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Today, SpaceX fired up the engines on its new passenger spacecraft, the Crew Dragon, during a ground test in Cape Canaveral, Florida — paving the way for the company to perform a crucial test flight of the vehicle in the months ahead. If that test flight goes well, SpaceX is then poised to fly humans on the Crew Dragon for the first time next year.

The engines that SpaceX ignited today are part of the Crew Dragon's emergency abort system — a crucial part of the spacecraft that will activate if there's ever a catastrophe during launch. The Crew Dragon is designed to travel into space on top of one of SpaceX's Falcon 9 rockets, but if for some reason that rocket fails in mid-air, the emergency engines embedded in the hull of the spacecraft will ignite and carry the capsule away to safety. The capsule would then land using its own parachutes.

These emergency abort engines, known as SuperDracos, have recently become a source of concern for SpaceX. In April, a Crew Dragon test capsule exploded after the engines had been ignited a few times during routine testing. SpaceX immediately formed a team to figure out what happened. Months of investigation later revealed that a leaky valve had caused some of the propellant from the engines to cross over into another system, sparking a chain

reaction that destroyed the capsule. SpaceX assured the public that it would redesign the system and replace the valves moving forward.

With today's engine test, SpaceX's investigation into the accident is now closed, and the company can move forward with the development of the Crew Dragon. The company has been working for years on this spacecraft as part of NASA's Commercial Crew Program, an initiative to fly NASA astronauts on commercially made US vehicles. Both SpaceX and rival Boeing have been working on separate capsules to ferry these astronauts to and from the International Space Station.

The companies are required to perform certain testing milestones before people can ride on the capsules, and today's firing means the SpaceX is on tap for its next big test. Soon, the company will test out the emergency abort engines mid-flight. So far, SpaceX has only tested out the system on the ground. In 2015, the company performed what is known as a pad abort test, which ignited the SuperDraco engines on a Crew Dragon sitting alone on a launch pad. The test was a success, and the engines carried the Crew Dragon up and away from the pad to the ocean, where the vehicle splashed down with parachutes.

Now, SpaceX wants to see if the SuperDracos can do the same thing on top of an actual rocket. At some point in the future, SpaceX plans to launch one of its used Falcon 9 rockets from Cape Canaveral,

Florida with a test Crew Dragon capsule on top. Just after launch, the spacecraft's emergency abort system will activate and attempt to carry the vehicle away from its rocket ride.

Once that test is complete, SpaceX will be done with most of its test flight milestones for the Commercial Crew Program. The company already sent an uncrewed Crew Dragon to the ISS in March, showing that the capsule could successfully dock to the station and then return to Earth via parachutes. The company recently announced that they'd also completed 13 successful rounds of parachute testing. NASA had asked SpaceX to conduct more parachute tests before the first crews fly on the Crew Dragon, as the company's parachutes have struggled to perform as expected up until now.

SpaceX's last major test will be the company's first crewed mission, which will send two NASA astronauts — Bob Behnken and Doug Hurley — to the ISS for a quick stay before returning back to Earth. Once these two astronauts fly safely, then SpaceX will eventually be certified to start sending crews regularly to the ISS.

It's possible that SpaceX could fly as early as the first part of 2020, but any unforeseen issues could lead to more postponements. And the Commercial Crew Program has had enough delays; the first crewed flights were originally supposed to take place in 2017, but none have yet to occur.

“If something comes up that we didn’t know, then it could be longer than that,” NASA administrator Jim Bridenstine said during a recent visit to SpaceX headquarters. “Regardless of whether we make it in the first part of next year is less relevant than the fact that we will make it.”