

Armored Tactical Vehicles – Army

Executive Summary

- The Army is adding armored cabs to tactical wheeled vehicles. In the urban and non-linear battlefields of Iraq and Afghanistan crews of tactical wheeled vehicles are susceptible to small arms fire, mines, IEDs, and rocket-propelled grenades.
- Many tactical wheeled vehicles are undergoing armor upgrade development, live fire, and operational testing. Development includes redesigned crew cab structures and heavier duty axles, transmissions, and other components that increase weight-bearing capability to accept attachable armor that can be installed as the tactical situation demands.
- The M915A5 Line Haul Tractor completed an FOT&E in FY09.

System

- The following tactical wheeled vehicle programs designed armor protection kits and were tested in FY09:
 - The M915A5 Line Haul Tractor is a diesel-powered, 6x4 truck tractor system that will be compatible with the M872 and other legacy tankers and trailers.
 - The High Mobility Multi-purpose Wheeled Vehicle (HMMWV) is a general purpose light, highly mobile, diesel-powered, four-wheeled-drive that is configured as a troop carrier, armament carrier, shelter carrier, ambulance, anti-tank guided-missile carrier, and scout vehicle.
 - The Expanded Capacity Vehicle (ECV2) is a HMMWV variant designed to restore lost payload, performance, and crew protection. The ECV2 is a light, highly mobile, diesel-powered, four-wheel-drive utility vehicle that is configured as a troop carrier, shelter carrier, and scout vehicle.
- The following tactical wheeled vehicle programs are in the planning and development stages of up-armorizing their cabs:
 - The Heavy Equipment Transport System (HETS) is composed of the M1070 tractor and M1000 semitrailer. This system is used to transport, recover, and evacuate a combat loaded M1 series main battle tank or equivalent loads up to 75 tons.
 - The Joint Light Tactical Vehicle (JLTV) will consist of three payload categories:
 - Category A (3,500 pounds)
 - Category B (4,000 pounds for the Marine Corps and 4,500 pounds for the Army)
 - Category C (5,100 pounds)
 - Each Variant is equipped with a companion trailer. Both Services will employ the vehicle for general-purpose mobility, infantry carrier, reconnaissance, heavy guns carrier, anti-tank guided missile carrier, ambulance, and shelter carrier.



ECV2 / HMMWV



M915A5

Mission

- The Army employs truck systems as multi-purpose transportation and unit mobility vehicles in maneuver, maneuver support, and sustainment units. The threat to personnel and tactical wheeled vehicles has created a need for augmented and flexible mission-based ballistic protection.
- The M915A5 is a line haul tractor truck used in active and reserve component transportation units for the rapid transport of bulk and containerized supplies from ocean ports to division support areas within a theater of operation.
- The HMMWV is a light tactical wheeled vehicle for command and control, troop transport, light cargo transport, shelter carrier, ambulance, towed prime mover, and weapons platform throughout all areas of the battlefield or mission area.

Prime Contractors

- M915A5: Daimler Truck North America, Charlotte, North Carolina
- HMMWV and ECV2: AM General, South Bend, Indiana
- HETS – M1070 Truck: Oshkosh Corporation, Oshkosh, Wisconsin
- HETS – M1000 Trailer: Systems & Electronics, St. Louis, Missouri
- JLTV: BAE Ground Systems, Santa Clara, California; Lockheed Martin Systems, Owego, New York; General Dynamics Land Systems, Sterling Heights, Michigan

ARMY PROGRAMS

Activity

- M915A5
 - The Army completed the FOT&E of the M915A5 in September 2009. Testing was done in accordance with the DOT&E-approved Test and Evaluation Master Plan and test plan.
 - The Army completed M915A5 live fire testing in September 2009.
- HMMWV
 - The Army completed HMMWV live fire testing in June 2009.
- ECV2
 - The Army conducted ECV2 developmental testing and completed the live fire test program. Army Test and Evaluation Command (ATEC) executed the ECV2 Customer Test at Fort Bragg, North Carolina, and Fort Polk, Louisiana, from March to May 2009.
 - The Army decided to not initiate the ECV2 program in June 2009.
- LFT&E
 - The Army is taking a common building block approach to live fire testing. It begins with ballistically characterizing the armor solutions, followed by a series of exploitation shots against the base armor and armor protection kits of prototype cabs. The focus is on armor and door seams, windows, latches, and seals using small arms threats. Final testing includes full-up and system-level tests against production vehicles using realistic threats such as mines, IEDs (to include explosively formed penetrators), and rocket-propelled grenades.
- Based upon live fire testing, the M915A5 provides armor protection to the crews against the likely threats while still maintaining mission capability.
- HMMWV
 - Live fire system-level testing of the HMMWV confirmed an improvement in protection provided by various rapidly fielded armor kits, but vulnerabilities to the crew still exist.
- ECV2
 - During the ECV2 Customer Test and Developmental Test, the ECV2 demonstrated a higher payload capacity and more interior volume compared to an up-armored HMMWV. The ECV2's improved suspension, power-train, and ground clearance increased off-road mobility. The lack of a mount for weapons on the ECV2 command and control variant decreased survivability for that variant.
 - The ECV2 demonstrated 1,628 Mean Miles Between Operational Mission Failure-Hardware (MMBOMF-H) prior to the Customer Test compared to the requirement of 2,250 MMBOMF-H. ECV2 failures experienced during developmental test were with its semi-active suspension, oil leaks, and production quality assurance problems.
 - Soldiers had difficulty diagnosing ECV2 malfunctions during the Customer Test because of the ECV2's increased automotive complexity over the existing HMMWV.
 - Live fire system-level testing of the ECV2 demonstrated crew protection against the required mines and IEDs but crew survivability vulnerabilities similar to those of the HMMWV exist against larger and more realistic threats.

Assessment

- M915A5
 - Analyses of M915A5 FOT&E results are not complete. DOT&E observed that all FOT&E missions were successful. The M915A5 tractor truck demonstrated the capability to conduct short- and long-haul transport of various combat loads specified in the Operational Requirements Document.
 - The Army's emerging evaluation of M915A5 FOT&E results along with developmental and live fire test data will inform a production cut-in decision scheduled for November 2009.

Recommendations

- Status of Previous Recommendations. The Army accepted all previous recommendations.
- FY09 Recommendations.
 1. The Army should update the M915A5 Test and Evaluation Master Plan to include details of developmental and live fire testing, and FOT&E results.
 2. Additional live fire testing will be required if armor upgrades or design changes are developed for any of the currently tested vehicles.
 3. The Army should continue to address the vulnerabilities identified during the HMMWV live fire testing.