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SUPERSEDING
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MILITARY SPECIFICATION

TRAILERS, CARGO: 2 WHEEL, 1/4 TON TO 1-1/2 TON

This specification is approved for use within the 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 2 wheeled trailers of various capacities, 1/4 ton to 1-1/2 ton inclusive, for tactical operations. All models are capable of fording operations, and some are also capable of floating for amphibious operations.

1.2 Classification. Trailers shall be classified by model, as follows (see 6.2):

<u>Model</u>	<u>Description</u>
M101A2	- Trailer, Cargo, 3/4 Ton, 2 Wheel.
M105A2	- Trailer, Cargo, 1-1/2 Ton, 2 Wheel.
M332	- Trailer, Ammunition, 1-1/2 Ton, 2 Wheel, with Equipment (W/E).
M416	- Trailer, Cargo, 1/4 Ton, 2 Wheel.
M416A1	- Trailer, Cargo, 1/4 Ton, 2 Wheel.
M416B1	- Trailer, Cargo, 1/4 Ton, 2 Wheel.
M716	- Trailer, Maintenance, Telephone Cable Splicer, 1/4 Ton, 2 Wheel.
M762	- Trailer, Flatbed, 3/4 Ton, 2 Wheel.

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-GDS, Warren, MI 48397-5000, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document, or by letter.

AMSC N/A

FSC 2330

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2. APPLICABLE DOCUMENTS

2.1 Government documents.

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

SPECIFICATIONS
FEDERAL

VV-L-800 - Lubricating Oil, General Purpose, Preservative (Water Displacing, Low Temperature).

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MIL-P-514 - Plates, Identification, Instruction and Marking, Blank.
 MIL-L-3150 - Lubricating Oil, Preservative, Medium.
 MIL-H-5606 - Hydraulic Fluid, Petroleum Base; Aircraft, Missile and Ordnance.
 MIL-G-10924 - Grease, Automotive and Artillery.
 MIL-G-23827 - Grease, Aircraft and Instrument, Gear and Actuator Screw.
 MIL-R-46164 - Rustproofing for Military Vehicles and Trailers.
 MIL-C-46168 - Coating, Aliphatic Polyurethane, Chemical Agent Resistant.
 MIL-B-46176 - Brake Fluid, Silicone, Automotive, All Weather, Operational and Preservative.
 MIL-V-62038 - Vehicles, Wheeled; Preparation for Shipment and Storage of.

STANDARDS

FEDERAL

FED-STD-595 - Colors.

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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-642 - Identification Marking of Combat and Tactical Transport Vehicles.

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MIL-STD-882	- System Safety Program Requirements.
MIL-STD-1179	- Lamps, Reflectors and Associated Signaling Equipment for Military Vehicles.
MIL-STD-45662	- Calibration Systems Requirements.

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

DRAWINGS
ARMY

8358932	- Trailer, Ammunition; 1-1/2 Ton, 2 Wheel, M332, W/E.
8358993	- Trailer, Cargo; 1-1/2 Ton, 2 Wheel, M105A2.
8736302	- Trailer, Cargo; 1/4 Ton, 2 Wheel, M416.
8736623	- Trailer, Cargo; 1/4 Ton, 2 Wheel, M416B1.
8736716	- Trailer, Maintenance; Telephone Cable Splicer, 1/4 Ton, 2 Wheel, M716.
8736755	- Trailer, Flatbed; 3/4 Ton, 2 Wheel, M762.
8736995	- Trailer, Cargo; 1/4 Ton, 2 Wheel, M416A1.
8750053	- Trailer, Cargo; 3/4 Ton, 2 Wheel, M101A2.

(Copies of specifications, standards, drawings and other Government documents required by the contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

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

3. REQUIREMENTS

3.1 First article. Unless otherwise specified, the contractor shall furnish sample trailers for first article inspection and approval (see 4.3 and 6.2). First article samples shall be inspected by the contractor under the surveillance of the Government to determine conformance to quality assurance provisions of this specification. First article samples shall be fully representative of trailers to be supplied from production tooling and facilities. Any change or deviation of production units from first article sample shall be subject to the approval of the Government.

3.1.1 Reliability. Trailers with rated payload, except as specified in table I, shall possess not less than 60 percent (%) probability of completing not less than 6000 miles of operation without failure of components,

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assemblies or subassemblies; i.e., suspension, including springs, axles and wheels; brake systems; landing device; leveling jacks, when specified; lunette; and frame (see 4.3.2.1).

