

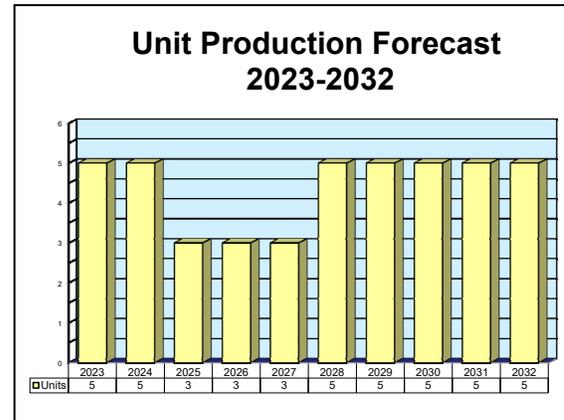
# ARCHIVED REPORT

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## Dragoon Family of Armored Vehicles

### Outlook

- Low-rate production on an as-needed basis for export and small domestic sales
- Sales to internal security and police customers often go unreported, limiting our ability to properly evaluate this program in terms of real market share
- Production estimate reflects expectation of sporadic sales



### Orientation

**Description.** Wheeled armored 4x4 vehicles.

**Sponsor.** AV Technology Corp, now a component of GDLS, sponsored the Dragoon as a private venture.

**Licensees.** None.

**Status.** Development through as-needed production.

**Total Produced.** Through 2022, we estimate the prime contractor produced 606 Dragoon vehicles.

**Application.** A multipurpose armored vehicle, optimized for internal security missions.

**Price Range.** The basic Dragoon vehicle reportedly maintains a unit price of \$362,000 in 2023 U.S. dollars.

### Contractors

#### Prime

<b>General Dynamics Land Systems</b>	<a href="http://www.gdls.com">http://www.gdls.com</a> , 38500 Mound Rd, Sterling Heights, MI 48310-3200 United States, Tel: + 1 (586) 825-4000, Fax: + 1 (586) 825-4013, Email: <a href="mailto:info@gd.com">info@gd.com</a> , Prime
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#### Subcontractor

<b>Allison Transmission Division, General Motors Corp</b>	<a href="http://www.allisontransmission.com">http://www.allisontransmission.com</a> , One Allison Way, PO Box 894, Indianapolis, IN 46222-3271 United States, Tel: + 1 (317) 242-5000 (MT-653 DR Gearbox & Components)
<b>BAE Systems plc</b>	<a href="http://www.baesystems.com">http://www.baesystems.com</a> , 6 Carlton Gardens, Stirling Sq, London, United Kingdom, Tel: + 44 1252 373232, Fax: + 44 1252 383991 (Model 520 Laser Rangefinder)
<b>CMI Defence, Cockerill Mechanical Industries</b>	<a href="http://johncockerill.com/en/defense">http://johncockerill.com/en/defense</a> , Avenue Greiner 1, Seraing, Belgium, Tel: + 32 4 330 2444, Fax: + 32 4 330 2582 (90mm Mk 3M-A1 Cannon)

## Dragoon Family of Armored Vehicles

<b>Detroit Diesel Corp</b>	<a href="http://www.demanddetroit.com">http://www.demanddetroit.com</a> , 13400 Outer Dr W, Detroit, MI 48239-4001 United States, Tel: + 1 (313) 592-5000, Fax: + 1 (313) 592-5158, Email: <a href="mailto:defense@detroitdiesel.com">defense@detroitdiesel.com</a> (6V-53T Diesel Powerpack)
<b>Raytheon Technologies</b>	<a href="http://www.rtx.com">http://www.rtx.com</a> , 1000 Wilson Blvd, Arlington, VA 22209 United States, Tel: + 1 (781) 522-3000, Fax: + 1 (781) 860-2520 (Model LWMS Periscopic Sight)

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](mailto:rich.pettibone@forecast1.com)

## Technical Data



### Dragoon Armored Personnel Carrier

Source: General Dynamics Land Systems – AV Technology

### **Dragoon Armored Personnel Carrier**

**Crew.** Three: commander, gunner, and driver, plus 11 infantrymen.

**Configuration.** 4x4.

**Armor.** Steel alloy armor providing protection against 7.62mm ball projectiles all around. An enhanced level of armor protection (proof against 7.62mm armor-piercing projectiles) is also available.

