INCH-POUND
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SUPERSEDING
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COMMERCIAL ITEM DESCRIPTION

TRUCK, FIRE FIGHTING (AIRCRAFT RESCUE) (ARFF)

The General Services Administration has authorized the use of this commercial item description for all federal agencies.

1. SCOPE. This commercial item description (CID) covers two sizes of diesel engine driven ARFF vehicles. The ARFF vehicle is intended to carry rescue and firefighting equipment for rescuing occupants and combating fires in aircraft.

2. CLASSIFICATION. The ARFF trucks covered by this CID are classified as follows:

Class	**Minimum Rated Water Capacity** (gallons)
2	1,500
4	3,000

Note that Classes 1 (1,000 gallon capacity) and 3 (2,500 gallon capacity) were defined by the previous version of this CID, but were never used.

3. SALIENT CHARACTERISTICS. The ARFF truck shall be in accordance with the applicable requirements of National Fire Protection Association (NFPA) 414, 2001 Edition.

3.1 Administration.

3.1.1 Manuals.

3.1.1.1 Technical manuals. The overall format for the manuals may be military specification, commercial, or a combination of both. Each technical manual shall have a title page. Line art shall be used to the maximum extent possible for illustrations and parts lists.

The contractor may submit digitized technical manuals in lieu of printed paper copies. The contractor may recommend the delivery of files developed in a "native" format as the final delivery medium. Native format includes MS Word, Framemaker, Interleaf, et cetera. However, all recommendations for native formatted data or graphics shall be approved by the Technical Order Manager prior to any work being performed.

The contractor shall validate the technical manuals for accuracy prior to submission to the procuring activity for verification. The contractor shall submit one complete set of draft manuals to the procuring activity for verification at least 60 days prior to the first production test. Any changes or corrections noted by the procuring activity shall be corrected and updated pages or manuals shall be submitted to the procuring activity.

Once approved by the procuring activity and a Technical Order number is assigned, the contractor shall pack two complete sets of both hard copy and CDs (if applicable) with each vehicle. An additional two complete sets of both hard copy and CDs (if applicable) shall be submitted to the procuring activity for stock.

One set of engine and transmission parts, service and operator’s manuals shall be packed with each vehicle. An additional two complete sets of engine and transmission parts, service and operator’s manuals shall be submitted to the procuring activity for stock.”

3.1.1.1.1 Operator's manual. The operator's manual shall include all information required for the safe and efficient operation of the vehicle, including the fire extinguishing equipment, and any special attachments or auxiliary equipment. The operator's manual shall include at least the following:

a. Location and functions of all controls and instruments shall be illustrated and fully described.

b. Safety information that is consistent with the safety standards established by the Occupational Safety and Health Administration (OSHA).

c. Checks and adjustments in preparation for placing the vehicle for service upon receipt from the contractor.

d. Preparation for shipment or storage.

e. Warranty information and period of the warranty for the complete vehicle and for any component warranty that exceeds the warranty of the complete vehicle. Addresses and telephone numbers shall be provided for all warranty providers.

f. General description of and step-by-step instructions for the operation of the vehicle and its fire extinguishing system(s) and auxiliary equipment.

g. Description of the post-operational procedures (draining, flushing, et cetera).

h. Checklists for the daily maintenance inspection and mission readiness checks that the operator is expected to perform, including basic troubleshooting procedures.

i. Procedures for towing a disabled vehicle.

j. Procedures for changing a tire.

k. Schedules for required preventative maintenance and required periodic maintenance.

l. A line art drawing of the vehicle, including front, rear, left, and right side views, showing basic dimensions and weights (total vehicle and individual axle weight for the unloaded and fully loaded vehicle).

3.1.1.1.2 Service manual. The service manual shall identify any special tools and test equipment required and shall cover troubleshooting and maintenance as well as minor and major repair procedures. The text shall contain performance specifications, tolerances, and fluid capacities; current, voltage, and resistance data; test procedures; and such illustrations and exploded views as may be required to permit proper maintenance by qualified mechanics. The manual shall contain an alphabetical subject index as well as a table of contents. The service manual shall contain at least the following, where applicable:

a. Fire fighting system schematic(s).

b. Hydraulic schematic.

c. Pneumatic schematic.

d. Electrical schematic.

e. Winterization schematic.

f. Fuel schematic.

g. Schedules for required preventative maintenance and required periodic maintenance.

h. Location, procedure, and interval for parts of the truck and equipment that require lubrication.

3.1.1.1.3 Parts manual. The parts manual shall include illustrations and exploded views, as needed, to properly identify all parts, assemblies, subassemblies, and special equipment. All components of assemblies shown in illustrations or exploded views shall be identified by reference numbers that correspond to the reference numbers in the parts lists. All purchased parts shall be cross-referenced with the original manufacturer's name and part number. The parts identification manual shall provide the description and quantity of each item used per vehicle. The size, thread dimensions, torque specifications, and special characteristics shall be provided for all nonstandard nuts, bolts, screws, washers, grease fittings, and similar items. The manual

shall contain a numerical index. The parts manual shall contain a list of all of the component vendor names, addresses, and telephone numbers referenced in the parts list.

3.1.1.2 Video tape or DVD. A product familiarization video tape or DVD shall be provided with each truck. The tape or DVD shall verbally and visually provide all information required for operation and routine inspection and maintenance of the vehicle and its components, using the manuals as a baseline. An additional copy of the video tape or DVD shall be provided to the procuring activity.

3.1.2 Painting, plating, and corrosion control.

3.1.2.1 Finish. Exterior surfaces shall be prepared, primed, and painted with polyurethane paint in accordance with all of the paint manufacturer's instructions and recommendations. Unless otherwise specified (see 7.2), the exterior finish color shall be Candy Apple Red, Sikkens Color Number FLNA3021, DuPont Color Number 97902U or 4737U, PPG Color Number 71528 (the PPG name for this color is Cardinal Red), or equal. When specified, the exterior finish color shall be Forest Green, Color Number 24052 of FED-STD-595, or Desert Sand, Color Number 30313 of FED-STD-595. The interior of all compartments shall be painted with an impact resistant, textured coating that resists stains, scuffs, chips, and scratches.

a. For vehicles painted Candy Apple Red, the cab upper body (from the bottom of the windshield) and roof shall be painted White, Color Number 17875 of FED-STD-595. All bright metal and anodized parts, such as mirrors, horns, light bezels, treadplate, and roll-up compartment doors, shall not be painted. Compartment interiors shall be Gray.

b. For vehicles painted Forest Green or Desert Sand, all exterior surfaces, including all normally bright metal and anodized parts and any interior surfaces visible with any compartment door open (but not the interior of the cab), shall be painted body color. This includes compartment shelves and mounting hardware, but does not include items mounted in the compartments. Non-metallic materials may be black or gray.

3.1.2.2 Dissimilar metals. Dissimilar metals, as defined in MIL-STD-889, shall not be in contact with each other. Metal plating or metal spraying of dissimilar base metals to provide electromotively compatible abutting surfaces is acceptable. The use of dissimilar metals separated by suitable insulating material is permitted, except in systems where bridging of insulation materials by an electrically conductive fluid can occur.

3.1.2.3 Protective coatings. Materials that deteriorate when exposed to sunlight, weather, or operational conditions normally encountered during service shall not be used or shall have a means of protection against such deterioration that does not prevent compliance with performance requirements. Protective coatings that chip, crack, or scale with age or extremes of climatic conditions or when exposed to heat shall not be used.

3.1.2.4 Reflective stripes. Horizontal, reflective stripes in accordance with 1.3.4 of NFPA 414 shall be applied around the vehicle. Offsets in the reflective stripes shall be made to maximize the length of reflective surface. Bright metal trim or anodized parts may interrupt the reflective

stripes. The pattern shall be 10 inches wide with three reflective stripes (1 inch reflective, 1 inch body color, 6 inches reflective, 1 inch body color, and 1 inch reflective). The reflective stripes shall be white for vehicles painted Candy Apple Red and Desert Sand, and black for vehicles painted Forest Green.

