Lunar lander firing up for touchdown

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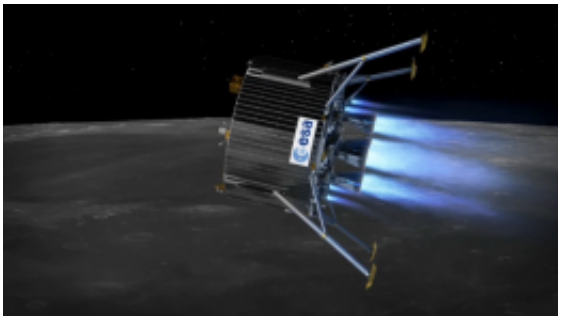

ESA's Lunar Lander on its approach to the lunar south pole. The larger exhaust flames visible in blue are from the central engines that provide most of the braking. The smaller, outer exhaust flames are generated by modified engines used on ESA's Automated Transfer Vehicle (right image). Each providing 220 N of thrust, they will steer Lunar Lander to a safe landing site as well as contributing to the braking. Credits: ESA

Europe's ambition of touching down at the Moon's south pole by 2018 has been boosted by recent test firings of the craft's thrusters. The robot lander will prove new techniques for sending humans to the Moon and assess lunar hazards.

With no atmosphere on the Moon, Lunar Lander cannot rely on parachutes to slow its descent. Instead, the craft will need to fire its engines in a rather unconventional way.

One of these thrusters was recently put through its paces at Astrium's specialised facility in Lampoldshausen, Germany.

The test chamber was configured to reproduce the vacuum and temperatures that Lunar Lander will face on its way down to the Moon's surface.

A complete descent and touchdown was simulated, with the thruster firing in a series of short bursts, reaching a white-hot 1100ºC.

One of the engines that will be used on the Lunar Lander to guide the spacecraft to a safe landing site on the Moon. The engines have been used on ESA's series of Automatic Transfer Vehicles. When tested for their new role on the Lunar Lander they were shown to perform well even when reaching temperatures of up to 1100ºC. In addition, five engines adapted from boosting telecommunication satellites will fire for 10 minutes to slow Lunar Lander's descent to the Moon's surface. Credits: Astrium

According to ESA's Bérengère Houdou, the results are positive: "The thruster operations were smooth and stable, with great performance, even under the stress of Lunar Lander's operating conditions."

To save the cost of developing a new engine, ESA engineers looked to the tried-and-tested thrusters of Europe's proven Automated Transfer Vehicle (ATV) space ferry.

ATV has already completed two fully automated missions to the International Space Station, delivering supplies and boosting the complex to a higher orbit.

The third ATV is set for launch this month.

But landing on the Moon is very different from docking with a space station. Before these tests, it was unclear whether the thrusters would be suitable for a lunar voyage.

Ahead of landing, the craft will orbit the Moon some 100 km above the surface. To descend to the Moon's southern pole, central engines will fire for 10 minutes as the ATV thrusters steer the spacecraft to a safe landing.

There is no GPS for the Moon, so Lunar Lander will navigate by digitally imaging the surface and recognising features.

A laser will complete the picture to avoid hazards such as boulders and craters at the target site.

Lunar Lander's powerful processor will make intelligent decisions to search for a safe area and touch down without human help. European technology will be used throughout.

Provided by European Space Agency