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FEDERAL SPECIFICATION

SCRAPER-TRACTORS: EARTH MOVING, HYDRAULIC OPERATED, 12 AND 20 CUBIC YARD MINIMUM HEAPED CAPACITY, DED

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers self-propelled, diesel-engine-driven, hydraulic operated, 12 and 20 cubic yard (cu yd) heaped capacity, earth moving, scraper-tractors.

1.2 Classification.

1.2.1 Types. The scraper-tractors furnished under this specification shall be of the following types as specified (see 6.2):

Type I - Two Driven Traction Wheels, 4 by 2
Type II - Four Driven Traction Wheels, 4 by 4
Type III - Four Driven Traction Wheels, 6 by 4

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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, *
*621 Pleasant Valley Road, Port Hueneme, CA 93043-4300, by using the *
Standardization Document Improvement Proposal (DD Form 1426) appearing at the
*end of this document or by letter. *
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FSC 3805

2. APPLICABLE DOCUMENTS

2.1 Government documents.

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

Federal Specifications

W-B-131 - Battery, Storage, Vehicular, Ignition, Lighting, and Starting

Federal Standards

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

(Activities outside the Federal Government may obtain copies of Federal specifications, standards, and commercial item descriptions as outlined under General Information in the Index of Federal Specifications, Standards, and Commercial Item Descriptions. The Index, which includes cumulative bimonthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

(Single copies of this specification and other Federal specifications and commercial item descriptions required by activities outside the Federal Government for bidding purposes are available without charge from General Services Administration Business Service Centers in Boston, MA; New York, NY; Philadelphia, PA; Washington, DC; Atlanta, GA; Chicago, IL; Kansas City, MO; Fort Worth, TX; Denver, CO; San Francisco, CA; Los Angeles, CA; and Seattle, WA.)

(Federal Government activities may obtain copies of Federal standardization documents, and the Index of Federal Specifications, Standards, and Commercial Item Descriptions from established distribution points in their agencies.)

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 military specifications and standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation (see 6.2).

Code of Federal Regulations

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

Occupational Safety and Health Standards

(The Code of Federal Regulations (CFR) and the Federal Register (FR) are for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. When indicated, reprints of certain regulations may be obtained from the Federal Agency responsible for issuance thereof.)

2.2 Other publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation (see 6.2).

ASTM:

ASTM E 380 - Use of the International System of Units (SI) (the Modernized Metric System)
ASTM D 3951 - Commercial Packaging

(Application for copies should be addressed to the ASTM, 1916 Race Street, Philadelphia, PA 19103.)

European Tyre and Rim Technical Organisation (ETRTO):

ETRTO Standards Manual

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

Society of Automotive Engineers, Inc. (SAE):

SAE J386 - Operator Restraint Systems for Off-Road Work Machines
SAE J534 - Lubrication Fittings
SAE J741 - Capacity Rating-Scraper, Open Bowl
SAE J898 - Control Locations for Off-Road Work Machines
SAE J994 - Alarm - Backup - Electric - Performance, Test and Application
SAE J1040 - Performance Criteria for Rollover Protective Structures (ROPS) for Construction, Earthmoving, Forestry and Mining Machines

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

Tire and Rim Association, Inc. (TRA):

TRA Yearbook

(Application for copies should be addressed to the Tire and Rim Association, Inc., 175 Montrose West Avenue, Suite 150, Copley, OH 44321.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Standard commercial product. The scraper-tractor 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 scraper-tractors 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.

3.2 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.2.1, 6.2, and 6.3).

3.3 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. Unless otherwise specified, none of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification.

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

3.5 Measurement systems. Unless otherwise specified, either the U.S. Customary System of Units (US) or International System of Units (SI) shall be used in the design and construction of the machine. When only one system of measurement is acceptable, the particular system required shall be as specified (see 6.2). In this specification, all measurements, dimensions, sizes and capacities are given in US units. These measurements may be converted to SI units through the use of the conversion factors and methods specified in ASTM E380.

