

MIL-T-62514(AT)  
18 October 1985  
 SUPERSEDING  
 (see 6.5)

# MILITARY SPECIFICATION

## TRUCKS, 5-TON, 6X6, M939A1 SERIES

This specification is approved for use by US Army Tank-Automotive Command, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

### 1. SCOPE

1.1 Scope. This specification covers general and special purpose 5-ton, diesel powered, 6x6, military design truck chassis, trucks, and truck tractors having single front, intermediate, and rear wheels.

1.2 Classification. Vehicles shall be of the following types and models (see 6.2):

TABLE I. Vehicle type, model, and description.

Type	Model	Description
1	M923A1	Truck, cargo, 14-foot (ft) body, drop sides
	M924A1	Truck, cargo, 14-ft body
	M925A1	Truck, cargo, with (w/) winch, 14-ft body, drop sides
	M926A1	Truck, cargo, w/winch, 14-ft body
	M927A1	Truck, cargo, 21-ft body
	M928A1	Truck, cargo, w/winch, 21-ft body

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

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TABLE I. Vehicle type, model, and description - Continued.

Type	Model	Description
2	M929A1	Truck, dump, 5-cubic-yard
	M930A1	Truck, dump, w/winch, 5-cubic-yard
3	M931A1	Truck, tractor
	M932A1	Truck, tractor, w/winch
4	M934A1	Truck, van, expansible
	M935A1	Truck, van, expansible, w/lift gate
5	M936A1	Truck, wrecker, medium
6	M939A1	Chassis, truck, [179-inch (in) wheel base (W/B)], w/winch
	M939A1	Chassis, truck, (179 in W/B), without (w/o) winch
	M940A1	Chassis, truck, (179 in W/B), w/winch
	M941A1	Chassis, truck, (167 in W/B), w/winch
	M941A1	Chassis, truck, (167 in W/B), w/o winch
	M942A1	Chassis, truck, (215 in W/B), w/winch
	M942A1	Chassis, truck, (215 in W/B), w/o winch
	M944A1	Chassis, truck, (215 in W/B), w/o winch
	M945A1	Chassis, truck, (215 in W/B), w/winch

## 2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

SPECIFICATIONS  
FEDERAL

O-A-548	- Antifreeze/coolant, Engine, Ethylene Glycol, Inhibited, Concentrated.
O-I-00490	- Inhibitor, Corrosion, Liquid Cooling System.
P-C-437	- Cleaning Compound, High Pressure (Steam) Cleaner.
VV-B-680	- Brake Fluid, Automotive.
VV-F-800	- Fuel Oil, Diesel.

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- VV-L-800 - Lubricating Oil, General Purpose, Preservative (Water-Displacing, Low Temperature).
- PPP-C-96 - Can, Metal, 28 Gage and Lighter.
- PPP-P-704 - Pails, Metal (Shipping, Steel, 1 through 12 Gallons).

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- MIL-P-514 - Plate, Identification, Instruction and Marking, Blank.
- MIL-L-2104 - Lubricating Oil, Internal Combustion Engine, Tactical Service.
- MIL-L-2105 - Lubricating Oil, Gear, Multipurpose.
- MIL-R-3065 - Rubber, Fabricated Products.
- MIL-L-3150 - Lubricating Oil, Preservative, Medium.
- MIL-H-6083 - Hydraulic Fluid, Petroleum Base, for Preservation and Operation.
- MIL-L-6085 - Lubricating Oil: Instrument, Aircraft, Low Volatility.
- MIL-A-8421 - Air Transportability Requirements, General Specification for.
- MIL-G-10924 - Grease, Automotive and Artillery.
- MIL-A-11755 - Antifreeze, Arctic-type.
- MIL-C-16173 - Corrosion Preventive Compound, Solvent Cutback, Cold-Application.
- MIL-G-23827 - Grease, Aircraft and Instrument, Gear and Actuator and Screw, NATO Code Number G-354, Metric.
- MIL-P-46046 - Preservative Fluid, Automotive Brake System and Components.
- MIL-R-46164 - Rustproofing for Military Vehicles and Trailers.
- MIL-L-46167 - Lubricating Oil, Internal Combustion Engine, Arctic.
- MIL-E-52798 - Enamel, Alkyd, Camouflage.
- MIL-E-52835 - Enamel, Modified Alkyd, Camouflage, Lusterless.

STANDARDS  
MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-193 - Painting Procedures and Marking for Vehicles, Construction Equipment and Material Handling Equipment.
- MIL-STD-417 - Classification System and Test for Solid Elastomeric Materials (Use ASTM D 2000).
- MIL-STD-461 - Electromagnetic Emission and Susceptability Requirements for the Control of Electromagnetic Interference.
- MIL-STD-462 - Electromagnetic Interference Characteristics, Measurement of.

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- MIL-STD-642 - Identification Marking of Combat and Tactical Transport Vehicles.
- MIL-STD-1474 - Noise Limits for Army Material.
- MIL-STD-45662 - Calibration Systems Requirements.

## HANDBOOKS

- MIL-HDBK-759 - Human Factors Engineering Design for Army Material (Metric).

2.1.2 Other Government documents, drawings, and publications. The following documents, drawings, and publications form a part of this specification to the extent specified herein.

## DRAWINGS

## ARMY

- 5704495 - Tarpaulin Extension Kit.
- 7077063 - Chain, Tow.
- 8383241 - Block Assembly, Snatch.
- 8389583 - Installation Instruction, Tie Down Kit.
- 8389670 - Installation Instruction, Tie Down Kit.
- 8390117 - Kit, "A" Frame.
- 8736992 - Truck, Van, Expansible, 5 Ton, 6 x 6, M934.
- 8736993 - Truck, Van, Expansible, 5 Ton, 6 x 6, M935.
- 8750142 - Chassis, Truck: 5 Ton, 6 x 6, M939A1.
- 8750143 - Chassis, Truck 5 Ton, 6 x 6, w/o winch, M939A1.
- 8750144 - Chassis, Truck: 5 Ton, 6 x 6, w/winch, M940A1.
- 8750145 - Chassis, Truck 5 Ton, 6 x 6, w/winch, M941A1.
- 8750146 - Chassis, Truck 5 Ton, 6 x 6, w/o winch, M941A1.
- 8750147 - Chassis, Truck 5 Ton, 6 x 6.
- 8750148 - Chassis, Truck 5 Ton, 6 x 6, w/o winch, M942A1.
- 8750149 - Chassis, Truck 5 Ton, 6 x 6, w/o winch, M944A1.
- 8750150 - Chassis, Truck 5 Ton, 6 x 6, w/winch, M945A1.
- 8750151 - Truck, Cargo: Dropside, 5 Ton, 6 x 6.
- 8750152 - Truck, Cargo: 5 Ton, 6 x 6, w/winch, M925A1.
- 8750153 - Truck, Cargo: 5 Ton, 6 x 6.
- 8750154 - Truck, Cargo: 5 Ton, 6 x 6, w/winch, M926A1.
- 8750155 - Truck, Cargo: 5 Ton, 6 x 6, w/o winch, M927A1.
- 8750156 - Truck, Cargo: 5 Ton, 6 x 6, w/winch, M928A1.
- 8750157 - Truck, Dump: 5 Ton, 6 x 6.
- 8750158 - Truck, Dump: 5 Ton, 6 x 6, w/winch, M930A1.

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8750159	- Truck, Tractor: 5 Ton, 6 x 6.
8750160	- Truck, Tractor: 5 Ton, 6 x 6, w/winch, M932A1.
8750161	- Truck, Van: Expansible, 5 Ton, 6 x 6, w/o winch, M934A1.
8750162	- Truck, Van: Expansible, 5 Ton, 6 x 6, M935A1.
8750163	- Truck, Wrecker: 5 Ton, 6 x 6, M936A1.
10921727	- Heater Assembly, Bonnet Front.
10937439	- Kit, Lifting, Rear.
10937509	- Kit, Lifting, Front.
11672522	- Bow and Tarpaulin Kit, Cargo Body (Long).
11672523	- Bow and Tarpaulin Kit, Cargo Body (Drop Side).
11672524	- Bow and Tarpaulin Kit, Cargo Body (Short).
11677311	- Mounting Kit, Machine Gun, 50 Caliber or 1.62 mm.
12256226	- Fording Kit.
12256227	- Hard Top Kit.
12256301	- Air Brake Kit.
12256442	- Chemical Agent Alarm Mounting Kit.
12256443	- Kit, Fuel Burning Heater.
12256466	- Kit, Engine Coolant Heater.
12256609	- Kit, Radiator and Hood Cover.
12301115	- Wheel Assembly.
12301128	- Wheel and Beadlock Assembly.
12302775	- Kit, Swingfire Heater.
12303001	- Intentionally left blank.
TA13216E6310	- Air Conditioner, Horizontal, Compact, 36,000 BTU/HR, 209 Volt, 3 Phase, 50/60 Hertz (TROSCOM).

(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Other publications. The following document(s) form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

## SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE J816a	- Test Method for Measuring Weight of Organic Trim Materials.
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(Application for copies should be addressed to the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.)

(Industry association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

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2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

## 3. REQUIREMENTS

3.1 First article. Unless otherwise specified (see 6.2), the contractor shall furnish trucks which shall be subjected to first article inspection (see 4.4 and 6.2). First article inspection samples, properly marked with identifying information shall be representative of the unit to be furnished to the Government. All subsequent trucks delivered to the Government shall conform to these samples in all of their pertinent physical and performance attributes.

3.2 Materials. Materials shall be as specified herein and in referenced specifications, standards, and drawings. Materials shall be free of defects which affect performance or serviceability of the finished product (see 4.8.1).

3.2.1 Ozone resistance products. Rubber products procured under requirements of MIL-R-3065 shall be ozone resistant to the climatic environment specified herein and by the requirements of MIL-STD-417. Rubber components con-  

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 (see 4.8.1).

3.3 Design and construction.

3.3.1 Qualified products. The contractor shall be responsible for using parts and assemblies from Qualified Products Lists (QPLs) whenever available. The contractor's inspection records shall specifically list all QPL items by number and date of the QPL, name of supplier, and part or drawing number(s). When parts and assemblies are approved as qualified products, but are not yet listed on the QPL, the contractor shall list the products by number and date of the approved document and name of supplier(s) (see 4.8.1).

3.3.2 Construction. Vehicles shall be constructed in accordance with the drawings, specifications, and standards listed or referenced in the drawings specified in table II. If more than one unit of a particular component is used on the vehicle, the components used shall be identical in make, material, and quality. The riveting, welding practices, and quality shall be the same on each vehicle (see 4.8.1).

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TABLE II. Engineering drawings.

Drawings	Vehicle
8750142	Chassis, truck: 5-ton, 6 x 6, w/winch, M939A1.
8750143	Chassis, truck: 5-ton, 6 x 6, w/o winch, M939A1.
8750144	Chassis, truck: 5-ton, 6 x 6, w/winch, M940A1.
8750145	Chassis, truck: 5-ton, 6 x 6, w/winch, M941A1.
8750146	Chassis, truck: 5-ton, 6 x 6, w/o winch, M941A1.
8750147	Chassis, truck: 5-ton, 6 x 6, w/winch, M942A1.
8750148	Chassis, truck: 5-ton, 6 x 6, w/o winch, M942A1.
8750149	Chassis, truck: 5-ton, 6 x 6, w/o winch, M944A1.
8750150	Chassis, truck: 5-ton, 6 x 6, w/winch, M945A1.
8750151	Truck, cargo: 5-ton, 6 x 6, w/o winch, M923A1.
8750152	Truck, cargo: 5-ton, 6 x 6, w/winch, M925A1.
8750153	Truck, cargo: 5-ton, 6 x 6, w/o winch, M924A1.
8750154	Truck, cargo: 5-ton, 6 x 6, w/winch, M926A1.
8750155	Truck, cargo: 5-ton, 6 x 6, w/o winch, M927A1.
8750156	Truck, cargo: 5-ton, 6 x 6, w/winch, M928A1.
8750157	Truck, dump: 5-ton, 6 x 6, w/o winch, M929A1.
8750158	Truck, dump: 5-ton, 6 x 6, w/winch, M930A1.
8750159	Truck, tractor: 5-ton, 6 x 6, w/o winch, M931A1.
8750160	Truck, tractor: 5-ton, 6 x 6, w/winch, M932A1.
8750161	Truck, van, expansible: 5-ton, 6 x 6, w/o winch, M934A1.
8750162	Truck, van, expansible: 5-ton, 6 x 6, w/o winch, w/ hydraulic lift gage, M935A1.
8750163	Truck, wrecker: 5-ton, 6 x 6, w/winch, M936A1.

