



SAAB

GRIPEN

Built by Canada



Gripen for
Canada Team



SAAB



IMP AEROSPACE & DEFENCE
A Business Unit of IMP Group



CAE



Peraton

Gripen for Canada

Technical Specification

The weapons, capabilities and technical details.



Tactical Mission Systems

Datalink, radar, electronic warfare systems, self-protection in hostile environments and the processing of multiple information in the current combat scenario.



The Smart Fighter

Network communication, data fusion with an open and modular architecture.



Gripen, Defending Sovereignty

Gripen, the smarter choice for enhancing Canadian sovereignty.



A Unique Offer

Canada is choosing a new fighter. A decision that will see the new fighter defending Canada's sovereign interests, deterring threats and meeting Canada's NORAD, Five Eyes and NATO obligations. The decision on which fighter Canada chooses is a once in a lifetime opportunity. One of those choices is Gripen from Saab.

Saab has undertaken a detailed assessment of Canada's Future Fighter requirement and has tabled a proposal for 88 Gripen E fighters to meet those operational needs. A proposal that will provide Canada with the perfect fighter for Canada. Gripen E is a true swing-role fighter with outstanding capabilities. The fighter is developed to counter and defeat the most advanced threats in a modern battlespace and to continuously evolve in order to keep up with new challenges. We have built an intelligent fighter system that rapidly embraces new technology and tactics in a way that will always keep Gripen ahead.

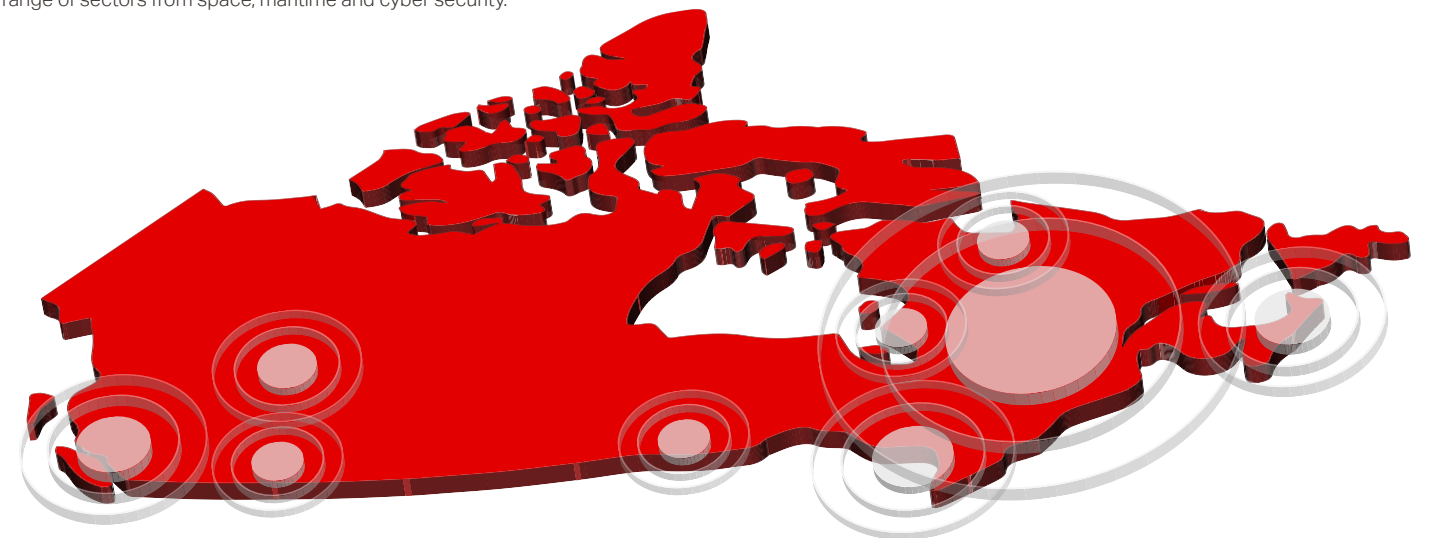
The benefits of operating Gripen will last decades but that also extends to Canada's economic prosperity and in particular its aerospace sector. Canadian companies with employees from across Canada, coast to coast, together with Saab have formed the Gripen for Canada Team. The Gripen for Canada Team will be building, supporting, sustaining, and enhancing Gripen in Canada, offering Canada a unique level of sovereign control. IMP Aerospace & Defence will lead in-country production building Gripen at their Halifax site and in-service support for the life of the Canadian Gripen fleet. CAE will provide training and mission systems solutions, while Peraton Canada will provide avionic and test equipment,

