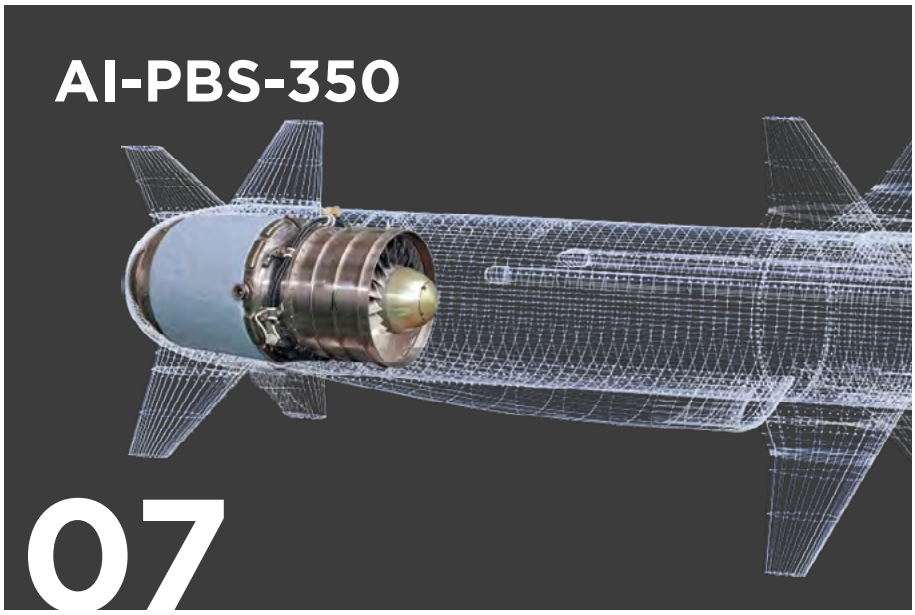
PBS INDIA MAGAZINE

PARTNERSHIP BUSINESS PRUDUCTS COMPANY

PBS INDIA

Contents



PBS INDIA PRIVATE LIMITED: Market Expansion in India and Southeast Asia

PBS, with its 200-year history, is among the world's most established engineering brands. After registering the PBS brand in India in 1955, we've focused on the aviation and space industries, particularly in research and development. Our key products for these sectors include turbojet and turboprop engines, auxiliary power units (APU), environmental control systems (ECS), and foundry products.

India's vision to be a global leader in self-reliant defence technologies aligns with our product range, positioning us as a potential significant contributor to this mission. The Southeast Asian landscape also holds promise, paving the way for potential expansions and strengthened partnerships. Our commitment to India goes beyond business. It's about building a lasting, mutual partnership, further highlighted by the formation of PBS INDIA PRIVATE LIMITED. Our collaborations span a broad spectrum, involving the Indian Air Force, private UAV sector entities, and prominent state-owned enterprises.

The ‚Make in India' initiative offers opportunities for collaboration. During the Covid-19 pandemic, we provided support to India, showing our dedication. Based in Bangalore, our influence is felt across India. Our participation in events like Aero India and DefExpo is a testament to our commitment. The support we receive from the Czech Republic's representation in New Delhi and our relationship with the Indian Embassy in Prague emphasizes the trust between our nations.

Petr Motyl, CEO,
PBS INDIA PRIVATE LIMITED

PBS GROUP International Activities

PBS and Pratt & Whitney Join Forces for Next-Gen APU

PBS has signed a Memorandum of Understanding (MoU) with Pratt & Whitney (P&W) to explore next-generation auxiliary power unit (APU) development. The collaboration aims to meet future fixed-wing and rotorcraft needs while accommodating hybrid-electric propulsion systems, expanding its versatility. This partnership is set to redefine APU standards, with a groundbreaking design expected in five years.

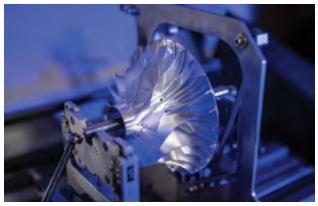
AI-PBS-350 Turbojet: PBS and Ivchenko-Progress Collaborate

PBS and Ivchenko-Progress SE are co-developing the AI-PBS-350, a 3,400 N turbojet optimized for defense unmanned aerial vehicles. Featuring cutting-edge technology like a four-stage axial compressor and single-stage axial turbine, the engine represents a leap in compact, high-performance design. The partnership also extends to other aerospace, defense, and energy projects, cementing a long-term, mutually beneficial collaboration.

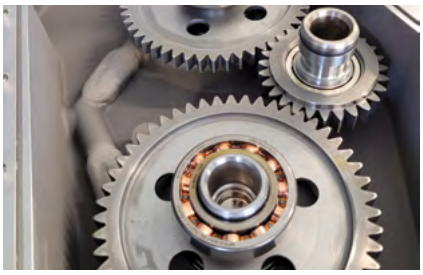
PBS Partners with Lockheed Martin on F-35 Development

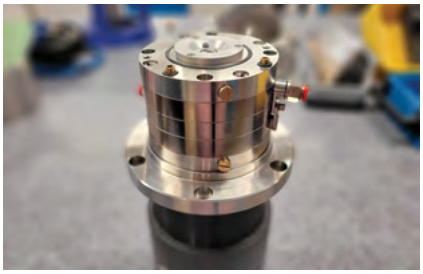
PBS, alongside Czech companies ONE3D and HiLASE, is collaborating with Lockheed Martin on the F-35 aircraft's integrated power package exhaust screen. The agreement, signed in May 2024, aims to qualify for the F-35 supply chain by 2029. This partnership enhances PBS's global aerospace presence while advancing Czech industry through innovation and rigorous quality standards.

About Us



PBS Velka Bites production plant





For over 200 years, PBS has been a leading engineering company globally recognized as one of the industry's oldest and most respected brands.

Our expertise lies in manufacturing turbine engines designed for UAVs, UCAVs, target drones and other aircraft. Our development in this field currently focuses on optimizing existing engines for specific customer needs and developing new engines with increased thrust.

We have over 50 years of experience developing and supplying Auxiliary Power Units (APU) and Environmental Control Systems (ECS), which are crucial for ensuring optimal performance and reliability in aircraft operations.

PBS is also one of Europe's leading nickel and cobalt-based superalloy castings suppliers. Our precision castings are used in various industries, including aviation, power engineering, transport, glass, and healthcare.

Furthermore, PBS is at the forefront of cryogenics, leading the way in developing solutions for the world's largest manufacturers of gas liquefaction systems. Our experience also includes collaborations with renowned research institutions.

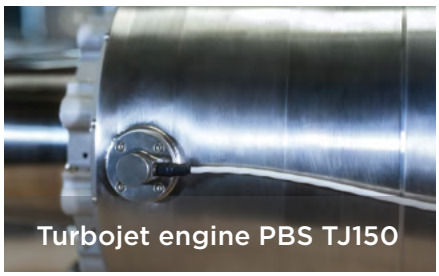
Our commitment to excellence is further strengthened by ongoing investment in advanced R&D initiatives and modern testing facilities. These facilities not only enable comprehensive product testing, but also drive advancements in aerospace engineering.

At our test facility, we utilize 16 specialized test cells dedicated to testing turbine engines, APUs, and air conditioning systems. We conduct high-speed jet engine tests up to Mach 0.9, ensuring our products consistently meet high standards of performance and reliability. Separate test cells are also available for thorough testing of cryogenic products, demonstrating our adaptability and dedication to addressing diverse engineering challenges.

