

NOT MEASUREMENT SENSITIVE

MIL-T-62068C
 22 February 1991
 SUPERSEDING
 MIL-T-62068B
 8 October 1984

MILITARY SPECIFICATION

TRUCKS, TANK: SPRINKLER, FLUSHER, AND DISTRIBUTOR TYPES,
 1,000 TO 2,000 GALLON, DIESEL AND GASOLINE ENGINE DRIVEN,
 16,000 TO 43,000 POUNDS GVW, 4X2, 6X4 AND 6X6, MODIFIED COMMERCIAL

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

1. SCOPE

1.1 Scope. This specification covers diesel and gasoline engine driven; four-wheel, two-rear-wheel drive; six-wheel, four-wheel drive; and six-wheel, six-wheel drive; 1,000 to 2,000 gallon; sprinkler, flusher and distributor type modified commercial tank trucks having minimum gross vehicle weights (GVW) of 16,000 to 43,000 pounds, for normal operating conditions. Vehicles procured under this specification are commercial items which are warranted by the manufacturer as specified in acquisition documents.

1.2 Classification. The vehicle shall be one of the types and classes shown in table I, as specified (see 6.2).

TABLE I. Vehicle classification.

Type	Nomenclature	Class
I	Sprinkler	16, 21, 28, 34.5, 43
II	Flusher	28, 34.5, 43
III	Distributor	28

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: US Army Tank-Automotive Command, ATTN: AMSTA-UED, Warren, MI 48397-5000, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC-2320

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1.2.1 Class. The class of the vehicle shall be determined by minimum gross vehicle weight (GVW) rating, as follows:

TABLE II. Vehicle class.

Class	GVW	Payload capacity	Wheels and wheels driving
16	16,000 pounds	1,000 gallons	4x2
21	21,000 pounds	1,500 gallons	4x2
28	28,000 pounds	1,800 gallons	4x2
34.5	34,500 pounds	2,000 gallons	6x4
43	43,000 pounds	2,000 gallons	6x6

2. APPLICABLE DOCUMENTS

2.1 Government documents.

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

SPECIFICATIONS

FEDERAL

W-B-131

- Battery, Storage: Vehicular, Ignition, Lighting and Starting.

VV-F-800

- Fuel Oil, Diesel.

MILITARY

MIL-P-514

- Plates, Identification, Instruction and Marking, Blank.

MIL-T-5624

- Turbine Fuel, Aviation, Grades JP-4 and JP-5.

MIL-N-12314

- Nozzle, Fire Hose, Water, Spray and Stream.

MIL-V-16721

- Valve, Foot, Low Pressure (for Water).

MIL-M-43719

- Marking Materials and Markers, Adhesive, Elastomeric, Pigmented, General Specification for.

MIL-B-46176

- Brake Fluid, Silicone, Automotive All Weather, Operational and Preservative.

MIL-T-83133

- Turbine Fuel, Aviation, Kerosene Type, Grade JP-8.

STANDARDS

FEDERAL

FED-STD-297

- Rustproofing of Commercial (Nontactical) Vehicles.

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MIL-STD-1223	- Nontactical Wheeled Vehicles Treatment, Painting, Rustproofing, Identification Marking and Data Plate Standards.
MS39153	- Coupling, Quick Disconnect, 3-Inch, for Construction Equipment.
MS51118	- Pintle Assembly, Towing: 40,000 Lbs. Capacity, Manual Release.
MS75020	- Connector, Plug, Electrical - 12-Contact, Intervehicular, 28-Volt, Waterproof.
MS75021	- Connector, Receptacle, Electrical - 12-Contact, Intervehicular, 28-Volt, Waterproof.

* (Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Naval Publications and Forms Center, Military Specifications and Standards, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

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

DEPARTMENT OF DEFENSE (DoD)

Department of Defense Index of Specifications and Standards (DODISS).

(Copies of the DODISS are available on a yearly subscription basis either from the Government Printing Office for hard copy, or microfiche copies are available from the Director, Navy Publication and Printing Service Office, 700 Robbins Avenue, Philadelphia, PA 19111-5093.)

DEPARTMENT OF TRANSPORTATION (DoT)

Federal Motor Carrier Safety Regulations.

Federal Motor Vehicle Safety Standards.

Regulation Governing Transportation of Dangerous Articles in Tank Motor Vehicles.

(Application for copies of DoT publications should reference the Code of Federal Regulations, 49 CFR and the Federal Register, and should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.)

ENVIRONMENTAL PROTECTION AGENCY (EPA)

Control of Air Pollution from New Motor Vehicles and New Motor Vehicle Engines.

Noise Emission Standards for Transportation Equipment - Medium and Heavy Trucks.

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(Application for copies of EPA publications should reference the Code of Federal Regulations, 40 CFR, and the Federal Register and should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.)

2.2 Non-Government publications. The following documents 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 SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM Standards

ASTM Designation: A-53- Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless (DOD adopted).

(Application for copies of ASTM publications should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103).

THE EUROPEAN TYRE AND RIM TECHNICAL ORGANISATION (ETRTO)

Standards Manual

(Application for copies of ETRTO publications should be addressed to the European Tyre and Rim Technical Organisation, 32, Avenue Brugmann, 1060 Brussels, Belgium.)

SAE. INC.

SAE Standards and Recommended Practices

J318	- Air Brake Gladhand Service (Control) and Emergency (Supply) Line Couplers - Trucks, Truck-Tractors, and Trailers (DoD adopted).
J537	- Storage Batteries (DoD adopted).
J551	- Performance Levels and Methods of Measurement of Electromagnetic Radiation from Vehicles and Devices (30-1000 MHz).
J560	- Seven-Conductor Electrical Connector for Truck-Trailer Jumper Cable.
J588	- Turn Signal Lamps.
J589	- Turn Signal Switch.
* J682	- Rear Wheel Splash and Stone Throw Protection (DoD adopted).
J688	- Truck Ability Prediction Procedure (DoD adopted).
J704	- Openings for Six- and Eight-Bolt Truck Transmission Mounted Power Take-Offs (DoD adopted).

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J706	- Rating of Winches.
J844	- Nonmetallic Air Brake System Tubing (DoD adopted).
* J1067	- Seven-Conductor Jacketed Cable for Truck-Trailer Connections.
J1349	- Engine Power Test Code - Spark Ignition and Diesel.

(Application for copies of SAE publications should be addressed to SAE, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.)

THE TIRE AND RIM ASSOCIATION, INC.

Year Book.

* (Application for copies of Tire and Rim Association publications should be addressed to The Tire and Rim Association, Inc., 175 Montrose West Ave., Copley, OH 44321.)

(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 document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Standard vehicle and accessories. Except as specified in 3.1.1 through 3.1.1.10, the vehicle, components, assemblies, and accessories to be delivered under the contract shall be standard or optional items, which meet or exceed the requirements of this specification. Except as specified in 3.1.1 through 3.1.1.10, no removal, substitution or alteration of the chassis manufacturer's standard or optional chassis model components shall be made. All chassis items shall be as represented in the chassis manufacturer's technical data book. Special bodies or mounted equipment shall be as represented in the body and equipment manufacturer's technical data. Technical data shall be limited to specifications and technical material identical to that furnished to the authorized company representatives for selection of vehicle models and components, and shall be on file in the engineering offices of the procuring activity, prior to delivery of the items. The chassis model furnished shall be not older than the chassis manufacturer's current model on the date of invitation for bids.

3.1.1 Special requirements. In addition to the standard vehicle and components specified in 3.1, the vehicle shall be furnished with special equipment as specified herein.

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* 3.1.1.1 Painting and marking. Treatment, painting, marking and data plates shall be in accordance with MIL-STD-1223. The exterior color and the identification markings shall be in accordance with the requirements of MIL-STD-1223 for the military service identified by the procuring activity (see 6.2). When specified (see 6.2), concealed markings shall be furnished.

3.1.1.2 Rustproofing. When specified (see 6.2), the vehicle shall be rustproofed in accordance with FED-STD-297. When specified (see 6.2), tropical rustproofing in accordance with FED-STD-297 shall be furnished.

3.1.1.3 Drain plugs. Drain plugs installed in manual transmission(s), the transfer case, and the rear axle(s) shall be of the permanent magnet type.

3.1.1.4 Towing devices. Towing devices consisting of two hooks, loops, eyes or pins or the chassis manufacturer's standard single center mounted eye or pin shall be mounted on the front of the vehicle. All towing devices shall be frame rail mounted or reinforced back to each frame rail.

3.1.1.5 Trailer towing package. When specified (see 6.2), a trailer towing package consisting of a pintle, safety chain attachment devices, a lighting receptacle, and associated reinforcements and wiring shall be installed on the rear of the vehicle. For class 28, 34.5 and 43 vehicles, a trailer brake control system conforming to 3.4.11.3 shall be furnished. The pintle shall be of the rotating type conforming to MS51118 and shall be installed on the chassis frame with reinforcements to transfer a vertical tongue load of not less than 4,000 pounds and a horizontal drawbar load of not less than 40,000 pounds directly to the chassis rails. The rearmost portion of the pintle shall be forward but not more than four inches forward of the rearmost part of the vehicle. Two trailer safety chain attachment devices, one adjacent to each side of the pintle, shall be provided. Each attachment device shall provide an ultimate strength at least equal to the GVW of the truck furnished. The attachment devices shall be capable of accommodating a standard grab hook (4-9/16 inches wide, 1-5/16 inches thick, 25/32-inch throat width) for a 5/8-inch chain. The lighting receptacle, conforming to SAE J560 with its conductors connected and color coded as specified therein, or number coded, shall be mounted in a readily accessible location near the pintle.

* 3.1.1.6 Wheel splash and stone throw protection. All tilt cabs shall have rubber mud flaps to the rear of the front wheels. A metal strip not less than 0.125 inch thick and not less than 1 inch wide, extending the entire width of the mud flap, shall be installed to prevent the bolt heads or bolt nuts from damaging the mud flap. As an alternate method of attaching the mud flaps, tabs or clips with minimum surface contact dimensions of 1 inch high by 1.250 inch wide by 0.094 inch thick shall be furnished at each bolt. All splash shield and mud flap installations, front and rear, shall conform to the rear wheel splash and stone throw protection provisions of SAE J662.