component maintenance, repair and overhaul, and material management. GE Aviation will provide and sustain the fighter's engines in Canada. A Gripen Centre in Quebec will be the fighter's industrial and technological centrepiece, bringing together Canadian expertise from the Gripen for Canada Team. Work at the Centre will be conducted by Canadians to ensure Gripen meets NORAD and NATO requirements. The Gripen Centre will also act as a hub for supporting and sustaining Gripen, while allowing Canada to manage future upgrades in-country.

The Gripen for Canada Team members will in turn work with their own Canadian supply chain, extending the economic benefits throughout the aerospace sector. This rich industrial ecosystem will be mirrored by a research and development network linking universities and other research organisations with industry, working on the next generation of technologies and knowledge. An Aerospace R&D Centre will be created in Quebec to act as a hub for a network of research and innovation over decades, and so represents a key component of Saab's long-term vision in Canada. The Aerospace R&D Centre will develop, test and produce next generation aerospace systems and components to complement the existing Canadian aerospace industry, which may include unmanned aerial systems, Artificial Intelligence and environmentally friendly aviation technologies.

Only Gripen delivers all these benefits and is the smarter choice for Canada.

Saab's offer will bring benefits from coast to coast with the involvement of the Gripen for Canada Team and a Canadian supply chain that will create sustainable long term jobs. Alongside a Gripen industrial ecosystem, there will be centres of research and development across a wide range of sectors from space, maritime and cyber security.



Gripen E

Technical Specification

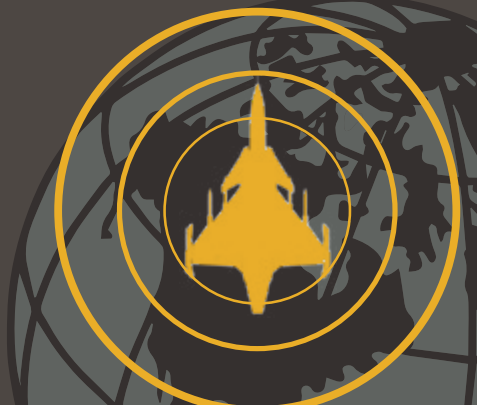
Armaments



Gripen carries a wide range of missiles and guided bombs for missions against targets across air, land and sea. These include advanced weapons such as Meteor, the West's longest range air combat missile that is not yet available on any US fighter.

Each aircraft can carry a combination of these armaments and external sensors to fulfil a wide range of tasks in the same mission, from NORAD air defence, interdiction to reconnaissance without having to go back to base and change its configuration.

Range and endurance



Ferry range
2160 NM

Combat range
810 NM

Combat air patrol range
490 NM

All Gripen aircraft have the capability to carry large drop tanks and a retractable probe for air-to-air refuelling.

These features increase the combat radius and time on station. Allowing for missions longer than 8 hours in the air.

NORAD & NATO compliant

Gripen is operated by two NATO air forces and protects Europe's eastern borders as part of the Baltic Air Policing Mission alongside other NATO operators flying US-made fighters.

Saab's radars and combat software operate onboard Canada's Halifax frigates as part of the NORAD Maritime Warning Mission. Canada will control the integration of NORAD and Five Eyes capabilities for Gripen to ensure the same level of mission success.

Maximum speed: Mach 2
Maximum altitude: More than 16 thousand meters

External hardpoints: 10

In-flight refuelling probe: Retractable

Width overall: 8,6m

G-limits:
-3G/+9G

Length overall: 15,2m

Engine: General Electric
F414-GE-39E of 98kN thrust

Gripen E

Tactical Mission Systems



Gripen sensor sharing

IRST
Passive infrared search & tracking

EW active
and passive search

Radar
active searching

RADAR / IRST

The Active Electronically Scanned Array (AESA) radar, has small electronic transmit and receive modules that track targets in different directions, in the air or on the ground/sea, simultaneously, and at different frequencies, without needing to move the position of the antenna.