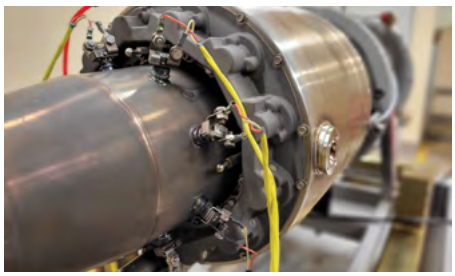
Supported by a strong R&D team, PBS has successfully launched six distinct engine programs in the past two decades. Recent advancements include pyrotechnic ignition for our engines tailored for in-flight launch applications. We also introduced the AI-PBS-350 jet engine, which stands as our most powerful product yet, expanding our thrust range up to 3400N.

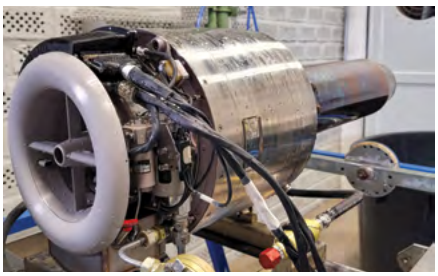
From our state-of-the-art manufacturing facilities to our rigorous quality control processes, PBS ensures that every product meets the highest standards of performance and durability.

Turbojet engine PBS TJ100



Turbojet engine PBS TJ150



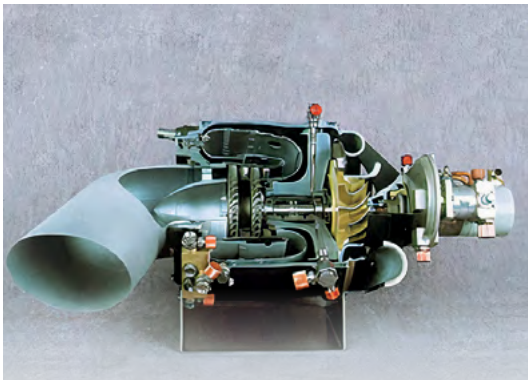


2024

PBS, ONE3D, HiLASE and Lockheed Martin have established a development consortium

2020

Establishment of PBS INDIA PRIVATE LIMITED in India



1973

Commencement of the development of generators and auxiliary power units

2003

Commencement of the serial production of jet engine TJ100

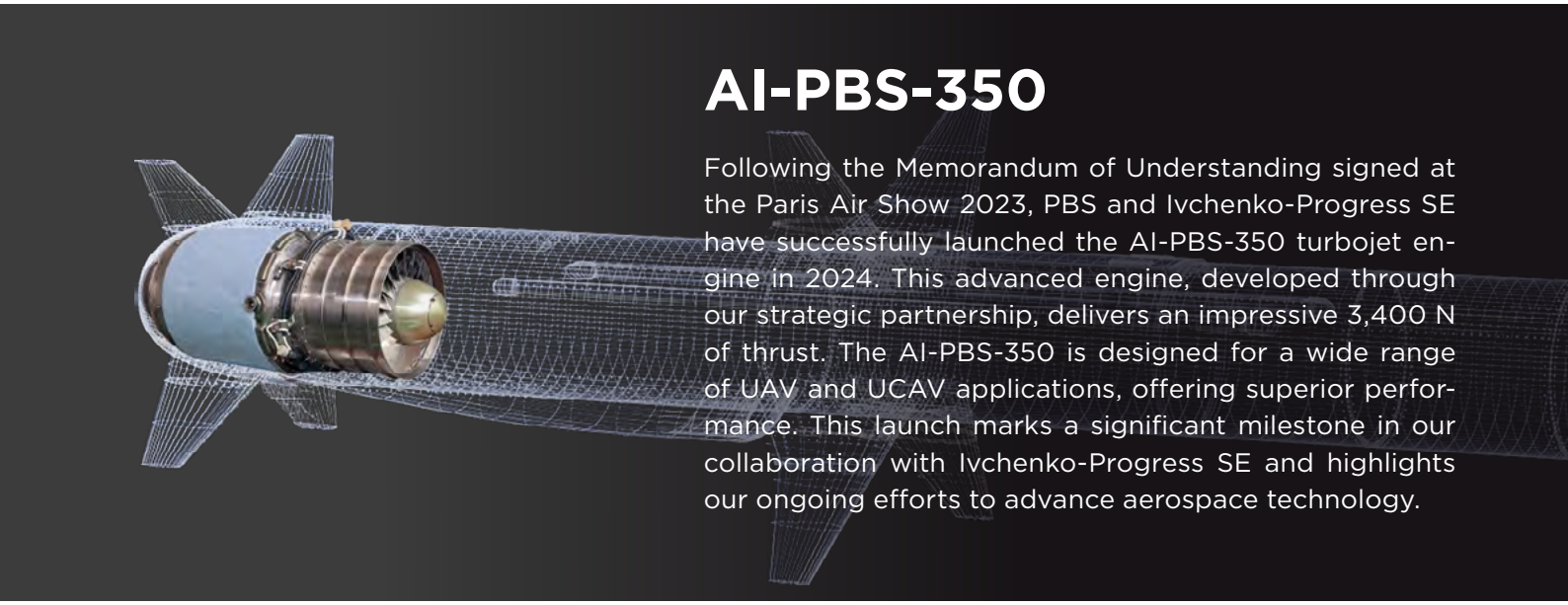
1955

Registration of PBS brand in India

1814

Establishment of the machine works in Slapanice, the foundation of Prvni brnenska strojirna by Jan Reiff