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3.1.1.7 Silicone brake fluid. When specified (see 6.2), and if available as the manufacturer's standard or optional brake fluid, brake fluid conforming to MIL-B-46176 shall be provided in the hydraulic brake system on class 16 and 21 vehicles. A tag on the master cylinder or a permanent decal near the master cylinder shall be furnished stating "CAUTION: USE SILICONE BRAKE FLUID ONLY, MIL-B-46176" (see 3.1.1.8).

3.1.1.8 Decals and data plates. The silicone brake fluid notice, the power takeoff caution notice and the operating instruction plate and distribution charts for type III vehicle shall conform to type I or type II, class 1 of MIL-M-43719 or composition A (class 1 or 2) or composition C of MIL-P-514.

* 3.1.1.9 6x6 conversion. The chassis manufacturer's standard 6x4 truck chassis may be modified to provide all wheel drive conforming to the requirements specified herein if:

- (a) The conversion axle manufacturer's engineering department specifically approves and certifies that all such modifications meet the design requirements and standards of the conversion axle manufacturer. Certification shall be based on both design analysis and proving ground test reports, which shall be made available to the engineering and quality assurance offices of the procuring activity.
- (b) The chassis manufacturer's front axle before conversion has the same rating as the conversion axle to be installed.
- (c) Components used in the all wheel drive conversion are of current production.
- (d) Components used in the all wheel drive conversion are approved for the conversion application by the component manufacturers.
- (e) The converted vehicle is certified to conform to Federal Motor Vehicle Safety Standard No. 121, by the intermediate or final manufacturer.
- * (f) Replacement headlights, if required to be added, shall meet the height requirement of not less than 22 inches and not more than 54 inches, measured above the road surface, in conformance with Federal Motor Vehicle Safety Standard No. 108. Replacement headlights shall be equivalent in mounting, protection, and range and precision of adjustment to the chassis manufacturer's original standard headlights.
- (g) Unused headlight cavities are covered in a neat workmanlike manner, treated and painted to match the chassis cab color with treatment and painting equivalent to the chassis cab manufacturer's process for the remainder of the chassis cab. Cavities and their covers shall be rustproofed in accordance with 3.1.1.2.

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(h) Complete installation drawings are made available to the procuring activity after award of contract.

* 3.1.1.10 Brake lights. At least one pair of brake lights shall override the four-way emergency flasher or the two systems shall be independent of each other. Modifications to the manufacturer's standard product to accommodate this requirement shall not compromise conformance to any Federal Motor Carrier Safety Regulation referenced herein or to any Federal Motor Vehicle Safety Standard. If additional lights are added to the vehicle, the lights shall be selected from the chassis manufacturer's standard matching hardware.

3.2 General design.

3.2.1 Federal Motor Vehicle Safety Standards. The vehicle and furnished accessories shall comply with all Federal Motor Vehicle Safety Standards in effect on the date of manufacture.

3.2.2 Air pollution control. The vehicle shall comply with EPA Regulations governing Control of Air Pollution from New Motor Vehicles and New Motor Vehicle Engines in effect on the date of manufacture. In addition, vehicles destined for California shall comply with State of California regulations governing air pollution control in effect on the date of manufacture.

* 3.2.3 Sound level. The cab interior sound level shall not exceed 84db(A) when measured in accordance with Federal Motor Carrier Safety Regulation 393.94. The vehicle exterior sound level shall conform to EPA Noise Emission Standards for Transportation Equipment - Medium and Heavy Trucks.

3.2.4 Curb weight. The curb weight shall include the weight of the chassis and cab with all attachments, accessories, and equipment, the body, and a full complement of fuel, lubricants, and coolant.

3.2.5 Gross vehicle weight. Gross vehicle weight (GVW) shall consist of the curb weight, operator (weight computed at 175 pounds), and a payload to provide not less than the specified GVW. Vehicles with a crew (four-door) cab shall have the GVW computed with 525 pounds of payload in the rear seat.

3.2.6 Weight distribution. The distribution of the gross vehicle weight for the purpose of establishing suspension, axle and tire capacities shall be determined with the payload uniformly distributed over the load area.

3.2.7 Ratings. Vehicle ratings shall be manufacturer's published ratings. Component and vehicular ratings shall not be raised to meet the requirements of this specification. When published ratings are not available, verification of ratings must be submitted to the engineering

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office of the procuring activity. Minimum GVW rating shall conform to 1.2.1 for the specified class of vehicle. In addition, the actual GVW rating of the vehicle furnished shall exceed the minimum GVW rating specified if required to provide for a payload weight equal to 8.3 pounds per gallon times the size of the tank body in gallons (see table II).

3.2.8 Overall width. The overall width of the vehicle, exclusive of tires and safety related items such as mirrors, lights and reflectors, shall be not more than 96 inches. The width over the tires shall be not more than 100 inches.

3.2.9 Accessibility. The design of the vehicle and optional equipment shall permit access for routine servicing and shall permit access for replacement and adjustment of component parts and accessories with minimal disturbance of other components and systems.

3.2.10 Asbestos. Except as permitted in 3.4.11, asbestos materials shall not be used in any form in any part of the vehicle.

3.3 Performance. 6x6 vehicles shall meet the performance requirements with the front wheel drive disengaged, except vehicles equipped with interaxle compensating devices which shall meet performance requirements with the front wheel drive engaged.

3.3.1 Speeds and gradeability. High and low speed requirements shall be met with the vehicle loaded to the specified GVW.

3.3.1.1 High speed gradeability. The vehicle shall ascend continuous grades specified in table III at 50 miles per hour (mph). Gradeability requirements shall be met with the main transmission in direct drive and, when a multispeed axle, multirange or auxiliary transmission is furnished, with the axle, multirange, and auxiliary transmission in high speed range. Gradeability shall be verified with calculations in accordance with SAR J688 (see 6.3).

TABLE III. Gradeability.

<u>Vehicle class</u>	<u>Percent grade</u>
16	2.5
21	1.5
28	1.0
34.5	0.5
43	0.5

* 3.3.1.2 Low speed. Low speed for vehicles with a manual transmission shall be calculated with the engine operating at not less than 35 percent of the recommended governed speed and shall provide not more than the vehicle speed specified in table IV for the corresponding number of available forward speeds.

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TABLE IV. Low speed requirement.

Number of forward speeds	Speed (mph)
4 or 5	4.5
8	3.5
9 or 10	3.0
13	2.5

3.3.1.3 Maximum geared speed. The maximum geared speed at engine governed speed shall be not less than 52 mph for 6x6 vehicles, and not less than 58 mph for all other vehicles. Conformance to geared speed specified shall be determined by calculating in accordance with the following formula:

$$\text{Maximum geared speed (mph)} = \frac{\text{Governed speed (rpm)}}{\text{Total gear reduction} \times \text{tire factor (see 6.3)}}$$

3.3.2 Service brakes. The service brakes shall control and hold the vehicle, when loaded to its required GVW, on a 30 percent grade. The service brakes shall stop the vehicle, loaded to specified GVW, within the stopping distance requirements of Federal Motor Carrier Safety Regulation 393.52.

3.4 Chassis components.

3.4.1 Engine. The engine furnished for the respective, specified vehicle class shall be the chassis manufacturer's standard or optional engine for the commercial model truck which meets or exceeds the requirements of this specification.

* 3.4.1.1 Diesel engine. Unless otherwise specified (see 3.4.1.2), the vehicle shall be equipped with a liquid cooled, compression ignition, two-stroke or four-stroke cycle diesel engine, with not less than six cylinders. Engine net horsepower used in performance prediction calculations shall be determined in accordance with SAE SAE J1349. The engine shall demonstrate the performance characteristics specified herein when using diesel fuel conforming to VV-F-800. In addition, when specified (see 6.2), the engine shall operate satisfactorily on grade JP-4 and grade JP-5 fuel conforming to MIL-T-5624 under emergency, short duration conditions and on grade JP-8 fuel conforming to MIL-T-83133 under normal conditions. A power loss when operating on JP-4, JP-5 or JP-8 is acceptable.

3.4.1.2 Gasoline engine. When specified (see 6.2), class 16, 21 and 28 vehicles shall be equipped with a liquid cooled, internal combustion, four-stroke cycle gasoline engine with not less than six cylinders. The engine furnished shall produce the required vehicle performance when operated on unleaded fuel with a research octane rating of 91, at an engine speed not more than the manufacturer's recommended operating speed. The engine shall

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be capable of warranted operation on unleaded fuel when used in accordance with the operator's manual. Engine net horsepower figures used in performance prediction calculations shall be determined in accordance with SAE J1349.

* 3.4.1.3 Oil filter. A full flow or combination full flow and bypass oil filter with replacement element shall be furnished.

3.4.1.4 Governor. An engine governor shall be furnished and set and sealed to limit the engine to the engine manufacturer's maximum recommended operating speed.

3.4.1.5 Cooling system. The cooling system shall maintain the engine coolant at a temperature below the boiling point with the vehicle loaded to GVW and operated at an altitude of 10,000 feet above sea level or in an ambient air temperature of not less than 125 degrees Fahrenheit (°F). The coolant system shall include a surge tank or a coolant recovery reservoir of not less than two-quart capacity. On tilt cab models, a radiator servicing access door shall be provided to allow verification of the coolant level.

3.4.1.6 Coolant temperature control. Thermostatic control of engine coolant temperature shall be provided. On diesel engine driven vehicles, the control shall include complete thermostatic control of all coolant flow through the radiator.

3.4.1.7 Fan clutch. A fan clutch shall be provided. The fan clutch shall reduce the fan speed automatically when the fan is not required for engine cooling. The fan clutch shall be asbestos free.

