

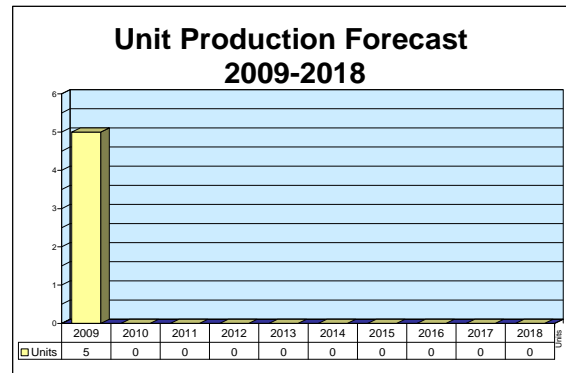
ARCHIVED REPORT

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Véhicule de l'Avant Blindé – Archived 9/2010

Outlook

- Original VAB and VBC-90 production runs complete; VAB Improved production occurs on an as-needed basis only
- September 2006: Indonesia procured 32 upgraded VAB for service in Lebanon
- Production forecast reflects minimal export potential of the VAB Improved on the international market



Orientation

Description. Light wheeled armored vehicles.

Sponsor. The Délégation Générale pour l'Armement (DGA) sponsors the development and French Army procurement of the VAB.

Licensees. None

Status. Development through serial production.

Total Produced. Through 2008, we estimate the prime contractor produced 36 VBC-90 and 5,082 VAB series vehicles.

Application. A family of light multirole wheeled armored vehicles, optimized for supporting infantry during offensive and defensive operations.

Price Range. In 2009 U.S. dollars, the 6x6 VAB Improved reportedly maintains a unit price of \$397,000.

However, the September 2006 Indonesian order for 32 upgraded VAB yielded a unit price of \$973,437.

Contractors

Prime

Nexter	http://www.nexter-group.fr , 13, rue de la Minière, Versailles, 78034 France, Tel: + 33 1 30 97 37 37, Fax: + 33 1 30 97 39 78, Email: presse@nexter-group.fr , Prime
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Subcontractor

Hutchinson SA	http://www.hutchinsonrubber.com , 2 Rue Balzac, Paris, 75384 France, Tel: + 33 1 40 74 83 00, Fax: + 33 1 43 59 97 11, Email: marketing@hutchinson.fr (Run Flat Insert)
MAN SE	http://www.man.de , Ungerestrasse 69, PO Box 401347, Munich, 80805 Germany, Tel: + 49 89 36098 0, Fax: + 49 89 36098 250, Email: public.relations@ag.man.de (D2356)

Vehicule de l'Avant Blinde

	HM72 Diesel Engine)
Messier-Dowty International	http://www.messier-dowty.com , Zone Aéronautique Louis Breguet, BP 10, Velizy-Villacoublay, 78140 France, Tel: + 33 1 46 29 18 00, Fax: + 33 1 46 29 18 03 (VAB Torsion Bar Suspension)
Michelin	http://www.michelin.com , Place des Carmes Dechaux, Clermont-Ferrand, 63040 Cedex 9, France, Fax: + 33 1 45 66 15 53 (14.00x20 Run-Flat Tires)
Renault Trucks	http://www.renault-trucks.com , 99 Rte de Lyon, Saint-Priest Cedex, 69802 France, Fax: + 33 4 72 96 27 63 (MIDS 06.20.45 EURO 2 Diesel Engine)
Zahnradfabrik Friedrichshafen AG	http://www.zf.com , Graf von Soden Platz 1, Friedrichshafen, 88046 Germany, Tel: + 49 07541 77 0, Fax: + 49 07541 77 908000, Email: postoffice@zf.com (VAB Automatic Gearbox)

Comprehensive information on Contractors can be found in Forecast International's "International Contractors" series. For a detailed description, go to www.forecastinternational.com (see Products & Samples/Governments & Industries) or call + 1 (203) 426-0800.

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

Technical Data

Véhicule de l'Avant Blindé (VAB)

Crew. Two to three: commander, driver, and gunner (on some variants), plus 10 infantrymen.

Configuration. 4x4 or 6x6.

Dimensions. The following data are for the basic 4x4 VAB. Data for the 6x6 VAB are in parentheses where different. Height is to the top of the hull.