3.3.3 Special kits. When specified (see 6.2), the following kits shall be furnished as required for a specific vehicle (see 4.8.3).

3.3.3.1 Arctic kits. Arctic kits (see 3.3.3.1.1 through 3.3.3.1.4) shall assure engine starting and vehicle operation in ambient temperatures from minus 25 to minus 50 degrees Fahrenheit (°F) (when measured four to six feet above ground level).

3.3.3.1.1 Engine coolant heater kit. The engine coolant heater kit shall be in accordance with Drawing 12256466 (and 12302775 for Alaska only).

3.3.3.1.2 Radiator and hood cover kit. The radiator and hood cover kit shall be in accordance with Drawing 12256609.

3.3.3.1.3 Personnel heater kit. The personnel heater kit shall be in accordance with Drawing 12256443.

3.3.3.1.4 Hard top kit. The hard top kit shall be in accordance with Drawing 12256227.

3.3.3.2 Deep water fording kit. The deep water fording kit shall be in accordance with Drawing 12256226.

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3.3.3.3 A-frame kit. The A-frame kit shall be in accordance with Drawing 8390117. The kit shall include an A-frame or derrick mounted at the front of the vehicle for use as a general utility lifting device, and as a derrick in conjunction with the vehicle winch.

3.3.3.4 Vehicle rear lifting kit. The vehicle rear lifting kit shall be in accordance with Drawing 10937439.

3.3.3.5 Lifting kit. The vehicle front lifting kit shall be in accordance with Drawing 10937509.

3.3.3.6 Bow and tarp kit (extra long wheel base, M927A1 and M928A1). The bow and tarp kit (long cargo body) shall be in accordance with Drawing 11672522.

3.3.3.7 Bow and tarp kit (long wheel base, M923A1 and M925A1). The bow and tarp kit (drop side cargo body) shall be in accordance with Drawing 11672523.

3.3.3.8 Bow and tarp kit (long wheel base, M924A1 and M926A1). The bow and tarp kit (short cargo body) shall be in accordance with Drawing 11672524.

3.3.3.9 Tarpaulin extension kit. The tarpaulin extension kit shall be in accordance with Drawing 5704495.

3.3.3.10 Gun-ring mounting kit. The gun-ring mounting kit conforming to Drawing 11677311, when installed, shall permit a 360° rotation without interference.

3.3.3.11 Automatic alarm kit. The automatic alarm kit shall be in accordance with Drawing 12256442.

3.3.3.12 Hand air brake kit. The hand air brake kit shall be in accordance with Drawing 12256301.

3.3.3.13 Tie-down kit. Twenty-four tie-downs shall be installed in the 14-foot cargo body in accordance with Drawing 8389670. Thirty-six tie-downs shall be installed in the 21-foot cargo body in accordance with Drawing 8389583.

3.3.4 Tires and wheels. All vehicle models shall be equipped with tubeless 14.00-R20 radial tires in conformance with Drawing 12303001. Wheels for all vehicles shall be in accordance with Drawings 12301115 and 12301128 (see 4.8.3).

3.3.5 Front winch. Winch, controls, and equipment installed in accordance with applicable drawings on vehicles requiring winches shall supply power to retrieve disabled equipment under all climatic conditions. The single line capacity of the winch shall not be less than 20 000 pounds (lb) on the bare drum. The 5/8 inch (in) diameter wire rope for the winch shall not be less than 150 feet in continuous length, without splice or



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joint, and shall be provided with a chain and hook. Army vehicles with front mounted winches shall be furnished with rigging block in accordance with Drawing 8383241 and utility chain in accordance with Drawing 7077063. When specified (see 6.2), rigging blocks and utility chains shall be furnished for other using services (see 4.8.2).

3.3.6 Engine. The engine shall be a commercially proven, liquid cooled, internal combustion diesel engine in accordance with Drawing . The engine assembly shall include the following accessory equipment (see 4.8.1 and 4.8.5).

- a. Alternator and belts.
- b. Air compressor.
- c. Power steering pump and belts.
- d. Cooling clutch fan and belts.
- e. Starter.
- f. Injection pump and nozzles.
- g. Lube filter.
- h. Water pump and belt.
- i. Tachometer drive adapter.
- j. Temperature and pressure sending units.
- k. Primary positive fuel shut-off.
- l. Emergency, immediate positive fuel shut-off.
- m. Flywheel housing.
- n. Flexplate and starter ring gear assembly.
- o. Cold weather starting aid for ambient temperatures down to minus 25°F, complete with piping and electrical harnesses(s).

3.3.6.1 Production engine settings and requirements. The engine assembly as defined herein, and with alternator, air compressor, and power steering pump operating and otherwise unloaded and corrected to standard conditions as established in SAE J816a shall meet the following requirements:

Intentionally left blank.

3.3.6.2 Engine governor. The engine governor provided shall be set to an engine speed limit no greater than revolutions per minute (rpm), no load. The governor shall be sealed or constructed so that any tampering with the setting will be readily apparent (see 4.8.2 and 4.8.5.1).

3.3.6.3 Fuel. The engine shall be capable of full performance using fuel in accordance with grades DF-A, DF-1, and DF-2 of VV-F-800, commensurate with applicable fuel grade operational temperature ranges (see 4.8.1 and 4.8.5.2).

3.3.6.4 Engine lubrication system. The lubrication system shall operate satisfactorily under all intended service, operating, and performance requirements specified herein when serviced with seasonal grades of oils as specified in MIL-L-2104 from minus 10°F to plus 125°F, and in MIL-L-46167 from 0°F to minus 65°F. The oil pressure shall not fall below the minimum

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recommended by the engine manufacturer, even with the oil level at the lowest safe operation level marked on the oil gage. At initial truck assembly, the contractor may utilize an engine oil of his own selection for ambient temperatures of minus 10° to plus 125°F only, provided the oil selected is compatible with the oil specified in MIL-L-2104 (see 4.8.3 and 4.8.5.3).

3.3.6.5 Oil filler and gage. The crankcase oil filler shall be arranged so that a funnel is not required to pour oil into the filler opening from a container conforming to type II, 5-quart size of PPP-C-96; and type II, 5-gallon size of PPP-P-704. The engine shall be provided with a properly accessible waterproofed dipstick that ensures ready and accurate determination of crankcase oil level with the engine stopped (see 4.8.5.4).

3.3.6.6 Cooling system. The cooling system shall maintain engine coolant outlet and engine oil sump temperatures below the engine manufacturer's specified maximums. Transmission oil temperature at the converter outlet shall be no greater than 325°F. The above shall apply under all environmental and performance requirements specified herein. The engine and cooling system as installed in the vehicle shall perform as specified herein using water, water and antifreeze compound conforming to MIL-A-11755, or water and corrosion inhibitor compound conforming to O-I-00490 (see 4.8.5.5).

3.3.7 Exhaust system. The exhaust system shall be of leakproof construction, securely mounted, and able to withstand vehicle racking; it shall not be subject to damage resulting from normal engine and vehicle vibration. The system shall meet all applicable requirements of MIL-HDBK-759. Material for the exhaust system, including those used for the muffler and tailpipe, shall effectively resist corrosion. Exhaust piping shall be secured to the exhaust manifold in order for it to be quickly disconnected and connected. Design of the exhaust system shall be such that it shall not interfere with engine removal (see 4.8.2 and 4.8.6).

3.3.7.1 Concentrations. The exhaust system as installed shall be gastight and leakproof. During normal vehicle operation, the concentration of nitric oxide (NO) in the crew compartment shall not exceed five parts per million (ppm) and the concentration of carbon monoxide shall not exceed 50 ppm (see 4.8.6.1).

3.3.8 Noise limits. All vehicle models shall meet the noise limit requirements for interior noise and drive-by noise per MIL-STD-1474 (see 4.8.3 and 4.8.7).

3.3.9 Safety. No condition shall exist which may create a safety hazard to operating or maintenance personnel (see 4.8.1 and 4.8.8).

3.3.10 Soft top. The soft top furnished and installed in accordance with applicable drawings shall provide protection for personnel when the vehicle is operating in adverse climatic conditions (see 4.8.9).

3.3.11 Stowed material. All basic issue items (BII) shall be stored on the vehicle in the spaces provided to assure that items will not interfere with other components and operation of the vehicle (see 4.8.10).

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3.3.12 Air induction system. The air induction system as fabricated and properly installed shall be free of all foreign material. The system shall prevent entrance of all foreign material and withstand pressure up to two pounds per square inch (psi). All vent lines and air compressor intake lines shall be connected to the air induction ducting for fording purposes. The elevated inlet shall be located so that the induction of exhaust gases is minimized under all conditions of operation, and shall be compatible with the machine gun installation. The intake stack provision shall provide for a reduced overall operational height of 84 in with rain cap, and in its normal position shall be suitable for use during deep water fording (see 4.8.11).

3.3.13 Wood treatment. All wood parts for vehicles furnished in accordance with this specification shall be cleaned and treated in accordance with the requirements of MIL-STD-193 (see 4.8.12).

3.3.14 Servicing and adjustment. Unless otherwise specified (see 6.2), the contractor shall service the vehicles for operational use prior to delivery. Such servicing, fit, and adjustment shall include the focusing of lights, and the proper adjustment of the engine, transmission, transfer, electrical system, brake system, lights, doors, windows, windshield, windshield wipers, windshield washers (with all-temperature solvent), horn, hood, tailgate, front wheel alignment, and tire pressure. The chassis, engine, and all running gear shall be serviced with lubricants of the proper grade for the climatic conditions. The power steering system shall be serviced with oil conforming to grade 10 of MIL-L-2104. The engine cooling system shall be serviced with a solution of ethylene glycol (see table IV) and water in equal parts by volume (see 4.8.13).

3.4 Performance. Vehicle performance requirements shall be demonstrated with the specific vehicle loaded as specified in table III, except the payload for tractors shall be understood to be the weight imposed by the towed load upon the fifth wheel. The wrecker shall tow an M939 series vehicle during 50 percent of the 11 400 mile test. All vehicle performance shall be demonstrated with a full compliment of fuel, lubricants, and coolant, as specified in table IV; with driver and assistant driver or equivalent weight of 200 lb each; with soft-top cab; and with all on-board vehicular equipment. The vehicle, serviced and equipped for existing climatic conditions, shall operate as specified without special equipment. Gross vehicle weight (GVW) shall not include tire chains, metal cab enclosures, or special equipment kits. Except as otherwise specified herein, performance shall be demonstrated on level, smooth, hard-surfaced roads, free of loose material. The vehicle(s) shall operate to the percentages listed in a through c, below (see tables VI, VII, or VIII, as applicable).

a. 20 000-mile percentages for all models except wreckers, expansible vans, and tractors.

1. 30 percent on paved roads, either concrete or asphalt or any combination thereof.
2. 28 percent on secondary roads.
3. 41 percent on level and hilly cross country.
4. 1 percent on Belgian block.

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b. 20 000-mile percentage for truck tractors.

1. 60 percent on paved roads either concrete or asphalt or any combination thereof.
2. 24 percent on secondary roads.
3. 15 percent on level and limited hilly cross country.
4. 1 percent on Belgian block.

c. 11 400-mile percentages for wreckers and expansible vans.

1. 66 percent on paved roads, either concrete or asphalt or any combination thereof.
2. 13 percent on secondary dry roads.
3. 20 percent on level and hilly corss country.
4. 1 percent on Belgian block.