3.1.2.5 Lettering. Vehicles painted Candy Apple Red shall have the letters "UNITED STATES" and "AIR FORCE" applied in synthetic or encapsulated gold leaf, with outline and black shadow, on the front door on both sides in long radius elliptical arches above and below the lettering center line. The size of the lettering shall be a minimum of 2½-inches to a maximum of 6-inches. Vehicles painted Forest Green or Desert Sand shall have no lettering.

3.1.3 Identification plate. A permanently marked identification plate shall be securely mounted at the driver's compartment. The identification plate shall contain the following information:

a. NOMENCLATURE

b. MANUFACTURER'S MAKE AND MODEL

c. MANUFACTURER'S SERIAL NUMBER

d. REGISTRATION NUMBER

e. NATIONAL STOCK NUMBER (NSN)

f. VEHICLE CURB WEIGHT: kg (pounds)

g. PAYLOAD, MAXIMUM: kg (pounds)

h. GROSS VEHICLE WEIGHT (GVW): kg (pounds)

i. FUEL CAPACITY AND TYPE: l (gallons)

j. DATE OF DELIVERY (month and year)

k. WARRANTY (months and km (miles))

l. CONTRACT NUMBER

A second permanently marked information data plate shall be securely mounted on the interior of the driver's compartment door. The plate shall contain the information required by 1.3.5 of NFPA 414. A single plate that combines or contains the information required for both plates is acceptable.

3.1.4 Environmental conditions.

3.1.4.1 Temperature range. The vehicle shall be capable of satisfactory storage and operation in temperatures ranging from -40° to 110° F. The vehicle shall be equipped with a cab, chassis, and agent winterization system, permitting operation at -40° F. The winterization system shall not detract from the performance of the vehicle or the firefighting system in ambient temperatures up to 110° F. The vehicle chassis winterization system shall maintain the engine coolant, lubricants, fuel, and electrical systems operational at ambient temperatures of -40° F. The vehicle agent winterization system shall provide sufficient insulation and heating capacity, by means of hot circulating liquids and forced air heat exchangers, to permit satisfactory operation of the vehicle and firefighting systems for a 2-hour period at ambient temperatures as low as -40° F with the vehicle fully operational and the engine running. At the end of this 2-hour period, the vehicle shall be capable of successfully discharging its agents.

3.1.5 Foreign object damage. All loose metal parts, such as pins, shall be securely attached to the vehicle with wire ropes or chains. "Dog tag" style beaded chains shall not be provided. Removable panels, if provided, shall be attached with captive fasteners. Tire valve stem caps shall be made of plastic.

3.1.6 Mobility.

3.1.6.1 Operating terrain. The vehicle shall operate on paved roads, graded gravel roads, cross country terrain, and a sand (desert) environment. Cross country terrain shall consist of open fields, broken ground, and uneven terrain.

3.1.6.2 Grade ability. The fully loaded vehicle shall be able to ascend any paved slope up to and including 50-percent.

3.1.6.3 Side slope stability. The fully loaded vehicle shall be stable on a 30° side slope when tested in accordance with 5.4.1 of NFPA 414. A slip/trip rail, with a maximum height of 2 inches, may be used. If an adjustable height suspension system is provided, the suspension system may be set to the height normally used on hard pavement.

3.1.6.4 Cornering stability. The fully loaded vehicle shall be stable in accordance with 5.3.2.5 and 5.3.2.6 of NFPA 414 when tested in accordance with 5.3.2 of NFPA 414.

3.2 Weights and dimensions.

3.2.1 Overall dimensions. Overall dimensions shall be the minimum consistent with the operational performance and the design constraints necessary to achieve the specified performance. Overall dimensions shall not exceed:

	Class 2	**Class 4**
Length (inches)	420	480
Width(inches, excluding mirrors)	120	120
Height (inches)	163	163

3.2.2 Angles of approach and departure. The fully loaded vehicle shall have angles of approach and departure of not less than 30°.

3.2.3 Field of vision. The vehicle shall have a field of vision in accordance with 4.2.2.3 of NFPA 414.

3.2.3.1 Mirrors. Combination flat and convex outside rearview mirrors shall be installed on each side of the cab. The flat mirrors shall be of the motorized remote control type, providing not less than 60° horizontal rotational viewing range. The flat mirrors shall also have electrically heated heads. Mirror remote and heating controls shall be located on the instrument panel within reach of the seated driver. To provide the driver a clear view of the area ahead of the vehicle, a rectangular mirror shall be installed on the lower corner of each side of the windshield, but not within the driver's direct line of sight, having a minimum area of 35 square inches.

3.3 Chassis and vehicle components.

3.3.1 Engine. The vehicle shall have a turbocharged diesel engine that is certified to comply with the Environmental Protection Agency (EPA) on- or off-highway emission requirements at the time of manufacture.

3.3.1.1 High idle switch. A high idle switch, which does not increase engine speed more than 25 percent above normal low idle speed and does not exceed the engine manufacturer's recommendation, may be provided to increase alternator, air compressor, or air conditioning compressor output to meet the maximum load requirements. A lighted rocker or toggle switch, accessible from the driver's seated position, shall activate the high idle control unit. The high idle switch shall operate only when the vehicle is out of gear and the parking brake is engaged. The high idle control unit shall automatically disengage if the transmission is placed in gear, the parking brake is released, or the fire pump is engaged. The high idle control unit shall not engage automatically; the high idle control unit shall only engage when the high idle switch is in the "ON" position.

3.3.1.2 Acceleration. The fully loaded vehicle shall accelerate from 0 to 50 miles per hour (mph) within 25 seconds (Class 2 truck) or 35 seconds (Class 4 truck) on a level, paved road.

3.3.1.3 Maximum speed. The fully loaded vehicle shall attain a minimum top speed of 65 mph on a level, paved road.

3.3.1.4 Pump and roll on a 40-percent grade. The fully loaded vehicle shall be capable of pump and roll operations on a paved, dry, 40-percent grade in accordance with 4.3.1.3 of NFPA 414.

3.3.2 Engine cooling system. The engine cooling system shall be in accordance with 4.3.2 of NFPA 414. Silicone radiator and heater hoses, constant-torque clamps, and a coolant filter shall be provided. A label shall be installed near the coolant reservoir reading “Coolant Fill.”

3.3.3 Fuel system. The fuel system shall be in accordance with 4.3.3 of NFPA 414.

3.3.3.1 Fuel priming pump. The vehicle shall be equipped with a 12-volt electric fuel pump in addition to the mechanical fuel pump. The electric pump shall be used as a priming pump capable of re-priming the engines fuel system.

3.3.3.2 Fuel filters. Primary and secondary fuel filters and a heated fuel/water separator shall be provided. The fuel/water separator shall include a water coalescer and a drain valve that is readily accessible by an operator or a mechanic, and shall be in accordance with SAE J1839. A combination fuel filter and fuel/water separator may be provided. Fuel filter elements shall be easily replaceable by a mechanic without loss of engine prime.

3.3.3.3 Fuel tank. The vehicle shall have one or two fuel tanks with a minimum usable capacity in accordance with 4.3.3.5 of NFPA 414. Each tank shall have a fill opening of 3 inches minimum, readily accessible to personnel standing on the ground and designed to prevent fuel splash while refueling. Each tank shall be located and mounted so as to provide maximum protection from damage, exhaust heat, and ground fires. If more than one tank is furnished, means shall be provided to assure equalized fuel level in both tanks. An overturn fuel valve shall be provided for each tank to prevent spillage in the event of a rollover. Each tank must be prominently labeled "Diesel Fuel Only."

3.3.4 Exhaust system. The exhaust system shall be in accordance with 4.3.4 of NFPA 414. The exhaust system shall be constructed of stainless steel. The muffler(s) shall be constructed of aluminized steel or stainless steel. Exhaust system outlet(s) shall be directed upward or to the rear, away from personnel accessing equipment compartments and the engine air intake, and shall not be directed toward the ground.

