----
* NOT MEASUREMENT *
*   SENSITIVE   *

OO-R-2780
June 5, 1992

SUPERSEDING
MIL-R-22870D
18 January 1984

FEDERAL SPECIFICATION

ROLLERS, MOTORIZED, PNEUMATIC-TIRED

This specification is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE

1.1 Scope. This specification covers a self-propelled, pneumatic-tired roller to be used for compacting fine and coarse grained soils and asphaltic concrete.

1.2 Classification. Pneumatic-tired rollers shall be one of the following types and classes, as specified (see 6.2):

Type I - 7 wheel; 3 front, 4 rear
Type II - 9 wheel; 5 front, 4 rear, or 4 front, 5 rear
Type III - 11 wheel; 5 front, 6 rear

Class 1 - Diesel-engine-driven
Class 2 - Gasoline-engine-driven

2. APPLICABLE DOCUMENTS

2.1 Government documents.

Beneficial comments (recommendations, additions, deletions) and any pertinent
*data which may be of use in improving this document should be addressed to: *
*Commanding Officer (Code 156), Naval Construction Battalion Center, Port *
*Hueneme, CA 93043-5000, by using the Standardization Document Improvement *
*Proposal (DD Form 1426) appearing at the end of this document or by letter. *

FSC 3895

2.1.1 Specifications and standards. Unless otherwise specified the following specifications and standards 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.

Federal Specifications

W-B-131 - Battery, Storage, (Vehicular, Ignition, Lighting and Starting)
VV-L-800 - Lubricating Oil, General Purpose, Preservative, (Water-Displacing, Low Temperature)
ZZ-I-550 - Inner Tube, Pneumatic Tire

Federal Standards

FED-STD-123 - Marking for Shipment (Civil Agencies)
FED-STD-595 - Colors Used in Government Procurement

Military Specifications

MIL-V-173 - Varnish, Moisture and Fungus Resistant (for Treatment of Communications, Electronics and Associated Equipment)
MIL-T-704 - Treatment and Painting of Materiel
MIL-R-3075 - Rollers, Motorized, Road, Diesel-or Gasoline-Engine-Driven, Packaging of

Military Standards

MIL-STD-129 - Marking for Shipment and Storage
MIL-STD-209 - Slinging and Tiedown Provisions for Lifting and Tying Down Military Equipment

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

DEPARTMENT OF LABOR (DoL)
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

Occupational Safety and Health Standards.

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

2.3 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.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

A283 - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates of Structural Quality
D1557 - Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb Rammer and 18-Inch Drop

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

SOCIETY OF AUTOMOTIVE ENGINEERS, INC. (SAE)

SAE Handbook

J1472 - Braking Performance - Roller Compactors, Standard
J534 - Lubrication Fittings, Standard
J551 - Performance Levels and Methods of Measurement of Electromagnetic Radiation from Vehicles and Devices (30 to 1000 MHz), Standard
J598 - Sealed Lighting Units for Construction, Industrial and Forest Machinery, Recommended Practice

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

2.4 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 Description. The roller shall consist essentially of a steel body and frame or connecting bodies with pivoting frames, pneumatic-tired wheels, engine, and power train. Rolling width shall be defined as the overall linear width covered by all of the roller's wheels on a single pass. Ground contact pressure (gcp) shall be defined as the amount of force in pounds applied to each square inch of ground surface in contact with tires at specified inflation pressure. Empty weight shall be defined as the basic weight of a complete roller, ready to operate, exclusive of ballast. Gross weight shall consist of empty weight plus ballast weight. Rollers shall meet the minimum requirements specified in table I.

TABLE I. Dimensions.