TABLE III. Load allowances in pounds (1b).

Model	Maximum gross <u>1/</u> load allowance	Maximum payload <u>2/</u> allowance	Towed load <u>3/</u> allowance
M923A1		10 000	15 000
M925A1		10 000	15 000
M927A1		10 000	15 000
M928A1		10 000	15 000
M929A1		10 000	15 000
M930A1		10 000	15 000
M931A1		15 000 <u>5/</u>	37 500 <u>4/</u>
M932A1		15 000 <u>5/</u>	37 500 <u>4/</u>
M934A1		5000	15 000
M935A1		5000	15 000
M936A1		7000 <u>6/</u>	20 000
M939A1	12 500		15 000
M940A1	22 300		20 000
M941A1	14 600		15 000
M942A1	15 100		15 000
M944A1	13 300		15 000
M945A1	16 000		15 000

1/ Maximum gross load allowance consists of body and payload without operating personnel (for truck chassis only).

2/ Maximum payload allowance consists of payload for complete truck without operating personnel.

3/ Maximum towed load allowance is measured on the pintle.

4/ Semitrailer towed load utilizes the truck-tractor fifth-wheel.

5/ This is maximum vertical load on truck-tractor fifth-wheel.

6/ This is towed suspended payload on crane hook with boom braced and secured.

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TABLE IV. Fuels, lubricants and preservative materials.

Application	Specification	Types or grades
Corrosion preventives: Preservative Nonlubricating	MIL-P-46046 MIL-C-16173	One grade Grade 1, 2, 3
Engine oils: Heavy duty Subzero	MIL-L-2104 MIL-L-46167	10, 30 One grade
Fuels: Fuel oil	VV-F-800	All grades
Grease: Automotive and artillery Aircraft and instrument	MIL-G-10924 MIL-G-23827	One grade One grade
Hydraulic oils: Hydraulic brake fluid Preservative	VV-B-680 MIL-E-6083	One grade Type I
Lubricating oils: Universal, gear Instrument Preservative, medium, oil can Preservative, special	MIL-L-2105 MIL-L-6085 MIL-L-3150 VV-L-800	75, 80, 90 One grade One grade One grade
Coolant compounds: Antifreeze, ethylene glycol Subzero	O-A-548 MIL-A-11755	Type I One grade

3.4.1 Mean miles between failure (MMBF). During the first production vehicle(s) 20 000 mile test or 11 400 mile test, as applicable (see 3.3.16.3.3), the vehicle(s) shall achieve not less than 675 MMBF for each body type (see 4.8.14).

3.4.1.1 Failure definition/scoring criteria (FD/SC). Failures will be scored during official scoring conferences held at the midpoint and conclusion of initial production testing (see 4.3.2) and with the contractor in attendance. The system FD/SC guidelines and the appendix to this specification will be used (see 4.8.14.1).

3.4.1.2 Maintainability. The contractor shall assure the vehicle maintainability by complying with the system(s) design characteristics that permit easy access to all items requiring periodic service and field maintenance. The total maintenance time, excluding driver/crew checks and services, shall be no more than 280 manhours during the 20 000-mile test and no more than 160 manhours during the 11 400-mile test. The maintenance ratio (MR) equates to 0.28 at an average 20 miles per hour (mph) (see 4.8.14.2).

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3.4.1.3 Durability. The durability of the vehicle system shall be such that it will demonstrate no less than 50 percent confidence with a 0.6 probability of completing the 20 000-mile test without replacement or overhaul of the engine, transmission, transfer case, or differential (see 4.8.14.3).

3.4.2 Environmental. The vehicle shall operate in an ambient air temperature of minus 25 to plus 120°F without special equipment. With special arctic equipment installed, the vehicle shall operate in an ambient air temperature of minus 25 to minus 50°F. The complete vehicle, when in storage, shall withstand a climatic extreme of minus 65°F without deterioration that may cause failure of any component part of the vehicle (see 4.8.14.4).

3.4.3 All-terrain operation. The vehicle shall transport the rated payload and towed load over highway, unimproved roads, trails, open fields, hills, and rough cross-country terrain (see 4.8.14.5).

3.4.4 High speed and low speed operation.

3.4.4.1 High speed. The vehicle transporting its rated payload and towed load, limited to its maximum gross combination weight, shall operate at a sustained high speed of not less than 50 mph (see 4.8.14.6).

3.4.4.2 Low speed. With the engine operating in the speed range which delivers maximum torque, the vehicle shall operate at a sustained low speed of not more than 2-1/2 mph without damage to the vehicle (see 4.8.14.7).

3.4.5 Fording. The vehicle shall transport the rated payload and towed load when fording hard bottomed crossings of fresh or salt water without requiring addition of special equipment or adjustments (see 4.8.14.8).

3.4.6 Deep water fording. All models with the exception of the expansible van shall ford to a depth of 78 in, including wave height. With the deep water fording kit installed, vehicles shall ford hard-bottomed fresh or salt water crossings, remaining immersed with the engine operating. While still submerged, the engine shall restart after being stopped and shall then operate without damage to the vehicle. With the fording kit installed, the vehicle shall operate continuously on land, before and after fording operations, without damage to the vehicle. The expansible van shall ford water up to the bottom of the van floor (see 4.8.14.9).

3.4.7 Gradeability. The vehicle shall demonstrate gradeability operations on prepared grades having the minimum percentage specified herein without stalling, overheating, or upsetting (see 4.8.14.10).

3.4.7.1 Longitudinal grades. The vehicle transporting its rated and towed load, limited to a maximum gross combination weight of 50 000 lb, shall ascend a two percent grade at a speed of 30 mph. The vehicle transporting its rated payload, without towed load, shall negotiate a 60 percent grade at a minimum speed of 2-1/2 mph. Grade surface shall be smooth, dry concrete (see 4.8.14.10.1).

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3.4.7.2 Side slope. The vehicle, loaded with rated payload, shall function on side slopes up to 20 percent with each side of the vehicle up-slope. As a result of the operation, no evidence of faulty lubrication, leakage, or other malfunction shall be found (see 4.8.14.10).

3.4.7.3 Engine operation on grades and slopes. The engine, as installed in the vehicle, shall start and demonstrate the performance characteristics specified herein for 30 minutes in each direction, with oil at both full and add levels, on longitudinal grades up to 60 percent and on lateral slopes up to 30 percent. As a result of this operation, no evidence of faulty lubrication, cooling, or fuel supply, nor leakage or other malfunction shall be found (see 4.8.14.10).

3.4.8 Braking ability. The vehicle, fully equipped and loaded with designated payload shall be decelerated, held, and controlled by use of the brakes under the conditions specified herein for each braking system. The road surface shall be smooth, dry concrete (see 4.8.14.11 and 4.8.14.12).

3.4.8.1 Service brakes. Application of service brakes shall stop, hold, and control the vehicle when ascending and descending 60 percent grades. On relatively level roadway, application of service brakes shall bring the vehicle to a complete stop from a speed of 20 mph, within 30 feet, measured from the point of brake application. Applicable loads are as follows: M923A1, M925A1, M927A1, M928A1, M929A1 and M930A1 are 20 000 lb; M931A1 and M932A1 are 25 000 lb; M934A1 and M935A1 are 15 000 lb; and M936A1 is 12 000 lb (see 4.8.14.11).

3.4.8.2 Hand (parking) brake. Application of the hand brake shall hold the vehicle motionless on a dry concrete 40 percent grade, when headed up or down the grade, with rated payload less than the towed load (see 4.8.2 and 4.8.14.12).

3.4.9 Cramping angle. The front wheel cramping angle shall be not less than 28°, measured at the front wheel on the inside of the turning circle. Angle stops shall be provided and adjusted (within a tolerance of plus 1°, minus 0°) to provide the maximum safe cramping angle. When adjusted, axle stops shall be so set that the angle adjustment cannot be readily altered and will positively limit the cramping angle to the maximum angle intended by the stop adjustment (see 4.8.14.13).

3.4.10 Cruising range. The vehicle with rated payload shall operate for not less than 300 miles, at an average road speed of 30 mph on hard surfaced roads over an average rolling terrain without refueling (see 4.8.14.14).

3.4.11 Air transportability. All vehicles, except the M934A1, M935A1 and M936A1 models, shall be air transportable in phase II airborne operations without disassembly. The M934A1, M935A1, and M936A1 models shall be air transportable in phase III airborne operations without disassembly. The M934A1 and M935A1 models shall be air transportable in phase II airborne operations when the body is removed from the chassis (see 4.8.14.15).

3.4.12 Truck, wrecker, M936A1 - crane. Crane performance shall be required under the following operating conditions:



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- a. Level ground, and slopes fore and aft to either side up to 5°.
- b. Oil of the type and grade specified in table IV for the applicable air temperature. Oil temperature of 100°F.
- c. Power take-off operating at 2300  $\pm$  70 revolutions per minute (rpm).
- d. A 3000 lb load (see 4.8.14.16).

3.4.12.1 Boom extension. The crane shall operate as indicated in the following circumstances (see 4.8.14.16.1):

- a. The boom length, from the center of rotation to the boom sheave, shall extend and retract at least within the limits of 10 feet and 18 feet.
- b. With the boom fully retracted and horizontal, maximum distance from the center of the boom sheave to the rear bumperettes shall be 34 in.
- c. With the boom in the maximum extended and elevated position, the lifting height (distance from the hook to the ground) shall not be less than 219 in. With the boom at a 15-foot radius (measured horizontally from the rotation center), the lifting height shall not be less than 186 in.

3.4.12.2 Pulley arrangement. The lifting cable configuration specified in table V shall consist of no more than three parts, a two-part line is preferred (see 4.8.14.16.2).

3.4.12.3 Controls. Each control for operation of the crane shall be of the "deadman" type and shall automatically return to neutral position should the operator inadvertently or intentionally release the control (see 4.8.2 and 4.8.14.16.3).

3.4.12.4 Rotation. The crane shall be capable of continuous rotation through 360° without stops, and it shall traverse at a rate up to four rpm (see 4.8.14.16.4).

3.4.12.5 Hoist line speed. Hoist line speed shall be up to 54 feet per minute (see 4.8.14.16.5).

3.4.12.6 Lifting capabilities. With outriggers deployed, the crane shall lift weights in accordance with table V (see 4.8.14.16.6).

TABLE V. Lifting requirements.

Radius (feet)	Load (not less than, pounds)	Crane boom support
18	4000	None
10	10 000	None
15	20 000	From ground
10	20 000	From vehicle



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3.4.12.7 Settling rate. With outriggers in place, the crane at a 10-foot radius, and the power take-off lever engaged or disengaged, settling (rate of load descent) shall not exceed three inches in 30 minutes with a two-part line, or two inches in 30 minutes with a three-part line (see 4.8.14.16.7).

3.4.12.8 Maximum load. The vehicle shall be stable and suffer no damage when lifting and replacing on the ground a 20 000-lb weight (see 4.8.14.16.8).

### 3.4.13 Trucks, van, expansible M934A1 and M935A1.

3.4.13.1 Van body extended. The bodies shall expand to the maximum width without interference, binding, or damage to the basic and extended positions of the van body or equipment. All locks and fasteners shall be positive in locking or fastening the extended portion to the basic van body in such manner as to provide firm water-tight joints (see 4.8.14.17.1).

3.4.13.2 Waterproofness. Van bodies and all components shall be waterproof to preclude the entrance of water due to rain, melting snow, road splash, and the penetration of moisture from other causes. Vapor barrier material shall be applied to prevent possible accumulation of condensation on the interior of the van body. Prior to riveting, seams shall be coated with sealer to provide a waterproof joint (see 4.8.14.17.2).

3.4.13.3 Heaters and air conditioners. Heaters and air conditioners shall conform to M934A1 Drawing 8736992 and M935A1 Drawing 8736993 which depict configuration of the van body bonnet with the heater(s) and the air conditioner installations (see 4.8.14.17.3).

