

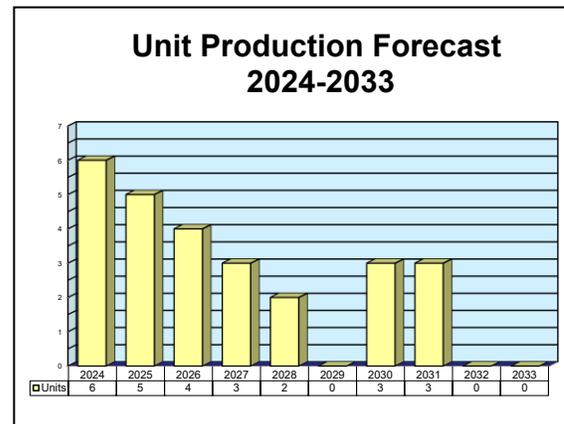
ARCHIVED REPORT

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Cayman Armored Reconnaissance Vehicle

Outlook

- Belarus' political turmoil continues to stunt vehicle's market potential
- August 2018: Cayman ARV secured its first export order, with Cote d'Ivoire purchasing eight vehicles
- 2021: New variants unveiled; development ongoing
- Forecast reflects future low-level orders by Belarusian security forces, as well as anticipated export sales



Orientation

Description. A wheeled armored reconnaissance vehicle (ARV).

Sponsor. The Ministry of Defense and State Military Industrial Committee of the Republic of Belarus sponsor the production of Cayman Reconnaissance Vehicles for procurement by the Belarusian Army and export sale.

Status. Development through serial production.

Total Produced. Through 2023, we estimate the prime contractor produced 56 Cayman armored reconnaissance vehicles, including prototypes.

Application. A light-armed scout/reconnaissance vehicle designed to perform forward operations in special forces, policing, and counterinsurgency contexts.

Price Range. In 2024 U.S. dollars, the Cayman ARV carries an estimated unit price of \$221,553.

Contractors

Prime

Beltechexport	http://www.bte.by/en/ , Nezavisimosti Ave, 86-B, Minsk, Minsk Region, Belarus, Tel: + 375 173698383, Fax: + 375 173698012, Email: mail@bte.by , Prime
Joint Stock Company 140 Repair Plant	http://140zavod.by/en/ , L. Chalovskoy str. 19, Borisov, Minsk, Belarus, Tel: + 375 177 672032, Email: info@140zavod.org , Prime
Military Industrial Committee of the Republic of Belarus, VPK	http://www.vpk.gov.by/en/ , 115, Nezavisimosti Ave, 220114, Minsk, Minsk Region, Belarus, Tel: + 375 172809100, Fax: + 375 172809081, Email: gvpk01@mail.belpak.by , Prime

Cayman Armored Reconnaissance Vehicle

Subcontractor

Minsk Automobile Plant, MAZ	http://maz.by/en/ , Vulica Sacyjalistycznaja 2, Minsk, Minsk Region, Belarus, Tel: + 375 172179809 (D-245.30E2 Diesel Engine)
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Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 75 Glen Road, Suite 302, Sandy Hook, CT 06482, USA; rich.pettibone@forecast1.com

Technical Data

Crew. Two: commander and driver. In the standard configuration, the troop compartment carries up to four fully equipped infantrymen.

Configuration. 4x4.

Armor. The Cayman features a monocoque, steel-alloy construction configuration providing all-around protection against small arms fire. Armored protection

rated at the BR4/BR5 GOST R-50963-96 standard, per the technical requirements of the State Standard of the Russian Federation for Armored Cars. Vehicle glass rated at 5aHL.

Dimensions. The following data reflects the production-standard Cayman armored reconnaissance vehicle. The Cayman has a combat weight of about 7.0 tonnes (7.71 tons).

	<u>SI Units</u>	<u>U.S. Units</u>
Length	6.0 m	19.70 ft
Width	2.82 m	9.25 ft
Height	2.07 m	6.80 ft
Combat weight	7.0 tonnes	7.71 tons
Fuel capacity	280 liters	73.96 gal

Performance. The speed and range data reflects use of the standard Cayman model on paved roads.

	<u>SI Units</u>	<u>U.S. Units</u>
Maximum speed	110 kmph	77.6 mph
Maximum water speed	8 kmph	4.9 mph
Maximum range	1,000 km	621.38 stat mi
Step	45 cm	1.48 ft
Trench	150 cm	4.92 ft
Slope	30%	30%
Gradient	25%	25%
Fording	Amphibious	Amphibious

Engine. Minsk Automobile Plant (MAZ) D-245.30E2 liquid-cooled, four-cylinder supercharged diesel engine. This powerplant generates 115 kilowatts (156.4 hp), with a power-to-weight ratio of 7.38 kilowatts per tonne (9.9 hp/ton).

