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KKK-A-2809  
 April 23, 1993  
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SUPERSEDING  
 MIL-A-29247(YD)  
 24 October 1986

## FEDERAL SPECIFICATION

AUGER, EARTH, TRUCK-MOUNTED, 4 BY 4, DIESEL ENGINE DRIVEN,  
 28,000 LB MINIMUM GVW, WITH POLE SETTER AND WIRE REEL

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 an earth auger, mounted on a  
 commercial chassis truck, diesel engine driven, 4 by 4, with a minimum gross  
 vehicle weight (GVW) of 28,000 pounds (lb), equipped with a pole setter and  
 wire reel.

### 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  
 (see 6.2).

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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 3820

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## Federal Specifications

- W-B-131 - Battery Storage (Vehicular, Ignition, Lighting, and Starting).
- RR-W-410 - Wire Rope and Strand.
- TT-P-664 - Primer Coating, Alkyd, Corrosion-Inhibiting, Lead and Chromate Free.
- UU-T-81 - Tag, Shipping and Stock.
- KKK-T-2110 - Trucks and Truck Tractors: Commercial, Diesel or Gasoline Engine Driven, 16,000 to 35,000 pounds GVW, 4X4.
- PPP-B-601 - Boxes, Wood, Cleated Plywood.
- PPP-B-621 - Box, Wood, Nailed and Lock-Corner.
- PPP-P-40 - Preservation and Packing of Hand Tools: Tools and Tool Accessories for Power Driven, Metal and Woodworking Machinery.
- PPP-T-60 - Tape: Packaging, Waterproof.

## Federal Standard

- FED-STD-595 - Colors Used in Government Procurement.

## Military Specifications

- MIL-P-116 - Preservation, Methods of.
- MIL-B-121 - Barrier Material, Greaseproofed, Waterproofed, Flexible.
- MIL-S-196 - Support Items, Accessories and Kits, Mechanical, Packaging of.
- MIL-E-10062 - Engines: Preparation for Shipment and Storage.

## Military Standards

- MIL-STD-129 - Marking for Shipment and Storage.
- MIL-STD-209 - Slings and Tiedown Provisions for Lifting and Tying Down Military Equipment.
- MIL-STD-281 - Automobiles, Trucks, Truck Tractors, Trailers and Trailer Dollies; Preservation and Packaging of.
- MS35844 - Plugs, Machine Thread, Magnetic; Drain.
- MS49006 - Plugs, Pipe, Magnetic-Headless; Aluminum, Iron, or Steel.

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

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of the documents not listed in the DODISS shall be the issue of the non-Government documents which are current on the date of the solicitation.

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Society of Automotive Engineers, Inc. (SAE)

- SAE J88 - Sound Measurement, Earthmoving Machinery, Exterior.
- SAE J534 - Lubrication Fittings.
- SAE J833 - Human Physical Dimensions.
- SAE J898 - Control Locations for Off-Road Work Machines.
- SAE J899 - Operator's Seat Dimensions for Off-Road Self-Propelled Work Machines.
- SAE J919 - Sound Measurement, Earthmoving Machinery-Operator-Singular Type.
- SAE J925 - Minimum Service Access Dimensions for Off-Road Machines.

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

(Non-Government standards and other publications are normally available from the organizations which prepare or which 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 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 Description. The earth auger shall consist of a power transmission system, a boring assembly, and pole-setting and wire reeling equipment. The auger shall meet all operational requirements specified herein at any temperature from 0 degrees Fahrenheit (oF) to 125oF.

3.2 First production vehicle. When specified (see 6.2), the contractor shall furnish one truck-mounted auger for first production vehicle inspection (see 4.2 and 6.3).

3.3 Materials. Materials shall be as specified herein and in applicable specifications, standards, and other referenced documents. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification. Materials shall be free of defects which adversely affect performance or serviceability of the finished product.

