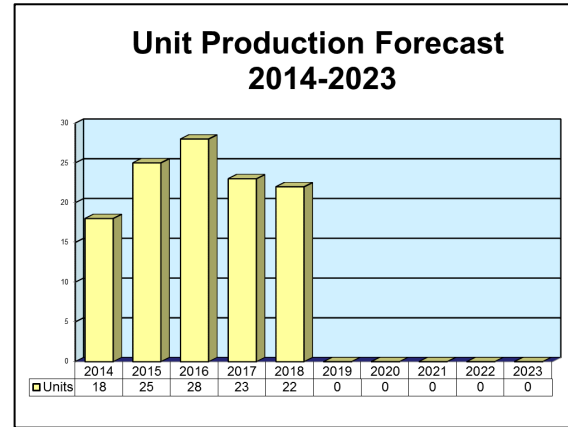


# Puma (Type 6634 AVL)

## Outlook

- Italian Army completed 580-vehicle initial procurement in 2004; status of potential follow-on orders uncertain
- Puma possesses only minimal modernization potential
- Production forecast reflects contractor's expectations of minor follow-on procurement for the Italian Army as well as possible export sales



## Orientation

**Description.** A wheeled armored vehicle.

**Sponsor.** Iveco Defence Vehicles Division (formerly the Iveco Fiat-Oto Melara consortium) developed the Type 6634 AVL Puma as a private venture.

The Italian Ministry of Defense, through the Italian Army, sponsors further development and Italian Army procurement of the Puma.

**Licensees.** None.

**Status.** Development through serial production.

**Total Produced.** Through 2013, we estimate the prime contractor produced 591 Puma vehicles.

**Application.** A light, multirole wheeled armored vehicle, optimized for the scout/reconnaissance mission.

**Price Range.** In 2013 U.S. dollars, the Italian Army 6x6 Puma VBL would reportedly carry a unit price of about \$330,000.

## Contractors

### Prime

|  |  |
|--|--|
| <b>Iveco SpA Defence Vehicles Division</b> | <a href="http://www.iveco.com">http://www.iveco.com</a> , Via Volta 6, Bolzano, 39100 Italy, Tel: + 39 0471 905111, Fax: + 39 0471 905444, Email: <a href="mailto:dvdvzcom@iveco.com">dvdvzcom@iveco.com</a> , Prime |
|--|--|

### Subcontractor

|  |   |
|--|---|
| <b>Honsel/VVG France (Fonderie Lorraine SAS)</b> | <a href="http://www.honsel.com">http://www.honsel.com</a> , 20 rue du Lhotaud, Frasné, 25560 France, Tel: + 33 3 81 49 89 46, Fax: + 33 3 81 49 89 47, Email: <a href="mailto:contact@honsel.fr">contact@honsel.fr</a> (Combined Telescopic Strut)                        |
| <b>Michelin</b>                                  | <a href="http://www.michelin.com">http://www.michelin.com</a> , Place des Carmes Dechaux, Clermont-Ferrand, 63040 Cedex 9, France, Fax: + 33 1 45 66 15 53 (11.00x16 Run-Flat Tires)  |
| <b>Oto Melara SpA</b>                            | <a href="http://www.otomelara.it">http://www.otomelara.it</a> , Via Valdicocchi 15, La Spezia, 19136 Italy, Tel: + 39 0187 5811 11, Fax: + 39 0187 58266, Email: <a href="mailto:press-office@otomelara.it">press-office@otomelara.it</a> (Otobreda 6634 AVL Puma Turret) |

## Puma (Type 6634 AVL)

|   |  |
|---|--|
| <b>Zahnradfabrik Friedrichshafen AG</b> | http://www.zf.com, Graf von Soden Platz 1, Friedrichshafen, 88046 Germany,<br>Tel: + 49 07541 77 0, Fax: + 49 07541 77 908000, Email: postoffice@zf.com<br>(4 HP 22 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](http://www.forecastinternational.com) (see Products & Services/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](mailto:rich.pettibone@forecast1.com)

## Technical Data

**Crew.** Three: driver, gunner, and commander. The vehicle can also carry five infantrymen.

**Configuration.** 4x4 and 6x6.

**Armor.** Monocoque-construction hull of steel alloy, providing protection against 7.62mm armor-piercing projectiles and ballistic fragments. Appliqué armor kits are also available.

