Falcon Heavy – driving the future

Not many of us would have expected a Tesla Roadster to be orbiting the Sun in 2018. But on February 6th, the unusual payload was hurled into space by SpaceX's Falcon Heavy. International audiences watched in awe as the world's most powerful rocket launched from Florida's Cape Canaveral – blasting off from the same launch pad that sent the Apollo 11 astronauts to the moon. Now astronomers are tracking it just like an asteroid or comet.

Aside from putting the first commercial car into space, why has SpaceX wowed the world with Falcon Heavy? Let's take a closer look at what makes this launch such a big achievement, what it means for the space industry and why many of us are feeling more than a little star-struck.

OUT OF THIS WORLD

Falcon Heavy is the most powerful operational rocket in the world by a factor of two. Stage one of the rocket had more than five million pounds of thrust at lift off – equal to approximately eighteen 747 aircraft at full power. Stage one is made up of three Falcon 9 rockets: comprising 27 Merlin engines all working in tandem, strapped together to create one giant spacecraft. But it's not just sheer lifting ability that sets Falcon Heavy apart. It also pioneers reusable rocket technology. SpaceX believes that reusability is the key breakthrough needed to reduce the cost of space travel. It reuses its empty boosters; two of Falcon Heavy's rockets in fact had been used in previous missions.

A ROARING SUCCESS

In February's launch, almost three minutes after lift-off the two outer boosters broke away and returned to Earth. In a breathtakingly controlled landing they touched down almost simultaneously. Booster three wasn't so lucky – although it correctly broke away from the rocket's upper section (containing the sportscar) it was only able to relight one of three engines needed to land, missed its landing pad and hit the Atlantic at 300mph. But hey, two out of three ain't bad, right?

The Falcon Heavy boasts other money-saving features that make it (relatively) more affordable. SpaceX streamlines its production methods. Rather than producing a range of different engines with different specs, SpaceX has just one – the Merlin. Quite simply, the more powerful the rocket needed, the more Merlins are strapped into its first stage. Apparently, Falcon Heavy provides a cost of roughly US$ 1,300 per kg of payload. In comparison, NASA's space shuttle cost US$ 60,000 per kg. Time will tell what impact this price drop will have on the space industry.

A PAYLOAD WITH PIZZAZZ!

To simulate the mass of a potential payload, previous similar test flights used massive concrete or steel blocks. In February we witnessed SpaceX's founder Elon Musk throw his cherry-red Tesla convertible into space, with the message *made on Earth by humans*. Musk posted on Instagram: '… we decided to send something unusual, something that made us feel.' The sportscar carries a dummy in a SpaceX space suit, and blasts David Bowie's 'Space Oddity' from its speakers. A second Hot Wheels version of the Tesla sits on the real Roadster's dashboard. Back here on Earth collectors are now paying more than 100 times the retail price for the toy. Although the Tesla adds pizzazz to this test flight, it also signals a shift in the space industry. The private sector is bringing the power of commercial competition into an industry historically run by national space agencies. It has energised the rocket business.

ANOTHER GIANT LEAP FOR MANKIND?

The upper stage of the rocket – the chunk containing the Tesla – made it into space. A long way into space. After a six-hour coast, the engine restarted. The Tesla was pushed into an elliptical deep space orbit, aiming to take the same journey Mars takes around the Sun. The 'third burn' overshot, sending it into an orbit between Mars and Jupiter, where it's thought the Tesla will eventually pass through the Asteroid Belt.

There's a sportscar in space, and humanity has a new heavy-lift launch vehicle – the most powerful reusable operational rocket to have ever existed. I don't know about you but I'm feeling pretty excited about the future of space travel.

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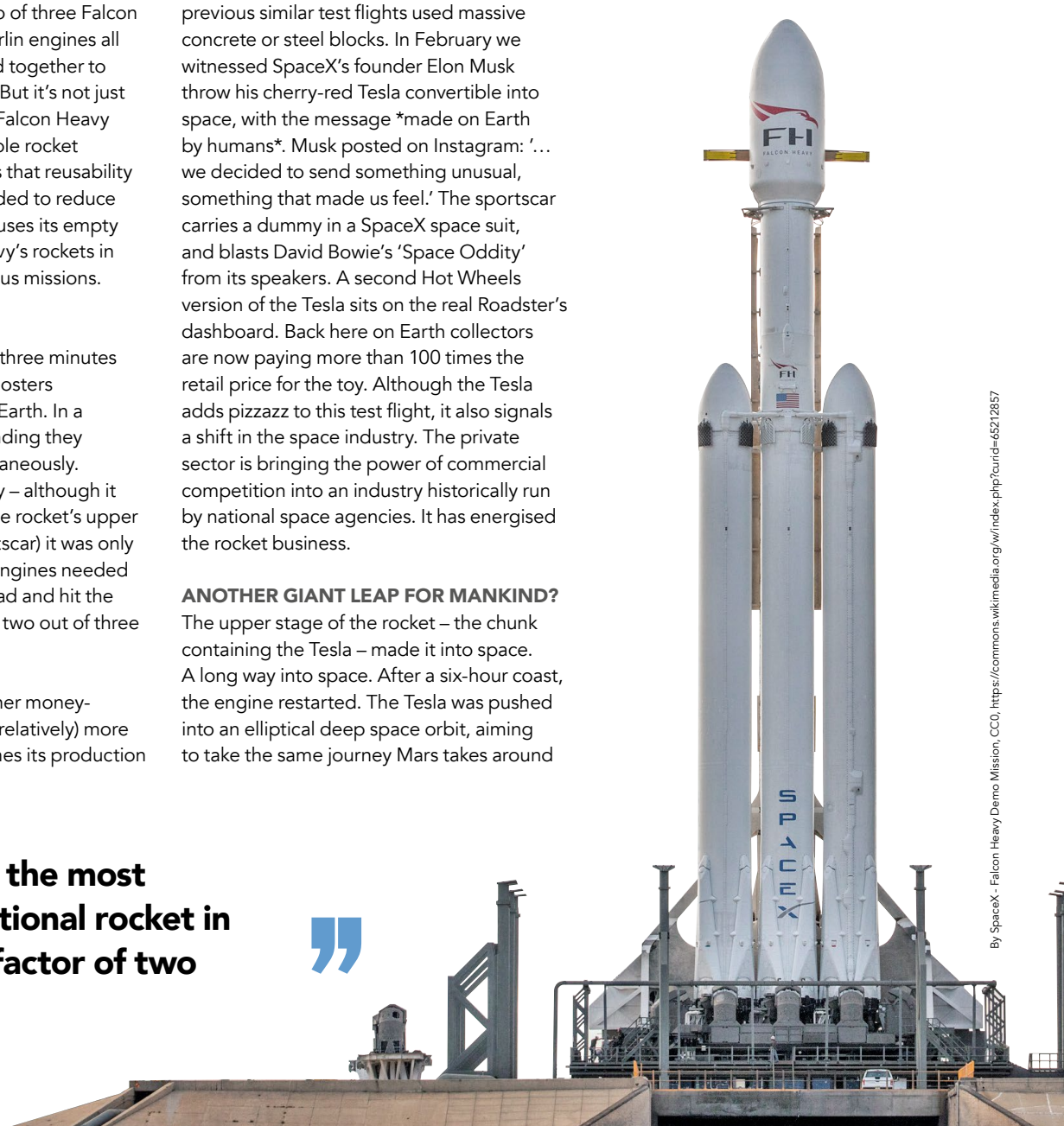

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