TABLE I. Sequence of 6000 mile test (Government proving ground).

Course	Mileage and speeds
Gravel roads <u>1/</u>	50 miles at varying speeds up to maximum
Belgian block road <u>1/</u>	30 miles at speeds applicable to trailer characteristics
Hard-surfaced roads <u>2/</u>	2320 miles at varying speeds up to maximum
Gravel and dirt roads <u>2/</u>	1500 miles at varying speeds up to maximum
Level cross-country roads <u>2/</u>	1380 miles at varying speeds up to maximum
Hilly cross-country roads <u>2/</u>	600 miles at varying speeds up to maximum
Belgian block roads <u>2/</u>	40 miles at speeds applicable to trailer characteristics
Gravel roads <u>1/</u>	50 miles at varying speeds up to maximum
Belgian block road <u>1/</u>	30 miles at speeds applicable to trailer characteristics

1/ Without payload

2/ With payload

3.1.1.1 Operational profile. Test mileage shall be apportioned as follows:

- | | |
|--------------------------|-----|
| a. Hard-surfaced roads | 40% |
| b. Gravel and dirt roads | 25% |
| c. Level cross-country | 23% |
| d. Hilly cross-country | 10% |
| e. Belgian block | 2% |

3.1.1.2 Failure. A failure is any malfunction of an end item requiring overhaul, replacement, rebuild, salvage or other corrective action as prescribed by the maintenance manual, which cannot be deferred for the remainder of 6000 miles.

3.1.1.3 Corrective action. Corrective action is not deferrable if malfunction causes, or would cause if not corrected:

- Inability to commence operation or cessation of operation.
- Inability to conform to the requirements of the specification.
- Critical or catastrophic hazard as defined in MIL-STD-882.

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3.1.1.4 Malfunction. Any malfunction which the operator or crew can remedy will not be considered a failure provided that repair is authorized, or prescribed, as an operator function, and can be accomplished within 15 minutes using only controls, tools, or spare parts incorporated in, or carried with, the end item, or its prime mover.

3.1.2 Maintainability. Total scheduled maintenance excluding driver/crew checks and services shall be between 4.0 and 6.0 manhours, and total unscheduled maintenance shall be between 0 and 10.0 manhours, during the first 6000 miles of operation in accordance with the operational profile (see 3.1.1.1). This equates to a Maintenance Ratio (MR) of 0.013 to 0.053 at 20 mph, and an MR of 0.02 to 0.08 at 30 mph. Scheduled maintenance intervals shall be 3 months, or 3000 miles of operation, whichever comes first, for first article and initial production tests only (see 4.3.2.2). Maximum time to repair (to include diagnosis, repair and verification) using personnel normally employed at:

- a. Organizational maintenance level shall not exceed 2 manhours 95% of the time.
- b. Direct support maintenance level shall not exceed 4 manhours 95% of the time.

3.2 Materials. Materials shall be as specified herein and in referenced specifications, standards, and drawings (see 4.8.1 and 6.5).

3.2.1 Recycled, virgin and reclaimed materials. There are no requirements for the exclusive use of virgin materials. The use of recycled or reclaimed (recovered) materials is acceptable provided that all other requirements of this specification are met (see 6.5.1).

3.3 Design and construction. Completed vehicles shall conform to this specification and the Army technical data package of the applicable drawing listed under Army drawings in 2.1.2 and table III. The trailer shall be constructed in accordance with drawings and specifications applicable to the specific trailer on contract (see 4.8.1 and 4.8.2).

3.3.1 Qualified products list (QPL). The contractor shall be responsible for using parts and assemblies necessary in vehicle construction that are listed as qualified products on the QPL and those approved for inclusion on the QPL. The contractor's manufacturing inspection records shall specifically list all QPL items by part or drawing number(s), name of supplier(s), and number and date of the QPL. When assemblies and parts are approved as qualified products, but not yet listed on the QPL, the contractor shall list the products by number and date of the approved document with the name of supplier(s) (see 4.1.4 and 4.8.1).

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3.3.2 Electrical.

3.3.2.1 Electrical circuits. Electrical circuits shall maintain continuity from end to end, without evidence of internal or external shorts, during all trailer operating conditions (see 4.8.2).

3.3.2.2 Lights. All lights specified on applicable drawings shall operate throughout all trailer operating conditions, and shall meet the requirements of MIL-STD-1179 (see 4.8.2).