Highliht s

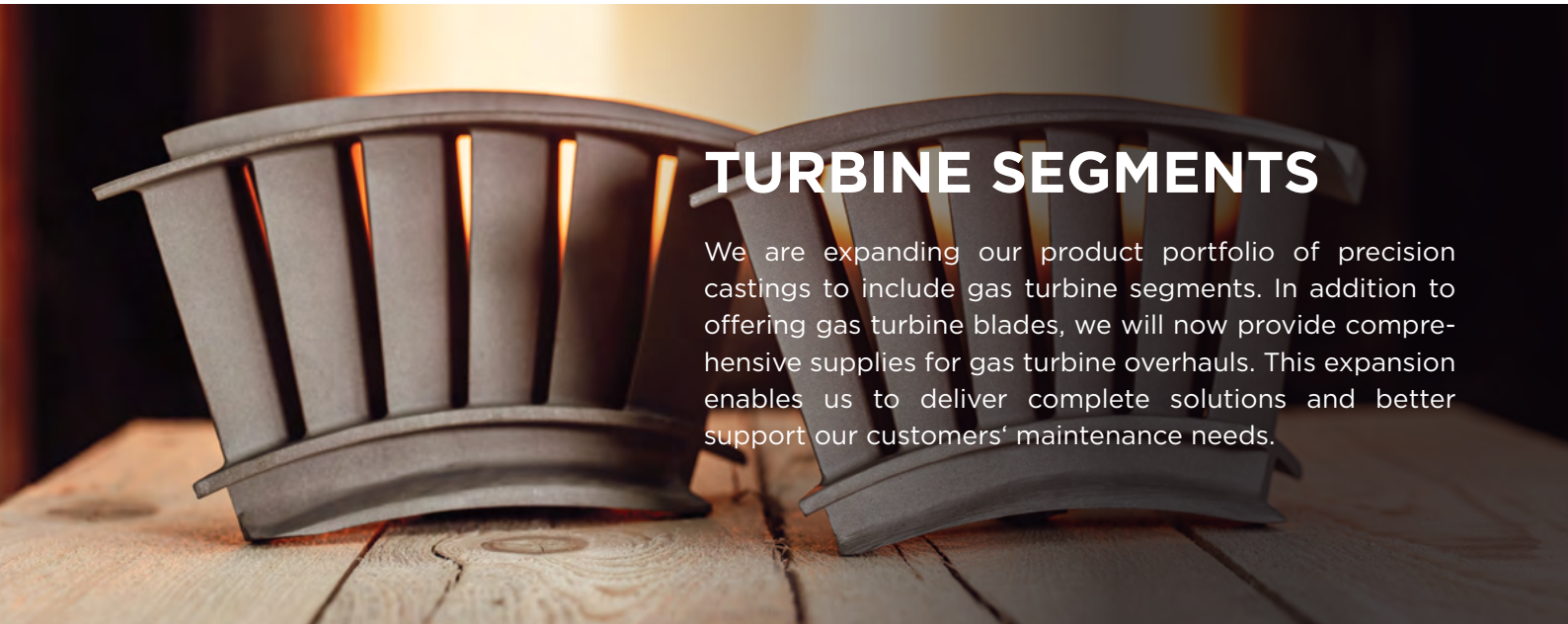


AI-PBS-350

Following the Memorandum of Understanding signed at the Paris Air Show 2023, PBS and Ivchenko-Progress SE have successfully launched the AI-PBS-350 turbojet engine in 2024. This advanced engine, developed through our strategic partnership, delivers an impressive 3,400 N of thrust. The AI-PBS-350 is designed for a wide range of UAV and UCAV applications, offering superior performance. This launch marks a significant milestone in our collaboration with Ivchenko-Progress SE and highlights our ongoing efforts to advance aerospace technology.

PBS APU SPARK40

At the Paris Air Show 2023, PBS proudly introduced the new PBS APU SPARK40 auxiliary power unit. This innovative APU doubles the AC power available for onboard systems while also providing increased amounts of compressed air. Additionally, the PBS APU SPARK40 is lighter, features an expanded operating envelope, and has an optimized fuel-oil system. The unit also offers improved reliability and an extended lifespan for the combustion chamber.



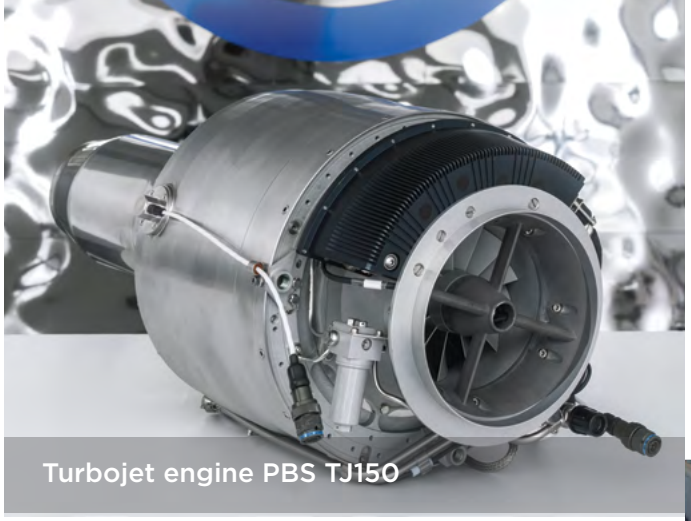
TURBINE SEGMENTS

We are expanding our product portfolio of precision castings to include gas turbine segments. In addition to offering gas turbine blades, we will now provide comprehensive supplies for gas turbine overhauls. This expansion enables us to deliver complete solutions and better support our customers‘ maintenance needs.

PRECISION ENGINEERING AT ITS BEST

AIRCRAFT ENGINES

PBS designs and produces a range of turbojet, turboprop, and turboshaft engines known for their high-performance capabilities in both manned and unmanned aircraft systems. Different versions of these engines are tailored specifically for defence applications, including missile systems. Our reliability is demonstrated by widespread use across UAVs, airborne targets, microjets, and light helicopters.



Turbojet engine PBS TJ150

APU - AUXILIARY POWER UNITS

As a certified manufacturer of APUs under EASA regulations, PBS specializes in tailoring our products to meet customer-specific requirements. PBS APUs are widely integrated into medium helicopters and training aircraft worldwide due to their proven reliability and performance.

PBS APU SPARK40

ECS - ENVIRONMENTAL CONTROL SYSTEMS

Our ECS solutions are designed to meet specific customer requirements effectively. With a substantial number of PBS ECS units produced and installed to date, they are predominantly utilized in medium helicopters and training aircraft, while also being adaptable for use in light transport aircraft and business jets.

Example of ECS installation

INVESTMENT CASTING

We are proud to introduce ourselves as one of the most modern precision casting foundries in Central Europe with a rich history dating back to 1969. Our goal is to gain visibility on the international stage and offer a wide range of precision casting services for the aerospace, power engineering, construction, and other industrial sectors. Our foundry is equipped with the most modern equipment for all stages of the precision casting process, from metal melting to the final product.

This allows us to produce high-quality castings from a wide range of materials like nickel and cobalt superalloys. We offer comprehensive services from design casting, simulation of solidification, reverse engineering and after casting also machining to the final product. Our castings are characterized by their high durability and meet even the most demanding customer requirements.

Our highest specialization is the production of impellers for turbocharger and aircraft engine, further blades for gas turbines, spinner discs for glass wool production, and femoral components. Thanks to our innovative technologies and experience, besides these segments, we are a reliable partner also for major suppliers to many other industrial areas.

We are flexible and can adapt to the individual needs of our customers. We are also aware that by meeting deadlines and ensuring the requested quality requirements, thus building long-term and reliable partnerships with our customers. We believe that our advanced technologies, wide range of materials, high-quality services, and extensive experience make us the ideal partner for your precision casting projects. We look forward to working with you and helping you achieve your goals.

VACUUM FURNACE

We are expanding our precision casting technology. Currently, we are acquiring a new vacuum furnace and a new annealing furnace. These investments will enhance our capacity and technological capabilities in precision casting.

Casting of turbine wheel

CRYOGENICS

Since the late 1980s, we have specialized in designing and supplying cryogenic turbines for the liquefaction of inert gasses, such as helium. Today, we are a key provider of turboexpanders, compressors, and pumps to top global manufacturers of cryogenic systems.

Turboexpander

TURBOEXPANDERS

Our turboexpanders enhance efficiency by recovering energy in industrial processes. These devices are vital in liquefaction of inert gases and reducing operational costs. Our advanced designs, including eddy current brakes, ensure exceptional performance and reliability to meet modern industry demands.

SURFACE TREATMENTS

Our electroplating plant has been providing its services to internal and external customers for more than forty years. We offer anodizing, blackening, zinc plating, tin plating, nickel plating and other surface treatments in top quality and with a responsible professional approach to every job.

Blackening

GLOBAL AEROSPACE INNOVATION

"INSPIRING SUCCESS STORIES"

TURBOJET INNOVATIONS AT HIMTECH 2024

PBS India Showcases Turbojet Innovations at HIMTECH 2024

PBS India proudly participated in HIMTECH 2024, a premier event organized by FICCI and the Indian Army at the Rinchin Auditorium in Leh, Ladakh. This event provided a unique platform to showcase our advanced technologies tailored for high-altitude operations, reinforcing our commitment to innovation in aerospace and defense.

Cutting-Edge Applications for High-Altitude Operations

We presented two key applications that highlight the unmatched performance of turbojet engines in challenging environments:

Jet-Based Kinetic Kill Solution: Designed for precision strikes, this solution underscores the power and reliability of jet technology in defense scenarios.

Heavy Weight-Lift Application: Developed for high-altitude operations, this application leverages turbojet engines to overcome the limitations of electric propulsion, ensuring consistent performance even in low-oxygen conditions.

The critical advantage of turbojet engines lies in their ability to maintain consistent thrust in thin air, where electric propulsion systems often falter. Above altitudes of 3,500 meters, turbojet-powered drones excel with superior power output and reliability. This makes them ideal for high-altitude missions that demand extended range, heavy payload capacity, and dependable performance, even in extreme cold where batteries lose efficiency.

