

# ARCHIVED REPORT

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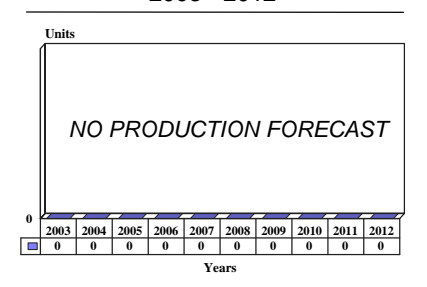
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## Simba - Archived 8/2004

### Outlook

- No additional production of this vehicle by the prime contractor is forecast
- Production by the licensee is not forecast to resume, and the program is being replaced by the Kalakian
- Although Simba is no longer being marketed by Alvis Vickers, the technical data package for the vehicle is still available

10 Year Unit Production Forecast  
2003 - 2012



### Orientation

**Description.** A wheeled vehicle.

**Sponsor.** The Simba is a private development program funded by the prime contractor.

**Contractors.** The Simba was developed and manufactured by GKN Defence-Land Systems; Telford, Shropshire, England, United Kingdom. In 1998, the armored vehicles business of GKN Defence was acquired by Alvis Limited (now Alvis Vickers). Major subcontractors include Clark Equipment and Perkins Engines.

**Licensees.** The Asian Armored Vehicle Technologies Corporation was overseeing the Philippines license assembly/production program; the actual assembly work was undertaken by Philippine Corporation at its Subic Bay facility. The original prime contractor, GKN Defence, was offering to license the technical data

package to other nations. Alvis Vickers has continued this effort.

**Status.** The serial production of the Simba is dormant, but it is available for new orders; the vehicle is in service in the Philippines.

**Total Produced.** As of January 1, 2003, a total of 152 Simba vehicles had been manufactured.

**Application.** A multipurpose armored personnel carrier which can be used as a light engineer vehicle, mortar or missile carrier, and command/control vehicle.

**Unit Price.** If production of the Simba is restarted, the unit price of the base vehicle armed with the M2HB machine gun would be \$246,000 in equivalent 2003 United States dollars. This price can vary, depending on the options that are chosen.

### Technical Data

**Crew.** Two: commander and driver, plus 10 to 12 infantrymen depending on the interior fit of the vehicle.

**Configuration.** 4x4

**Armor.** The Simba is fabricated from conventional steel alloy armor, affording protection from 7.62 millimeter armor piercing projectiles.

**Design Features.** The Simba is designed for ease of fabrication and operation in lesser-developed areas of the world.

**Dimensions.** The following data are for the latest production standard Simba in the armored personnel carrier configuration. The height figure is with the low-profile cupola fitted.

	<b><u>SI units</u></b>	<b><u>US units</u></b>
Length:	5.35 meters	17.55 feet
Width:	2.5 meters	8.2 feet
Height:	2.19 meters	7.2 feet
Combat weight:	9.9 tonnes	10.91 tons
Fuel capacity:	296 liters	78.72 gallons

**Performance.** The maximum speed and range figures are on a metaled road.

	<b><u>SI units</u></b>	<b><u>US units</u></b>
Maximum speed:	100 kilometers per hour	62.5 miles per hour
Maximum range:	660 kilometers	409.86 statute miles
Step:	45 centimeters	1.47 feet
Trench:	41 centimeters	1.35 feet
Slope:	40%	40%
Gradient:	60%	60%
Fording:	1.0 meters	3.28 feet

**Engine.** Perkins Engines supplies the model 210 Ti eight-cylinder, supercharged diesel engine for this vehicle. This engine is rated at 158.15 kilowatts (212 horsepower) at 41.67 revolutions per second (2,500 revolutions per minute). The power-to-weight ratio for the basic armored personnel carrier version described above is 15.97 kilowatts per tonne (19.43 horsepower per ton). A 24 volt electrical system with two 12 volt, 90 ampere-hour batteries is fitted.

**Gearbox.** Clark Equipment provides the 13.7 LHR 28422 automatic gearbox with one reverse and four forward gear ratios. A two-gear-ratio transfer case offering a choice of two or four wheel drive is standard, and steering is power assisted.

**Suspension and Running Gear.** While two wheel drive is available, the Simba is considered to be a four-wheel-drive vehicle. The suspension system uses semi-elliptical springs and hydraulic shock dampers at each wheel station. The 13.00x20 radial tires are fitted with run-flat inserts.