	<u>SI Units</u>	<u>U.S. Units</u>
Length	5.98 m	19.62 ft
Width	2.49 m	8.17 ft
Height	2.06 m	6.76 ft
Combat weight	13 (14.20) tonnes	14.33 (15.65) tons
Fuel capacity	300 l	79.78 gal

Performance. The speed and range data reflect use on a paved road.

	<u>SI Units</u>	<u>U.S. Units</u>
Maximum speed	92 kmph	57.13 mph
Maximum water speed	7 kmph	4.3 mph
Maximum range	1,000 km	621 stat mi
Step	50 cm	1.64 ft
Trench	70 (99) cm	2.29 (3.25) ft
Slope	35%	35%
Gradient	50%	50%
Fording	amphibious	amphibious

Engine. Renault MIDS 06.20.45 six-cylinder, liquid-cooled supercharged diesel engine. This powerplant generates 164.05 kilowatts (220 hp), with a power-to-weight ratio of 12.62 kilowatts per tonne (15.35 hp/ton) in the 4x4 configuration and 11.55 kilowatts per tonne (14.05 hp/ton) in the 6x6 configuration.

Earlier versions of the VAB mounted the MAN D2356 HM72 six-cylinder, liquid-cooled diesel engine. This powerplant generates 175.31 kilowatts (235 hp), with a

power-to-weight ratio of 13.49 kilowatts per tonne (16.40 hp/ton) in the 4x4 configuration and 12.35 kilowatts per tonne (15.02 hp/ton) in the 6x6 configuration.

All versions employ a 24-volt electrical system with four 6TN 12-volt batteries. Two waterjets at the rear of the hull provide water propulsion.

Vehicle de l'Avant Blinde

Gearbox. Renault model Transfluide gearbox, with one reverse and five forward gear ratios. A torque converter with a lock-up device is standard.

Suspension and Running Gear. Torsion bar suspension, with independently sprung wheels and shock dampers. The vehicle features hydro-pneumatic disk brakes and hydraulic-assist steering. The Michelin 14x20 radial tires feature Hutchinson run-flat inserts.

Armament. One 7.62x51mm NATO (.308 Winchester) machine gun, mounted on a Nexter (Creusot-Loire) CB.52 rotating gun ring. Other available options include a 12.7x99mm (.50 caliber) M2HB machine gun, mounted on a Creusot-Loire CB.127 gun ring.

Véhicule de l'Avant Blindé Improved (VAB Improved)

Crew. Same as standard VAB.

Configuration. 4x4 or 6x6.

Armor. Same as standard VAB.

Dimensions. The following data are for the basic 4x4 VAB Improved. Data for the 6x6 VAB Improved are in parentheses where different. In addition to the standard fuel capacity (below), four feeder tanks provide an additional 80 liters (21.3 gal) of fuel.

	<u>SI Units</u>	<u>U.S. Units</u>
Length	6.10 m	20.01 ft
Width	2.50 m	8.20 ft
Height	2.10 m	6.89 ft
Combat weight	13.60 (14.80) tonnes	14.99 (16.31) tons
Fuel capacity	280 l	79.78 gal

Performance. The speed and range data reflect use on a paved road.

	<u>SI Units</u>	<u>U.S. Units</u>
Maximum speed	110 kmph	68.31 mph
Maximum water speed	7 kmph	4.3 mph
Maximum range	1,000 km	621 stat mi
Step	50 cm	1.64 ft
Trench	70 (150) cm	2.29 (4.92) ft
Slope	40%	40%
Gradient	60%	60%
Fording	amphibious	amphibious

Engine. Renault MIDR 06.20.45 EURO 2 liquid-cooled, twin, supercharged diesel engine. This powerplant generates 223.71 kilowatts (300 hp), with a power-to-weight ratio of 16.45 kilowatts per tonne (20.01 hp/ton) in the 4x4 configuration and 15.12 kilowatts per tonne (18.39 hp/ton) in the 6x6 configuration.

All versions employ a 24-volt electrical system with four 6TN 12-volt batteries. Two waterjets at the rear of the hull provide water propulsion.

Gearbox. Unspecified Zahnradfabrik Friedrichshafen automatic gearbox, with one reverse and six forward gear ratios. A torque converter with a lock-up device is standard.

Suspension and Running Gear. Same as standard VAB. A central tire inflation system is available as an option.

Armament. Same as standard VAB.