3.6 Design.

3.6.1 Safety. All moving parts, parts subjected to high operating temperatures, and parts energized electrically which are of such a nature or so located as to become a hazard to operating and maintenance personnel shall be insulated, enclosed, or guarded to the extent necessary to eliminate the hazard. Protective devices shall not impair the operating functions. Platforms, steps, handholds, and rails shall be furnished and located, where necessary, to assure safe, easy access by personnel to those areas requiring frequent maintenance or service. All safety systems provided for the operator shall be in accordance with OSHA "Occupational Safety and Health Standards." The scraper-tractor shall be provided with not less than the following safety equipment:

a. Windshield with power operated windshield wiper(s).

b. Horn.

c. Rearview mirror with not less than 32 square inches reflective surface.

d. Backup alarm device conforming to SAE J994.

e. Seat belt for operator’s seat.

f. Rollover protective structure at operator’s station.

g. Fenders over all driving wheels, front and rear.

3.6.2 Drive axles. The drive axle of the tractor for Types I, II, and III and drive axle of the scraper for Types II and III shall be equipped with an increased traction differential device, and utilize planetary positive reduction gearing or direct spur gear reduction gearing.

3.6.2.1 Type I scraper-tractor (4 by 2). The tractor of the Type I scraper-tractor shall have two wheels driven by a single self-contained engine. The tractor shall be coupled to tow the scraper equipped with two nondriven wheels.

3.6.2.2 Type II scraper-tractor (4 by 4). The tractor of the Type II scraper-tractor shall have two wheels driven by a single self-contained engine. The tractor shall be coupled to tow the scraper, which shall be equipped with a single self-contained engine mounted on the rear end of the scraper to provide power to two driven wheels.

3.6.2.3 Type III scraper-tractor (6 by 4). The tractor of the Type III scraper-tractor shall be a 4 by 2 type with two steering and two driving wheels. The two rear-mounted wheels of the tractor shall be driven by a single self-contained engine. The tractor shall be coupled to the scraper, which shall be equipped with a single self-contained engine mounted on the rear end of the scraper to provide power to two driving wheels.

3.6.3 Power to weight ratio. The scraper-tractor gross weight ratio to the net flywheel horsepower (hp) shall be not greater than 375 pounds (lb) per hp for the Type I (4 by 2), not greater than 345 lb per hp for the Type II (4 by 4), and not greater than 400 lb per hp for the Type III (6 by 4).

3.6.4 Capacities, cutting and spreading dimensions, turning radius, and travel speeds. The scraper-tractor shall conform to the capacities, and cutting and spreading dimensions specified in Table I. The struck and heaped cubic yard capacity ratings shall be in accordance with SAE J741. The turning radius and travel speeds shall be as specified in Table II.

3.6.4.1 Air transportability configuration. When specified (see 6.2), the Type I scraper-tractor shall be subject to air transportability configuration and shall not be greater than 105 inches in width and 102 inches in height in a reduced configuration. In addition, the Type I scraper-tractor shall not be greater than 13,000 pounds per single axle or 20,000 pounds per tandem axle with the fuel tank 0.75 percent full in a reduced configuration. Achieving a reduced configuration shall be limited to the removal or relocation of mechanically attached (nonwelded) components and shall not affect the transportability of the scraper-tractor, including the ability to negotiate, without interference, a 15-foot ramp at an angle of 17 degrees between two horizontal surfaces. If self-powered, the Type I scraper-tractor shall be transportable under its own power with the operator in the standard seat provided. Removal, relocation, or reinstallation time of all components required to achieve the reduced configuration shall be not greater than 4 manhours. Removal, relocation, and reinstallation process shall be described in the equipment manual(s). When delivered to the Government, the scraper-tractor shall not be in the reduced configuration.

TABLE I. Capacities, Payloads, and Cutting and Spreading Dimensions.

Types	Minimum Capacities: Struck	Heaped	Payload	Cutting Width 1/	Cutting Depth 1/: Minimum	Spreading Depth 1/: Minimum
Type I	9 cu yd	12 cu yd	28,000 lb	N/A 2/	N/A	N/A
Type I	14 cu yd	20 cu yd	48,000 lb	108	11	17
Type III	14 cu yd	20 cu yd	48,000 lb	108	11	17

1/ Note: Cutting and spreading dimensions are in inches

2/ N/A: Not applicable

TABLE II. Turning Radius and Travel Speeds.