**Dimensions.** The following data are for the production-standard 4x4 vehicle. Height is to the top of the hull. Data for the 6x6 version are in parentheses where different.

|               | <u>SI Units</u>    | <u>U.S. Units</u> |
|---------------|--------------------|-------------------|
| Length        | 4.65 (5) m         | 15.26 (16.40) ft  |
| Width         | 2.08 (2.30) m      | 6.82 (7.54) ft    |
| Height        | 1.67 (1.70) m      | 5.48 (5.58) ft    |
| Combat weight | 5.50 (7.50) tonnes | 6.06 (8.27) tons  |
| Fuel capacity | 150 (270) liters   | 39.89 (71.81) gal |

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

|               | <u>SI Units</u> | <u>U.S. Units</u>       |
|---------------|-----------------|-------------------------|
| Maximum speed | 105 kmph        | 65.20 mph               |
| Maximum range | 800 (960) km    | 496.80 (596.20) stat mi |
| Step          | 40 cm           | 1.31 ft                 |
| Trench        | 60 cm           | 1.97 ft                 |
| Slope         | 30%             | 30%                     |
| Gradient      | 60%             | 60%                     |
| Fording       | 1.20 m          | 3.94 ft                 |

**Engine.** Fiat 8140 TCA four-cylinder, liquid-cooled, supercharged diesel engine. This powerplant generates 134.28 kilowatts (180 hp), with a power-to-weight ratio of 24.40 kilowatts/tonne (29.70 hp/ton) in the 4x4 configuration and 17.90 kilowatts/tonne (21.77 hp/ton) in the 6x6 configuration. The 24-volt electrical system features two 12-volt/100-ampere-hour batteries.

**Gearbox.** Reco automatic gearbox, with one reverse and five forward gear ratios. Preproduction vehicles featured a Zahnradfabrik Friedrichshafen 4 HP 22 automatic gearbox, with one reverse and four forward gear ratios. The drivetrain features a two-speed transfer case.

**Suspension and Running Gear.** Independently sprung suspension system, featuring a Messier

combined telescopic strut on top and transverse links/torsion bars on the bottom. The vehicle mounts Michelin 11.00x16 run-flat tires.

**Armament.** The basic vehicle design can accommodate a variety of armament options, including 7.62mm machine guns, an 81mm mortar, and the MILAN anti-tank guided missile system. Three electrically operated smoke grenade launchers mount on each side of the hull, to the rear.

The initial Italian Army configuration mounts a 12.7x99mm (.50 cal) M2HB machine gun in an Otobreda turret.

**Puma (Type 6634 AVL)****Variants/Upgrades**

**Variants.** Iveco is developing the following variants from the basic Type 6634 AVL Puma 4x4 and 6x6 vehicles:

| <u>Designation</u> | <u>Description</u>   |
|--------------------|--|
| Puma               | Basic 4x4 or 6x6 light armored vehicle. See <b>Technical Data</b> , above.   |
| Anti-Tank          | MBDA (Euromissile) MILAN anti-tank guided missile system or BGM-71 TOW system.   |
| Anti-Aircraft      | Mistral anti-aircraft missile system.  |
| Mortar Carrier     | Turntable-mounted 81mm mortar and a crew of four.  |
| Command Post       | Communications equipment and a crew of five.   |
| Ambulance          | Unarmed. Crew of two, plus two stretchers.   |
| Other Variants     | Additional designs could mount RBS70 and Blowpipe/Javelin anti-aircraft missiles, the 106mm M40 recoilless rifle, and several types of turrets with up to a 20mm cannon. |

**Modernization and Retrofit Overview.** Not applicable at this time.



4x4 Puma VBL

Source: Italian Army

**Program Review**

**Background.** In 1984, Iveco Fiat announced that it was developing a new range of light armored vehicles. To keep costs down and offer vehicles of high reliability, the contractor used proven commercial components wherever possible. The new family of vehicles consisted of the following:

- 4x4 Type 6634 Armored Vehicle Light
- 4x4 Type 6633 Armored Vehicle Medium
- 6x6 Type 6636 Armored Vehicle Heavy

By 1988, Iveco Fiat had terminated the Type 6633 and Type 6636; the contractor concentrated on developing the Type 6634 for an Italian Army requirement.

