

INCH-POUND

MIL-T- 83813 (84)

14 Jun 90

MILITARY SPECIFICATION

TRUCK, CARGO, DEPOT TRANSPORTER

This specification is approved for use within 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 establishes the characteristics, performance, and acceptance requirements for a Truck, Cargo, Depot Transporter with pneumatic, rubber-tires and power operated, conveyorized bed for use in multipallet or unit load transport in interwarehouse and interdepot short haul over prepared roadways.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications standard, and handbooks. The following specifications, standards, and handbooks form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the (SEE 6.2).

SPECIFICATIONS

FEDERAL

W-B-131	Battery, Storage (Vehicular, Ignition, Lighting, and Starting)
VV-F-800	Fuel Oil, Diesel
KKK-T-2108	Trucks and Truck Tractors: Commercial, Diesel or Gasoline Engine Driven, 24,000 to 32,000 Pounds GVW, 4 X 2
A-A-1108	Extinguisher, Fire Vaporizing Liquid

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: WR-ALC/MMDETb, Robins AFB GA 31098-5609 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of the document or by letter.

AMSC N/A

FSC 2320

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

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MIL-P-514	Plates, Identification, Instructions and Marking. Blank
MIL-P-27443	Pallet, Cargo, Aircraft, HCU-6/E, HCU- E, and HCU-10/C
MIL-C-46168	Coating, Aliphatic Polyurethane, Chemical Agent Resistant
MIL-T-52864	Trucks, Lift, Fork: DED, Pneumatic Tires, 10,000, 15,000, and 20,000 Pound Capacity; General Specification for
MIL-C-53039	Coating, Aliphatic Polyurethane, Single Component Chemical Agent Resistant
MIL-C-62122	Cable Assembly, Slave, Electrical, Connectors, Plug and Receptacle
MIL-T-83133	Turbine Fuel, Aviation, Kerosene Type, Grade JP-8
MIL-H-83282	Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Aircraft
MIL-C-83286	Coating, Urethane Aliphatic Isocyanate, for Aerospace Applications

STANDARDS

FEDERAL

FED-STD-595	Colors
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MILITARY

MIL-STD-12	Abbreviations for Use on Drawings and on Specifications, Standards, and Technical Documents
MIL-STD-130	Identification Marking of US Military Property
MIL-STD-461	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference
MIL-STD-462	Electromagnetic Interference Characteristics, Measurements of
MIL-STD-721	Definition of Terms for Reliability and Maintainability
MIL-STD-481	Configuration Control-Engineering Changes (short form), Deviations and Waivers
MIL-STD-781	Reliability Design Qualification and Production Acceptance Tests: Exponential Distribution
MIL-STD-808	Finishes, Materials, and Processes for Corrosion Prevention and Control in Support Equipment
MIL-STD-810	Environmental Test Methods and Engineering Guidelines
MIL-STD-831	Test Reports, Preparation of
MIL-STD-889	Dissimilar Metals
MIL-STD-970	Standards and Specifications, Order of Preference for for the Selection of
MIL-STD-1223	Nontactical Wheeled Vehicle Treatment, Painting, Identification Marking, and Data Plate Standards
MIL-STD-1595	Qualification of Aircraft, Missile, and Aerospace Fusion Welders

2.1 (Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

2.1.2 Other Government documents. The following other Government documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date specified in the solicitation.

LAWS AND REGULATIONS

49CFR 393	Federal Motor Carrier Safety Regulations (FMCSR)
49CFR 571	Federal Motor Vehicle Safety Standards (FMVSS)

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(The Code of Federal Regulations (CFR) and the Federal Register (FR) are for sale on a subscription basis by the Superintendent of Documents, US Printing Office, Washington DC 20402. When indicated, reprints of certain regulations may be obtained from the Federal agency responsible for issuance thereof).

2.2 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, 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 (see 6.2).

AMERICAN NATIONAL STANDARDS INSTITUTE INCORPORATED (ANSI)

ANSI B29-1

Chains

(Application for copies should be addressed to American National Standards Institute, Incorporated, 1430 Broadway, New York NY 10018).

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

Welding Qualifications

(Application for copies should be addressed to American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York NY 10017)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B633

Electrodeposited Coatings of Zinc on Iron and Steel, Specification for

(Application for copies should be addressed to American Society for Testing and materials, 1916 Race Street, Philadelphia PA 19103).

AMERICAN WELDING SOCIETY (AWS)

Standard D1.1

Standard Qualification Procedure of the American Welding Society

Standard B2.1

Standard for Welding Procedure and Performance

Qualifications

(Application for copies should be addressed to American Welding Society, 2510 NW Seventh Street, Miami FL 33125).

ANTI-FRICTION BEARING MANUFACTURERS ASSOCIATION STANDARD (AFBMA)

(Application for copies should be addressed to Anti-Friction Bearing Manufacturers Association, 1101 Connecticut Avenue NW, Suite 700, Washington DC 20036).

EUROPEAN TYRE AND RIM TECHNICAL ORGANIZATION

Standards

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(Application for copies should be addressed to European Tyre and Rim Technical Organization, 32 Avenue Brugmann-B, 1060 Brussels Belgium).

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

J198	Windshield Wiper Systems--Trucks, Buses, and Multipurpose Vehicles
J293	Vehicle Grade Parking Performance Requirements
J336	Sound Level for Truck Cab Interior
J360	Motor Vehicle Grade Parking Performance Test Code
J366	Exterior Sound Level for Heavy Trucks and Buses
J517	Hydraulic Hose
J534	Lubrication Fittings
J695	Turning Ability and Off Tracking--Motor Vehicles
J704	Openings for Six and Eight Bolt Truck Transmission Mounted Power Takeoffs
J786	Brake System Road Test Code--Truck, Bus, and Combination of Vehicles
J992	Brake System Performance Requirements--Truck, Bus, and Combination of Vehicles
J994	Alarm--Backup--Electric--Performance, Test and Application
J1077	Measurement of Exterior Sound Level of Trucks with Auxiliary Equipment
J1349	Engine Power Test Code, Spark Ignition and Diesel General Requirements for Aerospace Ground Support Equipment, Motorized and Nonmotorized

(Application for copies should be addressed to Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale PA 15096.)

TIRE AND RIM ASSOCIATION

Year Book

(Application for copies should be addressed to Tire and Rim Association Incorporated, 3200 West Market Street, Akron OH 44313).

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets, or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS3.1 Design.

3.1.1 Selection of specifications and standards. Specifications and standards, necessary commodities and services not specified herein shall be selected in accordance with MIL-STD-970.

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3.1.2 Materials. Materials shall be as specified herein. materials not specifically covered by this specification or referenced document shall be suitable in every respect for this type equipment. Except as otherwise specified, wood shall not be used. Recycled and recovered raw materials should be used to the maximum extent possible in lieu of virgin raw materials as long as these materials do not jeopardize the intended use and fully comply with all contract requirements. materials used shall be free from defects which could affect the performance or maintainability of individual components of the overall assembly.

3.1.2.1 Protective treatment. Materials that are subject to deterioration shall be protected in such a manner that shall in no way prevent compliance with the performance requirements of this specification. Protective coatings that will chip, crack, or scale with age or extremes of climatic conditions shall not be used.

3.1.2.2 Dissimilar metals. Unless protected against electrolytic corrosion, shall not be used in intimate contact with each other. Dissimilar metals are defined in MIL-STD-889.

3.1.3 Design and construction. The vehicle shall be constructed so that parts do not work loose in service and shall withstand the loads, shock, vibrations, and other conditions incident to operation, shipping and storage with minimum loss of time for maintenance, repair, and servicing. The design of the vehicle shall ensure safe, efficient, and economical operation. All assemblies, controls, and installed equipment shall be located so that there is no adverse interference with each other, or with the operation, and shall be readily accessible for maintenance, operation, removal, and replacement.

3.1.3.1 Reliability. The vehicle, including all components, shall have an observed Mean-Time-Between-Failure (MTBF) of not less than 100 hours, demonstrated in accordance with 4.6.7. A failure is defined as the event, or inoperable state, in which any item, or part of an item, does not, or would not, perform as previously specified. Definitions of reliability terms not included herein shall be as found in MIL-STD-721 and MIL-STD-781 In the event of a conflict between these documents, MIL-STD-781 shall take precedence. The vehicle shall be designed for a life expectancy of at least 20 years.

3.1.3.2 Maintainability. The vehicle shall be designed and constructed to provide the following:

- a. A minimum number of parts consistent with the performance required
- b. A minimum amount of time for assembling, disassembling, locating trouble sources, and maintaining the vehicle. Where practical, components shall be located for rapid inspection and recognition of potential failure.
- c. Ease of adjusting, servicing, and replacing parts and components.
- d. Use of readily available standard tools and equipment for maintenance.
- e. Maintenance with a minimum number of tools.
- f. Mean corrective maintenance downtime of no greater than two hours.
- g. Maximum corrective maintenance downtime of no greater than five and one-half hours.
- h. Maximum total downtime to perform all daily scheduled maintenance and servicing tasks of not greater than 35 minutes.

3.1.3.2.1 Maintenance tasks. The vehicle shall be designed so that one mechanic, using common hand tools, can perform the following maintenance operations within the time specified.

- a. Remove, replace, and adjust all engine driven belts

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- b. Remove and replace alternator - 1.1 hours.
- c. Remove and replace all filters, screens, and strainers in all hydraulic systems - one hour.
- d. Remove and replace engine coolant system hoses - 1.5 hour.
- e. Drain engine lubricating oil, remove and replace oil filter element(s) and refill crankcase - one hour.
- f. Remove and replace fuel filter element(s) - 0.6 hour.
- g. Disconnect battery cables, remove and replace batteries and battery cables - 1.5 hours.
- h. Drain torque converter oil and transmission oil, remove and replace all filter elements and strainer and refill converter and transmission - two hours.
- i. Remove and replace starter 1.2 hours.
- j. Remove or install the engine/transmission package, two mechanics - 5.25 hours.