3.4.1.8 Silicone rubber hoses. When specified (see 6.2), silicone rubber radiator and heater hoses shall be furnished.

3.4.1.9 Power plant heaters and fuel warmer. When specified (see 6.2), a coolant heater; an engine oil heater; and a fuel warmer (diesel engine driven vehicles only) shall be provided. Unless otherwise specified (see 6.2), a battery heater shall be provided when power plant heaters are specified. Heaters shall operate on 110-volt alternating current (ac), and shall be wired through a junction block, including a fuse or circuit breaker, 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 Federal Motor Carrier Safety Regulation 393.77(c)(7). The electrical insulation of the connecting cable shall withstand normal operating stresses in low ambient air temperatures (down to minus 60°F) without cracking or loss of dielectric capacity. All heater

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lead wires shall be installed without interfering with vehicle component operation, and without loose excess wire. Provisions for stowage of the cable shall be provided in the vehicle cab. Heaters shall be furnished as follows:

- (a) A coolant heater, 1500-watt minimum rating, shall be installed in the engine block or in the lower coolant inlet hose. An engine thermostat with an operating range of 170°F to 195°F shall be installed.
- * (b) An oil pan heater of the permanent external surface mount, permanent in-pan mount, or immersion type that meets the following requirements shall be installed:
 - (1) Not less than 22 watts per quart heating capacity.
 - (2) Not more than 18 watts per square inch heating capacity
 - (3) Thermal balance design or thermostat control providing for uninterrupted operation.
 - (4) Provision for mounting below minimum service oil level.
- (c) The battery heater shall have a capacity adequate to maintain the battery electrolyte at a temperature of not less than 10°F during vehicle exposure in ambient air temperatures as low as minus 60°F, and shall embody a thermostat to limit the temperature of the electrolyte to not more than 80°F.
- (d) For diesel engine driven vehicles, 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 minus 40°F to an outlet temperature of plus 9°F, with a flow rate not less than the maximum fuel demand of the engine fuel system. A coolant shutoff valve shall be provided for the coolant inlet side of the fuel warmer unit.

3.4.2 Electrical system. The electrical system shall be in accordance with Federal Motor Carrier Safety Regulations 393.27 through 393.31 and 393.33.

* 3.4.2.1 Starting system. For diesel engine driven vehicles, a 12- or 24-volt direct current (dc) starting system with a 12-volt lighting system shall be furnished. Engine starting equipment shall include an ether starting system, glow plug or grid heater. If an ether system is furnished in lieu of a glow plug or grid heater, it shall be of the measured shot type. The measured shot type ether system shall be key operated or manually operated from the driver's compartment and shall be inoperative with the engine warm. Complete provisions for a replaceable ether reservoir of not less than 12 fluid ounces shall be furnished. A reservoir need not be furnished.

* 3.4.2.2 Ignition system. For gasoline engine driven vehicles, a 12-volt ignition system shall be furnished.

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* 3.4.2.3 Alternator. Unless otherwise specified (see 6.2), on diesel engine driven vehicles a minimum 75-ampere alternator shall be furnished. The alternator output with the engine at engine idle speed shall be not less than 45 amperes. Unless otherwise specified (see 6.2) on gasoline engine driven vehicles, an alternator of not less than 85 amperes rated capacity, and which provides not less than 45 amperes dc output at normal engine idle speed, shall be furnished.

3.4.2.4 Lighting. All vehicles lights, reflectors, and wiring shall conform to Federal Motor Carrier Safety Regulations 393.12, 393.19, 393.20, and 393.22 through 393.26(d). Lights and reflectors shall not be mounted on the vertical surface of rub rails (unless recessed and fully protected) or mounted on vehicle bumpers.

3.4.2.5 Turn signals. Turn signal lamps shall conform to SAE J588. Operating units shall conform to SAE J589 class A and shall be mounted on the steering column. Turn signal units shall be installed in accordance with SAE J588. Turn signal operating units shall have a visible and audible type flash indicator.

3.4.2.6 Trailer lighting cable. When specified (see 6.2), a trailer lighting cable, conforming to SAE J1067, shall be furnished. The cable shall be coiled and shall be not less than 110 inches long when fully extended. Both ends of the cable shall be equipped with a round plug conforming to SAE J560. The plugs shall be equipped with a grip for withdrawing from the connector sockets. The cable shall be packaged and stowed in the vehicle tool compartment.

3.4.2.7 Batteries. Each battery shall be of 12-volt potential. The total reserve capacity rating and the total cold cranking rating at 0°F, both measured in accordance with SAE J537, shall be not less than specified in table V. The batteries shall be of the maintenance-free type having the maintenance-free characteristics listed in W-B-131.

TABLE V. Batteries.

Engine type	Reserve capacity (minutes)	Cold cranking (amperes)
Diesel (less than 220 gross gross horsepower)	320	1,200
Diesel (220 gross horsepower and over)	460	1,740
Gasoline	100	450

3.4.2.8 Auxiliary 24-volt system with trailer receptacle. When specified (see 6.2), an auxiliary 24-volt system with a trailer receptacle assembly shall be furnished. Either a converter type (see 3.4.2.8.1) or an alternator type (see 3.4.2.8.2) system meeting specified requirements shall

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be furnished. A trailer receptacle, conforming to MS75021-2, with cover assembly shall be provided in an accessible location on the rear end of the vehicle. A twelve-conductor truck tractor lighting cable not less than 110 inches long with both ends of cable equipped with connectors conforming to MS75020-1 and MS75020-2 shall be furnished. The cable assembly shall be stowed in the vehicle. The 24-volt service lighting circuit shall be connected through the appropriate lighting controls to terminals B, D, E, J and L of MS75021-2.

3.4.2.8.1 Converter type 24-volt system. The 12- to 24-volt converter(s) shall operate from the 12-volt battery (see 3.4.2.7). The output capacity shall be not less than 12 amperes.

3.4.2.8.2 Alternator type 24-volt system. The alternator type 24-volt system shall be separate from the 12-volt vehicle lighting and ignition system and shall include:

- (a) Nominal 24-volt alternator with not less than 25-ampere rated capacity and capable of providing not less than 7 amperes dc output at normal engine idle speed;
- (b) Two 12-volt batteries with a combined capacity of at least 40 ampere-hours at a 20-hour rate or one 24-volt battery with a 20 ampere-hour capacity at a 20-hour rate;
- (c) Voltage regulating device;
- (d) An ammeter, mounted on the instrument panel.

3.4.2.9 Radio interference suppression. The vehicle shall be suppressed to limit the electromagnetic radiation in accordance with SAE J551. Any body equipment emitting radiation shall be suppressed to the same level as the vehicle chassis.

3.4.3 Fuel system. The fuel system shall conform to Federal Motor Carrier Safety Regulations 393.65 and 393.67.

3.4.3.1 Air cleaner. An air cleaner shall be furnished.

* 3.4.3.2 Fuel tanks. The fuel tank(s) shall have not less than 80 gallons total capacity. Class D and E vehicles shall be equipped with a step type fuel tank(s). When more than one tank is furnished on diesel engine driven vehicles, means shall be provided to assure equalized fuel level in both tanks. When more than one tank is furnished on gasoline engine driven vehicles, a selector valve connecting either tank to the engine fuel intake shall be provided and means shall be provided to monitor the fuel level of either tank from a single fuel gage; or an equalizing pump shall be used to maintain the same fuel level in both tanks.

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3.4.4 Exhaust system. The exhaust system shall conform to Federal Motor Carrier Safety Regulation 393.83. Vertical exhaust mufflers, capable of being reached easily by personnel entering or leaving either side of the cab, shall be furnished with a heat shield. Vertical exhaust systems shall be provided with a hinged rain cap.

3.4.5 Gear train.

3.4.5.1 Transmission. Input torque capacity of the transmission shall be at least equal to the maximum torque delivered by the engine. Gear ratios in transmission and axles shall be matched to provide a progressive shifting pattern throughout the complete range, and shall provide required vehicle performance (see 3.3.1 through 3.3.1.3).

* 3.4.5.1.1 Manually shifted transmission. Unless otherwise specified (see 3.4.5.3), a manually shifted transmission shall be provided on the vehicle. Unless otherwise specified (see 6.2), class 16 vehicle shall have not less than four forward and one reverse speed with SAE J704 power takeoff opening provided; for class 21 and 28 vehicles, the transmission shall have not less than five forward and one reverse speed with SAE J704 power takeoff openings on both right and left sides; for class 34.5 and 43 vehicles the transmission shall have not less than 9 forward speeds, and shall be provided with power takeoff opening(s) conforming to SAE J704. When more than four or five forward speeds are required, a multispeed transmission or auxiliary transmission shall be provided. The transmission shall provide for maximum ease of shifting in all speeds.

* 3.4.5.1.2 Transfer case (6x6 vehicles). Six-wheel, six-wheel drive vehicles shall be provided with a transfer case. Unless the transfer case is equipped with devices which compensate for differential torque and speeds between front and rear axles, the transfer case shall provide for driver selection of either four-wheel or six-wheel drive. When furnished, interaxle compensating devices shall provide for positive transfer of power to all driving axles. When a two speed transfer case is furnished, the speedometer shall read accurate speed (mph) with the speed selector in high or low range.

3.4.5.2 Clutch. The clutch shall be the largest capacity clutch offered for the type and class vehicle and engine furnished, with the clutch torque capacity exceeding the maximum delivered engine torque. The clutch lining shall be asbestos free.

* 3.4.5.3 Automatic transmission. When specified (see 6.2), an automatic transmission shall be furnished. The transmission shall include a hydraulic torque convertor and not less than four forward gear ratios for class 16, 21 and 28 vehicles and not less than five forward gear ratios for class 34.5 and 43 vehicles. Normal driving range selector position shall provide not less than four gear ratios without movement of the selector. The transmission shall be provided with a power takeoff opening.

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3.4.5.4 Power takeoff. The power takeoff shall be of a rated capacity to operate powered equipment. Controls to operate the power takeoff shall be located in the truck cab accessible to the seated driver. A caution plate or decal reading "DO NOT OPERATE VEHICLE AT HIGHWAY SPEEDS WITH POWER TAKEOFF ENGAGED" shall be installed so as to be readily visible to the seated driver (see 3.1.1.8).