3.4.13.3.1 Heaters. The contractor shall furnish and install two multi-fuel burning space heaters conforming to Drawing 10921727, each having an output capacity of not less than 60 000 British thermal units per hour (BTU/hr). The heaters shall operate from a 120 volt (V), single phase, 60 cycle electrical source.

3.4.13.3.2 Air flow modulation. To control the percentage of circulating air mixture, each heater shall incorporate an air inlet damper. The damper shall be actuated from the underside of the bonnet on the outside of the van by pulling for fresh air and pushing for recirculating air.

3.4.13.3.3 Air conditioner. Van body hardware shall accommodate, for subsequent installation, a 36 000 BTU/hr air conditioner which conforms to Drawing TA13216E6310. The air distribution system shall be redesigned to be compatible with the high speed fan air flow from the air conditioner, and to control the noise level. The noise level resulting from the installed operating unit shall not exceed the levels specified in MIL-STD-1474, category E.

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3.4.13.4 Electrical system. All wiring shall be fastened or clipped as necessary and at points of bending, and shall be protected against chafing and damage. Special care shall be exercised to prevent damage of insulation by fasteners employed in the van body assembly. All electrical circuits shall meet electromagnetic compatibility requirements specified herein (see 4.8.2 and 4.8.14.17.4).

3.4.13.5 Lightproofness. The van bodies in the expanded position, with the access door closed and blackout shades covering the windows, shall be sufficiently lightproofed so that during the night the interior van light shall not be visible from outside and during the day bright sunlight shall not be visible in the interior of the van (see 4.8.14.17.5).

3.4.13.6 Lift gate platform (M935A1 only). The lift gate platform of the M935A1 model shall raise, lower, and hold a 3000 lb payload safely to the positions specified on the drawings, without damage to the vehicle and without interference or binding of the various components (see 4.8.2 and 4.8.14.17.6).

3.4.14 Dump truck. With the hydraulic system filled with engine oil of the type and grade specified in table IV for the applicable temperature and with adjustment completed, the dump truck shall demonstrate performance requirements with loads specified herein during dumping operations. The hydraulic system controls shall control and actuate the system to raise and lower the dump body, and hold the body in any position during the raising and lowering range of operation. The controls shall operate without binding, interference, or failure, using hand effort only. The body shall hold in all stop positions without slippage. When the tailgate lock is released, the tailgate shall swing freely, commensurate with the angle of the body lift (see 4.8.2 and 4.8.14.18).

3.4.15 Drop side cargo body. The drop sides and tailgate shall be capable of being raised and lowered freely, without binding. The locking devices shall retain the sides and tailgate rigidly in closed position without chatter for failure, using hand effort only. The drop sides shall be interchangeable (see 4.8.2 and 4.8.14.19).

3.4.16 Radio interference suppression. The vehicle shall meet radio interference suppression requirements of MIL-STD-461, class IIIA (see 4.8.14.20).

3.4.17 Steam and water jet cleaning. The engine and all its components shall withstand cleaning with high pressure steam and cleaner conforming to P-C-437 and water jet without deterioration of seals and hoses, water leakage past seal gaskets, or other defects. Paint removal shall not be a basis for rejection under this requirement (see 4.8.14.21).

### 3.5 Finish.

3.5.1 Painting. The vehicle body(s) and components shall be cleaned, treated, and painted in accordance with MIL-STD-193, when specified for the appropriate service. Painted surfaces shall be free of sags, runs, and thin areas (see 4.8.2).

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3.5.1.1 Engine treatment and painting. The engine and its accessories shall be prepared and treated in accordance with good commercial practice, and painted any dark color that is nonluminous and nonbrilliant. The engine spare parts and components shall be conditioned, primed, and painted in accordance with MIL-STD-193.

3.5.1.2 Rustproofing. Vehicles shall be rustproofed in accordance with MIL-R-46164.

3.6 Identification marking (see 4.8.2).

3.6.1 Marking. Vehicle marking shall be in accordance with MIL-STD-642. Letters and numbers shall be black lusterless paint and/or decals having equivalent infrared reflectance specified in MIL-E-52798 or MIL-E-52835.

3.6.2 Data plates. Data plates conforming to type III, composition A, class 2 of MIL-P-514 shall be used.

3.6.2.1 Engine data plates. The engine data plates furnished shall be installed on the engine block in a location(s) readily visible to personnel performing maintenance on the engine in the vehicle.

3.7 Workmanship. The workmanship displayed in the fabrication and assembly of the vehicle(s) shall be such as to meet performance requirements under all applicable environmental conditions. The quality of workmanship shall assure delivery of vehicles that are free of defects, improper manufacturing or assembly practices, and which meet or exceed requirements specified herein. Defective components, or parts and assemblies which have been repaired or modified to overcome deficiencies shall not be furnished (see 4.8.2 and 4.9).

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order (see 6.2), the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform or witness any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Inspection equipment. Unless otherwise specified in the contract (see 6.2), the contractor is responsible for the provision and maintenance of all inspection equipment necessary to assure that supplies and services conform to contract requirements. Inspection equipment must be capable of repetitive measurements to an accuracy of 10 percent of the measurement tolerance. Calibration of inspection equipment shall be in accordance with MIL-STD-45662.

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4.1.2 Government verification. All quality assurance operations performed by the contractor will be subject to Government verification at unscheduled intervals. Verification will consist of (a) surveillance of the operation to determine that practices, methods, and procedures of the written quality assurance system plan are being properly applied, and (b) Government product inspection to measure the quality of the product offered for acceptance. Deviation from the prescribed or agreed upon procedure, or instances of poor practices which might have an adverse effect upon quality of the product, will immediately be called to the attention of the contractor. Failure of the contractor to promptly correct deficiencies shall be cause for suspension of acceptance until corrective action has been made, or until the conformance of the product to prescribed criteria has been demonstrated.

4.1.3 Qualified products. When a part or component is to conform to a specification having a Qualified Products List (QPL), the contractor shall make available to the Government documentation of item acquisition from such QPL. The documentation shall include the QPL date and identification of the supplier, purchase order, and quantity.

4.1.4 Quality assurance provisions. In the conduct of inspection, the contractor shall adhere to Quality Assurance Provisions (QAP) and General Quality Assurance Requirements (STA Form 4452) as applicable and as required by the documents forming part of this specification.

4.1.5 Certification. Where certification (see 4.8.1) is required to verify material or component conformance to a specification, the contractor shall furnish such certification along with documented test results and performance and analytical data, as applicable.

4.2 Classification of inspection:

- a. First article inspection (see 4.3).
  - 1. First production vehicle inspection (FPVI) (see 4.3.1).
  - 2. Initial production test (IPT) (see 4.3.2).
- b. Quality conformance inspections (QCI) (see 4.4).
- c. Control tests (see 4.5).
- d. Comparison tests (see 4.6).

4.3 First article inspection. First article inspection shall be performed on the first production vehicle and additional vehicle(s), selected from early production which shall be designated as initial production item(s). Approval of the first article samples shall not relieve the contractor of the obligation to supply vehicles that are fully representative of those inspected as a first article sample. Any change or deviation of production vehicles from the first article sample shall be subject to the approval of the contracting officer.

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4.3.1 FPVI.

4.3.1.1 In-process inspection. The first production vehicle shall be inspected during fabrication to determine conformance of materials and workmanship to specified requirements. These inspections shall precede application of primer and paint. Processing and welding procedures, the quality system, inspection records, calibration procedures, radiographic procedures, and welder certifications shall be reviewed and evaluated.

4.3.1.2 Completed vehicle inspections.

4.3.1.2.1 Contractor inspection. The contractor shall subject the vehicle to a road test and the FPVI specified in table IX. The road test shall be conducted with actual or simulated payload on a smooth, relatively level hard-surfaced road for a distance of not less than 50 miles and ten laps on the two-inch washboard course at 5 to 10 mph.

4.3.1.2.2 Preliminary inspection. The responsible Government inspection element will conduct the FPVI specified in table IX to the extent that acceptability of the vehicle is verified.

4.3.1.2.3 Provisional inspection. The Government procuring activity will perform the FPVI specified in table IX to the degree required to justify approval of the vehicle.

4.3.1.2.4 Vehicle disposition. After completion of inspection, the first production vehicle shall remain at the manufacturing facility as a production sample, and shall be the last vehicle of its type shipped on the contract. The vehicle(s) may be released sooner at the discretion of the contracting officer. The contractor shall service and maintain the vehicle(s) during this period in accordance with applicable documents for care and preservation while in storage. All configuration changes taking place after the first production inspection shall be made to the first production vehicle(s) so that the vehicle(s) will be representative of the current configuration throughout the life of the contract. No configuration changes may be implemented on production vehicles after Government conditional acceptance of the first production vehicle (applicable vehicle type) without written authorization from the Government.

4.3.1.2.5 Final approval and acceptance. Final approval and acceptance by the Government of the first production vehicle(s) shall be withheld until the initial production test (see 4.3.2) has been completed and a final determination has been made regarding conformity of the vehicle(s) to contractual and specification requirements; including, but not limited to, workmanship and materials.

4.3.2 IPT. Initial production vehicles of each configuration shall be randomly selected by the Government. Quantity of test vehicles and variants to be tested shall be delineated in the production contract. Such tests shall be conducted by the Government at a Government selected test site(s). The vehicles shall be tested with actual or simulated payload. Unless otherwise specified by the Government procuring activity, the contractor shall recondition each test vehicle to like-new condition (see 6.3) after test completion.

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NOTE: Ninety percent of the mileage specified for each course shall be performed with payload. The remaining ten percent of the mileage shall be performed without payload. Trailed loads for vehicles shall be towed 25 percent of each course. Payloads for truck tractors (on a semitrailer) may be utilized for the tests, with determination to be made by the Government as to proper weight distribution and type of payloads.

4.3.2.1 Contractor inspection. The contractor shall inspect the initial production test vehicle(s) in accordance with 4.4.

4.3.2.2 Government inspection. The Government shall perform the IPT specified in table IX and a 20 000- or 11 400-mile reliability, availability, maintainability-durability (RAM-D) test as specified in tables VI, VII or VIII, as applicable.

TABLE VI. 20 000-mile test for all models, except tractors, wreckers, and expansible vans.

Course	Mileage and speeds	Payload
Hard-surfaced roads	6000 miles at varying speeds up to maximum	Highway
Secondary roads	5625 miles at speeds applicable to conditions of terrain	Highway
Level and hilly cross country	8225 miles at speeds applicable to conditions of terrain	Limited cross country and cross country
Belgian block	150 miles at speeds applicable to conditions of terrain	Cross country

TABLE VII. 20 000-mile test for truck tractors in combination.

Course	Mileage and speeds	Payload
Hard-surfaced roads	12 000 miles at varying speeds up to maximum	Highway
Secondary roads	4850 miles at speeds applicable to conditions of terrain	Limited cross country
Level and hilly	3000 miles at speeds applicable to conditions of terrain	Limited cross country
Belgian block	150 miles at speeds applicable to conditions of terrain	Limited cross country

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TABLE VIII. 11 400-mile test for wreckers and expansible vans.

Course	Mileage and speeds	Payload
Hard-surfaced roads	7500 miles at varying speeds up to maximum	Highway
Secondary roads	1525 miles at speeds applicable to conditions of terrain	Highway
Level and hilly	2275 miles at speeds applicable to conditions of terrain	Limited cross country and cross country
Belgian block	100 miles at speeds applicable to conditions of terrain	Cross country

4.3.3 Deficiencies. Unresolved failures or deficiencies during, or as a result of, first article inspection shall be cause for rejection of the vehicles until evidence has been provided by the contractor that corrective action has been taken to eliminate the deficiency. Any deficiency found during, or as a result of the IPT shall be evidence that all vehicles already accepted prior to completion of the IPT are similarly deficient unless contrary evidence satisfactory to the contracting officer is furnished by the contractor. Such deficiencies on all vehicles shall be corrected by the contractor at no cost to the Government.

TABLE IX. Classification of inspections.

