

Mars 2020 rover gets its wheels

June 21 2019



Credit: NASA/JPL-Caltech

In this image, taken on June 13, 2019, engineers at NASA's Jet Propulsion Laboratory in Pasadena, California, install the starboard legs and wheels—otherwise known as the mobility suspension—on the Mars 2020 rover. They installed the port suspension later that day.

"Now that's a Mars [rover](#)," said David Gruel, the Mars 2020 assembly, test, and launch operations manager at JPL. "With the suspension on, not only does it look like a rover, but we have almost all our big-ticket items for integration in our rearview mirror—if our rover had one."

Within the next few weeks, the team expects to install the vehicle's robotic arm, the mast-mounted SuperCam instrument and the Sample Caching System, which includes 17 separate motors and will collect samples of Martian rock and soil that will be returned to Earth by a future mission.

Both of the rover's legs (the starboard leg's black tubing can be seen above the wheels) are composed of titanium tubing formed with the same process used to make high-end bicycle frames. The wheels in this picture are engineering models and will not make the trip to Mars. They will be swapped out for flight models of the wheels sometime next year.

Made of aluminum, each of the six wheels (each 20.7 inches, or 52.5 centimeters, in diameter) features 48 grousers, or cleats, machined into its surface to provide excellent traction both in soft sand and on hard rocks. Every wheel has its own motor. The two front and two rear wheels also have individual steering motors that enable the vehicle to turn a full 360 degrees in place.

When driving over uneven terrain, the suspension system—called a "rocker-bogie" system due to its multiple pivot points and struts—maintains a relatively constant weight on each [wheel](#) and minimizes rover tilt for stability. Rover drivers avoid terrain that would cause a tilt of more than 30 degrees, but even so, the rover can withstand a 45-degree tilt in any direction without tipping over. With its [suspension](#), the rover can also roll over rocks and other obstacles as well as through depressions the size of its [wheels](#).

Mars 2020 will launch from Cape Canaveral Air Force Station in Florida in July of 2020. It will land at Jezero Crater on Feb. 18, 2021.

Charged with returning astronauts to the Moon by 2024, NASA's Artemis lunar exploration plan will establish a sustained human presence on and around the Moon by 2028. We will use what we learn on the Moon to prepare to send astronauts to Mars.

JPL is building and will manage operations of the Mars 2020 rover for the NASA Science Mission Directorate at the agency's headquarters in Washington.

If you want to send your name to Mars with NASA's 2020 mission, you can do so until Sept. 30, 2019. Add your name to the list and obtain a souvenir boarding pass to Mars here: [go.nasa.gov/Mars2020Pass](https://www.nasa.gov/Mars2020Pass)

More information: For more information about the mission, go to: mars.nasa.gov/mars2020/

Provided by Jet Propulsion Laboratory

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