Types	Maximum Turning Radius (Outside Dimension)	Minimum Travel Speed (With Heaped Load)
Type I	40 feet (ft)	20 miles per hour (mph)
Type II	48 ft	23 mph
Type III	60 ft	25 mph

3.6.5 Tractor frame. The tractor frame shall support or incorporate as integral parts the towing device(s), crankcase guard, fenders, oscillating hitch assembly, operator's stations, powerplant, and power train. Towing devices(s) shall withstand a pulling force of not less than 150 percent of the scraper-tractor's gross vehicle weight (see 6.5.1). The crankcase guard shall protect the crankcase, flywheel housing, accessories, and other assemblies exposed to damage from projecting obstructions likely to be encountered during normal earth moving operations.

3.6.6 Scraper frame.

3.6.6.1 Draft frame. The draft frame shall consist of the hitch assembly housing, gooseneck, and yoke. The front of the frame shall be coupled to and supported by the tractor. The draft frame shall be equipped with a positive mechanical locking device to prevent separation of the tractor and scraper during lifting operations and maintenance functions.

3.6.6.2 Push frame. The push frame shall incorporate towing hook(s) and either a push plate or roller mounted on the rear of the scraper. The frame shall support the rear engine and power train on the Type II (4 by 4) and Type III (6 by 4) scraper-tractors. The push plate or roller and frame shall withstand the forces applied to it without deformation or breakage, when the scraper-tractor is push-loaded with other equipment of equal size.

3.6.7 Scraper bowl. The scraper bowl shall be of the front-loading, front-lifting, open-bowl type, complete with apron, blade base, ejector, cutting edges, and side bits. The complete bowl operation shall be hydraulically operated. The bowl shall be power raised and power lowered and shall hold any position through its travel range with any load throughout the capacity range. A mechanical means shall be provided for locking the bowl in the raised position. The bowl shall be free of overhead beams, structures, and hydraulic components that would obstruct loading by means of crane shovels, draglines, and loaders. The bowl shall withstand, without permanent deformation or damage, all operating forces of the apron and ejector. When tested as specified in 4.4.2, the bowl shall carry a rated heaped payload without permanent deformation or damage and without deflecting in overall width to an extent which would adversely affect operation or cause excessive rub plate wear. In no case shall the overall width deflection be greater than 0.50 inch.

3.6.7.1 Cutting edges. The cutting edges shall consist of not less than three sections or more than four sections. All sections shall be reversible with two sections interchangeable. The cutting edges shall have a cutting width not less than that specified in Table I.

3.6.7.2 Side bits. The side bits shall be reversible side-to-side and interchangeable.

3.6.8 Transmission(s) and torque converter(s). The scraper-tractor shall have full torque power shift transmission(s) and torque converter(s). The transmission system shall provide not less than five forward and one reverse speed. Both transmissions of the tractor and scraper for the Types II (4 by 4) and III (6 by 4) shall be controlled and shifted together. Torque converter oil coolers shall be furnished. The coolers shall maintain the temperature of the oil entering the converters at a temperature of not greater than 275 degrees

Fahrenheit (F). Tractor torque converter oil temperature indicators or high temperature warning devices shall be provided and located at the operator's station. The torque converter oil temperature may be monitored by an audible warning system.

3.6.9 Steering mechanism. The steering mechanism for the scraper-tractor shall be power steering or power assisted steering. The steering mechanism shall be capable of turning the tractor 90 degrees right or left of the longitudinal centerline of the scraper.

3.6.10 Brakes.

3.6.10.1 Service brakes. The scraper-tractor shall be equipped with full air or combination air-over-hydraulic service brakes on all wheels, stopping the fully loaded scraper-tractor from a speed of 20 mph within 90 feet from the point of brake pedal application. Brakes shall be equipped with an emergency stopping system to provide braking in the event of air pressure loss. Air reservoir(s) shall have moisture bleeder(s).