3.3.1 Safety. All belts, gears, shafts, pulleys, sprockets, spindles, drums, chains, and other reciprocating, rotating, or moving parts of equipment shall be guarded when such parts are exposed to contact by personnel or otherwise create a hazard. All hot surfaces of equipment, including exhaust pipes and other lines which may be subject to high temperatures, exposed to contact by personnel, or which create a fire hazard shall be fully guarded or insulated. Fuel tanks shall be located in a manner which will not allow spills or overflows to run onto the engine, exhaust, or electrical equipment.

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Exhaust or discharges from equipment shall be directed so that they do not endanger personnel or obstruct the view of the operator. All points requiring lubrication during operation shall have fittings located or guarded so as to be accessible without hazardous exposure to personnel performing these operations. Nonfunctional sharp edges, projecting points, and excessive length of fastening devices shall be avoided.

3.3.2 Noise limits. If the noise level in the area occupied by the operator exceeds 85 decibels (dB), when tested in accordance with SAE J919, a caution plate shall be permanently posted on the auger in a conspicuous protected location and shall be clearly visible and legible to all personnel exposed to excessive noise levels. The caution plate shall read: CAUTION - HEARING PROTECTION REQUIRED. The plate shall have a yellow background with black lettering and plate shall be made of corrosion-resistant material. Exterior noise shall not exceed 88 dB, verified in accordance with SAE J88.

3.3.3 Instruction plates. The auger 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 1/8-inch diameter.

3.4 Power transmission system. The auger shall be diesel engine driven, with a hydrostatic drive system.

3.4.1 Diesel engine. The diesel engine shall be a heavy-duty commercial industrial type, capable of operating on diesel fuel conforming to VV-F-800. Full-flow type oil filter(s) shall be utilized in the engine lubricating system. The engine shall be equipped with the following:

- a. Fuel tank of sufficient capacity for 8 hours normal operation.
- b. Two-stage dry type intake air cleaner with service indicator.
- c. Exhaust muffler and stack with rain cap or 90° bend in the outlet.
- d. A 12-volt negative ground direct current cranking system with battery in accordance with W-B-131. The battery shall have a capacity of not less than 150 ampere hours at a 20-hour rate.
- e. Battery charging alternator with a rating of not less than 30 amperes.
- f. Safety control devices of the visual or audible type for high coolant temperature and low lubricating oil pressure.
- g. Hood and side doors.
- h. Mechanical or electrical liquid quantity fuel indicator located at the tank.
- i. Hour meter.
- j. Instrument and control panel located at the operator's station and equipped with the following indicators and controls:
  - (1) Water coolant temperature indicator.
  - (2) Ammeter.
  - (3) Lubricating oil pressure indicator.
  - (4) Tachometer.
  - (5) Manual speed control.

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- (6) Emergency shutdown device.
- (7) Ignition or start switch.

k. Weatherproof battery box painted with acid-resistant paint.

3.4.2 Power and speed rating. The power and speed rating of the diesel engine shall be such that operation of the auger under any of the operating conditions specified herein will not require horsepower (hp) in excess of the continuous rating of the engine as published by the engine manufacturer, or 85 percent of the engine manufacturer's published maximum hp rating, at the applied speed, whichever is less.

3.4.3 Transmission. The transmission shall be a fully hydrostatic drive, utilizing both a variable displacement pump and variable displacement motor. The hydrostatic motor shall be directly coupled to the right angle drive. There shall be no intermediate gear box or shifting of gears throughout the speed range. The hydrostatic system shall have pressure override protection built into the pump to protect the kelly bar and the ring and pinion gear sets.

3.5 Boring assembly. The boring assembly consists of the leveling mechanism, auger bar, auger bits and teeth, controls, and power supply assembly.