3.3.4.1 Exhaust filter system. When specified (see 7.2), the vehicle shall be equipped with an exhaust filter system. The system shall remove all visible smoke from the exhaust for an adjustable period of 10 to 99 seconds after the vehicle starts, at all times when the vehicle is in reverse gear, and for an adjustable period of 10 to 99 seconds after the vehicle's transmission is shifted out of reverse. The time of filter operation shall be easily set by a mechanic with common hand tools. The system shall be completely automatic, not requiring action by any personnel at any time, with the exception of normal maintenance. Operation of the system shall not be detrimental to the vehicle or any vehicle components. The system shall protect the engine by automatically preventing itself from activating when back pressure exceeds 1.8 pounds per square inch (psi), at which time a light on the cab dash shall indicate that the filter requires changing. The filter shall be easily replaced by a mechanic using common hand tools.

3.3.5 Transmission. A fully automatic transmission with a hydraulic torque converter and at least five forward speeds shall be provided. The normal driving range selector position shall provide at least four gear ratios without movement of the selector. The transmission shall be in accordance with 4.5 through 4.5.3 of NFPA 414.

3.3.6 Driveline. The vehicle driveline shall be in accordance with 4.5.1, 4.5.4, and 4.5.5 of NFPA 414. If the driveline is equipped with a differential locking control, a warning/caution label shall be placed in view of the driver indicating the proper differential locking/un-locking procedures. The operator's manual shall also include a similar warning/caution.

3.3.7 Axle capacity. Each axle shall have a rated capacity, as established by the axle manufacturer, in accordance with 4.5.7 of NFPA 414.

3.3.8 Suspension. The suspension system shall be in accordance with 4.6 of NFPA 414.

3.3.9 Tires and wheels. Tires and wheels shall be in accordance with 4.7 of NFPA 414. The vehicle shall be equipped with single tires and wheels at all wheel positions. The vehicle shall be equipped with tubeless steel belted radial tires with non-directional on/off-road type tread mounted on disc wheel assemblies. Tire and wheel assemblies shall be identical at all positions. Tires and wheels shall be certified for not less than 25 miles of continuous operation at 60 mph at the normal operational inflation pressure. A spare tire and wheel assembly shall be provided; however, the spare tire and wheel assembly is not required to be mounted on the vehicle. Tires shall be new; retreads, recaps, or re-grooved tires shall not be permitted. A central tire inflation system (CTIS) shall not be provided.

3.3.10 Towing connections. The vehicle shall be equipped with towing connections in accordance with 4.8 of NFPA 414. The vehicle shall be designed for flat towing; the capability to lift and tow the vehicle is not required.

3.3.11 Brake system. The vehicle shall be equipped with a multi-channel all-wheel antilock brake system with at least one channel per axle; one channel per wheel is preferred. The brakes shall be fully air-actuated; disc brakes are preferred. Brakes shall be in accordance with Code of Federal Regulations (CFR) 49 CFR 393.40 through 393.42(b)), 393.43, and 393.43 through 393.52. The braking system complete with all necessary components shall include:

a. Air compressor having a capacity of not less than 16 standard cubic feet per minute (scfm).

b. Air storage reservoir(s), each tank equipped with drain, and with safety and check valves between the compressor and the reservoir tank.

c. Moisture ejector on each air storage reservoir.

d. Automatic slack adjusters on cam brakes or internal self-adjusting brakes on wedge brakes on all axles.

e. Spring set parking brakes.

All components of the braking system shall be installed in such a manner as to provide adequate road clearance when traveling over uneven or rough terrain, including objects liable to strike and cause damage to the brake system components. No part of the braking system shall extend below the bottom of wheel rims, to ensure, in case of a flat tire, that the weight of the vehicle will be supported by the rim and the flat tire and not be imposed on any component of the braking system. Slack adjusters and air chambers shall be located above the bottom edge of the axle carrier.

3.3.11.1 Air dryer. A replaceable cartridge desiccant air dryer shall be installed in the air brake system. The dryer shall have the capability of removing not less than 95 percent of the moisture in the air being dried. The dryer shall have a filter to screen out oil and solid contaminants. The dryer shall have an automatic self-cleaning cycle and a thermostatically controlled heater to prevent icing of the purge valve.

3.3.11.2 Compressed air shoreline. A checked, auto-eject compressed air shoreline connection shall be provided to maintain brake system pressure while the vehicle is not running. The shoreline shall be flush mounted (not to extend outside the body line), located on the exterior of the vehicle, either on the left side rear corner of the cab, within 6 inches of the left side front corner of the body, or at the rear of the vehicle. A minimum 50 foot long air supply hose equipped with an appropriate mating shoreline connector and an air fitting shall be provided with the vehicle.

3.3.12 Steering. The vehicle shall be equipped with power steering.

3.3.12.1 Steering effort. The steering system performance shall be in accordance with 4.10.2 of NFPA 414.

3.3.12.2 Turning diameter. The fully loaded vehicle shall have a wall to wall turning diameter of less than three times the overall length of the vehicle in both directions.

3.3.13 License plate bracket. A lighted license plate bracket shall be provided at the left rear of the vehicle.

3.4 Cab. The vehicle shall have a fully enclosed two door cab of all aluminum or all stainless steel construction. Cab door openings shall extend for the full vertical height of the side panels. Steps and handrails shall be provided for all crew doors, and at least one grab handle shall be provided for each crew member, located inside the cab for use while the vehicle is in motion. The lowermost step(s) shall be no more than 22 inches above level ground when the vehicle is fully loaded. A tilt and telescoping steering column shall be provided.

3.4.1 Windshield and windows. The windshield and windows shall be of tinted safety glass. Each door window shall be capable of being opened far enough to facilitate emergency occupant escape in the event of a vehicle accident. If the cab is equipped with power windows, a roof hatch shall be provided to facilitate emergency occupant escape in the event of a vehicle accident. A label reading “Emergency Escape Hatch” shall be installed on the cab interior side of the hatch.

3.4.2 Cab interior sound level. The maximum cab interior sound level shall be in accordance with 4.11.3 of NFPA 414.

3.4.3 Instruments and controls. All instruments and controls shall be illuminated. Gauges shall be provided for oil pressure, coolant temperature, and automatic transmission temperature. In addition to the instruments and controls required by 4.11.4.4 of NFPA 414, the following shall be provided within convenient reach of the seated driver:

a. Master warning light control switch,

b. Work light switch(es), and

c. Compartment "Door Open" warning light and intermittent alarm that sounds when a compartment door is open and the parking brakes are released or the transmission is in any position other than neutral.

3.4.4 Windshield deluge system. The vehicle shall be equipped with a powered windshield deluge system. The deluge system shall be supplied from the agent water tank and shall have an independent pumping system. The deluge system activation switch shall be located within reach of the seated driver and turret operator.

3.4.5 Forward looking infrared. The vehicle shall be equipped with a forward looking infrared (FLIR) system in accordance with 4.11.4.8 of NFPA 414. The camera shall be identical whether installed on a vehicle equipped with a roof turret or a high reach extended turret (HRET). The FLIR monitor described in 4.11.4.4 (15) of NFPA 414 shall have a minimum dimension of 10 inches (measured diagonally). The monitor shall be so located as to be visible to both the seated driver and turret operator.

3.4.6 Climate control system. The offeror/contractor's standard heater/defroster and air conditioning system shall be provided. In 100° F ambient temperature and at maximum compressor speed, the air conditioning system shall cool the fully occupied cab to 75° F within 30 minutes. The climate control system shall induct at least 60 cubic feet per minute of fresh air into the cab. At least four adjustable panel louvers shall be provided, approximately evenly spaced across the width of the cab; each shall provide approximately equal flow. Cab mounted components shall be protected from inadvertent damage by personnel.

