NOT MEASUREMENT SENSITIVE

MIL-PRF-32080(USAF)
1 March 2001

PERFORMANCE SPECIFICATION

TRUCK, TANK, AIRCRAFT REFUELING, 6000 GALLON, A/S32R-11

This specification is approved for use by the department of the Department of the Air Force and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirements for one type of aircraft refueling tank truck capable of fueling and defueling military and commercial aircraft on Government installations worldwide. The truck is road legal for transport of fuel and converts for air transport in C-130, C-141, C-17, and C-5 aircraft.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use improving this document should be addressed to: WR-ALC/LER, 225 Ocmulgee Court, Robins AFB GA 31098-1647, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 2320

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

FEDERAL

A-A-393	Extinguisher, Fire, Dry Chemical (Hand Portable)
A-A-50696	Reels, Static Discharge, Grounding, 50 and 75 Foot Cable Lengths
A-A-50271	Plate, Identification
A-A-59326	Coupling Half, Quick Disconnect, Cam locking Type

DEPARTMENT OF DEFENSE

MIL-DTL-5624	Turbine Fuel, Aviation, Grades JP-4, JP-5, and JP-5/JP-8 ST
MIL-N-5877	Nozzle, Pressure Fuel Servicing, Locking, Type D-1, D-1R, D-2, and D-2R, Nominal 2-1/2 Inch Diameter
MIL-DTL-25524	Turbine Fuel, Aviation, Thermally Stable
MIL-A-25896	Adapter, Pressure Fuel Servicing, Nominal 2.5 Inch Diameter
MIL-C-46168	Coating, Alphaic Polyurethane, Chemical Agent Resistant
MIL-C-53039	Coating, Alphaic Polyurethane, Single Component, Chemical Agent Resistant
MIL-DTL-83133	Turbine Fuels, Aviation, Kerosene Types, NATO F-34 (JP-8), NATO F-35, and JP-8+100

STANDARDS

FEDERAL

FED-STD-297	Rust proofing of Commercial (Nontactical) Vehicles
FED-STD-595	Colors
FED-STD-807	Trucks and Truck Tractors: Heavy Commercial 6X4 & 6X6, 18,000 to 30,000 KG (40,000 to 66,000 LBS) GVW

DEPARTMENT OF DEFENSE

MIL-STD-461	Requirements for the Control of Electromagnetic Interference Emissions and Susceptibility
MIL-STD-810	Environmental Test Methods and Engineering Guidelines

HANDBOOKS

DEPARTMENT OF DEFENSE

MIL-HDBK-1223	Nontactical Wheeled Vehicle Treatment, Painting, Identification Marking and Data Plate Standards
MIL-HDBK-1791	Internal Aerial Delivery in Fixed Wing Aircraft

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

TECHNICAL MANUALS

TO 36-1-191	Technical and Managerial Reference for Motor Vehicle Maintenance

DRAWINGS

MS24484	Adapter, Pressure Fuel Servicing, Nominal 2.5 Inch Diameter

LAWS AND REGULATIONS

Code of Federal Regulations

Title 29: Labor, Section XVII Occupational Safety and Health Administration (OSHA) Parts 1900-1999

Title 49: Transportation

(The Code of Federal Regulations (CFR) is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

(Copies of Government documents required by the contractor in connection with this acquisition functions should be obtained from or as directed by the contracting activity.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise indicated, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation.

AMERICAN PETROLEUM INSTITUTE (API)

API RP 1004	Bottom Loading and Vapor Recovery for MC-306 Tank Motor Vehicles
API BULL 1529	Aviation Fueling Hose
API PUBL 1581	Specification and Qualification Procedures for Aviation Jet Fuel Filter Separators
API RP 2003	Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents

(Copies are available from the American Petroleum Institute, 1220 L Street, NW, Washington DC 20005.)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME Boiler and Pressure Vessel Code

Section IX Welding Qualifications

(Copies are available from the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York NY 10017.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D3240 Standard Test Method for Undissolved Water in Aviation Turbine Fuels

(Copies are available from the American Society for Testing and Materials, 1916 Race Street, Philadelphia PA 19103.)

AMERICAN WELDING SOCIETY (AWS)

B2.1-84 Standard for Welding Procedure and Performance Qualification

(Copies are available from the American Welding Society, 2501 NW Seventh Street, Miami FL 33125.)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 385 Tank Vehicles for Flammable and Combustible Liquids
NFPA 407 Aircraft Fuel Servicing

(Copies are available from the National Fire Protection Association, Batterymarch Park, Quincy MA 02269.)

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE J447	Prevention of Corrosion of Motor Vehicle Body and Chassis Components
SAE J534	Lubrication Fittings
SAE J682	Rear Wheel Splash and Stone Throw Protection
SAE J695	Turning Ability and Off Tracking
SAE J821	Electrical System for Construction and Industrial Machinery
SAE J833	Human Physical Dimensions
SAE J925	Minimum Service Access Dimensions for Off-Road Machines
SAE J1099	Technical Report on Fatigue Properties
SAE APR1247	General Requirements for Aerospace Ground Support Equipment Motorized and Nonmotorized

(Copies are available from the Society of Automotive Engineers, 400 Commonwealth Dr. Warrendale PA 15096.)

2.4 Order of precedence. In the event there is a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3 REQUIREMENTS

3.1 First article. When specified (see 6.2), sample(s) shall be subject to first article inspection in accordance with 4.2.

3.2 Materials. The truck, components, and all materials shall be selected based on the defined purpose for the specified service life at the environmental extremes stated herein. Materials shall be certifiable for the application. Proprietary materials or processes shall not be used. Components shall not be used outside their published ratings.

3.2.1 Prohibited materials. Magnesium alloys, wood products, PVC, polyester, RTV (yielding acetic acid), or asbestos shall not be used in any component or assembly of this truck.

3.2.2 Recycled materials. To the maximum extent, recovered materials shall be used for fabrication of this truck, without affecting the intended use. Used or rebuilt parts shall not be defined as recovered materials.

3.2.3 Fungus proof materials. Where possible, materials used to construct this truck shall not be nutrients for fungi.

3.2.4 Metals. Aluminum materials shall be anodized, except for tanks. Copper based materials shall not come in direct contact with fuel, except within components certified for use with the fuels listed herein.

3.2.5 Impregnation of castings. Aluminum castings may be impregnated to prevent weeping.

3.2.6 Galvanic Corrosion. Avoid the use of combinations of metals that are widely separated in the galvanic series, as defined by SAE J447.

3.2.7 Elastomers. Elastometric materials shall be certified compatible with all fuels specified herein.

3.2.8 Protective treatment. Coatings subject to failure at the extremes specified herein shall not be used.

3.3 Design and construction. The truck shall receive, transport, store, and pump turbine and jet fuels, and all other types of commercial and military use diesel. The truck shall withstand conditions incidental to operation, shipping, and storage, at the environmental extremes specified herein. The truck cab and chassis, and the refueling systems components shall be selected, and verifiable by shock dynamic and finite element analysis (FEA) and strain gauge testing, for a design service life of not less than 15 years. Service life applies to the truck frame and driveline, cab, body, cargo tank, piping, wiring, and the like, which shall not require periodic rebuilds to attain. Unless otherwise specified, SAE ARP 1247 requirements for aerospace ground support equipment, as applicable to a refueling truck, shall apply.

3.3.1 Human engineering. All system operations, servicing, and maintenance functions shall be configured to be accomplished by a range of personnel from a fifth percentile female to a ninety-fifth percentile male in accordance with human engineering design criteria of SAE J833.

3.3.2 Controls. The range of control positions of any device shall not obstruct the range of control positions of another device. Bearings shall be installed at each location where there is relative rotation between two parts.

3.3.3 Servicing provisions. Special tools shall not be required to access drains, lubrication, or service checkpoints.

3.3.4 Foolproofness. Component design, by shape or by mounting pattern, shall prevent improper installation.

3.3.5 Foreign Object Damage (FOD). Any metal cap, plug, pin, or plate, which must be removed for inspection, service or operation, shall be retained by wire rope lanyard or chain, so it cannot become separated from the truck.

3.3.6 Bonding. All metal components shall be bonded in accordance with the guidelines of API RP 2003. A braid, with less than 10 ohms resistance, shall be attached to all system drains as a bonding point for the drain bucket.

3.3.8 Prevention of static electricity. Fuel shall not be required to spray or free fall into or out of the cargo tank during operation or servicing. Nonmetallic components shall be certified to a resistance of 108 ohms/in^2 or less.

3.3.8 Lubrication. Lubrication fittings shall conform to SAE J534. Grease seals shall include pressure relief devices to prevent damage. Extended lubrication fittings may be used to overcome accessibility problems. A lubrication data plate (see 3.24.2) shall identify every lubrication fittings on the truck, with the type and grade of lubricant required for all operational temperatures.

3.3.9 Fastening devices. Threaded fasteners shall include prevention for the loss of torque, while allowing for disassembly. An assembly torque shall be specified for all threaded fasteners. Internal threads of aluminum components shall withstand not less than twenty fastener installation cycles to required torque. Adhesive backed wiring supports shall not be used.

3.3.9.1 Permanent fasteners. Permanently fastened overlapping surfaces shall be sealed. Rivet selection shall be for a minimum joint strength. Rivet heading shall be consistent with published data for a matching application.

3.3.10 Welders and welding. Welders shall be certified as specified in B2.1-84, Standard Qualification Procedure of the American Welding Society, and Section IX, Welding Qualifications of the ASME.

