

The Falcon 9



The Falcon 9 has the ability to land itself its powered by a merlin engine
And it is a very efficient rocket. The falcon 9 can carry payloads up to 22,800 kilograms

According to wiki **Falcon 9** is a partially reusable [two-stage-to-orbit](#) medium-lift launch vehicle designed and manufactured by [SpaceX](#) in the United States. It is powered by [Merlin](#) engines, also developed by SpaceX, burning cryogenic [liquid oxygen](#) and rocket-grade kerosene ([RP-1](#)) as propellants. Its name is derived from the fictional [Star Wars](#) spacecraft, the *[Millennium Falcon](#)*, and the nine Merlin engines of the rocket's first stage.^{[15][16]} The rocket evolved with versions [v1.0](#) (2010–2013), [v1.1](#) (2013–2016), [v1.2 "Full Thrust"](#) (2015–present), including the [Block 5 Full Thrust](#) variant, flying since May 2018. Unlike most rockets, which are [expendable launch systems](#), since the introduction of the Full Thrust version, Falcon 9 is [partially reusable](#), with the first stage capable of [re-entering the atmosphere](#) and [landing vertically](#) after separating from the second stage. This feat was achieved for the first time on [flight 20](#) with the v1.2 version in December 2015. SpaceX has only come this far by building upon the incredible achievements of NASA, having NASA as an anchor tenant for launch, and receiving expert advice and mentorship throughout the development process. SpaceX would like to extend a special thanks to the NASA COTS office for their continued support and guidance throughout this process. The COTS program has demonstrated the power of a true private/public partnership, and we look forward to the exciting endeavors our team will accomplish in the future.^[36]

Falcon 9 testing

According to wiki The **Falcon 9 first-stage landing tests** were a series of controlled-descent [flight tests](#) conducted by [SpaceX](#) between 2013 and 2016. Since 2017, the first stage of [Falcon 9](#) missions has been routinely landed if the rocket performance allowed it, and if SpaceX chose to recover the stage.

The program's objective was to reliably execute controlled re-entry, descent and landing ([EDL](#)) of the Falcon 9 [first stage](#) into Earth's atmosphere after the stage completes the boost phase of an [orbital spaceflight](#). The first tests aimed to touch down vertically in the ocean at zero velocity. Later tests attempted to land the rocket precisely on an [autonomous spaceport drone ship](#) (a barge commissioned by SpaceX to provide a stable landing surface at sea) or at [Landing Zone 1](#) (LZ-1), a concrete pad at [Cape Canaveral](#). The first ground landing at LZ-1 succeeded in December 2015, and the first landing at sea on a drone ship in April 2016. The second landed booster, [B1021](#), was the first to fly again in March 2017, and was recovered a second time.