3.1.3.3 Foolproofness. Where improper installation of an item could cause a malfunction, an asymmetric mounting system shall be provided, where practical, to ensure proper mounting of the item.

3.1.3.4 Fastening devices. All screws, bolts, nuts, pins, and other fastening devices shall be properly designed, manufactured, and installed with adequate means of preventing loss of torque or adjustment. Cotter pins, lock washers or nylon patches shall not be used for this purpose, except as provided in commercial (see 6.3.2) components. Tapped aluminum threads shall have a minimum thread engagement of at least two times the nominal fastener diameter.

3.1.3.5 Servicing provisions. Drains, grease fittings, lines, and check points for all components shall be so located that they are readily accessible and do not require special tools for proper servicing.

3.1.3.6 Lubrication. All parts normally requiring grease for lubrication shall be provided with lubrication fittings in accordance with SAE J534. Where the use of high lubrication pressures may damage grease seals, a pressure relief device shall be provided. Extended fittings shall be provided to lubricate parts or assemblies which are not readily accessible for direct lubrication or which are likely to be overlooked because of inaccessibility.

3.1.3.7 Component protection. All space in which work is performed during operation, service, and maintenance of the vehicle shall be free of hazardous protrusions, sharp edges, or other features which may cause injury to personnel. All rotating and reciprocating parts and all parts subject to high operational temperatures or subject to being electrically energized, that are of such nature or so located as to be hazardous to personnel, shall be guarded or insulated to the extent necessary to eliminate the hazard.

3.1.3.8 Foreign object damage. All loose metal parts, such as pins and valve caps, shall be securely attached so they cannot become separated from the vehicle.

3.1.3.9 Bonding. Metal parts shall be specifically bonded together to minimize the possibility of sparks.

3.1.4 Environmental conditions. The vehicle shall be capable of satisfactory storage and operation as described herein under the following conditions:

- a. Full time exposure to temperatures ranging from -25°F to +125°F for operation; -25°F to +160°F for storage.

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- b. Full time exposure to relative humidities up to 100 percent.
- c. Part time (five percent of the time) exposure to rain; droplets of size 2.0 mm to 4.5 mm falling at a rate of 13 cm per hour.

3.1.5 Weight distribution. The weight distribution of the vehicle in any loading condition shall not be unbalanced or improperly distributed. The difference in load between the left and right wheels of any axle shall not exceed 5.0 percent of the total load on the axle when the vehicle is unloaded and the deck is in its lowest position.

3.1.6 Vehicle lean. The vehicle shall not lean to either side more than one percent of the maximum width, in either the fully loaded or the unloaded condition. vehicle lean measurements shall be made at the outermost portion of the vehicle (excluding mirrors) mirror support brackets, lights, or asymmetrical shapes) directly above each axle; the difference in vehicle height at each axle shall not exceed one percent of the maximum width at the location.

3.1.7 Electromagnetic interference. The vehicle shall comply with the requirements of MIL-STD-461, Class CI, Group III for electromagnetic interference, except that the limits for UM03 (Figure 8-1) shall be relaxed by 20dB.

3.1.7.1 Exterior sound level. The maximum sound level produced by the vehicle shall not exceed 83dBA when measured in accordance with SAE J366b. An additional 2dBA allowance shall be permitted for production units to provide for variation in test site, temperature gradients, test equipment, and inherent differences in nominally identical vehicles.

3.1.7.2 Cab interior sound level. The maximum sound level in the cab interior shall not exceed the SAE recommended design criteria for new vehicles when measured in accordance with SAE J336a.

3.1.7.3 Equipment operation sound level. The maximum sound level produced by the vehicle shall not exceed 85dBA when measured in accordance with SAE J1077. In addition, the vehicle shall be positioned so that the microphone is located 24 inches from the auxiliary equipment operators control panel when tested by the stationary test procedure.

3.2.1 Mobility. the fully loaded and equipped vehicle in the travel-I mode shall:

- a. Maintain a speed of 55 miles per hour (MPH) over a paved road with a 0.05 percent grade.
- b. Accelerate from a stop to a speed of 20 MPH within 30 seconds on a level paved road.
- c. Ascend and descend a 20 percent grade without spillage of any fluid.
- d. Negotiate a 10 percent side slope in each direction.
- e. Have a reverse speed of 5 MPH over level pavement.
- f. Traverse graded gravel roads at a speed of 10 MPH.
- g. Traverse Belgian Block at a speed of 7 MPH.
- h. Comply with all service brake performance requirements of SAE J992b.
- i. Comply with all parking brake performance requirements of SAE J293, except that the required grade shall be 20.4 percent.

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j. Have a wall to wall turning diameter of 72 feet maximum in either direction measured in accordance with SAE J695.

3.2.2 Axle articulation. Sufficient articulation shall be provided to ensure that loading on each tire and wheel does not exceed the rating of that tire and wheel, when one wheel/dual wheel is elevated five inches higher above the horizontal plane than the other wheels. vehicle shall be capable of negotiating 3.5 inch high obstacles spaced to provide a racking of the chassis at a minimum speed of 5 MPH. Axle travel shall be limited to preclude interference damage with other vehicular components.

3.2.3 Stability. Track and wheel base dimensions shall be that optimum stability of the mover is achieved for all operations. Wheelbase shall be at least 144 inches long. The transporter shall be capable of turning a complete circle having a diameter of not more than that specified in 3.2.1(j). Road clearance shall be 8.0 inches minimum when fully loaded. Under the following combined conditions, the transporter shall be stable:

- a. Speeds up to 1.0 MPH in both forward and reverse directions.
- b. Full turn, right hand and left hand.
- c. Deceleration rate of at least 12 ft/sect.
- d. Fully loaded.
- e. Level road surface.
- f. Deck elevated to highest position.
- g. Forty knot wind from any direction.

3.2.4 Structure. Integrity of all structures shall comply with the structural design requirements of SAE ARP 1247B for design stresses. The structure shall be designed to provide, based on yield strength, a static safety factor of three to one, or a dynamic safety factor of two to one while accomplishing any of the performance requirements described herein, whichever is greater. Design loads shall be those imposed by typical loading conditions of braking, acceleration, 3 1/2 inch obstacle negotiation, dock impact, steering, and other design considerations consistent with the item as a cargo transporter and a system whose intended function is the handling and transport of deck payloads. A Goodman analysis of all fasteners shall indicate infinite life.

3.3 Chassis. The chassis shall be the manufacturer s commercial (see 6.3.2) standard, except to comply with the specific requirements herein. Splash pans or guards shall be provided as necessary to give adequate protection against moisture, dirt, snow, sleet, and mud to all exposed components. Full fenders or mud flaps on each wheel shall be provided.. The chassis shall conform to the requirements of KKK-T-2108, Type I.

3.3.1 Powertrain.

3.3.1.1 Engine. The vehicle shall be equipped with a commercial (see 6.3.2) liquid cooled diesel engine of not less than six cylinders. The total power output required by all items driven by the engine shall not exceed its net power output rating at 2,000 feet elevation, determined in accordance with SAE J1349 The engine shall demonstrate the performance characteristics specified herein when using diesel fuel in accordance with VV-F-800 and shall operate satisfactorily on Grade JP-8 in accordance with MIL-T-83133. Any engine that is adversely affected by any of the above fuels is not acceptable.

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3.3.1.1.1 Engine installation. The engine shall be installed to allow easy maintenance operations (see 3.1.3.2). Engine and transmission vibrations shall be dampened so as to not adversely affect other vehicle components.

3.3.1.1.2 Engine lubrication system. Lubrication to all internal engine components shall be provided during all vehicle attitudes and mobility requirements (see 3.2.1). The oil filler opening shall be accessible with a five quart oil container so as to allow replenishment of engine oil.

3.3.1.1.3 Engine cooling system. The engine shall be equipped with a cooling system capable of satisfactory performance under the environmental conditions specified herein; coolant temperature shall not exceed the engine manufacturer's recommended maximum. Expansion tanks of sufficient capacity for expansion of all coolant in the system shall be provided.

3.3.1.1.4 Engine starting system. The engine shall start within 5 minutes in any ambient temperature within the required operating range of the vehicle. Installed glow plugs, fluid starting aids, and heat from the winterization system may be used prior to and during the start period to facilitate engine starting under the following conditions:

TEMPERATURE RANGE (DEGREES FAHRENHEIT)STARTING AIDS PERMITTED

+40 through 125

None

+1 through 39

Glow plugs and fluid starting aids

-25 through 0

Glow plugs, fluid starting aids, and heat from the winterization system

The starting system shall be equipped with an interlock device to prevent starter engagement when the engine is running or when the transmission is in any position other than neutral.

3.3.1.1.5 Exhaust system. The exhaust system shall be designed to expel exhaust gases in a manner that is hazardous to operators or mechanics; the outlet shall not be directed toward the ground. The exhaust shall be emitted above the cab so as to not contaminate the cargo. The exhaust system including all fasteners, shall be constructed of corrosion resistant materials. The system shall be protected from damage which could result from traversing rough terrain.

3.3.1.2 Transmission. A commercial (see 6.3.2) automatic transmission shall be provided, complete with a hydraulic torque converter. The normal drive range selector position shall provide not less than four gear ratios without selector movement. The transmission shall have a torque capacity of at least 110 percent of the maximum net engine torque. The transmission shall be equipped with an auxiliary transmission oil cooler. The transmission shall be provided with SAE J704 power takeoff openings.

3.3.1.3 Axles. Commercial (see 6.3.2) axles shall be provided. The load rating of each axle shall be not less than the imposed load on the axle, measured at the ground, with the vehicle at gross weight. The rear axle shall be a standard commercial axle with differential carrier rated to match the maximum torque output of the engine and transmission selected. The front axle shall be the steering axle.

3.3.2 Steering system. The vehicle shall be equipped with a power assisted steering system, with manual steering available in the event of power assist failure. The steering system shall not require more than four turns lock to lock. The steering mechanism shall provide for ease of operation and shall be capable of controlling the direction of the fully laden transporter under all operating conditions.

