Fed Std 794 AC
July 1, 2009
Superseding
Fed Std 794AB
June 1, 2008

FEDERAL STANDARD

TRUCKS: MEDIUM COMMERCIAL, 4X2 and 4X4 9,500 TO 16,000 KG (21,000 TO 35,000 LBS) GVWR

794

TRUCKS AND TRUCK TRACTORS: Medium Commercial 4X2 & 4X4, 9,500 TO 16,000 KG (21,000 TO 35,000 LBS) GVWR

Federal Standards Number 794AC July 1, 2009
Superseding Federal Standard Number 794AB, June 1, 2008

1. SCOPE AND CLASSIFICATION

1.1 SCOPE.

This document covers new commercially produced, four wheeled, two and four wheel drive (4x2 & 4x4) medium trucks. It is intended to simplify competitive procurement of commercial vehicles, and achieve a practical degree of standardization within the federal fleet.

This Federal Standard does not include all the varieties of the commodity indicated by the title but is intended to cover only those vehicles generally acquired by the Government. This standard highlights, in concise form, types of trucks with standardized components and equipment. A selection of coded optional additional systems and equipment is included for agencies divergent geographic and operational related needs. The requirements of the standard may be tailored to meet unusual operating conditions, to incorporate special purpose equipment, and to provide for exceptions not otherwise covered.

These trucks are warranted by the contractor/supplier upon delivery as specified in 6.3 of this standard. Vehicle procurement must comply with the Federal Property Management Regulations (FPMR) and the Federal Procurement Regulations (FPR).

The types of vehicles covered by this standard are listed below.

1.2 CLASSIFICATION.

The vehicle(s) are divided into “Types” and “Classes.” The vehicle types are determined by the chassis/body configuration. The “Class” of vehicle(s) shall be determined by the minimum gross vehicle weight rating (GVWR) as follows:

Figure 1. Types and Classes

TYPES	NOMENCLATURE	CLASS
I	Chassis, truck, with cab (see 3.5.1)	C D F G
II	Truck, tractor, with cab (see 3.5.2)	E F G
III	Truck, stake, with cab (see 3.5.3)	C D F
IV	Truck, dump, with cab (see 3.5.4)	C D F G
V	Reserved	Reserved
VI	Reserved	Reserved
VII	Truck, van, with cab (see 3.5.7)	C D F
VIII	Truck, refrigerator van, with cab (see 3.5.8)	C D F

CLASS	C	D	E	F	G
(KG)	9,500	11,500	12,700	14,500	15,900
(LBS)	21,000	25,500	28,000	32,000	35,000

ITEM #	TYPE	CLASS	ITEM #	TYPE	CLASS
414	I	C	434	III	C
444	IV	C	571	VII	D
			573	VII	F
474	VII	C	581	VIII	D
484	VIII	C	583	VIII	F
511	I	D	712	I	D
513	I	F	714	I	F
514	I	G	732	III	D
522	II	E	734	III	F
523	II	F	742	IV	D
524	II	G	744	IV	F
531	III	D	745	IV	G
533	III	F			
541	IV	D			
543	IV	F			
544	IV	G			

1.3 STANDARD TRUCK AND ALTERNATE COMPONENTS.

The standard truck shown as a “numbered item” with components listed as “GSA Min Req” in the Autochoice/Autostandards database are minimum requirements and shall be furnished in accordance with the referenced specification. A selection of alternate options and equipment are listed under “Options Description” in each item number at the end of the minimum requirements for each Item Number with “codes” applicable to the specific type/style truck. These shall be furnished when the code(s) are specified. NOTE: Payload is reduced by the weight of options specified such as lift gates, winch, snowplow, increased body size, and other equipment not included in the minimums for each Standard Item.

2. APPLICABLE DOCUMENTS

2.1 ISSUES OF DOCUMENTS.

The following documents of the issue in effect on date of invitation for bids or request for proposal form a part of this standard to the extent specified herein.

Fed. Std. No. 595B -Colors.

Federal standards and specifications are available from:

GSA Specification Section
Suite 8100
470 L’Enfant Plaza, S.W.
Washington, D.C. 20407

Telephone: (202) 619-8925.

Copies of this standard are available on the Internet at www.gsa.gov.

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, in effect on date of solicitation.

COMMERCIAL ITEM DESCRIPTIONS

A-A-55439 Battery, Storage: Vehicular, Ignition, Lighting and Starting.

A-A-50271 Plate, Identification, instruction and marking.

HANDBOOKS

MIL-HDBK–1223 Nontactical Wheeled Vehicles Treatment, Painting, Identification Marking, and Data Plate Standard.

MIL-HDBK–1791 .... Designing for Internal Aerial Delivery in Fixed Wing Aircraft

DH-1-11AFSC Design Handbook.

SPECIFICATIONS

MILITARY

MIL-T-5624 Turbine Fuel, Aviation, Grades JP - 4 and JP-5.

MIL-T-83133 Turbine Fuel, Aviation, Kerosene Type, Grade JP-8.

MIL-PRE-20696 Cloth, Waterproof, Weather Resistant.

STANDARDS

FEDERAL

FED-STD-297 Rustproofing of Commercial (Nontactical) Vehicles.

MILITARY

MIL-STD-209 Lifting and Tiedown Provisions

MS 75020 Connector, Plug, Electrical - 12 Contact, Intervehicular, 28-Volt, Waterproof.

MS 75021 Connector, Receptacle, Electrical - 12 Contact, Intervehicular, 28-Volt, Waterproof.

Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from:

Naval Publications and Forms Center
Military Specifications and Standard, Bldg. 4D
700 Robbins Avenue
Philadelphia, PA 19111-5094

2.1.2 OTHER GOVERNMENT DOCUMENTS, DRAWINGS, AND PUBLICATIONS.

The following other Government document, drawings, and publications form a part of this specification to the extent specified herein. Unless otherwise specified, the issues are those in effect on date of solicitation.

Department of Commerce (DOC)

Voluntary Product Standard PS 1-95 Construction and Industrial Plywood

Application for copies of DOC publications should be addressed to:

Superintendent of Documents

U.S. Government Printing Office
Washington, D.C. 20402-9325.)

DEPARTMENT OF TRANSPORTATION (DOT)

Federal Motor Carrier Safety Regulations.

Federal Motor Vehicle Safety Standards.

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, DC 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.

Application for copies of EPA publications should reference the Code of Federal Regulations, 40 CFR, and the Federal Register and should be addressed to:

Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

Subpart N Cranes, Derricks, Hoists, Elevators, and Conveyors.

Application for copies of OSHA publications should reference the Code of Federal Regulations, 29 CFR, and the Federal Register and should be addressed to:

The Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402.)

2.2 NON-GOVERNMENT PUBLICATIONS.

The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issued of the documents that are DOD adopted are those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents in effect on the date of solicitation.

THE EUROPEAN TYRE AND RIM TECHNICAL ORGANIZATION (ETRTO)

Standards Manual.

Application for copies of the ETRTO publication should be addressed to:

European Tyre and Rim Technical Organizations
32, Avenue Brugman
1060 Brussels, Belgium

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA No. 70 National Electric Code.

Application for copies of NFPA publications should be addressed to:

The National Fire Association
Batterymarch Park
Quincy, MA 02269

NATIONAL TRUCK EQUIPMENT ASSOCIATION (NTEA)

Conversion Hoist Chart.

Dump Body Hoist Chart.

Application for copies of NTEA publications should be addressed to:

National Truck Equipment Association
38705 Seven Mile Road, Suite 345
Livonia, MI 48152

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).

J350 Spark Arrester Test Procedure for Medium Size Engines (DOD adopted).

J516 Hydraulic Hose Fittings.

J517 Hydraulic Hose.

J537 Storage Batteries.

J551 Performance Levels and Methods Measurement of Electromagnetic Radiation from Vehicles and Devices (30-1000 MHz).

J560 Seven-Conductor Electrical Connector for Truck-Trailer Jumper Cable.

J682 Rear Wheel Splash and Stone Throw Protection (DOD adopted).

J683 Tire Chain Clearance - Trucks, Buses, and Combinations of Vehicles.

J700 Upper Coupler Kingpin - Commercial Trailers and Semi trailers.

J704 Openings for Six- and Eight-Bolt Truck Transmission Mounted Power Take-Offs.

J844 Nonmetallic Air Brake System Tubing (DOD adopted).

J994 Alarm- Backup- Electric.

J1067 Seven-Conductor Jacketed Cable for Truck-Trailer Connections.

J2188 Truck Ability Prediction Procedure (DOD adopted).

(Application for copies of SAE publication 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 publication should be addressed to:

Tire and Rim Association, Inc.,
175 Montrose West Avenue
Copley, OH 44321

THE MAINTENANCE COUNCIL (TMC).

Recommended Maintenance Practices Manual.

RP 105B Battery Cable Assemblies.
RP 109A Battery Ratings and Engine Cranking Requirements
RP 111B Circuit Protections
RP 112 Terminals for Heavy Duty Truck-Tractor Primary Wiring Systems.
RP 113A Electrical Systems Connectors.
RP 114A Harness Protection.
RP 118A Turn Signal Switches.
RP 120A Wiring Systems Identification.
RP 137 Antilock electrical supply for tractors through SAE J560 seven pin connector.
RP 138 Auxiliary forward lighting.
RP 321 Fuel Crossover Line Protection and Configuration Guidelines.
RP 325 Radiator Integrity for Highway Trucks.
RP 329 Specifications for Ethylene Glycol Base Coolant Containing Nitrite.
RP 403 Placement of Safety Equipment.
RP 404B Truck and Tractor Access System
RP 417 Supporting pneumatic electrical lines between cab and trailer.
RP 418 Heavy-duty, in-cab R134A air conditioning systems.
RP 624 Synthetic Lubricants.
RP 637 Air Dryer Guidelines.
RP 710 Overhead door selection.
RP 711 12 year life swing - type freight van, trailer doors.

Applications for copies of TMC publications should be addressed to:

The Maintenance Council
American Trucking Associations
2200 Mill Road
Alexandria, VA 22314-5388.)

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 specified exemption has been obtained.

2.4 ABBREVIATIONS AND DEFINITIONS.

Following are the abbreviations or contractions and their meanings as they appear and are used in this standard:

ABBREVIATIONS	DEFINITIONS
AMP	AMPERE
AT	ALL TERRAIN TIRES
AUX	AUXILIARY
BAT	BATTERY
BBC	FRONT BUMPER TO BACK OF CAB
CA	CAB TO CENTER OF REAR AXLE
CAP	CAPACITY
CM	CENTIMETERS

CYL .....CYLINDERS
DIA .....DIAMETER (IN INCHES)
FC.....FORWARD CONTROL
FT .....FOOT OR FEET
FRT .....FRONT
GAS.....GASOLINE

ABBREVIATIONS	DEFINITIONS

GAWR .....GROSS AXLE WEIGHT RATING
GCWR.....GROSS COMBINED WEIGHT RATING
GHP.....GROSS HORSEPOWER
GVWR .....GROSS VEHICLE WEIGHT RATING
H.D. .....HEAVY DUTY
H.D.A.....HEAVIEST DUTY AVAILABLE
HWY .....HIGHWAY
HYD.....HYDRAULIC
IN.....INCHES
KG .....KILOGRAMS
L .....LITERS
LBS.....POUNDS
M .....METERS
MAN .....MANUAL
MAX.....MAXIMUM
MFR.....MANUFACTURER'S
MIN.....MINIMUM
MPG .....MILES PER GALLON
MSPC.....MFR. STD. PAINT COLOR
N/A .....NOT APPLICABLE OR NOT AVAILABLE
NHP.....NET HORSEPOWER
OEM .....ORIGINAL EQUIPMENT MANUFACTURER
OO.....ON-OFF ROAD TIRES
OPT .....OPTION, OPTIONAL
PASS.....PASSENGERS
PTO .....POWER TAKEOFF OPENING
RAD.....RADIAL
RBM .....RESISTING BENDING MOMENT
SPD .....SPEED
STD .....STANDARD (SPECIFICATIONS)
V .....V-TYPE (ENGINE)
W/, & W/O .....WITH, AND WITHOUT
/ .....AND

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 standard. 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. Component rated capacities shall not exceed those published in the manufacturers' 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 available to 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.

3.1.1.1 TREATMENT AND PAINTING.
The vehicle body, including compartments, doors, and tool boxes, except bright finish aluminum and stainless steel, shall be treated and painted in accordance with MIL-HDBK-1223. Interiors on dump bodies need not be painted. The manufacturer's standard treatment and painting for cab and chassis is acceptable. Unless otherwise specified, the exterior color shall be selected by the manufacturer from one of the manufacturer's standard, nonmetallic light or medium colors. When specified, color selection will be made after contract award from the standard color charts to be supplied by the manufacturer.

3.1.1.2 DRAIN PLUGS.
Drain plugs installed in manual transmissions, transfer case and rear axles shall be of the permanent magnet type.

3.1.1.3 WOOD TREATMENT.
Unless otherwise specified, the manufacturer's standard wood treatment is acceptable. Soft wood shall be pressure treated with a wood preservative. Hardwood need not be treated. When specified, wood shall be treated in accordance with MIL- HDBK-1223.

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 WHEEL SPLASH AND STONE THROW PROTECTION.
Type III stakes, Type IV dumps, Type VII vans, and Type VIII refrigerator vans shall have rubber mud flaps to the rear of the rear wheels. Type II tractors shall have rigid quarter fenders to the front of the rear wheels and rubber mud flaps to the rear of the rear wheels. Tractor mud flaps and their extension supports shall be readily removable, to increase landing wheel clearance, without the use of hand tools. A metal strip not less than 3.2 mm (0.125 in) thick and not less than 25 mm (1 in) 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 25 mm (1 in) high by 32 mm (1.25 in) wide by 2.4 mm (0.094 in) thick shall be furnished at each bolt. All tilt cabs shall have rubber mud flaps to the rear of the front wheels. All splash shield and mud flap installations, front and rear, shall conform to the rear splash and stone throw protection provisions of SAE J682. The quarter fenders on tractors need extend down only to the height of the

centerline of the rear axle. Splash shields shall have no advertising or logos, except that of chassis or body manufacturer.

3.1.1.6 BRUSH GUARD.

The 4x4 vehicle shall be equipped with a radiator and headlamp brush guard. When the headlamps are recessed into and protected by the front bumper, a headlamp brush guard is not required.

3.1.1.7 4X4 CONVERSION.

The chassis manufacturer's standard 4x2 truck chassis may be modified to provide all-wheel drive conforming to the requirements specified herein if:

(a) The conversion axle manufacturer 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.

(b) The chassis manufacturer's front axle rating before conversion is not exceeded by 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 560 mm (22 inches) and not more than 1370 mm (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, 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.

(h) Complete installation drawings for the specific chassis are available.

(i) Warranty and parts service is available at a facility no more distant than the chassis manufacturers nearest authorized dealer.

3.1.1.8 ELECTRICAL COMPONENTS FOR TRUCK BODIES AND ACCESSORY EQUIPMENT.

Truck bodies and accessory equipment shall conform to TMC RP 105B, RP 111B, RP 112, RP 113A, RP 114A, and RP 120A when applicable.

3.1.1.9 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. On

truck tractors, the brake lights need to override the four-way flasher only when coupled to a semi trailer, in accordance with TMC RP 118A.

3.1.1.10 HYDRAULIC SYSTEM GENERAL REQUIREMENTS.

The following requirements shall apply to vocational hydraulic systems installed on vehicles covered by this Standard. Hydraulic tailgates are exempt from these requirements.

A. Drive systems.

Hydraulic pumps shall be driven by one of the following:

1. Engine or transmission mounted PTO. Pumps shall be flange mounted for transmission mounted PTO. Drive shafts from the PTO to the pump are not acceptable. Belt drives of any type are not acceptable and shall not be used.
2. Electric motor driven pumps (authorized for hydraulic tailgates only) shall be flange mounted to the electric motor.
3. Engine crankshaft front PTO driven. Only OEM integral frame extensions and OEM approved and furnished chassis for front PTO shall be used.
4. Pump support brackets shall be installed from the transmission to support the pump(s) if the combined weight of the pump(s), hoses, and fittings exceed 40 lbs., of if the combined length of the PTO and pump(s) exceeds 18 inches measured form the center-line of the PTO to the end of the pump(s).
5. PTO's shall be rated at a minimum of 150% of the maximum horsepower requirement of the hydraulic system. The minimum PTO horsepower rating shall be calculated by the following formula:

$$\frac{PV \times 1.50}{1714 \times .85} = \text{Minimum PTO HP Rating}$$

Where P = max working pressure in PSI and V = max flow in GPM

6. PTO's shall be of the power shift design. PTO shift controls shall be electric-over-hydraulic for automatic transmissions, manual transmissions shall have electric shift controls for hydraulic braked chassis and air shift controls for air braked chassis. There shall be a PTO engagement indicator located in the truck cab, in close proximity to control switch. Over speed engagement protection shall be furnished. PTO shall disengage when pre-set engine RPM is reached.
7. The torque or horsepower required of the hydraulic drive PTO shall not exceed the maximum torque or horsepower rating of the PTO opening on the transmission or PTO drive pad on the engine or engine crankshaft.
8. All PTO's shall be installed within the backlash recommendations of the PTO manufacturer.

B. Hydraulic system hoses, fittings, pressures, and flow rates.

1. Hydraulic hoses shall be rubber covered double wire braid reinforced and comply with SAE 100R2, Type A or AT, or 100R9, type A or AT, of SAE J517. The working pressure of the hose shall exceed the pressure setting of the relief valve. Hoses shall be sized such that the maximum velocity of hydraulic fluid in the hose does not exceed the following:

a. Fluid velocity in suction lines shall not exceed 4 ft. / sec.

b. Fluid velocity in discharge lines shall not exceed 25 ft. / sec

2. All hoses shall be installed in accordance with the requirements and recommendations of SAE J1273

3. System working pressures shall not exceed 3500 PSI. A system pressure test port shall be provided. The test port shall be located so that the maximum pressure produced by the system can be monitored without disconnecting any component of the system.

4. Hydraulically actuated implements, such as snowplows, which are deployed while the vehicle is moving, shall be furnished with an automatic reset breakaway mechanism to prevent hydraulic shock if the implement strikes an obstruction while the vehicle is in operation.

5. Hydraulic hose fittings shall comply with the requirements of SAE J516 for permanently attached (crimped) fittings with JIC 37° flare. Field replaceable type fittings are not acceptable. Forged steel hydraulic adapters shall be used. Cast steel fittings are not acceptable.

C. Pressure protection:

All hydraulic systems shall be furnished with either a spring or pilot actuated pressure relief valve. The relief valve shall be used for overpressure protection only and shall not be used for any flow control purpose. In no case shall a relief valve be set at a pressure higher than the working pressure of the lowest rated component (hose, coupler, adapter, cylinder, etc.) in the system.

D. Flow control valves.

Flow control valves shall be of a type (such as open-center valves) that assures that hydraulic fluid is never deadheaded and forced to flow over the relief valve. Flow control valves shall be expandable to control multiple devices, either in parallel or in series. Series designed systems shall not exceed the maximum working pressure of any component in the series. Flow control valve body shall not be mounted inside the cab. Flow control valves shall be operated through leavers mounted inside the cab within easy reach of the seated driver. Control leavers shall operate flow control valves through flexible cables or air pressure and permit smooth, infinitely variable operation of equipment through the full designed range of operational travel/speed limits of the equipment.

E. Fluid filtration.

A return line hydraulic filter shall be furnished having a minimum efficiency rating of 99% down to 10-micron size particles and meet or exceed the filtration requirements of the pump, motor, or driven device manufacturer. The filter shall be furnished with a pressure differential type service gage or service indicator.

F. Hydraulic system cooling.

Hydraulic systems shall be designed to operate in ambient temperatures ranging from –20 deg F to +120 deg F.

The hydraulic system shall be designed such that the maximum hydraulic oil temperature does not exceed 200 deg. F. For continuously driven devices, such as spreaders and other motor driven applications, auxiliary cooling, such as air-to-oil coolers or water-to-oil coolers, shall be furnished if required to meet the

maximum oil temperature requirement. The government reserves the right to request and be furnished test documents showing maximum stabilized temperatures of hydraulic systems.

G. Hydraulic reservoirs.

A stainless steel, aluminum (6061-T6 or 5086-H32 construction only), or other non corroding type hydraulic reservoir shall be furnished and sized such that the reservoir working volume is a minimum of 150% of the maximum hydraulic flow rate. The reservoir shall be furnished with the following:

1. The reservoir shall be furnished with a baffle separating the suction from the return flow.
2. The reservoir shall be furnished with minimum ¾ in. air filtration type breather or combination breather cap with not greater than 10-micron air born particle rating.
3. The reservoir shall be furnished with a sump and valve for draining water from the bottom of the tank and for draining oil.
4. The reservoir shall be furnished with a metal enclosed and protected sight glass for observing oil level.
5. The reservoir shall be furnished with a maximum 300 mesh (50 micron) fill strainer.
6. The reservoir shall incorporate a return tube that discharges return oil below the surface of the reservoir oil.

H. Hydraulic oil.

Hydraulic oils shall meet the minimum requirements of the hydraulic pump or other critical component manufacturer(s). Water based hydraulic fluids shall not be used. A nameplate shall be affixed near the fill cap on the reservoir indicating the type of oil to be used. See 3.1.1.6.

I. Installation and workmanship.

The hydraulic system shall comply with the following requirements:

1. All tapered threaded fittings shall be installed using an anti-seize thread sealing compound. Teflon tape is not acceptable.
2. Hoses shall be routed for easy tracing of hoses and shall be protected with grommets when passing through bulkheads. Hoses shall be protected from abrasion when routed over or through bare metal edges.
3. Hydraulic hoses shall be supported with metal hose clamps that provide protection for the hose from the metal portion of the clamp. Hoses shall not be allowed to droop or to be entangled with other hoses or lines. The clamps shall be spaced not more than 18 in. apart.
4. Overhanging weight of fittings, hoses, valves, or piping shall be supported from the reservoir to eliminate flexing of sidewalls.
5. All hoses shall be routed and installed in accordance with the requirements and recommendations of SAE J1273. Special attention to routing and installation shall be given to avoid the following:
    a. Tensile loads on the hose

b. Side loads
c. Flattening
d. Kinking
e. Thread damage
f. Damage to sealing surfaces
g. Abrasion
h. Twisting
i. Exceeding minimum hose bend radius
j. Operational Test

The hydraulic system and hydraulically driven components shall be operated and checked for leaks and proper operation. The operational test shall include the maximum requirements (height, extension, speed, etc.) of the driven devices under no-load conditions. No leakage is permitted beyond a class "1" leak in accordance with SAE J1176-External Leakage Classifications for Hydraulic Systems.