3.3.11 Air transportability. The truck shall be convertible for air transport, without shoring, as specified in MIL-HDBK-1791 in Types C-130, C-141, C-17, and C-5 aircraft. Worse case limits for dimensions, axle loading, ramp angle, g-loading, rapid decompression, and the like, shall be the minimum requirement. A transportation data plate (see 3.24.2) shall be provided, with the following minimum information:

a. Side and rear silhouette views of the truck, with the center-of-gravity locations identified.
b. Shipping weight.
c. Loading cubage.
d. Overall height, width, and length.

3.3.11.1 Equipment removal for air transport. Component removal to attain an air transport configuration shall be limited to the use of common hand tools applied to standard fasteners and fittings. Individual removed components shall not exceed 30 pounds for a one-person lift or 80 pounds for a two-person lift. Each removed component shall have a specified storage location within the truck. Any caps and plugs required for driving and/or storage while in air transport configuration shall be provided and shall store within the truck. The time required attaining air transport configuration or to restore to operational configuration shall not exceed 15 minutes for two trained mechanics.

3.2.11.2 Tie downs. The air transport tie down points shall restrain the movement of the truck frame with respect to the aircraft. Truck tie down points shall provide clearance for the hooks in the restraining chains/straps and shall coordinate with attaching points for each aircraft identified.

3.3.12 Workmanship. The truck and all components shall be constructed and finished in a workmanlike manner. Particular attention shall be given to; dimensional accuracy; elimination of sharp edges and burrs; alignment; welding; attaching fasteners; wiring; surface preparation, and finish.

3.4 System safety analysis. A System Safety Analysis (SSA) shall establish the risk levels associated with the fueling systems. A Subsystem Hazard Analysis (SSHA) shall include, in industry terms, a Failure Mode Effects and Criticality Analysis (FMECA). The SSHA shall include pumping, bottom loading, venting, the controls systems, and the chassis interfaces. The SSA shall also include methods for controlling any identified hazard.

3.5 Reliability. A reliability analysis shall be performed for the fueling system design. Design reliability shall be demonstrable in terms of Mean Time Between Failure (MTBF) and Mean Time Between Critical Failure (MTBCF). A test cycle shall validate both MTBF and MTBCF. Reliability terms shall be defined as:

a. FAILURE: The event, or inoperable state, where any part does not, or would not, perform as specified.

b. CRITICAL FAILURE: A failure, or combination of failures, that obstructs or prevents loading, storing and transporting fuel, or from fueling or defueling an aircraft.

c. MTBF: A measure of reliability of repairable items. The mean number of life units during which all system component parts shall perform within their specified limits, at the extreme conditions stated herein.

d. MTBCF: A measure of mission reliability. The mean number is the total mission time, divided by the number of critical failures during a stated series of missions.

3.6 Maintainability. Maintainability shall be a consideration in the design of the fueling systems. Except for daily operational inspections, maintenance will be performed by trained mechanics. Maintainability shall be a measure of the time required to accomplish defined tasks. The maintainability design objective shall include the following:

a. Service access clearances while wearing arctic mittens and clothing, as specified in SAE J925.

b. No requirement to disconnect or remove components to gain access to other components.

c. Specialized hand tools, shop equipment, and custom tools, if necessary, be provided with every truck to service or repair any part of the fueling system or a sub-system.

d. A one task time limit of eight hours for any item in the fueling system, such as; a filter elements change; a PTO, a pump, a hose reel, or a fueling hose replacement; and the like.

e. A 15 minute time limit for one person to perform all daily inspection and service tasks, including, but not limited to; inspection for leaks; checking brakes, steering, horn, lights, engine, transmission, and PTO, drive belts; adjusting lubricants, coolant, hydraulic and windshield washer fluid levels, and tire pressure.

f. Provisions for quick disconnects in hydraulic and pneumatic lines, and in electrical harnesses.

g. A nominal 400-hour interval for scheduled maintenance during normal operational conditions. Normal conditions are defined as between 0°F and 100°F, at any humidity, no blowing dust, and no salt fog.

h. Scheduled maintenance intervals of not less than 24 operating hours at any environmental condition.

i. Selection of wear items for a minimum of 2,400 hours of normal operation.

3.7 Performance.

3.7.1 Environmental conditions. All truck systems and all fueling systems shall store, start, and operate under the following environmental conditions:

a. Full time exposure to temperatures ranging from -40 to +125° F.

b. Full time exposure to a relative humidity of 100 percent.

c. Part-time (5%) exposure to salt fog; five percent salt solution with fallout of 3.0 ml/80cm^2/hr.

d. Part-time (5%) exposure to blowing dust; velocity 1,750 ft/min, concentration 2.2 g/m^3.

3.7.2 Pumping system operation. The system shall deliver a minimum of 5,700 gallons of fuel from a single fill of the cargo tank. The system shall flow fuel between zero and the mode selection limit, by manual control of flow (pump speed) and automatic control of pressure. Pressure and flow shall be stable at any operating condition. Maximum flow shall not exceed 625 gallons per minute (GPM) and maximum nozzle pressure shall not exceed 60 pounds per square inch gauge (psig). The pumping system shall:

a. Pump in LOW FLOW mode, from the tank, through the filter system, the meter, and the primary hose or the overwing hose, to the overwing nozzle, at rates up to 100 GPM, or simultaneously at rates up to 200 GPM. After flow is established by throttle setting (pump speed), flow shall be regulated by the demand of the nozzles.

b. Pump in HIGH FLOW mode from the tank, through the filter system, the meter, the primary hose to the single point nozzle, at rates up to 600 GPM against a nozzle pressure of 50 ± 5 psig. After flow is established by throttle setting (pump speed), flow shall be regulated by the demand of the nozzle.

c. Defuel a minimum of 5700 gallons of fuel from an aircraft, with or without the assistance of the aircraft pumps, through the single point nozzle, the primary hose, the filter system, the meter, and into the cargo tank, at constant flow rates up to 175 GPM, until the cargo tank is full. Defuel a ground level tank at flow rates up to 100 GPM, through adapters to the

single point nozzle. Defuel an underground tank at flow rates up to 50 GPM, through a 15 foot long, 1-1/2 inch hose, attached to the single point nozzle. An automatic high level shutoff shall stop flow when the tank is full. If a mechanical shutoff is used, a pretest system shall simulate a full tank. If any part of the level control system is not functional, the truck shall not defuel.

3.7.2.1 Closed discharge. The pump shall operate at maximum rated pump speed, against a closed discharge for a minimum of 30 minutes without evidence of damage, or overheating.

3.7.2.2 Dry operation. The pump shall operate dry at maximum pump speed for ten minutes without damage.

3.7.3 Bottom loading system. The bottom loading system shall accept up to 750 GPM of fuel at 200 psig inlet pressure. An automatic shut-off shall stop flow when the tank is full. If a mechanical shutoff is used, a pretest system shall simulate a full tank. If any part of the level control system is not functional, the truck shall not load.

3.8.4 Mobility. The truck, with fully loaded tank, filter system, and piping, shall attain; 55 miles per hour (mph) on a level highway; 40 mph over an unimproved road; and, 15 mph over Belgian block paving.

3.7.4.1 Suspension articulation. The fully loaded truck shall negotiate an 8 inch high radius top berm, with 15 % approach and departure angles (secondary containment barrier around a fill stand), in a straight pass and mid-way through a minimum radius turn in either direction. There shall be no part failures, interference, bottoming out of a mounting system, or permanent distortion of any portion of the truck, the cargo tank or the pumping system.

3.8 Truck Chassis and Cab

3.8.1 Chassis. The truck shall be a standard commercial product conforming to FED-STD 807 for a 6-by-4 chassis with a 2 door cab, Type 1, Class F, as modified to comply with the specific requirements defined herein. A rear air suspension system shall be provided. The wall-to-wall turning diameter, as defined by SAE J695, shall not exceed 106 feet. A fully loaded truck shall be towable from the front with or without the front tires off the ground.

3.8.2 Frame assembly. The truck frame shall withstand the imposed loads of operation under all of the conditions described herein. The frame, less crossmembers and reinforcements, shall have a resisting bending moment (RBM) of each rail of not less than [(0.167) (wheelbase) (gross vehicle weight)] at the area of maximum depth.

3.8.3 Axles. The commercial load rating of each axle shall exceed the gross imposed load, measured at the ground.

3.8.4 Wheel loading. Wheel loading variation on any axle shall not exceed 2.5 percent of the total axle load, for either curb or gross load conditions. Gross load conditions shall include the

fully optioned truck weight, plus the tank, pump and piping systems full of JP-8 fuel, and a crew of two 250-pound operators.

3.8.5 Engine. The truck engine shall provide the necessary power to meet the minimum performance requirements specified herein while operating on JP-8 fuel, as specified in MIL-DTL-83133. A valve, with reset capabilities, in the air supply shall be controlled from the emergency engine shutoff on the pumping control panel (see 3.17.1.6).

3.8.5.1 Engine starting system. The engine shall start within 15 seconds, at temperatures above +40°F, with only the starter motor. The engine shall start within 60 seconds, at temperatures between +40 and 0°F, with the starter motor and non-remote powered starting aids. The engine shall start within five minutes, at any temperature between 0° and -40°F, with the starting aids and the additional assistance of a remote powered winterization system.

3.8.5.2 Exhaust pipe and muffler. The truck muffler shall be mounted under and behind the front bumper, with a right side outlet pointing down and forward. The exhaust system shall not extend behind the truck cab.

3.8.6 Transmission. The truck shall be equipped with an automatic transmission.

3.8.7 Power Take-Off (PTO). The fuel delivery system pump shall be driven through a PTO, designed to either move the truck or drive the pump (never both concurrently). The PTO rating shall exceed the greater requirement for power. PTO engagement, from road to pump or from pump to road, shall occur without gear clash or system shock loading. The auxiliary throttle (control panel) shall not operate while the PTO is in road mode and the truck accelerator pedal shall not operate while the PTO is in pump mode. PTO engagement shall be controlled from the driver's seated position and shall not occur unless/until the truck parking brakes are set.