3.5.1 Boring requirements. The truck-mounted auger shall be capable of:

- a. Boring holes up to 24 inches in diameter to a depth of at least 10 feet in all types of soil.
- b. Boring vertical holes 5 feet deep at an average rate of 85 seconds per hole when an 18-inch auger bit is used, measured in a soil which is well-compacted, coarse-grained, well-graded, gravel-sand-clay mixture with an excellent binder and medium-to-high dry strength (see 6.4).
- c. Boring holes within the following limits:
  - (1) From vertical to 20° away from the truck.
  - (2) From vertical to 10° towards the truck.
  - (3) From vertical to 90° to the right and left.
- d. Exerting a down pressure of not less than 5,000 lb.
- e. Exerting an up pressure of not less than 5,000 lb; and,

Depth of holes shall be measured from the ground level to the top of the loose dirt at the bottom of the hole.

3.5.2 Leveling mechanism. The boring assembly shall be equipped with a leveling device to permit the setting of the auger bar in a vertical position. The leveling mechanism shall be hydraulically operated. The leveling device shall raise the auger bar to the operating position and lower it to the traveling position.

3.5.3 Stabilizing jacks. The auger base shall be equipped with not less than two hydraulically operated stabilizing jacks. Two jacks shall be located at the rear of the base and may be installed on outriggers. The lowest

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extremity of the jacks, when fully retracted, shall not extend below the rear axle of the truck on which the auger is mounted. Operation of the jack shall be controlled by the operator at his station.

3.5.4 Auger bar. The auger bar shall be housed in a steel tube covered at the top. The bar shall be straight within 1/8-inch for every 5 feet of length. The auger bar shall be provided with a hydraulically actuated crowd mechanism. Bar material shall be an alloy steel as furnished commercially by the supplier. A minimum 5,000 lb capacity, 16 feet long, hydraulically operated, telescoping boom shall be furnished.

3.5.5 Auger bits and teeth. Augers shall be of the Pengo heavy-duty type. One each of the following sizes of auger bits shall be furnished:

- a. 8-inch
- b. 12-inch
- c. 18-inch
- d. 24-inch

Provision shall be made for stowing the auger bits when not in use. Stowage provisions shall allow easy access to the bits for removal and replacement.

3.5.6 Spoil throw off. Means shall be provided for throwing spoil from the auger bits so that spoil will not fall back into the hole when the auger is digging maximum depth holes, either by sufficient speed of the auger bar or by a high-speed throw off. If a high-speed throw off is used, operation shall not be dependent on shifting the transmission.

3.5.7 Auger controls. All controls shall be in accordance with SAE J833, J898, J899, and J925. All controls shall be placed within reach of the operator, and shall permit a clear view of the boring operation. The auger shall be provided with the necessary means of control, including, but not limited to, the following:

- a. Auger bar control
- b. Hand feed lever
- c. Emergency stop button

3.5.7.1 Auger bar control. The auger bar control shall remain in a neutral position until pressure is applied to the lever.

3.5.7.2 Hand feed lever. The hand-feed lever shall have positive disconnection provided by springs or other mechanical devices.

3.5.7.3 Emergency stop button. The emergency stop button shall stop the engine.

3.5.7.4 Identification plates. An identification plate shall be located on or adjacent to each control to indicate its intended function. The neutral and operating positions shall be shown by arrows and words. When the same lever or control serves more than one function, all functions shall be listed.

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3.6 Pole setting equipment and wire reel. The auger shall be equipped with the necessary equipment to convert the auger bar into a boom for setting poser or telephone poles of the I-treated, 75-foot class. This equipment shall at least include a power winch, wire rope, sheaves, wire reel, and winch line hook.

3.6.1 Pole grabber. The boom shall be equipped with a hydraulically operated, circumferential type pole grabber. The pole grabber shall maintain a constant clamping force at any angle of operation. Boom travel and pole grabber shall be controlled by the operator at his station.

