

Mars orbiter passes 4-sec test, big day tomorrow

Spacecraft Enters Red Planet's Sphere Of Influence

Arun Ram & Chethan Kumar | TNN

Chennai/Bangalore: In the Martian tourney, India won a T20 on Monday. The real test is on Wednesday.

The celebration lasted as much as the match – a mere four seconds – when at 2.30pm, Indian Space Research Organisation (Isro) scientists ‘woke up’ the main engine of Mars Orbiter Mission (MOM) spacecraft. Having ensured that the 440N engine is in good shape, they got back to preparations for the 24-minute firing early on Wednesday morning that would put the spacecraft in the red planet’s orbit.

The liquid apogee motor (LAM) engine has been idle for about 300 days since the spacecraft left the Earth’s orbit on a Martian trajectory on December 1, 2013. MOM executed with precision a set of commands sent from mission control in Bangalore last week and fired the engine.

A DATE WITH MARS
1 DAY TO GO

“With this, we have achieved two things,” Isro chairman K Radhakrishnan told TOI. “One, we checked if all is fine with the engine; two, we used the exercise to correct the trajectory to get nearer to Mars.” With this, MOM has also entered Mars’s sphere of influence.

There were apprehensions of the long duration of idling would have affected some valves because of the corrosive fuel used. If the main engine doesn’t fire on Wednesday, an alternative plan is to fire the eight thrusters of the spacecraft to capture the Martian orbit. This Plan B, however, would not help MOM achieve a perfect orbit to take up scientific studies during its elliptical journey around Mars.

If everything goes fine, Isro aims to put the spacecraft in an orbit with a periaresis (closest point to Mars) of 423km and an apoapsis (farthest point) of 80,000km.

The four-second firing used up a little more than half-a-kg of fuel. “Using 564 gram of fuel, we re-fired the engine to achieve the necessary trajectory correction by reducing the speed of the spacecraft by 2.18 metres per second,” said Isro scientific secretary V Koteswara Rao.

Radhakrishnan said the test firing boosted the scientists’ confidence. “But we cannot be complacent. We now know that we have the best chance since the launch of MOM to acquire the desired orbit,” he said. Rao said the Mars Colour Camera (MCC) is likely to transmit the first images of the red planet by Wednesday afternoon.

MANGALYAAN: US VERSUS INDIA

India’s Mars Orbiter Mission (MOM) overcame a major challenge on Monday, making way for its insertion into the Martian Orbit on Wednesday, while US’s Mars Atmosphere and Volatile Evolution (MAVEN) entered orbit on Monday. As the world watches two missions to the Red Planet, TOI compares them:



Attempts:

1st: MOM is India’s 1st attempt to send a spacecraft to Mars

15th: MAVEN mission is US’s 15th attempt, the first 6 of which were failures

Cost:

MOM **\$75m**

MAVEN **\$671m**

Lift-off weight:

MOM **1,350kg**

MAVEN **2,250kg**

Reach:

377-423 km: The closest distance from Mars for MOM

150 km: For MAVEN

Payloads:

Both missions have spacecraft carrying different kinds of payloads to achieve different objectives. MOM is carrying five payloads as opposed to seven being carried by MAVEN

MAVEN waits for MOM in Martian orbit

Srinivas Laxman

Mumbai: On a day India test-fired the engine of its Mars Orbiter Mission (MOM) spacecraft, Nasa’s MAVEN (Mars Atmosphere and Volatile Evolution Mission) spacecraft entered the Martian orbit. It will be a rare camaraderie in space when MOM and MAVEN go around the red planet and scientists of India and US share data from the two missions.

MAVEN, which could pave the way for an Indo-US collaboration in Martian scientific research successfully entered Mars’ orbit at about 8am IST on Monday after a 10-month journey covering 442 million miles.

According to Nasa, MAVEN will study the red planet’s upper atmosphere as never done before. “MAVEN is the first

spacecraft dedicated to exploring the tenuous upper atmosphere of Mars,” it said. On Wednesday, MOM will enter the Martian orbit. This is the first time in the history of Mars exploration that two spacecraft of two countries are reaching the red planet’s orbit in quick succession.

At a media interaction post insertion on Monday, MAVEN principal investigator Bruce Jakosky said: “We wish a successful Mars orbit insertion for the Mars Orbiter Mission.” Nasa’s planetary science director Jim Green said: “Nasa is quite interested in cooperating and correlating data sets. As both spacecraft get into orbit and the scientists understand their data, these opportunities will open up,” he said.

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