Type	Weight, lb, minimum Empty	Gross	Per Wheel	Not Less Than +/-5%	GCP Tire Inflation Pressure	Min dim. (inches) Rolling Width	Tire Overlap +/-5%	Tire Size	No. of Tire Ply
I	21,000	70,000	10,000	95	100	84	1	13.00 X 24	18
II	6,700	25,200	2,800	75	90	68	1/2	7.50 X 15	12
III	6,800	26,400	2,400	75	90	83	1/2	7.50 X 15	12

* 3.2 Standard commercial product. The roller shall, as a minimum, be in accordance with the requirements of this specification and shall be the manufacturer's standard commercial product. Additional or better features which are not specifically prohibited by this specification but which are a part of the manufacturer's standard commercial product, shall be included in the roller being furnished. A standard commercial product is a product which has been sold or is being currently offered for sale on the commercial market through advertisements or manufacturer's catalogs or brochures, and represents the latest production model. Contractors are required to submit a list of commercial (i.e., non-government) sales for the previous year and current specification data for review at the time their offer is made. The apparent low offeror would furthermore be required to submit a complete set of commercial operator/maintenance/parts and service manuals for review prior to contract award in order to ascertain compliance with specifications.

3.3 First article. When specified (see 6.2), the contractor shall furnish a roller of the type and class as required for first article inspection and approval (see 4.2.1 and 6.4).

3.4 Materials. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products are allowed under this specification unless otherwise specified.

3.5 Interchangeability. All units of the same classification furnished with similar options under a specific contract shall be identical to the extent necessary to insure interchangeability of component parts, assemblies, accessories and spare parts.

3.6 Safety. All rotating or reciprocating parts, and all parts subject to high operating temperatures, that are of such a nature or are so located as to be or become a hazard to operating and maintenance personnel, shall be adequately guarded or insulated to the extent necessary to eliminate the hazard.

All platforms, steps, and catwalks shall have antiskid surfaces. Ladders, steps, and handholds shall be provided for easy access to the control station and other work areas. The rollers shall comply with OSHA regulations applicable on the date of manufacture.

* 3.7 Performance. The roller shall be capable of compacting fine and coarse grained soils to a density equal to or greater than 90 percent Modified Proctor as determined in accordance with ASTM D1557. Compactive forces shall be controllable by varying ballast weight and tire inflation pressures. Inflation pressures shall be variable up to not less than 100 pounds force per square inch (psi) for types I and II. With the tires inflated and the roller ballasted to the minimum gross weight specified herein, the overlap and gcp shall be not less than as specified in table I. Maximum speed in high gear, fully ballasted and on a firm level surface, shall be not less than 12 miles per hour (mph) for type I, 14 mph for type II, and 15 mph for type III. Maximum speed in low gear shall be not more than 5 mph or one half of the top speed. The roller shall be capable of negotiating a 15 percent slope. Outside turning radius shall not be greater than 412 inches for type I, 336 inches for type II, and 270 inches for type III.

3.8 Maintainability. The roller shall be designed to permit ready accessibility to all parts for maintenance and repair in the field by utilizing conventional general-purpose tools associated with items of this nature. The replacement and adjustment of all parts shall be accomplished with minimum disturbance to other components.

* 3.9 Body and frame. The body and frame shall be of one piece continuous construction for rollers of all types, except type II may be of a twin-box type with hinged pivoting frame. The body for the roller shall be fabricated of steel plate of the manufacturer’s standard thickness for the type roller furnished. The quality of the steel plates used for the fabrication of body shall equal or exceed ASTM A283, grade B. Each body shall be internally reinforced with heavy structural members, attached to the body by continuous full length welds in accordance with a nationally recognized welding code, to form a rigid ballast box. Seams shall have uniform continuous welds in order to contain a full ballast load of gravel, sand, earth, or combination thereof, together with water or metal weights. Ballast box shall be watertight. Welds for the internal baffles may be placed in the "skip" fashion. The body shall withstand full load operational stresses without failure or permanent deformation. Ballast tank shall be provided with accessible fill and cleanout openings. Cleanout openings of not less than 9 by 13 inches shall be provided on the side or underside of the ballast body to facilitate complete removal of ballast and for washdown. Cleanout openings shall be equipped with watertight covers. When cleanout openings are located on the side of the ballast body, 2-inch American Standard taper pipe thread pipe plugs shall be provided for drainage. Fill opening(s) with non-skid or expanded metal cover(s) shall be provided on top of the tank. Machinery space, adjacent to and level with or below the control station, shall be completely covered with removable antiskid floor plate where personnel must stand or walk to perform recommended maintenance or operational functions. A ground clearance of not less than 9 inches shall be maintained on all rollers when ballasted.