Variants/Upgrades

Variants. Nexter (formerly Giat Industries) has offered the VAB in numerous major production models and variants, as follows:

<u>Designation</u>	<u>Description</u>
VAB	Basic 4x4 or 6x6 armored vehicle. See Technical Data , above.

Vehicule de l'Avant Blinde

<u>Designation</u>	<u>Description</u>
VAB NG	VAB Nouvelle Génération. Enhanced version of the basic VAB. Never sold; superseded by the VAB Improved.
VAB Improved	Enhanced version of the VAB, featuring many upgrades from the ill-fated VAB NG. See Technical Data , above.
T.20, TL.20S, and T.25	Mounts 20mm cannon and 7.62x51mm NATO (.308 Winchester) machine gun. Distinctions between the three models primarily relate to turret configurations.
Tli.52G	Mounts 7.62x51mm NATO (.308 Winchester) machine gun and 40mm mortar.
Dragar	Mounts 25mm cannon and 7.62x51mm NATO (.308 Winchester) machine gun.
VCAC MILAN	MILAN MCT anti-tank vehicle. Four launchers; three-man crew.
VCAC HOT (UTM-800)	HOT UTM-800 anti-tank vehicle. Four launchers; three-man crew.
VCAC HOT (Mephisto)	HOT Mephisto anti-tank vehicle. Four launchers; three-man crew.
TOW ALT	BGM-71 TOW anti-tank vehicle. Four launchers on a Kvaerner Eureka turret; three-man crew.
Anti-Aircraft	Series of twin 20mm-cannon variants, featuring various radar and fire control systems.
VDAA SANTAL	4x4 VAB, mounting Mistral SAM system. Features RA20S Rodeo radar or Thales TRS2600 S-band Doppler radar. Passive infrared is optional.
AA TA.23	Anti-aircraft variant, featuring TA.23 turret with twin ZSU 23mm cannon or Sakr Eye SAM system.
VDAA Albi	Mounts Mistral SAM system with optional tripod for remote launch.
ECH	Repair vehicle featuring hoist, extensive repair tools, and welding rig. Various machine gun armament options available.
Genie	Combat engineer vehicle.
Sanitaire	Ambulance; carries four litters or 10 seated patients.
VMO	Internal security vehicle; features dozer blade, tear gas dispenser, grenade launcher, and loudspeaker. Crew of two, plus eight infantrymen.
VMO/TOI	Upgraded version of the VMO with TOI observation and intervention cupola.
VTM-120	Mounts Tli.52G turret and tows 120mm mortar behind vehicle.
120mm Mortar Carrier	Mounts Thomson-DASA Armements 120mm MO120LT mortar on a turntable. Fires through two-part roof hatch.
VPM-81	81mm mortar vehicle.
Bromure	Electronic warfare vehicle.
PC	Command vehicle.
FDC	Fire direction center, mounting RASIT ground surveillance radar or RATAAC artillery radar.
Recovery	Recovery vehicle with hydraulic crane, winch, and associated equipment.
FOO	Forward observation post (part of ATILA system); supports 155mm AU F1 self-propelled artillery system.

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<u>Designation</u>	<u>Description</u>
Transmission	Communications vehicle for use with the RITA integrated communications system.
Reco	Nuclear, biological, and chemical (NBC) reconnaissance vehicle.
RATAC	Mobile radar fire-control system with RATAC radar; supports 155mm AU F1 self-propelled artillery system.
ATILA	Mobile data transmission system; supports 155mm AU F1 self-propelled artillery system.
RASIT	Mounts RASIT ground surveillance radar.
VBC-90	Modified internal configuration, accommodating a TS 90 turret with a 90mm CS 90 F4 rifled cannon.
Logistics	VAB logistics and support vehicle.

Modernization and Retrofit Overview. None at this time. The only program Nexter is currently planning would retrofit older VAB vehicles to the VAB Improved standard.



Véhicule de l'Avant Blindé

Source: Nexter

Program Review

Background. In 1969, the Société Anonyme de Véhicules Industriels et d'Equipements Mécaniques began private development of the Véhicule de l'Avant Blindé (VAB) in response to a French Army requirement for a new wheeled armored personnel carrier.

French Army Sponsorship

The French Ministry of Defense, through the Délégation Générale pour l'Armement (DGA), awarded a development contract to the firm in 1970 for two four-wheeled and three six-wheeled prototypes of the

new vehicle. The contractor delivered these prototypes to the French Army in 1973.