3.8.8 Propeller shafts. The cargo tank and the pumping system shall be protected from any part of a failed propeller shaft. A failed propeller shaft shall not drop to the ground and shall not generate a spark from contact with any restraining device.

3.8.9 Spare wheel and tire assembly. A spare wheel and tire assembly shall be provided with each truck. A mount point on the truck is not required.

3.8.10 Brakes. The truck chassis air system shall be rechargeable from auxiliary air lines, using .25 inch male style quick-disconnect fittings, one located at the front and one at the rear of the truck. A sealed emergency brake interlock override valve shall be mounted inside the cab. Each air reservoir shall have a wire rope operated drain valve.

3.8.11 Electrical System. The truck shall have a 12-volt electrical system.

3.8.11.1 Batteries. The battery box(s) shall be frame mounted and located forward of the back of the cab. If the battery(s) cannot be located forward of the back of the cab, it/they must be on the

right side of the truck with the power cables routed within conduit a minimum of six inches forward of the rear of the cab.

3.8.12 Chassis Winterization. Coolant, oil, and fuel warmers, available in FED-STD-807 may be provided, except the system shall operate on either 110 or 220 volts, 50 or 60 cycle, alternating current (AC). A set of plug adapters for non-U.S. outlets shall be included. A labeled light on the instrument panel shall indicate when the AC power is connected. The winterization system shall also include a truck mounted battery conditioner or charger. Battery warmers, if provided, shall maintain the electrolyte at not less than +10°F at –40°F ambient, and shall not operate above an electrolyte temperature of 80°F.

3.8.13 Cab. In addition to the cab requirements in FED-STD-807, the cab shall be equipped with: an air filter service indicator; a transmission temperature gauge; heated mirrors; and, two switched reading lights for use while seated or while standing at either door during night operations. A separate 15-amp circuit, with breaker, shall be provided in the cab for a purchaser provided radio.

3.8.14 Rear bumper. The truck shall have a rear bumper, with a rolled end design, in compliance with 49CFR178, DOT 406. Stop, tail, and back-up lights, and the license plate holder shall be recessed into the bumper.

3.8.15 Rear Fenders. The truck shall have metal fenders over the rear wheels. The fenders shall support a 250 pound operator at any point that can be stepped on, without permanent deformation. Mud flaps shall be installed at the front and rear of each fender, as specified in SAE J682.

3.8.16 Wheel chock storage container. Containers for two pair of wheel chocks shall be provided on the left side of the truck. Each container shall be not less than 10 inches wide by 8 inches high by 24 inches deep, with a drainable, smooth, interior. One larger container may be provided for two sets of wheel chocks.

3.8.17 Lighting and wiring system. In addition to the truck lights, reflectors and wiring required by Federal Motor Carrier Safety Regulations (49CFR 393), the following shall be provided.

3.8.17.1 Pumping compartment lights. The pumping compartment and the control panel shall be illuminated to a minimum level of 50 foot-candles. All controls, instruments, and the meter shall be illuminated. Lamps shall be vapor proof and not in the direct line of sight of the operator. Lights shall be switched from the control panel.

3.8.17.2 Night servicing lights. Two adjustable, vapor proof, service lights shall be located approximately eight feet above the ground, one at the left front and one at the left rear of the cargo tank. Each light shall switch and adjust from a control handle within reach of an operator standing on the ground. Combined light levels shall illuminate the entire side of the truck. The lights shall operate only while the truck clearance lights are “ON”.

3.8.17.3 Wiring. Wiring shall conform to SAE standards for low-tension insulated cable and shall be identified by color or number, or both, as specified in SAE J821. All electrical circuits shall be protected by circuit breakers located inside the cab. The circuit breakers shall be accessible to the operator.

3.9 Cargo Tank. The truck shall have a single-compartment cargo tank meeting all requirements of NFPA 385, NFPA 407, and 49CFR178 (DOT 406), with a minimum capacity of 6,000 gallons, plus a minimum three percent expansion space. A fixed indicator, in gallons, shall be visible through the manhole cover. The cargo tank bottom shall have an unobstructed path sloped towards a minimum 12 gallon rear sump. There shall be no metal-to-metal contact between the tank mounting brackets and the truck chassis mounting brackets.

3.9.1 Baffles. Tank baffles shall be approximately equally spaced and shall allow personnel internal access to the entire tank. In the top of all sections, except for the manhole, shall be a capped, minimum three inch, cleaning stub.

3.9.2. Sump drain. The rear sump shall have a minimum 1.5-inch self-closing drain valve. The drain valve shall be directed toward the ground, guarded from damage, and accessible without crawling under the truck.

3.9.3 Manhole. The cargo tank shall have a minimum 20-inch diameter manhole.

3.9.4. Pressure relief. The cargo tank shall be equipped with primary and secondary pressure and vacuum relief systems meeting all of the requirements of 49CFR178(DOT 406). The primary relief shall be not less than two power vents capable of exerting an opening force of 90 pounds, each sized for a fill or discharge rate of 750 GPM. Vent actuating cylinders shall be fail safe, such that the system cannot actuate unless at least one of the vents is fully open. The cargo tank shall also be equipped with at least two auxiliary vents, each sized for a fill or discharge rate of 50 GPM, with all other tank openings closed. All vents shall have covers, separate from the lid, which shall prevent particles larger than 0.01 inches from entering the tank. Vent covers shall deflect any relief down onto the top of the tank. If necessary, additional vents shall prevent a pressure or vacuum build-up in any baffled section of the tank due to the dynamic movement of fuel during acceleration, braking, or turning.

3.9.5 Catwalk. A catwalk shall span the full length of the top of the cargo tank and the manhole, and include a landing platform for the rear-boarding ladder. The catwalk shall be at least 30 inches wide, support 250 pounds per square foot without permanent deformation, and shall have a drainable surface. The catwalk shall have scuff guards on both sides and shall be equipped with fall protection, as required by 29CFR1910. Handrails, if provided, shall meet the requirements for air transport.

3.9.6 Boarding ladder. A boarding ladder shall access the catwalk from the rear center of the cargo tank. The ladder shall not project behind the rear bumper, and each rung shall support 250 pounds without permanent deformation. A folding step below the rear bumper shall facilitate access to the ladder.

3.10 Pumping compartment. The truck shall have an enclosed pumping compartment between the cab and the cargo tank. Except for the tank to pump piping and the pump, the entire pumping system and hose reel(s) shall be housed within the compartment. All system controls, the meter, and the dispensing hoses shall be accessible to a person standing on the ground.

3.10.1 Pumping compartment construction. The compartment shall be an assembly of: a structural frame; a floor; single panel walls; and, structural roof panels, forming a weather resistant enclosure. The roof panel shall have a continuous longitudinal center hinge and shall support 250 pounds per square foot without permanent deformation. The roof panels shall be latched to the structure and shall include lifting points to aid in removal.

3.10.1.1 Ventilation. The compartment shall provide for natural air circulation and shall not allow the accumulation of fuel vapors. The cab facing wall panel shall not be ventilated. The three remaining side panels shall have full-length louvers/vents near the top, and if necessary, near the bottom, with a combined total free area of not less than six square feet. The compartment floor shall have louvers/vents on each side, with a combined free area of not less than four square feet. Floor louvers/vents shall be guarded from water and debris thrown up by the front tires. Self-storing winterization covers shall be provided for each louver/vent. Drains shall be provided beneath the fueling nozzle(s) storage point(s).

3.10.1.2 Doors. A roll-up door shall be provided on both sides of the compartment. Vertical door openings shall be the maximum possible within the personnel working range. Doors shall latch in the open position. If the open door exceeds six feet above the ground, an assist strap shall be included. Latch handles shall be the full width of the door, operable while wearing arctic mittens, and releasable from any point. The left side compartment door shall be wide enough to access to the pumping system controls, the meter, and the servicing hose(s). The right side compartment door shall be wide enough for inspection and service access to the components and controls within.

3.11 Hose Reel. A hose reel, with 70 working feet (from the hose roller guide to the end of the nozzle) of 2-1/2 inch noncollapsible hose shall be installed in the pumping compartment. The hose reel shall include a clutch released drag brake that is adjustable from zero to 50 pounds force to deploy the hose. The hose reel shall also have a manual rewind, with a removable crank handle that stores in the pumping compartment. The hose reel shall be air powered and capable of retracting a fully deployed, fuel filled, hose over a paved surface in not more than 45 seconds, against a 15 pound force drag brake setting. The rewind control shall be placed so the operator can guide the hose with one hand while operating the control with the other. Serviceable rollers shall guide the hose during deployment or rewind. The hose assembly shall be API 1529 approved, Grade 2, Type C, including; non-reattachable corrosion resistant metal couplings, as specified in API 1529 Section 7; and, a dry break coupling compatible with the nozzle(s). The hose shall deploy off the top of the reel, with the last 1/2 turn restricted from unwinding. A type D-1 single point nozzle, as specified in MIL-N-5877, shall be attached to the hose with a dry break adapter. The nozzle shall include a 40 mesh stainless steel strainer and an automatic vacuum breaker. When specified (see 6.2), a D-2 single point nozzle shall replace the D-1 single

point nozzle. When specified (see 6.2), an OPW model 295AF nozzle, or equivalent, overwing nozzle with a dry break hose adapter shall be provided.