3.4.6 Driveline components. Driveline components shall be adequate to transmit the maximum delivered torque of the engine, as developed through the maximum gear train reduction.

3.4.7 Frame. The chassis frame shall be the manufacturer's standard for the class vehicle furnished. Chassis frame rails shall not project beyond the rear end of the body. For class 34.5 and 43 vehicles, reinforcements extending at least from the rear of the front suspension rear hanger bracket to the bogie trunnion mounting bracket shall be furnished.

3.4.8 Suspension. The vehicle shall be equipped with a suspension system, with components having a rated capacity at least equal to the load imposed on each member, measured at the ground, with vehicle loaded to required GVW. When suspension is rated at the spring pads, unsprung weight shall be deducted. The vehicle shall be equipped with hydraulic, double-acting shock absorbers at the front wheels.

* 3.4.9 Axles. Axle ratings shall be at least equal to the load imposed on each axle, measured at the ground, with the vehicle loaded to required GVW. When specified (see 6.2), the wheel bearings and axle spindles shall be oil lubricated, (on rear axle only on 6x6 vehicles). The hubcaps, except for driving axles, shall have a window for visual determination of oil level. Provisions for venting or with-standing internal pressure buildup and for replenishing the oil supply shall be provided.

3.4.9.1 Two-speed axle. When specified except for 6x6 models, (see 6.2), a two-speed axle shall be furnished, equipped with electric, vacuum or air shift and provided with ratios which will permit proper gear splitting. The gear ratio shall provide the performance specified in 3.3.1 through 3.3.1.3.

* 3.4.9.2 Rear bogie (6x4 and 6x6 vehicles). A rear bogie shall be provided on 6x4 and 6x6 vehicles. The rear bogie shall be of the four-wheel type, complete with axles, springs, torque rods, and all other necessary parts. The bogie shall be provided with means permitting differential action between the two axles, and a manually or automatically controlled lockout assuring equal power to each rear axle. Manual lockout control shall be located in the truck cab. Axle gear ratios shall provide performance specified in 3.3.1 through 3.3.1.3.

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3.4.9.3 Traction control. When specified (see 6.2), a traction control shall be furnished on one rear axle. The traction control shall actuate automatically to insure that power is transmitted to the wheel having traction when the opposite wheel loses traction. Maximum traction capabilities shall be maintained at all times under each drive wheel for the life of the vehicle.

* 3.4.10 Wheels, rims, tires and tubes. Unless wide base tires are specified, the vehicle shall be equipped with single front and dual rear wheels. Rims and tire ratings shall conform to Tire and Rim Association or European Tyre and Rim Technical Organisation recommendations, for the type and size of tires furnished. Except when tube type tires are specified in procurement documents, multi-piece rims shall not be furnished on front axles rated at 14,000 pounds or less, on rear single axles rated at 23,000 pounds or less, and on rear tandem axles rated at 52,000 pounds or less. Tire and rim sizes shall be the same for all wheels on each vehicle. When specified (see 6.2), wide base type tires and wheels for the front and rear axles shall be provided in lieu of conventional front and dual rear wheels and tires. Wide base wheels shall be interchangeable without the use of an adapter. When specified (see 6.2), 10-stud disc type wheels shall be furnished.

* 3.4.10.1 Tires. Tires shall be steel belted radial, or when specified (see 6.2), bias ply. Unless otherwise specified low profile or standard profile tires may be furnished. When specified (see 6.2), low profile tires shall be furnished. Tires for 4x2 and 6x4 vehicles shall have highway tread. Tires for 6x6 vehicles shall have nondirectional mud and snow tread. Tires shall be of the tubeless type or on axles where multi-piece rims are permitted (see 3.4.10) may be of the tube type. Tires shall be of a rated capacity at least equal to the load imposed on each tire, measured at each wheel at the ground, with the vehicle loaded to required GVW. Tires and tire size designation systems shall conform to Tire and Rim Association or to the European Tyre and Rim Technical Organisation recommendations.

3.4.10.2 Inner tubes. When tube type tires are permitted or specified in procurement documents, inner tubes shall be of heavy duty type, and shall be of proper size for the tires furnished. Tire flaps shall be provided for tube type tires in accordance with Tire and Rim Association recommendations.

* 3.4.10.3 Carrier for spare tire assembly. When specified (see 6.2), a carrier for a spare wheel or rim and tire assembly shall be installed in a readily accessible location on the vehicle. Threaded fasteners, when used to secure the spare tire in the carrier, shall be constructed of or plated with corrosion resistant material. The carrier design shall enable removal or mounting of the spare wheel assembly using only tools specified in 3.4.16.1. The carrier shall enable the safe removal and installation of the spare tire assembly from and to the vehicle and carrier without personnel positioning themselves or any part of their body under the spare tire assembly.

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3.4.10.4 Spare wheel or rim. When specified (see 6.2), a spare wheel or rim shall be furnished. When a spare tire assembly is specified (see 3.4.10.5), a spare wheel or rim shall be furnished.

3.4.10.5 Spare tire assembly. When specified (see 6.2), a spare tire assembly shall be furnished. The spare tire assembly shall include an inflated spare tire mounted on the spare wheel or rim. The spare tire shall be of the same size, tread design, and load range (ply rating) as the tires furnished on the vehicle.

3.4.11 Brakes. Brakes shall conform to Federal Motor Carrier Safety Regulations 393.40 through 393.43 and 393.45 through 393.52. Brake linings shall be of nonasbestos material on front axles, on single rear axles rated at 23,000 pounds or less and on rear tandem axles rated at 46,000 pounds or less.

* 3.4.11.1 Power-hydraulic type. Unless otherwise specified, class 16 and class 21 vehicles (see 3.4.11.2), shall be equipped with power assisted, hydraulically actuated, four-wheel service brakes.

3.4.11.1.1 Split hydraulic brake system. The power-hydraulic brake system shall be so arranged as to provide separate systems for at least two wheels and so designed and constructed that rupture or leakage type failure of any single pressure component of the service brake system, except structural failures of the brake master cylinder body, effectiveness indicator body, or other housing common to the divided system, will not result in complete loss of function of the vehicle brakes when force on the brake pedal is continued. "Pressure component" means any internal component of the brake master cylinder or master control unit, wheel brake cylinder, brake line, brake hose, or equivalent, except power assist components.

3.4.11.1.2 Indicator light. The split hydraulic brake system shall be equipped with an electrically operated red light mounted on the instrument panel to indicate system effectiveness. The light shall have an area of not less than 0.196 square inch. It shall illuminate before or upon application of the brakes when an actuating-pressure component of the system has sustained a loss of pressure. The indicator light system shall include a means for testing by the vehicle operator to assure that the light bulb is operable.

3.4.11.2 Air brakes. For class 28, 34.5 and 43 vehicles, and when specified (see 6.2) for other vehicle classes, the vehicle shall be equipped with a brake system consisting of full-air-application brakes on all wheels. The braking system, complete with all necessary components, shall include:

- (a) Air compressor, unloader-head-type, engine driven and engine lubricated, air or water cooled, and having a capacity of not less than 7-1/4 cubic feet per minute (cfm) for 4x2 vehicles and 12 cfm for 6x4 and 6x6 vehicles

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- (b) Air storage reservoir(s), each tank equipped with drain, and with safety and check valves between the compressor and the last reservoir tank
- (c) Foot control, suspended or treadle type
- (d) Air control valves
- (e) Air pressure gage, visible to the driver
- (f) Low air pressure warning, visible and audible
- (g) Service brake stop lamp switch
- (h) Automatic moisture ejector;
- (i) Automatic slack adjusters on cam type brakes or internal self-adjusting brakes on wedge and disc type brakes (not required for 6x6 vehicles).

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

3.4.11.3 Trailer brake control system. In addition to the components specified in 3.4.11.2, a trailer brake control system shall be furnished when a trailer towing package is required for class 28, 34.5 and 43 vehicles (see 3.1.1.5). The trailer brake control system shall include:

- (a) Identification of emergency and service lines
- (b) Coincident control of trailer brakes with prime mover foot control
- (c) Independent hand control for trailer brakes
- (d) Prime mover protection valve with dash control and automatic breakaway feature
- (e) Trailer stoplight control operative with foot brake and with hand control for trailer brakes
- (f) Two SAE J844 coiled air hoses, not less than 110 inches long when fully extended, with SAE J318 gladhand couplers on both ends of hoses. The hoses shall be packaged and stowed in the vehicle tool compartment for shipment
- (g) Air connectors for trailers with SAE J318 gladhand couplers mounted at the rear of the vehicle located to prevent interference with the trailer
- (h) Dummy gladhand couplers with chains
- (i) Prime mover only parking brake valve to permit prime mover parking brakes to be applied while charging the trailer air brake system.

3.4.11.4 Brake controls for use from a towing vehicle. When specified for vehicles with air brakes (see 6.2), the vehicle shall be furnished with a system for controlling the brakes from a towing vehicle (wrecker). The installation shall be complete with air brake couplers, relay emergency valve

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with no-bleed-back feature (except when spring applied emergency brake is furnished), additional air lines and fittings. The service and emergency couplers shall be mounted on the front in a protected position providing for ready attachment of air hoses from a towing vehicle. The service and emergency couplers shall be identified and provided with dummy gladhand couplers with chains. The system shall not compromise conformance to any Federal Motor Carrier Safety Regulation referenced herein or to any Federal Motor Vehicle Safety Standard.

3.4.12 Cab type. Unless otherwise specified, the chassis manufacturer shall furnish any type of his standard or optional full width model cab. When specified (see 6.2), a cab with a forward tilting hood and fender assembly, including tilting and locking mechanism; or a vehicle with a butterfly hood and with bolt on fenders capable of being removed or swinging forward when unbolted; shall be furnished. When specified, except for 6x6 vehicles (see 6.2), a tilt type cab with tilting and locking mechanism shall be furnished. Tilt cab features shall be in accordance with the Employee Safety and Health Standards of Federal Motor Carrier Safety Regulation 399, including the first step height, which shall be not more than 24 inches.