**Armament.** A wide range of armament in various turrets/cupolas can be fitted to the armored personnel carrier version of the Simba. These options range from single or twin 7.62 millimeter machine guns to an M2HB 12.7 millimeter machine gun. Other armament options for the Simba include a wide variety of turrets and cupola mountings with various armament fits, riot control equipment, and electrically operated smoke/gas grenade launchers. These options are further described below.

### **Simba Armored Infantry Fighting Vehicle**

**Crew.** Two: commander and driver, plus six infantrymen.

**Armor.** The Simba is fabricated from conventional steel alloy armor, affording protection from 7.62 millimeter armor piercing projectiles and ballistic fragments.

**Configuration.** 4x4

**Design Features.** This vehicle builds on the effective Simba platform for a highly cost-effective mechanized infantry fighting vehicle for lesser-developed areas of the world.

**Dimensions.** The following data are for the production standard Simba in the armored infantry fighting vehicle configuration. The height figure is with a 20 millimeter turret.

	<b><u>SI units</u></b>	<b><u>US units</u></b>
Length:	5.35 meters	17.55 feet
Width:	2.5 meters	8.2 feet
Height:	2.53 meters	8.3 feet
Combat weight:	10.6 tonnes	11.68 tons
Fuel capacity:	296 liters	78.72 gallons

**Performance.** The maximum speed and range figures are on a metaled road.

	<b>SI units</b>	<b>US units</b>
Maximum speed:	100 kilometers per hour	62.5 miles per hour
Maximum range:	660 kilometers	409.86 statute miles
Step:	45 centimeters	1.47 feet
Trench:	41 centimeters	1.35 feet
Slope:	40%	40%
Gradient:	60%	60%
Fording:	1.0 meters	3.28 feet

**Engine.** Perkins Engines supplies the 210 Ti eight-cylinder, supercharged diesel engine for this vehicle. This engine is rated at 158.15 kilowatts (212 horsepower) at 41.67 revolutions per second (2,500 revolutions per minute). The power-to-weight ratio for the armored infantry fighting vehicle as described above is 14.91 kilowatts per tonne (18.15 horsepower per ton). A 24 volt electrical system with two 12 volt 90 ampere-hour batteries is fitted.

**Gearbox.** Clark Equipment provides the 13.7 LHR 28422 automatic gearbox with one reverse and four forward gear ratios. A two-gear-ratio transfer case offering a choice of two or four wheel drive is standard, and steering is power assisted.

**Suspension and Running Gear.** While two-wheel drive is available, the Simba is considered to be a four-wheel-drive vehicle. The suspension system uses semi-elliptical springs and hydraulic shock dampers at each wheel station. The armored infantry fighting vehicle version of the Simba is fitted with 14.75x80 radial tires with run-flat inserts.

**Armament.** The basic armament fit of the armored fighting vehicle version is a 20 or 25 millimeter cannon in a variety of mountings, usually with a 7.62 millimeter machine gun which is coaxially mounted.

## Variants/Upgrades

**Variants.** The basic model of the Simba is the low-profile armored personnel carrier as described above. Other models and variants include the following:

**90 Millimeter Fire Support Vehicle.** This variant is fitted with the Cockerill CSE 90 turret mounting a Cockerill Mark III 90 millimeter gun and a coaxially mounted 7.62 millimeter machine gun. The two-man turret can be fitted with a variety of fire control equipment.

**Armored Infantry Fighting Vehicle.** This Simba variant is compatible with a variety of 20 and 25 millimeter turrets which are mounted on a removable roof plinth.

**Armored Personnel Carrier.** This version of the Simba is similar to the ones described above but has no low-profile cupola. An Alvis turret mounting a 7.62 or 12.7 millimeter machine gun is fitted. A total of 10 troops can be carried.

**Mortar Carrier.** The Simba Mortar Carrier is fitted with an 81 millimeter mortar mounted on a turntable which is fitted to the rear of the vehicle.

**Anti-tank Vehicle.** This version of the Simba, still a proposal, would integrate the Systems and Electronics Corporation TOW Under Armor system and the BGM-71 TOW anti-tank guided missile as fitted to the M901 Improved TOW Vehicle. An alternative proposal is to fit the MBDA (Euromissile) HCT turret with the HOT anti-tank guided missile.

**Internal Security Vehicle.** The Simba Internal Security Vehicle is designed for military and civil police and other internal security units. This version of the Simba can be fitted with a wide variety of equipment, including riot screens, a barricade remover, a public address system, and a special turret with a smoke/tear gas launcher.