3.11.1 Overwing hose reel. When specified (see 6.2), a second fuel dispensing reel and hose, in accordance with the above performance requirements, shall be provided. The reel shall hold a minimum of 60 working feet of 1-1/2 inch noncollapsible hose. The overwing hose shall operate independently of, or simultaneously with, the primary hose, up to the system pumping limit. An OPW model 295AF nozzle, or equivalent, shall be provided. The nozzle shall be attached to the servicing hose with a dry break adapter. Nozzle grounding wires shall be jacketed. When an overwing hose reel is provided, the hose reel isolation valves shall be controlled from the pump panel.

3.12 Deadman Control System. A deadman control system, as specified in NFPA 407 and as specified herein, shall be provided. The system shall stop flow, at the hose reel(s)and at the emergency tank shutoff valve, within three seconds and shall open to full flow within five seconds. The deadman shall be operable while wearing arctic mittens and shall allow the operator to range from the control panel to the full length of the refueling hose(s). Deadman deactivation shall reduce engine speed to idle. If an electrical deadman system is provided, it shall be certified intrinsically safe and incorporate a continuous operator input feature. If a hose reel is used, it shall be air powered and capable of retracting a fully deployed hose within one minute. The hose reel shall have a manual rewind with a removable crank handle that stores in the pumping compartment. A fairlead shall guide the hose during deployment or rewind.

3.13 Static discharge bonding/grounding reels. Two Type I grounding reels, as specified in A-A-50696, shall be installed side-by-side at the rear of the pumping compartment on the left side of the truck. One reel shall have a welder style grip clamp and the other shall have a grounding plug. There shall be no more than 0.5 ohm resistance between either reel and the cargo tank.

3.14 Fire extinguishers. Two Type I, Class 1, Size 20 fire extinguishers, as specified in A-A-393, shall be installed, one on each side of the truck. The extinguishers shall be accessible while standing on the ground and shall be protected from tire splash.

3.15 Clean-up materials compartment. A six cubic foot weather resistant compartment, for storage of 200 pounds of environmental clean-up materials, shall be mounted to the right side truck frame rail, below the cargo tank. The compartment shall have a hinged hatch type cover with hold open features.

3.16 Pumping system. The fuel pumping system shall include; piping, tank suction header, pump, filter unit, meter, and a control panel. Pumping at 600 GPM at 50 ± 5 psig for ten continuous hours shall not degrade the system.

3.16.1 Piping. Pipe mounting shall prevent failure due to chaffing, vibration, or movement, due to operational or mobility induced forces. Piping shall be protected when passing through sheet metal and shall be prevented from being used as a step. Pipe and fittings shall be either flange or groove connected, or a combination. Piping shall be not less than schedule 40 and shall

disassemble in sections. Coupling grooves in aluminum pipe must be cut. A minimum one inch self-closing drain valve shall be installed at every piping low point. A check valve shall be the first component in each line connected to the cargo tank, and, except for the pump suction line, shall be oriented to prevent flow from the tank. System pressure build-up in the piping and hose(s) shall relieve into the cargo tank.

3.16.2 Tank suction header. The tank suction header shall include: check valve, in-line strainer, shutoff valve, and a dedrumming stub. The suction line shall not originate at the tank sump. The in-line strainer shall be a Y-type, with a serviceable 8-mesh screen, rated for flows of 600 GPM. The suction header shutoff valve shall be a manual, quarter turn design, operable while standing or kneeling on the left side of the truck. The dedrumming stub shall include a dedicated shutoff valve, and a two inch cam lock coupler, with dust plug, in accordance with A-A-59326.

3.16.3 Pump. The pump shall be a self-priming, centrifugal, aircraft fuel-dispensing unit, direct driven by the PTO. Performance shall be met when pumping turbine fuel conforming to MIL-DTL-5624, MIL-DTL-25524, or MIL-DTL-83133. A self-closing manual drain valve shall be installed at the pump housing low point.

3.16.4 Pump discharge shut-off valve. A discharge shutoff valve shall be located downstream of the pump prior to any device or branch connection. The valve shall be a manual, quarter turn design, and operable while standing or kneeling on the left side of the truck.

3.16.5 Fuel Filtration System. The filtration system shall be rated for the maximum pump flow and pressure. The filter vessel shall be qualified to the current requirements of the API PUBL 1581 Specification and Qualification Procedures for Aviation Fuel Filter/Separators for Category M100, except the effluent fuel samples shall not exceed 10 parts per million free water content. The filter vessel shall be built in accordance with the ASME Boiler and Pressure Vessel Code and shall be stamped by an ASME inspector. The filter vessel must remain full, regardless of the level of fuel in the cargo tank, during pumping or while taking a sample from the drain. The filter drain shall have a self-closing valve, accessible to an operator standing or kneeling on the ground.

3.16.6 Sampling device. A fuel sampling device shall take samples downstream of the filter system. Space to connect a Millipore Corporation, Bedford MA, 01730, fluid sampling kit, catalog No. XX64 037 30, for solids and water samples shall be provided. The sampling device shall consist of the necessary corrosion resistant piping, a one quarter turn ball valve, and a Snap Tite Inc, part number SVEAC4-4F (JF), quick disconnect, with a Snap Tite Inc, part number AMPE-4 dry break coupler, with a dust plug, for connection to the sampling kit.

3.16.7 Flow Meter. All fuel flow through the filtration system, in or out of the cargo tank, shall be metered. The meter shall be certified accurate to ± 0.1 % between 80 and 800 GPM flow. A flow rate indicator, certified accurate to ± 5%, up to 1000 GPM flow, shall be provided. The meter shall be readable from 15 ft distant, day or night.

3.17 Pumping systems controls. Pumping system controls shall provide mode selections for HIGH flow and LOW flow dispensing, and for DEFUEL. Operations for fueling and defueling

aircraft shall not require any external sensing devices or equipment, beyond what is referred to herein. Refueling and defueling controls shall be limited to mode selection, vent activation, auxiliary throttle, deadman activation and, when required, isolation valves. After mode selection, manipulations of controls, except for the auxiliary throttle and the deadman, shall not be required. Fuel flow, once pump speed is established manually, shall be automatically regulated by the demand of the nozzle. Pressure shall be internally managed, without atmospheric pressure relief. The system vent control shall operate from the control panel and shall have a (pad) lockable feature. The pumping system shall not operate with the vent closed and locked. A padlock will be provided by the purchaser.

3.17.1 Control panel. All operations on pumping system control panel shall be accomplished while standing on the ground. The panel shall, as a minimum, contain; mode selector, auxiliary throttle, tachometer, hourmeter, pump pressure gauge, nozzle pressure gauge, differential pressure gauge, tank vent control, compartment and panel light switches, emergency engine shut down, high level shutoff indicator lights, and, when an overwing hose is specified, hose reel isolation valves. Controls shall be grouped by function. Vent controls and hose reel isolation valves shall be of the slide and latch type. The control panel shall be accessible for maintenance from the rear. Any caution notes required on the control panel shall applied in red color.

3.17.1.1 Selector control. Mode controls shall be fully independent. Multiple mode selections shall not be possible. A failure in one mode shall not cause either an activation or failure of another mode.

3.17.1.2 Auxiliary throttle. An auxiliary throttle, adjustable to within 50 rpms engine speed, shall be used during pumping operations. Maximum rated pump speed shall limit maximum engine speed. The throttle shall hold any speed setting, and shall also provide an emergency return to idle feature.

3.17.1.3 Tachometer. The tachometer shall have a red line to indicate the maximum engine speed for pumping.

3.17.1.4 Pressure gauges. Pump and nozzle pressure gauges shall be identified by function, not less than 4.5 inches in diameter, with contrasting numbers and faces, and shall be certified accurate to within one percent of the scale range. Gauge scales shall be at least 10% greater than any recordable pressure, with graduations not exceeding two psig increments. Gauges shall; have needles damped to minimize oscillations; be vacuum protected; and include a red line to indicate maximum safe operating pressure. The pump pressure gauge shall indicate system pressure upstream of the filter. The nozzle pressure gauge shall indicate actual pressure, or shall use a system reference point that gives a full range reading within five psig of actual pressure.

3.17.1.5 Differential pressure gauge. A Gammon Technical Products GTP-534-30A0 differential pressure gauge, or equal, shall monitor the psi pressure drop across the filtration media during operation.

3.17.1.6 Emergency engine shutoff. An emergency switch shall shut off the truck engine without the use of any other control. The switch shall be marked by a red circle at least one inch in diameter.

3.17.2 Defuel system. The defuel system shall:

a. Meter, in positive gallons, and filter fuel before returning it to the cargo tank.

b. Include an automatic high level shutoff to stop flow when the cargo tank is full, without shutting off the truck engine. If a mechanical high level shutoff is used, a pretest system shall simulate a full cargo tank.

c. Include a high level override control to allow for system recirculation for sampling purposes. The override control shall be located near the fuel sampling device connections. The override control shall be securable in the off position with a (pad)lock device. The override control shall not open with the lock installed. The padlock will be provided by the purchaser.

3.17.3 Adjustable valves. All adjustable valves in the pumping system shall be operable, while standing on the ground, in full view of the control panel gauges during adjustments. Unauthorized adjustments shall be prevented.

3.18 Flow and Pressure Control System. Controls shall consist of the necessary valves, pilot valves, manual and automatic selectors, venturi(s), gauges, and safety devices necessary to regulate pressure and flow.

3.18.1 Flow Control system. The flow control system shall limit maximum flow rates, based on the selector valve setting, regardless of the engine throttle setting or the downstream pressure drop.

