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Brazilian Tactical Vehicles - Archived 9/96

Orientation

Description. Military trucks.

Sponsor. Most of the vehicles covered in this report were directly or indirectly supported by the Brazilian Ministry of Defense. A few, such as the X-12 and X-15, were developed solely with private funding.

Contractors. Bernardini SA, Engenheiros Especializados SA (no longer trading - see below), Gurgel SA, TECTRAN Engenharia and Terex do Brasil.

Status. Development through production and service.

Total Produced. As of January 1, 1995, and since 1980 inclusive, a total of 12,976 vehicles of the types covered in this report had been manufactured.

Application. Military lightweight vehicles, trucks and cargo carriers of wheeled configuration to provide transportation and logistic support.

Price Range. In equivalent 1995 United States dollars, the vehicles covered in this report range in unit price from \$22,000 (the BT25) to \$159,000 (the TECTRAN 106).

Technical Data

Designation	Drive	Weight Class
<u>Manufacturer - Bernardini SA</u>		
Xingo BT25	4x4	750 kilogram
Xingo BT50	4x4	750 kilogram
<u>Manufacturer - Engenheiros Especializados SA</u>		
EE-12 Light Vehicle	4x4	500 kilogram
EE-34 Light Vehicle	4x4	750 kilogram
EE-15 Truck	4x4	1.5 tonne
EE-25 Truck	6x6	2.5 tonne
EE-50 Truck	6x6	5 tonne
<u>Manufacturer - Gurgel SA</u>		
X-12 Light Vehicle	4x2	800 kilogram
X-15 Light Vehicle	4x2	1 tonne
<u>Manufacturer - TECTRAN</u>		
2.56	4x4	8 tonne
56	6x6	13 tonne
106	6x6	20 tonne
<u>Manufacturer - Terex</u>		
UAI M1-34	4x4	750 kilogram
UAI M1-50	6x6	5 tonne

Variants/Upgrades

Numerous minor upgrades are constantly being integrated into the vehicles covered in this report. Also, these vehicles can be and often are modified into

specialized variants by the user in the field. Any manufacturer developed variants are described in the appropriate program in the section below.

Program Review

Background. Armed forces are extremely dependent on an adequate fleet of tactical and support vehicles to provide mobility and support for a wide range of general and specific missions, from personnel transport and cargo transfer to artillery and combat vehicle transport. The militarized vehicles are used primarily for off-road tasks unique to the military such as ammunition resupply. Available commercial vehicles are generally only used for rear area work and transport roles that do not require vehicles with high mobility characteristics.

Bernardini SA. This firm, better known in the tank field, is also a player in the light tactical vehicle market. The Xingu BT25 and BT50 are both 4x4 vehicles that are broadly similar to the Jeep type vehicle. The vehicles are essentially the same, the BT50 being slightly larger with a longer wheelbase. Early production vehicles were fitted with the OM 314 diesel engine from Mercedes Benz do Brazil, but later on in the production program, this was switched to the OM 364, rated at 70.12 kilowatts (94 horsepower); this is the present standard. Versions include a pickup truck with canvas covers, a communications vehicle and reconnaissance vehicle with a mount for the M40 106 millimeter recoilless rifle. In addition to at least two thousand being procured by Brazil, this vehicle has been sold to at least four other unidentified nations.

Engenheiros Especializados SA. Brazil's vehicle manufacturing capability has been dominated by this firm, a company that rose to international prominence in a very short time. This was due to its aggressive marketing methods, highly competitive pricing and refusal to accept the status-quo in areas historically dominated by French, German and other companies. It should be noted that the firm (often called ENGESA) successfully markets for military roles trucks which are almost standard civilian versions with little more than green paint for preparation. This is a tribute to the effectiveness of their basic design.