* 3.10 Power train. Engine power shall be transmitted to the drive wheels by a hydrostatic transmission or via a torque converter coupled to not less than a 3-speed transmission with power-shift forward and reverse and a propeller shaft, or a bevel gear differential and roller chain. A torque converter oil cooler shall be furnished, if necessary, to maintain the oil entering the converter at a temperature not exceeding 240 degrees Fahrenheit (oF). Chain drives shall be provided with means to maintain chain tension in proper adjustment. Chain drives shall be enclosed in dust- and moisture-proof enclosures. When applicable, chain enclosures shall be furnished with access covers to facilities adjusting and lubricating the chains. Roller shall be provided with an automatic locking device to lock the compensating action of the differential. Driving wheels shall be equipped with steel wheel hubs.

* 3.11 Suspension system. To obtain maximum compactive force, the type I roller shall be furnished with either a suspension system equipped with tilted axle oscillation on either the front wheels or rear wheels or individual hydraulic cylinders tied together. Either individual wheel axles or two wheel axles shall be furnished. Types II and III shall be equipped with oscillating wheels or axles. Pivoting frame type II rollers shall be furnished with individual oscillating rear wheel axles. Dustproof grease retainers shall be provided on each wheel.

3.12 Steering system. Hydraulic power assist or standard power steering for heavy-duty vehicles shall be installed on all rollers. A horn button, mounted on the steering wheel or steering post, shall be provided for all rollers.

* 3.13 Control station. The control station shall be furnished with an operator’s seat(s) with backrest(s). The seat(s) shall be covered with a durable, waterproof covering. Seat(s) shall be located on the station platform in a position that shall provide the operator, while seated in a normal operating position, with an unobstructed view fore and aft, and to either side of the roller. All controls and instruments necessary to operate the roller shall be located at the control station. When seated in a normal operating position, the controls shall be within easy reach of the operator, and instruments shall be readily visible. All controls and instruments shall be clearly identified for their intended operation and function with permanently affixed identification plates.

3.14 Brakes. Service brakes and parking shall be independently located and actuated. Service brakes shall be air or hydraulically actuated. Type I rollers shall be provided with air or air over hydraulic brakes. Rollers equipped with air brakes shall be provided with an air pressure indicator and warning device located at the control station. Service brakes shall meet the performance requirements specified in SAE J1472. When tested as specified in 4.4.4, there shall be no evidence of fading. Parking brakes shall be capable of holding, but not necessarily stopping the ballasted roller on a 15 percent grade, with the engine running, for a period of 30 minutes without the assistance of service brakes, transmission locked, wheel chocked, or any other means.

* 3.15 Tires, wheels, and rims. Tires shall be of the smooth tread type equivalent to those recognized in the trade as first-line, first-grade, rayon or nylon cord, and shall be of the tube or tubeless type, compounded from natural

or synthetic rubber, with antioxidant and wear-resistant composition, capable of withstanding high temperature resistant to bituminous materials, deterioration, aging, and cracking. Size of tire and number of ply shall be as specified in table I. When specified (see 6.2), tires with higher number of ply shall be furnished for extra heavy-duty operations. The tires and all component parts thereof shall be designed to give satisfactory service when installed on roller and operated under all conditions of rolling and compacting operations. Tires shall have individual rated load-carrying capabilities based on maximum individual tire loading and related inflation pressure required to obtain maximum compactive force specified herein. Tubes, if supplied, shall conform to ZZ-I-550. Wheels and rims shall be heavy-duty, wide base type designed for compaction service and shall exceed the maximum rated loading for individual wheels.

* 3.16 Tire pressure control system. When specified in 6.2, types I and II rollers shall be equipped with a tire pressure control system consisting of an air compressor of at least 7 cubic feet per minute capacity, reservoir with drain, controls, pressure gages, relief valve, and air lines to all tires. A pressure regulating valve shall be provided in the lines to all tires. The system shall be capable of maintaining or changing the inflation pressure of the tires to any selected pressure from the maximum to a minimum inflation pressure of 35 psi while in operation. Means shall be provided to prevent the inflation control system from deflating the tires below 30 psi under normal condition for a period of 100 hours with engine inoperative.