3.3.2.1 Steering wheel. The steering wheel shall have a diameter of 18 inches minimum. Not less than four inches clearance shall be provided between the steering wheel rim and the nearest projection in the plane of the steering wheel. Not less than four inches clearance shall be provided between the steering wheel rim and the nearest projection below the steering wheel.

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3.3.3 Brakes.

3.3.3.1 Service brakes. The vehicle shall be equipped with full air brakes on all wheels. Brakes shall be of either drum or disc type and conform to the requirements of SAE J992b, FMVSS 571.121 and FMCSR. With the deck in the travel position, the fully loaded vehicle shall be capable of stopping within 35 feet on a level dry hard road surface that is free of loose material, after application of the service brakes at a forward speed of 20 MPH. At a 5 MPH reverse speed, the brakes shall be capable of stopping the vehicle within 10 feet. Drums shall have flanges or ribbing to prevent distortion. A commercial (see 6.3.2) air dryer and necessary associated parts shall be added to the pneumatic system to eliminate excessive moisture and oil, thus increasing the life of the air brake components. It shall use desiccant for the final absorption process and shall be installed in the discharge line between the compressor and the first reservoir. A heater and thermostat assembly shall be provided with the air dryer to preclude freeze up when used in severe winter conditions. A drain shall be provided on each air reservoir and shall be readily accessible for service.

3.3.3.2 Parking brakes. The vehicle shall be equipped with parking brakes of the spring applied type on all nonsteering wheels. It shall be spring actuated and released by air pressure. The system shall be fully operable from the cab. Parking brakes shall hold the fully loaded vehicle on a 20.4 percent grade with all power functions off. the parking brake shall, when applied, prevent vehicle motion when maximum torque is applied to the driveline on level ground. Means shall be provided for manually releasing applied parking brakes so that the vehicle may be towed to another location for repair. A light shall be provided in the cab to indicate that the parking brake is applied.

3.3.4 Frame. The chassis frame shall form the basic structural element for the entire transporter. It shall be possible to jack the vehicle frame up to clear each individual wheel from the ground for tire changing using a hydraulic automotive jack. Frame jack locations shall be marked. The frame shall be designed per 3.2.4. A hook, loop, or pin for towing the cargo transporter cargo transporter shall be furnished on the chassis front and two on the chassis rear of the cargo

3.3.5 Suspension system.

3.3.5.1 Rear suspension system. The rear axle shall be attached to the frame through suitable heavy duty leaf spring suspension.

3.3.5.2 Front suspension system. the front axle shall be attached to the frame through suitable heavy duty spring suspension. Shock absorbers shall be provided for maximum operator comfort and to protect the load from vibrations.

3.3.5.3 Lockout cylinders. Rear spring lockout hydraulic cylinders, controlled from the cab, shall be installed to prevent spring deflection during loading/unloading operations. The spring lockout hydraulic cylinders shall be automatically incapacitate when the mover is placed in gear. The lockout cylinders can be an integral part of the shock absorbers. An indicator light shall be provided to show when lockout cylinders are actuated.

3.3.6 Wheels and tires. The vehicle shall be equipped with wheels and tires which meet Tire and Rim Association or European Tyre and Rim Technical Organization requirements for this application. Tubeless steel belted radial ply tires with all-weather, traction type tread shall be provided. Tires furnished shall be readily available on the commercial market. Tire and rim sizes shall be the same for all wheels. Wheels and rims shall be made of steel of a standard nonlocking ring type. The rear wheels shall be dual wheel type.

3.3.7.1 Fuel tank. A fuel tank shall be provided with at least a 40 gallon capacity or a capacity sufficient to provide at least eight hours of continuous loader operation. The tank shall have a fill opening

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of two inches minimum readily accessible to personnel standing on the ground. It shall be located and mounted so as to provide maximum protection from damage.

3.3.7.2 Fuel filter. At least one filter of the fuel-water separator type located in the fuel line between the fuel tank and the engine. It installed so that the element can be readily serviced without shall be shall be removing surrounding equipment. Unless the filter is mounted higher than the fuel tank, a shutoff valve shall be included in the inlet line to the filter.

3.4 Cab. The cab shall be a standard commercial (see 6.3.2) cab over configuration. The cab shall be equipped with, but not limited to, the following:

- a. Manufacturer's standard insulation and sound deadening material.
- b. Hand operated windows.
- c. Door checks and locks, operable from inside of the cab.
- d. Doors equipped with external key operated locks, keys, two sets.
- e. Manufacturer's standard heavy duty vinyl upholstery.
- f. Manufacturer's standard seats.
- g. Rear cab windows.
- h. Glove compartment.
- i. Interior lighting.

The cab shall be weatherproof and shall comply with all OSHA recommendations. Steps and handholds shall be provided to permit ease of operator entrance and exit from and to ground level. The cab shall have a fan and a document pouch.

3.4.1. Cab workspace. Workspace clearances and dimensional cab features shall be ergonomically designed to provide comfort and convenience to controls for the operator.

3.4.2 Seating. The cab shall be equipped with two seats and shall be equipped with safety belts. Seating shall provide comfort by preventing fatigue stresses induced by long operating periods, oscillation, and vibration resulting from hard chassis suspensions.

3.4.3 Windshield and windows. The windshield shall be laminated safety glass of sufficient size to provide visibility of the oncoming road surface.

3.4.3.1 Windshield wipers and washer. Windshield wipers and washer shall be provide in accordance with SAE J198.

3.4.3.2 Windows. Windows shall be installed on all sides, except the top for sufficient visibility. All cab windows shall be automotive tempered safety

3.4.4 Mirrors. An adjustable Rearview mirror of not less than 65 square inches shall be mounted on each side of the vehicle on a retractable bracket. The mirrors shall be positioned so that the driver can clearly observe the roadway and vehicle approaching from the rear on either side. A spotter mirror, at least five inches in diameter, shall be mounted below each rearview mirror. If a cab forward configuration is provided, a spotter mirror shall be mounted on each side of the windshield, installed so that the front of

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the vehicle is to the driver. The vehicle shall be equipped with a 16 inch convex mirror on the right rear of the vehicle positioned 50 that the operator may view the mirror while operating the left rear controls.

3.4.5 Instruments and controls. Instruments and controls shall be arranged so that those which are most vital to operation have the most predominant location. They shall be placed in blocks distinctly marked to group those instruments and controls pertinent to the operation of any individual component. For example, all instruments and controls relative to the operation of the engine shall be in one block. Controls having similar functions shall have similar actions. The controls panel shall be marked with etched metal labels. Silk screen process is not allowed. The platforms functions and conveyerized deck height adjustments shall be controlled by electrical command switches from the cab and shall be the "deadman type" for those functions where this type of switch adds to the safety of deck functions. The deck system shall be designed to minimize lag time between control command and deck function. A mode selector control with two positions labeled "drive" and "deck" shall be provided to preclude simultaneous deck and drive operations. Spring lockout control shall be provided in both the "drive" and "deck" modes. Interlocks shall be provided to required transmission to be in neutral, springs lockouts actuated, and parking brakes to be engaged for operation of deck functions. The selector control shall be required to be positioned at "drive" function before vehicle can be placed in motion. Indicator lights shall be green to indicate proper operation and red when warning is intended. All instruments and controls shall be illuminated with nonglare red lighting to be readily available for night operation. At least the following instruments, accessories, and controls shall be provided:

- a. Steering wheel.
- b. Service brake pedal.
- c. Accelerator pedal.
- d. Parking brake control.
- e. Transmission gear selector.
- f. Turn indicator switch.
- g. Ventilator, other than window.
- h. Instrument panel.
 - (1) Ignition switch with starter.
 - (2) Speedometer/odometer.
 - (3) Engine hourmeter.
 - (4) Tachometer.
 - (5) Ammeter or voltmeter.
 - (6) Engine coolant temperature gauge
 - (7) Engine oil pressure guage.
 - (8) Air pressure gauge and low pressure warning buzzer.
 - (9) Light switches.
 - (10) Panel lights.
 - (11) Climate control system.
 - (12) Two speed windshield wiper and windshield washer.
 - (13) Fuel gauge.
 - (14) Mode selector control ("deck"/"drive").
 - (15) Hydraulic fluid high temperature light.
- i. Deck control panel. The deck control panel in the cab shall be conveniently mounted on the

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right hand side of the operator. An additional set of controls shall be positioned at the left rear of the deck enclosure and shall include:

- (1) Master switch.
 - (2) Rear spring lockout controls and indicator light.
 - (3) Deck roll controls.
 - (4) Deck lift and pitch controls.
 - (5) Conveyor controls.
 - (6) Pallet restraints switch.
- j. Light dimmer switch and high beam indicator.
- k. Instruction plates.
- l. Horn button.

m. Fire extinguisher (Halon 1211, Type C) in accordance with commercial item description A-A-1108).

3.4.6 Deck controls. The depot cargo mover shall have two sets of deck controls. One set of deck controls shall be located in the cab within easy reach of the operator while in a seated position. The second set of deck controls shall be located at the left rear of the deck enclosure and shall be positioned so that the operator can operate the controls while standing outside the vehicle at ground level. The controls at the left rear of the vehicle shall maintain a constant height above the ground regardless of vehicle operation. The left rear controls may be on a retractable pendant. The controls shall be electrical deadman switches for those functions where this type switch adds to the safety of deck functions. Each control switch shall be labeled as to function. Each set of controls shall be equipped with a manual locking "emergency stop" control to shut down all operations of the set. Emergency stops shall not automatically reset. Exterior controller shall be enclosed in a protective enclosure.

3.4.7 Climate control system. The cab shall be equipped with a heater of the engine coolant to forced air system. The cab heater shall receive its heated water from the engine cooling system. The heater shall include fresh air intake and discharge outlets shall be provided to direct heated air to the floor and to windshield defroster louvers. Heater shall be complete with blower and controls mounted convenient to the operator.