3.6.2 Winch. The winch drum shall have a capacity of not less than 150 feet of the specified wire rope (see 3.6.4). The line speed on a bare drum shall be not more than 15 feet per minute (fpm) at low speed nor less than 50 fpm at high speed. The single-line bare drum pull at maximum drum speed shall be not less than 10,000 lb. The winch shall be provided with a brake that will control, stop, and hold a load of 15,000 lb on the bare drum. The winch shaft shall be of sufficient length to support the wire reel on the outside of the skid frame. The winch shall be hydraulically powered by the auger engine to permit independent operation of either the auger or winch.

3.6.3 Wire reel. The wire reel shall be of the heavy-duty, collapsible type and shall rewind all sizes of spool wires. The reel shall be mounted on the winch shaft with a bayonet catch. Controls shall be provided to permit operation of the winch and reel exclusive of other components of the auger. The diameter of the expanded reel shall be not less than 28 inches.

3.6.4 Wire rope. Wire rope shall conform to RR-W-410, type I, class 2, 7/16-inch diameter, preformed, uncoated, regular lay.

3.7 Truck. The auger shall be mounted on a commercial, 4 by 4, stake truck, with cab, rated at not less than 28,000 lb GVW. The truck shall meet the requirements of Federal specification KKK-T-2110 and the following ordering data of KKK-T-2110, paragraph 6.2, shall apply:

- b. Type III, 28,000 lb GVW class vehicle is required.
- d. US NAVY is the appropriate military service for painting.
- e. Exterior color shall be green, No. 14064, conforming to FED-STD-595 (3.11).
- g. US NAVY is appropriate military service for marking.
- i. Rustproofing IS required.
- k. Towing devices on rear ARE required.
- l. Trailer towing package IS required.
- m. Pintle height of 20 (+5/-0) inches IS required.
- y. Silicone rubber hoses ARE required.
- af. Auxiliary 24-volt system with trailer receptacle IS required.
- aj. Fuel and water separator IS required.
- ak. Spark arrestor IS required.
- al. Two-speed transfer case IS required.
- am. Automatic transmission IS required.
- an. Heavy duty frame IS required.
- aq. Traction control IS required.
- ar. Wide base type tires ARE required in lieu of duals.
- as. Disc type wheels ARE required.
- at. Tires with an aggressive off-road tread ARE required.

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- av. Spare tire carrier IS required.
- ax. Spare tire assembly IS required.
- bd. Tilting hood and fender assembly IS required.
- bg. Driver's seat SHALL be manufacturer's standard air ride suspension type.
- bj. Tools ARE required.
- bo. Air-operated horn IS required.
- bp. Engine hour meter IS required.
- bq. Back-up alarm IS required.

In addition to the ordering data, the following exceptions to KKK-T-2110 shall apply:

- a. Low speed, paragraph 3.3.1.2, shall be not less than 3 mph.
- b. Maximum geared speed, paragraph 3.3.1.3, shall be not less than 50 mph.
- c. The center line of the front and rear wheels shall be equidistant (+/-) 1 inch.
- d. A chassis frame with continuous rails shall be provided. On front-wheel drive conversion units, a two piece stacked-type chassis frame is not acceptable.
- e. Lights with electrical connectors mounted on other than the chassis manufacture's provided body light recesses, shall be weatherproofed. Unused headlight cavities shall be covered flush with the adjoining body surfaces in a neat workmanlike manner.