Title	Requirements	Inspection	First article		1/ QCI	1/ Control	2/ Comparison
			1/ FPVI	2/ IPT			
Materials and construction	3.2 thru 3.3.2, 3.3.4, 3.3.6.1, and 3.3.9	4.8.1					
Production engine	3.3.6.1	4.8.1	X			X	
Safety	3.3.9	4.8.1	X	X		X	X
Defects (see table X)	3.3.5, 3.3.6.2, 3.3.7, 3.4.8.2, 3.4.13.4, 3.4.13.6, 3.4.14, 3.4.15, 3.5.1, 3.6, and 3.7	4.8.2	X	X	X		



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TABLE IX. Classification of inspections - Continued.

Title	Requirements	Inspection	First article		1/ QCI	1/ Con- trol	2/ Compari- son
			1/ FPVI	2/ IPT			
Front winch	3.3.5	4.8.3	X	X		X	X
Engine governor	3.3.6.2	4.8.4.1					
Fuel	3.3.6.3	4.8.4.2		X			X
Engine lubrication system	3.3.6.4	4.8.4.3	X				
Oil filler and gage	3.3.6.5	4.8.4.4	X				X
Cooling system	3.3.6.6	4.8.4.5		X			X
Exhaust system	3.3.7	4.8.5	X	X			X
Concentrations	3.3.7.1	4.8.5.1		X			X
Noise limits	3.3.8	4.8.6		X			X
Safety	3.3.9	4.8.7	X	X		X	X
Soft top	3.3.10	4.8.8					
Stowed material	3.3.11	4.8.9					
Air induction system	3.3.12	4.8.10	X			X	
Wood treatment	3.3.13	4.8.11	X			X	
Servicing and adjustment	3.3.14	4.8.12	X	X		X	X
MMBF	3.4.1	4.8.13.1		X			
Maintainability	3.4.1.2	4.8.13.2		X			
Durability	3.4.1.3	4.8.13.3		X			
Environmental	3.4.2	4.8.13.4		X			X
All-terrain operation	3.4.3	4.8.13.5		X			X
High speed	3.4.4.1	4.8.13.6		X			X
Low speed	3.4.4.2	4.8.13.7		X			X
Fording	3.4.5	4.8.13.8		X			X
Deep water fording	3.4.6	4.8.13.9		X			X
Grades and slopes	3.4.7, 3.4.7.2, and 3.4.7.3	4.8.13.10	X	X		X	
Longitudinal grades	3.4.7.1	4.8.13.10.1		X			X
Service brake	3.4.8.1	4.8.13.11	X	X		X	
Hand brake	3.4.8.2	4.8.13.12	X	X		X	



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TABLE IX. Classification of inspections - Continued.

Title	Requirements	Inspection	First article		1/ QCI	1/ Control	2/ Comparison
			1/ FPVI	2/ IPT			
Cramping angle	3.4.9	4.8.13.13	X	X			X
Cruising range	3.4.10	4.8.13.14		X			X
Air transportability	3.4.11	4.8.13.15		X			
Truck, wrecker, M936A1-crane	3.4.12	4.8.13.16	X	X			X
Boom extension	3.4.12.1	4.8.13.16.1	X	X	X		X
Pulley arrangement	3.4.12.2	4.8.13.16.2	X	X		X	X
Controls	3.4.12.3	4.8.13.16.3	X	X	X	X	X
Rotation	3.4.12.4	4.8.13.16.4	X	X			X
Hoist line speed	3.4.12.5	4.8.13.16.5	X	X			X
Lifting capacities	3.4.12.6	4.8.13.16.6	X	X		X	X
Settling rate	3.4.12.7	4.8.13.16.7	X	X	X	X	X
Trucks, van, expansible, M934A1 and M935A1	3.4.13	4.8.13.17					
Van body extended	3.4.13.1	4.8.13.17.1	X				
Waterproofness	3.4.13.2	4.8.13.17.2	X	X		X	X
Heaters and air conditioners	3.4.17.3 thru 3.4.13.3.3	4.8.13.17.3	X	X			X
Electrical system	3.4.13.4	4.8.13.17.4	X	X		X	X
Lightproofness	3.4.13.5	4.8.13.17.5	X	X		X	X
Lift gate platform	3.4.13.6	4.8.13.17.6		X		X	X
Dump trucks	3.4.14	4.8.13.18	X	X		X	X
Drop side cargo body	3.4.15	4.8.13.19		X		X	X
Radio interference suppression	3.4.16	4.8.13.20		X			X
Steam and water jet cleaning	3.4.17	4.8.13.21	X				
Workmanship	3.7	4.9	X	X		X	X

1/ At place of manufacture

2/ At Government proving ground

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4.4 QCI.4.4.1 Sampling.

4.4.1.1 Lot formation. An inspection lot shall consist of all the vehicles produced in one month submitted at one time for acceptance.

4.4.1.2 Sampling for inspection. When sampling is authorized for QCI (see 4.4.2.2) samples shall be selected in accordance with general inspection level II of MIL-STD-105. Before sampling may be initiated, the contractor shall establish by 100 percent inspection of at least 20 consecutively produced vehicles that the process average percent defective, as defined in MIL-STD-105, is not greater than the specified AQL.

4.4.2 Inspection. QCI shall be performed in the following sequence and utilizing an approved Final Inspection Record (FIR).

- a. Examination for the defects specified in table IX and classified in table X.
- b. A 10-mile road test in accordance with 4.4.3.
- c. QCI specified in table IX.

4.4.2.1 One hundred percent. Each vehicle shall be subjected to the QCI specified in 4.4.2.

4.4.2.2 Acceptable quality level. When authorized by the Government contracting authority, one hundred percent QCI (see 4.4.2.1) shall be waived. Thereafter, samples shall be selected in accordance with 4.4.1.2 and shall be inspected to determine conformance to the following acceptable quality levels (AQL) on the basis of percent defective.

<u>Classification</u>	<u>AQL</u>
Major	2.5
Minor	4.0

TABLE X. Classification of defects.

<u>Category</u>	<u>Defect</u>	<u>Method of examination</u>
Critical	None	
<u>Major</u>	<u>AQL 2.5% Defective</u>	
101	Malfunction, leaks, unusual noise in engine.	Functional and visual
102	Malfunction, leaks, improper clearance in cooling system and components.	Functional and visual
103	Malfunction, seals in engine governor (see 3.3.6.2).	Functional and visual
104	Malfunction, damage in electrical system (see 3.4.13.4).	Functional and visual

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TABLE X. Classification of defects - Continued.

Category	Defect	Method of examination
105	Improper lighting connectors.	Functional and visual
106	Malfunction, leaks, improper adjustment of service and hand brake, and locks.	Functional and visual
107	Damage, leaks in exhaust system (see 3.3.7).	Functional and visual
108	Malfunction in instrumentation switches, warning indicators.	Functional and visual
109	Improper condition of tires.	Visual and gage
110	Malfunction, damage, improper size or length of winch and wire rope (see 3.3.5).	Functional
111	Nonconformance in speeds, high and low.	Functional
112	Poor welding and workmanship, improper dimensions of frame structure (see 3.4.13.6 and 3.7).	Visual
113	Improper welding, leaks in tank structure.	Visual
114	Malfunction, improper clearance in controls.	Functional and visual
115	Binding, leaks in drive train.	Visual
116	Improper clearance and performance of suspension.	Visual
Minor	AQL 4.0% Defective	
201	Improper adjustment or assembly of controls (see 3.3.5 and 3.4.14).	Functional and visual
202	Improper amount or mixture of coolant.	Functional and visual
203	Improper levels and types of lubricants.	Visual
204	Improper tire pressure.	Gage
205	Improper mounting or clearance of pulleys and fan.	Visual
206	Improper tension in belts.	Visual
207	Improper assembly, installation, or coding of wiring or tubing (see 3.4.13.4).	Visual
208	Improper assembly, installation, or protection of brake system components.	Visual
209	Improper fits, assembly, or installation; defective weldments racks, bows, flooring, seals, or hardware of body, cab, doors, hood items, stowage brackets and boxes, dump van.	Visual
210	Defective welding causing cracks or splits of sheet metal.	Visual
211	Improper installation or assembly of electrical system components (see 3.4.13.4).	Functional and visual
212	Improper application and color of paint (see 3.5.1).	Visual

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TABLE X. Classification of defects - Continued.

Category	Defect	Method of examination
213	Improper assembly or installation of exhaust system components (see 3.3.7).	Visual
214	Improper assembly or installation of cooling system.	Visual
215	Improper assembly or installation of fuel system components.	Visual
216	Damage, improper fit and installation of canvas tops.	Visual
217	Improper location of, missing, incomplete, painted-over decals, data, and instruction plates (see 3.6).	Visual

4.4.2.2.1 Defects.

4.4.2.2.1.1 Unclassified defects. All defects that have no effect on function, safety, interchangeability, or life, but are considered departures from good workmanship, will be noted in writing. Workmanship deficiencies falling within this category and recurring in five consecutive lots, or ten lots or more within a 30-day period, will be added to the minor defects classification with no increase in AQLs. These defects may be deleted from the minor classification of characteristics when five consecutive lots are found free of the deficiency.

4.4.2.2.1.2 Recurring major deficiencies. A major deficiency is recurring when the same defect occurs more than once in the same sample, or when the defect occurs in two successive samples. A major defect may be considered recurring when the historical inspection records ("P" chart or approved equivalent) reflect such a condition. Recurring major deficiencies shall be cause for the entire lot or lots to be inspected for the recurring deficiencies. The deficiencies shall be corrected when found (see 6.3.2).

4.4.2.2.1.3 Recurring minor deficiencies. A minor deficiency is recurring if it occurs more than twice in the same sample, or when the defect occurs in four successive samples. Recurring minor deficiencies shall be cause for the entire lot or lots to be inspected for the recurring deficiencies and correction shall be accomplished prior to acceptance (see 6.3.2).

4.4.3 Road test. Each vehicle shall be completely assembled, serviced, corrected of deficiencies (see table X), and then tested by the contractor for achieving 50 mph at a distance of not less than 10 miles. The vehicle shall also achieve 2.5 mph in the speed range which delivers maximum torque for a distance not less than 0.5 mile. This road test shall be conducted without payload at the place of manufacture on a smooth, relatively level, hard surfaced road. The vehicle shall be road tested on the two-inch washboard course with a minimum of three laps at 5, +5, -0 mph.

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4.4.3.1 Road test failure. If any vehicle fails to pass the road test, the Government shall withhold acceptance of subsequent vehicles until evidence has been provided by the contractor that corrective action has been taken to correct the deficiencies.

4.5 Control tests. Control tests shall be conducted at the place of manufacture on one vehicle from each lot of 20 vehicles consecutively produced or on one vehicle per week, whichever is more, except that not more than eight vehicles or less than four vehicles shall be tested in a 30 calendar-day period. The vehicles shall be road tested in accordance with 4.4.3, followed by an additional distance of 50 miles with full payload (see 4.5.1). The vehicles shall subsequently be subjected to the control tests specified in table IX.

4.5.1 Fifty-mile control test. The test vehicles shall be operated for a distance of not less than 50 miles on the relatively level, hard-surfaced test track and 10 laps on the two-inch washboard coarse at 5, +5, -0 mph.

4.6 Comparison test. The Government may randomly select vehicles at anytime during the production contract period and subject these vehicles to the comparison tests specified in table IX as well as the test of either table XI, XII, or XIII, as applicable. Tests shall be conducted by the Government at a site it shall select. Vehicles selected for comparison tests shall not have been previously tested according to 4.5, but shall have passed inspection according to 4.4.

TABLE XI. Comparison test of 10 000 miles for all models except truck tractor, wrecker, and expansible van.

Course	Mileage and speeds	Payload
Hard-surfaced Secondary	3000 miles up to 50 mph 2800 miles at speeds applicable to conditions of terrain	Highway Highway
Level and hilly cross country	4125 miles at speeds applicable to conditions of terrain	Limited cross country
Belgian block	75 miles at speeds applicable to conditions of terrain	Limited cross country

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TABLE XII. Comparison test of 10 000 miles for truck tractor combination.