After completion of competitive evaluations in 1974, the Société Anonyme de Véhicules Industriels et d'Equipements Mécaniques won a contract for the 4x4 vehicle without further pre-production testing. The firm delivered the first production vehicles in 1976. The vehicle underwent accelerated operational trials between May and September 1978; the VAB achieved limited operational capability in late 1978.

The contractor completed the serial production run of the original VAB in 1993. Following the failure of the

Vehicule de l'Avant Blinde

Nouvelle Génération version of the VAB to attract sales on the international market, the contractor developed the VAB Improved as the production standard in the late 1990s.

Corporate Evolution

The Société Anonyme de Véhicules Industriels et d'Equipements Mécaniques, (Limoges, France) was a truck subsidiary of Renault (Paris, France). This firm subsequently merged with Berliet, forming Renault Véhicules Industriels. In order to handle exports more effectively, Renault and Creusot-Loire Industrie later created the Société des Matériels Spéciaux to market the VAB family of vehicles. As part of the general reorganization of the French armored vehicle industry in the early 1990s, Giat Industries took over the VAB and VBC-90 production lines.

In October 2006, Giat Industries approved a reorganization and an associated name change to Nexter. Under the restructuring, the group maintained four core operations:

- Nexter Systems
- Nexter Munitions
- Nexter Electronics
- Nexter Mechanics

The move reportedly better prepared the firm for consolidation, possibly with either Thales or EADS.

Description. The VAB exhibits a somewhat unusual interior layout.

Unusual Layout

The driver sits at the left front of the hull, with the commander to his right. The driver's and commander's stations each feature a single-piece hatch cover and a side door with a bulletproof window. On French Army vehicles, a Creusot-Loire CB.52 rotating machine gun mount replaces the commander's roof hatch cover. The two-piece bulletproof windscreen features armored shutters.

The engine compartment occupies the space immediately behind the driver. A passageway on the right side of the vehicle connects the forward crew compartment with the rear troop compartment. This area can also accommodate 2,000 kilograms (2.2 tons) of cargo; it features a flat floor with a total surface area of 3.4 square meters (36.58 sq ft).

Each side of the rear troop compartment features inward-facing bench seats and three large unarmored windows, protected by armored plate covers. Two side-hinged rear doors provide primary troop access/egress; each rear door features an unarmored window with an armored plate cover. Three roof-mounted hatch covers provide secondary access to the troop compartment.

Range of Options

All models of this vehicle, with the exception of the VBC-90, have sufficient buoyancy to float; optional hydrojet propulsion units provide water propulsion.

Available optional equipment for the VAB includes:

- Firing ports with vision blocks
- A nuclear, biological, and chemical (NBC) protective suite (standard on French Army vehicles)
- A front-mounted winch
- An air conditioning system
- A gas dispenser
- A public address system
- A grenade-throwing device
- Various radio options

Nexter now considers the VAB Improved to be the production standard. The contractor no longer markets the earlier VAB or the VBC-90. However, the VAB Improved has yet to score any sales. Nexter continues to aggressively promote the VAB Improved, especially in the Middle East and portions of Asia.

Related News

Nexter Reports 2008 Results – Nexter Systems (a Giat Industries company) held its board meeting on March 4, 2009, to close Nexter Group consolidated accounts for the 2008 financial year.

- Turnover: EUR579 million;
- Operating profits: EUR71 million (12.3 percent of turnover)
- Orders: EUR1.895 million (approximately three years of activity)

Nexter Group orders taken during the 2008 financial year amount to EUR560 million (EUR495 million in 2007). This 13 percent increase results, among other factors, from a wider product range (VBCI infantry combat vehicle,

Vehicule de l'Avant Blinde

Caesar, etc.) and from an increasing demand for support services in relation to equipment in service with the Armed Forces.

Export orders amount to EUR70 million.

Nexter Group consolidated turnover for 2008 amounts to EUR579 million (EUR587 million in 2007). This consolidated turnover reflects a transitional year between the end of Leclerc deliveries and the beginning of production of new equipment to be delivered, among others, to the French Army (VBCI and Caesar).