Overcoming Challenges in Ladakh's Extreme Conditions

Operating in the high-altitude environment of Ladakh required meticulous preparation. Our team underwent a two-day acclimatization process to adapt to the low oxygen levels, where even basic activities like walking were physically taxing. Despite these challenges, the event proved to be an invaluable experience, offering insights into the operational needs of high-altitude missions.

Engaging with Industry Leaders and Stakeholders

HIMTECH 2024 facilitated productive interactions with senior leadership of the Indian Army, drone manufacturers, and government officials. These discussions highlighted the innovative capabilities of the TJ40 engine, particularly its adaptability for high-altitude applications. Participants were impressed with the engine's ability to handle extreme conditions, positioning it as a game-changer for defense and aerospace sectors.

Feedback and Future Prospects

The event underscored the growing interest in turbojet-powered solutions for high-altitude logistics. Attendees appreciated the robust performance of our technologies, recognizing their potential to revolutionize operations in demanding terrains. With the TJ40 engine, PBS India continues to lead in delivering cutting-edge solutions that meet the evolving needs of our clients.

SAFIR 5K/G MI: APU FOR INDIAN HELICOPTERS

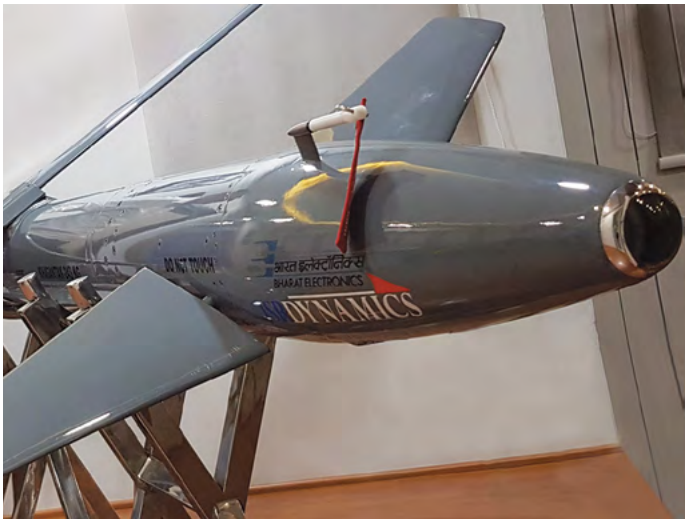
With more than 50 years of experience in aviation and defence and over 6,000 APUs supplied, PBS is a valuable partner for the Indian Air Force fleet of Mil Mi-8/17 helicopters. Many of them are flying with our SAFIR 5K/G MI APUs installed. We are able to offer alternatives to third-party APUs with better tactical/technical specifications suited ideally for harsh climatic conditions. Moreover, PBS is currently focusing its APU R&D activities towards APUs with enhanced performance specially designed for future helicopter programs.

Mil Mi-17 V5 equipped with SAFIR 5K/G MI APU

SELECTED INDIAN CUSTOMERS REFERENCES

We are building on our successful activities in India as suppliers of turbine engines for UAVs, UCAVs, aerial targets and missiles.

Here you can see one example of our successes in this area of cooperation with Indian manufacturers. They chose one of our PBS jet engines for their applications.



New UAV system developed in Indonesia

CVD INDONESIA

PBS collaborates with VLR of PT CVD (Vimana Laboratory & Research of PT Cakra Vimana Dinamycx) in Indonesia, a Research & Design Bureau specializing in scientific research, industrial applications, and defence and security systems. Registered with the Indonesian Ministry of Justice and Human Rights and Indonesian Ministry of Defence and partnered with the Indonesia Ministry of Research and Technology, VLR engages in conceptual design, research and development, engineering solutions, and services.

Since 2018, PBS Velka Bites has partnered with VLR to integrate turbojet engines into their aerial vehicle research, including flying test beds and target drones for air defence training. VLR of PT CVD selected PBS turbojet engines for their reliability, high-grade manufacturing quality, and affordability, suitable for professional and industrial applications.

Recently, PT CVD representatives visited PBS to explore new mutually beneficial projects. They plan to integrate more PBS solutions in their projects within Indonesia and internationally to ensure dependable outcomes in the years ahead.

TL ULTRALIGHT WITH PBS TP100

The StreamTurbo aircraft, manufactured by TL Ultralight, is designed as a lightweight, turboprop, two-seat trainer. Equipped with our PBS TP100 turboprop engine, renowned for its excellent performance and reliability, the aircraft has a takeoff weight of 800 kg. The StreamTurbo is suitable not only for training military pilots but also for use in the private sector. This collaboration highlights the successful combination of innovative aircraft design with the advanced engineering of our engine.

AERO VODOCHODY AEROSPACE A.S.

L-39 NG

The training and light attack jet aircraft L-39NG marks a new era of advanced and cost-effective jet training, building upon the proven reliability and legacy of the historic L-39 Albatros. It continues the tradition of the world's most widely utilized trainer aircraft, and we are proud to contribute to its ongoing success.

AERO Vodochody AEROSPACE a.s. is the largest aircraft manufacturer in the Czech Republic. It is one of the oldest aircraft manufacturers in the world.

As early as 1969, the turbostarters for the AI-25W jet engines of the L-39 Albatros trainer aircraft were the first PBS products for the aerospace production programme. In the following years, they were replaced by the production of the Safir 5 air generator, the predecessor of today's Safir 5K/G APU, which is still one of the key products of the Aircraft Division. In 1972, we also delivered the first 11 of the 4,500 sets of environmental control systems for the L-39.

50+ years of successful cooperation

The L-39 Albatros gained worldwide popularity mainly due to its flight characteristics, ease of control, and high reliability. Almost 2,900 of these aircraft were built between 1971 and 1997.

We believe that the very successful cooperation between PBS and Aero Vodochody, which has lasted for over 50 years, will continue and that new or upgraded aircraft with PBS equipment and components will continue to win accolades and demonstrate the high level of the Czech aviation industry all over the world.

CZECH ARMY USES SAFIR 5K/G MI APU

The SAFIR 5K/G MI auxiliary power unit (APU) manufactured by PBS has been successfully integrated into the Czech Army's Mi-171Sh transport helicopters, demonstrating exceptional reliability and performance over an extended period. This collaboration not only enhances the operational efficiency of the Mi-171Sh helicopters but also stands as a significant example of Czech engineering and technological capabilities in military aviation support systems. It reflects a strong partnership focused on maintaining high standards in aviation technology.

Helicopter Mi-17

Helicopter Mi-17

SUPPORTING OPERATIONS ACROSS DIVERSE LANDSCAPES

Our APUs excel in extreme climatic conditions and high altitudes, providing a crucial advantage in challenging environments like the Peruvian Andes.

We take pride in supporting the operation of Mi-17 helicopters equipped with our SAFIR 5K/G MI auxiliary power unit (APU) in South America. With a substantial fleet relying on our technology, we ensure seamless support of the operation of our APUs through spare parts deliveries and expert overhauls.

Additionally, within the European Union, we closely collaborate to support Mi-17 helicopter operations in Poland. These helicopters are equipped with the SAFIR 5K/G MIS variant of our APU.

We offer comprehensive services, including training opportunities and equipment testing for the Mi-17 V5, ensuring our customers receive exceptional support tailored to their operational needs.

ACC GROUP AB

Fighting Fires Together

This heavy-lift drone can carry the heaviest payloads in its category. Featuring a modular design and powered by a turbine engine, it utilizes a patented propulsion system that ensures mechanical rotor drive. Primarily, this drone is used for firefighting.

Thunder wasp drone

The Swedish company ACC Group AB, based in Åtvidaberg, Sweden, has been manufacturing autonomous and remotely controlled drones for many years. PBS proudly joined their Thunder Wasp large drone project.