However, despite its prominence, the company has more recently experienced a difficult period financially. This was confirmed in early 1990 when the company entered bankruptcy proceedings; finally, in late 1993, the firm ceased operations. A major reason for the economic troubles that prompted the demise of Engenheiros Especializados was the firm's heavy investment in the development of the Osorio tank. However, the tank was simply too much for the Brazilian Army and the multibillion dollar order expected from Saudi Arabia never materialized.

There have been efforts to rescue the company from its financial morass. The Brazilian government, the firm's

main creditor, extended to the company a two-year grace period starting in March of 1990, with the proviso that 40 percent of the approximately \$150 million in debt be repaid by March of 1991, and the other 60 percent in 1992. However, the production of its military vehicles ceased for a time beginning in October of 1990, thus leading to serious problems in honoring export contracts for spares, ammunition and technical assistance especially. One solution that was explored was forming partnerships with other companies; Vickers Defence Systems of the United Kingdom was often mentioned. An infusion of money in 1991 allowed production to resume, the Brazilian Government extending the grace period.

In mid-1991, a possible solution began to emerge in the form of three principal shareholders, each with a minority share. These shareholders would include the following: a European group (British Aerospace or (again) Vickers Defence Systems, mentioned as the potential head); a Brazilian group (mostly consisting of Engenheiros Especializados's creditors); and the Brazilian company IMBEL. A further holding group, smaller than the others, could be held by ENGESA employees. This new version of ENGESA was expected to begin business as soon as enough capital became available. Debt reduction could be achieved through such avenues as real estate sales, with production rationalization to come from a massive reduction in the workforce (a total of 8,000 jobs, bringing employment down to 3,000).

While Engenheiros Especializados SA officials then claimed that at least five international and three local groups had presented letters of intent to the government to buy a share of the firm, a complication arose from the fact that the Brazilian government insisted that no more than a 40 percent stake go to a foreign company. This requirement apparently got in the way of a potential deal with a major European company, possibly one of the ones mentioned above. Engenheiros Especializados SA had also been hoping for a share of the company being sold off; this was originally anticipated by late 1992 and never took place.

As the Engenheiros Especializados range of trucks has a wide distribution, they will continue to be covered for the time being.

The EE-12 is a fairly typical lightweight utility vehicle designed to replace some of the aging Jeeps in service worldwide. In appearance, it is closer to the British half tonne Land Rover than the Jeep. It can carry up to five people or 500 kilograms of cargo. The vehicle can be powered by either a General Motors spark ignition engine or a Perkins diesel engine. The powerplant is

coupled to a Clark manually operated gearbox with five forward and one reverse gear ratios. The maximum road speed is 110 kilometers per hour (68.3 miles per hour) and a range of 600 kilometers (372.6 statute miles) is possible. Versions of the EE-12 include a reconnaissance vehicle, an anti-tank vehicle armed with either anti-tank guided missiles or a recoilless rifle, an ambulance and a command vehicle. The EE-12 is in service with Angola, Brazil, Libya and several other unidentified nations.

The EE-34 was originally developed as a command vehicle, but can also be used as a light truck with a slightly larger wheelbase. It has an unloaded weight of 1,895 kilograms (4,169 pounds) in the command car configuration and 2,250 kilograms (4,950 pounds) as a light truck. It can carry up to 1,000 kilograms (2,204 pounds) in either configuration. Various engines are available, including the Perkins model 4.236 diesel and the Mercedes-Benz OM 314 diesel engine. The engine is coupled to a manually operated gearbox, although an automatic gearbox is available. Other options include a winch and power steering. Other versions include an ambulance, reconnaissance vehicle and a communications truck. Versions based on the longer wheelbase truck chassis include an ambulance and a cargo carrier. The EE-34 is in service with Brazil, Gabon and at least two other nations.