Gearbox. Smolensk Auto-Aggregate Plant SAAZ-4334M3 manual gearbox with one reverse and five forward gears.

Suspension and Running Gear. Full-time all-wheel drive. Independent torsion bar suspension configuration and centralized, operator-controlled tire inflation system to regulate the run-flat inserts.

Armament. The Cayman can mount an array of ring- or cupola-mounted machine guns and grenade launchers. The most common configurations can alternatively mount a 7.62 PKMT machine gun, 12.7mm NSVT heavy machine gun, or 30mm AGS-17 grenade launcher.

The Cayman can also integrate a SFTUE Belpetsvneshtekhnika Adunok remote weapon system (RWS) with a 12.7mm NSVT machine gun.

Two sets of three 902B Tucha smoke grenade launchers are mounted on each side of the vehicle hull.

Cayman Armored Reconnaissance Vehicle

Variants/Upgrades

Variants. The Patria AMV design is highly adaptable in terms of drivetrain and armament options. Patria currently offers the AMV as three basic classes of variants, all of which can be tailored to the customer's specifications:

<u>Designation</u>	<u>Description</u>
Basic Model	Basic Cayman ARV chassis intended to provide crews with a mobile, protected platform with which to fulfill reconnaissance, policing, and special operations requirements.
Communications Variant	Cayman variant integrating a roof-mounted 1.2-meter-diameter offset satellite antenna system for the performance of special-purpose communications tasks.
Kapustnik BME Command Variant	Cayman variant modified to integrate the Kapustnik BME artillery fire control system in order to serve as the command vehicle for a battery of 9K57 Uragan rocket artillery platforms.
Adunok 30mm	Cayman variant featuring a centrally mounted Adunok BM-30 turret outfitted with a single 30mm 2A42 cannon and a 7.62mm PKT machine gun. Unveiled at MILEX 2021.

Modernization and Retrofit Overview. Not applicable. However, the long-term potential for further drivetrain and armament integration exists as the Cayman design matures.



Cayman Armored Reconnaissance Vehicle with Adunok RWS

Source: Vitaly Kuzmin

Program Review

Background. In the aftermath of the dissolution of the Soviet Union in 1991, administrative authority over the Soviet state's Republican Unitary Enterprise 140 Repair Plant passed to the government of the newly independent Republic of Belarus.

From its inception during the Soviet period, 140 Repair Plant specialized in the repair and modernization of Soviet armored vehicles, including the ubiquitous BMP-1 and BMP-2 infantry fighting vehicles and T-72 main battle tanks.

After Belarusian independence, 140 Repair Plant became one of the key enterprises responsible for periodic modernization of the Soviet-legacy armored vehicle inventories that continue to comprise the majority of Belarus' armored force structure.

The plant's long history with these legacy Soviet vehicle designs also allowed it to expand its reach into the international market as a low-cost provider of repair and modernization services for customers in the former Soviet bloc and the developing world. The overseas market proved critical in sustaining Belarusian state-

Cayman Armored Reconnaissance Vehicle

owned defense enterprises through the financially tumultuous 1990s and early 2000s.

In the early 2000s, 140 Repair Plant began to experiment with the development of more ambitious vehicle modernization concepts alongside the execution of its traditional overhaul work.

Building a Belarusian Force

Cognizant of the danger posed both by an increasingly unpredictable Russian security posture marked by opportunistic territorial and systemic revisionism and by potential sources of domestic instability, the Belarusian Ministry of Defense began to develop and implement a new security doctrine for its armed forces.

Through the mid-2010s, the Belarusian economy continued to struggle from the knock-on effects of the 2008 financial crisis and lingering economic downturn in neighboring Russia. As a result, there was a strong impetus to foster innovation and develop new defense products for sale on the export market, which had continued to provide a reliable source of income even in difficult economic circumstances.

As part of this reorientation toward greater strategic autonomy, the Belarusian leadership was keen to reduce the reliance of its armed forces and segments of the defense industry on imported Russian components and hardware where feasible.

The relative simplicity and low costs associated with the manufacture of wheeled vehicle designs, an area in which a number of Belarusian contractors already possessed significant expertise, therefore made the leap to armored vehicles of this class a logical progression. The results of this initiative would include the launch of not only the Cayman, but also the V1 MZKT-490100 armored personnel carrier produced by Volat Defence (OJSC Minsk Wheeled Tractor Plant).

Pursuing an Opportunity

According to the official magazine of Belarus' State Military Industrial Committee, the catalyst for the development of the Cayman armored reconnaissance vehicle was a request made by Belarusian President Alexander Lukashenko in 2014 for an indigenously designed special forces vehicle to satisfy the specific requirements of the Belarusian armed forces. The broad program requirements called for amphibious capability and financial affordability, and stipulated that the vehicle's internal components be sourced as much as possible from domestic industries.