Currently, ACC is working on two development configurations: one designed for firefighting with a standard Bambi bucket, and another equipped with a special container tank that enables the drone to collect water while hovering close to the water surface.

Cutting-Edge Firefighting Capabilities

The engineers at ACC Group AB have elevated firefighting capabilities to new heights by selecting the PBS TS100 turboshaft engine for their innovative Thunder Wasp drone. This powerful engine is the perfect fit for the challenging tasks this drone is designed to tackle. Its compact size supports a sleek and agile design, crucial for maneuvering through tight spaces and navigating obstacles in fire zones.

Unmatched Power

Despite its compact size, the TS100 packs a serious punch, delivering an impressive 180 kW of continuous power. This ensures the Thunder Wasp can maintain its effectiveness even in high-altitude operations. This robust engine is designed to handle the toughest firefighting missions, providing the necessary power and reliability to tackle extreme conditions. Its performance is uncompromised by harsh environments, making it an ideal choice for the demanding nature of aerial firefighting.

A new twin-engine version of the Thunder Wasp is currently in development, which will significantly increase its payload capacity. The current model already boasts an impressive payload capacity of 400 kg, but the upcoming twin-engine variant aims to nearly double that capacity to almost 1,000 kg. This enhancement will further solidify the Thunder Wasp‘s position

SONEX AIRCRAFT SUBSONEX

The exceptional power-to-weight ratio of up to 1,250 N (292 lbf) combined with low fuel consumption in its thrust category, along with high reliability and advanced technical capabilities, led Sonex Aircraft to select the PBS TJ100 engine for their SubSonex Personal Jet. Introduced at AirVenture 2009, the SubSonex JSX-1 prototype successfully completed its maiden flight in August 2011 after being outfitted with the PBS TJ100 engine. A rigorous flight test program was completed in 2012, establishing its reliability. Today, numerous SubSonex aircraft are operational across the United States.

LEONARDO MIRACH 100/5

We proudly collaborate with Leonardo in enhancing the Mirach 100/5 training target. This training drone has been a cornerstone of Leonardo's portfolio for decades, widely adopted by international navies and air forces. Sixteen armed forces, including Belgium, Denmark, France, Germany, Greece, Italy, Spain, and the United Kingdom, have utilized the Mirach 100/5 for their training needs.

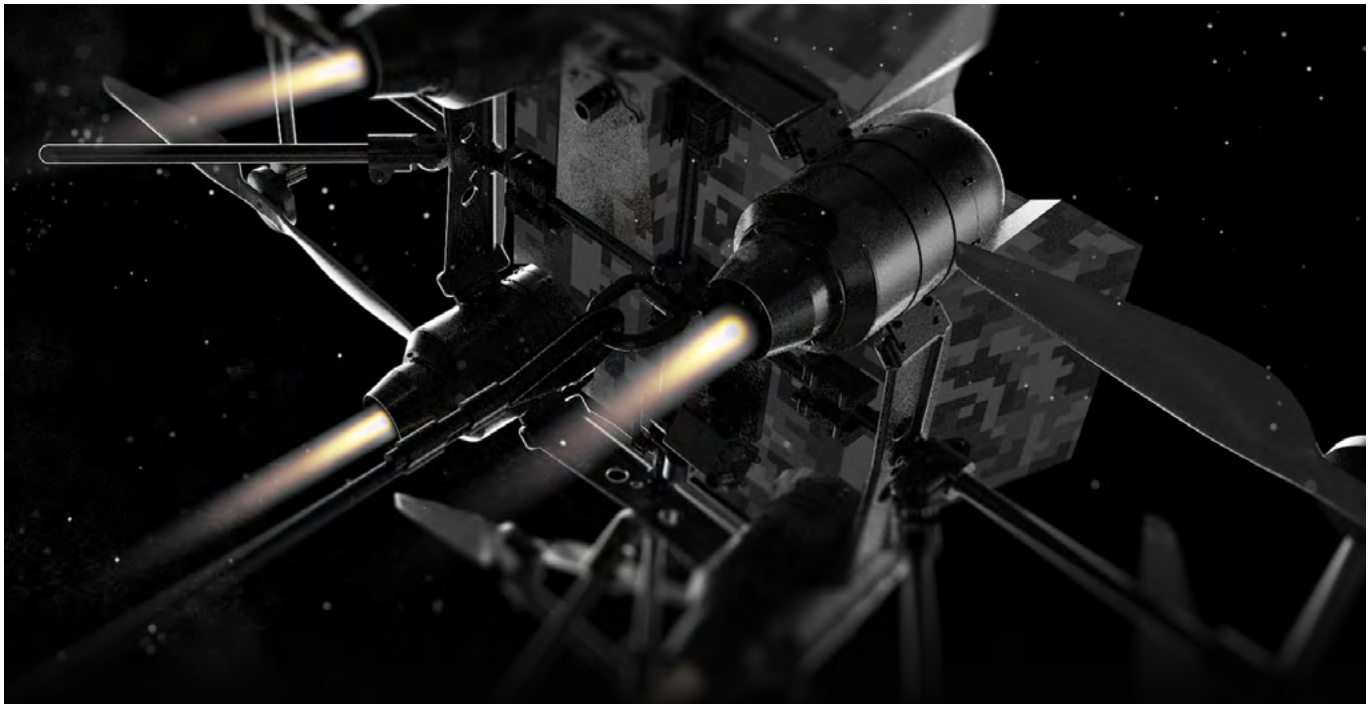
The upgraded Mirach 100/5 V2 represents the evolution of this successful platform, featuring mid-life enhancements such as the integration of the PBS TJ150 engine, advanced avionics, and enhanced reliability. It accurately simulates enemy aircraft and incoming missiles in training scenarios, providing realistic radar and weapon system training opportunities for armed forces.

Launch of the Mirach 100/5 aerial target


INTA aerial target

INSTITUTO NACIONAL DE TÉCNICA AEROESPACIAL: THE FIRST CUSTOMER

The first customer for the PBS TJ100 engine was INTA, the Spanish manufacturer of aerial target drones. Thanks to the continuous innovation process and more than 20 ongoing customer modifications, our jet engines have gradually gained customers in more than twenty countries. The degree of customization is a major advantage of PBS engines.



HYDRADRONES HYDRA

Combining the high specific thrust of PBS jet engines, with the quick response times of BLDC motors, the British company created an immensely powerful and maneuverable UAV. Being a VTOL, it does not require a runway to operate and can take off and land on virtually any flat surface. Due to the Extremely high energy density of jet fuel (12 kWh/kg) compared to batteries (<200 Wh/kg), Hydra is able to pack huge amounts of power into a small, lightweight form factor.

The advanced AI-powered sensor suite enables Hydra to operate GPS-denied environments. Using a long line and cargo net made of Kevlar, Hydra can carry up to 140 kg in a standard NATO half pallet.

CZECH CONSORTIUM AND LOCKHEED MARTIN LAUNCH COLLABORATIVE DEVELOPMENT PROJECT

F-35A Lightning II

A consortium of companies PBS, ONE3D, the HiLASE Centre of the Institute of Physics of the Academy of Sciences, and American Lockheed Martin launch a development collaboration

The consortium, composed of three companies – the hi-tech aerospace manufacturer PBS Group, the leader in additive manufacturing ONE3D, and the leading research Centre HiLASE of the Institute of Physics of the Academy of Sciences – today ceremonially signed a collaboration agreement with the leading American company in the aerospace and defense industry, Lockheed Martin.

Signing the Contract

The subject of the four-party agreement is co-operation on the development and qualification of an alternative manufacturing process for the F-35 aircraft's integrated power package exhaust screen. The goal is to join the F-35 supply chain, which is composed of global companies supporting the program.