**Dimensions.** The following data reflect the production-standard basic armored personnel carrier.

	<u>SI Units</u>	<u>U.S. Units</u>
Length	5.89 m	19.32 ft
Width	2.49 m	8.17 ft
Height	2.82 m	9.25 ft
Combat weight	13.07 tonnes	14.41 tons
Fuel capacity	350 liters	93.09 gal

## Dragoon Family of Armored Vehicles

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

	<u>SI Units</u>	<u>U.S. Units</u>
Maximum speed	116 kmph	72.03 mph
Maximum range	885 km	549.59 stat mi
Step	60 cm	1.96 ft
Trench	50 cm	1.64 ft
Slope	35%	35%
Gradient	60%	60%
Fording	Amphibious	Amphibious
Water speed	5.60 kmph	3.48 mph

**Engine.** Detroit Diesel 6V-53T diesel engine. This liquid-cooled, supercharged six-cylinder engine generates 223.81 kilowatts (300 hp), with a power-to-weight ratio of 17.12 kilowatts per tonne (20.82 hp/ton). The fully waterproofed and radio-suppressed 24-volt electrical system features two 12-volt/100-ampere-hour batteries.

**Gearbox.** Allison Transmission Division MT-653 DR automatic gearbox with one reverse and five forward gears. The drivetrain mounts a single-speed transfer case with two- or four-wheel drive at any speed. The vehicle features power-assisted steering, with a manual backup in case of hydraulic failure.

**Suspension and Running Gear.** Semi-elliptical spring suspension system with hydraulic shock damper at each wheel station. The vehicle mounts 14.50x21 radial pattern tires. A central tire inflation system and run-flat inserts are optional.

**Armament.** One pintle-mounted 7.62x51mm NATO (.308 Winchester) M60 machine gun, with 2,000 rounds of ammunition.

The basic vehicle design can also accommodate various cannon (20mm to 90mm) options. Four optional electrically operated smoke grenade launchers can mount on each side of the vehicle.



Dragoon LFV-90

Source: General Dynamics Land Systems – AV Technology

### Light Forces Vehicle 90mm (LFV-90)

**Crew.** Four: commander, gunner, loader, and driver. The vehicle can also carry four infantrymen.

**Configuration.** 4x4.

## Dragoon Family of Armored Vehicles

**Armor.** Same as Dragoon APC.

**Dimensions.** The following data reflect the Dragoon LFV-90 with a two-man turret.

	<u>SI Units</u>	<u>U.S. Units</u>
Length	5.89 m	19.32 ft
Width	2.49 m	8.17 ft
Height	2.82 m	9.25 ft
Combat weight	12.69 tonnes	13.99 tons
Fuel capacity	341 liters	90.69 gal

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

	<u>SI Units</u>	<u>U.S. Units</u>
Maximum speed	116 kmph	72.03 mph
Maximum range	885 km	549.59 stat mi
Step	60 cm	1.96 ft
Trench	50 cm	1.64 ft
Slope	35%	35%
Gradient	60%	60%
Fording	Amphibious	Amphibious
Water speed	5.60 kmph	3.48 mph

**Engine.** Same as Dragoon APC.

**Gearbox.** Same as Dragoon APC.

**Suspension and Running Gear.** Same as Dragoon APC.

### Armament

**Main Armament.** One CMI Defence (Cockerill) 90mm Mk 3M-A1 cannon in the electrically operated two-man turret, with 46 rounds of ammunition.

**Secondary Armament.** One coaxially mounted 7.62x51mm NATO (.308 Winchester) machine gun with 2,600 rounds of ammunition.

Optional secondary armament includes an additional 7.62x51mm NATO (.308 Winchester) machine gun. Four optional electrically operated smoke grenade launchers can mount on each side of the vehicle.