The EE-15 was developed for military and civilian use. The vehicle weighs 4,050 kilograms (8,910 pounds) unloaded and carries up to 1,500 kilograms (3,300 pounds) cross-country or 3,000 kilograms (6,600 pounds) on roads. It can tow up to 1,500 kilograms (3,300 pounds). It is powered by a 111.54 kilowatt (149 horsepower) Mercedes-Benz OM 352 liquid cooled diesel engine coupled to a Mercedes-Benz G-3/40 five-speed manually operated gearbox. The maximum road speed is 90 kilometers per hour (55.9 miles per hour). Optional equipment includes a winch and hydraulic cargo lifting system. Versions of the EE-15 include an ambulance, van and an airfield crash rescue truck. The EE-15 is in service with Angola, Brazil, Chile, Colombia, Gabon, Iraq, Libya and other undisclosed countries.

The EE-25 truck has been developed for both military and commercial sales. It can carry up to five tonnes (5.51 tons) of cargo on roads or 2,500 kilograms (5,500 pounds) cross-country. The vehicle is powered by a 129.8 kilowatt (174 horsepower) Mercedes-Benz OM 352A in-line diesel engine coupled to a manually operated gearbox with five forward and one reverse gear ratios. The maximum road speed is 90 kilometers per hour (55.9 miles per hour). Optional equipment includes a winch and a hydraulic crane. Versions of the EE-25 include an ambulance, tipper truck, recovery vehicle, command vehicle, workshop, chemical and biological decontamination truck, and an airfield crash truck. The

EE-25 has been sold to Angola, Bolivia, Brazil, Chile, Colombia, Gabon, Libya, Iran and other undisclosed countries.

The EE-50 was developed to meet the requirements of the Brazilian army and since its introduction in 1980 has become the army's standard five tonne truck. It weighs 12 tonnes (13.23 tons) unloaded. Although it is rated at five tonnes (5.51 tons) capacity, it can carry ten tonnes (11.02 tons) on roads and up to six tonnes (6.61 tons) can be towed. Powered by a 150.69 kilowatt (202 horsepower) Scania D11 liquid cooled diesel engine coupled to a manually operated gearbox with five forward and one reverse gear ratios, its maximum road speed is 80 kilometers per hour (49.7 miles per hour). Optional equipment includes cold starting systems, and a fire detection and extinguishing system. Versions of the EE-50 include an ambulance, van, fuel truck, water tanker, fire truck, mobile workshop and recovery vehicle. The EE-50 is in service with Angola, Brazil, Libya and at least three other nations.

Gurgel. The Gurgel X-12 RM was developed mainly for the commercial market, but it can be adapted for military use, primarily as a command and reconnaissance vehicle or military police vehicle. The vehicle series has 4x2 drive with a rear mounted Volkswagen 48.49 kilowatt (65 horsepower) spark ignition engine. The layout is unusual with the stowage at the front and a central crew area. There are nine versions ranging from a basic soft top model through to a fully enclosed van as used by the military police. The production of the G-15 is complete, as is the X-12. The X-12 and G-15 are in service with Brazil.

TECTRAN. This famous firm has developed a new range of military trucks in the eight to twenty tonnes class. All the trucks are powered by unspecified diesel engines. The model 2.56 eight tonne truck has an engine rated at 134.28 kilowatts (180 horsepower), the model 56 13 tonne truck has an engine rated at 149.2 kilowatts (200 horsepower) and the model 106 twenty tonne truck has an engine rated at 208.88 kilowatts (280 horsepower). A variety of body types and armored cabs are available, as are other accessories. A fifth wheel can be added so that the vehicle can be used as a tractor to tow trailers. The TECTRAN military trucks have been integrated with the ASTROS II multiple launch rocket system; the TECTRAN firm is a subsidiary of Avibras, the prime contractor for the ASTROS II. In the ASTROS II application, the 6x6 version of the TECTRAN truck is in service with Brazil, Iraq, Qatar and Saudi Arabia. The vehicle is in production and is available for additional production orders.