3.3.3 Controls. All electrical, mechanical, and hydraulic controls shall operate without malfunction, throughout all ranges of operation, under all trailer operating conditions (see 4.8.2).

3.3.4 Adjustment mechanisms. All adjustment mechanisms shall function properly, and maintain adjustment settings during all chassis operating conditions (see 4.8.2).

3.3.5 Welding. Welding shall meet the quality requirements specified on the applicable drawing, or QAR (see 4.8.1 and 4.8.2).

3.3.5.1 Welding repairs. Welding repairs of any kind shall be made only when, and to the extent, specifically authorized by the procuring activity (see 4.8.1 and 6.2).

3.3.6 Seals. When the trailer is fording or operating in mud, sand or snow the bearing seals shall prevent entrance of foreign matter into the bearings which are exposed to contamination during these operations. All bearing seals shall restrict the leaking of lubricants from bearings (see 4.8.2).

3.4 Performance. The trailer shall meet performance requirements of 3.4.1 through 3.4.9.1 of this specification when equipped as specified herein, as depicted on the drawings, serviced with standard products in table II, and loaded and coupled to the tactical prime mover specified in table III. The trailer, serviced and equipped for existing climatic conditions, shall operate as specified without special equipment (see 4.8.3).

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TABLE II. Service product specifications.

Product use	Ambient air temperature operating range	
	minus 10 to plus 132 degrees Fahrenheit (°F)	minus 65 to 0°F
Fluid: For hydraulic brakes For shock absorbers	MIL-B-46176 MIL-H-5606	MIL-B-46176 MIL-H-5606
Grease: For sealed bearings For general chassis lubrication, including wheel bearings	MIL-G-23827 MIL-G-10924	MIL-G-23827 MIL-G-10924
Oil: For general purpose lubrication	MIL-L-3150	VV-L-800

TABLE III. Loads and speeds.

Trailer	Preferred primer mover (truck capacity)	Payload, 1/ pounds (lbs), rated	Speed, miles per hour (mph)		
			Highway	Gravel roads	Cross- country
M101A2 (8750053)	1-1/4 Ton	1500	50	35	15
M105A2 (8358993)	2-1/2 Ton	3000	50	35	15
M332 (8358932)	1-1/2 Ton	3000	50	35	15
M416 (8736302)	1/4 Ton	500	50	35	15
M416A1 (8736995)	1/4 Ton	500	50	35	15

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TABLE III. Loads and speeds - Continued.

Trailer	Preferred primer mover (truck capacity)	Payload, <u>1/</u> pounds (lbs), rated	Speed, miles per hour (mph)		
			Highway	Gravel roads	Cross-country
M416B1 (8736623)	1/4 Ton	500	50	35	15
M716 (8736716)	1/4 Ton	500 <u>2/</u>	50	35	15
M762 (8736755)	1/4 & 2-1/2 Ton	1500	50	35	15

1/ Reliability test shall be conducted with mission payload; however, if such payload is not available, loads cited herein shall be applied.

2/ 500 lbs is the payload for the M716; however, splicing equipment chests in excess of 230 lbs total shall not be loaded.

3.4.1 Grade and slope operation. The trailer shall be towed without slipping or upsetting when ascending or descending grades of not more than 40%, and when crossing side slopes of not more than 20% (see 4.8.3.1).

3.4.2 Braking.

3.4.2.1 Service brakes. All trailers except the M416, M416B1, M716 and M762 shall be equipped with service brakes (see 6.2). The combined service brakes of the trailer and towing vehicle shall, under all conditions of loading, bring the combination to a positive stop within a distance of 30 feet from a speed of 20 mph on a dry, smooth and level road, free of any loose material (see 4.8.3.2 and 4.8.2).

3.4.2.2 Automatic brake actuator. The actuator shall automatically apply the trailer service brakes upon breakaway from the towing vehicle. The actuator shall maintain the application of brakes, holding the trailer stationary under all loads specified herein, for not less than 15 minutes (see 4.8.2 and 4.8.3.3).

3.4.2.3 Parking brake. A manually operated parking brake shall hold the trailer with cross-country payload on a dry, hard, smooth-surfaced road on a 30% grade while restrained by the towing vehicle at the pintle, and headed up or down grade (see 4.8.3.4).

3.4.3 Environmental. The trailer shall be capable of being towed under extreme conditions of weather and altitude in ambient air temperatures ranging from minus 50°F to plus 125°F. The complete trailer shall be capable of withstanding storage at minus 80°F without deterioration that causes failure of any component (see 4.8.3.5).

