

## Application Story

### BAM! ZOOM! TO THE MOON!

*NASA's new Chariot Lunar concept vehicle uses Ogura MMC 5 clutch...*

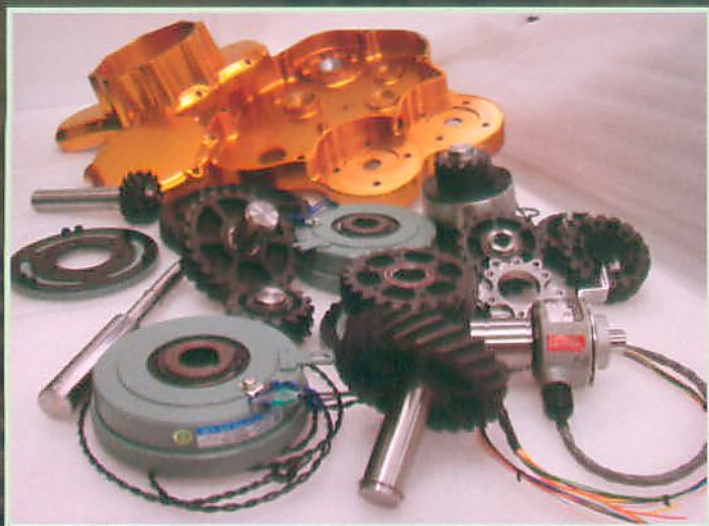


*Lunar Vehicle*

**I**t sounded strange. Every day Ogura receives calls from customers with far out applications. But this one was really far out.

NASA's Johnson Space flight center (Houston TX) was designing a vehicle that would have six double wheels, each with independent traction, steering and (active) suspension. In addition, the wheels needed to be capable of raising or lowering the entire machine so that they could traverse rocky, uneven terrain, or "Crab Walk" as they now call it.

The machine also needed to be very robust and able to continue on its way, even if one or two wheel sets became completely disabled. This robustness was a must because it would be operated far away from any repair depot; about 240,000 miles away on the MOON!!! NASA's goal for this machine is to help Astronauts set up an outpost on the Moon by 2020.



*Transmission Parts*

The Ogura MMC5 clutches are used to electrically engage and disengage each of the six motorized gearbox drive systems from the paired drive wheels. (This gives the vehicle a form of Traction Control.) In addition, the clutched drive system can disconnect one drive wheel from the motor and gearbox in the event of crash damage, a locked wheel, electric motor or transmission failure. When technical difficulties arise, the Ogura clutch helps to insure that the mission can be completed and get our Astronauts safely back to base.

Ogura worked with NASA to specify Ogura MMC high torque, single surface electric clutches into their transmissions. These clutches are used by our Marine customers on fishing vessels and are very reliable. They are the most lightweight, highest torque Industrial Clutches available today. The double flux design, together with a special metal to metal friction surface, make it perfect for the important size and weight concerns of this customer.

Ogura meets challenges of earth based projects every day. So it was a nice change for Ogura to consider the unique application presented to us by NASA. In these challenging times, Ogura continues to break new ground in applications for our products.

Ogura is pleased to help NASA kick up a little moon dust as we continue to explore this amazing universe of ours!



*MMC Series Clutch*

For a video of the Chariot in action see: <http://www.newscientist.com/article/dn13529-lunar-chariot-prepares-to-tear-up-some-moon-dust.ht>