wings. Even the Bell X-1 that broke the sound barrier for the first time had straight wings. But a straight-winged aircraft can run into major stability issues when it gets flying at transonic speeds.

In 1941, a Lockheed test pilot named Ralph Virden lost control of his P-38 Lightning in a dive and died in a crash. This prompted an engineer named John Stack to study airflow in a high speed wind tunnel using a special kind of photography.

As explained in the video above, air traveling over the top of a wing accelerates, generating lift. But Stack discovered that this acceleration could mean that an aircraft traveling *slower* than the speed of sound can generate pockets of airflow that are moving *faster* than the speed of sound on its wings, creating shockwaves. The shockwaves reduce lift and increase drag, which is what caused Virden to lose control of his P-38.

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In 1951, the Bell X-5 was developed—a plane that can change the angle of its wings mid-flight, making it perfect for studying the advantages of angled wings. The X-5 was modeled after a German prototype that was captured at the end of World War II.

By angling the wings of an aircraft toward the rear of the plane, the airflow over the top of the wing is reduced. The plane can then fly faster without generating shockwaves on the wings, giving us the commercial transonic flight that we complain about today.

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