3.6.10.2 Parking brake. The scraper-tractor shall be equipped with a parking brake and shall hold a fully loaded scraper-tractor on a 20 percent grade without the assistance of the service brakes.

3.6.11 Wheels, rims, and tires. The drive wheels of the tractor and wheels of the scraper shall be of the same size and interchangeable front to rear. The tires shall be wide base, tubeless, with all-terrain type tread. Tire and rim sizes, ply rating, and load rating at 30 mph shall conform to either the TRA Yearbook or the ETRTO Standards Manual recommendations. Tires shall be of rated capacity of not less than equal to the load imposed on each tire, measured at each wheel at the ground, with scraper-tractor loaded to rated gross vehicle weight.

3.6.12 Engine(s). The scraper-tractor shall be powered by the manufacturer's standard industrial type diesel engine(s). The power and speed of the engine(s) shall be sufficient to meet the performance requirements specified herein. When either the Type II or Type III scraper-tractor is provided, both engines shall be of the same make. The engine(s) shall be furnished complete with the following accessories:

a. Two stage intake air cleaner with service indicator.

b. Fuel filter(s).

c. Hour meter(s).

d. Fuel tank(s) with sufficient capacity for not less than 8 hours operation.

e. Electric cranking system (hydraulic or air starting acceptable for scraper engine).

f. Batteries (see 3.6.12.1).

g. Battery charging system.

h. Torque converter oil temperature indicator.

i. Radiator guard.

3.6.12.1 Dry charged batteries. When specified (see 6.2), batteries shall be dry charged in accordance with W-B-131, without electrolyte, with sealed caps to prevent the intrusion of atmospheric moisture.

3.6.12.2 Exhaust. The engine(s) shall be equipped with exhaust muffler and stack. The exhaust stack outlet(s) shall be provided with rain caps, 45-degree or 90-degree bends, or automatic moisture drain.

3.6.13 Lighting. The lighting system shall be 12 volts and shall include the following:

a. Two headlamps and two forward directed floodlamps or four headlamp bright and dim system.

b. Not less than two scraper floodlamps directed to illuminate the bowl, apron, and cutting edge at each side.

c. Instrument panel lamp(s) to illuminate all instruments.

3.6.14 Hydraulic system. A hydraulic system shall be utilized for transmitting engine power to the mechanisms that operate the apron, bowl, ejector, and steering. The hydraulic system shall be complete with all operating accessories, including pump(s), reservoir(s), valves, filters, hoses, piping, fittings, and pressure relief valve(s). The hydraulic system shall withstand a bursting pressure of four times the working pressure. The system, including hoses, shall be suitable for operating temperatures ranging from -20 degrees F to 250 degrees F. The hydraulic system shall be furnished with full flow filter(s) having a micronic rating not greater than 25.

3.6.15 Operator’s station. The operator’s station shall consist of a shock absorbing operator seat, steering wheel, a safety glass windshield equipped with power operated windshield wiper(s), instrument panel, operating controls, and a rollover protective structure conforming to SAE J1040. The seat shall be equipped with a seat belt conforming to SAE J386. All controls and instruments that are not already identified to show their intended function or operation shall be clearly identified for their intended operation and function with permanently affixed identification. Decals shall not be used. Controls shall be located within the dimensional spaces specified in SAE J898. All instruments and markings shall be in the English language or International type symbols. All instruments and markings shall be readily visible to the operator when seated in a normal operating position. Unless the scraper-tractor is equipped with an enclosed cab with lockable door, all instruments shall be protected against damage by an anti-vandalism panel guard.

3.6.15.1 Cab. When specified (see 6.2), a fully enclosed cab of all steel or fiberglass construction shall be furnished. The cab shall have a hinged door and shall enclose the operator’s seat, all controls, and shall not obstruct the view of the operator while seated. Closed cab accessories shall include a rearview mirror of the adjustable truck type, with a size of not less than 4 inches by 8 inches and mounted on the left exterior of the cab. The enclosed

cab shall be furnished with a heater and defroster. The heater and defroster shall be the manufacturer's standard for maintaining the operator's comfort in temperatures down to -20 degrees F. Electric or air-powered windshield wipers for front and rear windshields, with separate controls, shall be furnished.