3.5 Hydraulic system. The hydraulic system shall be an "open center" system and shall be closed only when actually operating. The hydraulic system shall provide power and control for the rear spring lockouts, rear door, deck, and conveyor circuit. The hydraulic(s) shall be complete including all pumps, valves, piping, cylinders, pressure controls, and reservoir(s) with sight gauge and safety devices required for economical operation and long life. Overload protection shall be provided on the high pressure line from the hydraulic pump to prevent damage to the hydraulic controls. Pressure relief valves shall be included at all hydraulic cylinders and motors to allow bypass of excess hydraulic pressure. The hydraulic fluid supply shall have a filter system to insure delivery of clean fluid to the hydraulic circuit. Hydraulic fluid used shall be in accordance with MIL-H-83282. The temperature of the hydraulic fluid shall not exceed 200°F during operation and shall not cause any detrimental effects on the hydraulic components. Check valves shall be provided at the hydraulic cylinder inlets to preclude uncontrolled lowering deck in the event of hydraulic line or control valve failures.

3.5.1 Reservoirs. The hydraulic fluid reservoir shall be designed to allow easy access to the fill port. The fill port and the outlet to the pump suction line shall be equipped with a strainer. The reservoir shall be equipped with an easily removed plate to allow for cleaning of the interior. The reservoir shall be vented and done in a manner to preclude rain water or dust from entering through the vent. The pump suction line shall be equipped with a manual valve to stop fluid flow when replacing hydraulic pumps or

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lines. The hydraulic fluid reservoir shall be located so that a positive head shall be provided to all pumps during any operation. Suction lines to hydraulic pumps shall be designed to respond to all fluid flow demands within the capacity of the pumps while maintaining a positive head at the pump intake ports. The capacity of the hydraulic fluid reservoir shall be sufficient to contain all fluid necessary for hydraulic system operation. The hydraulic reservoir shall be of such configuration and located so that any normal operational attitudes of the transporter does not cause the hydraulic head to be lost. The reservoir shall have a tapered bottom to a drain plug for thorough draining. The return line shall end below the minimum operational fluid level to prevent aeration. The reservoir shall be equipped with an easily read and guarded fluid level indicator. The reservoir shall be marked with the type hydraulic fluid to be used and any other appropriate warnings. The hydraulic fluid shall be filtered by a return line filter prior to entering the reservoir.

3.5.2 Pump. The hydraulic pump shall be installed on a rigid mounted bracket designed to minimize pump movement. The pump shall be driven by a heavy duty power takeoff unit mounted to the transmission. The coupling is to be installed without alterations in accordance with the coupling manufacturer's recommendations. Chain drives are not acceptable. The pump shall be powered in a manner to prevent pump overspeed under any condition of transporter operation. A pressure line filter shall be installed on the outlet side of the pump.

3.5.3 Valve enclosures. The hydraulic valve shall be grouped in banks to provide easy access for maintenance. The bank shall be installed in and enclosed by a weather debris protection enclosure. The enclosure shall be designed to provide easy access to the hydraulic valves. All hydraulic valves shall be marked to correlate with the hydraulic schematic. The hydraulic schematic shall be applied to a metal plate and mounted on the valve enclosure.

3.5.4 Hoses. Hydraulic hoses shall be of the wire braid type installed to meet SAE J517 recommended safety factor of four to one for burst pressure to operating pressure.

3.6 Conveyorized deck. The conveyorized deck shall be attached to the elevating mechanism.

3.6.1 Deck construction. The deck construction shall be of reinforced steel and provide for installation of the roller conveyors, pallet guide rails, pallet stops, restraints. Transfer of unbalanced and partial loads across the deck shall not result in structural flexing or deck movement of more than 0.5 inch when the deck is elevated to any position.

3.6.2 Power conveyors. Two hydraulically powered roller to roller chain driven conveyors, each at least 42 inches wide between frames, shall be installed level on the conveyor deck for transferring pallets, skidded loads, boxes, packages, and trays onto and off of the transporter. All rollers shall be powered and mounted in same horizontal plane. The distance between conveyors shall be no less than six inches and no more than eight inches, shall be clear space to allow for material overhand, and shall be suitable as a walkway. There shall be clear space between conveyor frames and pallet rails to allow for material overhang. The conveyors shall be designed so that either side of the conveyorized deck can be operated independently of, or simultaneously with, the other side of the conveyorized deck. The conveyors shall operate simultaneously to transfer up to three HCU-6/E pallets (108 inches X 88 inches each, per MIL-P-27443) plus pallet couplers, inches wide) loaded in any combination, to a gross weight of 15,000 pounds. No single pallet shall be loaded to more than 10,000 pounds gross weight. Each conveyor shall also operate separately to handle up to five standard wood slat pallets, 48 inches by 48 inches, loaded to a total gross weight of 7,500 pounds and operate in unison to handle ten 48 inches by 48 inches pallets loaded to a total of 15,000 pounds gross weight. Power to the conveyors shall be adequate to handle 15,000 pounds of loads at conveying speeds variable from 0 feet per minute (FPM) to 120 FPM with the deck level.

3.6.2.1 Rollers. Rollers shall be between 2.5 inches and 3.5 inches in diameter, seamless steel tubing, roller tubes shall be zinc electroplated in accordance with ASTM B633. Roller length shall be ap-

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proximately 40 inches and shall not vary from roller to roller by more than plus or minus 1/16 inch. roller shall have a minimum load rating of 600 pounds each.

3.6.2.2 Roller bearings. Bearings shall be antifriction steel ball bearing type rated for operation under a static and dynamic load of 600 pounds per roller. Bearings shall be prelubricated sealed type, or axle grease fittings shall be installed for lubrication. Bearing housing shall be zinc electroplated in accordance with ASTM B433. No spacer or retainer is permitted between the roller and the outer race or between the axle and inner race. Bearings shall be sized, manufactured, and installed in accordance with AFMBA Standards. Teflon bearings shall not be used.

3.6.2.3 Roller axles. Axles shall be steel and shall be retained by fasteners. Spring loaded axles shall not be acceptable for retaining rollers in the frame rail. The axles shall be constructed of steel hex rod.

3.6.2.4 Chains and sprockets. Chains and sprockets shall conform ANSI B29.1. Sprockets and chains shall be an ANSI Size 50, or larger, and shall have hardened teeth. Chains shall wrap connecting roller sprockets 180° minimum. Roller sprocket diameter, plus chain height, shall not extend above roller tube diameter. A maximum of two rollers shall be connected by one chain section. Each section of chain shall contain a master link for easy removal.

3.6.2.5 Frame rail. The conveyor frame rails shall be of structural steel designed to support a 15,000 pound evenly distributed load. Rollers shall be installed along the length a maximum of every 4.75 inches measured from centerline to centerline. A maximum of 30 rollers shall be driven off each conveyor drive motor. The conveyor deck shall have sufficient bracing to prevent deformation under all operating conditions including instances when any quarter section is loaded with a 1,500 pound load and the remainder of the conveyor deck is empty.

3.6.3 Pallet restraints. At least one pop-up pallet restraint shall be provided for each conveyor system, operated from the cab or exterior controls, to prevent HCU-6/E pallets and 48 inches by 48 inches pallets from moving past the rear of the deck. The pallet restraints shall incorporate a spring loaded fail safe feature that returns the restraints to the upright position when the switch is released or malfunctions, except when depressed by cargo loads being transferred onto the deck.

3.6.4 Pallet stops. A permanently positioned pallet stops for both conveyor system, shall be provided at the front of the deck (cab end) to prevent damage to the vehicle.

3.6.5 Pallet guide rails. Pallet guide rails shall be equally spaced from centerline of the conveyor system and bolted to each side of the deck 110.5 inches, plus or minus 0.25 inches, apart to provide directional control of HCU-6/E pallets (88 inches X 108 inches), with the 108 inch dimension placed perpendicular to the deck longitudinal centerline. Tiedown rings shall be provided to prevent cargo from shifting during mobile operations and shall be of sufficient strength to withstand loads associated with the transport mode. Seven tiedown rings shall be provided along both guiderails evenly spaced about the deck lateral centerline, for a total of 14 tiedowns. The tiedown rings shall not interfere with loads being transported or transferred on the deck. In addition, seven tiedowns shall be flush mounted in the center of the walkway between the conveyors and shall be spaced the same as the outside tiedowns.

3.6.6 Rubber bumpers. Rubber bumpers shall be mounted on the rear of the chassis and deck to preclude damage to the vehicle and dock during loading/unloading operations. The bumper on the deck shall not overhang the bumper on the chassis.

3.6.7 Elevating mechanism. A power elevating mechanism shall be incorporated in and supported by the vehicle chassis. The lift mechanism shall be capable of level lifting and lowering the deck without special manipulation of controls when a 15,000 pound load is evenly distributed over the entire length of the conveyor and when a 10,000 pound load is evenly distributed on a HCU-6/E pallet located on the front end and the same for the rear end of the deck. The elevating mechanism shall be so designed that it can

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raise the deck when fully loaded, partially loaded, and empty through the heights of 45.0 inches through 75.0 inches as measured from the top of the deck rollers to ground level. By special manipulation of the controls, it shall be possible to pitch the conveyORIZED deck both before and after 4.0°, plus or minus 0.5°, each way to compensate for road surface or dock irregularities. This degree of pitch shall be possible when the deck is raised sufficiently to prevent interference between the deck frame and chassis. The elevating mechanism shall have stops to preclude the operator from damaging the vehicle due to over travel. Interlocks shall be provided to preclude simultaneous operation of deck elevation controls and deck roll controls. All pins and hoisting devices shall be retained by positive means to eliminate parts from working loose during use. Alternate onboard means shall be provided to elevate the empty conveyor deck for maintenance purposes when the power source is inoperable. All components shall be protected or designed to withstand the environment, in particular, sand and dust~ road splash, and freezing mud and water.

3.6.7.1 Lifting and lowering speeds. Lifting and lowering shall be controllable at speeds that are infinitely variable between 0 feet and 10 feet per minute, when loaded under any condition specified herein.