Course	Mileage and speeds	Payload
Hard-surfaced Secondary	6000 miles up to 50 mph 2425 miles at speeds applicable to conditions of terrain	Highway Highway
Level and hilly cross country	1500 miles at speeds applicable to conditions of terrain	Limited cross country
Belgian block	75 miles at speeds applicable to conditions of terrain	Limited cross country

TABLE XIII. Comparison test of 5700 miles for wrecker  
and expansible van models.

Course	Mileage and speeds	Payload
Hard-surfaced Secondary	3750 miles up to 50 mph 762 miles at speeds applicable to conditions of terrain	Highway Highway
Level and hilly cross country	1138 miles at speeds applicable to conditions of terrain	Limited cross country
Belgian block	50 miles at speeds applicable to conditions of terrain	Cross country

4.7 Failure. Failure of any vehicle to pass any of the specified inspections or failure to meet inspection AQL levels, as applicable, shall be cause for the Government to refuse acceptance of the production quantity represented, until action taken by the contractor to correct defects and prevent recurrence has been approved by the Government.

#### 4.8 Methods of inspection.

4.8.1 Materials and construction. Conformance to 3.2 through 3.3.2, 3.3.4, 3.3.6.1, and 3.3.9, shall be determined by inspection of contractor records providing proof or certification that design, construction, processing, and materials conform to requirements. Applicable records shall include drawings, specifications, design data, receiving inspection records, processing and quality control standards, vendor catalogs and certifications, industry standards, test reports, and rating data.

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4.8.2 Defects. Conformance to 3.3.5, 3.3.6.2, 3.3.7, 3.4.8.2, 3.4.13.4, 3.4.13.6, 3.4.14, 3.4.15, 3.5.1, 3.6, and 3.7 shall be determined by examination for the defects listed in table X. Examination shall be visual, tactile, or by measurement with standard inspection equipment.

4.8.3 Features. Conformance to 3.3.3, 3.3.4, 3.3.6.4, and 3.3.8 shall be determined by exercising the vehicle, and by qualitative observation sufficient to demonstrate that specified characteristics and features are present and functional.

4.8.4 Front winch. To determine conformance to 3.3.5, test the winch and wire rope with load and examine them for proper assembly, installation, and functional requirements. Rated load of the winch system shall be tested at Government proving grounds (GPG). During the control test at the contractor's facility, winch and wire rope shall be tested and examined as above, except no load shall be used.

4.8.5 Engine. To determine conformance to 3.3.6, examine the engine and all the accessories specified therein for completeness, proper installation in vehicle, electrical hookups, fuel line connections, air line connections, mechanical control hookups, oil level, and cooling fluid hookups.

4.8.5.1 Engine governor. To determine conformance to 3.3.6.2, start the engine and operate it without load, with the foot accelerator depressed to the maximum permissible position. The governor shall be examined to assure that it is properly sealed or constructed.

4.8.5.2 Fuel. To determine conformance to 3.3.6.3, use fuel which conforms to the stated grades of VV-F-800 without degradation to vehicle performance for all GPG testing of vehicles.

4.8.5.3 Engine lubrication system. To determine conformance to 3.3.6.4, provide documentation that the engine oil meets the requirements of the stated specifications. Monitor the system gauges during road tests for proper readings. If other engine oil is selected, it shall be certified as being compatible with MIL-L-2104. Such certification shall be required per batch or lot purchased.

4.8.5.4 Oil filler and gage. To determine conformance to 3.3.6.5, pour oil into the crankcase filler opening from containers conforming to those specified. Check the engine dipstick for the specified requirements.

4.8.5.5 Cooling system. To determine conformance to 3.3.6.6, examine the cooling system to assure the system meets the cooling requirement. Also record the maximum values of transmission oil temperature, engine coolant temperature, and engine oil pressure during high ambient temperature and instrument tests conducted at GPG.

4.8.6 Exhaust system. To determine conformance to 3.3.7, examine the exhaust system for proper installation, absence of leaks, and conformance to MIL-HDBK-759.

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4.8.6.1 Concentrations. To determine conformance to 3.3.7.1, test the vehicle for concentration of NO not to exceed 50 ppm and concentration of carbon monoxide not to exceed 50 ppm. Measure concentration levels in the crew compartment with the cab windows up and all vents closed, personnel heater operating, and engine running at approximately 1500 rpm for a 30 minute period.

4.8.7 Noise limits. To determine conformance to 3.3.8, test the vehicle's interior noise limit and drive-by noise per MIL-STD-1474 at GPG.

4.8.8 Safety. To determine conformance to 3.3.9, locate, insulate, fully enclose, or guard all exposed parts which are electrically energised so as to prevent hazards to operating personnel and equipment performance. Enclose or guard all moving parts which could be a hazard to operating or maintenance personnel. Protective devices shall not impair operating functions.

4.8.9 Soft top. To determine conformance to 3.3.10, examine the soft top for proper assembly and installation.

4.8.10 Stowed material. To determine conformance to 3.3.11, examine the on-vehicle materials (OVM) and stowage space for completeness of material per OVM listing and packaging instructions.

4.8.11 Air induction system. To determine conformance to 3.3.12, pressure test the air induction system to hold no less than two pounds per square inch (psi) for a period of 30 minutes, with all vent lines and air compressor intake air lines connected to the air induction ducting. Position the elevated inlet so that no interference exists with the machine gun installation. The intake stack shall have a minimum overall height of 84 in.

4.8.12 Wood treatment. To determine conformance to 3.3.13, provide to the Government, upon request, a laboratory analysis showing that all requirements of MIL-STD-193 have been met.

4.8.13 Servicing and adjustment. To determine conformance 3.3.14, inspect and service vehicles for fit, adjustments, and functional adequacy. Record inspection and adjustment data on a final inspection record for the particular vehicle inspected.

4.8.14 Performance. Perform the following tests under the conditions specified in 3.4.

4.8.14.1 MMBF. To determine conformance to 3.4.1, conduct a reliability verification of the vehicle(s) test performance to verify that the MMBF requirements, as specified, have been attained utilizing generated test data, i.e., equipment performance reports (EPR).

4.8.14.1.1 FD/SC. The Government will unilaterally determine conformance to 3.4.1.1 and 3.4.1.2 by scoring failure incidents and severity classification on each vehicle, using the FD/SC specified in 3.4.1.1 and the regulatory guidelines of AMC and TACOM directives.



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4.8.14.2 Maintainability. To determine conformance to 3.4.1.2, in an environment which simulates the vehicle's operational and maintenance conditions, determine the maintenance ration (MR). Upon completion of the test, compute the MR, utilizing the scheduled and unscheduled man-hour data recorded in the final test report.

4.8.14.3 Durability. To determine conformance to 3.4.1.3, demonstrate that the vehicle(s) meets specifications without a replacement or overhaul.

NOTE: A durability failure is considered to have occurred when repair or corrective action required by a malfunction of any major component or system exceeds the capabilities of the organizational and direct support maintenance levels. The corrective action categories are defined in the vehicle approved maintenance allocation chart (MAC).

4.8.14.4 Environmental. To determine conformance to 3.4.2, test the vehicle at the stated temperature ranges for a period of not less than 24 hours per range specified. During testing, start the vehicle without external aids and operate the following equipment to determine proper operation:

- Engine, transmission and drive train components (inclusive);
- Winch;
- Electrical, including lights;
- Cooling system;
- Instruments/controls;
- Personnel heater and climate control.

4.8.14.5 All-terrain operation. To determine conformance to 3.4.3, test vehicles with towed load to the terrains specified in tables VI, VII, or VIII, as applicable.

4.8.14.6 High speed. To determine conformance to 3.4.4.1, test the vehicle at the specified weight for achieving and maintaining the specified high speed on level roads for at least two consecutive hours. During testing and upon test completion, check the power plant and power train.

4.8.14.7 Low speed. To determine conformance to 3.4.4.2, test the vehicle at the specified speed, in the specified speed range for at least two consecutive hours. During testing and upon test completion, check the power plant and power train.

4.8.14.8 Fording. To determine conformance to 3.4.5, operate the vehicle in no less than 30 in of water for no less than 15 minutes. Immediately following the fording test, remove the wheel hubs, and examine them for water contamination. Take oil samples from the engine; transmission; transfer transmission; and front, intermediate, and rear differentials. Water contamination in excess of one percent by volume shall be cause for rejection.

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4.8.14.9 Deep water fording. To determine conformance to 3.4.6, operate the vehicle, with the deep water fording kit installed, in 78 in of water for no less than 30 minutes. While the vehicle is still submerged, check that the engine restarts after being stopped for three minutes. Operate the vehicle for an additional 15 minutes while it is still immersed. Check that there is no damage to the vehicle. At the conclusion, no more than one percent water contamination by volume in lubricants and fluids is permissible. Examine for contamination as in 4.8.14.8.

4.8.14.10 Grades and slopes. To determine conformance to 3.4.7, 3.4.7.2, and 3.4.7.3, operate the vehicle on the grades or slopes specified. During operation on slopes and grades, check the vehicle for evidence of stalling, slipping, and overheating; and shut it off and restart it no less than two times in each direction (forward, backward, and both sides) with at least one minute during shutdowns. Monitor oil pressure. Check the vehicle during and after testing for leakage of fuel, coolant, and lubricant. During slope operations, monitor the vehicle for loss of fuel supply to the engine. Any evidence of faulty lubrication, cooling, fuel supply, leakage, or other malfunction during or following tests shall be cause for rejection.

4.8.14.10.1 Longitudinal grades. To determine conformance to 3.4.7.1, operate the vehicle at maximum combination weight of 50 000 lb to the stated requirement. Without the towed load, test the vehicle to its stated requirement. Overheating in the engine or transmission can be cause for rejection.

4.8.14.11 Service brake. To determine conformance to 3.4.8.1, check the service brakes for the ability to stop the vehicle within 30 feet at 20 mph measured from the point at which movement of the brake pedal begins on dry, hard, approximately level road surface that is free from loose material. Average the results of a minimum of three consecutive stopping distances to determine adherence to the stopping requirements. During braking tests, monitor the vehicle for excessive pulling to the left or right.

4.8.14.12 Hand (parking) brake. To determine conformance to 3.4.8.2, test a vehicle loaded to its specified gross vehicle weight (GVW) on the specified slope in both an upgrade and downgrade position with the parking brakes set. Operate the engine for at least two minutes and at least one minute with the engine shut down in each test position (upgrade and downgrade). There shall be no evidence of side slipping during the test. Conduct the test on slopes that are dry, hard surface, and are free from loose material. Check the parking brakes by setting the brake with the vehicle not in motion, and attempt to accelerate while in low gear. Failure of the parking brakes to prevent significant vehicle movement shall be considered unacceptable. Demonstrate the proper parking brake application, i.e., fifth percentile female, spring action, or other energy.

4.8.14.13 Cramping angle. To determine conformance to 3.4.9, the front wheels shall be turned to maximum right and left positions and, to assure that the turning angle is met, there shall be no clearance between the faces of the axle stops. Faces of stops must contact each other.

4.8.14.14 Cruising range. To determine conformance to 3.4.10, operate the vehicle with highway payload under conditions specified.

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4.8.14.15 Air transportability. To determine conformance to 3.4.11, load vehicles on aircraft to test the transportability. In lieu of actual testing, the vehicle dimensions may be compared to the loading capacity dimensions of each applicable aircraft contained in MIL-A-8421, paragraph 3.3.1 (and subparagraphs). In addition, test the vehicles to verify the capability of negotiating and departing the specified ramp.

4.8.14.16 Truck, wrecker, M936A1 - crane. To determine conformance to 3.4.12, test the crane, using the specified oils and on level ground, as specified. To operate the power take-off, shift the transfer to a neutral position; shift the transmission into fourth gear speed range; and, using the hand throttle, accelerate the engine to  $1800 \pm 50$  rpm. When crane oil reaches the specified temperature, begin tests.

4.8.14.16.1 Boom extension. To determine conformance to 3.4.12.1, use the operating characteristics for the specified models and test the crane for the specified requirements.