3.18.2 Pressure control system. The pressure control system shall limit single point discharge nozzle pressure to a maximum of 50 ±5 psig at any flow rate. Pressure surges shall be limited to a maximum of 120 psig at any time, including a one second shutdown at the aircraft. Any surge pressure developed shall not exceed the pressure rating of any single component in the system. The controls shall respond to pressures at the discharge nozzle or to a simulated nozzle pressure. Locked-in pressure shall not exceed 60 psig, 15 seconds after flow stops. The system shall automatically recover from an induced no-flow condition to full flow within 15 seconds.

3.18.3 System bypass. Providing that a bypass system is used to relieve excess pump pressure under flow conditions, the bypass shall be upstream of the filter system and shall terminate in the cargo tank. The bypass system shall not be used for any purpose other than as a safety pressure relief.

3.18.4 Safety provisions. Each pumping system valve or control, including the auxiliary throttle, shall be protected from the improper setting of any other valve or control in the system, or from

exceeding 60 psig at the single-point nozzle. Nonadjustable pressure protection device(s) shall prevent normal maximum operating pressures from being exceeded by more than 10 psig. A sequence of system valve and control adjustments shall be established to restore normal operational settings from any combination of miss-adjustments.

3.19 Pumping operation sound levels. The maximum A-weighted sound levels produced during pumping operations shall not exceed 84 dBA at the operator's location, in front of the system control panel.

3.20 Bottom loading system. The truck shall be equipped with an independent automatic bottom loading and vent system. The loading system shall use truck chassis air for power. All loading components and control lines shall be external to the cargo tank. The loading connections and controls shall be located at the left side of the cargo tank, in front of the rear bumper. The controls shall be protected from the elements. Components shall include: a control panel; inlet manifold, with single point receptacle, loading valve, and manual shutoff valve; high level shutoff controls; vent controls; and, when specified (see 6.2), vapor recovery. The vent system shall be automatically activated by connection to the inlet receptacle. The vent shall be interlocked to activate only after the truck parking brakes are set. Fuel shall not flow in or out of the cargo tank until the vent is fully open and shall stop flowing within 15 seconds if the vent closes. Instructions and diagram plates shall be mounted on or adjacent to the control panel.

3.20.1 Inlet manifold. The inlet manifold; shall connect the inlet receptacle to the cargo tank and shall be vented into the cargo tank. The bottom loading system shall operate with fuel stand pressures between 15 and 200 psig and shall close within 15 seconds if the pressure drops below 15 psig.

3.20.1.1 Inlet receptacle. The inlet receptacle shall include a housing as specified in MIL-A-25896 and a single-point nozzle adapter and a dust cover as specified in MS24484-2. The adapter shall allow a flow rate of at least 600 GPM, with intermittent rates up to 750 GPM.

3.20.1.2 Manual valve. A manual valve, with not less than eight segmented and latched positions from leak tight closed to full flow open, shall be installed in the bottom loading manifold.

3.20.2 Level control. A level controller shall terminate bottom loading to attain a fuel level within one inch of the set point, at fill rates up to 750 GPM. If a mechanical high level shutoff is used, a pretest system shall simulate a full cargo tank. The set level shall be adjustable to six inches below the 6000 gallon level. The level control shall be compatible with commercial "Scultrol"ST-15 Single Point and ST-35 Multiple Compartment loading rack monitors, or to an equivalent commercial systems by using a socket adapter. If the level control system is not functional, the truck shall not load.

3.20.3 Level control override. The level control system shall include a manual override to allow fuel recirculation through the supply hose(s) and for gravity discharge of the tank contents through the bottom loading manifold. The system shall gravity discharge 5,500 of the 6000 gallon

fuel cargo in not more than 55 minutes. The override shall be a hold-to-operate (attended) type. Release of the override shall close the bottom loading valve within 15 seconds.

3.20.4 Vapor recovery system. When specified (see 6.2), a system shall override the vent actuation system and shall remove fuel vapors from the cargo tank during loading. The recovery system shall terminate near the bottom loading connection with a dry break adapter and a dust cap. The system and adapter shall comply with API RP 1004.

3.21 Hydrostatic pressure. The pumping system, bottom loading system, and all components, shall withstand a hydrostatic pressure of 1-1/2 times the maximum design operating pressure. Components, built to a higher test pressure requirement, shall be tested to the higher requirement prior to being assembled into the respective system.

3.22 Electromagnetic interference. The truck shall comply with class C1, Group II requirements of MIL-STD-461, for electromagnetic interference and susceptibility.

3.23 Finishes and protective coatings.

3.23.1 Cleaning, painting, plating, anodic films, and chemical treatments. Cleaning, chemical treatments, painting, plating, and films shall be in accordance with best commercial practice. Colors shall be as identified in FED-STD-595 unless otherwise specified.

3.23.2 Gloss green. Unless otherwise specified (see 6.2), except for the tank boarding ladder, all exterior surfaces, all trim, and compartment interior surfaces shall be painted forest green, color 14052. The chassis and running gear may be green or black. Driveline and cab components, which are not visible during normal operations with the cab door closed, may be their original color. Markings shall be red, color 31136.

3.23.3 Gloss yellow. When specified (see 6.2), except for the tank boarding ladder, all exterior surfaces, all trim, and compartment interior surfaces shall be painted gloss yellow, color 13538. The chassis and running gear may be yellow or black. Driveline and cab components, which are not visible during normal operations with the cab door closed, may be their original color. Markings shall be white reflective tape on a red background.

3.23.4 Forest green. When specified (see 6.2), except for the tank boarding ladder, all exterior surfaces, all trim, and compartment interior surfaces shall be painted forest green, color 24052. The chassis and running gear may be green or black. Driveline and cab components, which are not visible during normal operations with the cab door closed, may be their original color. Markings shall be painted black, color 37038.

3.23.5 Desert sand. When specified (see 6.2), except for the tank boarding ladder, all exterior surfaces, all trim, and compartment interior surfaces shall be painted tan #686A, color 33446, as specified in MIL-C-46168 or MIL-C-53039. Markings shall be painted white, color 37875.

3.23.6 Rustproofing. The vehicle chassis and cab shall be rustproofed to a tropical level as specified in FED-STD-297. Rustproofing shall not be applied to the first article units until after approval of the test report.

3.24 Markings, data plates and operating instructions.

3.24.1 Markings. The truck shall be marked as specified in MIL-HDBK-1223 for the appropriate service, except Air Force markings shall be as specified in TO 36-1-191, Chapter 2. Four DOT hazardous material labels, Number 1863, shall be mounted on the vehicle, one on each side of the forward 1/3 of the cargo tank, one on the upper right hand corner of the rear of the tank, and one on the front bumper of the truck.

3.24.2 Data plates and operating instructions. All data plates, placards, charts, diagrams, and instruction plates shall conform to Class 2, Composition C, of A-A-50271. All controls, valves, gauges, and operational indicators shall be identified with nameplates. Diagrams of the pumping, electrical, and the bottom loading systems, shall be mounted at their respective control locations, with each component identified to a corresponding nameplate referenced part. Precautionary warnings and operating instructions shall be affixed near the affected system control and shall identify components by their nameplate reference on the diagrams. Tags or decals shall not be used. Temporary nameplates may be used during testing.

3.24.3 Cab nameplate. The cab shall have a mounted nameplate containing the following information inscribed, except for the serial number, vehicle registration number, and date of delivery, which must be stamped.

Serial Number
Vehicle Registration Number
Date of Delivery
Make and Model
National Stock Number
Contract Number
Cargo Tank Capacity (Gallons)
Vehicle Weight, Unloaded (Pounds)
Gross Vehicle Weight (Pounds)
Fuel Type
Oil, Engine, Above 32 Degrees F SAE Grade
Oil, Engine, Below 32 Degrees F SAE Grade

4. VERIFICATION

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

a. First article inspection (see 4.2)

b. Conformance inspection (see 4.3)

4.2 First article inspection. First article inspection shall be preformed on each complete truck when a first article sample(s) is required (see 3.1). This inspection shall include the examinations of 4.8 through 4.8.19.6.1, and 4.10. The user first article test truck shall complete all conformance inspection requirements of 4.3, test requirements of 4.9, and inspection requirements of 4.10.

4.3 Conformance inspection. Conformance inspection shall include the examination of 4.8.1, 4.8.6 through 4.8.6.9, 4.8.8, and 4.8.19.4.

4.4 The contractor shall be responsible for providing first article and conformance inspection facilities, and for performance of all inspections and tests specified herein. The Purchaser may repeat any test or inspection, as specified in 4.8 through 4.8.19.6.1, at its own expense. The Purchaser shall identify an operational test site of their own choosing.

4.5 Test conditions.

4.5.1 Preparation for testing. First article test trucks shall be fully serviced and full of fuel in both the chassis and cargo tanks, unless otherwise specified. Periodic servicing, at intervals defined by the manuals, shall be maintained throughout testing. Repairs or reconditioning shall not be permitted without prior knowledge of the Purchaser.

4.5.2 Lubricants. Lubricants used during each test shall be as specified in the technical manuals for the chassis or mounted equipment for the extremes defined.

4.5.3 Test fuel. The first article test fuel requirement shall be Grade JP-8+100, turbine fuel, as specified in MIL-DTL-83133. An exception may be taken for truck engine fuel during cold chamber tests.

4.5.4 Test filters. All filter elements shall be certified for use with JP-8+100.

4.5.5 Apparatus. Apparatus used in conjunction with the testing specified herein shall be of laboratory precision type and shall be calibrated at proper intervals to ensure laboratory accuracy.