3.2 GENERAL DESIGN.

3.2.1 FEDERAL MOTOR VEHICLE SAFETY STANDARDS.

The vehicle 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 and engine shall conform to 40 CFR Subchapter C-Part 86 - "Control of Emissions from New and In-use Highway Vehicles and Engines", as evidenced by an EPA certificate of compliance. Vehicles shall also comply with all pollution control requirements for the state of final destination. Certificates of compliance shall be made available upon request.

3.2.3 SOUND LEVEL.

The cab interior sound level shall not exceed 84 db(A) when measured in accordance with Federal Motor Carrier Safety Regulation 393.94. The vehicle exterior sound level shall conform to the Environmental Protection Agency Noise Emission Standards for Transportation Equipment, Medium and Heavy Trucks.

3.2.4 CURB WEIGHT.

The curb weight is defined as the empty weight (no payload included) of a fully equipped truck. Curb weight shall include the chassis-cab, body or fifth wheel for Type I chassis, all attached devices, equipment, and full complement of fuel, lubricants, and coolants.

3.2.5 GROSS VEHICLE WEIGHT.

The gross vehicle weight (GVW) shall consist of the curb weight, operator and passenger weight (computed at 80 kg (175 lb each) and a payload to provide not more than the specified GVWR.

3.2.6 SPECIFIED GAWR.

Class D, GVWR shall not exceed 11,800 kg (26,000 lb), without written approval of customer agency. Except Type II tractors, which are all subject to excise tax, Class F,

vehicles shall not exceed 15,000 kg (33,000 lb) GVWR, without written approval of customer agency.

3.2.7 GROSS COMBINATION WEIGHT.
Gross combination weight (GCW) shall consist of the truck or truck tractor curb weight, operator and passenger weight (computed at 80 kg (175 lb) each), and the weight of a trailer loaded to provide not less than the specified GCW. The fifth wheel shall be located so that with the truck tractor loaded to GVWR, the load rating of the chassis components are not exceeded.

3.2.8 WEIGHT DISTRIBUTION.
Except as specified in option codes MPR and MPS, the distribution of GVW for the purpose of establishing suspension, axle and tire capacities shall be determined with the payload uniformly distributed over the load area. For Type II tractors furnished with a sliding fifth wheel, option code ARW, the weight distribution shall be determined with the sliding fifth wheel in its most forward position of adjustment.

3.2.9 RATINGS.
Vehicle ratings shall be the manufacturer's published ratings. Component and vehicular ratings shall not be raised to meet the requirement of this specification. Minimum GVWR and GCWR shall conform to Figure 1 for the specified class of vehicle. All individual components, including engine, transmission, driveline and drive axle, shall have a minimum GCWR specified for each class.

Figure 1

GVWR and GCWR Minimums

VEHICLE CLASS	GVWR, KG (LBS)	GCWR, KG (LBS)
C	9,500 (21,000)	13,650 (30,000)
D	11,500 (25,500)	19,500 (43,000)
E	12,700 (28,000)	20,400 (45,000)
F	14,500 (32,000)	24,950 (55,000)
G	15,900 (35,000)	27,200 (60,000)

3.2.10 OVERALL WIDTH.
The overall width of the vehicle, exclusive of tires, wheel nuts and safety related items such as mirror, lights, and reflectors shall be not more than 2440 mm (96 inches). The width over the tires shall be not more than 2540 mm (100 inches).

3.2.11 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.

3.2.12 RECOVERED MATERIALS / REGULATORY REQUIREMENTS.
In accordance with Section 23.403 of the Federal Acquisition Regulations, the Government's policy is to acquire items composed of the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition without adversely affecting performance requirements or exposing supplier's employees to undue hazards from the recovered materials. The term "recovered materials" means materials that have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt

products is allowed under this document. The use of re-refined oil shall not be prohibited. This does not prohibit vehicle manufacturers from using performance criteria for acceptable oil. Any re-refined oil products shall meet the performance criteria of the vehicle and component manufacturers.

3.3 PERFORMANCE.

3.3.1 MAXIMUM VEHICLE SPEED

The maximum vehicle governed speed shall be not less than 113 km/h (70 mph) or more than 121 km/h (75 mph) for 4x2 and not less than 96 km/h (60 mph) or more than 104 km/h (65 mph) for 4x4. Under no circumstance shall the vehicle maximum governed speed exceed the speed rating of any of the furnished tires.

3.3.2 SERVICE BRAKES.

On all vehicles except Type II tractors, the service brakes shall stop the vehicle, loaded to specified GVW, within the stopping distance requirements of Federal Motor Carrier Safety Regulation 393.52. The service brakes on Type II tractors shall stop the tractor-semitrailer combination, loaded to specified GCW, within the stopping distance requirements of Federal Motor Carrier Safety Regulation 393.52. All service brakes shall be of the self-adjusting type.

3.4 CHASSIS COMPONENTS.

3.4.1 ENGINE.

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

3.4.1.1 DIESEL ENGINE.

Unless otherwise specified, the vehicle shall be equipped with a liquid cooled, compression ignited, diesel engine, electronically controlled, with not less than six cylinders.

3.4.1.2 OIL FILTER.

A full flow or combination full flow and bypass oil filter with replaceable element shall be furnished.

3.4.1.3 GOVERNOR.

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

3.4.1.4 COOLING SYSTEM.

The chassis manufacturer's heaviest duty cooling system for the model provided shall be supplied. The cooling system shall include a surge tank or a coolant recovery reservoir of not less than 1.89 L (two quart) capacity. On tilt cab models, a radiator servicing access door shall be provided if needed to allow verification of the coolant level without tilting the cab. For all Item numbers, the radiator furnished shall conform to TMC RP 325.

3.4.1.4.1 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.

3.4.1.4.2 ENGINE COOLANT.
The engine coolant shall be a solution of chassis manufacturers ethylene glycol antifreeze and water or propylene glycol antifreeze and water, in equal parts of antifreeze and water by volume (-36°C (-34°F protection)). The coolant supplied shall comply with TMC-RP329 or TMC-RP330 as applicable.

3.4.1.4.3 ENGINE BLOCK HEATER
Engine block heater of the OEM chassis manufacturer's 110/120 – volt design shall be furnished. A 25 ft. long commercial grade outdoor rated power line cable with in-line automatic reset Ground Fault Circuit Interrupter (GFCI) shall be furnished. The furnished power cable shall be UL Listed and rated no less than 10% greater than the maximum capacity of the furnished block heater.

3.4.1.5 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.

3.4.1.6 ELECTRONIC THROTTLE CONTROL.
An electronic hand throttle control with quick release shall be furnished.

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.
A 12-volt engine starting system, with 12-volt direct current (DC) lighting system shall be furnished. On diesel engines 6.6L and larger, the electric starter motor shall be equipped with a thermostat controlled, automatic resetting circuit breaker to protect the motor from over crank heat damage. Easily accessible remote jump - start post(s) shall be furnished, within close proximity to the battery box. Posts shall be furnished with protective rubber or plastic type covers that are tethered to prevent loss.

3.4.2.2 ALTERNATOR.
Unless otherwise specified, a minimum 130-ampere alternator shall be provided. The alternator output with the engine at idle speed shall be not less than 70 amperes.

3.4.2.3 LIGHTING.
All vehicle lights, reflectors, and wiring shall conform to Federal Motor Carrier Safety Regulations 393.19, 393.20 and 393.22 through 393.26(d). LED lighting shall be provided on all vocational body lamps. All added stop/tail directional, and marker lights shall be light emitting diodes. LED lights shall be installed with tamper resistant hardware.
Type I chassis need not be furnished with rear identification lamps or clearance lamps and reflectors. Type IV dump rear lighting shall be positioned or guarded to prevent damage during dumping of the cargo. Positioning and guarding shall permit normal replacement of the bulbs and lenses. Lights and reflectors shall not be mounted on vertical surface of rub rails (unless recessed and fully protected) or mounted on vehicle bumpers. When right hand drive is specified by acquisition documents, left-dip headlights shall be provided. Left-dip headlights may be provided as a replacement set, stowed in the cab for shipment. Daytime running lights shall be furnished, in accordance with FMVSS 108, and TMC RP 138. Truck bodies shall be furnished with conspicuity markings in accordance with FMVSS 49 CFR Part 571.108.

3.4.2.4 TURN SIGNALS.
Turn signal control shall be mounted on the steering column. Type II tractor turn signal units shall be visible when not in combination with a towed vehicle. Turn signals shall have visible flash indicators. Temporary mounting for rear signal units shall be provided on chassis models. Turn signals shall conform to TMC RP 118A.

3.4.2.5 LIGHTING CABLE FOR TYPE II TRUCK TRACTOR.
The semitrailer lighting cable for Type II tractors shall conform to SAE J1067. The cable shall incorporate a connector conforming to SAE J560 on both ends of the cable and a weather proof receptacle conforming to SAE J560 shall be mounted in the back wall of the cab . The cable shall be coiled and shall have an extended length of not less than 110 inches. The SAE J560 connector shall include a grip for withdrawing from the cab and semitrailer receptacle. Support for the cable shall be provided by the means of a hook and hanging loop or a protective holding bracket. Unless otherwise specified, support shall be by:

(a) A hook provided on the rear of the truck tractor cab.
(b) A hook on a pogo-stick type hose tender.
(c) A protective bracket mounted at the rear of the cab below the roofline. Each shall hold the cable plug so as to prevent water from entering the terminals. The lighting cable; when on the hook, loop or protective bracket; shall be accessible to an operator standing on the ground to the rear of the cab, on the street side of the vehicle.

3.4.2.6 BATTERIES.
Each battery shall be of 12-volt potential. The total reserve capacity ratings and the total cold cranking ampere ratings at -18°C (0°F), both measured in accordance with SAE J537, shall be not less than specified in Figure 2. The batteries shall be of the maintenance-free type having the maintenance-free characteristics listed in A-A-55439. Batteries shall conform to TMC RP 109A.

Figure 2

Batteries

RESERVE CAPACITY		COLD CRANKING
ENGINE TYPE	(MINUTES)	(AMPERES)
Diesel engine	540	1875
Gasoline engine	115	535

3.4.2.7 RADIO INTERFERENCE SUPPRESSION.
The vehicle shall be suppressed to limit electromagnetic radiation in accordance with SAE J551. Any body equipment emitting electromagnetic 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.
A dry type air cleaner shall be provided.

3.4.3.2 FUEL TANK(S).
Except as specified for Type II tractors or unless otherwise specified for other vehicle types, fuel tanks shall be not less than 189 L (50 gallons) total capacity. Type II tractors shall be equipped with fuel tank(s) of not less than 378 L (100 gallons) total capacity. When more than one fuel 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 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. When fuel crossover lines are furnished they shall be in accordance with TMC RP 321.

3.4.3.3 FUEL AND WATER SEPARATOR.
The manufacturer's standard or optional fuel filter shall be provided. A fuel and water separator shall also be furnished for diesel engines. The separator shall include water coalescent and a drain valve. A combination filter/separator unit may be provided. See option FFS for heated fuel and water separator.

3.4.4 EXHAUST SYSTEM.
The exhaust system shall conform to Federal Motor Carrier Safety Regulation 393.83.

3.4.5 TRANSMISSION.
Unless otherwise specified, the vehicle shall be equipped with an Allison or equal automatic transmission model 2500RDS, 3500RDS or 4500RDS as applicable for engine supplied. The automatic transmission shall include a hydraulic torque converter and not less than five forward gear ratios. Normal driving range selector position shall provide not less than five gear ratios without movement of the selector. The net torque capacity and the net power rating of the transmission shall exceed the maximum output ratings of the engine in all gears. The transmission shall be provided with power takeoff provisions to include gear and opening.

3.4.5.1 TRANSFER CASE.
A two-speed transfer case shall be provided on 4x4 vehicles.

3.4.6 DRIVELINE COMPONENTS.
Driveline components shall be rated to transmit the maximum delivered torque of the engine, as developed through the maximum gear train reduction. The drive shaft for front mounted winches shall have an angle not greater than 16 degrees from the longitudinal plane. Components shall be rated no less than the GCWR in 3.2.9. Drivelines shall be balanced and free of vibration.

3.4.7 FRAME.
The chassis frame shall be the manufacturer's standard for the type and class vehicle furnished. Reinforcements shall extend at least from the rear of the front suspension, rear hanger bracket to the front of the rear spring, front hanger bracket. Reinforcements for Type III stake dumps and Type IV dumps shall provide sufficient structural strength in the chassis frame, through increased resisting bending moment (RBM), to at least equal the loads imposed, with the dump truck loaded to provide specified GVW. Frame reinforcement for Type III stake with crane shall be in accordance with the body

manufacturer's recommendations for the size of the crane furnished. Frame rails shall not project beyond the rear end of the body. Unless otherwise specified, on Type II tractors, the chassis frame rails shall be cut off immediately to the rear of the rear spring rear hanger brackets or the frame crossmember closest to the rear of these brackets. When a RBM is specified, any frame combination of yield strength and section modulus that provides the required RBM is acceptable.

3.4.8 SUSPENSION.
Except as specified in option codes MPR and MPS, 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 the vehicle loaded to specified GVW. When suspension is rated at the spring pads, un-sprung weight shall be deducted. The vehicle shall be equipped with hydraulic, double-acting shock absorbers at the front wheels.

3.4.9 AXLES.
Except as specified in option codes MPR and MPS, axle ratings shall be at least equal to the load imposed on each axle, measured at the ground, with the vehicle loaded to specified GVW. The wheel bearings and axle spindles shall be oil lubricated or of a unitized, lifetime sealed no-maintenance design, except on front drive axles. For oil filled hubs, a window shall be provided for visual determination of oil level and provisions for venting or withstanding internal pressure buildup and for replenishing the oil supply shall be provided.

3.4.9.1 TRACTION CONTROL.
Automatic traction control shall be provided on all Type IV dumps. Maximum traction capabilities shall be maintained at all times under each drive wheel(s) for the life of the vehicle.

3.4.10 WHEELS, RIMS AND TIRES.
Unless otherwise specified, the vehicle shall be equipped with single front and dual rear wheels. Unless otherwise specified Hub piloted, disc type wheels shall be furnished. Disc wheel sizes shall be the same for all wheels except where required otherwise. Tire size and load range (ply rating) shall be the same for all tires except class F vehicles or where required to be otherwise. The rear axles of dump trucks shall have Goodyear G282MSD, Michelin XDE M/S or equal tires. Tire and wheel assemblies shall be balanced. 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. Tires and wheels shall conform to Tire and Rim Association or to the European Tyre and Rim Technical Organization recommendations for the type and size furnished. Under no circumstance shall the vehicle maximum governed speed exceed the speed rating of any of the furnished tires or wheels.

3.4.10.1 TIRES.
Unless otherwise specified, standard profile steel belted radial ply tires shall be provided. Tires shall have highway tread on 4x2 vehicles and all terrain (AT) tires or on-off road (OO) tires on 4x4 vehicles, and the rear axle of dump trucks. Tires shall be of the tubeless type. Except as specified in option codes MPR and MPS, tires shall be of rated capacity at least equal to the load imposed on each tire, measured at each wheel, at the ground, with the vehicle loaded to specified GVW. Tires shall conform to the Tire

and Rim Association or to The European Tyre and Rim Technical Organization recommendations.

3.4.10.2 TIRE CHAIN CLEARANCE.
Tire chain clearance in accordance with SAE J683 shall be provided. Allowance for spring deflection shall be included.

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 non-asbestos material. Class C vehicles shall be equipped with power assisted, hydraulic or air-hydraulic, service brakes.

3.4.11.1 AIR BRAKES.
The class D, E, F and G vehicles shall be equipped with full-air brakes. 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 340 L/min (12 cubic feet per minute (cfm)).
(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 on primary air storage reservoirs
(i) Automatic slack adjusters on cam type brakes or internal self-adjusting brakes on wedge and disc type brakes on all axles
(j) Brake dust shields on rear
(k) Spring set parking brake

3.4.11.1.1 AIR DRYER.
An air dryer with a replaceable spin on/off desiccant cartridge 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. Air dryer shall conform to TMC RP 637.

3.4.11.2 TRAILER BRAKE CONTROL SYSTEM.
In addition to the components specified in 3.4.11.1 and 3.4.11.1.1, a trailer brake control system shall be furnished for Type II tractors and when a trailer-towing package option code TTP is required for air brake equipped chassis. 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 operable with foot brake and with hand control for trailer brakes

(f) Two SAE J844 coiled air hoses, not less than 2800 mm (110 inches) long when fully extended, with SAE J318 glad hand couplers on both ends of hoses (not required for Type II tractors unless a trailer towing package is specified). The hoses shall be packaged and stowed in the vehicle tool compartment for shipment.

(g) Air connectors for trailer with SAE J318 glad hand couplers mounted at the rear of the vehicle, located to prevent interference with a trailer (not required for Type II tractors unless trailer towing package is specified). Air connectors and glad hands on Type IV dumps shall be located to prevent damage during dumping of the cargo.

(h) Two SAE J844 coiled (or straight when specified) connecting air hoses, not less than 2800 mm (110 inches) in length when fully extended, equipped with coiled spring hose guards, and SAE J318 glad hand quick connector on trailer end of hoses (Type II tractors only).

(i) Unless otherwise specified, supports on the cab or on a pogo stick type hose tender with dummy glad hand connectors to retain hoses when not in use (Type II tractors only). Supports shall not be mounted on the cab roof. The dummy glad-hand couplers shall be located on the street side rear of the cab and shall be accessible to an operator standing on the ground. Supports shall conform to TMC RP 417.

(j) Dummy glad hand couplers with security chains or cables (not required for Type II tractors unless a trailer towing package is specified).

(k) Prime mover only parking brake valve to permit mover parking brakes to be applied while charging the trailer air brake system.

3.4.11.3 ANTILOCK BRAKE SYSTEM.

Vehicles equipped with air brakes shall be provided with an antilock brake system in accordance with FMVSS 571.121. Vehicles equipped with hydraulic brakes, shall be provided with an antilock brake system in accordance with FMVSS 571.105. Type II tractors shall have the SAE J560 seven-pin connector wired to conform to TMC RP 137.

3.4.12 CAB.

Unless otherwise specified, an OEM conventional type full width cab shall be provided. Unless otherwise specified, a cab with a forward tilting hood and fender assembly, including tilting and locking mechanism, shall be provided. Tilting shall not interfere with installed equipment. Both cab doors shall be equipped with locks, operable from inside the cab through mechanical linkages and equipped with external, key operated locks. Drip protection shall be provided 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 and, in addition, for Type II tractors, to assist personnel in climbing onto the truck tractor deck plate. When step height into the cab exceeds 610 mm (24 inches) a secondary step shall be provided, in accordance with TMC RP 404B. When a snowplow or snowplow provisions are specified, service hatches or access or butterfly type hood shall be furnished to provide access for routine engine maintenance with a snowplow attached. Cab equipment shall include: a 12-volt electrical power point outlet

(receptacle), easily accessible to the seated driver; and tinted glass in all windows, where optionally available from the chassis manufacturer.

3.4.12.1 CAB INTERIOR.
Unless otherwise specified, the cab shall have an upholstered, full width, adjustable seat and back or individual, adjustable, driver's seat and individual passenger seat. 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 furnished. Interior lighting shall be provided. Three sets of seat belts shall be installed on bench seats. Outboard seats shall have combination pelvic and upper torso restraint seat belts. A rear cab window shall be furnished, unless a sleeper compartment is specified.

3.4.13 STEERING.
Power steering shall be furnished.

3.4.14 WINDSHIELD
The vehicle shall be equipped with dual windshield wipers and windshield washers. Windshield wipers shall be of the multi-speed intermittent type and operated by electric motor(s).

3.4.15 BUMPER.
Unless the bumper is an integral part of vehicle cab, a channel type front bumper shall be provided on each vehicle.

3.4.15.1 REAR END PROTECTION.
Except for Type I chassis, Type II tractors, and Type IV dumps, the rear end of the vehicle shall be protected in accordance with Federal Motor Carried Safety Regulation 393.86. A rear bumper shall be provided as specified herein for the various vehicle types.

3.4.16 TOOL STOWAGE.
Stowage space of sufficient size to accommodate a vehicle jack, hand tools, anti-skid chains (for outside tires on duals only) and emergency reflective triangles shall be provided. The stowage space shall provide for positive retention of this equipment during vehicle operation. Stowage space for these tools may be furnished in the cab. When stowage space for these tools is located outside the cab, it shall be weatherproof and shall provide for locking with a padlock or integral lock.

3.4.17 HEATER AND DEFROSTER.
The vehicle shall be provided with a hot water heater with fresh air intakes and discharge outlets to the 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 the 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 or voltmeter

(c).... Fuel gage

(d).... Oil pressure gage

(e).... Engine coolant temperature gage

(f)..... Speedometer with recording odometer

(g).... Dual sun visors

(h).... Driver's compartment ventilator other than window

(i)..... Tachometer (for diesel engine driven vehicles)

(j)..... Front door or seat mounted armrest on driver and on passenger side

(k).... An engine shutdown system shall be provided. The engine shutdown 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. When a Gasoline engine is furnished, engine shutdown feature is not required.

3.4.20 REARVIEW MIRRORS.
Outside rearview mirrors shall be mounted on both sides of the cab. The mirrors shall have flat and convex areas. The flat portion shall have not less than 636 square centimeters (100 square inches) of reflective area. The convex portion shall have not less than 324 square centimeters (50 square inches) of reflective area. The convex portion shall be attached to the lower mirror-supporting arm and shall not interfere with use of the flat mirror.

3.4.21 HORN.
The manufacturer's standard electric horn shall be furnished. In addition, on class D, E, F and G, an air operated horn shall be provided.

3.4.22 BACK ALARM
A back-up alarm shall be provided which provides an audible warning whenever the ignition switch is "on" and the vehicle transmission control is in reverse. The alarm shall automatically adjust to ambient noise levels. Alarm shall conform to SAE J994.