Terex. During 1987, Terex do Brazil started producing the UAI M1-50 6x6 five-tonne truck. It is powered by a

locally produced 177.54 kilowatt (238 horsepower) diesel engine coupled to a Zahnradfabrik Friedrichshafen gearbox with six forward gear ratios. The layout is fairly conventional with a canvas covered cab. The maximum load for cross country work is five tonnes (11 tonnes) but this can be increased to 16 tonnes (17.63 tons) on roads with an additional towed load of 13 tonnes (14.33 tons). This vehicle is in service with Brazil.

The UAI M1-34 is a lightweight 4x4 vehicle in the 750 kilogram class. It is powered by an unspecified 64.9 kilowatt (87 horsepower) diesel engine; a manually operated gearbox with five forward gear ratios and a two-speed transfer case is fitted. This vehicle is in production for an unspecified customer.

Funding

While the procurement of many of the vehicles covered in this report has been and is funded by the Brazilian Ministry of Defense, most of the vehicles covered in this report were directly or indirectly supported in development by the Brazilian Ministry of Defense. A few, such as the X-12 and X-15, were developed solely with private funding.

Recent Contracts

Unavailable as contractual information is not released.

Timetable

The following data are for the Brazilian vehicles covered in this report.

through	1980s	Engenheiros Especializados enjoyed high rate of truck sales
	1990	Engenheiros Especializados began operating under bankruptcy laws
Late	1993	Engenheiros Especializados ceased trading
Mid	1995	Development and production ongoing at a greatly reduced rate

Worldwide Distribution

Details of the exports of Brazilian trucks are as follows:

The Bernardini trucks are in service in Brazil (Xingu BT25 and BT50).

The Engenheiros Especializados trucks are reported in use in the following nations (Angola - EE-12, EE-15, EE-25, EE-50); Bolivia (EE-25); Brazil (EE-15, EE-25, EE-34, EE-50); Chile (EE-15, EE-25); Colombia (EE-15, EE-25); Gabon (EE-15, EE-25); Jordan (EE-25); Libya (EE-15, EE-25); Nigeria (EE-25) and Saudi Arabia (EE-15, EE-25).

The TECTRAN trucks are in service in Brazil, Iraq, Libya, Qatar and Saudi Arabia.

The Terex trucks are in service in Brazil (UAI M1-50, UAI M1-34).

Forecast Rationale

Previous to the late seventies, the production of wheeled tactical vehicles by Brazil was geared mostly to fulfilling the rather limited domestic requirements, rather than those of the export market. The few exports that did take place were made to other countries within the immediate geographic region. However, with Brazil's emergence (almost solely as a result of the efforts of Engenheiros Especializados) into the world military vehicle market, new export marketing strategies had to be undertaken in order to successfully sell Brazilian produced vehicles

throughout the world. Initially these strategies proved successful, particularly in the Middle East and Africa, where vast quantities of Engenheiros Especializados military equipment have been sold.

The forecast production for Brazilian tactical vehicles has plummeted dramatically since the demise of Engenheiros Especializados. In terms of value, it is now almost entirely based on the TECTRAN firm and those trucks mostly earmarked for the various ASTROS multiple launch rocket systems. This should continue to be the

case for most of the rest of the nineties. Eventually, a new firm or firms should get organized in Brazil to meet the demands of one of Latin America's largest military organizations. The production curve should then start trending upward. However, it remains doubtful that

Brazil can be expected to once again be a powerhouse in the tactical vehicle market and its future appears quite gloomy. It is not likely that international partners will ever be found for the company, much less that new capital will ever be found to revive the company.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION													
Designation	through 94	<u>High Confidence</u>					<u>Good Confidence</u>			<u>Speculative</u>			Total 95-04
		95	96	97	98	99	<u>Level</u>		02	03	04		
							00	01					
Brazilian tactical vehicles	12976	17	8	21	37	23	42	107	208	232	319	1014	
Note: the through 1994 figure is since 1980 inclusive and is for military sales only.													

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