***Italian Army Puma VBL***

Following evaluations of the two Type 6634 Armored Vehicle Light prototypes, Iveco Fiat completed three prototypes of the Type 6634 Puma in 1989.

Operational testing of the Puma ran into 1996. In January 2000, the Italian Army placed an initial order for 600 Puma VBLs (Veicolo Blindato Leggero) – 350 in the 4x4 configuration and 250 in the 6x6 configuration.

**Description.** The vehicle exhibits a basic design that emphasizes reliability, cost-effectiveness, and ease of operation.

## Puma (Type 6634 AVL)

### *Simple & Reliable*

The driver sits at the left-front of the vehicle; the engine compartment occupies the right-front, behind a fireproof bulkhead. The driver's station features a single-piece hatch cover that opens to the right, as well as a periscope and vision blocks.

A cupola mounts at the center of the vehicle roof. The cupola features a single-piece hatch cover and periscopes affording all-around vision. On the Italian Army vehicles, the cupola also features a pintle-mounted M2HB machine gun.

Each side of the vehicle features a forward-opening two-piece door with a vision block in its upper portion

and a firing port in the bottom portion. The troop compartment occupies the rear of the vehicle, providing individual seats for five infantrymen. Two rectangular roof hatches provide secondary access/egress for the troop compartment.

### *Limits on Italian Procurement*

The Italian Army originally held a procurement objective of 2,000 Puma vehicles, in both the 4x4 and 6x6 configurations. However, fiscal constraints forced the Army to reduce the objective to 580 units. Iveco reportedly completed this truncated production run in 2004, as scheduled. The Forecast International Weapons Group expects the Italian Army will place at least one follow-on order during the forecast period.



6x6 Puma VBL

Source: Italian Army

## Related News

***Djibouti Armed Forces Parade New Armor*** – The Djibouti armed forces displayed their newly acquired M109 self-propelled howitzers and Iveco 4x4 Puma armored personnel carriers (APCs) for the first time during the country's Independence Day celebrations held on June 27.

Earlier in June, the Djibouti Air Force had taken delivery of a new Modern Ark (MA) 60 twin-turboprop transport aircraft from Chinese aircraft manufacturer Xi'an Aircraft Corp (XAC).

All the new additions to the armed forces will help beef up defense capabilities against regional militant groups, such as Al-Shabaab in Somalia, and maritime piracy in the Indian Ocean. (FI, 7/14)

***Italian Army Procurement Sustains Centauro VBM Freccia Production*** – Serial production of the VBM Freccia is clearly now the center of gravity for the Centauro program. In 2007, Iveco commenced low-rate initial production of Centauro VBM vehicles. In 2009, the Italian Army reportedly accepted the first 54 Centauro VBMs into service. In June 2010, the Italian Army deployed 17 Centauro VBM Freccias to Afghanistan.

The Forecast International Weapons Group expects Italian Army procurement will exceed 600 Centauro VBM Freccias through 2023. A major Italian Army procurement could translate into significant export sales of this adaptable armored vehicle line.

In December 2010, Italian Defense Minister Ignazio La Russa announced that Russia had expressed an interest in the B1 Centauro and the Centauro VBM Freccia. Iveco delivered two B1 Centauro vehicles and two Centauro VBM

## Puma (Type 6634 AVL)

Freccia vehicles to Russia for testing in 2011. However, in January 2013, the commander in chief of the Russian Ground Troops publicly stated that Russia will not purchase Italian-made Centauro wheeled vehicles.

In May 2012, the Colombian Ministry of Defense announced a "renewed interest" in the Centauro VBM Freccia. To date, FI has no evidence this Colombian interest has translated into any procurement contracts. (FI, 7/14)

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## Funding

The consortium of Iveco Fiat and Oto Melara (now Iveco Defence Vehicles Division) originally funded the Puma as a private venture. The Italian Ministry of Defense, through the Italian Army, funds the development and Italian Army procurement of this vehicle.