3.4.7 Seats. The driver seat shall be adjustable fore and aft and for height. The turret operator's seat, located to the right front of the cab, shall be fixed (non-suspension) type. A third fixed (non-suspension) seat for an additional crew member shall be provided, located to the left, and possibly behind the driver. If the vehicle is not equipped with independent suspension, air suspension seats shall be provided for the driver and turret operator. When specified (see 7.2) a fourth crew seat shall be provided in the available space in the cab. The turret operator and the crew member seat(s) shall each be provided with a backrest and a bracket designed to store a 1-hour capacity Interspiro self-contained breathing apparatus (SCBA) in accordance with 15.5 of NFPA 1901. Each seat shall be provided with a Type 2 seat belt assembly (i.e., 3-point restraint) in accordance with Code of Federal Regulations (CFR) 49 CFR 571.209. A seat belt which is an integral part of the seat with no remote mounting point is preferred.

3.4.8 Windshield wipers and washer. The vehicle shall be equipped with electrically powered windshield wipers. The wiper arms and blades shall be of sufficient length to clear the windshield area described by SAE J198. Individual wiper controls shall include a minimum of two speed settings and an intermittent setting. The wiper blades shall automatically return to a park position, out of the line of vision. The vehicle shall be equipped with a powered windshield

washer system, including an electric fluid pump, a minimum one gallon fluid container, washer nozzles mounted to the wiper arms (wet arms), and a momentary switch.

3.4.9 Warning signs. Signs that state "Occupants must be seated and wearing a seat belt when apparatus is in motion" shall be provided in locations that are visible from each seated position in accordance with 4.11.6 of NFPA 414.

3.4.10 Lateral accelerometer. The vehicle shall be equipped with a lateral accelerometer in accordance with 4.11.8 of NFPA 414.

3.5 Body, compartments, and equipment mounting.

3.5.1 Body. The vehicle shall have all aluminum or all stainless steel body.

3.5.2 Compartments. The vehicle body shall have lighted compartments in accordance with 4.12.3 of NFPA 414 with a minimum of 10 cubic feet of enclosed storage space.

3.5.2.1 Compartment doors. Storage compartments shall have clear anodized aluminum, counterbalanced, non-locking, roll-up doors. Door latch handles shall be full-width bar type. Door straps shall be provided to assist in closing the compartment doors when the rolled up door height exceeds six feet above the ground.

3.5.2.2 Scuff plates. Replaceable scuff plates shall be provided at each compartment threshold to prevent body damage from sliding equipment in and out of the compartments. The scuff plates shall be securely attached to the compartment threshold but shall be easily replaceable in the event of damage.

3.5.2.3 Drip rails. Drip rails shall be provided over each compartment door. If the drip rails are not integral with the body, they shall be of anodized extruded aluminum and shall have a bright finish for vehicles painted Candy Apple Red.

3.5.2.4 Shelves. An adjustable and removable compartment shelf shall be provided for every 18 inches of each vertical storage compartment door opening. Shelving adjustments shall require no more than common hand tools, and shall not require disassembly of fasteners. Shelves shall support a minimum of 200 pounds without permanent deformation. Each shelf shall be accessible to crew members standing on the ground or using a pull out and tip-down configuration for shelving over 54-inches from the ground. Access to any shelf over 54 inches from the ground shall be facilitated by the installation of a pull-out step and a grab rail. Each shelf shall have drain holes located so as to allow for drainage of any water from the stowed equipment.

3.5.2.5 Drainage mats. Each compartment floor and shelf shall be covered with a removable black mat designed to allow for drainage of any water from the stowed equipment.

3.5.3 SCBA storage tubes. Tubes for storage of four SCBA 1-hour bottles shall be provided, two on each side of the vehicle. The tubes shall be in accordance with 15.5.6 of NFPA 1901. The

tubes shall be of sufficient size to accommodate cylinders that are 28 inches long with an 8-inch diameter.

3.5.4 Ladder, handrails, and walkways. Ladders, stepping, standing, and walking surfaces shall be in accordance with 4.12.4 and 4.12.6 of NFPA 414. Handrails shall be provided in accordance with 4.12.5 of NFPA 414. The lowermost step(s) or ladder rungs shall be no more than 22 inches above level ground when the vehicle is fully loaded.

3.5.5 Ancillary equipment. The following equipment items shall be furnished and mounted in compartments. Mounting locations shall be determined by the procuring activity.

a. Two spanner wrench holders.

b. Four spanner wrenches.

c. Two hydrant wrench holders.

d. Two hydrant wrenches.

e. One rubber mallet, 24 ounce, 15-inch overall length, 2-inch diameter, 4-inch long head.

f. Two couplings, hose, double male, swivel, internal 2½-inch hard coated aluminum with rocker lug.

g. Two adapters, double female, swivel, 2½-inch, aluminum.

h. One 2½-inch to two 1½-inch gated wye connection.

i. One 20 foot length of 6-inch soft suction hose with 4½-inch female National Hose thread connections.

j. One axe with a fiberglass handle, flathead and blade shield.

k. One axe with a fiberglass handle, pickhead and blade shield.

l. One extinguisher, 2½-gallon pressurized water.

m. One extinguisher, 20 pound, dry chemical.

n. Folding wheel chocks in accordance with 5.8.3 of NFPA 1901.

o. Storz wrenches and holders, 4-inch to 4½-inch.

p. Emergency road kit consisting of at least the following items:

1. Two highway warning triangles.
2. Two 20 minute flares.
3. One reflective vest.
4. Two cyalume light sticks.
5. One water resistant storage bag.

3.6 Agent system.

3.6.1 Agent pump. The vehicle shall be equipped with a centrifugal pump capable of providing the performance specified herein. The pump shall have a bronze body and impeller and a stainless steel shaft.

3.6.1.1 Agent system piping. All metallic surfaces of the piping and associated components that come into contact with the agent shall be of brass, bronze, or passivated stainless steel.

3.6.1.2 Tank to pump connection. A check valve and shutoff valve shall be provided in each tank to pump line.

3.6.1.3 Intake connections. The vehicle shall be equipped with two valved 4½-inch intake connections, one on each side. The vehicle shall be equipped with two valved 2½-inch intake connections, one on each side, adjacent to the 4½-inch intake connections and fitted with either 30° or 45° turn-down fittings. Each 4½-inch intake connection shall have male National Hose threads, a quarter-turn control valve, a bleeder valve in accordance with 16.6.5 of NFPA 1901, a strainer in accordance with 16.6.2 of NFPA 1901, a cap in accordance with 16.6.8 of NFPA 1901, and a slow-operating valve and an automatic pressure relief device in accordance with 16.6.4 and 16.6.6 of NFPA 1901. Each 2½-inch intake connection shall have rocker lug female National Hose threads, a quarter-turn control valve, a bleeder valve in accordance with 16.6.5 of NFPA 1901, a strainer in accordance with 16.6.2 of NFPA 1901, and a plug in accordance with 16.6.8 of NFPA 1901. The vehicle shall be capable of filling its water tank by pumping from a draft, a hydrant, or a nurse truck through any of the intake connections without the use of a hose from a discharge connection to a tank fill connection.

3.6.1.4 Discharge connections. Two 2½-inch discharge connections with male National Hose threads shall be provided. One 2½-inch discharge shall be provided on each side of the vehicle. Each connection shall be equipped with a cap in accordance with 16.7.4 of NFPA 1901, a quarter-turn control valve in accordance with 16.7.5 of NFPA 1901, a bleeder valve in accordance with 16.7.6 of NFPA 1901, and a pressure gauge in accordance with 16.12.3 of NFPA 1901. Each connection shall be rated at 250-gpm minimum.

3.6.1.5 Piping, couplings, and valves. The agent system piping shall incorporate groove type couplings to the maximum practical extent. All piping sections between agent system components shall be readily removable without disturbing the components.

3.6.1.6 Overheat protection. The agent system shall be equipped with an overheat protection system in accordance with 4.14.6 of NFPA 414.

