ISRO clears 200-second test of GSLV-F19 cryogenic engine

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News

The flight acceptance hot test of the cryogenic engine earmarked for the next GSLV mission, GSLV-F19, was conducted at the ISRO Propulsion Complex (IPRC), Mahendragiri, Tirunelveli district, on 5 November 2026. The engine was fired for 200 seconds; both the main engine and the gas generator ignited as planned. ISRO announced on 10 November that the performance was satisfactory and consistent with pre-test predictions. The engine will be integrated into the cryogenic stage of GSLV-F19, which will launch NVS-04, the next satellite of the NavIC navigation system. Media reports identify it as the CE-7.5 engine that powers the third stage of GSLV Mk II. Earlier, on 30 October 2026, GSLV-F18 successfully launched NVS-03. Such a ground test of each mission's engine before launch is standard practice.

Key facts for the exam

Point	Details
Test	Flight acceptance hot test
Date	5 Nov 2026 (ISRO release 10 Nov)
Place	ISRO Propulsion Complex (IPRC), Mahendragiri, Tirunelveli
Duration	200 seconds
Engine	CE-7.5 cryogenic (media reports); about 75 kN thrust

Point	Details
Propellants	Liquid hydrogen + liquid oxygen
Mission	GSLV-F19 – NVS-04 navigation satellite
Previous flight	GSLV-F18 – NVS-03 (30 Oct 2026)

Background

- A cryogenic engine uses super-cold liquid propellants: hydrogen liquefies at about −253°C and oxygen at about −183°C. They give a higher specific impulse than solid or storable liquid propellants, so they are used in upper stages to send heavy satellites to geosynchronous transfer orbit (GTO). A kerosene–liquid oxygen pair is called 'semi-cryogenic'.
- History: In 1991 India signed a cryogenic technology deal with Russia's Glavkosmos. After the US imposed sanctions in 1992 citing the Missile Technology Control Regime (MTCR), Russia dropped the technology transfer and supplied only a few KVD-1 cryogenic stages. ISRO built the CE-7.5 indigenously; GSLV-D3 failed in April 2010, and on 5 January 2014 GSLV-D5 (GSAT-14) succeeded with the indigenous cryogenic stage.
- ISRO's rockets: the CE-7.5 powers the third stage of GSLV Mk II, while the CE-20 powers the C25 upper stage of the bigger LVM3. To replace LVM3's L110 liquid stage, ISRO is building the SC120 stage with the 2,000-kN-class SE2000 semi-cryogenic engine; its power-head tests are also being run at Mahendragiri.
- NavIC (Navigation with Indian Constellation) is India's regional navigation system, covering India and about 1,500 km beyond its borders. Its satellites operate in geostationary (GEO) and inclined geosynchronous (GSO) orbits. NVS-03 carries an indigenous atomic clock and L1, L5 and S-band signals.

Tamil Nadu link: The ISRO Propulsion Complex (IPRC) lies at Mahendragiri, Tirunelveli district, at the southern end of the Western Ghats; once part of the Liquid Propulsion Systems Centre (LPSC), it became a separate centre in 2014. Every ISRO cryogenic and liquid engine is tested here. ISRO's second spaceport is coming up at nearby Kulasekarapattinam, Thoothukudi district.

Frequently asked questions

What is this news about?

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What are the key facts to remember for the exam?

Test: Flight acceptance hot test; Date: 5 Nov 2026 (ISRO release 10 Nov); Place: ISRO Propulsion Complex (IPRC), Mahendragiri, Tirunelveli; Duration: 200 seconds.

What is the background to this news?

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Practice questions (with answers)

1. Which propellant pair does the cryogenic upper-stage engine (CE-7.5) of the GSLV use?

A) LOX + kerosene

B) UDMH + N_2O_4

C) HTPB solid fuel

D) LH_2 + LOX

Answer: D – Explanation: Hydrogen liquefies at −253°C and oxygen at −183°C; high efficiency. Kerosene + LOX is semi-cryogenic (SE2000).

2. Mahendragiri hill, home to the ISRO Propulsion Complex, is part of which mountain range?

A) Eastern Ghats

B) Western Ghats

C) Javadhu Hills

D) Shevaroy Hills

Answer: B – Explanation: Southern tip of the Western Ghats, on the Tirunelveli–Kanyakumari border. Javadhu and Shevaroy are Eastern Ghats hills.

3. Which GSLV mission was India's first successful flight with an indigenous cryogenic stage?

A) GSLV-D3

B) GSLV-F06

C) GSLV-D5

D) GSLV-F10

Answer: C – Explanation: GSLV-D5 – 5 Jan 2014, carrying GSAT-14. The first attempt with the indigenous stage, GSLV-D3, failed in April 2010.

4. Which country dropped the transfer of cryogenic technology to India in the 1990s under US pressure?

A) France

B) Japan

C) Russia

D) Germany

Answer: C – Explanation: 1991 Glavkosmos deal; US sanctions in 1992 citing the MTCR. Russia gave only KVD-1 stages; ISRO then built the CE-7.5.

5. In which orbits do the satellites of NavIC, which NVS-04 will join, operate?

A) Low Earth orbit

B) Sun-synchronous polar

C) Medium Earth orbit

D) GEO and inclined GSO

Answer: D – Explanation: NavIC uses GEO and inclined GSO orbits, covering India + 1,500 km. The US GPS works in medium Earth orbit (MEO).

Sources: ISRO; Voice&Data; News On AIR; Telangana Today. © Shanmugam IAS Academy.