## Timetable

| <u>Month</u> | <u>Year</u> | <u>Major Development</u>   |
|--------------|-------------|--|
| Late         | 1987        | Development for Italian Army Type 6634 requirement                           |
| Aug          | 1990        | Consortium completes six prototype vehicles                                  |
| Jan          | 2000        | Italian Army places production order   |
|              | 2004        | Initial Italian Army production run complete                                 |
|              | 2014        | Production line available for new orders; development and marketing continue |

## Worldwide Distribution/Inventories

**Export Potential.** Italy has experienced a moderate level of success on the international market with its earlier light wheeled vehicles, such as the Type 6614 and Type 6616. With the aid of Italian Army procurement, the Type 6634 Puma could attract a moderate level of export sales in Italy's traditional market sphere of northern Africa and portions of the Middle East.

**Countries.** Italy (11 prototypes and 560 production vehicles), **Djibouti** (6 vehicles), **Libya** (20 vehicles).

## Forecast Rationale

The Puma (Type 6634 AVL) production line remains dormant, following the completion in 2004 of the Italian Army's initial 580-vehicle order.

### *Economic Challenges*

In 2001, the Italian Army held a total procurement objective of 2,000 Puma vehicles, in both 4x4 and 6x6 configurations. However, fiscal constraints and economic realities eventually forced the Army to reduce its objective to 580 units.

With both Italy and the broader eurozone still struggling to cope with the fallout from the 2008 financial crisis and the impact of economic austerity measures, the future of Italian Puma procurement is highly uncertain. Indeed, Italy's recent transfer of portions of its Puma vehicle stocks to the armed forces of Libya and Djibouti cast some doubt upon the prospect of renewed Puma procurement by the Italian Army within the forecast period.

Nevertheless, in the event further acquisitions become financially plausible, the Italian Army may yet attempt to pursue at least one follow-on order of Puma vehicles during the forecast period in order to buttress the long-term operational readiness of the service's wheeled armored vehicle fleet.

### *Limited Export Prospects*

In February 2013, the Italian Army donated 20 Puma vehicles to the Libyan Army. The donated vehicles comprise one part of a broader defense and cooperation plan between the Italian and post-Qadhafi Libyan armed services.

The donation was intended to signify Italy's dedication to the development and security of the post-Qadhafi Libyan state, and to increase the operational capabilities of the national Libyan Army so that it can better cope with the ongoing challenges of post-revolutionary civil instability.

## Puma (Type 6634 AVL)

In 2013, Djibouti acquired an unspecified quantity of Puma 4x4 vehicles. It remains uncertain as to whether the vehicles were purchased or donated, but reports suggest that in either case the vehicles were likely drawn from Italian Army stocks.

Evidence from a 2014 military parade in Djibouti indicates that the country operates at least six Puma 4x4 vehicles. However, the overall market potential of the

Puma remains heavily restrained by the contraction of defense budgets and implementation of domestic austerity measures across the European continent.

As a result, the Puma's strongest opportunities for export sales during the forecast period are likely to lie in the Middle Eastern, African, and South American defense markets.

## Ten-Year Outlook

| ESTIMATED CALENDAR YEAR UNIT PRODUCTION    |                 |      |      |      |      |                 |      |      |             |      |      |       |
|--|-----------------|------|------|------|------|-----------------|------|------|-------------|------|------|-------|
| Designation or Program                     | High Confidence |      |      |      |      | Good Confidence |      |      | Speculative |      |      |       |
|  | Thru 2013       | 2014 | 2015 | 2016 | 2017 | 2018            | 2019 | 2020 | 2021        | 2022 | 2023 | Total |
| <b>Iveco SpA Defence Vehicles Division</b> |                 |      |      |      |      |                 |      |      |             |      |      |       |
| <b>Puma Type 6634 AVL</b>                  |                 |      |      |      |      |                 |      |      |             |      |      |       |
|  | 591             | 18   | 25   | 28   | 23   | 22              | 0    | 0    | 0           | 0    | 0    | 116   |
| <b>Total</b>                               | 591             | 18   | 25   | 28   | 23   | 22              | 0    | 0    | 0           | 0    | 0    | 116   |