4.8.14.16.2 Pulley arrangement. To determine conformance to 3.4.12.2, use the operating characteristics for the specified models and test the crane for the specified requirement.

4.8.14.16.3 Controls. To determine conformance to 3.4.12.3, test controls for operation of the crane to assure automatic return to a neutral position when they are released.

4.8.14.16.4 Rotation. To determine conformance to 3.4.12.4, rotate the crane  $360^\circ$ , without stops.

4.8.14.16.5 Hoist line speed. To determine conformance to 3.4.12.5, lift a 3000-lb load.

4.8.14.16.6 Lifting capacities. To determine conformance to 3.4.12.6, use the operating characteristics for the specified models and test the cranes for the specified requirements.

4.8.14.16.7 Setting rate. To determine conformance to 3.4.12.7, use the operating characteristics for the specified models and test the crane for the specified requirements.

4.8.14.16.8 Maximum load. To determine conformance to 3.4.12.8, lift a weight of 20 000 lb to maximum height, and replace it on the ground.

4.8.14.17 Trucks, van, expansible, M934A1 and M935A1.

4.8.14.17.1 Van body extended. To determine conformance to 3.4.13.1, examine the vehicle for performance requirements with the vehicle body fully extended and locked into position.

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4.8.14.17.2 Waterproofness. To determine conformance to 3.4.13.2, apply vapor barrier material to each vehicle, and subject the van body to not less than 15 minutes spray test in both expanded and retracted conditions. Deliver the spray by nozzles operating at no less than 25 psi water pressure, sufficient in number to afford full coverage of the roof, floor, sides, front and rear of the body. Place nozzles within two feet of the area being tested. During the water test, all doors and windows shall be closed. If leaks (see 6.3) occur within the van body, the vehicle shall be rejected until defects have been corrected and the van body is successfully retested.

4.8.14.17.3 Heaters and air conditioners. To determine conformance to 3.4.13.3 through 3.4.13.3.3, inspect vehicles for proper installation and functional performance.

4.8.14.17.4 Electrical system. To determine conformance to 3.4.13.4, examine van body wiring for proper installation, protection against chafing, and damage of insulation.

4.8.14.17.5 Lightproofness. To determine conformance to 3.4.13.5, place each van in bright sunlight or expose it to high intensity illumination, with the access door closed and the blackout shades down. No light shall be visible inside the van body. Repeat the test at night with all sources of illumination operating within the van body. No light shall be visible outside the van body.

4.8.14.17.6 Lift gate platform (M935A1 only). To determine conformance to 3.4.13.6, place a 2500 to 3000 lb load on the lift gate; and raise and lower the load to maximum height five times. During the raising and lowering cycles, stop the lift gate during two of the cycles for 30 seconds at 6 in intervals, i.e., 6 in, 12 in, 18 in, etc., until maximum height is reached during both ascending and descending lifts. Hydraulic lines shall show no evidence of leakage during or after the test.

4.8.14.18 Dump truck. To determine conformance to 3.4.14, load the dump body with 20 000  $\pm$  500 lb, evenly distributed over the bed area. Raise and lower the body of the dump five times. During two of the five lift cycles, raise the body by a series of lifts approximately two feet at a time, pausing for 30 seconds at each two-foot increment, before continuing in both ascending and descending cycles. The hydraulic system, pump, lines, and controls shall evidence no leakage during or after the test. The tailgate locking handle shall remain permanently locked at all times during the test, until released by the operator. Release of the tailgate lock shall be easily effected by hand, without the use of pry bars, a hammer, or hard object.

4.8.14.19 Drop side cargo body. To determine conformance to 3.4.15, check that drop sides and tailgate can be raised and lowered without binding. Hold sides and tailgate rigidly in position, with locking devices engaged, using hand effort only. Change the drop sides from one side to the other to check interchangeability.

4.8.14.20 Radio interference suppression. To determine conformance to 3.4.16, subject the vehicle and components to the tactical vehicles suppression test of MIL-STD-462, class IIIA.

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4.8.14.21 Steam and water jet cleaning. To determine conformance to 3.4.17, after all other tests, steam and water jet clean the engine by applying the jet perpendicular to the surface being cleaned at a distance of not more than one foot from the surface for steam cleaning and not more than five feet from the surface for water jet cleaning. Clean at a rate of one square foot per minute. The jet pressure shall not be less than 100 psi and not more than 110 psi. The engine shall be equipped with all the components listed in 3.3.6. Disassemble the engine and components to the extent necessary to determine if any deterioration to seals, hose, gaskets, or driving belts exists; and to determine if any entry of water has occurred. Any evidence of above said deterioration or water entry resulting from the testing shall be cause for rejection.

4.9 Workmanship. To determine conformance to 3.7:

4.9.1 Weld workmanship. The limits established below represent the maximum discontinuities allowable for visual inspection of workmanship specimens and production steel weldments. (Workmanship specimens which require cross sectioning must also be evaluated for subsurface quality; these criteria are not contained herein.) Any discontinuity exceeding this limit is classified as defective and must be reworked or repaired, depending upon the nature and extent of the discontinuity. Evaluate weldments requiring subsurface weld inspection in accordance with the acceptance standard specified on the applicable drawing, and the following definitions and instructions.

4.9.1.1 Discontinuities:

- a. Crack - A weld crack is defined as a linear rupture resulting from excessive localized stress. It can occur in the weld metal, fusion zone, or heat affected zone.
  1. No cracks shall be allowed.
- b. Porosity - Porosity is defined as a rounded cavity, free of solid material, resulting from gas entrapment during solidification.
  1. Maximum pore size shall be 1/16 inch.
  2. There shall be no more than six pores for any 12 in length of weld. Small weldments with continuous welds less than 12 inches in length shall have proportionately less pores allowed. For example, no more than three pores shall be allowed for a six-inch length of weld.
- c. Overlap - Overlap is defined as a protrusion of weld metal beyond the bond at the toe of the weld.
  1. A radiused tie-in shall exist with the parent metal.
  2. The overlap condition shall not exceed ten percent of the total weld length.

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- d. Slag inclusion - Slag inclusion is defined as a nonmetallic solid material entrapped in or on the weld metal, or between the weld metal and base metal. This discontinuity is applicable to shielded metal arc welding (SMAW) and flux cored arc welding (FCAW) processes.
  - 1. No slag inclusions shall be allowed.
- e. Undercut - Undercut is defined as a groove melted into the base material adjacent to the toe of the weld and left unfilled by weld metal.
  - 1. For base materials 0.25 in and less in thickness, no undercutting shall be permitted.
  - 2. For base materials greater than 0.25 in thickness, undercut depth shall be 1/32 in, and width shall be not less than twice the depth.
  - 3. For any continuous 24 in length of weld, the length of undercut shall not exceed 2 in, cumulative.
  - 4. For continuous welds less than 24 inches in length, the cumulative length shall be in direct proportion to the above limit or 1 in, whichever is greater. For example, no more than a 1 in cumulative undercut length shall be allowed for an 8 in continuous length of weld.

4.9.2 Weld size.

## a. Fillet welds:

- 1. Measure fillet welds with fillet weld gages.
- 2. For welds 1/4 in and less, the weld size is the minimum specified on the applicable drawing symbol.
- 3. For fillet welds larger than 1/4 in, the weld may be undersize by 1/16 in for a length which is 10 percent of the continuous weld length.

## b. Groove welds:

- 1. No underfill shall be allowed.

## 5. PACKAGING

5.1 Preservation, packaging, packing, and marking. Preservation, packaging, packing, and marking for the desired level shall be in accordance with the applicable packaging standard or packaging data sheet specified by the contracting authority (see 6.2).

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## 6. NOTES

6.1 Intended use. The vehicles covered by this specification are general and special purpose trucks intended for use by the United States Military Services in transporting personnel or cargo, towing trailers or semitrailers, and recovering disabled equipment during military operations. When fitted with special equipment kits, the vehicles are intended for use under extreme or unusual conditions of climate, weather, terrain, and military services.

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Type, model, and drawing number of the vehicle (see 1.2).
- c. If first article samples are not required (see 3.1).
- d. If special kits are required (see 3.3.3).
- e. If rigging blocks and utility chain are required for other than Army (see 3.3.5).
- f. If servicing and adjustment are not required (see 3.3.14).
- g. If responsibility for inspection shall be other than as specified (see 4.1).
- h. If responsibility for inspection equipment shall be other than as specified (see 4.1.1).
- i. Selection of applicable levels of preservation, packaging, packing, and marking (see 5.1).

6.3 Definitions.

6.3.1 Leak. A leak is defined according to the following classifications:

- a. Weep: Any evidence of fluid beyond the seal.
- b. Seep: Any evidence of fluid beyond the seal that does not result in the formation of a droplet.
- c. Droplet: Any evidence of fluid beyond the seal that results in the formation of a droplet.
- d. Drip: Any evidence of fluid beyond the seal where a droplet forms and falls.

6.3.2 Deficiency sheet. A deficiency sheet is defined as an enumeration, Government verified, of all defects encountered during inspection of each vehicle. The Government inspection shall verify that a thorough inspection of each vehicle is performed by the contractor for the listed characteristics and for any departures from good workmanship. Defects noted on a deficiency sheet shall contain sufficient description to enable the Government inspector and the contractor's representative to classify the defects in accordance with the classification of defects (see table X) and definitions contained in MIL-STD-105. Corrective action shall be taken for recurring defects. A recurring defect during testing which results in the inability to move or perform a specified function shall be classified as pattern failure.

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6.3.3 Like-new condition. A like-new condition is defined as when the test vehicles, upon completion of contractor reconditioning, conform to all requirements of the applicable vehicle FIR, and when component wear tolerances specified in the vehicle technical manual are not exceeded.

6.4 Recycled materials. The use of recycled materials which meet the requirements of the applicable material specifications without jeopardizing the intended use of the item shall be encouraged (see 3.2).

6.5 Supersession data. This military specification supersedes Purchase Description ATPD-2056B, dated 30 July 1980.

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Preparing activity:  
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GUIDELINES FOR CLASSIFICATION OF TEST INCIDENTS

10. SCOPE

10.1 Scope. This appendix details the guidelines to be used to classify test incidents under the following categories: no-test, unscheduled and scheduled maintenance, system failures, and tactical mission failures. The impact of equipment failure characteristics is reduced through planned maintenance and servicing, which is developed prior to the test. It is necessary, therefore, to distinguish between test incidents resulting from programmed maintenance and test incidents requiring unprogrammed maintenance. With established guidelines, it must be recognized that incidents requiring performance vary from no effect to catastrophic failure. This appendix is not a mandatory part of the specification. The information contained herein is intended for guidance only. It is not possible to have hard rules for evaluating all incidents; therefore, judgement will have to be exercised in the classification of some incidents.

20. APPLICABLE DOCUMENTS

20.1 Government documents.

20.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this appendix to the extent specified herein.

STANDARDS  
MILITARY

MIL-STD-882 - System Safety Program Requirements.

30. DEFINITIONS

30.1 No-test. No-test is defined as a test incident that is not related to hardware performance and will typically involve pretest operations, test site limitations, test item abuse, unrealistic operating conditions, accidents, improper operation and maintenance procedures, modification kit installation, or engineering evaluation.

30.2 System failure. A system failure is defined as any actual or incipient malfunction of the end item (subject to the exclusions in 30.2.3) that required corrective action which could not have been deferred

- a. until the next scheduled maintenance (exclusive of lubrication services) if organizational maintenance is prescribed for correction; or
- b. for the remainder of its specified life before overhaul, replacement, rebuild, or salvage.

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30.2.1 Nondeferrable diagnostic and corrective action. Diagnostic and corrective action shall not be considered deferrable if the malfunction caused (or would have caused if not corrected) one of the following:

- a. Inability to commence operation, cessation of operation, or reduction in performance capability to the extent that a prescribed system function is either lost or significantly degraded.
- b. A critical or catastrophic hazard to personnel or equipment, as defined by MIL-STD-882.