* 3.4.12.1 Cab features. Cab doors shall be equipped with locks, operable from inside the cab through mechanical linkage, with at least the curbside door equipped with an external, key operated lock. Drip rails shall be installed above the cab doors. Safety grips or grab handles shall be provided on each side of the cab to assist personnel in entering and leaving the cab. When the front tires extend beyond the cab fenders, rubber fender extensions extending at least to the outside of the tire tread shall be furnished. For tilt type cabs, provisions to facilitate cleaning the windshield shall be provided by means of a bumper step, or bumper step cutouts, and a grab handle located under the windshield.

3.4.12.2 Cab interior. Unless otherwise specified, the cab shall have upholstered, full width, adjustable seat and back or individual, adjustable driver's seat and individual passenger seat. When specified (see 6.2), an individual adjustable driver's seat and an individual passenger seat shall be provided. When specified (see 6.2), the driver's seat shall be the manufacturer's standard air ride suspension type. The color of the upholstery and the interior finish shall be compatible with the exterior color (see 3.1.1.1). White upholstery shall not be provided. Interior lighting shall be provided. Two pairs of seat belts shall be installed.

3.4.12.3 Crew-cab. When specified (see 6.2), a four-door, full width crew-cab shall be furnished in lieu of the standard full width cab. The cab shall be furnished with two upholstered full width seats and backs. The front seat shall be adjustable. Fastenings and three pairs of seat belts shall be installed for both front and rear seats. The cab doors shall be equipped with locks operable from inside the cab through mechanical linkage with both front doors equipped with an external key operated lock. The cab

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doors shall have windows with crank operated window regulators. Safety grips shall be provided on each side of the cab to assist personnel in entering and leaving the cab. The cab roof shall be of one piece construction or if welded, the roof shall give the appearance of one piece, with weld seams being continuous, waterproof, and free of visible seams, bumps or protrusions. Full length drip moldings shall be mounted above the doors. When a crew-cab is furnished, the cab-to-axle dimension shall be measured from the back face of the crew-cab.

3.4.12.3.1 Crew cab seat spacing. With the front seat adjusted to the extreme forward position there shall be not less than 30 inches, measured in a horizontal plane, between the front of the rear seatback and the rear of the front seatback. A kick-space height of not less than 2.75 inches shall be maintained between the floor and the rear of the front seat in all positions of adjustment. Leg room and space forward of the front seat shall be equivalent to that provided ahead of the seat in a two-door standard cab.

3.4.13 Steering. Power steering shall be furnished.

3.4.14 Windshield wipers and washers. The vehicle shall be equipped with dual windshield wipers and windshield washers. Windshield wipers shall be multispeed type and operated by either air or electric motor(s).

3.4.15 Bumper. Unless the bumper is an integral part of the vehicle cab, a channel type front bumper shall be provided, except when a winch is specified (see 3.4.22).

3.4.15.1 Rear end protection. The rear end of the vehicle shall be protected in accordance with Federal Motor Carrier Safety Regulation 393.86. A rear bumper shall be provided.

* 3.4.16 Tool stowage. Stowage space of sufficient size to accommodate the vehicle jack, hand tools, antiskid chains, warning flares, and emergency reflective triangles shall be furnished for retaining the equipment during vehicle operation. The stowage space shall provide for positive retainment of this equipment during vehicle operation. Stowage space for these tools may be furnished inside the cab. When stowage space for these tools is located outside of cab, it shall be weatherproof and shall provide for locking with a padlock.

3.4.16.1 Tools. When specified (see 6.2), the vehicle shall be furnished with the tools required for exchanging a mounted tire assembly with the spare assembly, and shall include at least a hydraulic jack, jack handle, and wheelnut wrench. The jack shall be of such closed height as to permit its location under the axle or other satisfactory lift point at any wheel with the tire flat. The jack, without blocking, shall be capable of raising any wheel of the loaded vehicle to a height adequate to permit removal and replacement of the wheel and tire assembly.

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3.4.17 Heater and defroster. The vehicle shall be provided with a hot water heater with fresh air intakes and discharge outlet to floor and to windshield defroster louvers. The heater shall be complete with blower and mounted controls convenient to the driver.

3.4.18 Controls and operating mechanisms. All controls and operating mechanisms shall be located for left hand drive. Controls shall be complete and conveniently operable by the driver. Lever controls shall be designed and located to permit easy entrance and exit of the operator to and from the driver's compartment. Instruments and controls shall be identified as to their function and installed in a manner to facilitate removal and servicing. All instruments shall be visible to the driver when seated in a driving position.

3.4.19 Accessories and equipment. Chassis equipment shall be complete with all accessories furnished as standard equipment by the manufacturer. The following minimum equipment shall be furnished:

- (a) Key operated ignition switch
- (b) Ammeter, charging indicator, or voltmeter
- (c) Fuel gage
- (d) Oil pressure gage or red indicator warning light
- (e) Engine coolant temperature gage or high coolant temperature or low coolant level red indicator warning light
- (f) High coolant temperature or low coolant level alarm buzzer
- (g) Speedometer with recording odometer
- (h) Dual sunvisors
- (i) Front door mounted armrest on driver's side
- (j) Driver's compartment ventilator other than window
- (k) Tachometer (diesel engine driven vehicles only).

When specified (see 6.2), an ammeter or voltmeter gage, oil pressure gage, and coolant temperature gage shall be provided in lieu of the indicators and buzzers specified above. When specified (see 6.2), an automatic engine shutdown system also shall be furnished. The system shall include an engine coolant temperature, engine coolant level and engine oil pressure red indicator warning light and alarm buzzer. The warning light and buzzer actuation shall precede engine shutdown. The system shall permit engine restart and run for approximately 30 seconds following automatic shutdown. Also, engine oil pressure and engine coolant temperature gages shall be provided with the automatic engine shutdown system.

* 3.4.20 Rearview mirrors. Outside rearview mirrors shall be mounted on each side of the cab. The mirrors shall have flat and convex areas. The flat portion shall have not less than 50 square inches of reflective area. The convex portion shall have not less than 25 square inches of reflective area and a radius of curvature of not less than 20 inches. The mirrors shall have not less than two supporting arms.

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3.4.21 Horn. Manufacturer's standard electric horn shall be furnished. When specified (see 6.2), in addition, an air operated horn shall be provided on vehicles equipped with an air brake system.

3.4.22 Front mounted winch. When specified for class 34.5 and 43 vehicles (see 6.2), a winch assembly mounted on the front of the vehicle and powered by the manufacturer's standard power takeoff or hydraulically operated shall be furnished. The winch shall conform to SAE J706. The winch shall be a single drum type and shall have one forward and one reverse speed. All winch controls shall be mounted inside the cab. Winch controls shall be located to provide no interference with the entrance or exit of the driver. The winch shall have a rated single line pull capacity of not less than 20,000 pounds pull on the bare drum. The winch line speed on the bare drum shall be between 25 and 30 feet per minute at an engine speed equal to 35 percent of engine governed speed. The winch shall be wound with not less than 185 feet of 0.625 inch diameter, preformed 6x37, improved plow steel, wire strand core and shall be equipped with end chain and hook. An integral, adjustable, automatic safety brake shall be provided. The winch shall be equipped with a roller guide. Angles of the winch drive line U-joints shall be not more than 16-1/2 degrees.

3.4.22.1 Winch drum guard. A winch drum guard shall be furnished. The guard shall confine the cable to the area between the drum flanges. The guard shall consist of not less than 0.250 inch vertical side plates, conforming to the outside radius of the drum flanges. Six bars, 0.375 inch by 1.25 inches, shall be welded to the vertical side plates. Three bars shall be located on the bottom and spaced equally on the bottom radius. The vertical distance between the vertical side plates and the drum flanges shall be not more than one half the specified cable diameter.

3.4.22.2 Front bumper. When a front mounted winch is furnished, the bumper shall be mounted forward of the winch. The bumper shall be either a channel (see 3.4.15) or a pipe type. When a pipe type front bumper is furnished, the nominal diameter shall be not less than 3 inches and shall have a wall thickness of not less than that specified in Schedule 40 of ASTM A53. The pipe type front bumper shall have half-round ball ends.

3.4.22.3 Combination step plate and gravel guard. When a front mounted winch is furnished, the open area on either side of the winch shall be covered with a combination step plate and gravel guard. The step plate shall be fabricated of not less than 14 gage (0.0747 inch) steel tread plate exclusive of projections. The step plate shall be secured to the front bumper and shall be not less than 0.250 inch, or not more than 0.375 inch from the cab sheet metal. The step plate shall be capable of supporting 300 pounds per square foot. The step plate shall not deflect more than 0.125 inch under the loads imposed.

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3.4.23 Engine hour meter. An engine hour meter having a totalizing mechanism of not less than 9,999 hours shall be furnished for the chassis engine to register accurately the number of hours of operating time. The meter shall be of rugged construction to assure continuous trouble-free performance under severe operating conditions. The engine hour meter shall be mounted on the cab instrument panel or in the engine compartment in a readable location.

3.4.24 Back-up alarm. When specified (see 6.2), the vehicle shall be provided with an audible, pulsating, signaling device (electrical or mechanical) to caution personnel when the vehicle is in reverse gear operation.

* 3.4.25 AM/FM radio. When specified (see 6.2), the manufacturer's standard AM/FM radio shall be provided.

3.5 Body. Vehicles of all types and classes shall conform to table VI. The cab-to-axle (trunnion) dimensions specified for the various vehicle classes may be reduced not more than 2 inches when the vehicle is furnished with a tilt cab.

TABLE VI. Dimensions.