3.6.1.7 Pressure relief valves. The agent system shall be equipped with pressure relief valves in accordance with 4.14.7 of NFPA 414.

3.6.1.8 Drains. The agent system shall be equipped with a drainage system in accordance with 4.14.8 of NFPA 414.

3.6.1.9 Priming pump. The vehicle shall be equipped with a priming pump in accordance with 16.10.14 of NFPA 1901.

3.6.2 Water tank. The Class 2 vehicle shall have a water tank with a certified minimum capacity of at least 1,500 gallons. The Class 4 vehicle shall have a water tank with a certified minimum capacity of at least 3,000 gallons.

3.6.2.1 Water tank construction. The water tank shall be constructed of passivated stainless steel or polypropylene. All materials used shall be capable of storing water, foam concentrate, and water/foam solutions.

3.6.2.2 Water tank manhole cover and drain. The water tank shall be equipped with an easily removable manhole cover with a minimum opening diameter of 20 inches. The water tank shall incorporate a drain and drain valve. The valve shall be on the left side of the vehicle and controlled by a crew member standing on the ground. The drain line shall be 2-inch internal diameter (I.D.) minimum. The point for discharge for the water tank drain shall be below the under body panels.

3.6.2.3 Water tank overflow system and venting. The water tank shall incorporate a vent system to relieve pressure on the tank during fill and discharge operations at maximum flow rates and an overflow system to relieve excess liquid in the event of tank overfill. The vent and overflow system shall prevent leakage of water when the tank is filled to capacity and the vehicle is operating on the maximum side slopes and grades specified herein. Drainage from the vent and overflow system shall not flow over body panels or other vehicle components and shall not be in the track of any of the tires. Tank vent hoses shall be of the non-collapsible type.

3.6.2.4 Water tank top fill opening. A top fill opening of not less than 8 inches internal diameter with a readily removable ¼-inch mesh strainer shall be provided. The fill opening may be incorporated as part of the manhole cover, and shall be sized to accommodate a 2½-inch fill hose.

3.6.2.5 Water tank fill connections. The water tank shall incorporate a 4½-inch male National Hose thread connection and a 2½-inch rocker lug female National Hose thread connection on each side of the vehicle. Each connection shall be fitted with a 30° turn-down fitting. The water fill shall allow external re-supply of the water tank during discharge pumping operations. Each tank fill connection shall be in accordance with 4.15.3 of NFPA 414.

3.6.3 Foam system.

3.6.3.1 Foam concentrate tank. The foam concentrate tank(s) shall have a working capacity sufficient for two tanks of water at the maximum tolerance specified in NFPA 412, Standard for Evaluating Aircraft Rescue and Fire-Fighting Foam Equipment for 6-percent foam concentrate (i.e., 7.0-percent).

3.6.3.1.1 Foam tank construction. The foam tank shall be constructed of passivated stainless steel or polypropylene. All materials used shall be capable of storing foam concentrate.

3.6.3.1.2 Foam tank drain. The foam tank shall incorporate a drain and drain valve. The valve shall be on the left side of the vehicle and controlled by a crew member standing on the ground. The drain line shall have a minimum 1½-inch I.D. The foam tank drain outlet shall be located so that the contents of the tank can be drained into 5-gallon cans and 55-gallon drums.

3.6.3.1.3 Foam tank top fill trough. The foam tank shall incorporate a top fill trough mounted in the top of the tank readily accessible to at least two crew members on top of the vehicle. The top fill trough shall incorporate a cover and latch, sealed so as to prevent spillage under any operating condition. The top fill trough shall be designed to allow two standard 5-gallon foam concentrate containers to be emptied simultaneously. The top fill trough neck shall extend sufficiently close to the bottom of the tank to reduce foaming to a minimum during the fill operation. The top fill trough shall incorporate readily removable, rigidly constructed 10 mesh stainless steel or brass strainers. All components in and around the top fill trough shall be constructed of materials that resist all forms of deterioration that could be caused by the foam concentrate or water.

3.6.3.2 Foam tank fill connections. The foam tank shall incorporate a 1½-inch National Hose thread female hose connection on each side of the vehicle to permit filling by an external transfer hose at flow rates up to 75-gpm. The connections shall be provided with chained-on long handled plugs or rocker lug plugs. The top of the connections shall be no higher than 48 inches above the ground and readily accessible. The fill lines shall incorporate check valves and readily removable, rigidly constructed ¼-inch mesh strainers. All components in the foam tank fill system shall be constructed of materials that resist all forms of deterioration that could be caused by the foam concentrate or water.

3.6.3.2.1 Foam tank vent and overflow system. The foam tank shall incorporate a vent system to relieve pressure on the tank during fill and discharge operations at maximum flow rates and an overflow system to relieve excess liquid in the event of tank overfill. The vent and overflow system shall prevent leakage of foam when the tank is filled to capacity and the vehicle is operating on the maximum side slopes and grades specified herein. Drainage from the vent and overflow system shall not flow over body panels or other vehicle components and shall not be in front of or behind any of the tires. Tank vent hoses shall be of the non-collapsible type.

3.6.3.3 Foam transfer pump. An electric motor driven or pneumatic, self-priming, diaphragm pump shall be provided and mounted in a compartment on the vehicle. The pump shall be driven from the vehicle electrical or air system. The pump shall be capable of transferring and drawing foam liquid concentrate at adjustable flow rates up to 25-gpm directly through the pump and loading connections (see 3.6.3.2). All materials and components that come in contact with the

foam shall be compatible with the foam concentrate. The pump and its plumbing shall have provisions for flushing with water from the water tank. The pump shall be removable as an assembly without disturbing other components. A suitable length of hose with appropriate connections shall be provided for filling the foam tank from an external foam storage container.

3.6.3.4 Foam flushing system. The foam concentrate system shall be designed in accordance with 4.16.2.1 of NFPA 414 so that the system can be readily flushed with clear water.

3.6.3.5 Foam concentrate piping. All metallic surfaces of the piping and associated components that come into contact with the foam concentrate shall be of brass, bronze, or passivated stainless steel. The foam concentrate piping shall be in accordance with 4.16.3 of NFPA 414.

3.6.4 Foam proportioning system. The vehicle shall have an around-the-pump or a direct injection foam proportioning system for Aqueous Film-Forming Foam (AFFF). The system shall automatically and uniformly proportion water and 3-percent foam concentrate within a minimum ratio of 2.8-percent to a maximum ratio of 3.5-percent foam concentrate to water by volume. The system shall also be capable of proportioning 6-percent foam concentrate (5.6-percent minimum, 7.0-percent maximum). If a fixed orifice plate system is used, a plate shall be provided for each percentage foam concentrate; the additional plate shall be securely mounted in a protected location on the vehicle. A mechanic shall be able to interchange the plates using common hand tools.

3.6.5 Primary turret. Unless otherwise specified (see 7.2), the vehicle shall be equipped with a roof turret in accordance with 3.6.5.1. When specified, the vehicle shall be equipped with a high reach extended turret (HRET) in accordance with 3.6.5.2.

3.6.5.1 Roof turret. The roof turret shall be mounted near the front of the roof at the center of the vehicle. It shall have a non-air-aspirating, constant flow, variable stream nozzle with dual flow rates for foam or water rated at 750-gpm minimum for the class 2 vehicle and 1,250-gpm minimum for the class 4 vehicle. The discharge pattern shall be infinitely variable from straight stream to fully dispersed. The roof turret shall be power operated; power controls shall be positioned for use by the driver and the crew member seated to the right of the driver. The nozzle shall be designed to drain automatically when the discharge valve is in the OFF position.