3.8 Hydraulic system. When a hydraulic system is used, it shall be protected against the entrance of dirt or other foreign materials. The hydraulic system shall be complete with all operating accessories, including a pump, hydraulic cylinders, valves, reservoir, pressure relief valves, and a full flow 25-micron oil filter accessible for cleaning. The pump shall supply a continuous flow of hydraulic fluid, and shall have sufficient capacity to energize all hydraulically powered components. Hydraulic cylinders shall be of the double-acting type and shall be equipped with counterbalance or lock-type check valves. A wiper shall be provided on the cylinders adjacent to the piston rod seals to prevent dirt and abrasives from damaging the seal or entering the cylinder. Hydraulic cylinder piston rods shall be hard-chrome plated. Hydraulic valves shall control retracting speed of all hydraulic cylinders, or an internal flow restriction or bypass shall be provided at each end of the cylinders. The reservoir shall be baffled and shall be constructed to withstand vibrations and shocks. The reservoir shall have sufficient capacity to allow for maximum displacement of all cylinders, and aid heat dissipation. The return line shall terminate below the minimum oil level of the reservoir. The suction line shall be above the reservoir bottom and shall be protected with an accessible strainer. The reservoir shall be equipped with a removable cover plate for inspection and cleaning. Provisions shall be made for filling and draining the reservoir and for checking the quantity of fluid in the reservoir. The drainplug shall be of the magnetic type.

3.9 Maintainability. The auger shall operate as specified without maintenance other than the supplier's recommended schedule of adjustments as established by a maintenance schedule submitted by the supplier prior to test. All major assemblies shall be accessible for servicing, repair, and



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replacement without the removal of other major assemblies. Maximum use shall be made of interchangeable hardware and fasteners.

3.9.1 Tools. Any special tools required for routine maintenance and repair shall be provided by the contractor. All maintenance, assembly, or disassembly operations shall be accomplished with common handtools and those special tools furnished by the contractor.

3.9.2 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 or higher, will damage grease seals or other parts, a suitable warning shall be affixed to the equipment in a conspicuous location. The unit shall be lubricated prior to delivery with type of lubricant specified in the operator's manual and grade of lubricant recommended for ambient temperature at the delivery point. The unit shall be conspicuously tagged to identify the lubricants and their temperature range.

3.9.3 Filling, draining, and checking provisions. The hydraulic system reservoir and transmission housings shall be equipped with dipsticks to determine the fluid level. Other enclosures such as gearcases and reservoirs which contain lubricant or hydraulic oil shall be equipped with dipsticks or sight gages not less than 1/2-inch pipe size to determine the fluid level. Each enclosure shall be equipped for filling and for draining. The drain outlet shall be fitted with a magnetic drainplug having either tapered pipe threads or shoulder and gasket, size conforming to MS35844 or MS49006. When the auger is in a level position, drainage of fluids shall be to the ground without draining on or over any part of the auger. Accessibility to the fill opening, the fluid-level checking device, and the drainplug or valve shall be provided without removal or adjustment of accessories and parts, except plates equipped with hand-operable, quick-disconnect fasteners, or capscrews in applications where quick-disconnect fasteners are subject to damage. The drain outlets for the engine-cooling system shall provide complete drainage of the system. The radiator drain shall be such that coolant will not drain onto any part of the auger or carrier. An extension hose is acceptable to facilitate radiator drainage.

3.10 Lifting and tiedown attachments. The auger 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 mechanically attached to the auger. 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 auger on the carrier when shipped.

3.11 Cleaning, treatment, and painting. Surfaces normally painted in good commercial practice shall be cleaned, treated, and painted as specified herein. The color of the finish coat shall be as specified (see 6.2). Surfaces to be

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painted shall be cleaned and dried to insure 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 insure the adhesion of the coating system. The painting shall consist of at least one coat of primer and one finish coat. 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 Toolbox. The auger shall be provided with a toolbox made of metal not less than US standard gage No. 14 and of sufficient size to accommodate the operating and maintenance tools normally furnished with the auger.

3.13 Workmanship. The auger shall be free from defects such as incomplete welds, rust, cracks, and other defects that could impair the operation of the auger.

3.13.1 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.

3.13.2 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.

3.13.3 Bolted connections. Boltholes 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.

3.13.4 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.

3.13.5 Surfaces. All parts, components, and assemblies including castings, forgings, molded parts, stampings, bearings, seals, machined surfaces, and welded parts shall be cleaned and free of sand, dirt, fins, pits, sprues, scale, flux, and other harmful or extraneous materials. External surfaces shall be smooth, and all edges shall be rounded or beveled.