Designation	Class 16	Class 21	Class 28	Class 34.5	Class 43
Water capacity (gallons-minimum)	1,000	1,500	1,800	2,000	2,000
Cab-axle (trunnion) dimension (inches- minimum)	84	100	120	120	120
Tank, maximum dimensions:					
Length (inches)	144	168	180	180	180
Height - top of frame to manhole cover (inches)	54	58	58	58	58
Width (inches)	96	96	96	96	96

3.5.1 Tank. The tank shall be of the single compartment type, arranged for filling through a manhole and through a swivel connection for a 2.50 inch diameter fire hose. The length of the tank shall be such as to provide a load distribution on the front and rear axles of the chassis in proportion to the front and rear GAWRS. The tank shall have an elliptical or modified rectangular cross-section. The tank shall be of watertight, welded, smooth skin construction and shall withstand three pounds per square inch (psi) air pressure without leakage.

* 3.5.2 Material. The tank shell, baffles, bulkheads, pads, catwalk, manholes and outlets shall be of type 304 stainless steel. The tank shell, heads, bulkheads and baffles shall conform to the requirements of Safety

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Regulation 178.340 and 178.341. Specification MC306 for material, structural integrity, joints, supports and anchoring, circumferential reinforcement, and minimum thickness, except in no case shall the minimum thickness be less than 12 gage (0.1046 inch). Minimum thickness requirements shall be based on a product density of 8.3 pounds per gallon. All pipes and fittings welded or connected directly to the tank shell shall be fabricated of stainless steel. All other pipes and fittings shall be fabricated of stainless steel or galvanized steel.

3.5.3 Baffles. Where the provisions of DOT Safety Regulation 178.340 would require circumferential reinforcements, baffles shall be used in lieu of ring stiffeners. Baffles shall be flanged and dished. A half-round opening of not less than 3-inch radius shall be provided at the bottom of each baffle. Openings of equivalent size shall be provided at the top of each baffle. Each baffle shall also be provided with not less than an 18-inch diameter manway opening. The edges of the manway openings shall have flanges of not less than one inch.

3.5.4 Tank support. Full length box type, V type or Z type longitudinal subframe members shall be furnished. Full length welding pads of not less than 12 gage (0.1046 inch) steel shall extend not less than one inch beyond the flanges on the longitudinal subframe members and shall be continuously welded to the tank proper. Box type longitudinal subframe members shall be fabricated with not less than a 7 gage (0.1793 inch) mild steel outer leg and bottom with not less than a 12 gage (0.1046 inch) mild steel inner leg. A flange not less than one inch wide shall be provided at the top of both the outer and inner legs. Flanges shall be continuously welded to the pad the full length of the tank. V type longitudinal subframe members shall be fabricated of not less than 7 gage (0.1793 inch) mild steel inner and outer legs. A flange not less than one inch wide shall be provided at the top of both the inner and outer legs. Flanges shall be continuously welded to the pad the full length of the tank. Z type longitudinal subframe members shall be fabricated entirely of not less than 7 gage (0.1793 inch) mild steel. The width of the upper Z member shall be not less than two inches and shall be continuously welded to the pad the full length of the tank along both sides of the Z. With the Z type construction, additional steel pads shall be continuously welded to the tank proper at the front, rear, at each bulkhead, and at each baffle. Bolsters of 0.1875 inch mild steel shall be properly integrated with the Z type longitudinal and continuously welded to the pads at the front, rear, at each bulkhead and at each baffle.

3.5.5 Manhole. A round manhole opening in the top of the tank, not less than 19 inches in diameter with a hinged, gasketed, watertight cover with quick latch, shall be furnished.

3.5.6 Fill pipe. A fill pipe shall be located near the rear end of tank. The pipe shall be provided with a removable rustproof strainer. A swivel gooseneck and 100 feet of 2.50 inch nominal diameter filling hose

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shall be provided. Swivel threads shall be provided at the junction of the fill pipe and the gooseneck. Female swivel threads shall be provided on the inlet of the gooseneck mating with male threads on the filling hose outlet. The filling hose shall have a 2.50 inch National Hose (N.H.) female swivel thread on its inlet. A hose reel shall be furnished to provide stowage for the filling hose. A crank shall be provided for hand winding the filling hose. The hose reel shall be constructed to prevent damage to the hose and shall be mounted in an accessible location. An overflow pipe of not less than a 3-inch inside diameter (id) shall be provided. A float gage shall be furnished. A warning light shall be located in the vehicle cab and shall indicate when the tank is nearly empty.

3.5.7 Skirting. Skirting down to not less than 15 inches below the top of the chassis frame rails shall be provided the full length of the body on both sides, across the rear of the vehicle to the inside of the chassis frame rails and across the front to the outside of the chassis frame rails. At the rear, skirting shall be provided from the bottom contour of the tank down to the top of the chassis frame rails. Cutouts for the wheels shall be rounded. The radius of the rounded portion of the cutout shall be approximately 1.25 times the tire radius. Skirting shall be constructed of not less than 16 gage (0.0598 inch), hot-rolled mild steel. When the width over the tires exceeds the body width, rubber fenders around the wheelwells, extending to the outside of the tires, shall be provided.

3.5.8 Catwalk. A flat catwalk of type 304 stainless steel, not less than 24 inches wide running the full length of the tank body, shall be provided at the top of the tank body. The catwalk shall be covered with a special abrasive type of paint (ship's grip); shall be of grip-strut material; or shall be of open grating type. The catwalk shall be flanged at the sides to form a handhold for personnel. The catwalk shall be provided with front and rear drains on opposite sides of the vehicle and in such other locations as are necessary to prevent liquids from standing on the catwalk or on the top of the tank (except for open grating type catwalk).

* 3.5.8.1 Access ladder. An access ladder or equivalent access steps, grabhandles and grabrails shall be furnished, providing easy access to and from the catwalk. Ladders, steps, handles and rails shall be functionally spaced and arranged for maximum safety of personnel climbing up onto and down from the catwalk. All components shall be of stainless steel.

3.5.9 Body mounting. The body shall be secured with U-bolts, twin studs, or by brackets and shall include a wood breaker strip. For class 16 and 21, all but the rearmost, and for class 28, 34.5 and 43 at least the forward most pair of U-bolts, twin studs, or brackets shall be spring loaded to permit vertical movement between the chassis and body.

3.5.9.1 U-bolts or twin studs. When U-bolts or twin studs are used, there shall be not less than three U-bolts or twin studs per side for classes 16 and 21 and not less than four U-bolts or twin studs per side for class 28,

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34.5 and 43 vehicles. Each U-bolt or twin stud shall have a 0.5625 inch minimum body diameter with 0.625 inch minimum thread diameter. Tie-plates shall be at least 0.50 inch thick. The vehicle chassis frame shall be braced, using wood blocks at each mounting point, unless the mounting point is located at a full depth frame crossmember. Blocks shall incorporate a keeper strap or groove for the mounting bolt and shall be of a width and thickness to assure retention. Two tie-back straps shall be provided, one bolted to each side of the rear portion of the body subframe to maintain body alignment on the vehicle chassis. Forward body mounting bolts shall be located to the rear of the tapered portion of breaker strips (see 3.5.9.3).

3.5.9.2 Brackets. When brackets are used, they shall be bolted to the web of the chassis frame rails. The body mounting brackets shall provide a means of drawing down the body on the chassis rails and provisions shall be made to prevent lateral shifting of the breaker strips. When additional holes are required to secure mounting brackets to the chassis frame rails, they must be located within the area of the rail which is designated as being safe for drilling in accordance with the chassis manufacturer's body builders layouts. Attachments shall not interfere with, nor obstruct, existing chassis components.

3.5.9.3 Breaker strips. A hardwood or dense southern yellow pine breaker strip not less than 1.0625 inches finished thickness shall be installed between longitudinal sills and the vehicle chassis frame. Breaker strips shall have a taper of 1 inch in 18 inches at the forward end.

3.6 Vehicle types.

3.6.1 Type I (sprinkler). Type I vehicles shall be provided with a gravity sprinkler system.

3.6.1.1 Piping system and sprinkler bars. Two sprinkler bars shall be provided, one on each side behind the cab. Each sprinkler bar shall be provided with 0.1875 inch nominal diameter holes, spaced 6 inches on center, and shall lay down a uniform wetting pattern not less than 93 inches wide. Piping from the tank to each sprinkler bar shall be not less than 2 inches id. Each discharge pipe shall have a quick operating valve, controlled from the cab.

3.6.2 Type II (flusher). Type II vehicles shall be provided with a pressure discharge flusher system.

3.6.2.1 Piping system. A pump suction connection for a nominal 3.50 inch id pipe shall be provided in the center of the tank bottom. A pipe not less than 3.50 inches id shall extend from the bottom connection to the suction side of a pump. A readily accessible strainer shall be provided and a flexible coupling installed to take up vibration and expansion. A pump discharge header shall be provided. The discharge header shall be not less than 3-inch id pipe and shall be provided with a similar flexible coupling. Drain plugs shall be provided to completely drain the entire system.

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3.6.2.2 Nozzles. Three flusher nozzles shall be provided, one at the forward end of the truck and one on each side behind the cab. The nozzles shall be of brass or bronze and of horizontally split construction with smoothly finished orifice to produce a fan-shaped stream of water having a flow rate up to 150 gallons per minute (gpm) at 50 psi. Each nozzle shall be provided with three swing joints. The two side flushers shall be manually adjustable for flush patterns to effectively clean widths up to 40 feet. Three discharge branches shall be provided, one extending from the pump discharge header to each of the three flusher nozzles. The three discharge branches to the flusher nozzles shall be not less than 2.50 inch nominal pipe size and each shall be provided with a power actuated, quick-operating valve, easily accessible from the driver's seat, to quickly open or close any of the three flusher nozzles. A pressure gage to indicate the nozzle pressure shall be provided.

3.6.2.3 Pump. The pump shall be a single-stage, volute type, centrifugal pump with a maximum capacity of not less than 450 gpm at 125 psi to provide not less than 50 psi pressure at the flusher nozzles. The impeller renewable wearing rings shall be bronze. The impeller shaft shall turn in antifriction bearings. The case shall be close-grained cast iron with ready means for removal of impeller and shall be provided with necessary vent and drain facilities. The pump shall be connected to the auxiliary engine by a flexible coupling.