For the third year running, Nexter Group has achieved consolidated operating profits amounting to more than 10 percent of its turnover. Nexter Group consolidated net profits amount to EUR99 million. These profits take into account a high level of expenditure allocated to research and development for new products (16 percent of consolidated turnover).

Nexter Group order backlog amounts to EUR1.895 million and represents approximately three years of activity. (Nexter, 3/09)

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Funding

The French Ministry of Defense – through the Délégation Générale pour l'Armement – funds the development and French Army procurement of the VAB family of vehicles. The prime contractor funds the development of the VAB Improved as a private venture.

Contracts/Orders & Options

In Sep 2006, the Indonesian Ministry of Defense ordered 32 upgraded VAB vehicles for immediate service in Lebanon. Under the terms of the \$31.15 million contract, the contractor completed deliveries between Oct and Dec 2006.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1969	Design studies begin
Oct	1970	SAVIEM wins initial contract for prototype vehicles
	1974	French Army completes competitive trials
	1976	DGA awards initial production contract to SAVIEM
Nov	1976	First production vehicles rolled out for accelerated testing
Oct	1978	Initial Operational Capability
	1981	VBC-90 debuts
	1983	Full Operational Capability
	1993	Giat Industries assumes program; completes production of original VAB
	1996	Giat introduces VAB Improved
Sep	2006	Indonesia orders 32 upgraded VAB vehicles for use in Lebanon. Deliveries completed by end of 2006
Oct	2006	Giat Industries reorganizes as Nexter
	2009	Production of VAB Improved on an as-needed basis only for export orders

Worldwide Distribution/Inventories

Export Potential. The Véhicule de l'Avant Blindé has been one of the most successful light wheeled vehicle programs in the world for the past several decades. However, the sales prospects for the current production standard (VAB Improved) are becoming increasingly slim. Although the international reputations of the contractor and the

Vehicule de l'Avant Blinde

vehicle should generate at least some export sales during the forecast period, the VAB Improved is unlikely to make an impact on the glutted international market.

Countries. *Note that some of the vehicles mentioned herein are no longer in production.* **Brunei** (26 IS); **Central African Republic** (8 VTT; 8 ECH); **Cyprus** (98 VTT with CB.127; 4 PC, 27 with T.20 turret; 18 VCAC/HOT); **France** (4,151 VAB, including 135 Mephisto; 28 VBC-90); **Indonesia** (32 VAB); **Ivory Coast** (4 PC; 9 VMO); **Lebanon** (91 VTT; 2 PC; 2 ECH); **Mauritius** (11 VTT; 2 VCH); **Morocco** (12 VTM; 68 PC; 20 ECH; 49 VCI/Tucan I; 32 Mephisto; 54 VMO; 220 VTT; 42 VDAA); **Oman** (2 VCAC MILAN; 9 VDAA; 7 VTT; 2 ECH; 2 PC; 6 VMO; 6 VBC-90); **Qatar** (24 HOT UTM-800; 70 VCI; 6 PC; 10 ECH; 35 VMO; 5 Sanitaire; 5 VPM 81); and **United Arab Emirates** (5 VTT; 3 PC; 5 ECH; 7 VMO). Other, unidentified nations also reportedly have the vehicle in service.

Forecast Rationale

Production of the original Vehicule de l'Avant Blinde (VAB) and VBC-90 is complete; Nexter (formerly Giat Industries) no longer offers those vehicles for new production. The VAB Improved production line currently operates on an as-needed basis only.

Dwindling Prospects

In September 2006, the Indonesian Ministry of Defense ordered 32 upgraded VAB vehicles for immediate service in Lebanon. Under the terms of the \$31.15 million contract, the contractor completed deliveries between October and December 2006.

Despite a competitive unit price and the various development efforts, the VAB Improved has yet to

score its first sale after nearly a decade on the international market. Nevertheless, Nexter continues to promote the VAB as a viable market competitor.

Minimal Production Forecast

Our 10-year production outlook reflects the decidedly limited near-term prospects for the VAB Improved on the international market. The traditional African and Middle Eastern customers for French military equipment remain the most likely market for any VAB Improved export sales. However, it is highly unlikely the VAB Improved will ever approach the commercial success of its predecessors.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program	High Confidence					Good Confidence			Speculative			Total
	Thru 2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Nexter												
VAB Improved												
	20	5	0	0	0	0	0	0	0	0	0	5
Total	20	5	0	0	0	0	0	0	0	0	0	5