3.4.23 AM/FM RADIO.
An OEM AM/FM radio with clock shall be provided.

3.4.24 AIR CONDITIONING.
The vehicle shall be equipped with the chassis manufacturer's standard all weather air conditioner. The use of a Class I or Class II controlled substance refrigerant is prohibited. Air conditioning system shall conform to TMC RP 418.

3.5 VEHICLE TYPES.

The cab-to-axle dimension specified for the various vehicle types may be reduced by not more than 50 mm (two inches) when the vehicle is furnished with tilt type cab (see 3.4.12).

3.5.1 TYPE I (CHASSIS, WITH CAB).

Type I vehicles shall have specified one of the usable cab-to-axle (CA) dimensions shown in Figure 4 below. Usable cab-to-axle is defined as the distance from the most rearward vehicle obstruction that would interfere with body mounting to the centerline of the axle. Load area for the purpose of determining weight distribution (see 3.2.8) shall be as specified. Chassis shall be suitable for subsequent mounting of the size and type of body and equipment specified. Required CA dimensions must be specified when vehicle order is submitted.

Figure 4

Cab-axle (CA)		
CODE	LENGTHS (for fixed body) (select one)	RECOMMENDED MAXIMUM BODY LENGTHS
CABA	150/160 cm (59/60 in)	2.5 m/8 ft
CABC	180/190 cm (71/72 in)	3.0 m/10 ft
CABF	210/220 cm (83/84 in)	3.6 m/12 ft
CABJ	260/270 cm (101/108 in)	4.3 m/14 ft
CABM	300/320 cm (119/124 in.)	4.9 m/16 ft
CABP	340/360 cm (136/138 in)	5.5 m/18 ft
CABT	380/400 cm (150/156 in)	6 m/20 ft
CABW	420/440 cm (167/171 in)	6.6 m/22 ft
Specify as needed when other than types covered by Figure 4 are required.		

3.5.2 TYPE II (TRUCK TRACTOR).

Type II tractors shall conform to 3.5.2.1 through 3.5.2.6 with the fifth wheel on 4x2 vehicles mounted on a stationary base. The fifth wheel shall be a fore and aft rocking, 910 mm (36 inch) diameter fifth wheel with forks and semiautomatic locking for SAE J700 kingpin. The fifth wheel shall be capable of being uncoupled by the operator standing on the driver's side of the vehicle. Uncoupling action shall be protected by a secondary manual lock, preventing movement of the uncoupling lever until the secondary lock is manually released. The fifth wheel shall have a visual indicator or latching mechanism to ensure a positive lock of the kingpin. The vertical load capacity and the drawbar pull capacity of the fifth wheel shall be not less than the loads imposed with the vehicle loaded to the required GVW and GCW.

3.5.2.1 FIFTH WHEEL LOCATION.

The location of the fifth wheel, unless otherwise specified, shall load both front and rear axles to their maximum rated capacity simultaneously. The clearance from the centerline of the kingpin to the cab, or to the vertical spare tire assembly when furnished, or pogo stick type hose tender when furnished, shall be not less than 1620 mm (64 inches). When additional equipment to be mounted behind the cab is specified, the 1620 mm (64 inches) shall be measured to the rearmost point of a pogo stick to be mounted behind the additional equipment. The CA may be increased to provide needed clearance when additional equipment is added behind the cab.

3.5.2.2 FIFTH WHEEL MOUNTING.

Fifth wheel mounting shall conform to Federal Motor Carrier Safety Regulation 393.70(b).

3.5.2.3 FIFTH WHEEL HEIGHT.
The unladen level height of the fifth wheel shall be 48 inches, plus or minus 1 inch, above ground level on 4x2 vehicles, and no more than 60 inches on 4x4 vehicles.

3.5.2.4 RESERVED.

3.5.2.5 DECK PLATE.
A self-cleaning grating of sufficient structural strength for use by the operator in connecting air and electric lines between the tractor and a semitrailer shall be installed. The grating shall extend across and shall be bolted or clamped to the frame rails. Grab handle(s) and step(s), to allow safe access to personnel climbing onto the deck plate, shall be furnished. The grating shall be a minimum of 101 CM (40 IN) and the front edge shall be located as close to the cab as possible and shall extend toward the rear of the vehicle. Access through the grating for maintenance of fittings and other equipment shall be furnished. The deck plate shall be free of ragged or sharp exposed edges.

3.5.2.6 HOSE TENDER.
A cab mounted hose tender, as specified in 3.4.2.5, shall be provided unless otherwise specified. When additional equipment such as but not limited to vertical mounted spare tire carrier or rear mounted winch is mounted behind the cab a pogo stick type hose tender shall be provided in lieu of cab mounted hose tender. The pogo stick shall be mounted rearward of the rear mounted equipment. The furnished hose tender shall conform to TMC RP 417.

3.5.3 TYPE III (STAKE).
Type III stakes shall have body dimensions as specified in Standard Item minimum requirements. Rear bumper shall be furnished. Stake racks and platform body shall be painted black.

3.5.3.1 STAKE BODY.
The body shall consist of a steel frame platform, wood floor, and side and end racks. When a hydraulic crane, option code SAC, is furnished, the body shall be mounted to provide a space back of cab-to-body of not less than 810 mm (32 inches) for mounting the crane.

3.5.3.2 STAKE BODY FRAME.
Body framing shall be completely welded structure with members of minimum gage thickness specified in Figure 5 for carbon steel; high tensile steel may be furnished in two gages lighter weight in accordance with US Standard gage sizes. Crossmembers shall have no more than 40 cm (16 inch) center spacing, including ends and stub crossmembers as required for proper spacing over axle. Crossmembers shall be of full channel construction, or equal, with a minimum RBM of 55,000 in. / lb. reinforced by gusset plates or brackets at points of attachment to longitudinal sills, and contact edges of welded reinforcements shall be welded for not less than 50 percent of the edge length. Longitudinal sills shall be constructed of structural steel channels or formed channels. Formed channel sills shall be reinforced within the sill, at each crossmember or body mounting point, with formed channel reinforcements.

Figure 5

Framing Gauge for Stake Bodies				
FRAMING MEMBER	CLASS	STANDARD GAGE NO.	EQUIVALENT MILLIMETER	EQUIVALENT INCHES
Cross-member	ALL	10	3.416	0.1345
Side and end rails	D, E, F, G	10	3.416	0.1345
	C	12	2.657	0.1046
Longitudinal sills	D, E, F, G	8	4.176	0.1644
	C	10	3.416	0.1345
Reinforcement	D, E, F, G	8	4.176	0.1644
	C	10	3.416	0.1345
Rack post	ALL	12	2.657	0.1046

Wiring harness across the rear apron shall be enclosed in conduit or polyethylene loom except at terminal ends and shall be secured by rubber insulated metal cable clamps to the under body structure on not more than 12 inch centers.

3.5.3.3 STAKE BODY FLOORING.

The platform shall be floored with wood. Wood parts shall be treated in accordance with 3.1.1.3.

3.5.3.3.1 STAKE BODY WOOD FLOORS.

Wood floors shall be apitong, hardwood or pressure treated dense southern yellow pine not less than 29 mm (1-1/8 in) for class C and 33 mm (1-5/16 in) thick (finished dimension) for class D, E, F and G. Plywood type floors shall not be acceptable. Wood floors shall “run” longitudinally with either shiplap or tongue-and-groove joints.

3.5.3.4 SIDE AND END RACKS.

A full width front rack section, not less than three removable rack sections on each side, and two removable rack sections across the rear shall be provided. Each rack shall be equipped with a locking device to lock the rack to the body. Body hardware shall be attached to the rack slats with not less than 75 mm (3 inches) total weld for each fastener or bolted with not less than four bolts for each fastener. Upright posts shall be steel sections. Rack slats shall be steel of not less than 16 gauge with not less than 3 reinforcing ribs. The width of individual slats shall be manufacturer’s standard providing that total of slat widths is not less than 60 percent of total rack height. Not less than four slats per rack shall be provided. Slat edges and end corners shall be rounded or enclosed to protect cargo and personnel from sharp edges. Slats shall be riveted, bolted or welded to the inside (load side) of the upright posts, with rivet or bolt heads against the slats. When welded construction is used, not less than 4 welds shall be applied at each upright post and slat intersection. The front rack section shall be capable of withstanding a horizontal static load equal to one-half the payload capacity of the vehicle without permanent distortion of the rack section or its mounting. When a hydraulic tailgate of the type that folds against the rear side racks is furnished (option code HTG), the two removable rack sections across the rear of body are not required and each side rack section at the rear of body shall be provided with draw-down type of fastening equipped with a locking nut to secure the side racks in place. Rack height shall be a minimum of 102 cm (40 inches). When a hydraulic crane option code SAC, is furnished, the front rack height may be reduced as necessary to avoid interference with the crane operations.

3.5.3.5 BODY MOUNTING.
Body shall be secured with U-bolts, twin studs, or brackets. Body shall be mounted in full accordance with the chassis and body manufacturer's recommended practice.

3.5.3.5.1 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 class C and four U-bolts or twin studs per side for class D, and F each having 14 mm (0.563 inch) body diameter with 16 mm (0.625 inch) minimum thread diameter. Tieplates shall be at least 13 mm (0.5 inch) thick and a slight deformation upon assembly is permissible. The vehicle chassis frame shall be protected from crushing by using spacer 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 tieback 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 the breaker strips.

3.5.3.5.2 BRACKETS.
When brackets are used, they shall be bolted to the web of the chassis frame rails. The body mounting brackets shall provide means for 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 the 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 neither interfere with nor obstruct chassis components.

3.5.4 TYPE IV (DUMP).
Type IV vehicles shall have a hydraulic hoist operated dump body. A rear bumper is not required. Unless otherwise specified, the body shall have dimensions and level capacity of not less than that specified for the Standard Item Number.

3.5.4.1 DUMP BODY CONSTRUCTION.
Body sides and front head shall be constructed from not less than 8 gage (4.176 mm) (0.1644 inch) A570 (50,000 pounds psi yield strength) steel). Body floor shall be no less than ¼ inch AR235, (100,000 psi yield strength) steel. The front head shall be capable of withstanding a horizontal static load equal to one-half the payload capacity of the vehicle without permanent distortion. When body floor is constructed in two or more pieces, a continuous seam weld having full penetration shall be provided. Full length, formed rub rails of minimum width to cover rear dual tire treads shall be provided. Triangular or box-section_vertical side braces constructed of not less than 10 gage (3.416 mm) (0.1345 inch) steel shall be equally spaced between body front head and full box type rear corner posts and continuously welded to side plates. Not less than two vertical braces per side on Class C and D and not less than three vertical braces per side on Class F, and G, shall be provided. One horizontal brace (per side) running the entire length of the body, tied into the front and rear corner pillars is acceptable in lieu of vertical braces. They shall be sloped and continuously welded or formed into each side of the body. Front head sheet shall be formed or reinforced for rigidity. Front head and tailgate shall be not less than 150 mm (6 inches) for class C and 200 mm (8 inches) for class D, E, F, and G higher than the sides. Sides shall have pockets provided at each end for insertion of sideboards. The interior of the body shell and the side reinforcements shall be welded with continuous welds. The top rail, sides and

tailgate shall be completely boxed and continuously welded. The body shall have sloping running boards and sloping horizontal tailgate braces to minimize the buildup of dirt. Wiring harness across the rear apron shall be enclosed in conduit or polyethylene loom except at terminal ends and shall be secured by hangers to the under body floor, on not more than 12 inch centers.

3.5.4.2 CAB PROTECTOR.

A cab protector shall be attached to the front end of the body. The cab protector shall extend the full width of the cab. The cab protector shall extend not less than 580 mm (23 inches) forward from the front of the dump body. The cab protector shall be not less than 10 gage (3.416 mm) for class C and 8 gage (4.176 mm) (0.1644 inch) steel for class D, E, F, G or 12 gage (2.657 mm) for class C and 10 gage (3.416 mm) (0.1345 inch) high tensile, 345 MPa (50,000 psi) yield strength steel. The cab protector shall be capable of supporting an evenly distributed load of not less than 680 kg (1,500 pounds). The cab protector is not intended to be used for additional payload capacity. Cab protectors for vehicles with overseas destinations shall be removable and shall be secured in the dump body for shipment. Fasteners and components shall be packaged, boxed, marked and secured in the vehicle. When code CP is specified, and extended cab protector of not less than 100 cm (40 inches) from the front of the dump body shall be provided.

3.5.4.3 DUMP BODY TAILGATE.

The tailgate panel shall be not less than 8 gage (4.176 mm) (0.1644 inch) A570 steel (50,000 pounds psi yield strength). The tailgate shall be double acting, opening from top and bottom. The tailgate shall include hardware, support chains, and tailgate latch. The latch shall be operable by a control at the left front corner of the vehicle body. All pivot points on the tailgate release shall be furnished with grease fittings, including top pivot pin. The tailgate shall be reinforced to prevent deformation under load.

3.5.4.4 DUMP BODY UNDERSTRUCTURE.

The dump body understructure shall conform to 3.5.4.4.1 or option code UN, at the manufacturer's option except when specified by customer.

3.5.4.4.1 CHANNEL OR I-BEAM UNDERSTRUCTURE.

Body longitudinal sills, each having a minimum section modulus equivalent to that provided by a 125 mm (5 inch) by 10 kg/m (6.7 lbs/ft) channel for class C and 125 mm (5 inch), 14.9 kg/m (10 pounds-per-foot) I-beam for class D, E, F, and G shall be provided to support hoist load. Crossmembers shall be on not more than 380 mm (15 in.) center, for Class C and 300 mm (12 in.) centers for Class D, E, F and G. Cross members having an individual, minimum section modulus equivalent to that provided by a 75 mm by 6.1 kg/m (4.1 lbs/ft) channel for class C and 100 mm (4 inch), 8.0 kg/m (5.4 pounds-per-foot- channel, for class D and E shall be provided to support an evenly distributed load of not less than 6800 kg (15,000 lbs) for class C, 9070 kg (20,000 pounds) for class D, and 10,900 kg (24,000 pounds) for class E body. Crossmembers, each having a minimum section modulus equivalent to that provided by a 100 mm (4 inch), 11.5 kg/m (7.7 pounds-per-foot- I-beam, shall be provided to support an evenly distributed load of not less than 1800 kg/m2 (370 pounds per square foot) of floor area throughout the full lift range for class F and G vehicles. Crossmembers shall be welded to the body shell with not less than 100 mm (4 inch) lengths of weld, front and rear of both ends of each crossmember, and with staggered intermittent welds on not more than 300 mm (12 inch) centers. Contact edges of crossmembers with longitudinal sills

and contact edges of welded reinforcements shall be welded for not less than 50 percent of the edge length. Crossmembers shall be welded to the shaped outer rub rail to limit twisting. Gussets, 3/16 inches thick, shall be welded to every other crossmember and each longitudinal sill to provide reinforcement.

3.5.4.5 HYDRAULIC HOIST.
Unless otherwise specified, the hoist classification shall be as specified in the Standard Item Number minimum requirements and listed in the National Truck Equipment Association Dump Body Hoist Classification Chart. The hoist shall be a double-acting scissors or underbody type. Hoist cylinders shall be chrome plated. The hoist shall lift the body to a minimum dumping angle of 50 (+1,-2) degrees from the top of the truck chassis frame. The hoist shall be capable of lowering the raised body by gravity when the pump is disabled. Hydraulic system, pumping unit and controls shall comply with 3.1.1.11.

3.5.4.6 SAFETY LOCK.
A mechanical safety lock permanently affixed to the dump body or hoist shall be furnished. The safety lock shall provide positive retention of the dump body with the body in the up position for servicing or repair. The safety lock mechanism shall not interfere with operation of the body under any operating conditions.

3.5.4.7 DUMP BODY MOUNTING.
Full length rivet pads or a full-length subframe, shall be attached to the top of the chassis frame rails. The pads or subframe shall prevent the body longitudinal sills from contacting and chafing against the chassis frame rails. Body shall be mounted in accordance with OEM recommended practice.

3.5.4.8 DUMP BED COVER.
A dump bed cover with front wind protector, operated from ground level shall be provided. The dump bed cover shall be constructed of a knit mesh polypropylene material with 70% (nominal) mesh content.

3.5.5 RESERVED

3.5.6 RESERVED

3.5.7 TYPE VII (VAN).
Type VII vehicles shall have an overall height of not more than 3810 mm (150 inches) and the minimum dimensions as specified for the Standard Item Number. Effective means shall be taken to prevent electrolytic action between dissimilar metals.

3.5.7.1 VAN BODY.
The body subframe, rear corner posts, rear header, rear crossmember, rear bumper and dock bumper shall be constructed of steel. Body, front posts, roof panels, rub rails or buffer sheets, side and front wall panels shall be constructed of aluminum except when option code FRP is specified. Roof bows and side posts shall be aluminum or galvanized steel (see 3.5.7.4). The steel used shall be of the minimum gages specified for carbon steel; high tensile steel used may be two gages lighter weight in accordance with US Standard gages.

3.5.7.1.1 VAN BODY WIND DEFLECTION.
Unless otherwise specified herein, an aerodynamically streamlined body front shall be incorporated into the design of the body to direct airflow around the sides and over the top of the van body. The construction shall be integral with the van body front wall, sidewalls and roof, giving a curved front radius.

3.5.7.2 VAN BODY SUBFRAME.
Van body sub frame shall be welded steel construction, braced at all points of stress. Crossmembers shall be full width, minimum 7.5 cm (3 inches) depth, of full channel, I-beam or equivalent section, steel construction, attached to longitudinal sills by welds on maximum 30 cm (12 inches) centers. When sub framing is a welded assembly, angle gussets (when used), crossmembers, longitudinal sills, and welded reinforcements (when used) shall be joined by weld for not less than 50 percent of the length of the contact edge(s). Spacing of crossmembers shall be equal, ahead of, and to the rear of the wheels. Longitudinal sills shall be constructed of structural steel channels, structural steel I-beams, formed steel channels or form rolled steel I-beams. Formed channel sills shall be reinforced with formed channel reinforcements within the sill. Formed channel reinforcements shall be provided at each subframe crossmember attachment point and at each chassis mounting point. Form rolled I-beam sills shall be high tensile 345 MPa (60,000 psi) yield steel, not less than 100 mm (4 inches) high and not less than 4.75 kg/m (3.190 pounds per foot). Formed channel crossmembers, gussets, formed channel longitudinal sills and reinforcements shall be of not less than 7 gage (2.39 mm) (0.094 inch) steel. Extruded aluminum or steel side and front rails shall be furnished. When steel side and front rails (out-rails) are furnished they shall be of not less than 12 gage (2.657 mm) (0.1046 inch) steel. Design of the subframe shall permit low floor height, while providing tire chain clearance. Understructure shall be rust proofed in accordance with FED-STD-297.

3.5.7.3 VAN BODY FRAMING.
Side and front post construction of aluminum or galvanized steel bodies shall be extruded aluminum and shall be not less than 29 mm (1.125 inches) in depth and 0.49 kg/m (0.330 pound per foot) when side and front wall posts are spaced on 406 mm (16 inch) maximum centers. Side and front post construction shall be extruded aluminum and shall be not less than 32 mm (1.25 inches) in depth and 0.64 kg/m (0.43 pound per foot) when side and front wall posts are spaced on 460 mm (18 inch) maximum centers. Front corner posts, when used, shall be extruded aluminum and shall be not less than 25 mm (1 inch) in depth and 0.72 kg/m (0.482 pound per foot). When front radius corners without front corner posts are used, the radius corners shall be of not less than 1.8 mm (0.071 inch) aluminum or 0.94 mm (0.037 inch) stainless steel, attached to the nearest side and front posts. The front structure shall be capable of withstanding a horizontal static load equal to 0.4 times the payload capacity of the vehicle without permanent distortion. Rear corner posts shall be provided and shall be of not less than 10 gage (3.416 mm) (0.1345 inch) galvanneal or 12 gage (2.67) (0.1046 inch) stainless steel.

3.5.7.4 VAN BODY EXTERIOR.
The roof assembly shall be standard for the vehicle, and shall be constructed to ensure drainage. Roof support bow construction shall be extruded aluminum, or not less than 18 gage (1.214 mm) (0.0478 inch) galvanized steel, not less than 35 mm (1.38 inches) in depth. When aluminum roof support bows are spaced on 610 mm (24 inch) maximum centers, the roof bows shall be not less than 25 mm (1 inch) in depth and

0.54 kg/m (0.36 pound per foot), and the roof panel shall be not less than 0.81 mm (0.032 inch) aluminum alloy. When aluminum roof supports bows are spaced on 460 mm (18 inch) maximum centers, the roof bows shall be not less than 25 mm (1 inch) in depth and 0.57 kg/m (0.38 pound per foot), and the roof panel shall be not less than 0.64 mm (0.025 inch) aluminum alloy. When steel roof support bows are used, they shall be spaced on not more than 610 mm (24 inch) centers and the roof panel shall be not less than 1.0 mm (0.040 inch) thick aluminum alloy. Body side panels shall be not less than 0.81 mm (0.032 in.) prepainted aluminum alloy. Unless otherwise specified, the color of the prepainted side panels shall be the manufacturer's standard white. When a semi gloss or lusterless vehicle exterior color is specified (see 3.1.1.1), the side panels shall be painted to match that exterior color (see MIL-HDBK-1223). Body side panels shall be removable to facilitate body repair. All roof and body seams and joints shall be weatherproof. The body front posts and top front rail shall have a radius of not less than 115 mm (4.5 inches). All body and rub rails shall be extruded aluminum. Rub rails or buffer sheets extending outwards beyond the body skin shall be provided on both sides of the body. The rub rails or buffer sheets shall be permanently attached, or shall be an integral part of the exterior of the body at the floor line.

3.5.7.5 VAN BODY INTERIOR.

Two interior dome lights shall be furnished. Two three-way dome light switches, both controlling both lights, shall be furnished. One switch shall be located on the rear of the curbside wall recessed to prevent damage by cargo or equipment and shall be accessible by an operator standing on the ground at the curbside. The other switch shall be located in the cab with an indicator light. The interior of the body walls shall be lined with not less than 9.6 mm (3/8 inch) exterior grade plywood on the side walls and not less than 13 mm (1/2 inch) exterior grade plywood on the front wall, all full height. When front corner posts are not used, interior radius corners shall be lined with aluminum or 3.2 mm (1/8 inch) thick fiberglass material and the scuff plate shall extend completely around the front radius corners. When steel roof bows are furnished, an isolating material shall be installed between the roof skin and the roof bows to prevent electrolytic action.

