

Spirit Rover: Rear Wheel Trouble Continues

December 10 2009



An artist's concept portrays a NASA Mars Exploration Rover on the surface of Mars. Image credit: NASA/JPL/Cornell University

(PhysOrg.com) -- Results of diagnostic tests on Spirit's right-rear wheel on Sol 2109 (Dec. 8, 2009) continue to indicate a troubled wheel, which may leave the rover with only four operable wheels.

The Sol 2109 plan included a check of the grind motor of Spirit's rock abrasion tool (RAT) because it shares the same motor controller as the right-rear wheel. It also included rotor resistance tests on the right-rear motor at three temperatures using opposite voltage polarity from earlier tests, backward and forward commanded motion of the right-rear wheel, and a check of rotor resistance on all other operating wheels. The RAT motor appears okay, although a more exhaustive test will be tried later.

The right-rear wheel rotor resistance tests continue to show very elevated resistance, although not as high as in previous tests, and exhibiting a curious voltage-dependent effect. No motion of the right-rear wheel

occurred during the backward commanded motion. The forward motion was not executed since the initial backward motion did not occur. The rotor resistances on all the other operating wheels are nominal.

The plan ahead, still being developed, will likely include more [rotor](#) resistance tests, an attempt to apply higher voltage to the right-rear wheel to see if any movement will occur, and a check of the right-front wheel to confirm its status and to see if it may offer insight into the right-rear wheel's condition. Further ahead, steering tests will be considered to explore an external jam as a possible explanation.

Concurrent with this, the project is exploring whether any meaningful rover motion would be possible with only four operable wheels. Spirit lost the use of its right front [wheel](#) in 2006.

Because of the current rover tilt, the environmental conditions and [dust](#) accumulation on the [solar arrays](#), Spirit is at risk of inadequate power for surviving through the next southern Mars winter, which reaches solstice on May 13, 2009. Even if extrication is not possible, some limited rover motion may be able to improve rover tilt and increase the chance of winter survival.

Provided by JPL/NASA ([news](#) : [web](#))

Citation: Spirit Rover: Rear Wheel Trouble Continues (2009, December 10) retrieved 23 April 2024 from <https://phys.org/news/2009-12-spirit-rover-rear-wheel.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.