3.6.7.2 Slip rate and creep rate. The downward slip rate of the fully loaded elevated cargo deck shall not exceed 1/4 inch per hour, measured between the deck height and ground with the engine stopped. The upward creep rate of the loaded partially elevated platform shall not exceed 1/4 inch per hour measured between the deck height and ground with the engine running and the hydraulic pumps operative.

3.6.7.3 Locking devices. Positive locking devices shall be provided to hold the conveyor deck in the raised position for maintenance purposes. Provisions for their storage shall be incorporated on the cargo mover.

3.6.7.4 Deck roll. The deck shall be capable of roll motion in both CW and CCW direction through a range of 0.0° to 4.0° each way and shall be limited to not more than 6.0°. This degree of roll shall be possible when the deck is raised sufficiently to prevent interference between the deck frame and the chassis. Interlocks shall be provided to preclude simultaneous operation of deck elevation controls and deck roll controls.

3.7 Other equipment. The following shall be furnished.

3.7.1 Deck enclosure. The conveyORIZED deck shall be completely enclosed by metal shelter and 1/8 inch sheet metal or equivalent subdecking to protect cargo from the weather. The inside clearance height above the roller deck shall be no less than 99.0 inches when measured between the pallet guide rails with the rear door open. The inside walls of the shelter shall be smooth and covered with a sheet metal shield to prevent pallets and boxes from lodging against them. The shield shall be a minimum of eight gauge metal from the conveyors to a height of two feet above the conveyors and 16 gauge from two feet above the conveyors to the ceiling of the enclosure. The shelter shall be of a minimum number of components and made so that it can be readily removed from the deck by four men in two hours with aid of common hand tools and a 463L 10K standard forklift (in accordance with MIL-T-52844). If it is necessary to disconnect electrical, pneumatic or hydraulic lines, quick disconnect couplings shall be used. The rear of the shelter shall have a hydraulic power operated door. The door opening shall be flush with the inside walls of the shelter, and its centerline shall be aligned with the conveyor system centerline. The door shall withstand the impact of a 1,000 pound load traveling at 1.0 FPS over a four square foot area perpendicular to the vertical plane of the door when it is closed. The door shall be restrained from bouncing while the vehicle is in motion. The usable door opening shall be at least 109.0 inches wide and 47.0 high. A row of flush mounted D-rings shall be provided inside the deck enclosure. The rings shall be spaced a maximum of 12.0 inches apart and should run parallel to the cargo door opening along both side walls. The row of D-rings shall be placed as close to the door opening as possible but shall not interfere with the door functions. The D-rings will serve to attach a nylon net across the back of the enclosure to

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prevent cargo from becoming lodged against the closed door. The cargo door interlock, which requires that the door be closed before the vehicle can be placed into motion, shall be able to be bypassed in an emergency situation when the cargo door has been damaged or becomes inoperative. Shelter windows shall be provided and shall be impact and scratch resistant and be of such length and width as to give the operator an unobstructed view of loading and unloading operations from the cab. A minimum of two 18 inch by 18 inch window shall be installed on the left side rear section of the shelter for viewing of loading/unloading operations. Lights mounted inside the shelter shall provide a minimum of 25 foot candle level of illumination at the conveyor level on the deck with a minimum of 20 foot candles at any point. The shelter shall provide means for manually raising of the rear door when power motor failure occurs.

3.7.2 Tool storage container. A tool storage container shall be provided and located in the cab or on the chassis. the container shall have at least 1.5 cubic feet storage capacity. If located outside the cab of the vehicle, the tool storage container shall be waterproof and weatherproof.

3.8 Operation. The cargo mover shall be designed for the expeditious pickup, transport and transfer of commercial or military type loaded pallets, bulk, load, skidded loads and containerized loads from dock to dock and to other cargo movers or vehicles in and around warehouse. All loading and unloading shall be accomplished with the cargo transporter backed up against the dock, other cargo mover or vehicle.

3.8.1 Operating sequence. A typical operating sequence is as follows:

- a. Approach the dock, cargo transporter, or vehicle with empty cargo transporter.
- b. Stop cargo transporter, back cargo transporter into position for loading.
- c. Stop cargo transporter, set brake.
- d. Lock out vehicle springs.
- e. Elevate and adjust deck to proper load transfer height (e.g, pitch and roll deck for proper alignment).
- f. Lower pallet restraints.
- g. Transfer the load onto the depot cargo transporter.
- h. Lower deck and retract spring lockouts.
- j. release brake.
- k. Drive cargo transporter a short distance to destination/(unloading point).
- l. Stop depot cargo transporter.
- m. Back cargo transporter into position.
- n. Set brake.
- o. Lock out vehicle springs.
- p. Elevate and adjust deck to proper load transfer height, roll deck for alignment.

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- q. Lower the pallet restraints.
- r. Transfer load from transporter.

3.9 Electrical system. The vehicle shall be equipped with a 12 volt electrical system; a 24 volt starting system may be provided. Wiring shall be weatherproof and color coded or numbered for easy identification. All circuits shall be protected by circuit breakers to be located so as to be protected from environmental conditions and to be readily accessible to a mechanic. A master switch shall be provided to disconnect the batteries from the electrical system.

3.9.1 Alternator. The engine shall be equipped with an alternator sufficient for operating all vehicle electrical components simultaneously at engine idle speed. minimum capacity of the alternator shall be 105 amperes.

3.9.2 Batteries. The vehicle shall be equipped with at least two 12 volt batteries, rated at a total of 1,800 cold cranking amps(CCA) minimum The batteries shall comply with the maintenance free characteristics of W-B-131. Batteries shall be so arranged and connected to provide sufficient capacity for engine starting in all conditions specified herein. The batteries shall be mounted in an acid resistant tray; a sliding carriage shall be provided if the batteries must be moved sideways to permit access for servicing or replacement. An auxiliary power receptacle, MIL-C-62122, shall be installed near the batteries to permit engine slaving and battery charging and shall allow connection of auxiliary power cables by personnel while standing on the ground at the side of the chassis and with deck in any position.

3-9-3 Lighting.

3.9.9.1 Vehicle lighting. The vehicle shall be equipped with Halogen headlights, taillights, parking lights, clearance lights, brake lights, two backup lights, emergency flashers, turn signal lights and reflectors in accordance with FMVSS. The turn signal operating units shall have visible and audible flash indicators; turn signals shall be self cancelling. Front signals shall be installed in such a way as to provide a signal to vehicles approaching from the front and sides of the vehicle chassis. Lights and reflectors shall not be mounted on the vertical surface of rub rails or on vehicle bumpers. The headlights shall be adjusted by standard automotive adjustments. The backup lights shall illuminate road surface behind the transporter and be energized automatically when the cargo transported is in reverse gear. Headlights and taillights shall be recessed or similarly protected against damage. A flashing yellow beacon light shall be provided, located in the center of the cab roof, in order to warn of wide load vehicle.

3.9.3.2 Interior lighting. The cab and all compartments shall be provided with lighting adequate to enable personnel to readily obtain equipment and perform all functions necessary during night operation. Sealed contact switches shall be provided to automatically illuminate the lights in the cab or a compartment when its door is opened.

3.9.4 Winterization system. The vehicle shall be equipped with a winterization system to permit storage and operation in ambient temperatures as low as -25°F. Heaters shall operate on 110 volt alternating current (AC) and shall be wired through a junction block to a single three pronged male weatherproof slave receptacle for receiving external power and grounding the vehicle. A three wire connecting cable, 25 feet long and of adequate line capacity to supply power for all heater units simultaneously, shall be furnished. The connecting cable shall include a matching female connector at the vehicle end and a standard weatherproof three pronged (two power plus one ground) male connector at the other end. Electrical apparatus shall conform to FMCSR 393.77(c)(7). Electrical insulation of connecting cable shall withstand normal operating stresses in low ambient air temperature without cracking or loss of dielectric capacity. All heater lead wires shall be installed without interfering with vehicle component operation and without loose excess wire. Provisions for storage of the cable shall be provided in the vehicle cab. Heaters shall be furnished as follows:

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a. Coolant heater, 1,500 watt minimum rating, shall be installed in the engine block or in the lower coolant inlet hose. Engine thermostat, with an operating range of 170°F to 195°F, shall be installed.

b. Immersion type engine oil heater, 300 watt minimum rating, shall be installed in oil pan through any convenient opening. The oil heater shall be controlled by the coolant heater thermostat.

c. Battery heater shall be provided, having a capacity adequate to maintain battery electrolyte at a temperature of not less than 10°F during vehicle exposure in ambient air temperatures as low as -25°F, and shall embody a thermostat to limit the temperature of the electrolyte to not more than 80°F.

d. A fuel warmer or preheater shall be provided to prevent clogging of fuel filters due to wax crystallization in the fuel. The fuel warmer shall use engine coolant to transfer sufficient heat to the diesel fuel to heat it from an inlet temperature of -25°F to an outlet temperature of +9°F, with a flow rate not less than the maximum fuel demand of the engine fuel system.

3.9.5 Wiring diagram. A wiring schematic showing all wiring and systems on the cargo transporter shall be mounted to the inside of the cover of the main electrical junction box. The wiring schematic shall be applied to a metal plate and attached by riveting. Also, the schematic shall be as large as practical to provided maximum legibility. The wires and terminals shall be identified on the schematic and vehicles.

3.9.6 Enclosures. Electrical junction boxes enclosures shall be weatherproof and easily accessible for maintenance. Components and wires within the boxes shall be identified to match the electrical schematic.

3.10 Auxiliary equipment.

3.10.1 Backup alarm. An audible alarm shall be provided to caution personnel in the area when the vehicle is in reverse gear. The alarm shall be in accordance with SAE J994, Type D.

3.11.1 Cleaning, painting, plating, anodic films, and chemical treatments. Cleaning, painting, plating, anodic films, and chemical treatments shall be in accordance with MIL-STD-808, except that commercial (see 6.3.2) components may be prepared in the accordance with the manufacturer's standard practice, provided it is compatible with the exterior finish paint.