3.5.7.6 SCUFF PLATE.

A 300 mm (12 inch) high, 12 gage (2.657 mm) (0.1046 inch), smooth steel scuff plate, or an aluminum scuff plate of a thickness, providing an equivalent resistance to puncture, shall be installed on the front and side walls at the floor level. The entire scuff plate shall be treated or coated to resist corrosion (for steel) and need not be painted. The scuff plate shall be installed with corrosion-resistant countersunk screws, riveted, or welded to formed corner plates.

3.5.7.7 VAN BODY ROLL-UP OVERHEAD REAR DOOR.

Unless otherwise specified, a full width, roll-up, overhead rear door shall be provided. The door shall provide a clear opening of not less than 2030 mm (80 inches) in width and not less than 1950 mm (77 inches) in height. The door shall be of the sectional type having not less than five sections. Door sections shall incorporate joints of the tapered tongue and groove type or of shiplap type. The door shall be plastic-covered or aluminum-covered 19 mm (3/4 inch) exterior plywood construction. Door section corrosion-resistant hinges shall be mounted on the inside of the door, not less than four hinges at each section joint. The door track shall be manufacturer's standard corrosion-resistant type equipped with a positive stop at the end of the track. Door rollers, counterbalance unit and cables of corrosion-resistant construction shall be the

manufacturer's standard. The door shall be weather tight. A heavy duty, corrosion-resistant, cam operated, lever type lock shall be provided, equipped with provisions for the use of a padlock. One heavy duty, corrosion-resistant grab handle, closed type, shall be provided on the outside bottom of the door. One nylon pull-down strap, not less than 50 mm (two inches) wide and 300 mm (12 inches) in length, shall be provided and located adjacent to the door lock. Roll-up doors shall conform to TMC RP 710.

3.5.7.8 VAN BODY REAR DOCK AND DROP BUMPERS.
A channel type rear dock bumper of not less than 10 gage (3.416 mm) (0.1345 inch) steel and not less than 75 mm (three inches) in height shall be provided. The dock bumper shall be integral with the body and located not less than 35 mm (1 inch) below the rear door(s). The dock bumper shall be the full width of the body. A drop bumper with crossbar shall be provided in addition to the dock bumper.

3.5.7.9 VAN BODY MOUNTING.
Mounting of the van body shall be as specified in 3.5.3.5 through 3.5.3.5.2.

3.5.8 TYPE VIII (REFRIGERATOR VAN).
Type VIII vehicle shall have a maximum overall height of 3810 mm (150 inches), minimum interior width of 2080 mm (82 inches), minimum interior height of 2030 mm (80 inches), and the minimum body length specified for the Standard Item Number.

3.5.8.1 REFRIGERATED VAN PERFORMANCE.
Refrigeration performance may be demonstrated through actual performance testing, or through certification as a unit (truck/body as installed) by an independent professional engineer. The refrigeration unit cooling capacity, as installed, shall be capable of reducing the air temperature in the van body from 38°C (100°F) to -18°C (0°F) in not more than five hours while the vehicle is in an ambient air temperature of not less than 38°C (100°F) The unit shall be capable of shall maintaining -23°C (-10°F) in the van body under normal (STP) service conditions. The temperature shall be thermostatically controlled by means of a calibrated, manually adjustable device which shall maintain any selected temperature, within 2°C (4°F), from 2°C (35°F) to -23°C (-10°F). A thermometer that registers the inside temperature of the van shall be furnished. The thermometer shall be visible to the driver from the normal driving position. Mirrors may be furnished to provide visibility for thermometer reading by the driver. If a column type thermometer is furnished, a guard shall be provided to protect the column and shall be so located as not to obscure the reading.

3.5.8.2 REFRIGERATED VAN BODY.
The body shall be constructed as specified in 3.5.7.1 through 3.5.7.4 for Type VII vehicle including aluminum scuff plate. Vertical members that support the outer panels and the inner panels may have fiberglass transverse spacers to prevent heat transfer. Inner panels shall be secured to the inner vertical members.

5.8.2.1 INSULATION.
Insulation required for refrigerator van conformance to 3.5.8.1 shall be furnished. Insulation shall be of the foam-in-place type. The insulation shall have a K-factor of not more than 2.16 W/m2/°C/cm (0.15 Btu per square foot per degree Fahrenheit per hour per inch of thickness). Insulation shall not shrink or swell during the life of the body. The insulation shall be of cellular structure with closed cells. Insulation shall be non-hygroscopic, resistant to fungus growth and vermin retention, and shall be resistant to the passage of air and absorption of water.

3.5.8.2.2 REFRIGERATED VAN INNER PANELS.
Inner panels including the roof panels shall be ribbed or flat fiberglass sheet, a normal 2.4 mm [3/32 (0.09 minimum] inches) thick.

3.5.8.2.3 REFRIGERATED VAN FLOOR.
The floor shall be of extruded aluminum alloy sections having equally spaced longitudinal corrugations not less than 25mm (1 inch) in height and approximately 25mm (1 inch) in width. Floor sections, with corrugations lengthwise of body, shall overlap and shall be sealed or shall be welded full length to prevent leakage of moisture through floor to the insulation. The floor surface of the corrugations shall have extruded longitudinal ribs approximately 3.2 mm (0.125 inch) high and 3.2 mm (0.125 inch) wide, and spaced on 4.8 mm (0.188 inch) centers. The ribs shall be knurled or serrated on approximately 4.8 (0.188 inch) centers to provide an anti-skid surface. Sides and front of floor shall have an inverted skirt extending upwards for a distance of not less than 125mm (five inches) and shall be fitted between insulation and the inner panels. Floor design shall permit a concentrated load of not less than 975 kg/m^2 (200 pounds on any square foot) of floor area without permanent deformation. Understructure shall be rust proofed in accordance with FED-STD-297.

3.5.8.2.4 REFRIGERATED VAN REAR BUMPER.
Rear dock and drop bumpers conforming to 3.5.7.8 shall be provided. Unless a hydraulic tailgate is specified, the drop bumper shall be of the shelf, step type, extending not less than 230 mm (9 inches) to the rear. The step surface shall be of self-cleaning grating. The corners shall have a radius of not less than 25 mm (1 inch). All edges of the grating shall be enclosed and free of ragged or sharp edges. A vertical closure plate with cutouts for lights shall extend from the body down to the self step. The load carrying capacity of the bumper step shall be not less than 410 kg (900 lb) applied vertically and uniformly distributed over any two, 127 mm (5 inch) increments of step width [see Federal Motor Carrier Safety Regulation 399.207(5)].

3.5.8.2.5 REFRIGERATED VAN REAR DOORS.
Unless otherwise specified, two full width doors shall be provided. Doors shall be insulated so that body-insulating efficiency will not be reduced. A door gasket shall be installed to insure a seal. A door-locking device, with operating handle, shall be installed to provide positive closing action and shall have provisions for use of a padlock. The door shall be capable of being opened from inside when locked. The rear doors shall provide an opening within 100mm (4 inches) of the full width and the full height of the body interior. The doors also shall conform to applicable requirements of option code BDD.

3.5.8.2.6 REFRIGERATED VAN INTERIOR LIGHT.
Two interior dome lights shall be provided. A recessed control switch controlling both lights shall be located near the rear door, accessible to an operator standing on the ground at the curbside. A circuit-opening switch controlling both lights shall be operated by closing the door. Fixtures, switches and wiring shall be moisture proof and shall be accessible for repairs.

3.5.8.2.7 REFRIGERATED VAN ACCESS STEPS.
Access steps and grab handle(s) shall be provided on the front of the body leading up to the refrigeration unit. Steps shall be spaced vertically on not more than 380 mm (18 inches) centers. A platform for servicing the refrigeration unit shall be provided above the cab roof. The platform shall be of aluminum tread plate or open grating, not less

than 280 mm (11 inches) deep, not less than the width of the refrigeration unit, and shall be readily accessible from the access steps.

3.5.8.2.8 REFRIGERATED VAN WIND DEFLECTION.
An aerodynamically streamlined body front shall be incorporated into the design of the body. The construction shall be integral with the van body front wall, sidewalls and roof, giving a curved front radius.

3.5.8.2.9 REFRIGERATED VAN BODY MOUNTING.
Mounting of the body shall be as specified in 3.5.3.5 through 3.5.3.5.2.

3.5.8.3 REFRIGERATION UNIT.
The refrigeration unit shall contain all components, equipment and accessories normally furnished on the manufacturer's standard unit for comparable commercial applications and shall include all components and features specified herein. The refrigerating capacity, as installed and implemented in the vehicle, shall be adequate to efficiently obtain the performance requirements specified herein. Applicable components of the refrigeration unit shall be mounted on a frame attached to the front of the van exterior. The unit shall incorporate lifting eyes to facilitate removal for installation. The unit shall extend into, but occupy a minimum of, cubage within the van. All components and assemblies shall withstand vibration encountered in normal vehicle operation. The refrigerant shall be: hydrochlorofluorocarbon (HCFC); hydrofluorocarbon (HFC-134a); or other alternative technology. Chlorofluorocarbon (CFC) refrigerant is not acceptable. The unit shall be designed for use with both the primary and stand-by power units (see 3.5.8.3.2) with mean for rapid conversion from one to the other. Components requiring lubrication with grease shall be provided with pressure type grease fittings with flush type check ball. Radio interference suppression (see 3.4.2.7) shall be furnished.

3.5.8.3.1 COMPRESSOR.
A piston type compressor, with adequate performance characteristics for the specified requirements, shall be installed.

3.5.8.3.2 REFRIGERATION UNIT POWER.
The refrigeration unit shall be diesel powered with horsepower and torque capacity for maximum compressor requirements. Engine accessories shall include a starter (with a device to prevent the engine from driving the starter), and a generator or alternator. Provision shall be made to permit starting the engine under no-compression load. Fuel to operate the refrigeration unit shall be supplied from the truck's main fuel tank(s). When two main fuel tanks are furnished on the truck, both shall be connected to the refrigeration unit engine in a manner ensuring continued operation of the engine with either one of the tanks empty. An accessible fuel shut-off valve shall be provided. The system shall conform to Federal Motor Carrier Safety Regulations 393.65 and 393.67. When a water-cooled engine is furnished, visual means of checking the coolant level shall be provided and the cooling system shall be serviced in accordance with 3.4.1.4.2.

A standby, 208-volt, 3-phase, 60-hertz AC electric motor, with adequate horsepower and torque capacity for maximum compressor requirements, shall be installed for use when the vehicle is at rest. A slave receptacle, wired to the motor, shall be mounted on the van body or on the refrigeration unit control panel to accommodate an outside power source. All electrical materials and workmanship shall conform to the requirements of the National Electrical Code (NFPA No. 70).

3.5.8.3.3 CONDENSER.
A condenser designed and built according to best current commercial practice and adequate for the requirements specified herein, shall be provided.

3.5.8.3.4 RECEIVER.
A receiver of adequate strength and capacity, constructed of welded steel, shall be furnished.

3.5.8.3.5 EVAPORATOR.
A coil type or plate type evaporator designed and built according to best current commercial practice and adequate for the requirements specified herein, shall provided. The evaporator shall incorporate an evaporator fan and a defroster.

3.5.8.3.6 DEFROSTER.
Means shall be provided to bypass, when desired, refrigerant from the compressor discharge line directly through the evaporator to defrost the unit. A separate switch shall control the bypass valve and the discharge air duck damper.

3.5.8.3.7 DEHYDRATOR.
A dehydrator, with sufficient dehydrating capacity for the system, shall be installed in the refrigerant line. Means shall be provided to prevent the dehydrator from contaminating the refrigerant.

3.5.8.3.8 STRAINER.
A strainer shall be installed in the liquid line between the dehydrator and the expansion valve.

3.5.8.3.9 EXPANSION VALVE.
The expansion valve shall automatically control refrigerant flow by thermostatic means, or equal. Thermostatic expansion valves shall incorporate a superheat adjustment.

3.6 OPTION CODES AND REQUIREMENTS

A14 ALTERNATOR 140 AMP
When code A14 is specified, a minimum 140-ampere alternator shall be provided. The alternator output with the engine at idle speed shall be not less than 70 amperes.

AFW FIFTH WHEEL-AIR LIFT-MIN 40,000 LB & 11 IN. LIFT
When code AFW is specified, Type II tractors shall be equipped with an air lift fifth wheel. The vehicle shall conform to the following requirements The fifth wheel shall be of all steel, with a capacity to lift and support a load of not less than 18,150 kg (40,000 pounds) over a lifting range of not less than 280 mm (11 inches), from the lowest to the highest position. Actuation through the full lifting range shall not cause the center of the kingpin lock to shift more than 75 mm (3 inches) measured along the longitudinal centerline of the vehicle. The fifth wheel unit shall be of the bolt on type. A manual locking device shall be furnished to lock out lifting capability. A decal or plate reading “Lock down fifth wheel for highway use” shall be provided.
The air lift fifth wheel shall include the following:

(a) Additional air reservoir tank(s), not less than 210 L (7.4 cubic feet) total capacity, equipped with drain, safety and check valves between compressor and tank

(b) Automatic moisture ejection valve

(c) Two air starter valves to emit and expel air from the reservoir tank to the air bellows

(d) Three-way valve, for raising, lowering, or holding the fifth wheel in all desired positions. The valve shall be mounted on the truck tractor instrument panel in a location accessible to the seated driver driving.

(e) Snubbers to eliminate spring deflection

(f) Pneumatic system to open and lock the SAE J700 kingpin, operable from the truck tractor instrument panel.

The air lift fifth wheel shall be of the fore and aft rocking type, with a 910 mm (36 inch) diameter cast steel coupler plate with beveled approach forks. The fifth wheel mounting shall conform to Federal Motor Carrier Safety Regulation 393.70(b).

The air lift fifth wheel clearance, measured from the centerline of the kingpin to the cab or pogo stick, shall be not less than 1620 mm (64 inches). The landing wheel clearance to the vertical plane at the outside edge of the rearmost tire and the chassis frame rail, with the fifth wheel in its lowest position, shall be not more than 1620 mm (64 inches) for classes A, B and C vehicles, and also not less than 1400 mm (55 inches) for class C truck tractor. The unlined level height from ground level to the top of the fifth wheel plate shall be 1370 mm (54 inches) plus or minus 25 mm (1 inch). With the fifth wheel in its lowest position, the vertical centerline of the fifth wheel shall be not less than 200 mm (8 inches) forward of the centerline of the rear axle.

AICE CHAINS-TIRE-AUTOMATIC

When code AICE is specified, the vehicle shall be equipped with automatic tire chains on the rear axle. This option is available only on vehicles with air brakes. The chains shall be permanently mounted to the rear suspension. Controls to engage and disengage the chains shall be located in the cab, and be easily accessible to the seated driver. Activation of the chains shall be accomplished without stopping the vehicle, to enhance braking and traction in forward and reverse speeds. When activated the chains shall provide improved traction under tires on the rear axle. Installation of the chains shall be in accordance with the application requirements of the manufacturer of the automatic tire chains.

AM6 Automated Mechanical Transmission Six (6) Speed

When code AM6 is specified, the vehicle shall be furnished with a fully automated mechanical transmission (no clutch pedal). All shifting and clutching operations shall be automated. The transmission shall be computer controlled and have a minimum of 6 forward speeds. The net torque capacity and the net power rating of the transmission shall meet or exceed the output ratings of the engine in all gears. The transmission shall be provided with power takeoff provisions to include gear and opening.

AM10 Automated Mechanical Transmission Ten (10) Speed

When code AM10 is specified, the vehicle shall be furnished with a fully automated mechanical transmission (no clutch pedal). All shifting and clutching operations shall be automated. The transmission shall be computer controlled and have a minimum of 10 forward speeds. The net torque capacity and the net power rating of the transmission shall exceed the output ratings of the engine in all gears. The transmission shall be provided with power takeoff provisions to include gear and opening.

AM13 Automated Mechanical Transmission Thirteen (13) Speed

When code AM13 is specified, the vehicle shall be furnished with a fully automated mechanical transmission (no clutch pedal). All shifting and clutching operations shall be automated. The transmission shall be computer controlled and have a minimum of 13 forward speeds. The net torque capacity and the net power rating of the transmission shall exceed the output ratings of the engine in all gears. The transmission shall be provided with power takeoff provisions to include gear and opening.

AM18 Automated Mechanical Transmission Eighteen (18) Speed

When code AM18 is specified, the vehicle shall be furnished with a fully automated mechanical transmission (no clutch pedal). All shifting and clutching operations shall be automated. The transmission shall be computer controlled and have a minimum of 18 forward speeds. The net torque capacity and the net power rating of the transmission shall exceed the output ratings of the engine in all gears. The transmission shall be provided with power takeoff provisions to include gear and opening.

ART AIR RELEASE TAILGATE

When code ART is specified, the dump body tailgate bottom latch shall be air released.

ARW AIR SLIDE 5TH WHEEL - TRACTORS ONLY

When code ARW is specified, the fifth wheel shall be mounted on an adjustable sliding base. The slide locks shall be of the air release type with controls mounted on the instrument panel. The fifth wheel shall have an adjustment range of not less than 580 mm (23 inches) with adjustment increments of not more than 100 mm (4 inches). The fifth wheel shall conform to 3.5.2 through 3.5.2.6 and all options therein specified in procurement documents. All clearance requirements specified in 3.5.2.1 shall be met with the sliding fifth wheel in its most forward position of adjustment. With the sliding fifth wheel in its most forward position of adjustment, the centerline of the kingpin shall not be less than 380 mm (15 inches) forward of the centerline of the axle. There shall be no sliding positions to the rear of the axle. For safety, the actuating button in the cab shall be interlocked with trailer parking brake. Code ARW is not available with code OSW.

ASI AIR CLEANER SERVICE INDICATOR (DASH MOUNTED)

When code ASI is specified, a re-settable dash mounted service indicator or warning light that registers the highest air restriction reading shall be furnished.

ATC **TRACTION CONTROL-AUTOMATIC**
When code ATC is specified, automatic traction control through the ABS system shall be supplied.

ATR **AIR TRANSPORTABILITY**
When code ATR is specified, air transportability requirements for class C, D, E and F vehicles shall include air transport certification in C-130, C-141, C-5, and C-17 aircraft in accordance with the guidelines in MIL-HDBK-1791. In addition, all vehicles must be equipped with military standard tie down provisions as specified in MIL-STD-209 and option code TDN. See 4.4

ATR2 **AIR TRANSPORTABILITY**
When code ATR2 is specified, class C, D, E and F vehicles shall be air transportable certified for C-5 and C-17 aircraft (vehicle can not be loaded into C130 or C141) in accordance with the guidelines in MIL-HDBK-1791. In addition, all vehicles must be equipped with military standard tie down provisions as specified in MIL-STD-209 and option code TDN. See 4.4

AUXL **AUXILIARY LIGHTS**
When code AUXL is specified, two auxiliary lights shall be provided. Lights shall be mounted at the top corners of the protection rack and shall not protrude above the rack. Wiring shall be protected. The switch to operate the lights shall be located in the cab and shall be easily accessible to the seated driver. The lights shall be PAR 36 sealed beams Number 4411-1, 35 watts and shall be mounted in waterproof, adjustable, rubber automotive housings. Lights shall be capable of illuminating the entire frame to the rear of the cab protection rack.

AUXS **AUXILIARY SPRINGS**
When code AUXS is specified, auxiliary rear springs shall be provided.

B9 **9 FT. BODY**
When code B9 is specified, a 9 FT. body length and the appropriate wheelbase to provide proper load distribution shall be supplied.

B10 **10 FT. BODY**
When code B10 is specified, a 10 FT. body length and the appropriate wheelbase to provide proper load distribution shall be supplied.

B11 **11 FT. BODY**
When code B11 is specified, a 11 FT. body length and the appropriate wheelbase to provide proper load distribution shall be supplied.

B12 **12 FT. BODY**
When code B12 is specified, a 12 FT. body length and the appropriate wheelbase to provide proper load distribution shall be supplied.

B14 **14 FT. BODY**
When code B14 is specified, a 14 FT. body length and the appropriate wheelbase to provide proper load distribution shall be supplied.

B16 **16 FT. BODY**

When code B16 is specified, a 16 FT. body length and the appropriate wheelbase to provide proper load distribution shall be supplied.

AVSC **AUTOMATIC VEHICLE STABILITY CONTROL**

When code AVSC is specified, the OEM's integrated vehicle stability enhancement system shall be furnished. AVSC will help the driver control the vehicle on a variety of road surfaces, in inclement weather, and in avoidance maneuvers.

B18 **18 FT. BODY**

When code B18 is specified, a 18 FT. body length and the appropriate wheelbase to provide proper load distribution shall be supplied.

B20 **20 FT. BODY**

When code B20 is specified, a 20 FT. body length and the appropriate wheelbase to provide proper load distribution shall be supplied.

B22 **22 FT. BODY**

When code B22 is specified, a 22 FT. body length and the appropriate wheelbase to provide proper load distribution shall be supplied.

B24 **24 FT. BODY**

When code B24 is specified, a 24 FT. body length and the appropriate wheelbase to provide proper load distribution shall be supplied.

B26 **26 FT. BODY**

When code B26 is specified, a 26 FT. body length and the appropriate wheelbase to provide proper load distribution shall be supplied.

BBS **BULKHEAD STAKE BODY**

When code BBS is specified, a permanently attached solid front bulkhead, constructed of not less than 12 gage steel with a screened opening behind the cab window shall be provided in lieu of front end racks.

BCS **OPEN TOP CARGO BODY**

When code BCS is specified, a cargo body shall be provided. The cargo body shall be as specified in 3.5.3 through 3.5.3.3.1 and 3.5.3.5 through 3.5.3.5.2 for the class furnished, except that the cargo body shall be 12 feet, 6 inches long by 8 feet wide (nominal). The load space shall be minimum 147 inches in length and 88 inches in width. Sides and ends shall be 24 inches high (minimum) with 5 stake pockets on 35 inch. centers furnished on each side. Sides and ends shall be minimum 12 gauge steel. Floor shall be minimum 8 gage diamond tread plate. Drain holes shall be provided in the front corners. The front panel shall be capable of withstanding a horizontal static load equal to half the payload capacity of the vehicle without permanent distortion. The cargo body shall be adequately reinforced to provide support for an evenly distributed payload (GVW minus curb weight and driver weight). A minimum of 10 cross members shall be furnished. Cross members shall be minimum 10 gauge and shall be gusseted on each long sill. The tailgate shall be hinged at the bottom and provided with removable stay-chains of adequate length to retain the tailgate in a horizontal position. Two (2) steps shall be furnished on

each the left and right sides of the tailgate to assist personnel in mounting and dismounting. The rear lights and reflectors shall be recessed in the rear bolster and shall be positioned to prevent damage by the lowering of the tailgate. Grab handles shall be furnished at the rear of the body on both sides. Cargo tie downs, fully recessed, with 3 inch inside diameter and a 2000 pound load rating shall be furnished in the load space as follows:

a) One centered at the front of the load space

b) Four at the outboard edge of each side, equally spaced, the length of the load space.

