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Starship test flight

Starship 8 experienced a catastrophic failure during its test flight on March 6, with the rocket exploding just eight minutes after launch. For the second time in 2025, SpaceX has faced an explosion on one of its test flights, following previous incidents in April 2023 and January 2025. The FAA has confirmed that SpaceX will conduct a thorough investigation into the cause of the failure, which led to a loss of communications with the upper-stage vehicle. In a statement, SpaceX acknowledged that an "energetic event" occurred during the ascent burn, resulting in the loss of several engines and ultimately leading to the explosion. Despite the setback, SpaceX remains committed to improving its Starship technology and is expected to continue with launch preparations before the end of the year. SpaceX has successfully launched its ninth test flight, with the eighth one taking place in January 2025. The space company has been working on its Starship megarocket, which is designed to help humanity settle Mars. The Starship has undergone several test flights since May 2021, with some successful and others not. The latest test flight was the seventh, which took place in November 2024. According to Elon Musk, the CEO of SpaceX, there will be another test flight next week if everything goes according to plan. Musk also plans to give a company talk about the Mars game plan at Starbase, Texas, which will be live-streamed on X. The Starship is being developed to help humanity settle Mars and has undergone several long-duration static fire tests ahead of its upcoming test flights. The exact date for SpaceX's upcoming test flight of its Starship vehicle has not been confirmed, with May 21 currently being considered the target date pending approval from the US Federal Aviation Administration (FAA). The FAA is reviewing the investigation into the failed Flight 8 mission, which saw the vehicle's upper stage explode just over 10 minutes after liftoff. Despite this, SpaceX remains confident that all necessary approvals will be granted by next week. Updated Starship Launch License Includes Provisions for Orbital Flights, Revised Pre-Flight Operations and Reentry Activities. In space, the Starship will be powered by three RVacs and three Raptor engines. Its dimensions are 2.3 meters or 7.5 feet in height and 4.6 meters or 15.1 feet in length. It has a thrust of 258 tons-force per square inch or 568 kilopounds-force per square inch. SpaceX's latest test flight marked a major milestone in its Starship program, with the spacecraft successfully conducting a belly flop maneuver before making a controlled splashdown in the ocean. The mission also showcased the Super Heavy rocket booster's ability to return to the launchpad after launching the Starship. While SpaceX did not intend to recover the vehicle this time around, the test will aid future plans to land the Starship back on dry land. SpaceX founder Elon Musk expressed his gratitude towards NASA administrator Bill Nelson for their collaboration on the Artemis program, which aims to return humans to the Moon by 2026. The Polaris program, led by Jared Isaacman, is also working closely with SpaceX to develop a crewed mission using the Starship rocket. NASA's Artemis program has selected the Starship as its primary vehicle for carrying astronauts on the final leg of their trip to the lunar surface during the Artemis III mission. Today's test flight demonstrated significant improvements in the spacecraft's descent and landing capabilities, which is crucial for future missions to the Moon. The Super Heavy rocket booster successfully fired up its 33 engines and detached from the Starship before steering itself back to the launch site. The Starship then continued soaring into space, firing up its own six engines and enduring extreme temperatures and friction during re-entry. After re-entering Earth's atmosphere, the Starship performed a belly flop maneuver, plummeting towards the ground horizontally before using its onboard engines to swoop back to a vertical orientation. The vehicle made a controlled splashdown in the ocean, marking a major success for SpaceX's Starship program. The Starship spacecraft successfully completed its maneuver, with CEO Elon Musk likening it to a skydiver's bellyflop. The ship will free fall horizontally before relighting its engines and making a sharp turn back into vertical orientation just seconds before touchdown. According to Kate Tice, the vehicle has hit another "Max Q," a critical point in flight where dynamic pressure is at its peak. Max Q marks the moment when the atmosphere's density causes the highest strain on the spacecraft. The Starship is transmitting live views of its journey, thanks to the Starlink constellation of internet-beaming