3.6.2.4 Auxiliary engine. A liquid cooled, four-stroke cycle, gasoline engine shall drive the pump. The engine shall be complete with pressure lubrication, radiator cooling system with water pump and fan, magneto or automotive type ignition with impulse coupling, carburetor with air filter, velocity type governor, a fuel pump, an electric starter connected to the truck battery, and necessary instructions for ready removal. A housing shall be provided to protect the engine during inclement weather. A manual throttle shall be provided in the vehicle cab to control the engine speed. For diesel engine driven vehicles, an auxiliary engine fuel tank shall be provided. For gasoline engine driven vehicles, the auxiliary engine fuel pump shall be connected to the vehicle fuel tank. The auxiliary engine fuel tank shall have sufficient capacity to provide eight hours of continuous, full load operation.

3.6.3 Type III (distributor). Type III vehicles shall be provided with a pressure discharge distributor system.

3.6.3.1 Spraybar. A spraybar shall be provided at the rear of the vehicle. The spraybar shall consist of an 8-foot center section with provisions to add extensions to each end of the spraybar to make a total length of not less than 16 feet. The extension sections shall be 1-foot and 2-foot lengths. The spraybar shall be provided with four 1-foot extension sections and two 2-foot extension sections. The two ends of the center section of the spraybar and the extension sections shall be provided with a

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snap-over-center type coupling device to connect extension sections to the center section and to connect each extension section together. The coupling device shall permit connection and disconnection by hand without the use of any tools. The coupling device shall permit the connection of extension sections in only one position to maintain positive nozzle alinement. The caps on each end of the spraybar shall be connected by use of the coupling device. The extension-section connections and the end-cap connections shall not leak during any operation specified herein. When the extension sections are attached to the spraybar, provisions shall be made to reduce the length of the spraybar to 8 feet by folding the extended section. The spraybar shall lock in both the folded and extended positions. The flow of water to the folded section shall be automatically cut off when the bar is in the folded position. Supports shall be provided for all bar lengths to prevent damage or deformation to the spraybar during operation or highway travel. The ends of the bar shall swing horizontally without damage to the bar when the extended sections strike an obstruction. The bar shall be equipped with brass slotted nozzles spaced not greater than 6 inches on centers. The threaded portion of the nozzle shall be not less than 0.675 inch in diameter and shall be attached to threaded bosses that are welded on or built into the spraybar. The nozzles shall not extend beyond the inside diameter of the spraybar. The bar shall be laterally and vertically adjustable by means of mechanical linkages and shall be operable from the operator's platform. Lateral adjustment each way from the center shall be not less than 10 inches. The spraybar shall be supported to prevent swaying at any vertical adjustment during operation or travel.

3.6.3.1.1 Application and distribution. The width of distribution shall be 4 feet, 8 feet, and from 8 feet through the full width of spraybar in increments of 1 foot. The rates of application shall be from 0.1 gallon through 2.0 gallons per square yard in increments of 0.1 gallon per square yard. The distributor shall apply water through the spraybar to the surface being sprayed at all combinations of specified widths and rates. The accuracy of distribution over a given area shall be within plus or minus 5 percent. The application shall be accomplished without streaking or puddling, and spray from each nozzle shall overlap spray from each adjacent nozzle by not less than 50 percent at any spraybar height within the 10-inch vertical, adjustable range. The vehicle forward speed for any required distribution rate shall be not less than the low speed for the vehicle (see 3.3.1.2) and not greater than 15 mph.

3.6.3.2 Engine driven pump. A gasoline engine driven pump unit shall be provided at the rear of the tank and shall be accessible for service and maintenance. The gasoline engine shall be connected by a flexible coupling to the pump.

3.6.3.2.1 Pump. The pump shall be an integral self-priming, 4-inch suction and discharge, single-stage, single-suction, centrifugal pump. The impeller and renewable wearing rings shall be bronze. The impeller shaft shall be stainless steel and shall turn in antifriction bearings. The case

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shall be closed grained cast iron, with ready means for removal of impeller. The pump shall be provided with necessary vent and drain facilities. When operated against a total head of 30 feet and using a 25-foot, static suction lift, the pump shall deliver not less than 25 gpm. The pump shall deliver minimum capacities as specified in table VII when operating at speeds not exceeding 2,800 rpm and using a 10-foot, static suction lift.

TABLE VII. Minimum pump capacity.

Total head in feet	Gallons per minute
100	100
90	250
80	350
60	450
30	500

3.6.3.2.2 Auxiliary engine. An auxiliary engine shall be provided as specified in 3.6.2.4.

3.6.3.3 Pump fittings and connections. Piping from the pump to the spraybar shall include a 1.50 inch hose outlet with external threads. The suction side of the pump shall be furnished with a 4-inch coupling conforming to MS39153 (faucet end) for connecting the suction hose. The 4-inch inlet and the 1.50 inch outlet shall be provided with dust covers secured by security chains or cables. The necessary pipe, fittings, and controls shall interconnect the pump to the distributor in a manner such that the following operations will be possible:

- (a) Pump water from an outside source, such as lakes, ponds, or streams into the tank
- (b) Pump water from the tank to the spraybar
- (c) Pump water from the tank to a 1.50 inch hose outlet without water entering the spraybar
- (d) Pump water from an outside source, without water entering the spraybar or tank, to a 1.50 inch hose outlet.

3.6.3.3.1 Strainer. A removable, galvanized strainer with perforations smaller than the spray-nozzle openings shall be placed in the suction line ahead of the pump so as to filter all water from the tank or an outside source prior to entry into the pump. The strainer shall be removable without removing any fittings or connections other than the 4-inch inlet dust cover.

3.6.3.4 Pressure gage. A pressure gage shall be connected to the discharge side of the pump to indicate pressure in the line. The gage shall be calibrated in 5-pound increments from 0 to not less than 110 percent of the maximum working pressure.

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3.6.3.5 Operator's platform. A platform for the operator shall be provided at the rear of the distributor. The platform shall extend the full width of the distributor. The platform shall be equipped with a rack for holding the discharge hose. The platform shall provide access to all distributor controls located at the rear of the distributor. Steps shall be provided for access to the platform from the ground. The platform and steps shall be provided with nonskid, metal decking.

3.6.3.6 Operating controls. All operating controls shall be located within reach of the operator while the operator is standing on the operator's platform. Controls shall be clearly identified for their intended operation and function on permanently affixed plates (see 3.1.1.8). Controls shall permit the following operations:

- (a) Fill the tank from an outside source using the pump
- (b) Pump water from the tank to either or both halves of the spraybar
- (c) Pump water from the tank to a 1.50 inch diameter connection for the hose attachment without water entering the spraybar
- (d) Empty the tank through the spraybar by gravity
- (e) Pump water from an outside source, without water entering the spraybar or tank, to a 1.25 inch hose outlet.

3.6.3.7 Instruction plate. An operating instruction plate shall be provided describing step-by-step procedures required to perform all operations specified herein and shall include a flow and valve diagram. The plate shall be permanently affixed to the distributor so as to be readily visible from the operator's platform (see 3.1.1.8).

3.6.3.8 Water control. An additional water control shall be provided to turn on and shut off the flow of water from the pump to the spraybar. The controls shall be located inside the cab of the truck and shall be operable by the driver in normal operating conditions.

3.6.3.9 Distribution charts. Two distribution charts shall be provided and shall contain the following information:

- (a) the pressure (pump gage)
- (b) the travel speed in feet per minute required to distribute water at all rates specified herein for the spraybar lengths of 4 feet, 8 feet, and from 8 feet through the full width of the spraybar in increments of 1 foot.

The charts shall be coated with a clear plastic material for protection. One chart shall be located inside the cab and shall be readily visible by the driver while in the operating position. One chart shall be affixed to the distributor and shall be readily visible from the operator's platform.

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3.6.3.10 Suction and discharge hoses. A suction hose assembly and a discharge hose assembly shall be provided. Provisions shall be furnished to stow the hose assemblies.

3.6.3.10.1 Suction hose assembly. The suction hose shall consist of three 10-foot sections of 4-inch noncollapsible hose. The sections of the hose shall be fitted with 4-inch couplings conforming to MS39153 (hose end on one end, faucet end on the other end). Each faucet end shall be provided with a dust cover secured by a chain or cable. One double adapter shall be furnished. The third section of the hose shall be fitted on one end with a hose end, quick-detachable coupling and on the other end with a 4-inch pipe nipple with APT threads. A 4-inch foot valve conforming to MIL-V-16721 shall be provided for use with the suction hose.

3.6.3.10.2 Discharge hose assembly. The discharge hose shall be 1.50 inch inside diameter, 25 feet long, and made of synthetic rubber. A nozzle conforming to MIL-N-12314, type III, class A, 1.50 inch width, 0.625 inch tip opening shall be provided. A 2.50 inch by 1.50 inch reducing connection shall be provided to connect the nozzle end of the hose to a fire hydrant. Fixtures with hose threads shall be mounted in the tool box to provide safe storage for the connector and the nozzle.

3.6.3.11 Tool box. The vehicle shall be provided with a tool box made of not less than 12 gage (0.1046) sheet steel. The tool box shall have an overlapping hinged lid which prevents the entry of rain and dirt. The lid shall be held closed with two hook-type fasteners. The tool box shall be of a size to hold all the spraybar extension sections specified in 3.6.3.1. Holddowns shall be provided for each spraybar section.

3.7 Servicing and adjusting. Prior to acceptance of the vehicle by the Government inspector, the contractor shall service and adjust each vehicle and its mounted equipment for operational use including at least the following: alinement of lights; adjustment of the engine, electrical and brake systems; filling and charging of battery; alinement of front wheels; inflation of all tires; complete lubrication of chassis, engine, running gear, and mounted equipment with grades of lubricants recommended for the ambient air temperature at the delivery point; servicing of cooling system with a solution of ethylene glycol type antifreeze and water in equal parts by volume; and servicing of windshield washer reservoir with water and appropriate additives.