Lashing D rings shall be furnished at the exterior of each top rail, mid way between the front and the rear of the body. Mountings and D rings shall be capable of withstanding pulls of 3,000 pounds in any direction without permanent deformation. When D rings are positioned in the raised position, there shall be adequate clearance above the top rail to attach a 2-inch hook.

BDD DOUBLE REAR DOORS

When code BDD is specified, double rear doors shall be provided for a van body, full width and height, with bracing to prevent sagging, and equipped with three cast steel, or equal, hinges per door. The door locking devices shall include not less than three bolts or latches, located at top, bottom and center of the door. Cam type locking devices may be furnished at the top and bottom of the door. The center locking device shall be provided with an operating handle and shall be installed to ensure positive closing under all operating conditions. Provisions for the use of a padlock shall be furnished. The van body shall be equipped at the sides with catches for holding the doors in the fully open position. Hardware shall be the manufacturer's standard. Rear doors shall conform to TMC RP 711.

BDF DIAMOND TREAD STEEL FLOOR

When BDF is specified, diamond tread steel floors, one or two-piece, 3.2 mm (1/8 in) thick, shall be provided for the body with additional lateral support provided at the wheel wells. Two-piece floors shall be spliced longitudinally and completely welded the full length of the splice. One completely welded lateral steel floor splice is acceptable on bodies over 4880 mm (16 feet) in length. When specified diamond tread (code BDF2) or smooth (code BSF2) steel floor shall be minimum 5 mm (3/16 in) thick.

BDF2 HEAVY DUTY FLOOR

When BDF2 is specified, the body floor shall be diamond tread steel, with a minimum thickness of 5 mm (3/16 in) and additional lateral support provided at the wheel wells. Two-piece floors shall be spliced longitudinally and completely welded the full length of the splice. One completely welded lateral steel floor splice is acceptable on bodies over 4880 mm (16 feet) in length.

BDF3 APITONG FLOOR

When code BDF3 is specified, apitong wood floors shall be provided for the body.

BDF4 FLOORING-BED-RECYCLED MATERIAL

When option code BDF4 is specified, recycled tire and plastic plank boards, Rumber Materials Inc. or equal, shall be furnished. Plank boards shall be a

minimum of 1½ in. tongue and grove secured to bed frame with minimum ¼ in. stainless steel self tapping countersunk screws. The installation procedures and plank width shall be in accordance with the manufacturer's recommendation.

BDS DUMP STAKE BODY

When code BDS is specified, a dump stake/platform body shall be provided. The stake/platform body shall be as specified in 3.5.3 through 3.5.3.5.2 for the vehicle class furnished, except the rear end racks shall be the manufacturer's standard swing type, hinged to each side rack. The stake/platform body shall be adequately reinforced to provide support for an evenly distributed payload (GVW minus curb weight and operator weight). The body shall be mounted to a hydraulic hoist unit. Locking devices shall be provided near the center of the rear racks to lock closed and to lock the racks to the body. All locking devices shall be operable from the ground. A rear bumper is not required. When a steel floor is furnished on dump stakes, it shall have a smooth finish.

The body shall be mounted to the hoist unit in accordance with the hoist manufacturer's recommendations and shall be reinforced, for added strength when necessary, for hoist operations. Rear body mounting shall include hinges securely welded to the body longitudinal sills, a connecting cross shaft, and a plate securely bolted to the chassis main frame rails.

A hydraulic conversion type hoist shall be furnished. Unless otherwise specified, the conversion hoist shall have a minimum lifting capacity rating of Class D hoist for Class C vehicles, Class E hoist for Class D vehicles and Class F hoist for Class F vehicles. Conversion hoist ratings shall be in accordance with the National Truck Equipment Association Conversion Hoist Chart. The hoist shall be a double-acting scissors or under body type with an internal bypass system. Hoist hydraulic cylinder piston rods shall be chrome plated. The hoist shall lift the body to a minimum dumping angle of 45 degrees (+1, -2) measured from the top of the truck chassis frame. The hoist shall be capable of lowering the raised body by gravity when the pump is disabled. The controls shall be located in the truck cab and shall be accessible to the seated driver. The location of the controls shall not interfere with the entry and exit of the driver. Hydraulic system and pumping unit shall comply with 3.1.1.10.

A mechanical safety lock, permanently affixed to the body, shall be furnished. The safety lock shall provide positive retention of the body in the up position for servicing or repair. The safety lock mechanism shall not interfere with the operation of the body under any operating conditions.

BFA FLOOR, ALUMINUM TYPE

When code BFA is specified, a diamond tread aluminum plate floor, 3.2 mm (1/8 inch) thick and an underlay laminated hardwood of not less than 29 mm (1-1/8 inch) thick, shall be provided for a van body. Wood parts shall be treated in accordance with 3.1.1.3. Wood floorboards shall be attached to the subframe at cross members with self-tapping, countersunk, corrosion-resistant screws.

BR **TRANSLUCENT ROOF**

When code BR is specified, the van body roof panel over the cargo section shall be translucent white, fiberglass reinforced, polyester material, minimum 1.8 mm (.070 in).

BRT **INTERIOR ROPE TIES**

When code BRT is specified, interior rope ties, fold-down lashing rings, rope cleats, or rod type, shall be installed and secured to wall frame members of the van body. When code FRP is specified, interior rope ties using through fasteners with a head diameter of not less than 13 mm (0.50 inch) shall be provided. FRP/plywood fastener installation shall be waterproofed and exposed fasteners shall be painted to match the vehicle exterior. A minimum of 36 rope ties shall be arranged in three evenly spaced tiers, four rope ties per tier on each wall, including the front wall. The first tier shall be located just above the scuff plate, the second tier at 1/3 of the wall height, and the third tier at 2/3 of the wall height. Rope ties shall project not more than 9.5 mm (0.375 inch) into the cargo area beyond the wall lining. Rope tie protrusions shall be rounded and constructed to prevent injury to personnel and snagging of payload inside the cargo area. Note: Code BRT is not available when code CRT is specified.

BSD **DOOR, CURBSIDE**

When code BSD is specified, curbside swing door, not less than 178 cm (70 in.) high and not less than 76 cm (30 in.) wide shall be provided on a van body. The door shall be located near the center of the body. The door shall be of aluminum faced plywood or of all aluminum with bracing to prevent sagging. The door shall be equipped with at least three hinges. A cam type locking device shall be provided with an operating handle and shall be installed to ensure positive closing under all operating conditions. Provisions shall be incorporated for a padlock. Handles shall be located to permit operation from ground level. The hardware shall be manufacturer's standard. The door shall have a weather tight rubber or plastic seal around the perimeter. The body shall be equipped with devices to hold door in a fully open position. Side doors on refrigerated van shall be insulated and sealed as required for designated classification.

BSF **SMOOTH STEEL FLOOR**

When BSF is specified, smooth steel floors, one or two-piece, 3.2 mm (1/8 in) thick, shall be provided for the body with additional lateral support provided at the wheel wells. Two-piece floors shall be spliced longitudinally and completely welded the full length of the splice. One completely welded lateral steel floor splice is acceptable on bodies over 4880 mm (16 feet) in length. When specified diamond tread (code BDF2) or smooth (code BSF2) steel floor shall be minimum 5 mm (3/16 in) thick.

BSF2 **HEAVY DUTY SMOOTH FLOOR**

When BSF2 is specified, the body floor shall be smooth steel, with a minimum thickness of 5 mm (3/16 in) and additional lateral support provided at the wheel wells. Two-piece floors shall be spliced longitudinally and completely welded the full length of the splice. One completely welded lateral steel floor splice is acceptable on bodies over 4880 mm (16 feet) in length.

BSR SWING, RIGHT & LEFT SIDE CENTER RACKS

When code BSR is specified, the center racks on both sides shall be the manufacturer's standard swing type, for easy side loading.

BTB TARPAULIN, BOWS/TIES

When code BTB is specified, a fitted tarpaulin with knockdown type bows and tiedown devices shall be provided. The tarpaulin shall be fabricated of number 8 cotton duck conforming to Type I of CCC-C-419, or of vinyl-coated nylon conforming to Type II, Class 2 of MIL-PRF-20696. The tarpaulin material shall be reinforced at the corners and other wear points with patches fabricated of the same base material as the tarpaulin. The tarpaulin material shall be water repellent and fire-resistant. The tarpaulin color shall be olive drab. The rear curtain shall be of the roll-up type. The front curtain shall have a window size of not less than 300 mm by 610 mm (12 in by 24 in) and shall be aligned with the rear window of the vehicle cab. The tarpaulin shall completely cover the entire body and shall extend down the sides, front and rear, with the bows in place, to within 75 mm (three inches) of the platform. Bows shall be on the outside of the racks and shall be constructed of metal or metal and hardwood components. At least five bows shall be furnished and shall provide and inside height of not less than 1780 mm (70 inches) between the floor of the platform body and the tarpaulin cover at the top. Not less than five evenly spaced tiedown devices shall be provided on each side of the vehicle body.

BTC TOOL COMPARTMENT, STEEL WITH LATCH

When code BTC is specified, a toolbox shall be provided. The toolbox shall provide for storage in addition to that required by 3.4.16. Minimum dimensions shall be 457 mm (18 in) by 457 mm (18 in) by 609 mm (24 in). A door opening size of not less than 482 mm (19 in) by 330 mm (13 in) shall be furnished. The toolbox shall be fabricated of not less than 14 gage (2.657 mm) (0.1046 in) steel or of equivalent strength aluminum. The toolbox shall be weatherproof and shall provide for locking. The toolbox shall be mounted as close as possible to the rear of the cab. Toolbox shall be mounted on the curbside of the vehicle whenever space permits.

CC CREW-CAB, 4 DOOR

When code CC is specified, a four-door, full width crew cab shall be provided. The cab shall be equipped with two upholstered, full width seats and backs. The front seat shall be adjustable. With the front seat adjusted to the extreme forward position there shall be not less that 760 mm (30 inches), measured in a horizontal plane, between the front of the rear seat back and the rear of the front seat back. A kick-space height of not less than 70 mm (2.75 inches) shall be maintained between the floor and the rear of the front seat in all positions of adjustment. Legroom and space forward of the front seat shall be equivalent to that provided ahead of the seat in a two-door standard cab. Three pairs of seat belts shall be installed for both the front and rear seats. Front outboard seats shall have combination pelvic and upper torso restraint seat belts. Cab doors shall be equipped with locks operable from inside the cab through mechanical linkages, with both front doors equipped with an external key operated lock. Cab doors shall have windows with crank operated window regulators. A rear window shall be provided. Interior lighting shall be provided. Safety grips or grab handles shall be provided at each door

of the cab to assist personnel climbing into 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 bumps or protrusions. Full-length drip moldings shall be mounted above the doors.

CE CAB, EXTENDED STYLE

When code CE is specified a chassis OEM extended cab having an inside length (from firewall to back of cab) of not less than 78 In. nor more than 81 In. shall be provided.

CNG DEDICATED COMPRESSED NATURAL GAS

Supply dedicated compressed natural gas engine and fuel system in lieu of diesel fueled engine. Shall comply with all applicable FMVSS, FMCSR, and National Fire Code requirements

COE TILT CAB

When code COE is specified, a cab-over-engine (tilt cab) shall be provided. 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.

CPR CAB PROTECTION RACK

When code CPR is specified, a cab protection rack shall be provided. The cab protector rack shall be mounted behind the cab and shall be the full width (+2/-3 inches) of the regular non-sleeper cab. Cab protector rack shall be the same height (+5/-5 inches) as the regular non sleeper cab. The cab protector rack for sleeper cabs shall be a minimum of 86 inches wide X 75 inches high. The cab protector rack shall permit driver visibility of the vehicle rear frame area through the rear window; when a rear window is furnished. The cab protector rack shall conform to Federal Motor Carrier Safety Regulation 393.106.

CPR1 CAB PROTECTION RACK, PLUS

When code CPR1 is specified, a cab protection rack meeting the requirements for code CPR and furnished with a locking chain rack, and full width locking tool tray (minimum 10 inches high and 8 inches deep) shall be provided.

CPT PAINT-CUSTOM COLOR

When code CPT is specified, a custom or Federal Standard 595 color shall be provided.

CRP LOGISTIC POST

When code CRP is specified, van body sidewall posts shall be the logistic type. Logistic posts shall be minimum 12-gage steel and shall be 1 ¼ inch (nominal) deep; with “E” type logistics slots on 4-inch centers land shall be rated at 500 pounds per foot of body length.

CRT CARGO RESTRAINING TRACK

For each code CRT specified, one set of cargo restraining tracks shall be installed, one on each interior side wall at the manufacturer’s standard height(s), unless specific heights are specified. One cross bar and hardware

for insertion into the tracks shall be furnished per set of tracks. Each cargo-restraining track shall be the full length of the van body interior. Tracks shall be attached between posts through full-length wood fillers, to the side wall lining, or not more than 150 mm (6 inch) centers. The track fitting holes or slots shall be on approximately 64 mm (2-1/2 inch) centers. The cargo control tracks shall be fabricated of steel with a thickness of not less than 12 gage (2.657 mm) (1.046 inch). One control track bar shall be provided per CRT. The tracks and cargo control bars shall be capable of withstanding a rearward static load of 17.8 kN (4,000 pounds) without permanent deformation. Code CRT is not available when code CRP is specified.

CWR COMPONENT WARRANTY REGISTRATION

CWR requires the Contractor to register all vehicle components which require registration to begin warranty coverage or validate start mileage and time. The registration must reflect the date and mileage at the time of delivery as recorded at the final destination. The Contractor's agent is responsible for collecting any information required for the registration and will not involve any parties of the Government to facilitate completing the documentation.

D1 DIFFERENTIAL LOCK OUT

When code D1 is specified, a driver controlled differential lockout shall be provided.

D3 SPECIAL TRACTION DIFFERENTIAL

When code D3 is specified, the differential traction control shall actuate automatically to ensure that power is transmitted to the wheel having traction when the opposite wheel loses traction.

DA DELETE AIR CONDITIONING

When code DA is specified, the vehicle supplier shall furnish the vehicle without air conditioning components.

DBC DELETE OPEN BODY COVER

When code DBC is specified, the dump bed cover shall be deleted.

DBEM DELETE SIDE AND END RACKS

When code DBEM is specified, side and end racks shall not be provided and code BBS shall be provided.

DDR (H) (G) (A) DEALER DELIVERY

When code DDR is specified, the contractor shall have the final predelivery inspection and servicing performed at an authorized dealer of the same make nearest to the destination. Following predelivery servicing, the dealer shall notify the person/office designated on the delivery order that the vehicle is ready for pick up. (DDRH designates Hawaii, DDRG designates Guam, DDRA designates Alaska.)

DHD HEAVY DUTY BODY

When code DHD is specified, a heavy-duty dump body shall be provided. The sides and front shall be constructed of not less than 7 gauge (0.1792 in.) A570 steel (65,000 psi tensile strength/50,000 psi yield strength). The floor shall be

constructed of not less than ¼ inch AR400F one-piece steel (180,000 psi tensile strength/145,000 psi yield strength). A tailgate having not less than six sections shall be provided.

DRLD DAYTIME RUNNING LIGHTS-DELETE

When code DRLD is specified, daytime running lights shall not be provided.

DSS DRIVER'S SEAT, SUSPENSION TYPE

When code DSS is specified, a driver's individual, adjustable suspension seat and an individual passenger seat shall be provided. The driver's suspension seat shall be the manufacturer's standard mechanical type on class C and air ride suspension type on class D, E and F.

DSS2 DRIVER & PASSENGER'S SEAT, SUSPENSION TYPE

When code DSS2 is specified, the driver seat and the passenger seat shall conform to the requirements of code DSS.

GAS GASOLINE ENGINE

When code GAS is specified, the vehicle shall be equipped with a liquid cooled, internal combustion, four-stroke cycle gasoline engine with not less than eight cylinders. The gasoline engine shall meet or exceed the horsepower required for the diesel engine it replaces. The rated horsepower shall be obtained when operated on unleaded fuel with an octane rating of 87. The engine rated horsepower shall be at or below the manufacturer's governed or recommended maximum speed. The battery(s) supplied with the gasoline engine shall, as a minimum, have ratings of 535 CCA @ -18o C and reserve of 115 amps.

ECB ENGINE COMPRESSION BRAKE

When code ECB is specified, a system which opens all or some of the engine exhaust valves near the end of the compression stroke, thereby converting vehicle motion to a pumping loss (engine compression break), shall be furnished. A dash mounted switch shall be provided to activate, modulate, or cut the brake augmentation. The switch shall be marked to indicate its position. When active, the system shall be fully controlled by means of the conventional driving controls to apply retardation during vehicle deceleration, and to cut it out in the other operating modes. The retarder shall be approved by the engine manufacturer.

EDR RETARDER-DRIVELINE-ELECTROMAGNETIC

When code EDR is specified, an electromagnetic or hydrodynamic drive shaft retarder shall be furnished. A dash mounted switch shall be provided to activate, modulate, or cut the brake augmentation. The switch shall be marked to indicate its position. When active, the system shall be fully controlled by means of the conventional driving controls to apply retardation during vehicle deceleration, and to cut it out in the other operating modes.

EHM ENGINE HOUR METER

When code EHM is specified, an engine hour meter shall be provided. The meter shall have a totalizing mechanism of not less than 9,999 hours for the chassis engine to register accurately the number of hours of operating time. The meter shall be of rugged construction to ensure continuous trouble-free

performance under severe operating conditions. The meter shall be mounted on the cab instrument panel or in the engine compartment in a readable location.

EXB ENGINE EXHAUST BRAKE

When code EXB is specified, a controlled gate valve in the exhaust manifold, which produces backpressure on the engine pistons during the exhaust stroke (engine exhaust brake), shall be furnished. A dash mounted switch shall be provided to activate, modulate, or cut the brake augmentation. The switch shall be marked to indicate its position. When active, the system shall be fully controlled by means of the conventional driving controls to apply retardation during vehicle deceleration, and to cut it out in the other operating modes. The retarder shall be approved by the engine manufacturer.

FEX SAFETY KIT, FIRE EXTINGUISHER & ETC.

When code FEX is specified, emergency equipment in accordance with FMCSR 393.95 shall be provided. Equipment shall consist of 393.95: (a)(2)(i) fire extinguisher, min 10 B:C; (c) spare fuses if electrical overload protection devices is not of the reset type; and (f)(z)(i) reflective triangles, in accordance with TMC RP 403.

FFE FRONT FRAME EXTENSIONS

When code FFE is specified, an integral front frame extension, minimum 45 cm (18 in) ahead of the grille shall be provided, with a radiator, hood, and other equipment required for the installation of a front crankshaft PTO. A stationary grill shall be furnished. The PTO itself is not included or required. The FFE bumper shall be the chassis manufacturer's swept-back full width channel front bumper.

FFP COOLANT HEATER-FUEL FIRED

When code FFP is specified, for diesel engine driven vehicles, a diesel fuel fired engine water heater shall be provided to preheat the engine. The heater shall include a timer, a thermostat and a circulating pump, and shall be connected to the engine coolant system. The heater shall be capable of starting and operating at -40°C (-40°F) and shall heat the engine to 4°C (40°F) from -40°C (-40°F) in not more than 1 hour. The system shall be equipped with a start light, visible to the seated driver, to indicate that the preheater is operating.

FFS FUEL/WATER SEPARATOR, HEATED

When code FFS is specified, a heated fuel and water separator shall be the supplied.

FFP FUEL FIRED ENGINE PREHEATER

When code FFP is specified, for diesel engine driven vehicles, a diesel fuel fired engine water heater shall be provided to preheat the engine. The heater shall include a timer, a thermostat and a circulating pump, and shall be connected to the engine coolant system. The heater shall be capable of starting and operating at -40°C (-40°F) and shall heat the engine to 4°C (40°F) from -40°C (-40°F) in not more than 1 hour. The system shall be equipped with a start light, visible to the driver, to indicate that the preheater is operating.

FHD **HEAVY DUTY FRAME**

When code FHD is specified, a heavy-duty frame having the following minimum shall be provided.

Heavy Duty Frame Requirements

CLASS	RBM MINIMUM IN LB
C	590,000
D	850,000
E	900,000
F	1,275,000
G	1,600,000

FLU **FORK LIFT USE**

When code FLU is specified, a reinforced floor shall be provided. The reinforced floor shall withstand concentrated loads imposed by forklifts having a 6350 kg (14,500 lbs.) axle load supported by 180 mm (7 inch) wide tires spaced 760 mm (30 inches) apart on the tire centerline. Floor design shall permit vehicle operation at speeds up to and including 121 km/h (75 mph), over improved roads.

In addition to the above when code FLU is specified for a refrigerated van, sides and front of reinforced floor shall have an inverted skirt extending upwards for a distance of not less than 125 mm (five inches) and shall be fitted between insulation and the inner panels.

FPH **HAZMAT PLACARD HOLDERS**

When code FPH is specified, hazardous material placard holders in accordance with 49 CFR Part 172 shall be installed on each side and each end of the vehicle. Truck tractors need not be placarded in the rear.