Only the most technologically advanced companies that must undergo a complex certification process can succeed in contributing to the program. The PBS-ONE3D-HiLASE consortium aims to achieve qualification by 2029 with the potential to become part of Lockheed Martin's supply chain.

The project will utilize the latest technologies such as additive manufacturing, laser surface enhancement and advanced heat treatment in a vacuum furnace. The result will be an innovative production of a special component that is part of the F-35 aircraft.


Members of the Consortium and Lokheed Martin

(from left: David Baker, Lockheed Martin; Pavel Čechal, PBS GROUP; Michal Prouza, HiLASE and Tomáš Dokoupil, ONE3D

WE ARE EXPANDING

MAKE IN INDIA, TRUSTED WORDLWIDE

Advancement in Overseas Production with Focus on India and the USA

We are steadily advancing in our global strategy by laying the groundwork for localized production facilities in key markets, including the United States and India. These efforts reflect our commitment to strengthening our international presence, building robust supply chains, and delivering top-quality products closer to our customers.

Breaking New Ground in the United States

In late 2024, we successfully tested our first jet engines finalized in the United States. This milestone highlights the technical maturity of our products and confirms our readiness to invest in the localization and expansion of production in this crucial market. A planned investment of 20 million USD will support the creation of production conditions and supply chains necessary for fully assembling and testing jet engines using U.S.-manufactured parts by 2025.

The recent engine tests, carried out under the strictest aviation industry standards, underline our commitment to reliability and safety. These achievements are part of our strategy to strengthen relationships with key partners and customers in the U.S. while developing technological cooperation on a global scale.

Preparing for High-Altitude Innovations in India

Simultaneously, we are advancing plans to establish production capabilities in India, aligning with the country's growing demand for aerospace solutions tailored to challenging environments. Following our successful participation in HIMTECH 2024 in Ladakh, where we showcased turbojet-powered high-altitude logistics drones, the Indian branch is gearing up for similar localization efforts. By leveraging the expertise gained in the U.S., we aim to build a robust supply chain and establish production conditions that address India's unique operational needs.

Turbojet-powered solutions, such as those designed for high-altitude missions, exemplify the technological innovation that we are bringing to India. These engines provide consistent thrust in low-oxygen environments above 3,500 meters, where electric propulsion systems struggle. Their superior performance ensures reliability and range, making them ideal for defense and logistics applications.

A Unified Vision for Global Excellence

Our efforts in both the United States and India underscore our dedication to delivering reliable, efficient, and innovative solutions worldwide. By establishing localized production facilities, we not only reduce lead times but also foster closer relationships with our clients, meeting their demands with unparalleled precision.

PBS GROUP'S PARTNERSHIP WITH CZECH GOVERNMENT BOOSTS GLOBAL PRESENCE

Czech Prime Minister


Minister for Industry and Trade

Minister of Defence

Building a Strategic Path with the Czech Government

PBS GROUP greatly values the support from the Government of the Czech Republic, including the Ministry of Defence, the Ministry of Industry and Trade, and the Ministry of Foreign Affairs. Cooperation with these administrations is essential for our growth and global market success.

As a strategic enterprise of the Ministry of Defence, we receive considerable support. Last year, Defence Minister Jana Cernochova visited our production facility in Velka Bites and endorsed our projects. We appreciate the efforts and the support of the Ministry of Defence's Industrial Cooperation Section, which is crucial for developing key projects. As a result, we signed significant contracts with the leading American company Lockheed Martin in May 2024 for the F-35 aircraft component development. Alongside our partners ONE3D and Hilase, PBS GROUP will develop and provide components for the aircraft production supply chain.

The Agency for Intergovernmental Defence Cooperation (AMOS) is another vital partner within the Ministry of Defence. Together, we are implementing projects to support Ukraine, a war afflicted country. Our long-term assistance to Ukraine is a critical part of our strategy and activities in humanitarian aid.

The Ministry of Industry and Trade plays a pivotal role in the expansion of our business activities. It supports our participation at international trade fairs and exhibitions, enabling us to showcase our products and seize new opportunities. These activities are closely tied to the Ministry of Foreign Affairs' economic diplomacy initiatives, enhancing our involvement in trade missions and the acquiring valuable contacts in our target regions. Additionally, the CzechTrade agency and Czech embassies worldwide provide substantial assistance in our export activities.

Cooperation with the Licensing Administration and the Department of Common Foreign and Security Policy of the Ministry of Foreign Affairs is crucial for the export of our products. Their guidance and assistance are indispensable for the process of successfully obtaining the necessary export licenses.

PBS GROUP is also involved in industry associations and chambers like the Association of the Czech Aerospace Industry, Defence and Security Industry Association, the Chamber of Commerce, and the Confederation of Industry of the Czech Republic. Their support for companies in our sector, as well as their efforts to promote Czech industry domestically and internationally, is invaluable.

Collaboration with the Czech Government is fundamental to our success and global expansion, empowering us to innovate and strengthen our market position.

PBS TURBINE ENGINE PORTFOLIO

PBS TJ40






PARAMETERS	PBS TJ40-G1		PBS TJ40-G2		PBS TJ40-G1NS	
Thrust	395 - 425 N	89 - 96 lbf	395 - 425 N	89 - 96 lbf	395 - 425 N	89 - 96 lbf
Power supply	14 V DC	14 V DC	28 V DC	28 V DC	14 V DC	14 V DC
El. power output	150 W	150 W	1,100 W	1,100 W	150 W	150 W
SFC	0.147 kg/N/h	1.442 lb/lbf/hr	0.147 kg/N/h	1.442 lb/lbf/hr	0.147 kg/N/h	1.442 lb/lbf/hr
TBO	50 hrs	50 hrs	50 hrs	50 hrs	50 hrs	50 hrs

DIMENSIONS

Outer diameter	147 mm	5.79 in	147 mm	5.79 in	147 mm	5.79 in
Length	304 mm	11.97 in	373 mm	14.69 in	304 mm	11.97 in
Weight	3.40 kg	7.50 lb	3.80 kg	8.38 lb	3.60 kg	7.94 lb

OPERATING ENVELOPE

Max. altitude	9,000 m	29,528 ft	9,000 m	29,528 ft	9,000 m	29,528 ft
Max. speed	0.8 M	0.8 M	0.8 M	0.8 M	0.8 M	0.8 M
Ambient temperature	-50/+50 °C	-58/+122 °F	-50/+50 °C	-58/+122 °F	-50/+50 °C	-58/+122 °F

STARTING ENVELOPE

Max. altitude	4,500 m	14,764 ft	4,500 m	14,764 ft	4,500 m	14,764 ft
Max. speed	0.35 M	0.35 M	0.35 M	0.35 M	0.15 M	0.15 M
Ambient temperature	-40/+50 °C	-40/+122 °F	-40/+50 °C	-40/+122 °F	-30/+50 °C	-22/+122 °F

PBS TJ80-90

PARAMETERS	METRIC	IMPERIAL
Thrust	900 N	202 lbf
Power supply	28 V DC	28 V DC
El. power output	650 W	650 W
SFC	0.125 kg/N/h	1.226 lb/lbf/hr
TBO	25 - 50 hrs	25 - 50 hrs

OPERATING ENVELOPE	METRIC	IMPERIAL
Max. altitude	10,000 m	32,808 ft
Max. speed	0.9 M	0.9 M
Ambient temperature	-50/+45 °C	-58/+113 °F

DIMENSIONS	METRIC	IMPERIAL
Outer diameter	235 mm	9.25 in
Length	636 mm	25.04 in
Weight	12.80 kg	28.22 lb

STARTING ENVELOPE	METRIC	IMPERIAL
Max. altitude	6,000 m	19,685 ft
Max. speed	0.6 M	0.6 M
Ambient temperature	-35/+45 °C	-31/+113 °F