**Philippines Simba.** The Simba vehicles manufactured in the Philippines have a larger fuel capacity. All of the first 150 vehicles are fitted with a one-man turret armed with an M2HB 12.7 millimeter machine gun and four electrically operated smoke grenade launchers.

**Modernization and Retrofit Overview.** No modernization/retrofit programs had been developed for the Simba. None are expected for the Philippine inventory.

## Program Review

**Background.** The Simba, early on referred to as the FS 100, is another in the rather successful line of light wheeled vehicles developed and produced by (then) GKN Defence (formerly called GKN Sankey). In 1998, the armored vehicles business of GKN Defence was acquired by Alvis Limited, now known as Alvis Vickers.

Development of the Simba, which is somewhat similar to the Saxon, began in 1980 as a complement to the Saxon. The Simba was designed from the outset to be a versatile weapons platform fully capable of accommodating a wide variety of weapons, including weapons up to 90 millimeters in caliber. The program was revealed in 1982, and development continued through the 1980s, with the vehicle gradually becoming known simply as the Simba.

**Description.** The monocoque hull of the Simba is of all-welded steel alloy armor construction, affording full protection from 7.62 millimeter armor piercing rounds as well as ballistic fragments. The driver is seated to the front of the vehicle on the left. The driver is provided with bulletproof windows and a single-piece hatch cover. The engine and gearbox are located in a

compartment beside the driver. All the automotive components are commercially available and are of an especially robust design. In the basic armored personnel version, the commander sits in the middle, slightly above the driver, and is provided with a cupola with four vision blocks. The troop compartment, located to the rear of the vehicle, seats the infantrymen across from one another. Armored vision blocks and firing ports are positioned along the sides of the troop compartment. The armored personnel carrier version usually mounts single or twin 7.62 or a single 12.7 millimeter machine gun on a pintle mount; in either case, a crew of 10 infantrymen are carried.

Standard equipment on the Simba includes a fire extinguishing system, run-flat inserts for the tires, a forced air ventilation system, and interior roof insulation. The optional equipment includes air conditioning, an auxiliary power unit, searchlights, a heating system for both the crew compartment and engine, a front-mounted winch, and other specialized internal security equipment.

## Funding

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Funding for the development of the Simba was provided by the contractor.

## Recent Contracts

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Not available, as contractual information is not released. The Philippine contract for 150 Simba vehicles was worth GBP30 million in 1992.

## Timetable

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<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1980	Design conceived
	1981	Engineering development, prototype fabricated
	1982	Simba program unveiled
Through	1980s	Continued contractor testing and demonstrations
Mid	1989	Philippine joint assembly/production plan announced
	1997	Production of first order completed
Mid	2003	Awaiting further orders; technical data package on offer

## Worldwide Distribution

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**Export Potential.** As is the norm with this type of vehicle, many sales of the Simba can be expected to go unrecorded because they involve police and other internal security units. However, there has been no production except for the Philippine requirement. The British are noted for their development and production of this type of vehicle, and their track record on the export market is excellent, but the Simba has yet to have a significant impact

on the market. As there is no warm British production line, and the Philippine program is complete, any export orders will most likely be addressed through the sale of the technical data package to some other nation.

**Licensed Assembly/Production.** In 1989, it was learned that the Republic of the Philippines was negotiating a coproduction agreement with (then) GKN Defence for the Simba. Later that year, a new joint venture company, Asian Armored Vehicle Technologies Corporation, was set up in Manila to assemble and eventually license manufacture the Simba. In the initial phase of the licensed assembly program, which began in 1991, 150 vehicles were produced. The first eight were supplied in complete condition from GKN Defence. In addition, two vehicles were supplied in knocked-down form and two more in kit form for assembly in the Philippines. For a time it was thought that any future orders for the Simba, especially from Southeast Asia, would be filled by the Philippine licensee. But the Philippines has allowed the program to go dormant in favor of a domestically developed vehicle called the MX-1 Kalakian. While bearing a strong resemblance to the Simba, the Kalakian is actually quite a different vehicle, which, as of mid-2003, had yet to be ordered.

**Countries. United Kingdom** (two prototypes with the contractor). The manufacture of eight all-up vehicles for the Philippine order is complete, as is the initial phase of the licensed assembly program. The **Philippines** has 150 vehicles in service.

## Forecast Rationale

The production program for the Simba in the Philippines remains dormant, and it is not forecast to be restarted.