FRP **FIBERGLASS DELIVERY VAN BODY**

When code FRP is specified, FRP/plywood van body side and end panels shall be provided. FRP/plywood panels shall be fabricated of one-piece plywood core laminate with fiberglass-reinforced plastic. The plywood furnished shall equal or exceed U.S. Department of Commerce Standard PS 1-95, C-D (plugged) with exterior glue and with all plies group 1 species or better. Core material shall be butted, scarfed or finger-joined with joint gaps not greater than 3.2 mm (0.125 inch). The fiberglass-reinforced plastic (FRP) shall contain not less than 0.51 kg (18 ounces) fiberglass woven roving material. The plastic shall be of the thermo set polyester family of resins. The plastic shall be fully cured under heat and pressure to ensure the resins from an integral bond to the plywood core. The exterior surfaces shall consist of a gel coat or tedlar finish of 0.38 mm + 0.08 mm (.015 inch + .003 inch). The gel coat or tedlar finish shall be pigmented manufacturer's standard white. Panels shall have an overall finished panel thickness of not less than 16 mm (0.625 inch). Finished panels shall exhibit a smooth vehicle exterior surface with no evidence of discontinuity. The FRP/plywood panels shall be installed with extruded aluminum corner posts, top rails, bottom rails and side door frames. Panels shall be one-piece. Vertical intermediate body posts shall not be used. Posts, rails and side doorframes shall have receiving edges providing attachment to panels with fasteners. Panels shall be secured to posts and

rails using through-fasteners with a head diameter of not less than 13 mm (0.50 inch). Panel edges shall be sealed with waterproof mastic prior to installation. Installed panels shall be sealed with a high performance silicone caulking compound on all enclosing edges. All fastener installations shall be waterproof.

FRT **REAR FENDERS FOR TRACTOR**
When code FRT is specified, full rear fenders constructed of minimum 3/16" aluminum shall be furnished. Fenders shall run half way down the front and rear of the tire and have rear mud flaps.

FTC **70 GALLONS MINIMUM FUEL CAPACITY**
When code FTC is specified, fuel tank(s) totaling not less than 265 L (70 gallons) shall be provided.

FTD **100 GALLONS FUEL CAPACITY**
When code FTD is specified, fuel tank(s) totaling not less than 380 L (100 gallons) shall be provided.

FTE **FUEL CAPACITY 200 GALS.**
When code FTE is specified, dual 378 L (100 gallons) capacity tanks shall be providing a total fuel capacity of 757 L. (200 gallons)

FTR **EXTENDED TAPERED FRAME**
When code FTR is specified, the frame rails shall extend and shall taper from maximum cutoff position so as to form a ramp to assist in coupling to a semi trailer.

H4 **COOLANT-PROTECTION-TO–50 DEG C (-60 DEG F)**
When code H4 is specified, the percentage of antifreeze in the cooling system shall be increased to provide protection against freezing down to -50° C (-60° F).

HAPG **Hybrid Electric Auxiliary Power Generator**
When code HAPG is specified, the vehicle shall be furnished with an auxiliary power generator driven by the vehicle's hybrid electric system. The hybrid electric auxiliary power generator shall be capable of powering electric tools at a stationary work site. HAPG may only be specified when HEV option is selected. The auxiliary power generator shall be powered by the hybrid electric system and provide 5KW of 120 volt power to allow auxiliary power function at a job site with vehicle engine off capability. The vehicle engine shall automatically activate when signaled by the hybrid electric system indicating hybrid battery recharging is required. The vehicle engine shall automatically de-activate when signaled by the hybrid electric system indicated hybrid battery recharging is complete. The hybrid electric auxiliary power generator system shall be rendered non-functional when 1) signaled by the vehicle's hood open safety feature 2) signaled the vehicle's parking brakes and neutral gear are not engaged.

HEV **HYBRID ELECTRIC**
When code HEV is specified, the standard equipment diesel engine and transmission shall be replaced with a propulsion system that incorporates a

higher efficiency diesel engine and a driveline capable of converting kinetic energy into electrical energy and storing it for future use.

HF HIGH FLOTATION TIRES

When code HF is specified, wide base type tires and single wheels for front and rear axles shall be provided. Unless otherwise specified, steel belted radial ply tires shall be provided. Wide base wheels shall be interchangeable without the use of an adapter. The front track of wide base tires shall be within plus or minus 25 cm (10 in) of the rear track. Unless otherwise specified disc type wheels shall be furnished. 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. Under no circumstance shall the vehicle maximum governed speed exceed the speed rating of any of the furnished tires or wheels.

HPTO Hybrid Electric Power Take Off

When code HPTO is specified, the vehicle shall be furnished with an electric hybrid power system that drives an electric power take off feature. The hybrid electric power take off (ePTO) feature is to be specified when additional hydraulic powered systems such as a bucket lift or similar is desired at a stationary work site and may only be specified when HEV option is selected. The electric power take off shall be powered by the hybrid electric system and provide a minimum of 13 continuous horsepower and 26 peak horsepower to allow PTO function at a job site with vehicle engine-off capability. The vehicle engine shall automatically activate when signaled by the hybrid electric system indicating hybrid battery recharging is required. The vehicle engine shall automatically de-activate when signaled by the hybrid electric system indicating hybrid battery recharging is complete. The hybrid electric power take off system shall be rendered non-functional when 1) signaled by the vehicle's hood open safety feature 2) signaled the vehicle's parking brakes and neutral gear are not engaged.

HTG HYDRAULIC TAILGATE, FOLD UP.

When code HTG is specified, the tailgate shall fold vertically against the rear of the vehicle for travel. Unless otherwise specified, the hydraulic tailgate shall have a rated capacity of not less than 910 kg (2,000 lb) for Types III, VII and VIII. The tailgate platform width shall be not less than 2130 mm (84 in) for Type VII vans and Type VIII refrigerator vans and not less than 2290 mm (90 in) for Type III stakes. The tailgate platform shall be of the ramping type and shall have a depth of not less that 810 mm (32 in) exclusive of the ramp. The ramp shall taper down to ground level to facilitate loading with a wheeled handcart. Platform loading area shall be of nonskid sheet steel. The tailgate shall have devices for holding the platform in stowed position for vehicle travel. Controls shall be mounted outside the body on the curbside of the vehicle and shall include an electric control station with environmentally sealed connections, that the operator can reach easily while standing on the ground, or riding on the platform. Tailgate operations shall be hydraulically metered, providing for raising, lowering, folding and unfolding without manual assistance. The tailgate shall be operated hydraulically through an electric driven hydraulic pump. The hydraulic system shall comply with the requirements in paragraph 3.1.1.10. All hydraulic cylinders shall be provided with flow restrictors in the down port of the cylinders to prevent the tailgate

from falling rapidly in the event of a hydraulic system failure. The vehicle ignition switch or a separate switch in the driver's compartment shall allow the driver to disconnect the power source to the tailgate. A 150-ampere minimum, automatic reset circuit breaker shall be furnished with the electric system of the tailgate, to protect the electrical system of the vehicle. A minimum of 2-gage wire shall be furnished on the power cables for maximum operating efficiency and increased electrical component life. A rustproof enclosure shall be furnished to protect the pump motor from dirt and weather. Self-lubricated bearings shall be furnished on all load bearing rollers and hinges. All hydraulic lines shall be grommeted where they are routed through walls and supports and furnished with clamps for protection from damage.

The hydraulic tailgate operating instructions, the hydraulic fluid identification information and any caution notice shall be on a standard decal or plate from the supplier of that item. The decal or plate describing operation of the hydraulic tailgate shall be provided in close proximity to the hydraulic tailgate controls.

Rear bumper and additional rear end protection need not be furnished.

Hydraulic tailgates must conform to FMVSS-223 and 224.

HTGC CART STOP, HYDRAULIC TAILGATE PLATFORM.

When code HTGC is specified, a spring loaded cart-stop retention system shall be furnished on the end of the platform. The cart-stop shall spring up to a vertical position when the foot control is depressed. The cart-stop may be manually returned (with a maximum force of 25 pounds required) to the plane of the horizontal tailgate platform and automatically lock in place. The cart-stop shall remain locked in horizontal or vertical position until the foot control mechanism is depressed.

HTGR HYDRAULIC TAILGATE, RAIL LIFT

When code HTGR is specified, the tailgate shall be a body mounted rail lift type, the platform shall fold vertically against the rear of the vehicle for travel. Unless otherwise specified, the hydraulic tailgate shall have a rated capacity of not less than 910 kg (2,000 lb) for Types III, VII and VIII. The tailgate platform width shall be not less than 2130 mm (84 in) for Type VII vans and Type VIII refrigerator vans and not less than 2290 mm (90 in) for Type III stakes. The tailgate platform shall be of the ramping type and shall have a depth of not less that 810 mm (32 in) exclusive of the ramp. The ramp shall taper down to ground level to facilitate loading with a wheeled handcart. Platform loading area shall be of nonskid sheet steel. The tailgate shall have devices for holding the platform in stowed position for vehicle travel.

Controls shall be mounted outside the body on the curbside of the vehicle and shall include an electric control station with environmentally sealed connections, that the operator can reach easily while standing on the ground, or riding on the platform. Tailgate operations shall be hydraulically metered, providing for raising, lowering, folding and unfolding without manual assistance. The tailgate shall be operated hydraulically through an electric driven hydraulic pump. The hydraulic system shall comply with the requirements in paragraph 3.1.1.10. All hydraulic cylinders shall be provided with flow restrictors in the down port of the cylinders to prevent the tailgate from falling rapidly in the event of a hydraulic system failure. The vehicle ignition switch or a separate switch in the driver's compartment shall allow the

driver to disconnect the power source to the tailgate. A 150-ampere minimum, automatic reset circuit breaker shall be furnished with the electric system of the tailgate, to protect the electric system of the vehicle. A minimum of 2-gage wire shall be furnished on the power cables for maximum operating efficiency and increased electrical component life. A rustproof enclosure shall be furnished to protect the pump motor from dirt and weather. Self-lubricated bearings shall be furnished on all load bearing rollers and hinges. All hydraulic lines shall be grommeted where they are routed through walls and supports and furnished with clamps for protection from damage.

The hydraulic tailgate operating instructions, the hydraulic fluid identification information and any caution notice shall be on a standard decal or plate from the supplier of that item. The decal or plate describing operation of the hydraulic tailgate shall be provided in close proximity to the hydraulic tailgate controls.

Rear bumper and additional rear end protection need not be furnished.

Hydraulic tailgates must conform to FMVSS-223 and 224.

HTGU HYDRAULIC TAILGATE, FOLD UNDER.

When code HTGU is specified, the tailgate shall manually fold under the vehicle for travel and manually unfold for use. Unless otherwise specified, the hydraulic tailgate shall have a rated capacity of not less than 910 kg (2,000 lb) for Types III, VII and VIII. The tailgate platform width shall be not less than 2130 mm (84 in). The hydraulic tailgate for Type VI maintenance/line body shall have a rated capacity of not less than 590 kg (1,300 lb).and the tailgate platform width shall be not more than 4 inches wider than the floor width, allowing body recessed lights to be located outside of the vertically stowed tailgate. The tailgate platform shall be of the ramping type and shall have a depth of not less that 810 mm (32 in) exclusive of the ramp. The ramp shall taper down to ground level to facilitate loading with a wheeled handcart. Platform loading area shall be of nonskid sheet steel. The tailgate shall have devices for holding the platform in stowed position for vehicle travel.

Controls shall be mounted outside the body on the curbside of the vehicle and shall include an electric control station with environmentally sealed connections, that the operator can reach easily while standing on the ground, or riding on the platform. Tailgate operations shall be hydraulically metered, providing for raising and lowering without manual assistance. The tailgate shall be operated hydraulically through an electric driven hydraulic pump. The hydraulic system shall comply with the requirements in paragraph 3.1.1.10. All hydraulic cylinders shall be provided with flow restrictors in the down port of the cylinders to prevent the tailgate from falling rapidly in the event of a hydraulic system failure. The vehicle ignition switch or a separate switch in the driver's compartment shall allow the driver to disconnect the power source to the tailgate. A 150-ampere minimum, automatic reset circuit breaker shall be furnished with the electric system of the tailgate, to protect the electric system of the vehicle. A minimum of 2-gage wire shall be furnished on the power cables for maximum operating efficiency and increased electrical component life. A rustproof enclosure shall be furnished to protect the pump motor from dirt and weather. Self-lubricated bearings shall be furnished on all load bearing rollers and hinges. All hydraulic lines shall be grommeted where they are routed through walls and supports and furnished with clamps for protection from damage.

The hydraulic tailgate operating instructions, the hydraulic fluid identification information and any caution notice shall be on a standard decal or plate from the supplier of that item. The decal or plate describing operation of the hydraulic tailgate shall be provided in close proximity to the hydraulic tailgate controls.
Rear bumper and additional rear end protection need not be furnished.
Hydraulic tailgates must conform to FMVSS-223 and 224.

HTGX INCREASED CAPACITY FOR HYDRAULIC LIFT GATE

When code HTGX is specified, the tailgate (HTG, HTGR or HTGU) shall have a rated capacity not less than 1350 kg (3000 lb) and meet all other requirements of the specified liftgate (HTG, HTGR or HTGU)

HTR HIGHWAY TRANSPORTABILITY

When code HTR is specified, highway transportability requirements for class C, D, E and F vehicles shall include unrestricted highway transport in both the Continental United States (CONUS) and Outside the Continental United States (OCONUS) in accordance with the interface criteria published in "http://www.tea.army.mil/pubs/nr/deploy/transinstruction/MIL-STD-1366D.pdf" \t "_blank", for unrestricted highway transport. In addition, all vehicles with a highway transportability requirement must be equipped with military standard tie down provisions as specified in MIL-STD-209 and option code TDN. See 4.4

LH LOW PROFILE CHASSIS

When code LH is specified, a low profile chassis shall be provided with minimum 19.5 tires and a maximum of 25 cm (35 in) to top of unloaded frame at centerline of rear axle.

LNG DEDICATED LIQUIFIED NATURAL GAS

Supply dedicated compressed natural gas engine and fuel system in lieu of diesel fueled engine. Shall comply with all applicable FMVSS, FMCSR, and National Fire Code requirements

LSD SYNTHETIC LUBE – DIFFERENTIAL

When code LSD is specified, differentials shall be provided with synthetic lubricant. Synthetic lubricant supplied shall be approved by the component manufacturer and furnished by the chassis OEM.

LST LUBRICANT, SYNTHETIC FOR MANUAL TRANSMISSION

When code LST is specified, the manual transmission shall be provided with synthetic lubricant. Synthetic lubricant supplied shall be approved by the component manufacturer and furnished by the chassis OEM.

LTD LIFTING AND TIEDOWN PROVISIONS.

When option code LTD or MTR is specified, the vehicle shall be equipped with four (4) lifting provisions and four (4) tie down provisions to ensure interoperability between transported equipment and lifting and tie down devices commonly used in the transportation environment. Lifting and tie down provisions shall conform to MIL-STD-209 for both Type I and Type II equipment. The contractor shall perform a structural analysis of the tie down and lifting provisions and the surrounding structural elements in accordance

with MIL-STD 209 requirements. In cases when the structural analysis indicates the provisions will clearly pass the requirements, actual physical testing may not be necessary. In cases when where the structural analysis indicates the provisions will marginally pass the requirements, redesign or testing shall be recommended to the contractor. In cases where the structural analysis indicates the provisions will clearly fail the requirements, a redesign of the provisions shall be required.

A shipping data plate shall be furnished and shall conform to composition A (class 1 or 2) or composition C of A-A-50271. The shipping data plate shall be inscribed with a diagram showing the lifting attachments and lifting slings, the capacity of each attachment, and the required length and size of each sling cable. A silhouette of the vehicle showing the center of gravity shall be provided on the transportation plate. Stenciling or other suitable marking shall identify all lifting and tie down attachments. Tie down markings shall clearly indicate that the attachments are intended for the tie down of the equipment on the carrier. See 4.4

MHW WINCH HYDRAULIC

When code MHW is specified, a winch assembly mounted on the front of the vehicle shall be provided. The winch shall be powered by the manufacturer's standard power takeoff or powered hydraulically. If hydraulically powered, the hydraulic system shall comply with the requirements in paragraph 3.1.1.10. The winch shall conform to SAE J706. The winch shall be of the 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 89 kn. (20,000 pounds) pull on the bare drum. The winch line speed on the bare drum shall be between 4.6 and 9.1 meters/min (15 and 30 feet per minute) at an engine speed equal to 35 percent at engine-governed speed. The winch shall be wound with not less than 56 m (185 feet) of 16 mm (0.625 inch) diameter, preformed, 6x37, improved plow steel, independent wire rope core (IWRC) 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 driveline U-joints shall be not greater than 16.5 degrees.

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 6.4 mm (0.25 inch) vertical side plates, conforming to the outside radius of the drum flanges. Six bars, 9.5 mm by 32 mm (0.375 inch by 1.25 inches), shall be welded to the vertical side plates. Three bars shall be located on the top and spaced equally on the top radius, and 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 half the specified cable diameter.

The chassis bumper shall be mounted forward of the winch. The bumper shall be either a channel or a pipe type front bumper. When a pipe type front bumper is furnished, the nominal diameter shall be not less than 75 mm (three inches), and the wall thickness shall be not less than that specified in schedule 40 of ASTM A53. The pipe type front bumper shall have half-round ball ends. The open area on either side of the winch between the bumper and grill/fenders shall be covered with a combination step plate/gravel guard. The

step plate/gravel guard shall be secured to the front bumper and shall be not less than 6.4 mm (0.25 inch) or greater than 9.5 mm (0.375 inch) from the chassis sheet metal. The step plate/gravel guard shall be fabricated of not less than 14 gage (1.897 mm) (0.0747 inch) steel tread plate exclusive of projections. The step plate/gravel guard shall be capable of supporting 1460 kg/m2 (300 pounds per square foot). The step plate/gravel guard shall be supported so that it will not deflect more than 3.2 mm (0.125 inch) under the required load.

MIL DATA PLATES AND DD250

When code MIL is specified, the following shall be supplied.
1. A Nameplate as described in paragraph 5.6.1 of MIL-HDBK-1223 "NONTACTICAL WHEELED VEHICLES TREATMENT, PAINTING, IDENTIFICATION MARKING AND DATA PLATE STANDARDS". The nameplate/data plate shall be completed in accordance with requirements of receiving military service and attached to the vehicle(s). No other exterior military markings shall be furnished.
2. DD Form 250 "MATERIAL INSPECTION AND RECEIVING REPORT" furnished in lieu of a GSA form 308.

MPP POWER ANGLING OF SNOW PLOW

When code MPP is specified, the snowplow (MPS) moldboard shall be power angling with controls located in the cab.

MPR SNOW PLOW PROVISION

When code MPR is specified to accommodate future installation of a snowplow, a chassis hood that will permit checking of normal maintenance items such as oil and water with the snow plow attached shall be supplied. The front GAWR shall be not less than the load imposed by an 860 kg (1,900 lb) load located 1520 mm (60 in) forward of the centerline of the front axle plus the front axle portion of the Federal Standard Item No. required payload uniformly distributed over the load area plus the chassis and body front axle weight. The rear GAWR shall be not less than the load imposed by the Item No. required payload without the snowplow plus the chassis and body rear axle weight.

Note: when code MPR is specified, a significant increase in the chassis GVWR may be required. The increased GVWR could possibly change a non-CDL or a non-FET chassis to a chassis that requires the operator to have a CDL or to be subject to FET.

MPS SNOWPLOW, REVERSIBLE

When code MPS is specified, a hydraulically operated snowplow shall be provided. A chassis hood that will permit checking of normal maintenance items such as oil and water with the snow plow attached shall be supplied. The front GAWR shall be not less than the load imposed by the furnished snowplow in raised position plus the front axle portion of the required payload for the Federal Standard Item No. plus the chassis and body front axle curb weight. The snowplow shall be complete with a moldboard, a tripping device, a hitch, a hydraulically operated lifting mechanism, a set of auxiliary lights, a snow deflector or radius curve edge and all other necessary mounting and operating apparatus. The plow shall be shipped in the load space and lights shall be shipped within the cab when possible. Brackets and connections shall be installed on all vehicles to enable ready installation of the lights and snowplow at the destination. Snowplow and lights shall be installed on the

first vehicle to assure proper operation, and they may be removed for shipment after Government inspection.

The moldboard assembly of the reversible type snowplow, exclusive of the snow deflector, shall have a vertical height of not less than 810 mm (32 inches) for classes B through E and 910 mm (36 inches) class F and G, and shall be capable of clearing a path of not less than 2620 mm (8 feet and 7 inches) at a blade angle of 30 degrees, plus 2 degrees, minus 0 degrees. The actual length of the moldboard shall be not less than 3050 mm (10 feet). The moldboard shall be of not less than 7 gage (4.554 mm) (0.1793 inch) high tensile steel or a one piece (not spliced) sheet of 9.5 mm (0.375 inch) thick polyethylene material. The polyethylene material shall not become brittle in temperatures as low as -54°F), shall not corrode, and shall have an abrasion resistance factor at least equivalent to steel. A snow deflector shall be provided the full length of the top of the moldboard. The snow deflector shall be of the manufacturer's standard design to prevent snow from topping the snowplow. The snowplow shall be equipped with two heavy duty steel casting, full swivel shoes or tow caster wheels for classes B through E. Class F and G shall be equipped with two heavy duty 410 mm (16 inches) full swivel caster wheels with pneumatic tires. Both the caster wheels and swivel shoes shall be adjustable. The caster wheels shall be roller or ball bearing mounted, shall be of the shielded type to prevent entrance of water and foreign matter, and shall have lubrication fittings.

The push-frame assembly shall attach to the moldboard and hitch in a manner to provide ample road clearance of the assembly and permit sufficient oscillation for the snowplow to follow road contour and clear snow evenly. The positioning of the snowplow moldboard to the right and to the left shall be of the manual angling type and shall be capable of being accomplished by one man without the use of tools. The snowplow shall have a minimum of two angle adjustments both to right hand cast and left hand cast. A shear pin shall be used to lock the snowplow in any of its five plowing positions. Under normal plowing conditions, the shear pin shall be designed to minimize damage to the snowplow and vehicle should the snowplow's leading edge come into contact with an immovable object.

The plow hitch shall be of the push-frame type designed to be attached to and transmit the entire plowing thrust to the truck frame in such a manner that no plowing thrust shall be absorbed by the truck front axle. Front axle hitch supports, when used, shall be attached in a manner to prevent chafing or other damage. Hitch mainframe members and lift frame vertical and horizontal members shall be of adequate size, properly braced, and reinforced to sustain the loads imposed under severe operating conditions. The hitch shall be removable.