3.8 Workmanship. Defective components or parts and assemblies which have been repaired or modified to overcome deficiencies shall not be furnished. Welded, bolted, and riveted construction utilized shall be in accordance with the highest standards of the industry.

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4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements (examination and tests) as specified herein. Except as otherwise specified in the contract, 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 contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility for ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this 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 Government verification. Quality assurance operations performed by the contractor will be subject to Government verification at unscheduled intervals. Verification will consist of observation of the operations to determine that practices, methods, and procedures of the contractor's inspection are being properly applied. Failure of the contractor to promptly correct product deficiencies discovered shall be cause for suspension of acceptance until correction has been made or until conformance of product to specification criteria has been demonstrated.

4.3 First production vehicle inspection. The first vehicle produced under the contract shall be inspected by the contractor at his plant under the direction and in the presence of Government representatives. The purpose of the inspection shall be to determine vehicle conformance to the contract. Acceptance of the first production vehicle shall not constitute a waiver by the Government of its rights under the provisions of the contract.

4.3.1 Vehicle weight. The first production vehicle shall be weighed to determine the curb weight and distribution of the curb weight on the front and rear axles. The total imposed loads on the front and rear axles shall be computed by the contractor and verified by the Government, using the curb weight, the operator weight at 175 pounds, and the payload required to provide the specified GVW. The calculated imposed loads on the front and rear axles shall be compared to the suspension, axles and tire load capacity ratings to determine if these components are of adequate capacity to meet contractual requirements.

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4.3.2 Road test. The vehicle, for rear wheel drive models and models built to all wheel drive while on the chassis manufacturer's production line, shall be road tested by the contractor with and without payload. The road test shall be for not less than 10 miles at speeds up to 55 mph. The vehicle, for all wheel drive models qualifying under 3.1.1.9, also shall be road tested with and without payload. The conversion unit road test for each of the two conditions (loaded and unloaded) shall be for not less than 30 miles at speeds up to 52 mph over highways and gravel roads and for not less than 5 miles at speeds up to 15 mph over cross country terrain with ground and grade requiring all wheel drive. During the loaded and empty portions of the road test, the brakes shall be applied firmly, bringing the vehicle to a sudden stop not less than 5 times during each portion of the road test. During the road test, the front and rear suspension and the drivetrain shall be periodically inspected for interference and contact with other vehicle components. Abnormal contact of the drivetrain or suspension components with other components shall be cause for rejection. Front spring bumpers shall not make contact with frame stops except under the most extreme cross country conditions. Operational or mechanical failure of vehicle components during the road test shall be cause for rejection. Failure includes permanent deformation as well as breakage.

4.3.3 Leakage test. The completely assembled tank body, including all piping, shall be tested for leaks at its design pressure in accordance with DoT Safety Regulations Governing Transportation of Hazardous Materials, Section 178.341, Specification MC306. In addition for types II and III, all piping and hoses shall be tested for leaks at the maximum pressure they can encounter during use of the vehicle mounted pump.

4.3.4 Pump test. Type II and III vehicle pumping equipment shall be tested to determine performance requirements specified in 3.6.2.3.1 and 3.6.3.2.1.

4.3.5 Body treatment and painting. The certification regarding the body cleaning, treating, prime painting and salt spray resistance testing, as required by MIL-STD-1223, shall be presented to Government representatives for examination and approval.

4.3.6 Radio frequency suppression verification. The vehicle manufacturer shall indicate on the military questionnaire (commercial vehicle engineering data) if the vehicle will be suppressed to limit electromagnetic radiation in accordance with SAE J551.

4.3.7 Production sample. Upon acceptance of the first production vehicle, it shall remain at the manufacturing facility as a production sample, and be the last vehicle shipped on the contract. The contractor shall maintain the vehicle in a serviceable condition for the duration of the contract.

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4.3.8 Failure. Failure of the first production vehicle to meet requirements of the contract shall be cause for the Government to refuse acceptance of all vehicles under contract until corrective action has been taken.

4.4 Inspection of production vehicles. The contractor's inspection system shall, as a minimum, assure that the vehicle conforms to the physical and dimensional requirements and is capable of meeting performance requirements contained herein. For each vehicle under contract, the contractor shall make available to the Government, at the point of final acceptance, records acceptable to the Government indicating that the servicing and adjusting required by 3.6 have been accomplished.

5. PACKAGING

5.1 Vehicle processing. The vehicle shall be processed for shipment, from manufacturer's plant to initial receiving activity, in accordance with the manufacturer's standard commercial practice.

6. NOTES

6.1 Intended use. The vehicles covered by this specification are intended for general nontactical use by the Government in the performance of the maintenance tasks indicated, and in accurately distributing water as necessary in soil stabilization and compaction operations.

6.2 Ordering data. Acquisition documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Type and class of vehicle required (see 1.2).
- (c) Issue of DODISS to be cited in the solicitation and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
- (d) Identification of appropriate service for painting and marking (see 3.1.1.1).
- (e) Concealed marking, if required (see 3.1.1.1).
- (f) Rustproofing, if required (see 3.1.1.2).
- (g) Tropical rustproofing, as specified (see 3.1.1.2).
- (h) Trailer towing package, if required (see 3.1.1.5).
- (i) Silicone brake fluid, if required (see 3.1.1.7).
- (j) Satisfactory operation on JP-4, JP-5 and JP-8 fuels, if required (see 3.4.1.1).
- (k) Gasoline engine, if required (see 3.4.1.2).
- (l) Silicone rubber hoses, if required (see 3.4.1.8).
- (m) Power plant heaters, if required (see 3.4.1.9).
- (n) If a battery is not required with power plant heaters (see 3.4.1.9).
- (o) Alternator capacity, if other than as specified (see 3.4.2.3).
- (p) A lighting cable, if required (see 3.4.2.6).

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- (q) An auxiliary 24-volt system with trailer receptacle, if required (see 3.4.2.8).
- (r) Automatic transmission, if required (see 3.4.5.3).
- (s) Oil lubricated wheel bearings and axle spindles, if required (see 3.4.9).
- (t) A two-speed axle, if required (see 3.4.9.1).
- (u) Traction control, if required (see 3.4.9.3).
- (v) Wide base type tires, if required (see 3.4.10).
- (w) Disc type wheels, if required (see 3.4.10).
- (x) Bias ply tires, if required (see 3.4.10.1).
- (y) A carrier for a spare wheel or rim and tire assembly, if required (see 3.4.10.3).
- (z) Spare wheel or rim, if required (see 3.4.10.4).
- (aa) Spare tire assembly, if required (see 3.4.10.5).
- (ab) If air brakes are required for class A and B vehicles (see 3.4.11.2).
- (ac) Brake controls for use from a towing vehicle, if required (see 3.4.11.4).
- (ad) Tilting hood and fender assembly, if required (see 3.4.12).
- (ae) A tilt type cab, if required (see 3.4.12).
- (af) Individual adjustable driver's and passenger seat, if required (see 3.4.12.1).
- (ag) Air ride driver's seat, if required (see 3.4.12.1).
- (ah) A crew-cab, if required (see 3.4.12.3).
- (ai) Tools, if required (see 3.4.16.1).
- (aj) Gages if required in lieu of indicators (see 3.4.19).
- (ak) Automatic engine shutdown system, if required (see 3.4.19).
- (al) An air operated horn, if required (see 3.4.21).
- (am) Winch assembly, if required (see 3.4.22).
- (an) A backup alarm, if required (see 3.4.24).

6.3 Performance prediction. SAE Truck Ability Prediction Procedure computations and computations for low speed and maximum geared speed will be required by the contract. The SAE Work Sheet Item 1 should include vehicle model number, engine model number, and vehicle type and class. Unless other conditions are cited in the contract computations should be made for normal atmospheric pressure, normal ambient air temperature, and still, dry air. The factors to be used in predicting truck ability (see 3.3.1.1) are established as follows for the corresponding SAE Truck Ability Prediction Procedure Tables:

Table 1	- <u>Tire Factor.</u> This factor must relate to the size of tires furnished by the contractor in accordance with this specification.
Table 2	- <u>Altitude Factor.</u> 1.00
Table 3	- <u>Rolling Factor.</u> 1.613
Table 4	- <u>Area Factor.</u> 0.173
Table 5	- <u>Velocity Factor.</u> 250.0

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Table 6	- <u>Altitude Factor</u> . 1.00
Table 7	- <u>Chassis Friction Horsepower</u> . Use applicable power unit GVW (to nearest, higher, tabulated 1,000 pounds) and the engine rpm (to nearest 100 revolutions) which is required for 50 mph geared speed. For GVW and engine speed beyond the range of this table, factors shall be extrapolated.
Table 8	- <u>Grade Factor</u> . 0.75.
Table 8A	- <u>Correction Factor</u> . Not required.
Table 9	- <u>Road Factor</u> . 0.0.

6.4 Subject term (key word) listing.

Catwalk
Piping system
Skirting
Soil compaction
Soil stabilization
Spraybar.

6.5 Identification of changes. Asterisks are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

6.6 Classification change. Tank truck, 2,000 gallon, diesel engine driven, 34,500 and 43,000 GVW, 6x4 and 6x6 of MIL-T-62323A, dated 26 April 1982, may now be procured under class 34.5 and 43 of this specification. MIL-T-62323A was cancelled 2 November 1984.

Custodians:
Army - AT
Navy - YD
Air Force - 99

Preparing activity:
Army - AT

Project No.2320-0441

Review Activity:
Air Force - 84

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<p>DOCUMENT IDENTIFIER (Number) AND TITLE MIL-T-62068C TRUCK TANK: SPRINKLER, FLUSHER AND DISTRIBUTOR TYPES, 1000 TO 2000 GALLON, DED AND GED, 16,000 TO 43,000</p>	
<p>NAME OF ORGANIZATION AND ADDRESS OF SUBMITTER GVW, 4x2, 6x4, AND 6x6, COMMERCIAL</p>	
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