3.6.5.2 HRET. The HRET shall be in accordance with 4.18.6 of NFPA 414 and shall have the vertical and horizontal reach necessary to service the highest placed engine of the aircraft being serviced (DC-10/KC-10). It shall have a non-air-aspirating, constant flow, variable stream nozzle with dual flow rates for foam or water rated at 750-gpm minimum for the class 2 truck and 1,000-gpm minimum for the class 4 vehicle. The discharge pattern shall be infinitely variable from straight stream to fully dispersed. The nozzle shall be designed to drain automatically when the discharge valve is in the OFF position. The HRET shall be controlled by one or two joysticks, each with a pistol grip handle, positioned for use by the driver and the crew member seated to the right of the driver (the turret operator). The cab design shall provide clear visibility of the turret to both the driver and the turret operator with the turret in any position.

3.6.5.2.1 Video camera and monitor. When specified (see 7.2), the HRET shall be equipped with a remote video camera and a cab mounted monitor. The system shall be a complete video system consisting of a single color camera equipped with auto-focus and a cab controlled zoom. The camera/lens assembly shall be protected from the heat of the fire and from the same climatic extremes as the truck. A color video monitor with a minimum dimension of 10 inches (measured diagonally) shall be positioned in the cab within view of both the driver's and the turret operator's seated positions. One monitor may be provided for both the FLIR (see 3.4.5) and the camera with a switch to change between the FLIR and the camera.

3.6.5.2.2 Aircraft skin penetrator. When specified (see 7.2), the HRET shall be equipped with an aircraft skin penetrator and agent application tool. The skin penetrator shall be a minimum of 24 inches long, installed at the tip of the HRET, and connected to the water/foam agent discharge line. Agent application through the skin penetrator shall be controlled from the cab.

3.6.6 Bumper turret. The vehicle shall be equipped with a joystick controlled, constant flow, non-air-aspirating, variable stream type bumper turret. The bumper turret shall be capable of discharging at a flow rate of 250-gpm minimum of foam or water, with a pattern infinitely variable from straight stream to fully dispersed. The bumper turret shall be capable of automatic oscillation, with the range of oscillation fixed at 45° each side of center.

3.6.7 Preconnected handlines. A 200 foot, 1¾-inch preconnected woven jacket handline, with a 1½-inch control valve and a pistol grip nozzle, shall be located on each side of the vehicle. A safety system shall be provided to prevent charging of the hose until the hose has been fully deployed. The handlines and nozzles shall be in accordance with 4.19.4 of NFPA 414, and shall provide 125-gpm at 100 psi nozzle pressure. A control for charging each handline shall be provided for operation by both the driver and the turret operator.

3.6.8 Structural panel. The vehicle shall be equipped with an agent system structural control panel, on the left side of the vehicle, operable while standing on the ground. Structural panel activation shall be interlocked to operate only with the vehicle parking brakes set and the transmission in neutral position. Controls and instruments shall be grouped by function. The control panel shall be hinged or accessible from the rear for maintenance. Instruments shall be lighted for night operation. The structural panel shall include, as a minimum, the following:

a. Panel activation switch, including the panel lights.

b. Manual engine throttle with micro adjustments, or may be pilot controlled by manually regulated agent system pressure.

c. Engine tachometer.

d. Engine oil pressure gauge with low pressure warning light.

e. Engine coolant temperature gauge with high temperature warning light.

f. Liquid filled pump suction gauge, -30 inches Hg vacuum to 600 psi.

g. Liquid filled pump pressure gauge, 0 to 600 psi.

h. Manually adjustable pump pressure, using either a relief valve with indicator lights, pilot controlled engine throttle, or an electronic pressure sensing governor.

i. Foam or water selection switch.

j. Primer pump control.

k. Water and foam tank liquid level indicators. Identical water and foam tank liquid level indicators shall be provided on both sides of the vehicle, adjacent to the water and foam tank fills.

l. Two 10 foot long, light weight 5-inch hard suction hoses, with 4½-inch National Hose thread long handle female couplers on one end and 4½-inch National Hose thread long handle male couplers on the other, shall be carried on the top of the vehicle or stored in a recessed compartment in drainable trays. A chrome-plated 4 ½ -inch National Hose thread barrel suction strainer and mounting hardware shall be provided with the vehicle and stored in a compartment.

In lieu of a structural panel, the vehicle may be equipped with an electronic pressure sensing governor type pump pressure control system that is fully managed by the seated driver or seated turret operator from inside the cab. This system shall maintain the selected pressure regardless of flow. If this system is provided, items a. through i. above is not required; however, items j. through l. shall be provided. An additional control for charging each handline shall be provided for operation by both the driver and the turret operator.

3.7 Dry chemical agent system. The vehicle shall be equipped with a 450-pound minimum capacity potassium bicarbonate dry chemical auxiliary agent system. The propellant gas cylinder shall be replaceable within fifteen minutes by two crew members standing on the ground. The propellant gas cylinder shall be secured to withstand off-road operations. A pressure indicator shall be visible to any person opening the tank fill cap. Blow-down piping shall be directed beneath the vehicle. The dry chemical agent tank shall include lifting rings and shall have a nameplate indicating, as a minimum, the following:

a. Extinguishing agent.

b. Capacity.

c. Weight full.

d. Weight empty.

e. Operating pressure.

f. Hydrostatic test date.

g. Type of agent required for re-servicing.

3.7.1 Dry chemical primary turret discharge nozzle. When specified (see 7.2), the primary turret shall be replaced with a combination dry chemical/AFFF turret of the concentric direct injection type, designed to entrain the dry chemical agent within the foam solution discharge. Dry chemical discharge control shall be within reach of the driver and the turret operator.

3.7.2 Dry chemical hose reel. A hose reel, equipped with at least 100 feet of dry chemical hose, shall be mounted in a compartment. Handline agent and purge controls shall be mounted in or adjacent to the compartment. All electrical components shall be sealed against entry of water. The hose reel shall have both electric and manual rewind provisions. The manual rewind handle shall be bracket mounted and stored in the compartment. A quick acting control shall be provided to activate the handline from the cab of the vehicle.

3.7.3 Spare forcing agent cylinder. When specified (see 7.2), a spare forcing agent cylinder shall be provided with, but not mounted on, the vehicle.

3.8 Electrical systems and warning devices. The vehicle shall have a 12-volt electrical and starting system.

3.8.1 Alternator. A single or dual alternator charging system in accordance with 13.3 of NFPA 1901 shall be provided. The minimum continuous electrical load shall include operation of the air conditioning system.

3.8.2 Batteries. Batteries shall be of the maintenance-free type; addition of water shall not be required during normal service life. The battery cover and vent system shall be designed to prevent electrolyte loss during service and to keep the top of the battery free from electrolyte.

3.8.2.1 Battery compartment. The batteries shall be enclosed in a weatherproof box or compartment and be readily accessible.

3.8.3 Battery charger or conditioner. The vehicle shall have a DC taper type battery charger or an automatic battery conditioner, providing a minimum 12 amp output. The charger/conditioner shall be permanently mounted on the vehicle in a properly ventilated, accessible location. The charger/conditioner shall be powered from the electrical shoreline receptacle (see 3.9.1). A charging indicator shall be installed next to the receptacle. When a battery conditioner is provided, the conditioner shall monitor the battery state of charge and, as necessary, automatically charge or maintain the batteries without gassing, depleting fluid level, overheating, or overcharging.

3.8.4 Electromagnetic interference. The vehicle electrical system shall be in accordance with SAE J551/2 for electromagnetic interference.

3.8.5 Work lighting.

3.8.5.1 Cab interior lights. Cab interior light levels shall be sufficient for reading maps or manuals. At least one red and one white cab interior dome light shall be provided.

3.8.5.2 Compartment lights. White lighting sufficient to provide an average minimum illumination of 1.0 footcandle shall be provided in each compartment greater than 4.0 cubic feet and having an opening greater than 144 square inches. Where a shelf is provided, this illumination shall be provided both above and below the shelf. Lights shall automatically illuminate only when the respective door is opened and the vehicle electrical master switch is in the "on" position. Light switches shall be of the magnetic (non-mechanical) type.