Gripen E is also equipped with an Infrared Search and Track (IRST) sensor that helps to find low observable targets. IRST is passive and undetectable as it uses the target's heat emissions to locate and track it. The IRST can act in conjunction with the AESA radar or be used independently thereby reducing the possibility of Gripen being detected.

IFF - Identification Friend or Foe
Identifies Gripen along with other friendly allied forces versus those who are not.

ECM - Electronic Countermeasures
Electronic Warfare antennas interfere with enemy radars, either jamming them or creating ghost signatures thereby preventing the Gripen from being targeted.

EAD - Expendable Active Decoys
Expendable decoys that emit signals to fool or jam enemy fire control radars and missiles.

MAWS - Missile Approach Warning System
Alerts about the approach of missiles fired in the direction of Gripen.

RWR - Radar Warning Receiver
Shows the location of signals coming from any radar on the ground, at sea or in the air that is searching for Gripen.

CHAFF / FLARE
Pyrotechnic devices used to deceive missiles guided by radar or heat.

The Smart Fighter

Modern air combat requires being constantly one step ahead of potential threats and opponents. Rapid technological progress has driven the development of longer reach weapons and radars with greater precision, low signature targets and advanced electronic warfare. Combat effectiveness is increasingly defined and driven by technology. But it's also about how to use that technology in a smart way. Born to fight a superpower, smart thinking is in Gripen's DNA. In an age where software beats hardware and adaptability beats predictability, Gripen has redefined what it means to fight smarter. Let's look at some of the key features that make it the Smart Fighter.

AT THE HEART OF THE NETWORK

Information is critical to combat effectiveness. Gripen is designed to operate like an information supercomputer, seamlessly integrating and sharing data while operating at the heart of Joint Operational Force. Gripen generates combat information from its radar, IRST, Electronic Warfare sensors which via datalinks can be shared with off-board sources or in turn acquire information from them. That can be from or with other aircraft, ground troops, a naval task force, or other surveillance assets.

A Gripen task force could have their radars turned off, but would still receive targeting data about the enemy's position from a NORAD or NATO ally through the datalinks. With their networking, Gripens can maintain a separation of tens of kilometres from each other, making it difficult for the enemy to detect them. One Gripen could use its radar to scan targets on the ground while another uses its Infra-red Search and Track (IRST) to seek for threats in the air. The third Gripen can cause electronic jamming of the enemy's defences. The tactical flexibility Gripen brings confuses the opponent about the number of aircraft in the air and the tactics they are facing. All these factors translate to superior combat effectiveness while helping to protect those who fly Gripen.

MODULAR ARCHITECTURE

In today's world, threats and technologies are constantly evolving, but combat aircraft may undergo only one or two upgrades throughout their service life which can exceed 40 years. Normally any upgrade or integration of new capabilities in a fighter incurs high costs and can take years to complete. Then when delivered, the threat scenario has further evolved and the fighters are quickly out of date again.

Gripen overcomes this and redefines what is possible. Using a revolutionary systems architecture and avionics design, Saab can adapt Gripen to new threats and upgrade the computing power of the aircraft far quicker than opponents. The software and hardware are independent of each other.

In practical terms, it means that the integration of a new weapon or sensor is a matter of a software update, while inserting the latest computing hardware only brings benefits from increased processing power instead of complicating integration.

An air force could update its Gripen fleet within weeks, instead of it taking months or years. All for a much lower cost at a time when operating budgets demand optimum efficiency. This is one of the reasons why Gripen is called a Smart Fighter.

The open architecture also allows Saab to offer the sovereign capability to users to develop the systems and capabilities their needs demand, and avoid being caught in another nation's onerous life cycle plans.

Gripen is designed to beat the opponent and bring the pilot home.





COCKPIT

The entire architecture and interface of Gripen was developed to put the pilot first. The ergonomics, the fusion of the information, the tactical recommendations that are presented in a intuitive manner, are all there to help the pilot make the correct decisions in fractions of a second.

