

SpaceX will attempt to fly the same rocket for the third time Sunday

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- Here's a new photo of the Falcon 9 rocket that will attempt a launch Sunday.
- The first stage appears sooty because it has flown twice previously into space.
- Here's this same first stage launching for the second time, in August. (Less soot).
- And here's the first launch of this rocket, back in May. All clean!

Sunday's launch attempt of a Falcon 9 rocket from Vandenberg Air Force Base in California, with a primary launch window from 1:32pm ET (18:32 UTC) to 2pm ET (19:00 UTC), is significant for a number of reasons.

For one, this will be the company's 19th launch of 2018, and if successful, it will break SpaceX's record for most missions flown in a calendar year. With a handful of launches remaining on its manifest in December, SpaceX is on pace to fly as many as 22 rockets this year. This signifies that SpaceX has solved production and processing issues that prevented it from launching more than eight rockets a year prior to 2017 and that last year was not a fluke.

Perhaps more importantly, a successful flight Sunday would mark the third flight of this particular first stage of a Falcon 9 rocket. This core first flew on May 11, for the Bangabandhu-1 mission, and then again on August 7 for the Merah Putih mission. Now, for the first time ever, SpaceX will attempt to fly the same first stage (and its nine Merlin engines) for a third time.

Such a feat—flying the same rocket three times in less than seven months—would bring the company closer to its cost-cutting goal of flying each Falcon 9 rocket 10 times between significant refurbishment. This has become possible after the company introduced a final variant of its Falcon 9 booster, dubbed Block 5, which engineers designed for optimal reusability. (The May flight of this rocket core marked the first time a Block 5 variant of the Falcon 9 launched). As but one (very) minor example of time and cost-reduction efforts, SpaceX no longer washes the first stage of the rocket between uses, which explains why the lower two thirds of the assembled rocket appears singed, but the top third is a pristine white. This is because the upper stage and payload fairing are new for each flight.

Finally, Sunday's mission is notable for its payload—there are many of them as part of the Spaceflight SS0-A mission. SpaceX will seek to set a US launch record for most satellites put into space at a single time, with 15 microsats and 49 cubesats from commercial and government entities around the world. (Two of these, interestingly, originate from Kazakhstan, a country that hosts many of the launches by the Russian space agency).

A company called Spaceflight organized the four-ton manifest for Sunday's flight. It designed the payload stack and coordinated a variety of satellite dispensers for when the mission has reached a Sun-synchronous polar orbit at an altitude of 575km. Deployment of the satellites will begin about 13 minutes after liftoff and conclude about 30 minutes after that point.

SpaceX will again seek to recover this booster with the droneship *Just Read the Instructions* stationed downrange in the Pacific Ocean. If successful, we likely can expect to see this first stage make an unprecedented fourth flight sometime in 2019.

The webcast below should begin about 15 minutes before the launch window opens.

[embedded content]
Spaceflight SS0-A launch.
Listing image by SpaceX

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