3.11.2 Finish. The exterior paint finish shall show no evidence of uneven application, curtains, runs, sags, orange peel, lack of adhesion, or other defect, and shall be capable of passing the test described in paragraph 4.8.1 of MIL-C-83286.

3.11.2.1 Forest Green. Unless otherwise specified (see 6.2), the outer surface of the vehicle and the interior surfaces of compartments (except in the cab) shall be painted with Polyurethane paint, Forest Green, Color Number 24052 of FED-STD-595. The paint shall be in accordance with MIL-C-83286, or shall be DuPont Imron, or equal. All exterior trim items (such as wheels, wheel covers, running boards, metal radiator grilles, drip rails, bumpers door handles, and light trim rings) shall be painted with the same paint as the exterior of the vehicle.

NOTE

"Equal" is defined as having performance identical to or superior to DuPont Imron when subjected to the following tests:

a. Tests in accordance with MIL-C-46168:

(1) Paragraph 4.3.17 Flexibility.

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(2) Paragraph 4.3.23 Accelerated weathering.

b. Tests in accordance with MIL-C-83286:

- (1) Paragraph 4.8.6 Low temperature resistance.
- (2) Paragraph 4.8.10 Resistance to taping.
- (3) Paragraph 4.8.12 Pencil hardness.

3.11.2.2 Desert Sand. When specified (see 6.2), the outer surface of the vehicle and the interior surfaces of compartments (except in the cab) shall be painted with Polyurethane paint in accordance with MIL-C-46168 OR MIL-C-53039, Desert Sand, Color Number 30313 of FED-8TD-595. All exterior trim items (such as wheels, wheel covers, running boards, metal radiator grilles, drip rails, bumpers, door handles, and light trim rings) shall be painted with the same paint as the exterior of the vehicle.

3.11.3 Rustproofing. Unless otherwise specified (see 6.2), the vehicle shall be rustproofed in accordance with MIL-STD-1223. The first article units shall not be rustproofed until after approval of the first article test report.

3.12 Markings. Unless otherwise specified, markings for vehicles painted Forest Green shall be applied with black paint, Color Number 37038 of FED-STD-595.

3.12.1 Identification markings. Unless otherwise specified (see 6.2), the vehicle shall be marked for the appropriate service in accordance with MIL-STD-595.

3.13 Identification plates and operating instructions. All identification plates, instruction plates, data plates, etc, shall conform to MIL-P-514 and be of a size and shape consistent with the information required thereon. Abbreviations shall be in accordance with MIL-STD-1223.

3.13.1 Identification plate. An identification plate, permanently marked in accordance with MIL-STD-130, shall be securely attached to the vehicle in a readily accessible location. The identification plate shall contain the following information:

NOMENCLATURE

MANUFACTURER'S MODEL NUMBER

MANUFACTURER'S SERIAL NUMBER

MANUFACTURER'S NAME

MANUFACTURER'S ADDRESS

MANUFACTURER'S SERVICE PHONE NUMBER

DATE OF MANUFACTURE

CONTRACT NUMBER

NATIONAL STOCK NUMBER

3.13.2 Control markings. All controls, valves, gauges, and indicators used in the operation of the vehicle shall be identified by securely attached nameplates.

3-13.3 Operating instructions. Brief operating and precautionary instructions shall be permanently af-

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fixed near the appropriate controls. The instructions shall be clear, concise and adequate to enable operation of the vehicle without damage to the equipment or injury to personnel and shall refer to the components as identified by nameplates.

3-13.4 Lubrication plate. A lubrication plate shall be provided directing attention to all lubrication fittings and components which require lubrication. The plate shall identify the type and grade of lubricant required for all operational temperatures.

3.13.5 Transportation data plate. A transportation data plate shall be provided. The plate shall contain at least the following information:

- a. Side and rear silhouette views of the vehicle.
- b. Horizontal and vertical location of the center of gravity of the vehicle in transport condition.
- c. Shipping weight.
- d. Loading cubage.
- e. Overall length, width and height.

3.14 Part numbering of interchangeable parts. All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable.

3.15 Dimensions. The maximum overall width of the transporter shall be no greater than 128.0 inches (mirrors included). The maximum overall height shall be no greater than 156.0 inches above ground level.

3.16 First article. When specified (see 6.6), two samples shall be subjected to first article inspection (see 6.6) in accordance with 4.4.

3.17 Workmanship. The vehicle, including all parts and accessories, shall be constructed and finished in a thoroughly workmanlike manner. Particular attention shall be given to freedom from blemishes, defects, burrs and sharp corners and edges; accuracy of dimensions, surface finish, and radii of fillets; thoroughness of soldering, welding, brazing, painting, wiring, and riveting; marking of parts and assemblies; alignment of parts and tightness of assembly fasteners; etc.

3.17.1 Welders and welding.

3.17.1.1 Welders. All welder employed in the fabrication of the vehicle shall be certified before any welding is accomplished in accordance with MIL-STD-1595 or as prescribed by any of the following listed codes for the type of welding operation to be performed.

- a. Welding Qualifications of the American Society of Mechanical Engineers.
- b. Standard B2.1 Standard for Welding Procedure and Performance Qualification.
- c. Standard D1.1 Standard Qualification Procedure of the American Welding Society.

The certification that the welders have passed the qualification tests shall be on file at the contractors facility and available for review by the procuring activity.

3.17.1.2 Welding. The surface parts to be welded shall be free from rust, scale, paint, grease, and other foreign matter. Welds shall transmit stress without cracking or permanent distortion when the parts connected by the welds are subjected to test, proof, and service loadings.

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3.17.2 Screw assemblies. Unless torque is specified, threaded fasteners shall be tight and shall not work loose during testing or service usage.

3.17.3 Riveting. Riveting operations shall be performed to ensure tight fit and complete heading of the rivets.

3.17.4 Gear and lever assemblies. Gear and lever assemblies shall be properly aligned and meshed and shall be cooperable without interference, tight spots, loose spots, or other irregularities. Where required for accurate adjustment, gear assemblies shall be free of backlash.

3.17.5 Cleaning. The vehicle shall be thoroughly cleaned. Loose, spattered or excess solder, welding slag, tray bolts, nuts and washers, rust metal particles, pipe compound and other foreign matter shall be removed during and after final assembly.

4 QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of Sections 3 and 5. The inspection set forth in this specification shall become a part of the contractors overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.2 Classification of tests. The inspection and timing testing of the vehicle shall be classified as follows:

- a. First article testing (see 4.4).
- b. Acceptance testing (see 4.5).

4.3 Test conditions.

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

4.3.2 Data. During all testing specified herein, at least the following data, unless not applicable, shall be recorded at intervals not to exceed 30 minutes. additional data and/or shorter intervals shall be provided as appropriate for any specific test.

- a. Date.
- b. Time started.
- c. Time finished.

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- d. Ambient temperature.
- e. Engine speed.
- f. Engine oil pressure.
- g. Engine coolant temperature.
- h. Transmission oil temperature.
- i. Vehicle odometer reading at the start and finish of each test.
- j. Engine hourmeter reading at the start and finish of each test.
- k. Hydraulic fluid pressure at the pump outlet.
- l. Hydraulic fluid temperature in the reservoir.

4.3.3 Preparation for tests. The vehicle, equipped with all specified auxiliary equipment, shall be fully serviced and all equipment shall be prepared for immediate operation.

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

- a. Failure to conform to design or performance requirements specified herein.
- b. Spillage or leakage of any liquid, including fuel, coolant, lubrication or hydraulic fluid, under any operating condition, except as herein.
- c. Structural failure of any component, including permanent deformation or evidence of impending failure.
- d. Evidence of excessive wear.
- e. Interference between the vehicle components or between the vehicle, the ground, and all required obstacles, with the exception of normal contact by the tires.
- f. Misalignment of components.
- g. Evidence of undesirable roadability characteristics, including instability in handling during cornering, braking, and while traversing rough terrain.
- h. Conditions which present a safety hazard to personnel during operation, service, or maintenance.
- i. Overheating of the engine, transmission, or any other vehicle component.

4.4 First article testing.

4.4.1 First article test samples. The first article test samples and all production vehicles produced under the terms of this contract shall meet the requirements of the specification. In the event that the commercial chassis manufacturer changes the chassis design during production of the transporter, the contractor shall assure that the vehicle continues to meet the specification requirements. Any resultant configuration changes necessary by the prime contractor in meeting specification requirements shall be

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accomplished in accordance with the procedures of MIL-STD-481. Approval of the first article samples shall not constitute a waiver by the Government of its rights under the provisions of the contract. Two first article samples shall be produced and tested as follows:

- a. Contractor test sample (see 4.4.2.1).
- b. User test sample (see 4.4.2.2).

4.4.2 First article tests.

4.4.2.1 Contractor test sample. The contractor test sample shall be subjected to the tests described in 4.6.1 through 4.6.8.

4.4.2.2 User test sample. The user test sample shall successfully complete the tests in 4.6.1 and 4.6.2 prior to being shipped to the user test facility for the test described in 4.6.9.

4.5 Acceptance testing. Acceptance testing shall be classified as follows:

- a. Individual testing (see 4.5.1).
- b. Random sample testing (see 4.5.2).

4.5.1 Individual testing. Each vehicle shall be subjected to the tests specified in 4.6.1 and 4.6.2.

4.5.2 Random sample testing. Any production vehicle may be selected by the procuring activity at any time to be subjected to the test described in 4.6, with the exception of 4.6.3.1, 4.6.3.6, 4.6.3.7, 4.6.5.3, 4.6.6, 4.6.8, and 4.6.9.

4.5.2.1 Rejection and retest. When a vehicle fails to meet the requirements of this specification, vehicles to be delivered pursuant to the contract may not be accepted until the cause of the failure is determined, corrective action is taken by the contractor and the component that failed is successfully retested to assure compliance with this specification. Tests not involving the failed component may be continued pending the investigation of a test failure.