The hydraulic system shall consist of a power operated pumping unit, a hydraulic fluid reservoir or a reservoir integral with the hoist, controls, cylinder, hoses, piping, and all other parts essential for normal operation. The hydraulic system shall comply with the requirements in paragraph 3.1.1.10. Controls to the pumping unit shall be operable by the truck driver in his normal operating position and shall not interfere with the operation of any truck controls. The hydraulic pump shall be powered by the engine crankshaft or transmission mounted PTO. The snowplow hoist cylinder shall have sufficient travel to hoist the plow to not less than 200 mm (8 inches) ground clearance. The hoisting

mechanism, hoist cylinder and hydraulic system shall be capable of holding the snowplow in the fully raised position while the truck is driven over secondary gravel roads at speeds up to 48 km/h (30 mph). Hydraulic lines to the hydraulic cylinder and the pump shall be provided with quick disconnect hose couplers. Hose caps, pump caps and hydraulic cylinder caps shall be provided if no other protection system is provided. Caps shall be secured with a corrosion-resistant security device to prevent loss. Caps shall prevent entrance of contaminants into the hydraulic system when disconnected.

A set of raised auxiliary dual beam headlights, parking, and turn signal lights shall be provided for use with the snowplow. Parking and turn signal lights shall use a single light bulb. Mounts, adapters and an appropriate wiring harness shall be provided. Quick disconnect plugs and receptacles shall be provided and shall be weatherproof, or shall be located in a weatherproof location. A high beam indicator light shall be provided and shall be readily visible to the driver when in the driving position.

Snowplow markers shall be provided for the street side and curbside of the snowplow. The markers shall be removable when not in use. The markers shall eliminate guesswork as to position of the snowplow caused by blind spots.

Note: when code MPS is specified, a significant increase in the chassis GVWR may be required. The increased GVWR could change a non-CDL or a non-FET chassis to a chassis that requires the operator to have a CDL or to be subject to FET.

MS **MUD & SNOW TIRE**

When code MS is specified on 4x2 vehicles, mud and snow tread shall be provided on rear axles.

MTL **TRAILER LIGHTING CABLE 110 INCHES**

When code MTL is specified, a trailer lighting cable conforming to SAE J1067 shall be provided. The cable shall be coiled and shall be not less than 2800 mm (110 in) 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.

MTR **MARINE TRANSPORTABILITY**

When code MTR is specified, marine transportability requirements for class C, D, E and F vehicles shall include unrestricted water transport by all standard military and commercial watercraft in accordance with the interface criteria published in “MIL-STD-1366 Transportability Criteria”. In addition, all vehicles must be equipped with military standard lifting and tie down provisions (option LTD) as specified in MIL-STD-209 and option code LTD. See 4.4.

NAS **SPREADER TAILGATE**

When code NAS is specified, an under-tailgate type sand and salt spreader shall be provided and shall be easily removable. When a snowplow is specified, the sand and salt material feed auger and spreader shall be hydraulically powered by the snowplow hydraulic system. If no plow is specified, the spreader may be powered by a PTO mounted hydraulic pump or by its own auxiliary diesel engine driven hydraulic pump. Controls shall be

located in the cab. Hydraulic lines shall be provided with quick disconnect hose couplers. Hose caps, pump caps and hydraulic motor caps shall be provided if no other protection system is provided. Caps shall be secured with a corrosion-resistant security device to prevent loss. Caps shall prevent entrance of contaminants into the hydraulic system when disconnected.

NSP SAND AND SALT SPREADER

When code NSP is specified, a skid mounted sand and salt spreader with a material hopper of not less than 2.3 cubic meters (3 cubic yards) capacity shall be provided. The sand and salt material feed auger and spreader shall be hydraulically driven by the snowplow hydraulic system when a snowplow is specified. If no plow is specified, the spreader shall be hydraulically powered by a PTO mounted hydraulic pump or by its own auxiliary diesel engine driven hydraulic pump. Controls shall be located in the cab. Hydraulic lines shall be provided with quick disconnect hose couplers. Hose caps, pump caps, cylinder caps and hydraulic motor caps shall be provided if no other protection system is provided. Caps shall be secured with a corrosion-resistant security device to prevent loss. Caps shall prevent entrance of contaminants into the hydraulic system when disconnected.

PL POWER LOCKS

When code PL is specified, OEM power door locks shall be supplied on all cab doors.

PSM PARTS AND SERVICE MANUALS

When code PSM is specified, a parts list, or book, all shop repair manual(s) for the vehicle and equipment shall be provided.

PSM2 PARTS AND SERVICE MANUALS

When code PSM2 is specified, one operator's manual shall be packed with each vehicle. Two sets of maintenance and parts data along with any operation, maintenance and parts data for mounted or specialized equipment, shall be furnished, regardless of the number of vehicles the consignee is receiving. Example: if 15 vehicles are shipped to a consignee, only two sets of the tech manuals mentioned above are shipped to the consignee; however, an operator's manual shall be provided for each vehicle.

PSMA PARTS AND SERVICE MANUALS - AIR FORCE

When code PSMA is specified, a total of two sets of technical manuals consisting of operating, maintenance, and parts for the chassis and mounted equipment, shall be sent to Warner Robbins AFB, GA as detailed in vehicle vendor's contract.

PSME PARTS AND SERVICE MANUALS ELECTRONIC

When code PSME is specified, the parts and service manual shall be furnished in electronic format (CD or web-based).

PWO POWER WINDOWS

When code PWO is specified, OEM power windows shall be supplied.

R35 REFRIGERATION/HEATING UNIT-HOLD VAN TO +35 DEG F

When code R35 is specified, the unit shall also have the heating capability to maintain the interior of the refrigerator van at 2°C (35°F), when the ambient air temperature is -32°C (-25°F), at a road speed of 88 km/h (55 mph).

RACS AM/FM RADIO WITH CASSETTE PLAYER

When code RACS is specified, an OEM AM/FM/clock radio with integrated cassette player shall be provided.

RAD AM/FM RADIO WITH COMPACT DISC PLAYER

When code RAD is specified, an OEM AM/FM/clock radio with integrated compact disc player shall be provided.

RDO DELETE STAND-BY ELECTRICAL REFRIGERATION POWER

When code RDO is specified, the standard stand-by electrical power source shall not be required and the refrigeration unit shall be powered only by the primary refrigeration power source (3.5.8.3.2) only.

RM3 MOTORIZED RIGHT SIZE MIRROR (INCLUDES RM4)

When code RM3 is specified, the curbside flat mirror shall be of the motorized type, with remote control. The mirror motor shall provide not less than 60 degrees horizontal rotational viewing range. Code RM3 shall include the requirements of code RM4. Mirror remote controls shall be within reach of the seated driver.

RM4 HEATED FLAT MIRRORS

When code RM4 is specified, the flat mirrors shall be electrically heated. Mirror heating controls shall be within reach of the seated driver.

ROD ROLL-UP DOORS

When code ROD is specified, a full width, roll-up, rear overhead door shall be provided on the refrigerator van. The door shall be of the sectional type having not less than five sections. Door sections shall be not less than 29 mm (1.125 inch) thick fiberglass filled with polyurethane foam with molded plastic end caps, or equal. Door insulation shall maintain body-insulating efficiency. Door gaskets shall be installed and shall be designed to ensure a positive seal. A door-locking device, with operating handle, shall be installed to provide positive closing action and shall have provisions for the use of a padlock. The door shall be capable of being opened from inside when locked. Door section corrosion-resistant hinges shall be mounted on the inside of the door, not less than four hinges at each section joint. Door track shall be the manufacturer's standard corrosion-resistant type equipped with a positive stop at the end of the track. Door rollers, counterbalance unit, and cables of corrosion-resistant construction shall be the manufacturer's standard. The door shall be weather tight. One heavy duty corrosion-resistant grab handle, closed type, shall be provided on the outside bottom of the door. One nylon double-loop pull-down strap, not less than 38 mm (1.5 inches) wide and 300 mm (12 inches) in length, shall be provided and located adjacent to the door lock. The door opening shall be within 125 mm (five inches) of the full width and within 230 mm (nine inches) of the full height of the body interior.

RTH TOWING HOOKS/LOOPS AT REAR

When code RTH is specified, additional towing devices shall be mounted on the rear of the vehicle.

RTR RAIL TRANSPORTABILITY.

When code RTR is specified, rail transportability requirements for class C, D, E and F vehicles shall include unrestricted rail transport in both the CONUS and OCONUS, unless otherwise specified, as described below and in accordance with the interface criteria published in "http://www.tea.army.mil/pubs/nr/deploy/transinstruction/MIL-STD-1366D.pdf" \t "_blank", for unrestricted rail transport.

RTR TESTING REQUIREMENTS

Vehicles must be capable of successfully completing the military standard rail impact test as prescribed in MIL-STD-810 using standard tie down procedures as illustrated in "http://www.tea.army.mil/pubs/nr/deploy/fgpamplets/PAM_55-19.pdf" \t "_new". In addition, all vehicles must be equipped with military standard tie down provisions as specified in MIL-STD-209 and option code TDN. See 4.4

SAC MATERIAL HANDLING CRANE

When code SAC is specified, a one-man operated, fully hydraulic, articulated boom type crane, mounted on the truck frame between the cab and the platform/stake body shall be provided. The crane shall conform to all applicable ANSI and OSHA requirements and regulations including OSHA 1926.550. The boom shall consist of an upper and lower section and a hydraulically operated extendable jib(s), and no more than one manual extension capable of extending to a lateral reach not less than 7.3 m (24 ft). Double-acting hydraulic outriggers independently controlled and integrally mounted to the crane base shall be furnished. With the outriggers in the down position, the crane shall be capable of lifting a minimum load of 700 kg (1,500 pounds) when the load is located at a radius of 7.3 mm (24 feet), without causing the vehicle to become unstable. Vehicle shall be deemed unstable when any one of the vehicle wheels lifts off the ground. The boom, when fully extended, shall have a normal lifting range of 7600 mm (25 feet) above ground level and shall fold to a travel height, between the stake body and the truck cab, not more than 2130 mm (84 inches) above the truck chassis frame. Crane controls shall be provided on each side of the vehicle. Crane and outrigger controls shall be accessible from ground level. Each outrigger control shall be located on the same side of the vehicle as the outrigger. Each outrigger landing pad shall be not less than 900 sq. cm (140 square inches).

A hydraulic pump driven from a power takeoff controlled from inside the truck cab shall be provided to furnish power for the crane. The pump shall be of the positive displacement type and shall provide a working pressure of not less than 12.4 megapascals (MPa) (1,800 psi). Controls shall be of the self-centering, fail-safe type with hydraulic bypass overload valves, and a check valve type locking system in boom and outriggers to prevent the load dropping due to hydraulic or power failure. Controls shall have fine metering qualities to provide variable raising, lowering and rotating motions of the crane boom. The crane hydraulic system shall comply with the requirements in paragraph 3.1.1.10 and contain the following minimum safety features:

(a) Check valve system in boom and outrigger system to prevent load drop due to hydraulic system failure.

(b) Flow valve in hydraulic lines or cylinder to prevent boom damage due to sudden load-lowering stops.

(c) Cushioning valves in boom rotating hydraulic system for rack-and-pinion mounted cranes to prevent damage due to sudden stops.

(d) Pressure relief valve to prevent loading beyond lifting capacity.

(e) Devices to limit vertical creep of the boom to not more than 25 mm (1 inch) per hour.

(f) Signs with 25 mm (1 inch) lettering visible to the operator at both sets of controls reading: OUTRIGGERS MUST BE IN PLACE BEFORE LIFT IS MADE.

SAR SUSPENSION-AIR SPRING-REAR.

When code SAR is specified, an air suspension shall be provided on the rear axle for class E, F and G vehicles. The suspension system shall have not less than 55 percent of the sprung weight carried on the air springs. The air suspension system shall incorporate at least one track bar to control lateral movement. Each end of the track bar(s) and of the torque rod(s), if so equipped, shall be equipped with rubber bushings that do not require periodic lubrication. The suspension system shall incorporate leveling valve(s) with time delay or other devices to minimize constant air consumption. On Type II tractors, the system shall be equipped with an air pressure dump valve. Controls shall be located in the cab, accessible to the seated driver. Hydraulic double-acting shock absorber(s) shall be provided near each of the air springs. The air suspension system shall include mechanisms to prevent damage from excessive extension when lifting and towing the vehicle. The suspension shall be provided with a mechanism at each wheel to assure lifting of the wheel and axle when jacking the vehicle from the applicable jacking location. Note: option not available on Type IV dumps.

SEHB OIL PAN HEATER

An oil pan heater of the permanent external surface mount or immersion type that meets the following requirements shall be installed.

(1) Immersion type - not more than 11 W/L (10 watts per quart) or less than 5W/L (5 watts per quart) heating capacity.

(2) Surface type - not more than 2.8 watts per square centimeter (W/cm2) (18 watts per square inch) or less than 1.4 watt/sq. cm (9 watts per sq. in.) heating capacity.

The oil pan heater shall conform to all requirements of Federal Motor Carrier Safety Regulation 393.77(b) (7).

SEHE AN IN-LINE FUEL WARMER

An in-line fuel warmer of the electrically heated type shall be provided and conform to all requirements of SAE J 1422 and Federal Motor Carrier Safety Regulation 393.77(b) (7).

SK METRIC ODOMETER

When code SK is specified, the odometer shall show cumulative distance in kilometers.

SLP LOW PROFILE TIRES

When code SLP is specified, low profile tires shall be provided.

SLP1 SHORT SLEEPER COMPARTMENT

When code SLP1 is specified, a sleeper cab meeting the requirements of 3.4.12 and 3.4.12.1 shall be provided with the following additional space, equipment and features: The sleeper compartment shall be not less than 914 mm (36 inches) in depth and fitted with a foam or inner spring mattress not less than 863 mm (34 inches) in depth, and a sleeper occupant restraint system. A luggage compartment with locking access doors on each side of the cab shall be provided. Curtains and a dome light shall be provided. The sleeper compartment shall have heating and air conditioning. Auxiliary air temperature controls or louvers shall be provided in the sleeper compartment. The controls or louvers shall provide for remote regulation of both heating and air conditioning from within the sleeper compartment.

SRP RUSTPROOFING

When code SRP is specified, the vehicle shall be rustproofed in accordance with FED-STD-297.

STA SPARE TIRE ASSEMBLY

When code STA is specified, a spare tire assembly for the front axle shall be provided. The spare tire assembly shall be identical to those on the axle for which it is intended. The spare tire assembly shall include an inflated spare tire(s) mounted on the spare wheel(s). If a Class F vehicle is furnished with a higher load range on the rear, the spare shall be the higher load range.

STB SPARE MATCH REAR

When code STB is specified, a spare tire assembly for the rear axle shall be provided.

STC SPARE TIRE CARRIER

When code STC is specified, a carrier for a spare tire assembly shall be provided. The carrier design shall enable safe removal or mounting of a spare tire assembly using only the tools specified in option JT. 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. Threaded fasteners, when used to secure the spare tire assembly in the carrier, shall be constructed of or plated with corrosion resistant material. The carrier shall be installed in a readily accessible location on the vehicle. Curbside location is preferred and shall be utilized whenever possible. On Type VII and Type VIII vehicles, the carrier shall be installed under the body forward of the rear axle.

STF **STAGGERED FRAME**

When code STF is specified, the frame shall be staggered behind the cab to lower the height of the rear frame by the amount the frame was raised to accomplish the 4X4 conversion.

T1 **RETARDER-AUTOMATIC TRANSMISSION-INTEGRAL**

When code T1 is specified, a hydrodynamic retarder integral with the automatic transmission (transmission retarder), shall be furnished. A dash mounted switch shall be provided to activate, modulate, or cut the brake augmentation. The switch shall be marked to indicate its position. When active, the system shall be fully controlled by means of the conventional driving controls to apply retardation during vehicle deceleration, and to cut it out in the other operating modes.

T6 **MANUAL TRANSMISSION SIX (6) SPEED**

When code T6, is specified, a six speed manual transmission, shall be provided. Gear ratios in the transmission shall provide a progressive shifting pattern throughout the complete range. The transmission shall be provided with SAE J704 power takeoff openings at the right and left sides. The transmission shall provide for maximum ease of shifting in all speeds. The input torque capacity of the transmission shall equal or exceed the maximum torque delivered by the engine. 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. The clutch shall be equipped with spring dampening and a greaseable release bearing.

T7 **MANUAL TRANSMISSION SEVEN (7) SPEED**

When code T7 is specified, a seven speed manual transmission shall be provided. Gear ratios in the transmission shall provide a progressive shifting pattern throughout the complete range. The transmission shall be provided with SAE J704 power takeoff openings at the right and left sides. The transmission shall provide for maximum ease of shifting in all speeds. The input torque capacity of the transmission shall equal or exceed the maximum torque delivered by the engine. 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. The clutch shall be equipped with spring dampening and a greaseable release bearing.

T10 **MANUAL TRANSMISSION TEN (10) SPEED**

When code T10 is specified, a ten speed manual transmission shall be provided. Gear ratios in the transmission shall provide a progressive shifting pattern throughout the complete range. The transmission shall be provided with SAE J704 power takeoff openings at the right and left sides. The transmission shall provide for maximum ease of shifting in all speeds. The input torque capacity of the transmission shall equal or exceed the maximum torque delivered by the engine. 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. The clutch shall be equipped with spring dampening and a greaseable release bearing.

TBE ELEC. TRAILER BRAKE CONTROL

When code TBE is specified, an electric trailer brake controller shall be provided. The controller shall be installed in the truck cab and wired through the lighting socket. The controller shall operate on the 12-volt electrical system of the vehicle and shall include the load control, hand lever, and accessories.

TBT TOWING BRAKE CONTROL

When code TBT is specified, the vehicle shall be provided with a system for controlling the brakes from a towing vehicle (wrecker). The installation shall be complete with air brake couplers, relay emergency valve 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 glad-hand 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.

TDN TIEDOWN PROVISIONS.

When option code TDN, ATR, HTR or RTR is specified, the vehicle shall be equipped with four (4) tie down provisions to ensure interoperability between transported equipment and tie down devices commonly used in the transportation environment. Tie down provisions shall conform to MIL-STD-209 for both Type I and Type II equipment. The contractor shall perform a structural analysis of the tie down provisions and the surrounding structural elements in accordance with MIL-STD 209 requirements. In cases when the structural analysis indicates the provisions will clearly pass the requirements, actual physical testing may not be necessary. In cases where the structural analysis indicates the provisions will marginally pass the requirements, redesign or testing shall be recommended to the contractor. In cases where the structural analysis indicates the provisions will clearly fail the requirements, a redesign of the provisions shall be required.

A shipping data plate shall be furnished and shall conform to composition A (class 1 or 2) or composition C of A-A-50271. The shipping data plate shall be inscribed with a diagram showing the tie down attachments, the capacity of each attachment, and the recommended tie down pattern for securing the equipment during transport. A silhouette of the vehicle showing the center of gravity shall be provided on the transportation plate. Stenciling or other suitable marking shall identify tie down attachments. Tie down markings shall clearly indicate that the attachments are intended for the tie down of the equipment on the carrier. See 4.4.

TJ TOOLS-TIRE REMOVAL AND JACK

When code TJ is specified, tools for changing a mounted tire assembly with the spare assembly shall be provided. Tools shall include at least a hydraulic jack, jack handle and wheel nut wrench. The jack shall be of such closed

height as to permit its location under an 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 a wheel and tire assembly.

TP TWO TONE PAINT

When code TP is specified, any of the manufacturer's production multi-tone paint combinations may be selected.

TPMS TIRE PRESSURE MONITORING SYSTEM

When specified requires real-time all-wheel direct monitoring of tire pressures using sensors mounted inside tires. A digital display in the driver's area shall indicate tire status with each wheel position and pressure.

TS TILT STEERING

When code TS is specified, the vehicle shall be equipped with the chassis OEM tilt steering column.

TSTF SYNTHETIC AUTOMATIC TRANSMISSION FLUID

When code TSTF is specified, the automatic transmission shall be furnished with synthetic lubricant. Lubricant supplied shall be approved by the component manufacturer and furnished by the chassis OEM.

TSW RATCHET BINDERS

When code TSW is specified, load securing straps and winch binders shall be provided. Code TSW shall include the following:

a) 4 inch wide by 27 feet long (minimum) nylon straps webbing, breaking strength 20000 lb/9074 kg, assembled breaking strength 15000 lb/6805 kg., working load limit 5000 lb/2270 kg. Flat hook working load limit 5000 lb/2270 kg on one end with aluminum abrasion clip to prevent chaffing.

b) Sliding steel track on curbside, welded to bottom of crossmembers from first crossmember to last crossmember, with removable stop at each end to prevent winches from being lost. Flat steel bar of adequate strength welded to bottom of crossmembers on street side, allowing strap hook to not protrude past side rail of body.

c) Storable winch binders, capable of storing a 4 inch A 27 feet strap placed in the slide track. A standard winch bar shall be provided, for use in winching down load straps.

Quantities of straps and winch binders shall be 6 each for 16 to 18 foot bodies and 7 each for 20 foot bodies and longer.

TTP TRAILER TOWING PACKAGE

When code TTP is specified, a trailer-towing package shall be provided. Note: option not available when code HTG, HTGU, HTGX, or BDS is specified. The trailer towing package shall consist of a pintle, with ground height, of 510 mm (+125 mm, - 0) (20 in [+5, -0]), unless other wise specified, safety chain attachment devices, a lighting receptacle, a trailer brake control system (see 3.4.11.2 for air brake equipped chassis), and associated reinforcements and wiring, and shall be installed on the rear of the vehicle. The pintle shall be of

the rotating type conforming to MS 51118-1. The pintle shall be installed on the chassis frame with reinforcements to transfer a vertical tongue load of not less than 1815 kg (4,000 lb) and a horizontal drawbar load of not less than 178 kilonewtons (kN) (40,000 lb) directly to the chassis rails. Except on Type II tractors, the rear most portion of the pintle shall be forward, but not more than 100 mm (4 in) forward, of the rear most 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 [116 mm (4-9/16 in) wide, 30 mm (1-3/16 in) thick, 19.8 mm (25/32 in) throat width)] for a 16 mm (5/8 in) chain. The lighting receptacle, conforming to SAE J560, with its conductors connected and color-coded or number coded, shall be mounted in a readily accessible location near the pintle. The lighting receptacle on Type IV dumps shall be located to prevent damage during dumping of the cargo.

TRAILER BRAKE CONTROL SYSTEM.

In addition to the components specified in 3.4.11.1 and 3.4.11.1.1, a trailer brake control system shall be furnished when a trailer-towing package code TTP is required for air brake equipped chassis. 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 operable with foot brake and with hand control for trailer brakes

(f) Two SAE J844 coiled air hoses, not less than 2800 mm (110 inches) long when fully extended, with SAE J318 glad hand couplers on both ends of hoses. The hoses shall be packaged and stowed in the vehicle tool compartment for shipment.