4.6 Test rejection criteria. The below listed criteria shall be cause for rejection of the test truck (see 4.7):

a. Instability during turning and braking, or other than tire contact with the ground or an obstacle.

b. Overheating of any truck chassis or pumping system component.

c. Conditions presenting a safety hazard to personnel during operation, service, or maintenance.

d. Failure or evidence of impending failure, permanent deformation, or wear beyond limits.

f. Interference or changes of alignment between components during operations.

g. Failure to attain the specified performance requirements.

h. Instability in pumping system pressure or flow.

i. Spillage or leakage of cargo, liquids or lubricants, except where specifically allowed.

j. Excess pressure or vacuum occurring in any baffled section of the cargo tank.

4.7 Rejection and retest. Providing a truck fails conformance testing or inspection the truck will be considered rejected until the cause is determined and corrective action is taken, only then shall retesting be accomplished.

4.8 Testing methods.

4.8.1 Examination of product. The truck shall be examined to determine compliance with the salient characteristics specified in Section 3, Requirements. Particular attention shall be given to accessibility of controls and levers, interchangeability, safety, performance, materials, welding, fasteners, and finish. For first article, this examination shall be accomplished using a checklist of requirements, not otherwise validated by tests.

4.8.2 Air transportability.

4.8.2.1 Air transportability analysis. An engineering evaluation shall show compliance with the requirements of MIL-HDBK-1791 for loading and securing the truck aboard any listed aircraft considering the worse case constraints for; dimensions, weight, ramp clearance, tie downs, rapid decompression and g-loading (see 3.3.11).

4.8.2.2 Dimensional check. Dimensions for the truck in air transportable configuration shall be compared with the engineering evaluation specified in 4.8.2.1. Dimensions for the in-service configuration of the truck at both curb and fully loaded conditions shall also be recorded.

4.8.2.3 Weight check. Individual wheel weights for the truck in air transportable configuration shall be compared with the engineering evaluation above specified in 4.8.2.1. Wheel loading for the curb and for the in-service configuration (cargo tank empty and cargo tank full of JP-8 fuel) shall also be recorded. The in-service configuration shall include the weight of a pumping system filled with fuel plus two equivalent 250 pound operators in the cab.

4.8.2.4 Ramp clearance test. Ramp clearance for the truck in air transport configuration shall be compared with the engineering evaluation above specified in 4.8.2.1. The truck shall approach, negotiate, and leave a sloped ramp between horizontal surfaces, in both forward and reverse directions. The ramp length and slope, including sharp angles with horizontal surfaces at the top and the bottom, shall be equal to the defined aircraft.

4.8.2.5 Equipment removal. The requirement to attain the air transportable configuration within 15 minutes shall be demonstrated. Folding or removal and storage of each component shall be demonstrated for both manpower and tool requirements. Any removed component shall be weighed. The time required to restore the truck to operational configuration shall also be demonstrated.

4.8.3 Reliability Demonstration. The contractor shall demonstrate the fueling system reliability projected by analysis (3.5). Accumulation of system reliability hours during tests involving system components may be made a part of the total hours required for demonstration. If the accumulated test hours are insufficient to reach a decision point, system specific durability testing shall be added to attain an accept or reject decision point. Periodic service, maintenance, and adjustments, at periods defined in the technical manuals, shall not count as failures.

4.8.4 Maintainability demonstration. The maintainability considerations (see 3.6) in the design objective of the fueling system shall be reported and demonstrated. Selection of wear items, in terms of operating hours, and maintenance intervals recommended during normal and extreme climactic conditions shall be reported. The use of common hand tools while wearing arctic mittens and clothing shall be demonstrated. Only actual time required to accomplish the maintenance action shall be recorded.

4.8.4.1 Corrective maintenance downtime. Compliance with corrective maintenance downtime (see 3.6,d) requirements shall be demonstrated by task performance. The contractor shall list all tasks required to service and/or maintain all components of the fueling system, and shall demonstrate 20 of the tasks selected by the purchaser. Task times and the maintenance personnel skill level shall be established at the demonstration.

4.8.4.2 Daily inspection and service task test. Performance of the daily inspections and service tasks within a 15 minute time limit shall be demonstrated. The tasks shall be not less than those listed in 3.6,e.

4.8.5 Environmental tests. Environmental tests shall be conducted as specified in MIL-STD-810.

4.8.5.1 High temperature test. The truck shall be subjected to high temperature testing in accordance with Method 501.3, Procedure II. The cargo tank shall contain 5,500 gallons of fuel. The test cell temperature shall be elevated to 125° F. After the cargo fuel temperature has stabilized, the truck engine shall be started. Testing shall be carried out while maintaining 125°F. Hoses shall be deployed from the reels, and re-wound by both power and the manual methods. Test 4.8.6.2 shall be conducted, except the 600 GPM flow rate at 50 ± 5 psig shall be maintained

for 30 minutes. A high level shut-off sequence shall be demonstrated. Each control and component of the pumping system and the bottom loading system shall be cycled to demonstrate high temperature operation. The engine coolant, and the lubricant temperatures for the engine, transmission and PTO shall not exceed the manufacturer's safe operating limit, as established prior to testing.

4.8.5.2 Low temperature test. The truck shall be subjected to low temperature testing in accordance with Method 502.3, Procedure II. The cargo tank shall contain 5,500 gallons of fuel. The test cell temperature shall be reduced to 0°F and maintained until the cargo fuel temperature stabilizes. The engine shall be started without the use of the winterization system. The test cell temperature shall then be reduced to -40°F. The chassis winterization system(s) may be operated throughout this cold soak period. Testing shall be carried out while maintaining -40°F. After the cargo fuel temperature has stabilized, the truck engine shall be started. Hoses shall be deployed from the reels, and re-wound by both power and the manual methods. Test 4.8.6.2 shall be conducted, except the 600 GPM flow rate at 50 ± 5 psig shall be maintained for 30 minutes. A high level shut-off sequence shall be demonstrated. Each control and component of the pumping system and the bottom loading system shall be cycled to demonstrate low temperature operation. If battery warmers are provided, the electrolyte temperature shall be recorded at -40°F, and it shall also be demonstrated that they are high temperature limited.

4.8.5.3 Humidity test. The truck shall be subjected to humidity in accordance with Method 507.3, Procedure III, Constant high humidity.

4.8.5.4 Salt-fog-test. The truck shall be subjected to salt-fog in accordance with Method 509.3, Procedure I.

4.8.5.5 Dust test. The truck shall be subjected to dust in accordance with method 510.3, Procedure I.

4.8.5.6 Night and visibility tests. The minimum lighting level inside the pumping compartment shall be measured at the control panel and at all other inspection and servicing points. The ability to read the fuel meter at a distance of 15 feet, day or night, shall be demonstrated.

4.8.6 Pumping system performance tests. All pumping system tests shall be accomplished with no more than the manipulation of the mode controls and the engine throttle. Pump engagement, without gear clash or shock loading, shall be demonstrated by engaging the PTO, before and after each pumping test, a minimum of five times. It shall be demonstrated that the auxiliary throttle (control panel) does not operate while the PTO is in road mode and the truck accelerator pedal does not operate while the PTO is in pump mode. It shall be demonstrated that PTO engagement is controlled from the driver's seated position and can not occur unless/until the truck parking brakes are set.

4.8.6.1 Flow through overwing servicing nozzle. Both primary fuel and overwing servicing hoses shall be deployed. An overwing nozzle shall be attached by adapter to the primary servicing hose. Both hoses shall be elevated to the manhole of the cargo tank. The nozzle outlets shall

extend into the fuel in the cargo tank. With the pump engaged, the mode selector shall be set to LOW FLOW. The auxiliary throttle shall be adjusted to a flow rate of 100 GPM. Full flow through each hose shall be demonstrated for five minutes. It shall then be demonstrated that flow rates can be maintained at any increment between zero and 100 GPM by manipulation of only the nozzle handle. The throttle shall then be adjusted to a flow rate of 200 GPM. Full flow through both nozzles shall continue for five minutes, and then by manipulation of only the nozzle handles, total flow rates shall be maintained at any increment between zero and 200 GPM. It shall be demonstrated that regardless of throttle setting, flow cannot exceed 100 GPM per hose.

4.8.6.2 Maximum flow and pressure regulation test. The primary fuel servicing hose shall be deployed, and the single-point nozzle shall be connected to the mating receptacle on the truck bottom loader. With the pump engaged, the mode selector shall be set to HIGH FLOW. The auxiliary throttle and the bottom loader manual valve shall be adjusted to produce a minimum flow rate of 600 GPM, at a nozzle pressure of 50 ± 5 psig. Without changing the throttle setting, the bottom loader manual valve shall be incrementally closed to reduce flow down to zero, then incrementally opened to increase flow back up to 600 GPM. Flow rates shall be maintained for five minutes each. Nozzle pressure shall remain stable as the flow rates are manipulated.

4.8.6.3 Single-point flow limiting test. Using the test setup in 4.8.6.2, the throttle shall be advanced to maximum governed engine RPM. When the bottom loader manual valve is opened fully, the flow rate shall not exceed 625 GPM and the nozzle pressure shall not exceed 60 psig. The test shall be repeated five times.

4.8.6.4 Surge pressure test. Using the test setup in 4.6.6.2, a quick closing valve shall be added between the single point nozzle and the bottom loader receptacle. While flowing 600 GPM at 50 ± 5 psig, the quick closing valve shall be shut within one second. Pressure at the single-point nozzle shall not exceed 120 psig. Locked in pressures shall automatically reduce to not more than 60 psig within 15 seconds after closure. The quick closing valve shall be re-opened and fuel flow shall be restored within 15 seconds. The test shall be repeated five times.

4.8.6.5 Aircraft fueling test. The single-point nozzle shall be connected to a storage tank. The minimum 5700 gallon fuel delivery from the cargo tank shall be demonstrated five times.