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3.4.4 Road and cross-country operation. The trailer shall be loaded as specified on the data plate and shall be towed at average speeds as specified in table III in accordance with the operational profile of 3.1.1.1 (see 4.8.3.6).

3.4.5 Landing device. Unless otherwise specified (see 6.2), the trailer shall be equipped with a swing-up type landing device. The landing device shall support the trailer under any load specified herein on a 10% grade in any direction, shall lift the lunette to a height required for coupling to the prime mover, and shall withstand strains imposed during coupling or uncoupling, without impairing operation of the trailer or towing vehicle. In the stowed position the device shall be horizontal and clear the ground during cross-country operation (see 4.8.3.7).

3.4.6 Leveling jacks. When specified (see 6.2), the manually operated leveling jacks shall raise and support the fully loaded trailer, and shall adjust to permit placing the jack bases on the ground and leveling the trailer on an off-road site (see 4.8.3.8).

3.4.7 Turning ability. When coupled to the prime mover operating in its minimum turning circle, the trailer shall follow without cramping and without damage to the towed trailer or prime mover, and without interference between the towed trailer and the prime mover (see 4.8.3.9).

3.4.8 Fording. The trailer shall be towed in fresh or salt water up to 60 inches in depth for periods up to 15 minutes, without impairing performance of the trailer or its components. Fording shall be accomplished without use of special kits, and with a minimum of preparation or servicing before and after the fording operation (see 4.8.3.10).

3.4.9 Amphibious operation. Trailers M416, M416A1, M416B1 and M716 shall support the rated payload while being towed by an amphibious prime mover in fresh or salt water of sufficient depth to permit flotation (see 4.8.3.11).

3.4.9.1 Body leakage. The M416, M416A1, M416B1 and M716 cargo body shall evidence no leakage whether filled with, or immersed in, fresh or salt water to a depth of 12 inches above floor level. Valves shall be closed during immersion or filling (see 4.8.3.12).

3.5 Painting. Unless otherwise specified (see 6.2), the exterior and interior of the trailer, component assemblies and parts which require painting shall be cleaned, treated and painted in accordance with MIL-STD-193 as specified for the appropriate service. When required, primer, topcoat, camouflage and noncamouflage paint shall be polyurethane type conforming to MIL-C-46168. Colors selected shall conform to FED-STD-595 (see 4.8.2).

3.6 Marking. Trailer marking shall be in accordance with MIL-STD-642 (see 4.8.2).

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3.6.1 Identification plates. Identification plates shall conform to MIL-P-514. Any special information required by the using service shall be as specified by the procuring activity (see 4.8.2 and 6.2).

3.7 Servicing and adjusting. Prior to acceptance of the trailer by the Government, the contractor shall adjust and service each trailer for immediate operational use, including at least the following: Adjust braking system, check electrical system, inflate all tires, and completely lubricate the trailer and all running gear with grades of lubricants recommended for the ambient temperature at the delivery point (see table II and 4.8.2).

3.8 Workmanship. The workmanship shall be of such quality as to assure that the vehicle and its components are free of defects that compromise, limit or reduce capability in the performance of its intended use (see 4.8.2).

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

4.1.2 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% of the measurement tolerance. Calibration of inspection equipment shall be in accordance with MIL-STD-45662.

4.1.3 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

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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 procedures, or instances of poor practices which might have an adverse effect upon the 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.

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

4.1.5 Quality assurance provisions. In the conduct of inspections, the contractor shall adhere to Quality Assurance Provisions (QAP) and quality assurance requirements (QARS) as applicable and as required by the documents forming part of this specification (see 2.1.2).

4.1.6 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 inspections:

- 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 on additional vehicle(s), randomly selected from the first month's production, or 1 from the first 10 produced which shall be designated as the initial vehicle. Approval of the first article samples shall not relieve the contractor of the obligation to supply vehicle(s) 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.

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

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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 IV. The road test shall be performed in accordance with 4.4.1.

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

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

TABLE IV. Classification of inspections.