There are three displays available in the cockpit. The largest and main one is the Wide Area Display (WAD). It displays the information that is collected, fused and presented to the pilot at each stage of the flight, such as operational data for navigation and combat, or the tactical scenario facing the aircraft, and its weapon systems. Changing the information is done by touching the screen, using the multifunctional

keys on the panel, or by operating the centre stick and throttle controls (HOTAS system). Above the WAD is located the wide-angle Head-up Display (HUD), at the eye level of the pilot and where flight, performance, sight and weapons information are displayed.

There is also the Targo Helmet Mounted Display where the HUD's information is presented. In addition it can be used to select targets for the sensors to interrogate, as well as fire at targets the pilot is looking at without having to turn the aircraft towards the threat.

ELECTRONIC WARFARE

The main objectives of the Electronic Warfare system of the aircraft are detecting and analysing potential threats against Gripen, as well as dispensing countermeasures such as expendable active decoys or chaff and flares. Thanks to a high processing rate and the fusion of threats that are detected, classified and prioritised by the Multi Functional System Electronic Warfare (MFS-EW), the pilot can have a complete view of the environment around him. The system will determine what and where the surveillance radars, air defence systems, ships, air defence fighters, early warning planes and friendly forces are and how they are categorised and displayed to the pilot. The EW can also jam, seduce, deceive and overwhelm enemy radar sensors and missiles, creating an electronic form of stealth that doesn't degrade but is ready to evolve.



Gripen armed with seven Meteor, the West's longest range air to air missile.

Gripen, defending sovereignty

In the 1980s it would have taken only 15 minutes for any of the approximately 4,300 combat aircraft, from the countries that constituted the former Warsaw Pact military alliance to reach Sweden. There were fighters, bombers, signals intelligence and Electronic Warfare aircraft positioned in dozens of air bases ready to attack the Scandinavian Peninsula.

Numerically this force was greater than the sum of the air forces of Sweden, Finland and the NATO air component based in Denmark and Norway. Sweden's geographical position was strategic for both the Western and Eastern-bloc countries during the Cold War, as it could be used to establish bases and launch attacks from. To preserve its neutrality and to guarantee the sovereignty of its territory, Sweden invested in defence research to remain at the technological forefront and not be dependant on other countries.

In this complex scenario Saab as the main partner of the Swedish Air Force designed fighter aircraft over the decades to meet and defeat the threats it faced. The newest generation of these is Gripen.

FOR SWEDEN'S DEFENCE

When the first Gripen was first designed, Sweden wanted a fighter that fulfilled the tasks of interception, attack and reconnaissance, with the pilot being able to switch from one mission to another in mid-flight by pressing a single button. That's how Gripen, a multi-mission fighter, inaugurated a new generation of fighters ahead of its time.

Saab developed this new combat aircraft in a way that was easy to manufacture, with acquisition and operational costs an important consideration. With its single-engine and low head-on profile, it is agile, difficult to detect yet simple to maintain. Internally it had an advanced on-board radar, self-protection systems, electronic warfare and datalinks to communicate with other planes, vessels and stations on the ground.

Gripen used computer-aided flight commands (Fly-By-Wire), a Head-Up Display digital display with the main flight information, tactics and weapons on the eye level, and a fully digital instrument panel with three monochrome multi-functional displays.

Upon returning to the base, the fighter could be armed and refuelled in a matter of minutes, at which point the ground crews would carry out the necessary repairs including, if needed, an engine replacement in a short time. For this reason, its on-board equipment was modular to allow this agility in the substitution of battle

damaged components.

In addition to the multi-mission capability, this mobility has made Gripen a force multiplier, given that with a few of these aircraft it is possible to challenge a numerically superior enemy.

Finally, Gripen would need to operate from remote bases or, in more extreme cases, from the country's highways. Thus, in addition to the need to land and take off runways measuring 16m wide and 800m long, the fighter would dispense with complex supporting infrastructure for its operations.

In 1996 Gripen A entered service with the Swedish Air Force.