**Fire Control.** Raytheon periscopic sight with an integral thermal imaging system and eight-power magnification. The fire control suite also features the BAE Systems Model 520 laser rangefinder. The commander's station features a display unit that relays data from the fire control system.

## Variants/Upgrades

**Variants.** The following are the current vehicles in the Dragoon family.

<b>Designation</b>	<b>Description</b>
Dragoon APC	Basic 4x4 armored personnel carrier. See <b>Technical Data</b> , above.
Dragoon 2	Introduced in 1997. Basic Dragoon with several improvements, including improved climate control systems, a central tire inflation system, upgraded suspension system components, a water spraying system for crowd control, improved armor protection, an improved NBC protective suite, a reduced infrared signature, and mission kits for a multipurpose dozer blade, obstacle ram, and push bumper.
Dragoon 3	Design proposal for a 6x6 variant based on stretched Dragoon 2 chassis.
Armored Command Vehicle	Command and control variant of basic Dragoon APC, mounting additional communications equipment.
Mobile Electronic Warfare System	Mounts enhanced electronic video surveillance equipment in turret, replacing armament. Extendable antenna mounts. The Teampack electronic detection system (and other sensors) can retract under armor. 7.62mm machine gun mounts on roof of turret.

## Dragoon Family of Armored Vehicles

Designation	Description
Patroller Armored Security Vehicle XC	Extended Cab (XC) variant. Same as basic vehicle but with larger and stronger windows, larger vision blocks, gun ports, and more headroom for crew of 12 with equipment.
Light Forces Vehicle 90	Mounts 90mm Mk 3M-A1 ordnance. See <b>Technical Data</b> , above.
Light Forces Vehicle 40mm/12.7mm	One-man turret, mounting 40mm Mk 19 automatic grenade launcher and 12.7x99mm (.50-cal) M2HB machine gun. Vehicle also carries eight fully equipped infantrymen.
TOW Carrier	Mounts BGM-71 TOW missile launcher on 360° rotating platform. Three-man crew; vehicle carries six reload missiles.
Mobile Armored Generator	Dedicated power unit supplies up to 120 kilowatts of electric power. Hydraulic generator available in multiple capacities from 3.5 to 60 kilowatts.
Armored Mortar Carrier	Mounts 81mm mortar on 360° rotating turntable. Five-man crew; vehicle carries 60 rounds of 81mm mortar ammunition.
Armored Maintenance Vehicle	Battlefield recovery and maintenance vehicle. Features hydraulically operated 2,268-kilogram (4,989.6-lb) crane, auxiliary power unit, and related equipment. Bi-fold doors on top provide equipment access. Five-man crew.
Logistics Support Vehicle	Accepts standard-size pallets and other containers. Features a hydraulically operated crane. Three-man crew.

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

## Program Review

**Background.** Verne Corp (Fraser, Michigan) began developing the Dragoon vehicle – originally known as the Dragoon 300 – in response to a U.S. Army specification for a light armored vehicle optimized for security applications. After the Army dropped the project, the contractor continued the program as a private venture. Arrowpointe Corp was formed as the dedicated marketing agent for the vehicle. Old Dominion Manufacturing Co (Culpepper, Virginia) undertook vehicle assembly.

### *Corporate Evolution*

In 1984, Verne and Arrowpointe merged into a new firm, AV Technology Corp. Subsequently, in August 1995, AV Technology and Lockheed Martin formed AV Technology LLC to develop and market light armored vehicles (including the Dragoon) and armored vehicle turrets. When General Dynamics purchased the defense vehicle activities of Lockheed Martin, AV Technology (and the Dragoon line) became a component of General Dynamics Land Systems.

**Description.** The contractor manufactures the Dragoon hull in a monocoque manner from welded XAR-30 steel alloy armor plate.

### *Conventional Layout*

The vehicle exhibits a conventional interior layout. The driver sits in the left-front, with the commander to his right. The driver's station features three vision blocks that afford a 180° field of view; the commander's station has one vision block. Each position also features a single-piece hatch cover.