Title	Requirements	Inspection	First article		1/ QCI	1/ Control	2/ Comparison
			1/ FPVI	2/ IPT			
Materials and construction	3.2, 3.3, 3.3.1 and 3.3.5	4.8.1	X				X
Defects (see table V)	3.3 thru 3.8	4.8.2	X	X	X		X
Reliability	3.1.1	4.3.2.1		X			X
Maintainability	3.1.2	4.3.2.2		X			X
Grade and slope operation	3.4.1	4.8.3.1	X	X			X
Service brakes	3.4.2.1	4.8.3.2	X	X		X	X
Automatic brake actuator	3.4.2.2	4.8.3.3	X	X	X	X	X
Parking brake	3.4.2.3	4.8.3.4	X	X	X	X	X
Environmental	3.4.3	4.8.3.5		X			X
Road and cross-country	3.4.4	4.8.3.6	X	X			X
Landing device	3.4.5	4.8.3.7	X	X		X	X
Leveling jacks	3.4.6	4.8.3.8	X	X		X	X
Turning ability	3.4.7	4.8.3.9	X	X	X	X	X
Fording	3.4.8	4.8.3.10		X			X
Floating	3.4.9	4.8.3.11		X			X
Body leakage	3.4.9.1	4.8.3.12		X			X

1/ At place of manufacture

2/ At Government proving ground

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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 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 vehicle 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 subsequent production vehicles after Government conditional acceptance of the first production vehicle (applicable vehicle type) without written authorization from the Government.

4.3.2 IPT.

4.3.2.1 Reliability verification. To determine conformance to 3.1.1, reliability shall be verified at a 60% confidence level while vehicles are subjected to the 6000-mile IPT (see 4.3.2.4).

4.3.2.2 Maintainability verification. To determine conformance to 3.1.2, maintainability shall be verified during the 6000-mile IPT (see 4.3.2.4). Maintenance shall be performed by the Government at a Government approved test site.

4.3.2.3 Contractor inspection. The contractor shall examine the IPT vehicle(s) in accordance with 4.4.

4.3.2.4 Government inspection. The Government shall perform the IPT specified in table IV. The vehicles shall be representative of production types. The selected vehicle(s) inspected in accordance with 4.5 shall be subjected to a 6000 mile RAM-D test in accordance with table I at a site(s) selected by the Government. These tests are to be performed by the Government. The contractor shall expeditiously furnish repair parts, as required, to adequately support the tests. In the event the production contract delineates test mileage less than 6000 miles, the mileage mix for the various types of courses in table I shall be proportional to the miles shown in the mileage and speeds column. Quantity of test vehicles and configurations to be tested shall be delineated in the production contract. The vehicles shall be tested with actual or simulated payload. Unless otherwise specified by the Government procuring activity, the contractor shall refurbish vehicles after test completion. See 4.3.2.1 and 4.3.2.2 for RAM-D requirements.

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

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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.

4.4 QCI.

4.4.1 Inspection. A QCI shall be performed in the following sequence, utilizing an approved Final Inspection Record (FIR).

- a. Examination for the defects specified in table IV and classified in table V.
- b. A road test for each vehicle without payload, shall be conducted for a distance of not less than 5 miles by the contractor. The vehicle shall be completely assembled and serviced. It shall be subject to tests specified to be performed at the place of manufacture in table IV. Performance of vehicles shall be demonstrated on smooth, relatively level hard-surfaced roads, and shall meet all requirements specified herein. After completion of the 5-mile road test, the vehicles shall be examined for lubrication leakage and other deficiencies.
- c. An automatic brake actuator test and parking brake test shall be conducted with payload in accordance with 4.8.3.3 and 4.8.3.4.
- d. The polyurethane paint surface shall be tested using an acetone-wetted paper towel. With the wetted towel, the paint shall be rubbed with normal wiping pressure 3 rubs (1 rub constitutes forward and back). If paint pigment color is picked up on the white paper towel, repeat the procedure (3 more rubs) to assure overspray is not being picked up. If paint pigment is still picked up on a towel (after 6 rubs), or if paint can be rolled off with fingernail pressure, the paint is unacceptable. If no pigment was picked up on the towel, the paint is acceptable.
- e. Other QCI tests as specified in table IV.

4.4.1.1 One hundred percent. Each vehicle shall be subjected to the QCI specified in 4.4.1.

4.4.1.2 Acceptable quality level. When authorized by the Government contracting authority, 100% QCI (see 4.4.1.1) shall be waived. Thereafter, samples shall be selected in accordance with 4.4.2.2 and shall be inspected to determine conformance to the following acceptable quality levels (AQL) on the basis of % defective.

<u>Classification</u>	<u>AQL %</u>
Critical	0
Major	1.5
Minor	2.5

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4.4.2 Sampling.