GRIPEN C - BEYOND SWEDEN

In 1997 Saab announced the development of the export version of its newest fighter. Gripen C, which was designed to be able to operate and be compatible with NATO systems. In addition, an in-flight refuelling probe was added to extend its range and the cockpit received new, larger, colour digital displays. The wings were also reinforced to support a greater variety of weapons. Saab developed the two-seat variant, called Gripen D, which had the same technologies as Gripen C. In a short time, more than 65 aircraft started their operational lives with the air forces of the Czech Republic, Hungary, South Africa and Thailand.

Gripen is designed to be re-armed and refueled before their opponents can.



Gripen E takes off with Meteor missiles and long range drop tanks.



Gripen E: designed in the North, at home worldwide.

IN ACTION

Across different parts of the globe, Gripen air forces regularly take part in national and international missions or exercises. Examples include Baltic Air Policing, a mission established by NATO on 30 March 2004, aimed at protecting the airspace of Estonia, Latvia and Lithuania.

Through a rotation system, NATO member fighters are ready to take off and intercept any aircraft 24 hours a day, all year round. The first time that the Czech Republic Air Force participated in this mission was in 2009 with four Gripen in Lithuania, repeating the mission again in 2012 and 2019. Hungary's first tour was in 2015 with four Gripen, before returning in 2019, which was one of the years with the highest number of scrambles carried out by NATO. More than 400 flight hours and 370 take-offs were made by the Hungarian Gripen crews. Another opera-

tion in which Gripen participated was NATO's Unified Protector, in which the Swedish Air Force Gripens flew tactical reconnaissance missions over Libyan territory. The first aircraft arrived on 2 April 2011, just 23 hours after the Swedish Parliament authorised the aircraft to go to the African continent and take part in the NATO-led operation. The deployment had eight Gripen and at the end of the mission, on 24 October 2011 had completed 650 combat missions and two thousand flight hours with the production of 150,000 reconnaissance photos.

GRIPEN E - THE SMART FIGHTER

The constant technological transformation of threats in the 21st century led Saab to conduct studies, in the mid 2000's, for the next generation of fighter. Designated as Gripen E (single seater) and Gripen F (two seater), the fighter gained a new electronic warfare suite designed to defend

Gripen in a hostile environment permeated by modern threats based on the ground and in the air. Its new sensors actively block or fool enemy radars. In the case of the AESA radar, it searches for targets electronically, instead of having to direct the antenna to the target, with its advanced processing capacity designed to detect the most elusive of targets. An Infrared Search and Track (IRST) sensor was also integrated and placed externally in front of the cockpit. It is capable of capturing, over great distances, the heat emissions from other aircraft, as well as vessels at sea and vehicles on the ground, allowing the pilot to launch a surprise attack. The system is passive and works silently without reporting its presence to the enemy, unlike radar signals which can be detected. The ability to communicate between fighters automatically in Gripen E is also a key feature. It is possible, within a Gripen formation, that one jams the enemy while another uses that information to launch an attack.

Ten external hard points provide increased weapon carriage and firepower with a wide range of missiles and guided bombs. Saab has integrated an wide area display in the cockpit, which can be easily configured with the information the pilot wants to see at any given time. For example, at the take-off and landing phase, it can show flight, fuel, engine, speed and altitude data. Or during the mission tactical data, weapons, radar and the enemy's position on the surface and in the air. This keeps the pilot focused on what is most important at that time. When the time comes for improvements and modernization, these can be made by updating the hardware and software independently of each other, thus reducing the time and costs to do so while enhancing capability. Adding all these features and capabilities together makes Gripen the Smart Fighter and capable of defeating any threat, today or tomorrow.

GRIPEN

Built by Canada



A fighter jet is key to Canadian sovereignty, prosperity and security. Only one advanced aircraft brings all these pieces together – Gripen.

This future-proof fighter will be built and sustained, with future enhancements, by Canadians in Canada, securing NORAD and NATO obligations, and strengthening Canadian sovereignty. This means Gripen will create new, high-value jobs across Canada, boosting Canadian knowledge, expertise, security and economic prosperity for decades to come.

Gripen: the smarter choice for enhancing Canadian sovereignty.

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