3.17 Tire wetting system. A gravity feed or air pressurized water supply tank, with a capacity of not less than 70 gallons, shall be provided on all rollers for wetting tire surfaces. All piping, controls, and other components necessary to provide an adequate supply of water shall be furnished. Rollers shall be equipped with cocoa mats or tire scrapers to keep tires clean. Means shall be provided to permit raising the scrapers or mats from the tire surface when not in use.

* 3.18 Engine. Unless otherwise specified (see 6.2), the engine furnished shall be of the diesel type having horsepower, torque, and speed characteristics to meet satisfactorily all the roller performance requirements specified herein. The engine shall be capable of meeting the performance requirements using diesel fuel conforming to VV-L-800. The diesel engine shall start within 5 minutes and be ready for full load operation within 15 minutes in any ambient temperature from +125oF to -20oF. When specified (see 6.2), glow plugs or fluid priming system shall be provided. When a fluid priming system is furnished, it shall be of the measured shot type with storage capacity of at least 12 fluid ounces. The engine shall be furnished complete with at least the following accessories:

a. An instrument panel complete with a lubricating oil pressure gage, a fuel gage, a cooling liquid-temperature indicator, a battery charge and discharge rate indicator, and an hour meter.
b. A fuel tank with sufficient capacity for 8 hours normal operation.
c. A 12-volt (V) or 24V electric cranking system.
d. Battery(s). Batteries furnished shall be dry charged in accordance with W-B-131, without electrolyte, with sealed caps to prevent the intrusion of atmosphere moisture or the manufacturer’s standard battery as specified (see 6.2).

e. A charging alternator with a capacity rating compatible to the system.
f. A cooling-liquid high temperature safety device of the warning type.
g. A lubricating oil safety device.
h. An engine housing so designed as to facilitate the maintenance of engine.
i. A transmission temperature gage.

3.19 Electromagnetic-radiation. When specified (see 6.2), the electromagnetic radiation from the roller shall be suppressed to conform to the recommended limits of SAE J551.

3.20 Lighting system. A complete 12- or 24V lighting system as specified (see 6.2), shall be provided. The lighting system shall include at least two forward and two rearward directed sealed beam or composite lights and two red lights at each end. Independent controls shall be provided for forward directed lights, rearward directed lights, front-mounted red lights, and rear-mounted red lights. Each control shall be clearly identified. Sealed beam floodlights shall conform to SAE J598 and shall be provided with lamp housings. Sealed beam lights or composites shall be used to floodlight the work area and to permit safe travel at night. Panel lamps shall be provided on the instrument panel for night illumination of all instruments. The circuit for panel lamps shall be connected for actuation by the controls for sealed beam or composite lights.

3.21 Fungus-resistance. When specified (see 6.2), electrical components and circuit elements, including terminal and circuit connections, shall be coated with varnish conforming to MIL-V-173, except that:

a. Components and elements inherently inert to fungi or in hermetically sealed enclosures need not be coated.
b. Current-carrying contact surfaces, such as relay contact points, shall not be coated.

3.22 Lubrication. Means for lubrication shall be in accordance with the manufacturer's standard practice. The lubricating points shall be easily visible and accessible. Hydraulic lubrication fittings shall be in accordance with SAE J534. Where use of high pressure lubricating equipment, 1,000 psi or higher, will damage grease seals or other parts, a suitable warning shall be affixed to the equipment in a conspicuous location.

3.23 Lifting and tie down attachments. When specified (see 6.2), roller shall be equipped with lifting and tying down attachments. Lifting and tiedown attachments shall conform to type II or type III of MIL-STD-209. A nonferrous transportation plate shall be provided and mechanically attached to the roller. Transportation plates shall be inscribed with a diagram showing the lifting attachments and lifting slings, the capacity of each attachment, and the required length and size of each sling cable. A silhouette of the item furnished showing the center of gravity shall be provided on the transportation plate. Tying down attachments may be identified by stenciling or other suitable marking. Tiedown marking shall clearly indicate that the attachments are intended for the tie down of the roller on the carrier when shipped.

3.24 Treatment and painting. Unless otherwise specified (see 6.2), the roller shall be treated and painted in accordance with the manufacturer's standard practice. The color shall be the manufacturer's shade closest to 13538 of FED-STD 595. All surfaces of the roller other than corrosion-resisting steel shall be protected against corrosion and present a neat appearance.