4.4.2.1 Lot formation. An inspection lot shall consist of all the vehicles of one type and part number, produced in one month, from one manufacturer, submitted at one time for acceptance.

4.4.2.2 Sampling for examination. When sampling is authorized for QCI (see 4.4.1.2), samples shall be selected in accordance with general inspection level II of MIL-STD-105. Before sampling may be initiated, the contractor shall examine at least 20 trailers of each model consecutively produced, excluding first article and initial production samples, to establish the process average (see 6.3) for each model. The examination shall establish that the process average % defective, as defined in MIL-STD-105, is not greater than the specified AQL (see 4.4.1.2).

4.4.3 Defects. The following rules shall be applied to the counting of defects (see table V and 6.4).

TABLE V. Classification of defects.

Category	Defect	Method of examination
Critical	None	
<u>Major</u>	<u>AQL 1.5% Defective</u>	
101	Frame - improper components, improperly welded, improperly riveted (see 3.3).	Visual
102	Axles - improperly assembled, improperly installed, improperly welded (see 3.3).	Visual and functional
103	Suspension system - damage, improper assembly and ground clearance (see 3.3).	Visual and functional
104	Wheels and tires - condition and assembly, tire damage (see 3.3.1).	Visual
105	Electrical system, cables, wiring, ground straps - malfunction, improper lighting sequence, improper components, improper operation, inoperative, damage (see 3.3.2).	Visual, functional and SIE <u>1/</u>
106	Controls, electrical, mechanical, hydraulic - malfunction, improper operation, inoperative (see 3.3.3).	Visual and functional
107	Adjustment mechanisms - cannot adjust, defective components, improper function (see 3.3.4).	Visual and functional
108	Service and parking brakes - inoperative, malfunction, component damage, nonconformance (see 3.4.2).	Visual and functional
109	Automatic brake actuator - inoperative, improper operation, component damage (see 3.4.2.2).	Functional

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TABLE V. Classification of defects - Continued.

Category	Defect	Method of examination
110	Safety chains, intervehicular hose, tubing - improper lengths, missing, improper coupling, damage (see 3.4.4).	Visual and SIE
111	Lunette eye - improper casting, improper size (see 3.4.4).	Visual and SIE
112	Landing device - malfunction, improperly installed, incomplete assembly (see 3.4.5).	Visual and functional
113	Leveling mechanism - inoperative, improper operation (see 3.4.6).	Functional
114	Paint - improper paint, improper compounding or curing (see 3.5).	Visual, functional and Acetone Rub Test
115	Faulty workmanship affecting performance (see 3.8).	Visual
<u>Minor</u>	<u>AQL 2.5% Defective</u>	
201	Frame and sheet metal - improper assembly, improper installation (see 3.3).	Visual
202	Suspension system - improper assembly, improper installation (see 3.3).	Visual
203	Wheels and tires - improper size, improper type, improper mounting, improper installation (see 3.3.1).	Visual and SIE
204	Electrical system - improper coding, improper protection, improper assembly, improper installation (see 3.3.2).	Visual
205	Controls, electrical, mechanical, hydraulic - malfunction, improper installation, inoperative, damage (see 3.3.3).	Visual and functional
206	Adjustment mechanisms - defective, improper installation, damage (see 3.3.4).	Visual and functional
207	Seals - improper lubrication, leakage, defective damage (see 3.3.6).	Visual
208	Brake system - improper assembly, improper installation, improper clearance (see 3.4.2).	Visual
209	Lunette eye - improper assembly, improper installation (see 3.4.4).	Visual
210	Tiedowns, lashings, lifts - missing, improper installation, improper welding (see 3.4.4).	Visual
211	Reflectors - missing, improper installation, improper reflection (see 3.4.4).	Visual
212	Landing device - improper assembly, improper installation (see 3.4.5).	Visual
213	Paint - improper color, improper application (see 3.5).	Visual

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TABLE V. Classification of defects - Continued.

Category	Defect	Method of examination
214	Marking, identification - missing, incomplete, improper size, improper installation (see 3.6).	Visual
215	Lube fittings - missing, improper installation, improper operation (see 3.7).	Visual
216	Lubrication - missing, improper grade, improper installation, seals leaking (see 3.7).	Visual
217	Hydraulic fluid - missing, improper grade, improper installation (see 3.7).	Visual
218	Rustproofing - missing, spots not covered (see 3.8).	Visual
219	Workmanship - improper, improper appearance (see 3.8).	Visual

1/ SIE = Standard Inspection Equipment

4.4.3.1 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 5 consecutive lots, or 10 lots or more within a 30-day period, will be added to the minor defects classification with no increase in AQLs (see 6.4).