3.6.16 Toolbox. The scraper-tractor shall be provided with a toolbox made of sheet steel. The toolbox shall have a hinged lid which shall open not less than 90 degrees and shall be provided with a latching device. The toolbox shall be securely fastened to the scraper-tractor in a protected and accessible location. The toolbox shall be of sufficient size to hold the tools normally used for daily maintenance of the scraper-tractor.

3.7 Performance. The scraper-tractor shall withstand the hard usage encountered, without permanent deformation or damage, while performing the following operations:

a. The Type I scraper-tractor shall load undisturbed or recompacted soil (see 6.5.2), to the struck capacity without assistance from auxiliary equipment.

b. The Type II and Type III scraper-tractor shall load undisturbed or recompacted soil to the struck capacity in not greater than one minute without assistance from auxiliary equipment.

c. The scraper-tractor shall dump and spread the soil without assistance from auxiliary equipment.

d. The scraper-tractor, loaded with the minimum heaped payload specified in Table I, shall travel at an average speed of not less than that specified in Table II on maintained earth haul roads (see 6.5.3).

e. The scraper-tractor, loaded with the minimum heaped payload specified in Table I, shall negotiate a grade having a slope of not less than 20 percent.

f. The scraper-tractor, when empty, shall traverse a longitudinal grade having a slope of not less than 30 percent and not less than 3 times the length of the scraper-tractor.

3.7.1 Environmental conditions. The scraper-tractor engine(s) shall start and perform as specified at a temperature from -20 degrees F to 125 degrees F. When an ether priming system is required, it shall be of the measured shot type with a storage capacity of not less than 12 fluid ounces.

3.8 Lifting and tiedown attachments. When specified (see 6.2), the scraper-tractor shall be equipped with lifting and tiedown 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 be mechanically attached to the scraper-tractor. 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. Tiedown attachments may be identified by stenciling or

other suitable marking. Tiedown marking shall clearly indicate that the attachments are intended for the tiedown of the scraper-tractor on the carrier when shipped.

3.9 Instruction plates. The scraper-tractor 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. Plates shall be securely affixed to the equipment with nonferrous screws or bolts of not less than 0.125 inch diameter.

3.10 Lubrication. Unless otherwise specified (see 6.2), 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 pound-force per square inch (psi) or higher, will damage grease seals or other parts, a suitable warning shall be affixed to the equipment in a conspicuous location.

3.11 Cleaning, treatment, and painting. Surfaces normally painted in good commercial practice shall be cleaned, treated, and painted as specified herein. Unless otherwise specified (see 6.2), the color of the finish coat shall be the manufacturer's standard yellow, nearest match to color number 13538 of FED-STD-595. Surfaces to be painted shall be cleaned and dried to ensure that they are free from contaminants such as oil, grease, welding slag and spatter, loose mill scale, water, dirt, corrosion product, or any other contaminating substances. As soon as practicable after cleaning, and before any corrosion product or other contamination can result, the surfaces shall be prepared or treated to ensure the adhesion of the coating system. The painting shall consist of at least one coat of primer and one finish coat of acrylic-based enamel. The primer shall be applied to a clean, dry surface as soon as practicable after cleaning and treating. Painting shall be with manufacturer's current materials according to manufacturer's current processes and the total dry film thickness shall be not less than 2.5 mils over the entire surface. The paint shall be free from runs, sags, orange peel, or other defects.

3.12 Workmanship.

3.12.1 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 ensure uniformity of size and shape.

3.12.2 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.

3.12.3 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 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.

3.12.4 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.

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 (examinations and tests) 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 this document where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this document shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in this document shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 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 the scraper-tractor when a first article is required (see 3.2 and 6.2). This inspection shall include the examination of 4.3, the tests of 4.4, and the preparation for delivery inspection of 4.5. 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, and the preparation for delivery inspection of 4.5.