4.8.6.6 Aircraft defuel test. The single-point nozzle shall be connected to a storage tank at least six feet above the ground. It shall be demonstrated that any failure in the high level shutoff system shall prevent defuel activation. With the mode selector set to DEFUEL, a flow rate no greater than 20 GPM shall be maintained for at least five minutes. Flow rate shall then be increased to at least 175 GPM for a minimum of five minutes and maintained until the high level shutoff terminates flow. If a mechanical high level shutoff is used, the pretest shall be demonstrated twice prior to the automatic shutoff. The minimum 5,700 gallon cargo tank fuel acceptance shall be demonstrated five times. With the cargo tank full, the high level override shall be demonstrated.

4.8.6.7 Underground defuel test. A 1.5 inch pigtail hose, 15 feet long, shall be connected to the single point nozzle. The hose shall be lowered into a storage tank at least three feet below grade.

With the mode selector on DEFUEL, a flow rate of at least 50 GPM shall be attained and held for five minutes. The test shall be repeated five times.

4.8.6.8 Closed discharge test. A flooded pump shall be operated at maximum speed for 30 minutes against a closed discharge, without damage or measurable wear to the pump assembly. Unless the contractor makes other provisions, measurements taken at 4.10 "Final inspection" shall be used to determine compliance.

4.8.6.9 Dry operation test. A dry pump (no fuel) shall be operated at maximum speed for 10 minutes without damage or measurable wear to the pump assembly. Unless the contractor makes other provisions, measurements taken at 4.10 "Final inspection" shall be used to determine compliance.

4.8.7 Bottom loader test. A fuel supply source of 750 GPM at 200 psig shall be established. The truck shall be positioned for bottom loading and the engine shut down. The bottom loading system shall accept 750 GPM at 200 psig until high level shutoff. Shutoff shall occur within one inch of the set point. It shall be demonstrated that any failure in the high level shutoff system shall prevent activation of the defuel system. If a mechanical high level shutoff is used, the pretest shall be demonstrated twice during each fill cycle. The test shall be repeated five times.

4.8.8 Cargo tank tests. A dimensional analysis of the tank and sump capacities shall be provided. Test reports and certifications of the tank, as specified in NFPA 407 and DOT 406, shall be provided for every truck produced.

4.8.9 Pressure relief. During all tests, including mobility, the cargo tank clean-out stubs shall be instrumented with pressure and vacuum gauges, with tell-tail indicators, to record the maximum readings occurring during every test. The powered cargo tank vents shall be individually tested. The capacity of each power vent to exert a minimum opening force of 90 pounds shall be demonstrated. The system actuation fail-safe features shall be demonstrated by obstruction of the power source to each and then to both of the vents. It shall be demonstrated that the pumping system and the bottom loading system shall not operate until at least one vent is open.

4.8.10 Auxiliary vent test. The cargo tank auxiliary vents shall be individually tested. Fuel shall be pumped into and out of the cargo tank at a rate of 50 GPM. Pressure and vacuum must build-up to 0 ± 0.2 psig before the vents open. Tank pressures shall be recorded at ten second intervals from when the flow is started, until tank pressure stabilizes. Maximum vacuum shall not exceed one (1) psig. Maximum pressure shall not exceed two (2) psig.

4.8.11 Hose reel tests. The primary and overwing hose reels shall be tested individually. The ability to adjust the drag brake to regulate the unwind force on the hose between zero and 50 pounds shall be demonstrated. Powered rewind rate shall be measured by retracting a fuel filled fully deployed hose on a hard surface against a drag brake setting of 15 pounds force. The relationship of the rewind control with the operator's ability to assist the hose onto the reel shall be demonstrated. Powered rewinds shall be repeated ten times and manual rewind shall be

performed one time. Hoses shall not overfill the reels or interfere with the compartment or other components.

4.8.12 Deadman control test. While the truck is operating in each pumping mode, including defuel, the deadman control shall be released. Flow in the servicing hose shall terminate within three seconds and the engine shall returns to idle. Closing the deadman shall restore engine speed and full flow within five seconds. The test shall be repeated five times for each mode setting.

4.8.13 Filter system hydrostatic test. The reports of testing and the certifications of the filter vessel, in accordance with reference build specifications, shall be provided.

4.8.14 Filter system test. The filter system shall be tested as specified in API 1581 for Full-Scale Test Series using Category M100 fuel, and verified by the Purchaser's representative. With the truck recirculating fuel through the bottom loader at a rate of approximately 400 GPM, the free water content in a sampling downstream of the filter shall be determine, by Aqua Glo analysis, as specified in ASTM D3240, to be less than three (3) PPM. While the fuel is recirculating, water shall be injected at the bottom of the cargo tank or into the suction side of the pump at a rate of one (1) GPM. At one minute intervals from the start of water injection, samples for free water content shall be taken until the differential pressure gauge indicates 22 inches. Water analysis shall not exceed of 10 PPM.

4.8.15 Pumping system tests.

4.8.15.1 Pumping system hydrostatic test.Certification of pressure ratings of the fuel dispensing system, in accordance with NFPA 407, shall be provided. Component with certifications to pressures greater than required by NFPA 407 shall also be provided.

4.8.15.2 Pumping system malfunction safety test. Starting with the test setup in 4.8.6.2, the internal pressure/flow relief system controls shall be set for maximum restriction. With the nozzle shut off, each system control, including the mode selector, shall be set to every possible erroneous combination. For each setting, when the nozzle is opened and the throttle is advanced fully, it shall be demonstrated that the flow or pressure generated does not damage or fail the system or a component. Nozzle pressure shall not exceed 60 psig and nozzle flow shall not exceed 625 GPM. The test shall be repeated with each system control line to or from the mode selector disconnected or clamped off to demonstrate that no other mode is affected and that nozzle pressure and flow are still being controlled.

4.8.15.3 Pumping system maintenance control adjustment test. Starting with each erroneous combination of setting, the technical manual instructions for re-setting the valves and controls of the pumping system shall be demonstrated.

4.8.15.4 Pumping operation sound level test. The sound levels produced by the truck during HIGH FLOW pumping shall be measured. Radiator shutters and/or fan clutches may be disengaged during the test. Ambient background sound levels prior to testing shall be at least 10 dBA below the sound level limit allowed for the truck. Microphone placement shall be two feet in

front of the pump operator's control panel and five feet above ground. During the sound level test, the microphone shall be directed toward the maximum sound source.

4.8.15.5 Pumping system durability test. The pumping system shall be operated for a net 200 hours at 600 GPM with a nozzle pressure of 50 ± 5 psig. The system shall be operated in units of not less than six consecutive hours each. Without adjusting any control, flow shall be shut off and re-established four times each hour. At the end of each hour of testing, the engine shall be returned to idle, the PTO shifted out of and then back into pump mode, and flow re-established. The final segment of the test shall be for ten continuous hours, without interruption.

4.8.15.6 Single-point nozzle pressure gauge test. If the nozzle pressure gauge readings at the control panel are not direct reading, a test shall establish the difference between actual and indicated pressure readings. Starting at a flow of 600 GPM at an actual nozzle pressure of 50 ± 5 psig, flow shall incrementally decreased in steps to zero flow, then increased in steps to the maximum flow. The flow and differences shall be recorded.

4.8.16 Bottom loading tests.

4.8.16.1 Bottom loader inlet manifold hydrostatic pressure test. The inlet manifold assembly shall be pressure tested to one and one half times the design pressure for 30 minutes.

4.8.16.2 Bottom loader inlet pressure test. An actual or simulated fuel fill stand, capable of developing a variable pressure between 10 and 20 psig, shall be provided. An inlet pressure of 10 psig shall be established, then raised in one (1) psig increments, until the valve opens. An inlet pressure of 20 psig shall be established, then reduced in one (1) psig increments, until the valve closes. Each test shall be repeated five times.

4.8.16.3 Level control shutoff test. The cargo tank shall be filled to capacity at a rate of 50 and 600 GPM until high level shutoff. Shutoff shall occur within 15 seconds and within one inch of the set point. Adjustment of the high level set point to six inches below the 6000 gallon level shall be demonstrated. The 50 GPM fill rate shall be demonstrated one time, and the 600 GPM fill rate five times, with a minimum fill of 3000 gallons each time.

4.8.16.4 Bottom loading system durability test. At least 3000 gallons of fuel shall be bottom loaded into the cargo tank at rates of 100, 300 and 600 GPM, at an inlet pressure of 20 psig, five times each, until high level shutoff. All flow rates shall be repeated with inlet pressures of 75 psig and 100 psig five times each.

4.8.16.5 Recirculation test. With a full cargo tank, the primary hose single point nozzle shall be connected to the bottom loader valve. A flow rate of 400GPM shall be established using the level control override. It shall be demonstrated that termination of recirculation occurs within 15 seconds of release of the override.

4.8.16.6 Gravity discharge test. At least 5,700 gallons of fuel shall be emptied from a full cargo tank, by gravity, through a three inch hose attached to the bottom inlet receptacle, at an average

flow rate of 100 GPM. Use of the level control override shall be demonstrated. The test shall be repeated five times.

4.8.16.7 Vent test. The interlock between the vent system and the truck parking brakes shall be demonstrated. It shall be demonstrated that the vents cannot be opened without the parking brakes set and the vent shall close if the brakes are released during operations. The "NO" loading interlock until the vents are open, and automatic vent closure, after high level shutoff, shall also be demonstrated.

4.8.16.8 Vapor recovery system test. The vapor recovery system shall be tested as specified in API RP 1004.

4.8 17 Structural integrity tests.