Each side of the hull features a two-piece door. The top half mounts a vision block and firing port; the lower half forms a step. An additional door, similar in design, is located at the rear of the vehicle. Additional vision blocks and firing ports are located on the sides of the vehicle. The basic Dragoon vehicle can accommodate a variety of weapons systems without special suspension components or mechanical modifications.

### *Standard Features & Options*

Standard features of the Dragoon family of vehicles include:

- A VRC-12 radio
- A 50,000-BTU heater
- Air conditioning
- A heavy-duty electrical system

## Dragoon Family of Armored Vehicles

- Three bilge pumps
- Blackout headlights
- A fire extinguishing system
- Armored fuel tanks
- A patented driveline system

The Dragoon vehicles are available with numerous options, including a propeller-type amphibious propulsion system, a central tire inflation system, a selection of tires, various radio options, a vehicle navigation system, a spotlight, and a dozer blade.

### *Parts Commonality*

The Dragoon boasts a 70 percent commonality with parts available through the Federal Stock System as government-furnished equipment. The engine, electrical system, and bilge pumps are the same as those of the ubiquitous M113 armored personnel carrier. The axles are interchangeable with those of the M809 5-ton truck. The gearbox is the same as that of the standard M35-series 2-1/2-ton trucks.

## Funding

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The contractor funds the Dragoon as a private venture.

## Worldwide Distribution/Inventories

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**Export Potential.** In addition to the United States, a number of other countries have expressed an interest in the Dragoon family of vehicles. Despite the glutted market conditions and its lack of name recognition, the Dragoon has scored sales with several nations. However, many transactions (often for fewer than three vehicles) go unrecorded because they involve units with classified missions or various internal security outfits.

**Countries.** Through 2022, confirmed holdings are as follows: **Thailand** (43), **Turkey** (140), the **United States** (136), and **Venezuela** (100). **Canada** has an unknown number of Dragoons in service. Other military and security users remain unidentified.

## Forecast Rationale

While undoubtedly a cost-effective light wheeled vehicle, the Dragoon has yet to achieve the level of international attention enjoyed by its competitors. Indeed, our research suggests that this lack of name recognition is the main factor that continues to hinder Dragoon sales on the international market.

### *Venezuela's Dragoons*

In recent years, Venezuela has been a particularly notable user of the Dragoon. Indeed, Venezuela's Presidential Honor Guard Brigade includes a Motorized Cavalry Squadron equipped with Dragoon armored vehicles. The Honor Guard's mission is to provide security to the Venezuelan president and his family.

The Venezuelan Army's major maintenance and modernization plan for its fleet of Dragoon vehicles is clearly in doubt. The plan was part of a massive overhaul project, worth over \$70 million, that the Venezuelan military announced in late 2013. The

recovery and upgrade program for 300 vehicles was scheduled to last two years. Work would take place at the Army's Armor Maintenance Center (CEMABLIN) located at Fort Paramacay in Valencia, Carabobo State. However, given the collapse of the Venezuelan economy, the Forecast International Weapons Group expects this ambitious plan has fallen by the wayside.

### *Incomplete Forecast Data*

The Forecast International Weapons Group expects a slow but steady stream of orders from domestic and foreign military and police/internal security units. As the operational nature of many customers precludes open-source reporting of Dragoon sales, we must base our production forecast on incomplete data.

In the current security environment, we believe the Dragoon will maintain a profitable – albeit hardly spectacular – niche market share.

**Dragoon Family of Armored Vehicles**

**Ten-Year Outlook**

<b>ESTIMATED CALENDAR YEAR UNIT PRODUCTION</b>												
<b>Designation or Program</b>		<b>High Confidence</b>				<b>Good Confidence</b>			<b>Speculative</b>			
	<b>Thru 2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>	<b>Total</b>
<b>General Dynamics Land Systems Division</b>												
<b>Dragoon/Dragon 2</b>												
	606	5	5	3	3	3	5	5	5	5	5	44
<b>Total</b>	606	5	5	3	3	3	5	5	5	5	5	44