4.3 Examination. Each scraper-tractor 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 requirement or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

4.3.1 Air transportability configuration examination. When air transportability configuration is specified for the Type I scraper-tractor (see 3.6.4.1 and 6.2), the scraper-tractor shall be examined to verify compliance with the requirements of 3.6.4.1. Scraper dimensions and axle-wheel loads shall be measured with the scraper in the reduced configuration. Conformance to ramp loading requirements may be verified by either testing or contractor engineering data and calculations. The results of the air transportability configuration examination shall be provided not less than 30 days prior to first article testing to the Government agency specified (see 6.2 and 6.3.1).

4.4 Tests. The first article shall be tested as specified in 4.4.1, 4.4.2, and 4.4.3. Each production unit selected shall be subjected to the test of 4.4.1. Failure to pass any test shall constitute cause for rejection.

4.4.1 Pre-operational test. Each scraper-tractor shall be completely assembled, properly adjusted, and otherwise serviced for operation. All controls shall be operated as many times as necessary 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. Gear cases and other moving parts shall be examined for excessive heating or abnormal operation insofar as is practicable and possible. Failure to pass any phase of this test shall be cause for rejection.

4.4.2 Performance tests. The performance test shall be performed in two phases. Each phase shall be performed utilizing undisturbed or recompacted soil. Phase one shall be performed prior to phase two. Each phase shall consist of not less than 50 load-haul-dump cycles with the load as specified in the individual phases. During both phases of the test, the scraper-tractor shall be observed to determine conformance to the following:

a. Cutting depth and width, spreading depth, and nonstop turning width specified in Table I and Table II.

b. Proper function of the following:

(1) Transmission(s) and torque converter(s) for conformance to 3.6.8.

(2) Steering mechanism for conformance to 3.6.9.

(3) Hydraulic system for conformance to 3.6.14.

(4) Operator's station for conformance to 3.6.15.

4.4.2.1 Phase one. Prior to performing phase one, the bowl width of the scraper-tractor shall be measured at 1.0 foot intervals both horizontally and vertically. These dimensions shall be recorded and used to compare the dimensions of the bowl at the conclusion of phase two. Perform not less than 50 load-haul-dump cycles with a one way haul distance of not less than 1500 feet on a maintained earth haul road and with each load consisting of the struck capacity specified in Table I. The Type I scraper-tractor may be push-loaded to achieve the required capacity. The Types II and III scraper-tractors shall not be push-loaded to achieve the required capacity. Failure of the scraper-tractor to pass the tests of phase one shall be cause for rejection. The following tests shall be performed during this phase:

a. Prior to loading, the scraper-tractor shall traverse longitudinally along a grade having a slope of not less than 30 percent. The grade shall be of compacted earth with a length of not less than three times the length of the scraper-tractor. The scraper-tractor shall make four passes: two from left to right and two from right to left.

b. The Types II and III scraper-tractor shall be timed during five loading cycles. The average time for these five cycles shall be not greater than 1.0 minute.

c. During not less than one-half of the haul cycles of this phase, the scraper-tractor shall attain a speed of not less than the travel speed specified in Table II. The following service braking tests shall be performed:

(1) After the scraper-tractor has attained the required speed, the service brake shall be applied on not less than five of the cycles and stop the scraper-tractor within 90 feet from the point of brake application. This test shall be accomplished without the activation of the emergency stopping system.

(2) After the scraper-tractor has attained the required speed, the emergency stopping system shall be activated on not less than one of the cycles and stop the scraper-tractor within 90 feet from the point of activation. This test shall be accomplished without the use of the service braking system.

4.4.2.2 Phase two. After successful completion of phase one, the scraper-tractor shall be subjected to phase two testing. Perform not less than 50 load-haul-dump cycles with a one-way haul distance of not less than 1500 feet on a maintained earth haul road and with each load consisting of the heaped capacity specified in Table I. The Type I scraper-tractor may be push-loaded to achieve the required heaped capacity. The Types II and III scraper-tractors shall not be push-loaded to achieve the required heaped capacity. Failure of the scraper-tractor to pass the tests of phase two shall be cause for rejection. The following tests shall be performed during this phase:

a. During 20 cycles of this phase, the scraper-tractor shall negotiate a well compacted earth grade having a slope of not less than 20 percent. The length of the grade shall be not less than three times

the length of the scraper-tractor. The fully loaded scraper-tractor shall be driven up and down the grade not less than 10 times. During the 10 cycles the following parking brake test shall be performed:

(1) The scraper-tractor shall be stopped five times going up and five times going down. After each stop, the parking brake shall be applied. The parking brake shall hold the scraper-tractor, after each stop, without the assistance of the service brakes. The scraper-tractor shall restart movement without assistance after each stop.

b. After completing the load-haul-dump cycles, the bowl width of the scraper-tractor shall be measured at 1.0 foot intervals both horizontally and vertically. These dimensions shall be compared with the recorded measurements taken at the beginning of phase one. There shall be no permanent deformation or damage and the overall width deflection shall not be greater than 0.50 inch.

4.4.3 Lifting and tying down attachment test. When furnished, lifting and tying down attachments shall be tested to determine conformance to 3.8. The manufacturer may furnish certified engineering calculations in lieu of a test to prove that the lifting and tying down attachments offered meet the requirements specified in MIL-STD-209.

4.5 Preparation for delivery inspection. The inspection of the preservation, packaging, packing, and marking shall be in accordance with the requirements of section 5.

5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. Preservation and packaging shall be commercial in accordance with the requirements of ASTM D3951.

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. The scraper-tractors covered by this specification are used for earth moving in construction projects.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification
b. Type required (see 1.2)

c. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1, 2.1.2, and 2.2)
d. When first article is required for inspection and approval (see 3.2 and 4.2.1)
e. If the scraper-tractor is required to be configured in a specific measurement system (US or SI), state required system (see 3.5)
f. When the Type I scraper-tractor is to be configured in the air transportability configuration and the Government Agency is to be provided with results of air transportability configuration examination (see 3.6.4.1 and 4.3.1)
g. When dry charged batteries are required (see 3.6.12.1)
h. When a fully enclosed cab of all steel or fiberglass construction is to be furnished (see 3.6.15.1)
i. When lifting and tying down attachments are required (see 3.8)
j. Means for lubrication, if other than as specified (see 3.10)
k. Color of finish coat, if other than as specified (see 3.11)

6.3 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.

6.3.1 Air transportability verification. When air transportability verification is required, the Contracting Officer should make arrangements for the contractor to submit documentation for verification of conformance to 3.6.4.1, not less than 30 days prior to first article test, to: Commanding Officer, Naval Construction Battalion Center (CESO Code 15322), 621 Pleasant Valley Road, Port Hueneme, CA 93043-4300.

6.4 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL), incorporated into the contract. When the provisions of DoD Federal Acquisition Regulations (FAR) Supplement, Part 27, Sub-Part 27.475-1 (DD Form 1423) are invoked and the DD Form 1423 is not used, the data should be delivered by the contractor in accordance with the contract or purchase order requirements.

6.5 Definitions.

6.5.1 Gross vehicle weight. The gross vehicle weight of the scraper-tractor is the total weight of the unit when fully loaded with fuel, oil, hydraulic fluid, and the scraper bowl is loaded to heaped capacity.

6.5.2 Recompacted soil. Recompacted soil is soil that has been recompacted to not less than 75 percent Standard Proctor and within +/-percent optimum moisture.

6.5.3 Maintained earth haul road. A maintained earth haul road has a smooth, firm, level, earth surface that undulates or slightly flexes under load, and is watered and maintained regularly.

6.6 Subject term (key word) listing.

Apron
Drive axles
Scraper bowl

6.7 Classification cross-reference. Cross reference of classification changes between this specification and the superseded specification is as follows:

MIL-S-28632D(YD)	OO-S-2771
Type I - Two driven traction wheels, 4 by 2	Type I
Type II - Four driven traction wheels, 4 by 4	Type II
Type II - Four driven traction wheels, 6 by 4	Type III

MILITARY INTERESTS:

Military Coordinating Activity

Navy - YD

Custodian

Navy - YD

Review Activities

Army - ME
Navy - YD
Air Force - 84, 99
DLA - CS

User Activity

Navy - YD

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FSS

PREPARING ACTIVITY:

Navy - YD

(Project 3805-0143)

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.