Alvis Limited is no longer actively promoting the Simba, although the technical data package is still on

offer. However, the Simba does not really have that much to offer, so we are forecasting no further international interest in this program. Unless some interest surfaces in the coming year, this report will be archived.

## Ten-Year Outlook

### ESTIMATED CALENDAR YEAR PRODUCTION

Vehicle	(Engine)	High Confidence Level				Good Confidence Level				Speculative			Total 03-12
		through 02	03	04	05	06	07	08	09	10	11	12	
ALVIS VICKERS LIMITED													
SIMBA (a)	TV8.540	14	0	0	0	0	0	0	0	0	0	0	0
Subtotal - ALVIS VICKERS LIMITED		14	0	0	0	0	0	0	0	0	0	0	0
ASIAN ARMORED VEHICLE TECHNOLOGIES (Coproduction)													
SIMBA (b)	TV8.540	138	0	0	0	0	0	0	0	0	0	0	0
Subtotal - ASIAN ARMORED VEHICLE TECHNOLOGIES (Coproduction)		138	0	0	0	0	0	0	0	0	0	0	0
Total Production		152	0	0	0	0	0	0	0	0	0	0	0

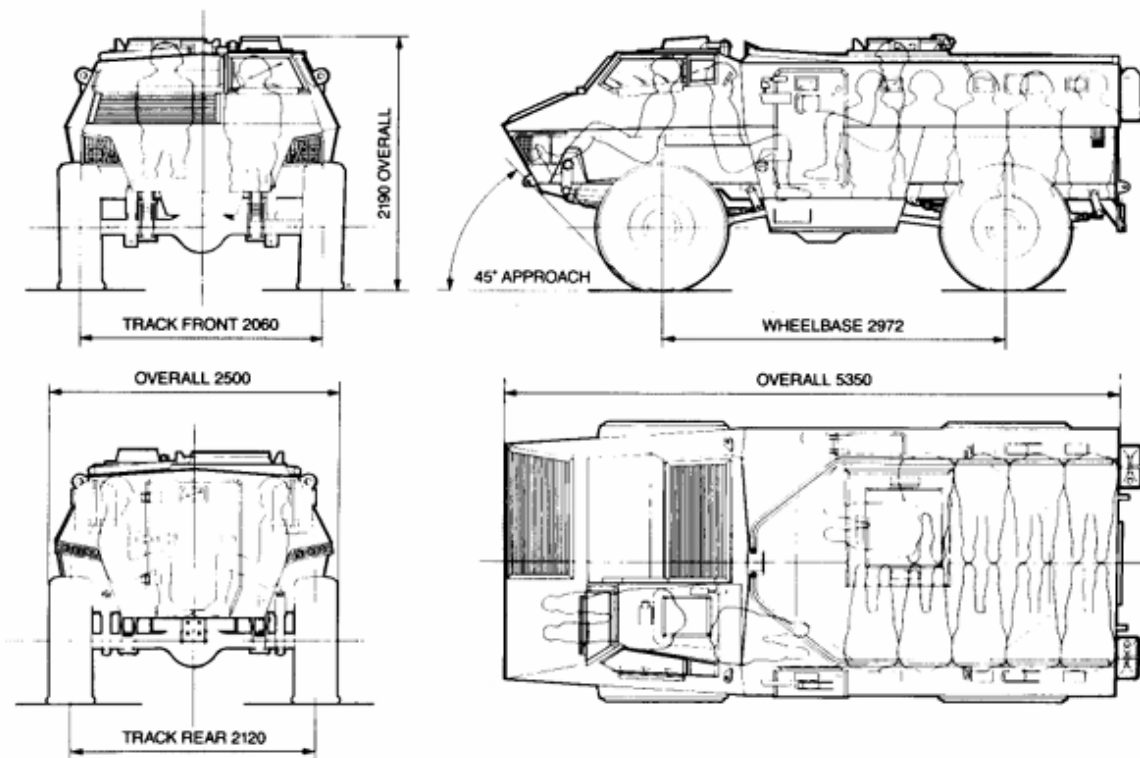
(a) The historical production includes two prototype and development vehicles as well as the eight initial complete vehicles, two knock-down vehicles, and two kit vehicles for assembly in the Philippines.

(b) No prototype or developmental vehicles are included. This production line is for the Republic of the Philippines requirement. The production does not include eight complete vehicles delivered from the United Kingdom, nor does it include two vehicles in knocked-down form and two in kit form supplied from the British production line for assembly in the Philippines.



Simba

Source: Alvis Vickers Ltd.



Simba

Source: Alvis Vickers