satellites. Engineers say this technology may enable real-time communication with the ship even during reentry, a critical phase where communications blackouts can occur due to plasma buildup on the exterior. By avoiding these downtime periods, Starlink could be a game-changer for future Starship flights and potentially other spacecraft. As the Starship reenters Earth's atmosphere, it will face extreme pressures and friction, generating temperatures as high as 2,600 degrees Fahrenheit. This heat can alter the state of matter around the vehicle, creating a thin layer of plasma that glows hot pink on livestreams. Currently, the vessel is coasting at approximately 26,200 kilometers per hour and isn't technically in orbit due to its trajectory. Instead, it's using gravity to lower its altitude, allowing for a controlled reentry. This nail-biting phase will put massive strain on the vehicle as it heats up. The Super Heavy booster has returned to Earth, but the Starship spacecraft remains in space, traveling at near-orbital speeds and on a fairly horizontal trajectory. Reentry expected at T+48 minutes, Starship to guide itself to controlled landing over Indian Ocean Starship will now use its engines to attempt to guide itself to a controlled landing over the Indian Ocean, a practice for future test flights when SpaceX will attempt to return the spacecraft back to dry land. The Super Heavy booster is now back at its launchpad, suspended mid-air between two massive metal arms — called “chopsticks.” Waves of deafening cheers rang out on the livestream as SpaceX engineers and employees celebrated the achievement. While the Super Heavy booster’s job is over, the Starship spacecraft is still soaring through space. The vehicle lit up its own engines after detaching from the booster. And it’s now coasting through space. In about one hour, Starship will reenter Earth’s atmosphere — another high-risk, must-watch milestone for today’s flight. The ship will attempt a landing maneuver over the Indian Ocean. “This is absolutely insane!” screamed SpaceX engineer Kate Tice on the livestream. The Super Heavy booster just made it into the arms of Mechazilla, SpaceX’s launch tower. It’s happening: SpaceX has given the Super Heavy booster the command to make its landing attempt. Engineers deemed the ground pad ready to attempt to catch the Super Heavy booster as it plummets back toward Earth. Starship then ignited its own engines and thrust itself away from the Super Heavy booster in a maneuver called “hot staging.” Hot staging is essentially pushing the Starship booster away from Super Heavy by way of blunt force trauma. The SpaceX rocket just hit “Max Q,” an aerospace term that refers to the point during flight at which a vehicle experiences its maximum dynamic pressure. It’s when the rocket is moving at very high speed, at a time when the atmosphere is still pretty thick, putting a lot of pressure on the vehicle. Given article text here The Starship has undergone significant improvements since its first launch, with each test flight demonstrating advancements in some areas while still addressing issues in others. One notable achievement is the successful recovery of the first-stage Super Heavy booster, which returns to the launchpad shortly after deploying the upper-stage Starship spacecraft to orbit. This feat requires 12 of the rocket's 33 Raptor engines firing to steady itself before being caught by the launch tower's mechanical arms. The system enables SpaceX to reuse the booster for multiple missions, reducing launch costs. Elon Musk expressed optimism about attempting this maneuver with the Starship spacecraft later this year, saying that if fate smiles upon SpaceX, the ship will be caught by the tower "just like the booster." Although challenging, SpaceX has already demonstrated its ability to bring home the Super Heavy and perform a controlled final descent. The long-term goal is to use the Starship for lunar and Mars missions, which will require reliable spacecraft performance. However, the company must address midflight failures in the seventh and eighth missions before moving forward. With the ninth test flight scheduled, SpaceX must ensure the Starship's reliability, particularly after Musk recently stated that it will take place next week. Despite this uncertainty, recent successes like the Bandwagon-3 mission demonstrate SpaceX's capabilities. SpaceX's mission to launch 27 Starlink satellites into low-Earth orbit wrapped up successfully on Monday, April 14, at midnight near Canaveral in Florida. This achievement comes just ahead of another significant milestone - the ninth flight test of Starship. On Thursday, SpaceX conducted a crucial ground-based firing of their Super Heavy booster, the world's most powerful rocket, at their Starbase site in Boca Chica, Texas.