30.2.2 Corrective action deferrable to scheduled maintenance. Prescribed organizational level corrective actions deferred or deferrable to the scheduled maintenance shall be accomplished without charging a system failure. Incipient malfunctions of the end item detected during prescribed inspections connected with scheduled maintenance shall also be corrected without charging a system failure, unless higher level maintenance is prescribed for the corrective action.

30.2.2.1 Corrective action not deferrable to final inspection. In the event that higher level maintenance is prescribed for the corrective action, a system failure shall be charged if the corrective action was not deferrable as described in 30.2.3(e).

30.2.2.2 Malfunction of subsystem of end item. A system failure shall be charged if a malfunction of a subsystem of the end item was detected during the scheduled maintenance that would previously have been considered a system failure if an attempt had been made to operate the affected subsystem prior to the scheduled maintenance, e.g., malfunction of a night vision device during daylight vehicle operation prior to scheduled maintenance.

30.2.2.3 Malfunction detected during correction of another malfunction. If an incipient malfunction of the end item was detected during the correction of another malfunction, two system failures shall be charged provided that the malfunctions were totally unrelated, maintenance was performed to prevent progression of the incipient malfunction, and both malfunctions comply with the stated definition of "system failure". However, if the malfunctions were related, e.g., secondary damage caused by primary component malfunction, only the primary malfunction shall be considered a system failure.

30.2.2.3.1 Malfunctions with common cause. When the occurrence of more than one actual malfunction is subsequently traced to a common cause which is positively isolated, corrected by maintenance actions, and verified; only one malfunction in the series shall be scored a system failure (if otherwise qualified). Diagnostic and unscheduled maintenance time associated with all malfunctions shall be chargeable.

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30.2.3 Exclusions. Incidents which comply with the above stated definition of "system failure" but which shall not be used in the determination of system MTBF or system reliability are:

- a. Actual or incipient malfunctions detected or corrected during initial technical inspection.
- b. Actual or incipient malfunctions for which corrective action is authorized or prescribed as an operator or crew function and can be accomplished within 60 minutes using only authorized controls, tools, and spare parts incorporated in or carried with the end item.
- c. Actual or incipient malfunctions resulting from failure to follow the prescribed operational or maintenance procedures dictated by the equipment manuals, or which can be directly attributed to improper replacement of components or omission of prescribed scheduled service or inspections. This exclusion does not apply if the malfunction is attributable to improper design of the test item, unclear instructions in the operator or maintenance manuals, or any other inadequate element of the maintenance test package.
- d. Actual or incipient malfunctions resulting from test item abuse, unrealistic operating conditions, nonvalid test, or accident.
- e. Malfunctions deferred to and corrected during the final technical inspection, except those which caused test termination or which would have been previously considered a system failure if an attempt had been made to operate the affected subsystem prior to final inspection.

#### 40. SCORING PROCEDURES

40.1 Test evaluation. A test incident shall be evaluated in accordance with the previous definitions and classified in accordance with the decision tree flow chart below. All unscheduled corrective maintenance actions shall be evaluated for severity, and may be charged as system failures.

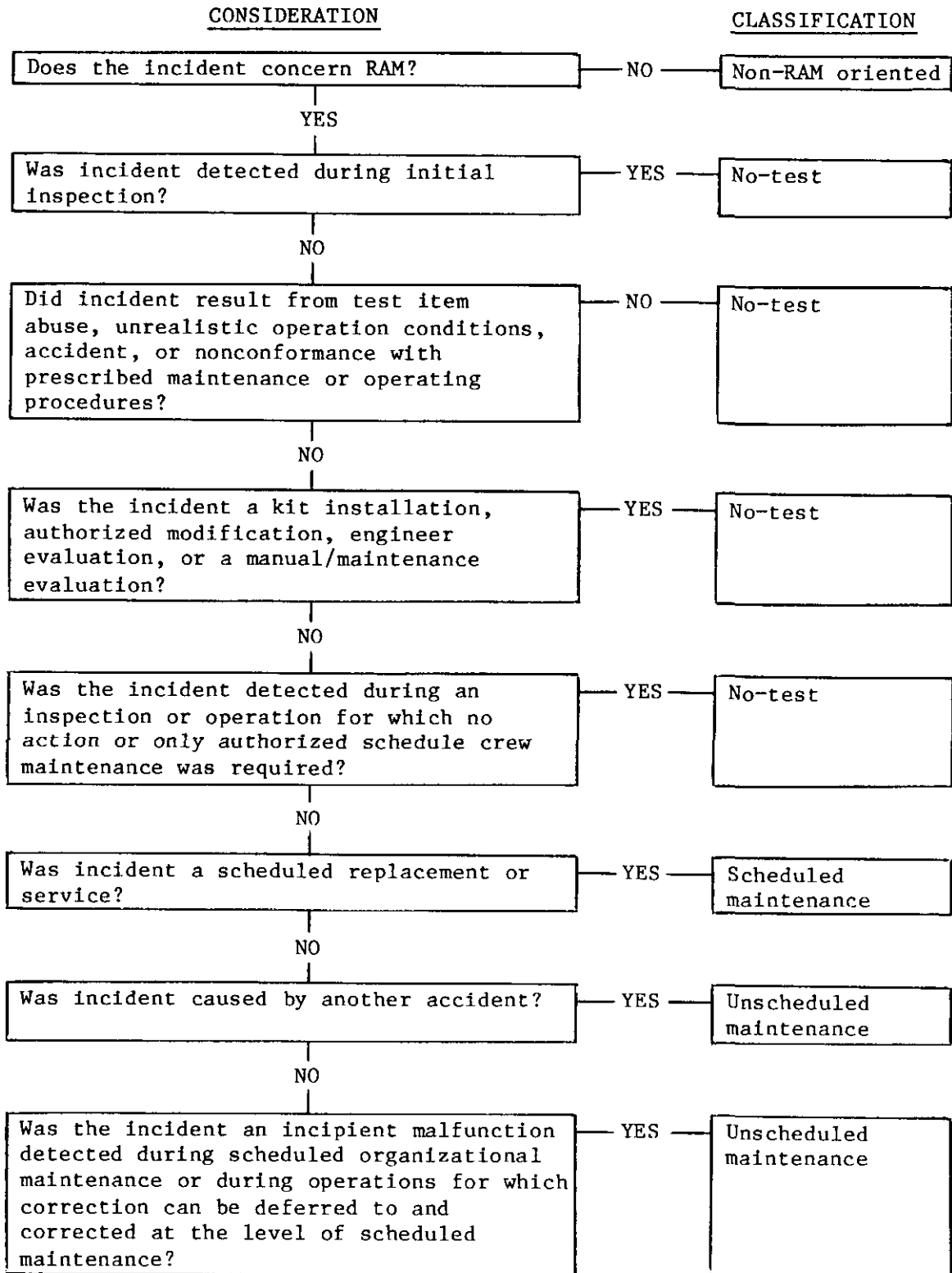
40.2 Reliability, availability, maintainability (RAM) characteristics. For the purposes of determining the RAM characteristics, the original scoring of incidents shall be subjected to periodic review predicted on institution of corrective actions. The basis for eliminating failures or maintenance time, in order to arrive at adjusted values, shall be scoring conference consensus that a given modification was satisfactory and would, therefore, have either precluded the failure (or maintenance time) or substantially reduced the failure rate for the component.

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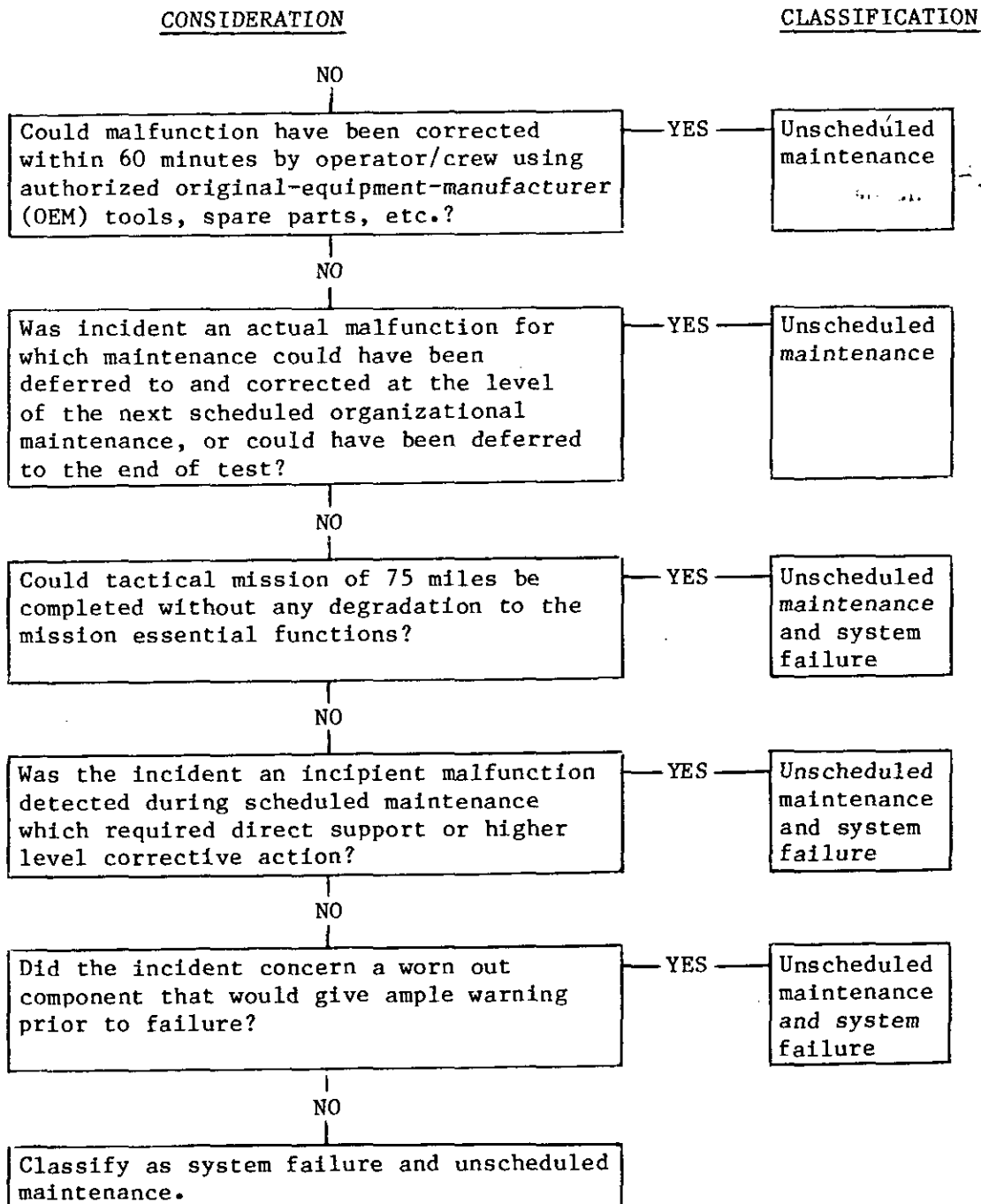
Decision tree flow chart

Consider the following when classifying incidents which occur during tests:



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Decision tree flow chart



## STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER MIL-T-62514(AT)		2. DOCUMENT TITLE TRUCKS - 5 TON - 6 X 6 - M 939A1 - SERIES	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION (Mark one)	
b. ADDRESS (Street, City, State, ZIP Code)		<input type="checkbox"/> VENDOR	
		<input type="checkbox"/> USER	
		<input type="checkbox"/> MANUFACTURER	
		<input type="checkbox"/> OTHER (Specify): _____	
5. PROBLEM AREAS			
a. Paragraph Number and Wording:			
b. Recommended Wording:			
c. Reason/Rationale for Recommendation:			
6. REMARKS			
7a. NAME OF SUBMITTER (Last, First, MI) - Optional		b. WORK TELEPHONE NUMBER (Include Area Code) - Optional	
c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional		8. DATE OF SUBMISSION (YYMMDD)	