Over the subsequent three-year period, the Cayman moved through the initial design and prototyping process, with the first prototype unveiled in 2016. In early 2017, 140 Repair Plant submitted production-

ready models for state testing, and the Belarusian Army began accepting small quantities of the vehicle into active service not long thereafter.

In 2020, Belarusian press outlets reported that 140 Repair Plant had begun developing a civilian variant of the Cayman, with plans to market it to private owners, commercial entities, and state public services such as forestry and emergency response. Such a variant could partially mitigate the loss of potential markets for the standard military version and take advantage of the large civil market in Russia for such vehicles.

Description. The Cayman ARV is an original armored vehicle concept and not the modernization of an existing Soviet-legacy vehicle. However, compared to Soviet-era predecessors of its same class, its structural design represents an evolutionary form of development rather than a radical overhaul.

The hull configuration displays considerable design continuity with the ubiquitous Soviet-era BRDM-2 patrol car, for example, but also integrates modern influences in the form of its sloped hull armor arrangement and the orientation of its windscreens and doors. Elements of the Cayman's design also bear significant outward resemblance to Krauss-Maffei Wegmann's modern Fennek light reconnaissance vehicle.

On the Cayman, the driver sits at the left-front of the hull, with the commander seated to his immediate right. The driver's and commander's stations each feature a single-piece overhead hatch for access to and egress from the vehicle. The driver's and commander's stations include three (total) bulletproof windscreens, with one large forward-facing windscreen and two smaller windscreens on each side of the front of the vehicle.

Four video-surveillance cameras mount on the outside of the vehicle. One is located directly above the forward-facing windscreen, one each above the troop compartment's side doors, and one facing rearward on the back end of the vehicle's roof. The cameras feed video footage to a multipurpose monitor integrated into the center-right of the vehicle's dashboard, accessible to both the driver's and commander's stations.

The troop compartment occupies the center of the vehicle hull. It features four seats, with two seats facing the front and two facing the rear of the vehicle hull. Troop compartment access is provided by two large doors – one positioned on each side of the compartment. Each door features a rectangular bulletproof windscreen and firing port.

The troop compartment also features a centrally located roof hatch. Depending on the variant, this hatch can open up to a turret cupola or unprotected mounted

Cayman Armored Reconnaissance Vehicle

weapon. On variants equipped with the Adunok RWS, the system is mounted to this roof hatch position, with the crew operating the system from the troop compartment.

There is additional external stowage space to the immediate rear of the side doors. A set of three 902B Tucha smoke-grenade launchers mount on each side of the vehicle hull.

The vehicle's powerplant occupies the rear of the vehicle hull.

Two hydraulic propellers for amphibious capability mount to the immediate rear of the vehicle's back tires. An electrohydraulic recovery winch with a pull capacity of 8.1 tonnes (9 tons) mounts on the right front of the vehicle hull.

Standard equipment includes an integrated GPS accessible through the dashboard monitor system; a radio communications system; a nuclear, biological, and chemical (NBC) protective suite; and air conditioning.

Funding

The Ministry of Defense of the Republic of Belarus funds the procurement of wheeled armored vehicles for the Belarusian Army.

Worldwide Distribution/Inventories

Belarus, Cote d'Ivoire.

Forecast Rationale

The Cayman ARV production line remains available for Belarusian procurement and export sales.

The Belarusian government will likely increase its investments in the country's domestic security apparatus, to which the government owes much of its survival.

Meanwhile, the country's pariah status among Western democracies limits the domestic defense industry's growth potential. The feasibility of the government's dream of asserting defense-industrial independence from Russia is becoming increasingly tenuous as its list of potential trade and economic partners steadily shrinks because of sanctions and diplomatic isolation.

Modest Sales Potential

The Forecast International Weapons Group anticipates that periodic small-quantity follow-on orders by the Belarusian Army and internal security forces, as well as

a modest stream of export sales, will sustain the Cayman's production line through the forecast period.

Although demand for 4x4 wheeled armored vehicles remains strong, the Cayman faces stiff competition.

Nevertheless, the Cayman has secured at least one export order. In August 2018, a representative of 140 Repair Plant reported to Russian news agency TASS that the Cayman had captured its first export order, from an undisclosed customer. Video footage from an Independence Day parade subsequently revealed the customer to be Cote d'Ivoire, which acquired eight vehicles and distributed them between the country's Army and Police Gendarme.

Small-scale orders such as this will likely form the bulk of Cayman export orders through the forecast period, with Belarus' access to an established client base serving to mitigate some of its market challenges.

Cayman Armored Reconnaissance Vehicle

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program		High Confidence				Good Confidence			Speculative			
	Thru 2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Total
Joint Stock Company 140 Repair Plant												
Cayman												
	56	6	5	4	3	2	0	3	3	0	0	26
Total	56	6	5	4	3	2	0	3	3	0	0	26