

THE KAVERI STORY POWERING INDIA'S NEXT LEAP IN DEFENCE

FROM DEPENDENCY TO DOMINANCE

Decoding India's journey to build an indigenous fighter jet engine and what it means for the future.



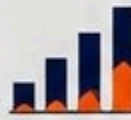
INDIGENOUS
ENGINE AMBITIONS



TECHNOLOGY &
INNOVATION PUSH



THE ROAD AHEAD
FOR INDIA'S AEROSPACE



STRENGTHENING
ATMANIRBHAR BHARAT

BUILDING POWER. SECURING TOMORROW. 

30 TEJAS JETS ARE READY— BUT THEY CAN'T FLY

India has built around 30 Tejas Mk1A fighter jets. But they are grounded.

Waiting for engines.



THE PROBLEM IN NUMBERS



₹5,400 CRORE
(~\$716 MILLION)

Contract signed with GE in 2021 for 99 F404 engines.



**PRODUCTION
LINE SHUT DOWN**

GE had shut down the F404 production line around 2016.



7 ENGINES

Delivered by July 2026, against an expected **24–26 engines per year.**



**LIQUIDATED
DAMAGES**

HAL has imposed liquidated damages, but that doesn't solve the supply problem.



**SQUADRON
SHORTFALL**

IAF has only around **29–30** fighter squadrons, versus a sanctioned **42.**



**THE DELAY ISN'T ON THE ASSEMBLY LINE.
IT'S ON THE SUPPLY CHAIN.**



INDIA SPENT 37 YEARS TRYING TO BUILD KAVERI—AND UNDERFUNDED IT.

The roots of today's problem go back to **1989**, when India approved the indigenous Kaveri engine programme, originally intended to power Tejas by **1996**.



The programme was initially sanctioned with only about **₹383 crore**—far too little for an advanced military turbofan requiring extensive materials research, destructive testing and high-altitude testing.

THREE STRUCTURAL PROBLEMS EMERGED:



India lacked the sophisticated facilities required to test the engine and had to send prototypes to **Russia**.



Kaveri struggled with turbine-blade materials and **high-temperature** performance.

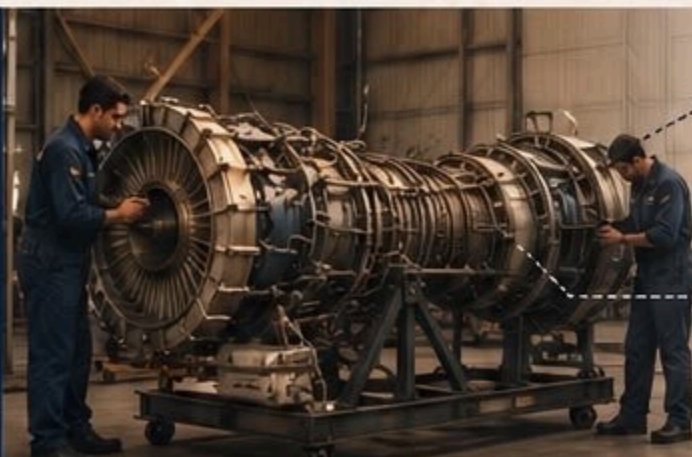


US sanctions after the **1998 Pokhran tests** further disrupted technological collaboration.



By 2008, Kaveri produced roughly **73 kN** of wet thrust, below the **80+ kN** required for Tejas.

India consequently delinked Kaveri from Tejas in **September 2008** and turned to **GE's F404** instead.



73 kN
WET THRUST
(ACHIEVED)

80+ kN
WET THRUST
(TARGET)



The irony is that India effectively saved money by underfunding Kaveri — and subsequently paid the much larger strategic cost of remaining **dependent on foreign engines**.



2026 CHANGED THE EQUATION: KAVERI FINALLY REACHED F404 TERRITORY

On **16 February 2026**, an upgraded Kaveri achieved **81–83 kN** of wet thrust in a full afterburner test.



KAVERI (UPGRADED)

GE F404

 **81–83 kN**
WET THRUST
(WITH AFTERBURNER)

VS

 **~84 kN**
WET THRUST
(WITH AFTERBURNER)



That's significant because GE's F404 produces roughly **84 kN**.

After **37 years**, India's indigenous engine had finally reached broadly the same thrust class as the foreign engine it had been importing.



BOOST FROM INDIAN INNOVATION

The programme also benefitted from technology and engineering inputs from **BrahMos Aerospace**, particularly around the afterburner and combustion system.



BRAHMOS
AEROSPACE

DRY KAVERI



A non-afterburning version targeting **49–51 kN** is expected to approach certification by **end-2026**.

This engine is intended for the Ghatak stealth UCAV and India's future unmanned combat-aircraft ecosystem.



POWERING INDIA'S UNMANNED FUTURE



The IAF reportedly wants **100+** Ghatak drones, operating under a manned–unmanned teaming concept where a **Tejas Mk2** acts as the “quarterback” for autonomous/semiautonomous drones.



**SO KAVERI IS NO LONGER
MERELY ABOUT REPLACING THE F404.**

**IT COULD BECOME THE PROPULSION FOUNDATION
FOR INDIA'S NEXT GENERATION OF UNMANNED WARFARE.**



INDIA'S REAL BATTLE: FROM BUYING ENGINES TO OWNING THE TECHNOLOGY

For decades, India has depended on foreign engines. The future demands a shift from **dependency to dominance** by owning the underlying IP and design capability.



THE GAP IN NUMBERS

CHINA'S ADVANTAGE



Moved from importing Russian **AL-31** engines



Developed **WS-15** (140–160 kN class)



Powers **300+** J-20 stealth fighters with indigenous engines

VS

INDIA'S PROGRESS



After 37 years, India achieved **83 kN** on a test bench



Has yet to fly an indigenous engine on a fighter

THE SAFRAN CLEAN-SHEET ENGINE PROPOSAL FOR AMCA MK2

(ADVANCED MEDIUM COMBAT AIRCRAFT MARK 2)



Around **120 kN** thrust



Roughly **\$7 billion** programme



400+ engines targeted



Proposed **100%** technology transfer



Full **IP rights**



No export restrictions

WHAT IS AMCA MK2?



AMCA MK2 is India's next-generation stealth fighter programme, envisioned as a twin-engine, 5th-generation aircraft with advanced avionics, low observability and supercruise capability.



It will act as the 'quarterback' in a manned-unmanned teaming (**MUM-T**) ecosystem, controlling loyal wingman drones and future combat assets.



WHY CHINA IS AHEAD



Long-term investment in R&D and testing infrastructure



Indigenous materials, metallurgy and high-temperature capability



Freedom to iterate, fail and scale production



Strategic autonomy in engine exports and usage



THE WAY FORWARD: FROM DEPENDENCY TO DOMINANCE.

The future will be powered by engines we **design, build and own.**