4.6 Test methods.

4.6.1 Examination of product. The vehicle shall be inspected to determine compliance with the requirements specified herein. Any painted surface on the exterior of the vehicle may be tested in accordance with paragraph 4.8.10 of Particular attention shall be given to materials, workmanship, dimensions, surface finishes, protective coatings and their application, welding and riveting, and markings. For the first article and random sample vehicle, this examination shall be accomplished by use of a checklist which lists each requirement not validated by a test and the results of the examination.

4.6.2 Operational checkout. The fully loaded vehicle shall be driven at various speeds for a minimum distance of 25 miles at a minimum average speed of 25 MPH over improved roads. During the tests, not less than 10 full left and 10 full right turns and 10 sudden stops shall be made. The following tests shall be performed on the fully loaded vehicle. Any malfunction, overheating, permanent deformation, failure, or tire wear shall be cause for rejection.

- a. Ten cycles of lift, from bottom to top of lift mechanism travel.
- b. Ten cycles of pitch, full travel fore and aft.
- c. Ten cycles of roll, full travel clockwise and counterclockwise.

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- d. Run powered conveyor system for 30 minutes.
- e. Engine starting, operation, and accessories.
- f. Check all lights (i.e, headlamps, turn signals, work lights, cab lights, etc).
- g. Check horn.
- h. Check steering with vehicle stationary.
- i. Check windshield wipers.
- j. Check spring lockout actuation.
- k. Check turn signals.
- l. Check all gauges and controls.
- m. Brakes, stationary (i.e, service and parking).
- n. Cab doors and windows.
- o. Climate control system, including defroster.
- p. Pallet stops, restraints, rollers (powered and nonpowered), guide rails.
- q. Miscellaneous equipment.

4.6.3 Mobility tests.

4.6.3.1 Road Tests. The vehicle shall be driven 880 miles consisting of four cycles of 220 miles each. The first cycle shall be run with the vehicle empty. The second cycle shall be run with the vehicle approximately 40 percent to 60 percent loaded. The third and fourth cycles shall be run with the vehicle loaded to rated capacity. During the highway portion of each cycle, at least 20 short radius right turns, 20 short radius left turns, and 10 sudden stops shall be accomplished. Each cycle shall be performed continuously without rest and shall be performed on these surfaces for the distances and speeds listed below:

- a. Highway - miles at an average speed of at least 45 MPH.
- b. Gravel road - 10 miles at an average speed of at least 10 MPH.
- c. Belgian Block pavement - 10 miles at an average speed of at least 5 MPH.

4.6.3.2 Maximum speed and acceleration. The time, speed, and distance relationship of the fully loaded vehicle shall be determined while accelerating from a standing start to maximum speed on a dry level paved surface to demonstrate compliance with 3.2.1(a) and 3.2.1(b). Not less than three runs, each in opposite directions, shall be conducted. Maximum speed and acceleration shall be the average for all runs.

4.6.3.3 Grade operation. The fully loaded vehicle shall be driven up and down and 0.5 percent dry paved grade. The maximum speed that can be maintained while climbing the grade shall be measured and recorded in the test report.

4.6.3.4 Side slope operation. The fully loaded vehicle shall be driven in both directions on a side

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slope of 10 percent. Engine oil pressure shall be observed and shall not be less than the manufacturer 5 recommended pressure at the engine operating speed. Engine starting ability shall be demonstrated in both directions on the slope.

4.6.3.5 Suspension articulation. The vehicle shall be tested to demonstrate compliance with 3.2.2. The blocks shall be 3.5 inch high obstacles minimum. The obstacles cross section shall be trapezoid. The entrance and exit angles to the obstacle shall be 30, plus or minus 10°. The distance across the flat of the top surface shall be 10 inches, plus or minus two inches. The sides of the blocks may be sloped. It is not the object of this test to obtain resonance. The obstructions shall be so staggered that two wheels of same axle do not travel over an obstruction at the same time and two wheels of same side do not travel over an obstruction at the same time. The minimum speed shall be 5 MPH. Each wheel of the transporter shall pass over not less than eight obstructions on a single pass.

4.6.3.6 Structural analysis. Stress analysis for worst case conditions including shear and moment diagrams and stress and design safety factor calculations shall be furnished to show conformance with 3.2.4.

4.6.3.7 Strain gauge testing.

4.6.3.7.1 Test course. For each test cycle, the vehicle shall be driven at 5 MPH minimum over the racking course (see 4.6.3.5) with a minimum of eight obstacles per wheel per pass. Only one pass is required.

4.6.3.7.2 Patterning. High stress areas, as shown in 4.6.3.6, of the vehicle frame assembly, lifting mechanisms, and deck structure shall be coated with brittle lacquer to determine the proper locations and orientation of the strain gauges. The loader shall be fully loaded and driven over the test course (see 4.6.3.7.1).

4.6.3.7.3 Dynamic strain recording. Strain gauges shall be positioned as indicated by the brittle lacquer patterning at high stress areas of the vehicle frame assembly, lifting mechanisms, and deck structure. A minimum of 50 strain gauges shall be used. Strains shall be recorded for each of the three cycles of the test course:

- a. At full load of pelletized cargo (15,000 pounds), one cycle.
- b. Forty percent to sixty percent of full load of pelletized cargo, one cycle.
- c. No load, one cycle.

Strain/occurrence histograms shall be supplied for each gauge for each test cycle. The actual test course shall be recorded on the histogram. A picture of each gauge, indicating its position shall be provided.

4.6.3.7.4 Static strain recording. Strain gauges shall be positioned as indicated by the brittle lacquer patterning at high stress areas of the vehicle frame assembly, lifting mechanisms, and deck structure. A minimum of 50 strain gauges shall be used. Strain shall be recorded for each of the gauges when the deck is loaded to 30,000 pounds evenly distributed over three HCU-6/E pallets.

4.6.3.7.5 Evaluation. The minimum ultimate tensile and yield strengths of the gauged components shall be documented. Any strain recorded indicating static stress greater than one third of the material minimum yield strength or a dynamic stress greater than one half of the material yield strength shall be cause for rejection.

4.6.3.8 Wall to wall turning diameter measurement. The vehicle wall to wall turning diameter for turns in each direction shall be measured in accordance with SAE J695 to demonstrate compliance with 3.2.1(j). At least 30 left full circle turns and 30 right full circle turns at maximum cramping angles shall be made at a minimum speed of 10 MPH.

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4.6.3.9 Brake tests.

4.6.3.9.1 Service brake tests. The vehicle shall be tested in accordance with SAE J7860 to demonstrate compliance with 3.2.1h) and 3.3.3.1.

4.6.3.9.2 Parking brake tests. The vehicle shall be tested in accordance with SAE J360 to demonstrate compliance with 3.2.1(i) and 3.3.3.2.

4.6.3.13 Engine performance. The contractor shall provide certification and the engine manufacturer's performance test data in order to show that the engine's performance characteristics comply with paragraph 3.3.1.1.

4.6.4 Capacity testing.

4.6.4.1 Test load. When specified in the contract (see 6.2), the Government will lend three HCU-6/E pallets to the contractor upon his request. Three HCU-6/E pallets shall be uniformly loaded to 5,000 pounds gross weight each, 15,000 pounds total gross weight, with a center of gravity located at 48 inches above the pallets and shall be placed on the deck for the tests below.

4.6.4.1.1 Lift test. While the ambient temperature is not less than 65°F, the vehicle shall be subjected to 100 cycles of operations of the following procedure.

- a. Lift the deck from the extreme lowered position to extreme raised position.
- b. Roll the deck full CCW and CW directions, then level the deck.
- c. Tilt the deck full fore and aft, then level the deck.
- d. Lower the deck.

The tests shall be conducted at full speed with the spring lockout cylinders actuated and shall be performed for five cycles without interruption. At the end of each five cycles, a rest period of 10 minutes is allowed for cooling. The temperature of the hydraulic fluid shall not exceed 200°F during the test. The hydraulic tank shall contain the normal operating volume of fluid and no auxiliary (off the vehicle) cooling shall be allowed during the test. For the first cycle and the last cycle, deck roller height measurements shall be taken and recorded to show conformance to 3.6.7 and 3.6.7.1.

4.6.4.1.2 Slip and creep rate test. Vehicle shall be tested for a minimum of two hours each to show conformance with 3.6.7.2.

4.6.4.1.3 Pallet transfer demonstration. Vehicle shall be moved to a loading/unloading dock where a full load of HCU-6/E pallets and, 48 inches by 48 inch pallets shall be transferred to and from the dock 100 items each by means of the powered conveyor system to show conformance with 3.6.2. A single HCU-6/E pallet with 10,000 pounds gross weight shall be transferred to and from the dock by means of the powered conveyor system 25 times. Speeds of pallets movement across the loader deck shall be recorded to show conformance with 3.6.2.

4.6.4.1.3.1 Pallet restrainers and stops test. An HCU-6/E pallet loaded with 10,000 pounds gross weight shall impact the pallet restrainers at 60 feet per minute (FPM) by means of the powered conveyor system, 25 times. Repeat test for the pallet stops.

4.6.4.2 Unbalanced load. A single HCU-6/E pallet with 10,000 pounds gross weight shall be positioned over the front half of the deck. The deck shall be raised from the lowest to the maximum height and then lowered to the minimum height 25 times. The load shall be moved to the rear half and the test

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repeated. malfunctions, permanent deformation, uneven lowering and raising shall be defined as any deviation from the plane of the deck surface.

4.6.4.3 Hydraulic line failure test. While loaded to rated load and the deck raised five feet, the hydraulic system shall be rigged to permit free flow of hydraulic fluid to simulate a hydraulic line failure. Under this condition, the lowering rate shall be not more than 0.25 inch per hour. The simulated failure shall be as close to the lift cylinder as possible.

4.6.4.4 Stability test. The vehicle shall be tested or calculations shall be submitted to show conformance with the requirements of 3.2.3.