3.8.5.3 Ladder, step, walkway, and area lights. Non-glare white or amber lighting shall be provided at ladders and access steps where personnel work or climb during night operations. In addition, ground lighting in accordance with 13.10.1 of NFPA 1901 shall be provided. These area lights shall be controlled with three-way switches on the cab instrument panel and near the light sources. The switch located in the cab shall be a master switch and must be turned on before auxiliary switches near the light sources are operational.

3.8.5.4 Floodlights. One or two halogen spot/floodlight(s) shall be attached at the end of the roof turret or the end of the HRET assembly. The floodlight(s) shall illuminate the area covered by the turret. The floodlight(s) shall be switched from the instrument panel.

3.8.5.5 Scene lights. A total of six 12-volt HID high mounted floodlights shall be provided to illuminate the work areas around the vehicle: two on each side and two in the front. Each pair of side mounted lights shall be controlled by a switch mounted on the side of the vehicle and by a switch mounted on the instrument panel. A switch shall also be mounted on the instrument panel to control the lights at the front."

3.8.6 Audible warning devices.

3.8.6.1 Siren. The vehicle shall be equipped with an electronic siren system. The amplifier unit shall include volume control and selection of "Radio," "PA," "Manual," "Yelp," "Wail," and "Hi-Lo" (European) modes, and a magnetic noise canceling microphone. The amplifier, microphone, and controls shall be within reach of the driver and the turret operator. Siren activating foot switches shall be located in front of the driver and the turret operator. The siren speaker shall be rated at 100 watts minimum and shall be located in a guarded position as low and as far forward on the vehicle as practical.

3.8.6.2 Horn. Dual forward facing air horns shall be installed in protected locations near the front of the vehicle. Air horn activating foot switches shall be located in front of the driver and the turret operator.

3.8.7 Emergency warning lights. All emergency warning lights shall use light emitting diode (LED) elements. Three identical LED light bars shall be provided, with two mounted on top of the vehicle, one toward the outside of the vehicle on each side, on or immediately behind the cab. Each of these light bars shall have eight LED elements, one on each corner, one at the front, one at the rear and one on each side. A third LED light bar shall be mounted on the top rear

center of the vehicle. This light bar shall also have eight LED elements, one on each corner, one at the front, one at the rear and one on each side. Three LED warning lights shall be provided on each side, one mounted as far forward, one mounted as far to the rear and one mounted as close as practical to the mid-point of the vehicle. Two LED warning lights shall be mounted on the front of the vehicle. Two LED warning lights shall be mounted on the rear of the vehicle. A switch shall be provided on the instrument panel to control all of the top, side, front and rear emergency warning lights. A switch shall also be provided on the instrument panel to disable all ten lower emergency warning lights when desired.

3.8.7.1 Emergency warning light color. Unless otherwise specified, all emergency warning lights shall be red. When specified (see 7.2), the rearward, red emergency warning lights shall be replaced with amber. When specified (see 7.2), all red emergency warning lights shall be replaced with blue. When blue lights are specified, the optical power requirements of B.11 of NFPA 414 are waived.

3.8.7.2 Headlight flashing system. A high beam, alternating/flashing, headlight system shall be provided. The headlight flasher shall be separately switched from the warning light panel.

3.8.8 Radio circuit. The vehicle shall have two separate 30 amp circuits, with breakers and at least 6-foot long wires, routed to a space provided adjacent to the driver and turret operator for purchaser provided radios and other electrical equipment.

3.8.9 Auxiliary power receptacles. The vehicle shall have 2 12-volt auxiliary power receptacles mounted adjacent to the driver and crew member positions, preferably in the instrument panel.

3.9 Line voltage electrical system.

3.9.1 Electrical shoreline connection. The battery charger/conditioner shall be powered from a covered, polarized, insulated, labeled, recessed, male, 110 volt AC auto-eject receptacle. The connection shall be located on the exterior of the vehicle at the rear. A weatherproof charge meter shall be installed next to the receptacle. A 50 foot long, three wire, 15 amp rated, 110 volt, AC power cable, with straight blade (non twist-lock) connectors, shall be provided. When specified (see 7.2), the receptacle and power cable shall be for 220 volts in lieu of 110 volts.

3.10 Air systems.

3.10.1 Air hose reel. When specified (see 7.2), an air hose reel shall be provided on the right side of the vehicle. The hose reel shall be equipped with 200 feet of 3/8-inch I.D. hoseline. A 3/8 inch National Pipe Taper (NPT) fitting and female style quick disconnect shall be connected to the end of the hoseline. A four-way roller guide shall be provided for the hose reel to prevent hose chafing and kinking. The hoseline shall be equipped with a rubber ball stop to prevent hose pull through on roller guides during rewinding operations. The hose reel shall have an electric rewind motor and provisions for manual rewind in the event of motor failure; the manual rewind handle shall be securely stored near the hose reel. A pressure protected air supply from the chassis air system shall be connected to the hose reel. The air supply lines shall be routed with minimum bends and located or guarded from damage from the carried equipment.

3.11 Workmanship. The vehicle, including all parts and accessories, shall be fabricated in a thoroughly workmanlike manner. Particular attention shall be given to freedom from blemishes, burrs, defects, and sharp edges; accuracy of dimensions, radii of fillets, and marking of parts and assemblies; thoroughness of welding, brazing, soldering, riveting, and painting; alignment of parts; tightness of fasteners; et cetera. The vehicle shall be thoroughly cleaned of all foreign matter.

4. REGULATORY REQUIREMENTS.

4.1 The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with 23.403 of the Federal Acquisition Regulation (FAR).

5. PRODUCT CONFORMANCE.

5.1 Product Conformance. The products provided shall meet the salient characteristics of this Commercial Item Description, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial market. The government reserves the right to require proof of such conformance.

5.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First production inspection (see 5.3).

b. Conformance inspection (see 5.4).

5.3 First production inspection. The first production vehicle shall be subjected to the examinations and tests described in 5.6.3.1 through 5.6.3.5 (if applicable). The contractor shall provide or arrange for all test equipment and facilities.

5.4 Conformance inspection. Each production vehicle shall be subjected to the examinations and tests described in 5.6.3.1, 5.6.3.1.5, 5.6.3.1.8, 5.6.3.1.9, 5.6.3.1.11, 5.6.3.1.3, 5.6.3.1.12, and 5.6.3.3.1 through 5.6.3.5 (if applicable).

5.5 Commercial item requirement. The vehicle furnished shall comply with the "commercial item" definition of FAR 2.101 as of the date of award. The government reserves the right to require the offeror/contractor to prove that their product complies with the referenced commerciality requirements and each salient characteristic of this CID.

The offeror/contractor shall provide an itemized technical proposal that describes how the proposed model complies with each salient characteristic of this CID; a paragraph by paragraph response to the salient characteristics section of this CID shall be provided. The offeror/contractor shall provide two copies of their commercial descriptive catalogs with their offer as supporting reference to the itemized technical proposal. The offeror/contractor shall

identify all modifications made to their commercial model in order to comply with the requirements herein.

5.6 Inspection requirements.

5.6.1 General inspection requirements. Apparatus used in conjunction with the inspections specified herein shall be laboratory precision type, calibrated at proper intervals to ensure laboratory accuracy.

5.6.2 Test rejection criteria. Throughout all tests specified herein, the vehicle shall be closely observed for the following conditions, which shall be cause for rejection:

a. Failure to conform to design or performance requirements specified herein or in the contractor's technical proposal.

b. Any spillage or leakage of any liquid, including fuel, coolant, lubricant, or hydraulic fluid, under any condition, except as allowed herein.

c. Structural failure of any component, including permanent deformation, or evidence of impending failure.

d. Evidence of excessive wear.

e. Interference between the vehicle components or between the vehicle, the ground, and all required obstacles, with the exception of normal contact by the tires.

f. Misalignment of components.

g. Evidence of undesirable road ability characteristics, including instability in handling during cornering, braking, and while traversing all required terrain.

h. Conditions that present a safety hazard to personnel during operation, servicing, or maintenance.

i. Overheating of the engine, transmission, or any other vehicle component.

j. Evidence of corrosion.

k. Failure of the firefighting system.