4.8.17.1 Fasteners. If the truck includes threaded fasteners into aluminum, any five fasteners may be selected by the Purchaser for a torquing test. The selected fasteners shall be removed and re-installed twenty times to the torque specified in the technical manuals.

4.8.17.2 Fenders. It shall be demonstrated that each rear fender can withstand a static load of 250 pounds per square foot at any position without permanent deformation.

4.8.17.3 Pumping compartment roof loading and removal. It shall be demonstrated that the pumping compartment roof can support 250 pound per square foot at any point without permanent deformation. It shall be demonstrated that the pumping compartment roof can be removed using the lifting points provided.

4.8.17.4 Boarding ladder and catwalk loading. It shall be demonstrated that each rung of the boarding ladder can support 250 pounds without permanent deformation. It shall be demonstrated that the catwalk can support 250 pounds per square foot at any designated point without permanent deformation.

4.8.17.5 Shock dynamic and finite element analysis verification. It shall be shown by FEA model, working papers, stress plots and mode analysis, that the cargo tank and pumping compartment assemblies, including the truck frame mounts and the pumping system shall maintain their structural integrity over the 15 year life of the vehicle. It shall also be shown that towing a fully loaded truck, with and without the front tires off the ground, does not overstress the truck frame or the rear axle and suspension. The analysis shall include values for imposed stresses; dynamic loading, vibrational distortions and shock loading that could be imposed on the subject components during operational use. Estimated analysis values may be used for calculations and shall be confirmed by strain gauge readings, or shall use direct readings from strain gauges prior to calculations. Placement of strain gauges shall be established by brittle lacquer patterning created while negotiating the operational and mobility requirements specified herein. Strain recordings shall be converted to stress as specified in SAE J1099. The maximum stress in any structure shall not exceed the material endurance strength, reduced for surface finish, size, and stress concentrations. Design changes made as a result of the testing shall be reflected in updated

calculations. The truck shall be considered fully loaded with JP8 fuel at all times, except during air transport. Partial loading of the tank only occurs while returning for refilling.

4.8.18 Electromagnetic interference test. The truck shall be tested as specified in the requirements of MIL-STD-461, class C1, Group II for electromagnetic interference and susceptibility.

4.8.19 Mobility tests.

4.8.19.1 Vehicle turning diameter test. The truck shall demonstrate wall to wall turning diameter in both directions.

4.8.19.2 Speed tests. It shall be demonstrated that a fully loaded truck can achieve a speed of 55 mph on level, paved highway, 40 mph over an unimproved road, and 15 mph over Belgian block paving.

4.8.19.3 Suspension articulation test. The fully loaded truck shall be driven over eight inch high blocks square to the straight line path of the truck and at least the full width of the truck. The blocks shall be spaced between one half and three quarters of the wheelbase length of the truck and shall have not less than 15 percent approach and departure angles. The truck shall alternately pass straight over a block and then pass over a block at the mid-point of tight turn, where the rear tandem approximately crosses the block with diagonally opposite rear tires. Turns shall be alternated to the right and to the left. The truck shall pass over a total of 2400 blocks. Test speed shall be at least five miles per hour. If a redesign is required due to part failures, interference, bottoming out of a mounting system, or permanent distortion of the truck, the cargo tank, or the pumping system, the test shall be fully repeated.

4.8.19.4 Road test. The fully loaded truck shall be driven at least 40 miles over paved roads and at least 10 miles over graded gravel or unimproved roads. During the test, all truck instruments shall remain in the normal zones and the transmission shall complete all shift sequences. During the test, the truck shall maintain speeds between 45 and 50 mph on paved roads and between 25 and 30 mph on unimproved roads. The truck shall complete a sequence of ten each short radius right and short radius left turns, and five sudden stops. Following the test, the truck shall show no evidence of loose parts, deformation, misalignment, leaks, oil consumption, or abnormal tire wear.

4.8.19.5 Three thousand mile test. The truck shall be driven 3,000 miles consisting of five cycles of 600 miles each. Truck engine fuel shall be JP-8 fuel as specified in MIL-DTL-83133. The first cycle shall be run with the cargo tank half full of fuel. The second, fourth, and fifth cycles shall be run with the cargo tank filled to capacity with fuel. The third cycle shall be run with the cargo tank empty. At the end of each fuel carrying cycle, the pumping system shall be operated for 60 minutes at 600 GPM at 50 ± 5 psig nozzle pressure. During the highway portion of each cycle, at least 50 short radius right turns, 50 short radius left turns, and 25 sudden stops shall be accomplished. The pumping system and the filter separator shall be filled with fuel through all cycles. Each cycle shall consist of the following phases:

a. Highway - 450 miles at an average speed of at least 45 mph.

b. Gravel road - 100 miles at an average speed of at least 25 mph.

c. Belgian block pavement - 50 miles at an average speed of at least 10 mph.

4.8.19.6.1 Inspection. During the 3000 mile test, if a cab and chassis or structural failure occurs during testing, repairs may be made at the time of occurrence and the testing extended by the number of accumulated hours at the time of failure. If a leak or malfunction occurs in the tank, the piping or the pumping system during the test, corrective action shall be taken and the entire test repeated. At the completion of all test cycles, the tank, the pumping and the bottom loading systems shall pass a repeat of all pressure tests.

4.9 Operational test. The truck shall be delivered to a Purchaser designated site for 90 days of operational use. The test period shall start after the truck has been inspected and prepared for service and the contractor has reviewed the operation and maintenance manuals with Purchaser personnel. The truck shall be scheduled for 12 continuous hours each day, seven days a week. Any day requiring more than two of the 12 scheduled hours for, maintenance, or repair shall not constitute a test day. The contractor shall provide a maintenance schedule and shall, when possible, give notice of repairs. Purchaser personnel, using the technical data supplied with the truck, shall perform inspections and maintenance. All parts and repairs shall be provided and accomplished by the contractor. The Purchaser may witness any required repair actions. During each operational day, the truck may be bottom loaded at least 40 times, at least 40 aircraft fueled, and at least five aircraft defueled. Defueling may also be performed on ground and below ground tanks. The filter system may be tested in accordance with (see 4.8.14), twice during the test period. At least one set of filter elements shall be replaced during the test. The truck may be driven up to 200 miles per day at maximum speed, which may include sharp turns and sudden stops. Any system test may be conducted, at the beginning or end of a test period, by Purchaser personnel. Accumulated operational hours may be used as a part of the Reliability demonstration (see 4.8.3). Any failure preventing the truck from completing an operational day shall constitute a reliability failure. Adjustments and component cleaning during the test will not be considered a failure.

4.10 Final inspection. Following all testing, the trucks shall be inspected for evidence of loose parts, deformation, misalignment, leaks, finish failures, and evidence of corrosion. The PTO/Pump assembly shall be disassembled and measured for wear.

4.11 Refurbishment. After completion of all testing, the first article trucks shall be restored to like new condition.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be preformed by DoD personnel, these personnel need to contact the responsible activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6 NOTES

(This section contains information of a general or explanatory nature which may be helpful, but is not mandatory.)

6.1 Intended use. This truck is intended for use in fuel servicing of all types of aircraft under worldwide conditions.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of the specification.
b Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2).
c Packaging requirements (see 5.1).
d. When first article is required (see 3.1).
e. When a type D-2 single point nozzle is to be substituted for a D-1 single point nozzle (see 3.11).
f. When an overwing nozzle with adapter is to be provided (see 3.11).
g. When an overwing hose reel is to be provided (see 3.11.1).
h. When a vapor recovery system is to be provided (see 3.20.4).
i. Finish color required, if not gloss green (see 3.23).
j. Identification markings required (see 3.24.1).

6.3 Definitions. For the purpose of this specification, the following definitions apply:

6.3.1 Recovered materials. Materials collected and recovered from solid waste and reprocessed to become a source of raw materials, as compared to virgin raw materials.

6.3.2 Self-priming centrifugal pump. A pump, when starting from a flooded suction, that is capable of initiating and sustaining flow, while also being able to free itself of entrapped air without losing prime.

6.3.3 Highway. A paved hard surface public road or equivalent.

6.3.4 Unimproved road. A level-to-rolling graded gravel surface.

6.3.5 Belgian block road. A rough wavy, hard surface. Cobblestones may be substituted.

6.4 Subject term (key word) listing.

Defuel
Vehicle
Jet fuel
Over the wing fueling
Single point refueling (SPR)
Aviation fueling
Mobile
Aircraft transportable

Custodian:
Air Force – 99

Preparing activity:
Air Force – 84

(Project 2320-0750)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.

2. The submitter of this form must complete blocks 4, 5, 6, and 7, and send to preparing activity.

3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	**1. DOCUMENT NUMBER** MIL-PRF-32080(USAF)	**2. DOCUMENT DATE (YYYYMMDD)** 1 March 2001

3. DOCUMENT TITLE TRUCK, TANK, AIRCRAFT REFUELING, 6000 GALLON, A/S32R-11

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*	b. ORGANIZATION	
c. ADDRESS *(Include Zip Code)*	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON *(if applicable)*	**7.DATE SUBMITTED** (YYYYMMDD)

8. PREPARING ACTIVITY

a. NAME John Chancellor	b. TELEPHONE *Include Area Code)* (1) Commercial (2) AUTOVON 468-7603 Ext-133
c. ADDRESS *(Include Zip Code)* WR-ALC TILCC 420 SECOND STREET, SUITE 100 ROBINS AFB. GA 31098-1640	**IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:** Defense Standardization Program Office (DLSC-LM) 8725 John J. Kingman road, Suite 2533 Ft. Belvoir, VA 22060-2533 Telephone (703) 767-6888 AUTOVON 427-6888