3.25 Identification plate. Unless otherwise specified (see 6.2), identification plate shall be furnished by the contracting officer. The contractor shall stamp all necessary data in the blank spaces of the plate provided for that purpose, and securely affix a plate to each roller in a conspicuous place with brass screws or bolts not less than 1/8 inch in diameter. The applicable nomenclature contained in the contract item description shall be placed in the top blank.

3.26 Instruction plates. The roller shall be equipped with instruction plates suitably located, describing any special or important procedures to be followed in operating and servicing the equipment. Plates shall be of a material which will last and remain legible for the life of the equipment, and shall be securely affixed.

3.27 Toolboxes. When specified (see 6.2) toolbox(es) shall be provided to carry those tools and accessories required to operate the roller. Toolbox(es) shall be constructed of steel; shall have a hinged lid, and a locking hasp of a type that will keep the lid closed when toolbox(es) is subjected to vibration. The toolbox(es) shall be securely fastened to the roller in a protected, but easily accessible location.

3.28 Workmanship.

3.28.1 Steel fabrication. The steel used in fabrication shall be free from kinks, sharp bends, and other conditions which would be deleterious to the finished product. Manufacturing processes shall not reduce the strength of the steel to a value less than intended by the design. Manufacturing processes shall be done neatly and accurately. All bends shall be made by controlled means to insure uniformity of size and shape.

3.28.2 Bolted connections. Bolt holes shall be accurately punched or drilled and shall have the burrs removed. Washers or lockwashers shall be provided in accordance with good commercial practice, and all bolts, nuts, and screws shall be tight.

3.28.3 Riveted connections. Rivet holes shall be accurately punched or drilled and shall have the burrs removed. Rivets shall be driven with pressure tools and shall completely fill the holes. Rivet heads, when not countersunk or flattened, shall be of approved shape and of uniform size for the same diameter of rivet. Rivet heads shall be full, neatly made, concentric with the rivet holes, and in full contact with the surface of the member.

3.28.4 Welding. Welding procedures shall be in accordance with a nationally recognized welding code. The surface of parts to be welded shall be free from rust, scale, paint, grease, or other foreign matter. Welds shall be of sufficient size and shape to develop the full strength of the parts connected by

the welds. Welds shall transmit stress without permanent deformation or failure when the parts connected by the weld are subjected to proof and service loadings.

3.28.5 Castings. All castings shall be sound and free from patching, misplaced coring, warping, or any other defect which reduces the casting's ability to perform its intended function.

4. QUALITY ASSURANCE PROVISIONS

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

4.1.1 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.2.1).
b. Quality conformance inspection (see 4.2.2).

4.2.1 First article inspection. The first article inspection shall be performed on one roller of the type and class specified when a first article is required (see 3.3 and 6.2). This inspection shall include the examination of 4.3, the tests of 4.4.1 through 4.4.7, and when specified, the preproduction pack inspection of 4.5 (see 4.5 and 6.2). The first article may be either a first production item or a standard production item from the supplier's current inventory provided the item meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract.

4.2.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.3, the tests of 4.4.8, and the packaging inspection of 4.5.

4.3 Examination. Each roller shall be examined for compliance with the requirements specified in section 3 of this document. Any redesign or modification of the contractor's standard product to comply with specified requirements, or any necessary redesign or modification following failure to meet specified requirements shall receive particular attention for adequacy and suitability. This element of inspection shall encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

4.4 Tests. The first article roller shall be tested as specified in 4.4.1 through 4.4.7. Each production roller shall be subjected to the operational test of 4.4.8 to verify satisfactory performance and compliance with the requirements of this specification. Failure to pass one or more tests shall be cause for rejection.