4.4.3.2 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 by the contractor when found.

4.4.3.3 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.

4.5 Control tests. The Government shall select at random, 1 of each 50 vehicles of each model(s) produced or 1 for each month's production, whichever occurs first. These shall be subjected to control tests in accordance with table IV and the following road test.

4.5.1 Fifty-mile test. Each vehicle selected for control tests by the Government shall be towed for a distance of not less than 50 miles by the prime mover. Vehicles shall be completely assembled and serviced. The control test vehicles will be weighed with on vehicle equipment. Test

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courses or areas shall be selected by the manufacturer and shall be on smooth, approximately level, hard-surfaced roads. Vehicles with full payload shall satisfactorily pass the performance requirements of the control test.

4.6 Comparison tests. The Government may randomly select vehicles at any time during the production contract period and subject these vehicles to the comparison tests specified in table IV as well as a 6000-mile test in accordance with table I. 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.

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, 3.3, 3.3.1, 3.3.5 and 3.3.5.1 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.

4.8.2 Defects. Conformance to 3.3, 3.3.2.1, through 3.3.6, 3.4.2.1 through 3.4.2.3 and 3.5 through 3.8 shall be determined by examination for the defects listed in table V. Examination shall be visual, tactile, or by measurement with standard inspection equipment.

4.8.3 Performance testing. To determine conformance to 3.4, the trailer shall pass the tests of 4.8.3.1 through 4.8.3.12. Prior to these tests, the vehicle shall be equipped, serviced, loaded and coupled to the prime mover as specified herein.

4.8.3.1 Grade and slope operation. To determine conformance to 3.4.1, the trailer shall be towed by the prime mover ascending and descending a 40% grade. Further, the trailer shall be towed across a 20% side slope. Trailer slip or upset shall be considered failure.

4.8.3.2 Service brakes. To determine conformance to 3.4.2.1, the brakes of the towing vehicle and trailer shall be applied simultaneously while the combination is traveling forward at 20 mph. Stopping distance in excess of 30 feet shall constitute failure of this test.

4.8.3.3 Automatic brake actuator. To determine conformance to 3.4.2.2, a fully loaded trailer, coupled to prime mover, shall be parked on a 15% grade. With prime mover brakes applied, disconnect air lines to trailer, allowing actuator to engage trailer brakes. For inertia brake systems,

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engage trailer brakes by pulling brake-away chain. The prime mover is to be moved to provide clearance between pintle and lunette so that trailer movement is possible. Reset prime mover brakes; trailer must remain stationary for 15 minutes. Any movement prior to 15 minutes shall constitute test failure. Perform this test both uphill and downhill. NOTE: Trailer shall not be disconnected from prime mover during this test.

4.8.3.4 Parking brake. To determine conformance to 3.4.2.3, the trailer with cross country payload, on a dry, hard, smooth surface, shall be parked headed up or down a 30% grade, remain coupled to the prime mover and the parking brake set. The prime mover shall be moved to provide clearance between the pintle and lunette so that trailer movement is possible. The trailer shall remain stationary. Any rolling movement shall constitute failure of this test.

4.8.3.5 Environmental. Conformance to 3.4.3 shall be determined by evaluation of the contractor's certification with supporting data that the trailer is capable of withstanding and being towed in the specified environments.

4.8.3.6 Road and cross country operation. To determine conformance to 3.4.4, the trailer shall be connected to a prime mover, loaded as specified and towed during road testing (see 4.4.1, 4.5.1 or 4.6) over terrain at speeds specified in table III. During and after road testing, trailers shall be inspected as specified and as applicable in 4.8.2 and table IV.

4.8.3.7 Landing device. To determine conformance to 3.4.5, the fully loaded trailer shall be towed to a position on a 10% grade and the landing device secured in a position to support the uncoupled trailer. The prime mover shall be uncoupled and removed. The landing device shall be operated to lower and raise the lunette to proper coupling height. The prime mover shall then be returned and recoupled to the trailer. Any movement of the trailer, except sinking in soft terrain, during uncoupling, free standing, or recoupling, or any impairment of operation of the landing device shall constitute failure of this test. The landing device shall be examined after cross country operation for evidence of interference with the ground. Interference with the ground shall constitute failure of this test.