4.6.5 Design verification.

4.6.5.1 Weight and weight distribution. The weight on each corner of the vehicle shall be measured with the unit standing on a flat level surface, both in the empty condition, to demonstrate compliance with 3.1.5. The fully loaded vehicle shall include ballast to simulate a 250 pound each seating position.

4.6.5.2 Dimensional verification. The dimensions specified herein shall be measured with the vehicle standing on a flat level surface. Overall height and vehicle lean shall be measured in both the empty and the fully loaded conditions as defined in 4.6.5.1.

4.6.5.3 Electromagnetic interference measurement. The vehicle and all electrical components shall be tested in accordance with MIL-STD-462 to demonstrate compliance with 3.1.7.

4.6.5.4 Sound level testing. The vehicle shall be tested in accordance with SAE J336a, J366b, and J1077 demonstrate compliance with 3.1.8.

4.6.6 Environmental tests.

4.6.6.1 Low temperature storage and operation. The complete vehicle, including all accessories, shall be tested in accordance with Test Method 502.2, Procedures I and II, of MIL-STD-810 to demonstrate compliance with 3.1.4(a). Temperature sensor location shall be approved by the procuring activity. Operational checkouts shall be performed in accordance with paragraph 4.6.6.5. Engine starting aids may be used (see 3.3.1.1.4). When applicable, a fine mist of water shall be applied to the entire windshield to form a thin film of ice. The defroster shall clear the windshield within one hour and maintain clear vision throughout the remainder of the test. "Standard ambient" and "controlled ambient" shall be defined as the ambient condition of the test site. For Procedure I, the vehicle shall be exposed to the minimum required cold storage temperature of 3.1.4(a) in a steady state condition for 24 hours. For Procedure II, the vehicle shall be exposed to required cold operational temperature of 3.1.4(a) in a steady state condition.

4.6.6.2 High temperature storage and operation. The complete vehicle, including all accessories, shall be tested in accordance with Test Method 501.2, Procedures I and II, MIL-STD-810 to demonstrate compliance with 3.1.4(a). Temperature sensor location shall be approved by the procuring activity. Operational checkouts shall be performed in accordance with paragraph 4.6.6.5. "Standard ambient" and "controlled ambient" shall be defined as the ambient condition of the test site. For Procedure I, the vehicle shall be exposed to the minimum required hot storage temperature of 3.1.4(a) in a steady-state condition for 24 hours. For Procedure II, the vehicle shall be exposed to required hot operational temperature of 3.1.4(a) in a steady state condition.

4.6.6.3 Rain. The complete vehicle, including all accessories, shall be tested in accordance with Test Method 506.2, Procedure III, of MIL-STD-810 to demonstrate compliance with 3.1.4(c). Operational checkouts shall be in accordance with 4.6.6.5. The interior of the cab and all compartments shall be examined for water; any evidence of leakage shall be cause for rejection.

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4.6.6.4 Other environmental tests. The components and materials used in the construction of the vehicle shall be subjected to, or certified as having passed, or being capable of passing, the Humidity test, Method 507.2, Procedure I of MIL-STD-810 to demonstrate compliance with 3.1.4.

4.6.6.5 Operational checkout. All controls, levers, mechanisms, and doors shall be actuated a sufficient number of times to ensure consistency of operation and to determine whether the test exposure produced system degradation. These actions are to result in the operation of the following system, but will not be limited to:

- a. Engine starting, operation and accessories; accessory powerplants.
- b. Lift mechanism, all attitudes.
- c. Hydraulic pump.
- d. Climate control system, including defroster.
- e. Cab doors and windows.
- f. Lights (i.e., headlamps, turn signals, gauges, controls, work lights, cab lights, etc.).
- g. Brakes, stationary (i.e., service and parking).
- h. Windshield wipers.
- i. Drive train (distance limited by chamber size).
- j. Aircraft interface/pintle interface/tractor interface.
- k. Steering.
- l. Hydraulic hoses/electrical lines/connectors.
- m. Equipment/compartments covers/doors.
- n. Pallet stops, restraints, rollers, (powered and nonpowered), guide
- o. Miscellaneous equipment.

4.6.7 Reliability demonstration. Compliance with the quantitative reliability requirement of 3.1.3.1 shall be demonstrated by the tests in 4.6.2, 4.6.3.1, 4.6.3.5, 4.6.4.1, 4.6.4.1.1, 4.6.4.1.3, 4.6.4.2 and 4.6.9. The tests in 4.6.1.1 and 4.6.4.1.3 shall be continued, if necessary, to accumulate the required 100 hours of operation. Scheduled maintenance, events, or adjustments authorized by this specification or the procuring activity shall not be counted as failures. A maintenance event is defined as any malfunction that entails maintenance or adjustment, but does not prevent delay, or reduce performance of the vehicle as specified herein.

4.6.8 Maintainability demonstration. Compliance with the maintenance downtime requirements shall be demonstrated by task performance. All scheduled maintenance tasks and all tasks listed in 3.1.1.2.1 shall be performed, except for item (i.e., In addition, corrective maintenance tasks shall be selected by the procuring activity from an approved list of tasks provided by the contractor in the first article test procedure. Not less than 25 percent or more than 50 percent of the total number of tasks shall be demonstrated to verify an average maintenance downtime within the required limit. As part of this demonstration, the recommended frequencies of the scheduled maintenance tasks and the time recorded to

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accomplish the tasks shall be used to develop an expected value of scheduled maintenance downtime per measure of use, such as calendar time, hours of operation or miles traveled.

4.6.9 User test. The user test sample shall be delivered to WR-ALC, Robins AFB GA for 30 available days (seven days a week) of user tests. The 30 available days shall be consecutive, except when interrupted for maintenance, repair downtime, as defined herein. The user test will not begin until after completion of the first article test, except the environmental tests (see 4.6.6), of the contractor test sample as defined by 4.4.2.1. The test period shall begin after the vehicle arrives at Robins AFB and the vehicle has been inspected and prepared for use. The user test shall end when 30 days of availability are complete or 45 calendar days have elapsed, whichever occurs first. If the user test sample has not been available for 30 test days after 45 calendar days have elapsed, the user test shall be considered a failure. The vehicle shall be available for any one period of eight consecutive hours during each day of the 30 day test. The periods shall be scheduled by the Robins AFB representative, and the schedules shall be provided to the contractor at least 12 hours in advance. Any period of more than two hours of the same day that the vehicle is out service for maintenance or repair shall not be considered an available day for the test period. The vehicle shall be operated, and scheduled maintenance shall be performed by Air Force personnel using the operation and maintenance procedures contained in the preliminary technical data to be supplied with the test sample. The contractor will provide any special tools, and/or equipment required to perform operators maintenance, or scheduled maintenance. Any parts or corrective actions required shall be provided by the contractor. Any maintenance actions performed by the contractor shall not begin before notification to a Robins AFB representative, and Government personnel shall be allowed to observe their actions. The Contractor shall provide all transporter consumables required in the course of the test except for diesel compressed air, and electrical power which will be furnished by Robins AFB. The contractor shall provide onsite familiarization to the operator and mechanics as necessary to perform this test. Test operation will be used in or simulate normal Air Force usage and will not exceed any performance requirements defined by Section 3 of this specification shall be cause for rejection. The contractor shall maintain a daily log. The daily log shall document, but not be limited to, the following:

- a. Operating time.
- b. Task completed.
- c. Technical manual errors.
- d. All failures and corrective actions taken.
- e. Operational problems encountered.
- f. Robins AFB representative comments.

The contractor shall report the user test results, including daily logs of activities, in the first article inspection report.

4.7 Refurbishment. After vehicle shall be restored to like new condition.

5 PACKING

5.1 Preparation for delivery shall be in accordance with the terms of the contract.

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6 NOTES

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

6.1 Intended use. The vehicle is intended for use at depots and other Air Force bases to transport cargo such as palletized cargo, containers and loose cargo from warehouse to warehouse on improved roadways.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Finish color required, if not Forest Green, Color Number 24052 of FED-STD-595 (see 3.11.2.1).
- c. Identification markings required (see 3.12.1).
- d. Rustproofing, if other than the manufacturer's standard commercial practice, is required (see 3.11.3).
- e. When required, three HCU-6/E pallets will be loaned by the Government to the contractor (see 4.6.4.1).

6.3 Definitions.

6.3.1 Belgian Block. A Belgian Block course is paved with unevenly laid granite block, forming an undulating surface. It duplicates a rough cobblestone road such as found in many parts of the world. A cobblestone course may be used as an alternate.

6.3.2 Commercial. A manufacturer's standard (product) having been marketed, in production, and sold in substantial quantities to the general public for a minimum of one year prior to the date of invitation for bid or request for proposal. An item is "sold in substantial quantities" only when the quantities regularly sold are sufficient to constitute a real commercial market. Nominal quantities such as models, samples, prototypes, or experimental units do not meet this requirement. The "general public" is a significant number of buyers other than the Government or affiliates of the offeror; the item involved must not be for Government end use. For the purpose of this specification, items acquired for "Government end use" includes items acquired for foreign military sales.

6.3.3 Cross country terrain. Cross country terrain consists of open fields, broken ground and uneven terrain in general.

6.4 First article. When first article inspection is required, the contracting officer should provide specific guidance to offerors whether the item(s) should be a first article sample, a first production item, or a standard production item from the contractor's current inventory and the number of items to be tested as specified in 4.4.1. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously

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acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.5 Subject term (key word) listing.

Conveyorized Bed
Elevating Deck
Pneumatic Rubber Tired

Custodian:

Air Force - 99

Preparing Activity:

Air Force - 84

Project Number:

2320-F448

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.
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-T-83813	2. DOCUMENT DATE (YYMMDD) 14 June 1990
3. DOCUMENT TITLE Truck, Cargo, Depot Transporter		
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 (YYMMDD)
8. PREPARING ACTIVITY		
a. NAME Michael A. Greene	b. TELEPHONE (Include Area Code) (1) Commercial 912-926-5616 (2) AUTOVON 468-5616	
c. ADDRESS (Include Zip Code) WR-ALC/MMDET Robins AFB GA 31098-5609	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	