4.4.1 Ground pressure test. Roller shall be completely assembled, properly adjusted, and otherwise serviced for operation. The roller shall be weighed empty, then ballasted, and weighed again to determine conformance to the minimum weight requirements specified in table I. On a smooth, level pavement and without engine running, the fully ballasted roller shall be lifted above ground level. The lower portion of the tire surface shall be painted with a heavy liquid bituminous mixture. A piece of heavy-duty hard cardboard shall be placed directly under the tires. The cardboard shall cover the full rolling width and extend beyond both ends of roller assembly. The roller shall then be slowly and levelly lowered in such a manner that the tires shall not rotate or slip and the full weight of the roller is supported by the tires. The roller shall then be lifted in such a manner that the tires will not roll or slip and the cardboard shall be removed. The total contact area of the tires shall be measured and converted to square inches; the ground pressure shall then be calculated to conform to table I using the following formula:

$$\frac{\text{Gross weight in pounds}}{\text{Total contact area (square inches)}} = \text{gcp}$$

This test shall be performed at the tire inflation pressure shown in table I for the applicable size of roller.

4.4.2 Soil compaction. The same test area may be used repeatedly provided it is prepared as specified herein before each test. Each compaction test shall be performed on an area of ground 10 feet by 150 feet. The test area shall be cleared of all vegetation, disked or plowed, smoothed and compacted. Rolling width and tire overlap shall be measured each time the tire inflation pressure changes to verify compliance to the requirements of table I.

4.4.2.1 Type I roller. A 6-inch lift of soil at optimum moisture shall be spread over the test area. The type I roller, fully ballasted and tires inflated to 70 psi, shall make two passes. One pass going forward and one reverse. Tires shall be inflated to 100 psi and the test repeated. After six passes, with tires at 100 psi, the compacted soil shall be tested for density to determine conformance to 3.7.

4.4.2.2 Type II and III rollers. A lift of soil, 4 inches thick, at optimum moisture shall be uniformly spread over the test area. The type II or III roller, as applicable, shall make two passes; one going forward and one reverse. Roller shall make six passes with tires inflated to 90 psi. The compacted soil shall be tested for density to ascertain compliance with 3.7.

4.4.3 Road test. The fully ballasted roller shall be driven over a smooth, hard surfaced road for a period of 25 hours. During this period the:

a. Roller shall be operated for not less than 6 hours in each transmission speed range at manufacturer's recommended engine speed. Roller shall be driven in each reverse gear during this period for a total time span of 9 hours. Throughout the test the roller shall be observed to determine conformance to the requirements of 3.7 for speed, and 3.10 for ease of power-shifting and torque converter oil temperature.
b. Roller shall be driven up and down a grade having a slope of not less than 15 percent to prove adherence to 3.7.
c. Turning radius shall be measured to verify compliance to 3.7.
d. Ground clearance shall be measured to determine conformance to 6.2.
e. When specified, the tire pressure control system shall inflate and deflate the tires six times from minimum to maximum psi. At the completion of this test, roller shall not be operated for 100 hours to prove its ability to maintain a tire inflation pressure of not less than 30 psi as specified in 3.15.
f. The tire wetting system shall be operated for not less than 2 hours to confirm compliance to the requirements of 3.17.

4.4.4 Brake test. The roller shall be completely stopped five times as specified in 3.14, within a period of 10 minutes, to test brake fadeout. The distance from point of brake application to actual stop shall be measured on the fifth pass to determine conformance to 3.14. The service brake test shall be conducted in both forward and reverse. With the roller stopped on a 15 percent slope, the parking brakes shall be applied and shall be capable of securing the roller in the position without creeping. The parking brake test shall be conducted with the roller heading up and down slope.

4.4.5 Field test. Type I roller shall be operated for not less than 100 hours; type II and III rollers for not less than 25 hours. Roller shall be operated in a field which has been plowed to a depth of not less than 4 inches. Not more than two passes may be made over the same tract. Roller operation shall include, but not necessarily be limited to the following:

a. At the start of each day of operation, while the brake shoes and drums are cold, the roller shall be in reverse gear and at maximum speed. The brakes shall be applied in a panic stop. The roller shall then be driven at maximum forward speed and the brakes shall be applied in a panic stop. Failure to satisfactorily stop shall be cause for rejection.
b. Twenty-five percent of each day of operation shall consist of figure-eight turns at the minimum turning radius and at the maximum safe operating speed over uncompacted soil. The figure-eight shall overlap but shall be concentric.

Roller shall be observed to determine conformance to:

(1) The accessibility and maintainability requirements of 3.8 and 3.22.
(2) The requirements of 3.9 concerning the structural integrity of the ballast box as noted by any evidence of damage or deformation and water tightness.
(3) The automatic differential locking device requirement of 3.10.