5.6.3 Detailed inspection requirements.

5.6.3.1 Examination of product. Each vehicle shall be examined to verify compliance with the requirements herein. A Government generated checklist that identifies each relevant requirement and the inspection results shall be used. Particular attention shall be given to materials, workmanship, dimensions, surface finishes, protective coatings and sealants and their

application, welding, fastening, and markings. Proper operation of each vehicle function shall be verified. A copy of the vehicle manufacturer's certifications shall be provided with each vehicle in accordance with 5.2.1 through 5.2.4 of NFPA 414. Each production vehicle shall be inspected to a reduced version of the checklist.

5.6.3.1.1 Road ability test. The fully loaded first production vehicle shall be driven over ten miles of paved and ten miles of cross country terrain consisting of open fields, broken ground, and uneven terrain. All loads shall be removed and all structure and surfaces shall be visibly inspected for failure or permanent deformation.

5.6.3.1.2 Grade ability test. The first production vehicle shall be tested in accordance with 5.3.8 of NFPA 414 to demonstrate compliance with 3.1.6.2.

5.6.3.1.3 Tilt table test. The first production vehicle shall be tested in accordance with 5.4.1 of NFPA 414 to demonstrate compliance with 3.1.6.3. A slip/trip rail with a maximum height of 2-inches may be used. If an adjustable height suspension system is provided, the suspension system may be set to the height normally used on hard pavement.

5.6.3.1.4 Cornering stability test. The fully loaded first production vehicle shall be tested in accordance with 5.3.2 of NFPA 414 to demonstrate compliance with 3.1.6.4.

5.6.3.1.5 Weight and weight distribution measurement. Each vehicle shall be weighed in accordance with 5.4.2 of NFPA 414 to demonstrate compliance with 4.2.1 of NFPA 414.

5.6.3.1.6 Dimension measurement. The first production vehicle shall be measured in accordance with 5.3.3 of NFPA 414. In addition to the dimensions listed in 5.3.3.4 of NFPA 414, the overall length, width, and height shall be measured to demonstrate compliance with 3.2.1.

5.6.3.1.7 Angles of approach and departure measurement. The angles of approach and departure of the fully loaded vehicle shall be measured to demonstrate compliance with 3.2.2.

5.6.3.1.8 Acceleration test. Each vehicle shall be tested in accordance with 5.4.3 of NFPA 414 to demonstrate compliance with 3.3.1.2. For the first production vehicle, a time-distance recorder shall be used to record data for this test.

5.6.3.1.9 Maximum speed test. Each vehicle shall be tested in accordance with 5.4.4 of NFPA 414 to demonstrate compliance with 3.3.1.3. For the first production vehicle, a time-distance recorder shall be used to record data for this test.

5.6.3.1.10 Pump and roll on a 40-percent grade test. The first production vehicle shall be tested in accordance with 5.3.5 of NFPA 414.

5.6.3.1.11 Service brake system test. Each vehicle shall be tested in accordance with 5.4.5 of NFPA 414. For the first production vehicle, a time-distance recorder shall be used to record data for this test.

5.6.3.1.12 Air system and air compressor test. Each vehicle shall be tested in accordance with 5.4.6 of NFPA 414.

5.6.3.1.13 Turning diameter test. The fully loaded first production vehicle shall be tested in accordance with 5.3.13.1 through 5.3.13.4 of NFPA 414 to demonstrate compliance with 3.3.12.2.

5.6.3.2 Cab interior sound level test. The cab interior sound levels of the first production vehicle shall be measured in accordance with 5.3.34 of NFPA 414 to demonstrate compliance with 3.4.2.

5.6.3.3 Agent system tests.

5.6.3.3.1 Agent discharge pumping test. Each vehicle shall be tested in accordance with 5.4.7 of NFPA 414.

5.6.3.3.2 Pump and maneuver test. Each vehicle shall be tested in accordance with 5.4.9 of NFPA 414.

5.6.3.3.3 Hydrostatic pressure test. Each vehicle shall be tested in accordance with 5.4.10 of NFPA 414.

5.6.3.3.4 Priming device test. Each vehicle that is equipped with a priming pump shall be tested in accordance with 16.13.5 of NFPA 1901.

5.6.3.3.5 Agent tank capacity test. The first production vehicle shall be tested in accordance with 5.3.1 of NFPA 414 to demonstrate compliance with the capacity requirements of 3.6.2 and 3.6.3.1.

5.6.3.3.6 Water tank fill and overflow test. The first production vehicle shall be tested in accordance with 5.3.15 of NFPA 414 to demonstrate compliance with 3.6.2.3.

5.6.3.3.7 Foam concentration test. Each vehicle shall be tested in accordance with 5.4.11 of NFPA 414 at the 3-percent concentration setting to demonstrate compliance with the foam concentration quality requirements of 3.6.4.

5.6.3.3.8 Primary turret flow rate test. The first production vehicle shall be tested in accordance with 5.3.17 of NFPA 414 to demonstrate compliance with 4.18.2 of NFPA 414. Each vehicle shall be tested in accordance with 5.4.12 of NFPA 414 to demonstrate compliance with 4.18.2 of NFPA 414.

5.6.3.4 Electrical system tests.

5.6.3.4.1 Electrical charging system test. The first production vehicle shall be tested in accordance with 5.3.6 of NFPA 414 to demonstrate compliance with Annex B.4 of NFPA 414.

5.6.3.4.2 Electromagnetic interference test. The first production vehicle shall be tested in accordance with 5.3.7 of NFPA 414 and MIL-STD-461E to demonstrate compliance with 3.8.4.

5.6.3.5 Piercing/penetrating nozzle test. Each truck equipped with a piercing/penetrating nozzle shall be tested in accordance with 5.4.13 of NFPA 414.

6. PACKAGING.

6.1 Preservation, packing, and marking shall be as specified in the contract or order.

7. NOTES.

7.1 Source of documents.

7.1.1 Department of Defense and Federal documents may be obtained at http://assist.daps.dla.mil or from the Document Automation and Production Service, Bldg 4D (DPM-DODSSP), 700 Robbins Avenue, Philadelphia PA 19111-5094.

7.1.2 The Code of Federal Regulations (CFR) may be obtained at http://www.gpoaccess.gov/cfr/ or from the Superintendent of Documents, U.S. Government Printing Office, Washington DC 20402.

7.1.3 SAE documents may be obtained at http://www.sae.org/servlets/index or from SAE, Inc., 400 Commonwealth Drive, Warrendale PA 15096.

7.1.4 NFPA documents may be obtained at http://www.nfpa.org/index.asp or from NFPA, Batterymarch Park, Quincy MA 02269-9101.

7.2 Ordering data. The contract or order should specify the following:

a. Finish color required (Forest Green or Desert Sand in place of Candy Apple Red) (see 3.1.2.1).

b. If an exhaust filter system is required (see 3.3.4.1).

c. If fourth crew member seat is required (For Air National Guard ONLY). (see 3.4.7).

d. Whether a roof turret or an HRET is required (see 3.6.5).

e. If an HRET-mounted video camera and cab-mounted monitor is required (see 3.6.5.2.1).

f. If an HRET-mounted aircraft skin penetrator is required (see 3.6.5.2.2).

g. If a dry chemical primary turret discharge nozzle is required (see 3.7.1).

h. If a spare forcing agent cylinder is required (see 3.7.3).

i. Emergency warning light color required (amber or blue in place of red) (see 3.8.7.1).

j. Electrical shoreline voltage, 220 volts instead of 110 volts (see 3.9.1).

k. If an air hose reel is required (see 3.10.1).

Custodian:
Air Force - 99

Reviewer:
DLA- CC

Preparing activity:
Air Force - 84

Agent:
Air Force – 99

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