PBS TJ80-120

PARAMETERS	METRIC	IMPERIAL
Thrust	1,200 N	269 lbf
Power supply	28 V DC	28 V DC
El. power output	2,250 W	2,250 W
SFC	0.125 kg/N/h	1.226 lb/lbf/hr
TBO	25 - 50 hrs	25 - 50 hrs

OPERATING ENVELOPE	METRIC	IMPERIAL
Max. altitude	10,000 m	32,808 ft
Max. speed	0.9 M	0.9 M
Ambient temperature	-50/+45 °C	-58/+113 °F

DIMENSIONS	METRIC	IMPERIAL
Outer diameter	235 mm	9.25 in
Length	636 mm	25.04 in
Weight	12.80 kg	28.22 lb

STARTING ENVELOPE	METRIC	IMPERIAL
Max. altitude	6,000 m	19,685 ft
Max. speed	0.6 M	0.6 M
Ambient temperature	-35/+45 °C	-31/+113 °F

PBS TJ100

PARAMETERS	METRIC	IMPERIAL
Thrust	1,100 - 1,250 N	247 - 281 lbf
Power supply	28 V DC	28 V DC
El. power output	700 - 2,300 W	700 - 2,300 W
SFC	0.126 kg/N/h	1.236 lb/lbf/hr
TBO	25 - 300 hrs	25 - 300 hrs

OPERATING ENVELOPE	METRIC	IMPERIAL
Max. altitude	10,000 m	32,808 ft
Max. speed	0.9 M	0.9 M
Ambient temperature	-50/+45 °C	-58/+113 °F

DIMENSIONS	METRIC	IMPERIAL
Outer diameter	272 mm	10.71 in
Length	636 mm	25.04 in
Weight	17.60 kg	38.80 lb

STARTING ENVELOPE	METRIC	IMPERIAL
Max. altitude	6,000 m	19,685 ft
Max. speed	0.6 M	0.6 M
Ambient temperature	-35/+45 °C	-31/+113 °F

PBS TJ150

PARAMETERS	METRIC	IMPERIAL
Thrust	1,500 N	337 lbf
Power supply	28 V DC	28 V DC
El. power output	600 - 2,250 W	600 - 2,250 W
SFC	0.12 kg/N/h	1.138 lb/lbf/hr
TBO	25 - 50 hrs	25 - 50 hrs

OPERATING ENVELOPE	METRIC	IMPERIAL
Max. altitude	10,000 m	32,808 ft
Max. speed	0.9 M	0.9 M
Ambient temperature	-50/+45 °C	-58/+113 °F

DIMENSIONS	METRIC	IMPERIAL
Outer diameter	272 mm	10.71 in
Length	636 mm	25.04 in
Weight	17.10 kg	37.70 lb

STARTING ENVELOPE	METRIC	IMPERIAL
Max. altitude	6,000 m	19.685 lbf
Max. speed	0.6 M	0.6 M
Ambient temperature	-35/+45 °C	-31/+113 °F

PBS TJ200

TECHNICAL PARAMETERS	METRIC	IMPERIAL
Thrust	2,280 N	512.54 lbf
Power supply	28 V DC	28 V DC
Electrical power output	4.0 kW	4.0 kW

OPERATING ENVELOPE	METRIC	IMPERIAL
Max. altitude	10,000 m	32,808 ft
Max. speed	0.95 M	0.95 M

DIMENSIONS AND WEIGHT	METRIC	IMPERIAL
Outer diameter*	246 mm	9.68 in
Length (including exhaust nozzle)	730 mm	28.74 in
Weight	28.0 kg	61.73 lb

*Excluding insulation and equipment

STARTING ENVELOPE	METRIC	IMPERIAL
Max. altitude	6,000 m	19,685 ft
Max. speed	0.4 to 0.8 M	0.4 to 0.8 M

AI-PBS-350

TECHNICAL PARAMETERS	METRIC	IMPERIAL
Thrust	3,400 N	764.35 lbf
Specific fuel consumption	0.125 kg/N/h	1.226 lb/lbf/h
Electrical power output	5.0 kW	5.0 kW

DIMENSIONS AND WEIGHT	METRIC	IMPERIAL
Length	706 mm	27.79 in
Outer diameter	298 mm	11.73 in
Weight	51.0 kg	112.43 lb

APU FAMILY

Following the completion of the development of the new APU and its launch this year, further development work is focused on the development of a next-generation APU that will be able to address current and anticipated future requirements for auxiliary power units in modern aircraft, helicopters, and unmanned aerial vehicles. Thorough market research is underway as well as sub-development work on subsystems of the future new APU.