(4) The suspension system requirements of 3.11.
(5) The steering system requirements of 3.12.

4.4.6 Electromagnetic radiation-test. When electromagnetic radiation suppression is required, the roller shall be tested to determine conformance to 3.19. In lieu of test to determine conformance to SAE J551, the manufacturer may furnish a certification that the roller meets the requirements, together with a list of the suppression devices installed. The list shall be sufficiently detailed to allow visual determination that the devices are installed.

4.4.7 Lifting and tying down attachment tests. When required, the lifting and tying down attachments shall be tested to determine conformance to 3.23.

4.4.8 Operational test. Each roller shall be completely assembled, properly adjusted, and otherwise serviced for operation. Each roller shall be operated, without ballast, for not less than 1 hour. Roller shall be driven not less than 5 miles. All controls shall be operated as many times as necessary, but not less than 30 times, to determine ease of operation, effectiveness, and responsiveness, and that the mechanisms actuated by the controls operate promptly, fully, and without restriction, malfunction, or excessive vibration. Gearcases, bearings, and other moving parts shall be tactually examined for excessive heating or abnormal operation insofar as is practicable and possible. Entire roller shall be examined for evidence of failure, slippage, or deformation. Failure to pass any phase of this test shall be cause for rejection.

4.5 Packaging inspection. The inspection of the preservation, packing, and marking shall be in accordance with the requirements of section 4 of MIL-R-3075. The inspection shall consist of the quality conformance inspection; and, when specified (see 6.2), a preproduction pack shall be furnished for examination and test within the time frame required (see 6.2).

5. PREPARATION FOR DELIVERY

5.1 Preservation/packaging and packing. Preservation/packaging and packing shall be in accordance with the requirements of MIL-R-3075 with the level of preservation/packaging and the level of packing as specified (see 6.2).

5.2 Marking.

5.2.1 Military agencies. Shipments to military agencies shall be marked in accordance with MIL-STD-129.

5.2.2 Civil agencies. Shipments to civil agencies shall be marked in accordance with FED-STD-123.

6. NOTES

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

6.1 Intended use. Use to replace MIL-R-22870D.

* 6.2 Ordering data. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. Type and class of roller (see 1.2).
c. When a first article roller is to be furnished for inspection and approval (see 3.3, 4.2.1, and 6.4).
d. When tires of specific size or higher number of ply are required (see 3.15).
e. When a tire pressure control system is required (see 3.16).
f. When other than diesel engine is required (see 3.18).
g. Whether 12- or 24V electric cranking system for engine is required (see 3.18).
h. When glow plugs or fluid priming system is required.
i. When a standard battery or a dry pack battery is required (see 3.18).
j. When electromagnetic radiation is to be suppressed (see 3.19).
k. Whether 12- or 24V lighting system is required (see 3.20).
l. When fungus proofing is required (see 3.21).
m. When lifting and tying down attachments are required (see 3.23).
n. When roller must be cleaned, treated, and painted in accordance with MIL-T-704 (see 3.24).
o. Color of paint (see 3.24).
p. When identification plates are not to be furnished by the contracting officer (see 3.25).
q. When toolboxes are to be furnished (see 3.27).
r. When a preproduction pack inspection is required and time frame required for submission (see 4.2.1 and 4.5).
s. Level of preservation and level of packing required (see 5.1).

6.3 Contract data requirements. When this specification is used in an acquisition which incorporates a DD Form 1423, Contract Data Requirements List (CDRL) and invokes the provisions of paragraph 7-104.9(n) of the Defense Acquisition Regulations (DAR), the data requirements will be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved CDRL (DD Form 1423) incorporated into the contract. When the provisions of DAR 7-104.9(n) are not invoked, the data shall be delivered in accordance with the contract requirements.

6.4 First article. When a first article inspection is required, the item will be tested and should be a first production item, or it may be a standard production item from the contractor's current inventory as specified in 4.2.1. The first article should consist of one unit. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

Custodians:

Army - ME
Navy - YD

Preparing Activity:

Navy - YD

(Project No. 3895-0312)

Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other documents referenced herein.