4.8.3.8 Leveling jacks. To determine conformance to 3.4.6, the loaded trailer shall be parked on an off-road site and the leveling mechanism activated. Inability to support the trailer, or to level the trailer floor, shall constitute failure of this test.

4.8.3.9 Turning ability. To determine conformance to 3.4.7, the prime mover shall be coupled to the trailer, and the combination shall be driven in the prime mover's minimum turning circle, to the right and left, without interference between the prime mover and towed trailer.

4.8.3.10 Fording. To determine conformance to 3.4.8, the trailer chassis shall be immersed in fresh or salt water for not less than 15 minutes. The trailer shall then be examined in accordance with 4.8.2.

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4.8.3.11 Floating. To determine conformance to 3.4.9, the properly loaded amphibious trailer shall be towed by an amphibious prime mover into fresh or salt water of sufficient depth to permit the combination to float as in intended use. The trailer shall be observed while underway, and without headway, for correct floating level. The trailer shall then be removed from the water and examined in accordance with 4.8.2.

4.8.3.12 Body leakage. To determine conformance to 3.4.9.1, the trailer shall be submerged to a uniform depth of 12 inches above the body floor in fresh or salt water. The trailer shall then be examined for leaks at or above the floor. Any leak shall constitute failure of this test. The trailer shall then be examined in accordance with 4.8.2 after removal of water. As an alternative test method, the trailer out of water shall be filled with water to depth of 12 inches above the cargo floor and examined externally for leaks.

5. PREPARATION FOR DELIVERY

5.1 Preservation, packaging, packing, and marking. Preservation, packaging, packing, and marking for the desired level shall be in accordance with the applicable packaging requirements and MIL-V-62038, as specified by the contracting authority (see 6.2).

6. NOTES

6.1 Intended use. Trailers covered by this specification are intended for use by military services to transport personnel, supplies and equipment, or as mounts for special equipment, during tactical military operations under extreme conditions of weather and terrain.

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Model, type, other identifying data of the trailer and applicable engineering drawings or military standards (see 1.2 and 2.1).
- c. Army part number of the required trailer (see 2.1.2).
- d. If first article samples are not required (see 3.1).
- e. If welding repairs are authorized, and extent allowed (see 3.3.5.1).
- f. If service brakes shall be provided (see 3.4.2.1).
- g. Type of landing device to be provided, if any (see 3.4.5).
- h. Type of leveling jacks to be provided, if any (see 3.4.6).
- i. Special painting requirements other than as specified (see 3.5).
- j. Any special identification information or marking required by the user (see 3.6.1).
- k. If responsibility for inspection shall be other than as specified (see 4.1).
- l. If responsibility for inspection equipment shall be other than as specified (see 4.1.2).
- m. Selection of applicable level of preservation (see 5.1).

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6.3 Process average. To determine conformance to 4.4.2.2, sampling may be initiated if the process average value for the first 20 vehicles inspected is less than the AQL specified in the classification of defects for major and minor defects.

$$\text{Process average} = \frac{\text{Number of defects}}{\text{Number of vehicles inspected}} \times 100$$

If the computed process average exceeds the specified AQL, 100% inspection shall be performed and continued until such time that the process average for 20 consecutive vehicles is less than the specified AQL.

6.4 Deficiency sheet. The Government inspector 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. The Government inspector shall assure that all defects encountered during inspection are enumerated on the deficiency sheet for the vehicle. 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 V) and definitions contained in MIL-STD-105. Corrective action shall be taken for recurring defects (see 4.4.3).

6.5 Definitions.

6.5.1 Recovered materials. Recovered materials' means materials that have been collected or recovered from solid waste (see 6.5.2).

6.5.2 Solid waste. "Solid waste" means (a) any garbage, refuse, or sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility; and (b) other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities. It does not include solid or dissolved material in domestic sewage, or solid or dissolved material in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Clean Water Act, (33 U.S.C. 1342 et seq.), or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) (Source: Federal Acquisition Regulations, section 23.402).

6.6 Subject term (key word) listing.

Cargo trailers: 2 wheel.

Two wheel cargo trailers.

Two wheel trailers, cargo: 1/4 ton to 1-1/2 ton.

6.7 Changes from previous issue. Asterisks (or vertical lines) are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

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Custodian:

Army - AT
Air Force - 99
Navy - YD

Preparing activity:

Army - AT

(Project 2330-0937)

User activity:

Army - ME

Review activity:

Navy - MC