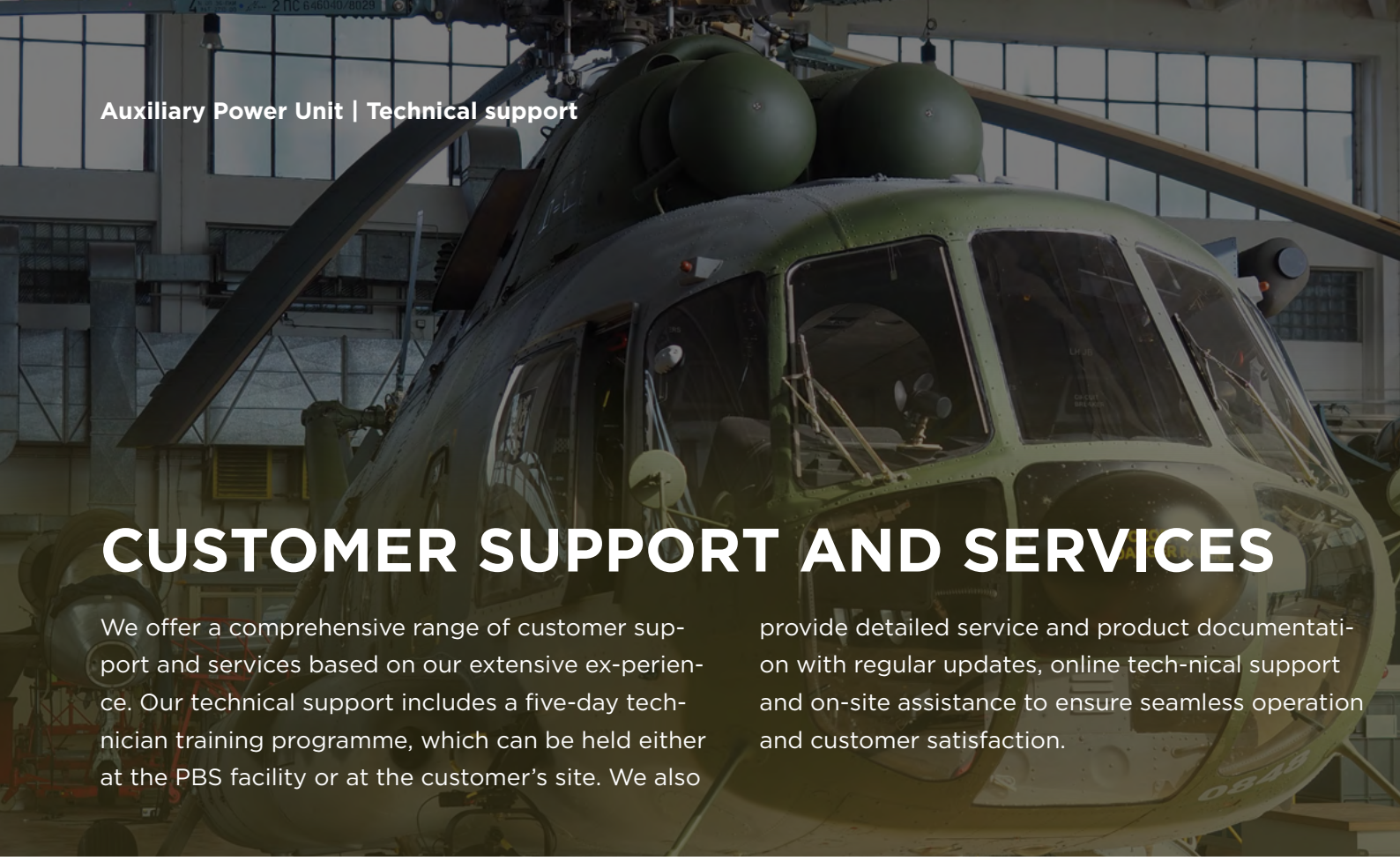
SAFIR 5K/G MI

SAFIR 5K/G MIS

SAFIR 5K/G Z8

PBS APU SPARK40

	SAFIR 5K/G MI	SAFIR 5K/G MIS	SAFIR 5K/G Z8	PBS APU SPARK40
Electrical power output	20 kVA	6 kW	40 kVA	40 kVA
Bleed air extraction	24 kg/min	24 kg/min	18 kg/min	27 kg/min
Specific fuel consumption	55 kg/h	55 kg/h	62 kg/h	60 kg/h
Dry weight	72.0 kg	64.5 kg	74.5 kg	72.0 kg
Max. operating altitude	6,000 m	6,000 m	6,000 m	8,000 m

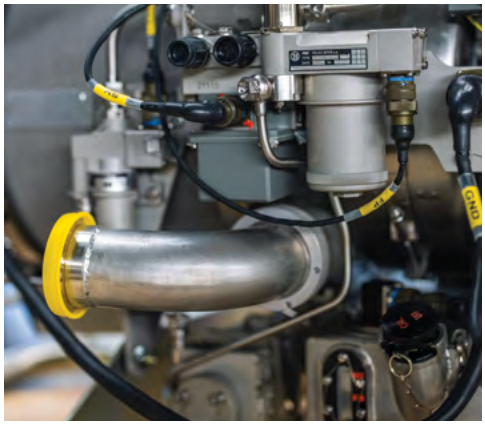


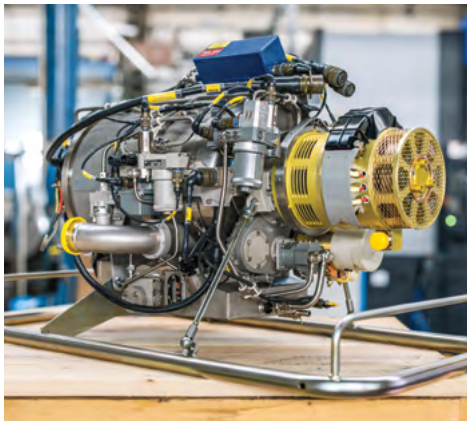
CUSTOMER SUPPORT AND SERVICES

We offer a comprehensive range of customer support and services based on our extensive ex-perience. Our technical support includes a five-day technician training programme, which can be held either at the PBS facility or at the customer's site. We also provide detailed service and product documentation with regular updates, online tech-nical support and on-site assistance to ensure seamless operation and customer satisfaction.

SUPPLY OF SPARE PARTS AND OTHER EQUIPMENT

1. 1:1 Basic spare parts kit for each APU
2. 1:5 Extended spare parts set
3. 1:10 Premium spare parts set
4. Specific delivery of spare parts based on current requirements
5. Optional TEPEJ diagnostic equipment
6. Optional APU PBS service tool set



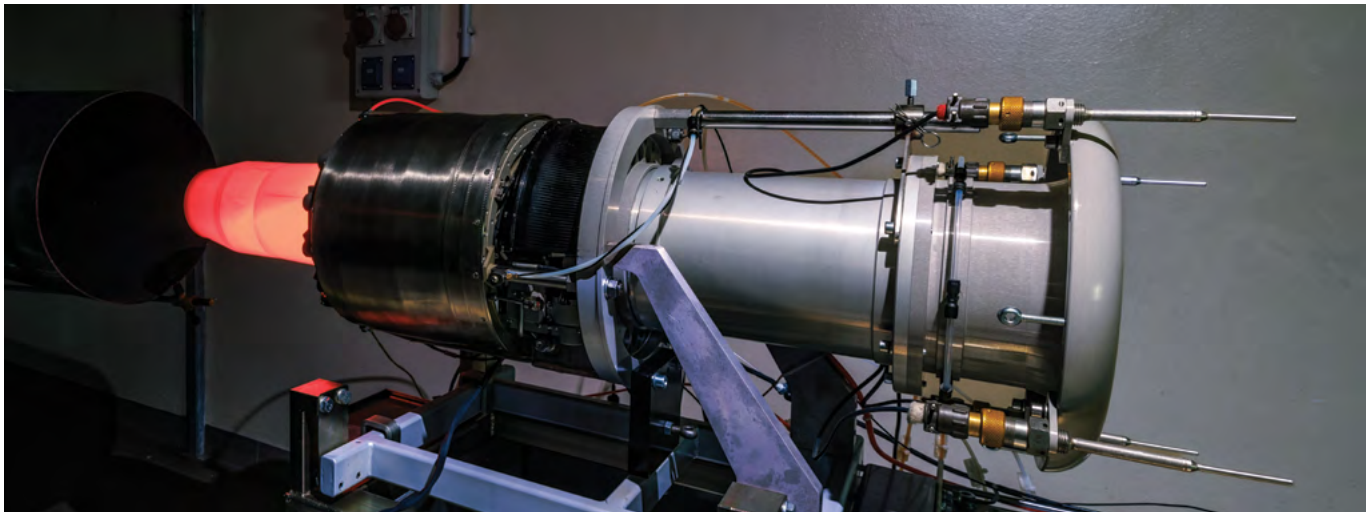


MAINTENANCE, REPAIR, AND OVERHAUL

1. Repairs of APU / components on-site
2. Repairs of APU / components at PBS facility
3. TBO extensions on-site
4. TBO extensions on-line
5. General overhauls

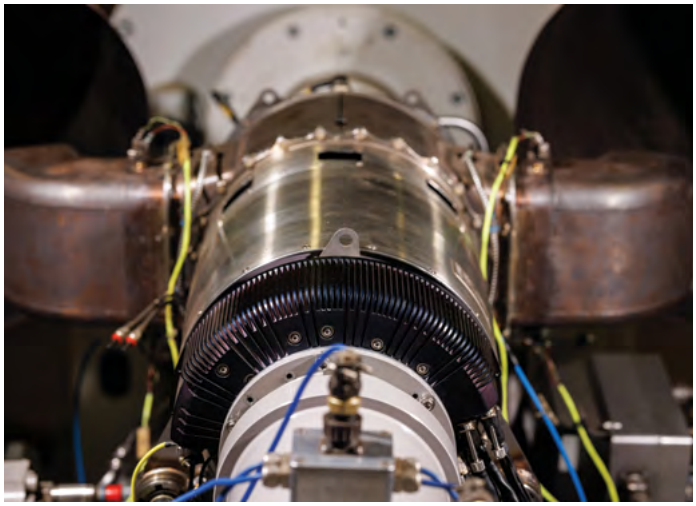
PBS TEST FACILITY

The development and production of UAV turbine engines at PBS is also supported by our own extensive in-house testing facility.
More than 50 experienced flight test engineers and technicians have a total of 16 specialized testing cells at their disposal for comprehensive testing of turbine engines as well as auxiliary power units and environmental control systems.



TEST CAPABILITIES

- Turbojet engines with a thrust of up to 2,500 N
- Flight speed simulations of up to 0.8 M
- Testing with an air pressure of up to 1,200 kPa
- Temperatures from -60 to 80 °C
- G-force limit tests
- Vibration and impact tests
- Complete ATP and production testing



PBS INDIA

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