(g) Air connectors for trailer with SAE J318 glad hand couplers mounted at the rear of the vehicle, located to prevent interference with a trailer. Air connectors and glad hands on Type IV dumps shall be located to prevent damage during dumping of the cargo.

(h) Dummy glad hand couplers with security chains or cables.

(i) Prime mover only parking brake valve to permit mover parking brakes to be applied while charging the trailer air brake system.

TWD TRACTOR WIND DEFLECTOR

When code TWD is specified, a wind deflector shall be installed or shall be furnished with the vehicle for subsequent installation on the cab roof by the receiving activity. The deflector shall be of molded fiberglass reinforced plastic; shall be not less than 1600 mm (63 inches) wide; and, unless otherwise specified, shall be of a height suitable for use with the vehicle cab furnished in combination with semitrailer vans having a level height of 3810 mm (12 feet 6 inches) at an upper fifth wheel height of 1250 mm (49 inches).

Mounting and support ribs and any other components that require manufacturer installation from the inside of the cab shall be installed by the cab manufacturer. Installation openings shall be sealed to prevent air and water from entering the cab. The deflector, including exterior mounting and supporting hardware, support ribs and the installation instructions, shall be securely stowed on the vehicle for shipment.

UN **UNDERSTRUCTURE, NESTED DUMP BODY**

When code UN is specified, a dump body with nested understructure shall be provided. The floor of the dump body shall directly contact and be supported by the longitudinal sills as well as the crossmembers. Longitudinal sills shall be capable of supporting the hoist load. Longitudinal for class D, E, F and G shall have a RBM of not less than 52,000 N-m (460,000 inch pounds). Crossmembers shall provide support under the floor every 380 mm (15 inches) or less. Each crossmember shall pass through the longitudinal and be shall be securely welded to longitudinal. Crossmembers shall have a RBM of not less than 12 300 N.M. (109,000 inch pounds). Crossmembers shall be capable of supporting an evenly distributed load of not less than 6800 kg (15,000 lbs) for class C, 9070 kg (20,000 pounds) for class D, 10 900 kg (24,000 pounds) for class E body and 1800 kg/m2 (370 pounds per square foot) of floor area for class F and G bodies. Longitudinals and crossmembers shall be welded for not less than 50 percent of the contact edges to the body floor. Longitudinals shall be welded for not less than 50 percent of contact edges with the body ends. Crossmembers shall be welded for not less than 50 percent at the contract edges with the body side rub rails.

VMS **VERTICAL SPARE TIRE CARRIER**

When code VMS is specified, a vertical carrier for a spare tire assembly shall be provided. The carrier shall be mounted behind the cab above the chassis frame for Type II tractors or Type IV dumps. When code VMS is specified, for Type III stakes, a vertical carrier for a spare tire assembly shall be provided. The carrier shall be mounted behind the cab on the front rack or bulkhead.

VOL **24 VOLT TRAILER SYS**

When code VOL is specified, an auxiliary 24-volt system, with a trailer receptacle assembly, shall be provided. Either a converter type (see below) or an alternator type (see below) system, meeting specified requirements, shall be provided. A trailer receptacle, conforming to MS 75021-2, with cover assembly, shall be provided in an accessible location on the rear end of the vehicle. A 12-conductor truck tractor cable, not less than 3048 mm (10 ft) long with both ends of cable equipped with connectors conforming to MS 75020-1 and MS 75020-2, 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 MS 75021-2. On Type II tractors, a pogo stick type hose tender shall be provided behind the cab to accommodate and secure the 24-volt cable.

CONVERTER TYPE 24-VOLT SYSTEM.

The 12- to 24-volt converter(s) shall operate from the 12-volt battery (see 3.4.2.6). The output capacity shall be not less than 24 amperes. More than one converter may be provided to furnish a total of 24 amperes.

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 amperes 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 at least 20 ampere-hours capacity at a 20 hour rate.

(c) Voltage regulating device.

(d) An ammeter for the 24-volt system, mounted on the instrument panel.

WLP WHEELS PAINTED SAME COLOR AS CAB

When Code WLP is specified, the vehicle's wheels shall be painted the same color as the vehicle cab.

XP EXPORT PACKAGE

When Code XP is specified, the vehicle is intended for export (shipment with final destination outside of the 48 contiguous states) and all separable and pilferable items including, but not limited to jacks, spare tires and wheels, mirrors, tarpaulins, etc., shall be boxed, banded, and secured to the vehicle in a manner to reduce as far as practicable the opportunity for theft. When this code is selected the contractor/vendor is to prepare GSA form 1611 and submit the completed form as instructed in box 12B of the MVDO.

3.7 WORKMANSHIP.

A. Vehicles shall be free from defects, which may impair their serviceability or detract from appearance.

B. All bodies, systems, equipment and interfaces with the chassis shall be done in accordance with the OEM's Body Builders Book. Whenever dissimilar metals are used they shall be insulated against corrosive action.

C. All components will be new. Defective components shall not be furnished. Parts, equipment and assemblies which have been repaired or modified to overcome deficiencies shall not be furnished without the approval of the purchaser. Component parts and units shall be manufactured to definite standard dimensions with proper fits, clearances and uniformity. Welded, bolted, and rivet construction utilized shall be in accordance with the highest standards of industry. General appearance of the vehicle shall not show any evidence of poor workmanship.

D. The following shall be reason for rejection:

1. ... Rough, sharp or unfinished edges, burrs, seams, corners, and joints.

2. ... Nonuniform panels. Edges that are not rounded, beveled, etc.

3. ... Paint runs, sags, orange peel, "fish eyes" etc., and any other imperfection or lack of complete coverage of paints or coatings.

4. ... Body panels or components that are uneven, unsealed, or contain cracks, dents or have voids.

5. ... Misalignment of body fasteners, glass, viewing panels, light housings, other items with large or uneven gaps, spacing etc. such as door, body panels and hinged panels.

6. ... Improperly fabricated and routed wiring or harnesses, and electrical connections.
7. ... Improperly supported or secured hoses, wiring harnesses, mechanical controls etc., including interference with other components.
8. ... Interference of chassis components, body parts, doors etc.
9. ... Leaks of any gas, vacuum, or fluid lines (air conditioning, coolant, oil, oxygen, etc.).
10. . Noise, panel vibrations etc.
11. . Inappropriate or incorrect use of hardware, fasteners, components, or methods of construction.
12. . Incomplete or improper welding, riveting or bolting.
13. . Lack of uniformity and symmetry where applicable.
14. . Loose, vibrating abrading body parts, components, subassemblies, hoses, wiring harnesses or trim.
15. . Improper body design or interface with the chassis that could cause injury during normal use or maintenance, and which fail to provide access to perform routine or mandatory repairs or maintenance on vehicle electrical and mechanical systems. In addition, the improper combination of options which by their combination and installation are inherently incompatible with regard to function or safety.
16. . Sagging non-form fitting upholstery or padding, holes, tears, discoloration, etc.
17. . Incomplete or incorrect application of rustproofing.
18. . Visual deformities and equipment malfunctions.
19. . Unsealed appurtenances or other body components, gaskets, etc.
20. . In addition, any deviation from specification requirements or any other item, whether or not stipulated herein, that affects form, fit, function, finish, durability, reliability, safety, performance or appearance shall be cause for rejection.

3.8 STANDARD AND ADDITIONAL REQUIREMENTS.

3.8.1 DECALS AND DATA PLATES.

An identification sticker, label, or plate shall be furnished on the vehicle; that will list the contractor name, point of contact, and phone number of contact. This point of contact will be the source of information for parts, part numbers, service, warranty, and answers to operating questions for the vehicle; including any furnished bodies and/or special equipment. The sticker, label, or plate shall be positioned so that the operator may locate and read it easily.

Unless otherwise specified, a GSA Form 1398 shall be affixed to the front door lock face or door post after final inspection. All marks on windows and other labels (except labels cautioning against drained transmission, crankcase and rear axle) shall be removed. Copies of GSA Form 1398 are available from the Contracting Officer.

3.8.2 OPERATORS, SERVICING AND PARTS MANUALS.

The successful bidder shall furnish at least one operator's and maintenance handbook, including a handbook(s) for any furnished special equipment.

3.8.3 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: alignment of lights, adjustment of the engine and brake systems; filling and charging of batteries; alignment of front wheels; inflation of all tires; complete lubrication of chassis, engine and running gear with grades of lubricants recommended for the ambient air temperature at the delivery point; servicing of the cooling system in accordance with 3.4.1.4.2; and servicing of the windshield washer reservoir with water and appropriate additives.

3.8.4 DELIVERY.

All vehicles shall receive the manufacturer's full suggested inspection and predelivery service. The vehicle shall be processed for shipment from the manufacturer's plant to the initial receiving activity, in accordance with the manufacturer's standard commercial practice. There are various ways a vehicle may be delivered to the consignee; however, the standard method for medium trucks is consignee delivery, wheels on ground. Vehicles may be driven, fully decked or partially decked (piggybacked). Regardless of the method used for transporting the vehicle, it is the contractor's (or his subcontractor's) responsibility to present the vehicle(s) to the consignee with all wheels on ground and in normal operating condition. It is not the Government's responsibility to provide undecking facilities or assist in the undecking operation. To facilitate vehicle transporting, some components may be removed and other modifications made to the vehicle(s); however, any and all modifications for transport shall be completely reversed before the receiving agency inspects and accepts delivery of the vehicle(s). It is not the Governments responsibility to reinstall any removed component or to reverse any modification made to the vehicle for transporting. The consignee, in the presence of the delivering driver, should immediately inspect the vehicle for damage, abuse, loss or theft that may have occurred during transit. Any such findings should be accurately described on the delivery receipt the driver presents for signature. If vehicle(s) are covered with snow or ice so as to prevent a complete inspection at the time of delivery, this is to be noted on the delivery receipt. The driver is required to acknowledge any notation on the delivery receipt by signature. If driver refuses to sign noted discrepancies the consignee must refuse to accept the vehicle(s). A claim for any delivery damage is to be made to the delivering company within 24 hours of vehicle delivery.

3.8.4.1 AUTHORIZED DELIVERY HOURS

All vehicles delivered to the consignee are required to be delivered between the hours of 8:00 am and 4:30 pm Monday through Friday, except Federal holidays. Any attempt by the carrier to deliver vehicles before or after these hours should be refused unless arrangements have been made for authorized, qualified personnel to be available to perform inspections and to accept the delivery. If the carrier is required to return during the specified hours, the Government is not liable, nor is the receiving agency authorized to pay for the return

►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 ensure 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.
When specified, 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 front and rear axles. The total imposed loads on front and rear axles shall be computed by the contractor and verified by the Government, using the curb weight, the operator and passenger weight at each seating position at 80 kg (175 pounds) each 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, axle and tire load capacity ratings to determine if these components are of adequate capacity to meet contractual requirements.

4.3.2 ROAD TEST.
The first production vehicle shall be road tested by the contractor without payload. The road test shall be for not less than 16 km (10 miles) at speeds up to 88 km/h (55 mph).

4.3.3 TRUCK BODY TREATMENT AND PAINTING.
A certification regarding the body cleaning, treating, prime painting and salt spray resistance testing, as required by MIL-HDBK-1223, shall be made to the Government representatives at the first production vehicle inspection. The manufacturer's records

shall be available to verify that all wood requiring treatment in accordance with MIL-HDBK-1223 has been treated.

4.3.4 TYPE VIII REFRIGERATION UNIT TESTS.

To determine conformance to 3.5.8.1, the following tests shall be conducted. Certification from the body supplier may be accepted. Certification shall be based on test data or calculations.

4.3.4.1 COOLING TEST.

The entire body, without payload and with the rear doors open, shall be soaked for four hours in an ambient air temperature of not less than 38°C (100°F). The cooling capability of the van shall then be determined to verify conformance to 3.5.8.1. The vehicle body shall be continuously exposed to the 38°C (100°F) ambient air temperature during the test.

4.3.4.2 HEATING TEST.

When a diesel powered refrigeration unit is required, (see 3.5.8.3.2), the vehicle, without payload, shall be exposed for four hours to the ambient air temperature at the time of the test. The body heating system shall be operated and the inside temperature shall be raised until a temperature differential between the inside and outside air reaches 33°C (60°F). With the heating system operating, the vehicle shall be driven for 30 minutes at a road speed of 88 km/h (55 mph) to test the capability of the system to maintain the 33°C (60°F) temperature differential.

4.4 TRANSPORTABILITY

When vehicles covered by this Standard are to be transported by Air (option ATR), Highway (option HTR), Sea (option MTR) or Rail (option RTR) by the using agency, the following sequence of events shall occur: GSA will notify and forward copy of the vehicle order (including the RPN, the vendor, the customer, and all options ordered) to The Air Transportability Test Loading Agency (ATTLA) when Air Transportability (option ATR) is requested or to The Military Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA) for all other modes of transportability.

ATTLA will open a case file, with action pending the contractor's data submittal of data, for ATTLA review, analysis and certification of vehicle Air Transport.

The contractor shall provide and submit all related drawings and engineering data, within 90 days after receipt of order, directly to ATTLA / SDDCTEA.

The contractor will continue to work with the ATTLA / SDDCTEA to obtain Transportability Certification for the vehicle(s) ordered. The contractor is responsible to track the status of the review including the date of their first submittal, resolution of all nonconformance or ATTLA's requests for information. The contractor shall provide good faith estimates in accordance to their best business practices for the expected vehicle axle weights and vehicle dimensions included with their first submittal to ATTLA. Contractor's shall state their tolerances (+ or -) on all estimates. ATTLA will compare the data and all weight estimates against the axle and suspension rated capacities to determine a rough order of compliance with the 80% loading rule as identified in MIL-HDBK-1791. ATTLA shall certify the vehicle in accordance to the axle ratings and GVWR of the vehicles.

The contractor shall supply the ATTLA / SDDCTEA certification memo to the customer agency within 120 days after receipt of the vehicle(s) order. A copy of the ATTLA / SDDCTEA certification memo shall be available during the final inspection and acceptance by the GSA IOA. The contractor shall present to the GSA IOA a certified weight ticket of the completed vehicle including curb weights of all axles. The GSA IOA shall then confirm and validate that the actual loaded axle weights are equal to or less than 80% of their ratings in accordance to the ATLLA certification.

ATTLA (The Air Transportability Test Loading Agency) is located at Wright Patterson Air Force Base and can be contacted via e-mail at "ATTLA@wpafb.af.mil". SDDCTEA (The Military Surface Deployment and Distribution Command Transportation Engineering Agency) is located in Newport News, VA and can be contacted by e-mail at “dpemail@tea.army.mil” or by phone at (757) 599-1113. A transportability report form for SDDCTEA can be obtained at “http://www.tea.army.mil/pubs/nr/deploy/transinstruction/DI-PACK-80880B.pdf” \t “_new”. References, publications, assistance and engineering services are available from SDDCTEA. Testing information can be obtained from the Aberdeen Test Center (ATC). ATC can be contacted through their website at “http://www.atc.army.mil”.

Upon receipt of the request, drawings and data; ATTLA / SDDCTEA conducts an analysis of the item's transportability at no cost to the requesting federal agency. If the Item meets the requirements, ATTLA / SDDCTEA return a certification memo to the customer agency with a copy to the contractor stating the conditions of approval. Otherwise, ATTLA / SDDCTEA recommend changes that will allow the item to meet those requirements. Very rarely an item cannot be airlifted or transported at all. In these cases ATTLA’s / SDDCTEA’s reply will include an explanation of the rejection.

If analysis alone cannot positively determine the transportability of the item, then a test loading may be required. Test loadings are done when the transportability is uncertain. The test loads require a formal test report and usually are conducted as Special Airlift or Transport Missions. The customer agency shall be responsible for all costs associated with test loadings when it is determined to be required.

Removal or relocation of mechanically attached (non-welded, non-riveted, etc.) components with common tools, requiring not more than 1 man-hour total to remove, relocate and tiedown; and not more than 1 man-hour total to return the vehicle to its original, as opposed to reduced, configuration; shall be acceptable. The self-mobility of the vehicle shall not be affected by reducing its configuration. Tie downs for removed or relocated equipment shall be furnished. In addition to the requirements 3.2.6 or 3.2.6.1, as applicable, the rated capacity of the axles and suspension system shall be not less than 1.25 times the load imposed on each by the curb weight of the vehicle. The vehicle shall be transportable as described above without any other special provisions and without any shoring. The vehicle shall not be delivered to the Government in its reduced configuration.

TRANSPORTABILITY VERIFICATION.

When transportability (ATR, HTR, MTR or RTR) (see 3.1.1.21) is specified, the vehicle shall be inspected to determine that it conforms to the approved certification memo the contractor received from Air Transportability Test Loading Agency (ATTLA) or Military Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA). As a minimum, the following angles, dimensions and descriptions shall be checked against approved data and drawings:

a) Angle of approach

b) Ramp breakover angle

c) Angle of departure

d) Height, longitudinal location and identification of highest component on truck

e) Dimensions and locations of any significant projections on truck

f) Curb weight of each axle

g) Wheelbase

h) Front overhang

i) Rear overhang

j) Articulation of rear suspension, unloaded, each axle (curb weight)

k) Rear axle spacing

l) Axle rating, front, and comparison to 1 ¼ times (curb weight) load

m) Axle rating, rear, and comparison to 1 ¼ times (curb weight) load

n) Suspension rating, front, and comparison to 1 ¼ times (curb weight) load

o) Suspension rating, rear, and comparison to 1 ¼ times (curb weight) load

p) If axle stops are to be removed for ramp loading on aircraft, verification that the driveline remains intact when cresting maximum ramp slope.

4.5 .. 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.

4.6 INSPECTION OF PRODUCTION VEHICLES.

The contractor's inspection system shall as a minimum ensure that the vehicle conforms to the physical and dimensional requirements and is capable of meeting performance requirements specified 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 3.4.25 have been accomplished. For civilian agencies, GSA Form 1455 or an approved equivalent form shall be used.

4.7 PRODUCT CONFORMANCE.

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

► 5. PACKAGING.

► 6. NOTES.

6.1 INTENDED USE.

The vehicles covered by this specification are intended for general use by the Government in transporting personnel or cargo; for use in performance of the maintenance and construction tasks indicated; or for the mounting of special bodies or

equipment. Agencies shall specify unusual operating conditions, items and requirements not specified herein.

6.2 SUBJECT TERM (KEY WORD) LISTING.

Chassis, truck
Truck, commercial
Truck, dump
Truck, refrigerator van
Truck, stake
Truck tractor
Truck, van

6.3 WARRANTY.

6.3.1 WARRANTY COVERAGE.

The contractor shall provide the chassis manufacturer's commercial warranty and the commercial furnished equipment warranties against parts failure or malfunction due to design, construction or installation errors, defective workmanship, and missing or incorrect parts for a minimum period of 12 months, and 15 months for vehicles outside the (50) states of the United States and District of Columbia, from date of acceptance or 161,000 km (100,000 miles) of operation, exclusive of any authorized accumulated drive away mileage, whichever occurs first. If the contractor receives from any supplier or subcontractor additional warranty on the whole or any component of the vehicle, in the form of time or mileage, including any pro rata arrangements, or the contractor generally extends to its commercial customers greater or extended warranty coverage, the Government shall receive corresponding warranty benefits. The warranty begins when the government accepts the vehicle from the contractor FOB point of origin/destination.

6.3.2 DOMESTIC USE.

When vehicles are used within the fifty States of the United States, the District of Columbia, Puerto Rico, American Samoa, Guam, The Commonwealth of the Northern Mariana Islands, the Trust Territory of the Pacific Islands, and the Virgin Islands, the warranty shall include the furnishing, without cost to the Government (FOB contractors nearest dealer or branch to vehicle's location or station), of new parts and assemblies to replace any that failed or malfunctioned within the warranty period. In addition, when the Government elects to have the work performed at the contractor's plant, branch, dealership, or with the contractor's approval (i) to correct the supplies itself; or (ii) to have them corrected by a commercial garage facility; the cost of the labor involved in the replacement of the failed or malfunctioned parts or assemblies shall be borne by the contractor.

6.3.3 FOREIGN USE.

When vehicles are used outside the fifty States of the United States, the District of Columbia, Puerto Rico, American Samoa, Guam, The Commonwealth of the Northern Mariana Islands, the Trust Territory of the Pacific Islands, and the Virgin Islands, the warranty shall include the furnishing of new parts or assemblies to replace any returned to the contractor by the Government which failed or malfunctioned within the warranty period The replacement parts or assemblies shall be delivered by the contractor to the port of embarkation in the United States designated by the Government. The contractor will not be required to bear the cost of the labor involved in correcting defects in vehicles operated in foreign countries.

6.3.4 WARRANTY EXCEPTIONS.
Unless within the additional coverage under 6.3.1, the following items are considered normal maintenance and repair for which the contractor need not assume liability for reimbursing the Government regardless of the vehicle age or mileage.

(a) Abuse, negligence, or unapproved alteration of original parts
(b) Damage from accidents
(c) Brake and standard clutch adjustments
(d) General tightening, headlamp adjustments
(e) Wheel alignment or tire balancing
(f) Tires and batteries (if warranted by their manufacturers)
(g) Miscellaneous expenses such as fuel, towing, telephone, travel, lodging, or loss of personal property.

6.4 STATEMENT OF ORIGIN OR BILL OF SALE.
A manufacturer's statement of origin or bill of sale showing the applicable purchase order number is required for each vehicle procured under this specification. Unless otherwise specified, such documents shall be forwarded to the consignee mailing address shown on the MVDO.

6.5 OPTION CODE INDEX
Available optional equipment for each Item number is listed with the Item number. A description of the option and the requirements for that option are listed alphabetically / numerically by option code in subparagraph 3.6.

MILITARY INTEREST:
ARMY - AT

NAVY - YD, MC

AIR FORCE – 84, 99

ENGINEERS

DIA

DLA

CIVIL AGENCY COORDINATING ACTIVITIES:

AGRICULTURE	JUSTICE
AAFES	PCC
COMMERCE	POSTAL SERVICE
DC GOVT	STATE
EPA	TRANSPORTATION
ENERGY	TREASURY
GSA	TVA
INTERIOR	VETERANS

PREPARING ACTIVITY:
GSA - FAS – QMDAA