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## 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 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.

4.2 First production vehicle inspection. When specified (see 3.2, 6.2, and 6.3), the first production vehicle produced under the contract shall be inspected by the contractor at his plant under the direction and in the presence of Government representatives. This inspection shall include the examination of 4.4 and the test of 4.5. The purpose of the inspection shall be to determine vehicle conformity with the requirements of the contract. Acceptance of the first production vehicle shall not constitute a waiver by the Government of its right under the provisions of the contract.

4.3 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.4 and the tests of 4.5.

4.4 Examination. Each auger shall be examined for defects listed in table I. Each attribute within each classification of multiple defects shall constitute one defect.

TABLE I. Classification of defects.

*-----*		*-----*	
*Classification	Defects	Requirement paragraph	*
*-----*			
*Critical			*
* 1	Safety guards missing or not as specified.	3.3.1	*
* 2	Noise levels greater than that specified, or caution plates missing or not as specified.	3.3.2	*
* 3	Leveling device missing or not as specified.	3.5.2	*
* 4	Stabilizing jacks missing or not as specified.	3.5.3	*
* 5	Specified auger controls not provided.	3.5.7	*
* 6	Auger not equipped with power winch, wire rope, sheaves, wire reel, and winch line hook.	3.6	*
* 7	Auger not mounted on a commercial, 4X4, truck.	3.7	*
* 8	Unit not lubricated prior to delivery as specified.	3.9.2	*

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*Major:			*
* 101	Auger not equipped with instruction plates as specified.	3.3.3	*
* 102	Auger bar not as specified.	3.5.4	*
* 103	Boom missing or not as specified.	3.6	*
* 104	Pole grabber missing or not as specified.	3.6.1	*
* 105	Means for throwing spoil from the auger bits not provided.	3.5.6	*
* 106	Winch not as specified.	3.6.2	*
* 107	Wire reel not as specified.	3.6.3	*
* 108	Truck not as specified.	3.7	*
* 109	Auger diesel engine not as specified.	3.4, 3.4.1 & 3.4.2	*
* 110	Auger transmission not as specified.	3.4 & 3.4.3	*
* 111	Lubrication points not as specified.	3.9.2	*
* 112	Hydraulic system not as specified.	3.8 & 3.9.3	*
* 113	Other enclosures such as gearcases and reservoirs which contain lubricant or hydraulic oil not as specified.	3.9.3	*
* 114	Engine-cooling system not as specified.	3.9.3	*
*Minor:			*
* 201	Materials not as specified.	3.3	*
* 202	Auger bits not of type and sizes specified.	3.5.5	*
* 203	Identification plates of auger controls missing or not as specified.	3.5.7.4	*
* 204	Wire rope not as specified.	3.6.4	*
* 205	Maintenance of auger not as specified.	3.9	*
* 206	Special tools required for maintenance, assembly, or disassembly of auger not furnished.	3.9.1	*
* 207	Lifting and tiedown attachments missing or not as specified.	3.10	*
* 208	Transportation plates not provided nor as specified.	3.10	*
* 209	Treatment and painting not as specified.	3.11	*
* 210	Toolbox missing or not as specified.	3.12	*
* 211	Workmanship not as specified.	3.13	*
* 212	Steel used in fabrication not as specified.	3.13.1	*
* 213	Welding not performed as specified.	3.13.2	*
* 214	Bolted connections not as specified.	3.13.3	*
* 215	Riveted connections not as specified.	3.13.4	*
* 216	Surface finish not as specified.	3.13.5	*
*-----*			*

4.5 Performance tests. The auger performance shall be verified by testing the truck roadability (see 4.6), the auger drilling ability (see 4.7), and the auger pole-setting capability (see 4.8).

4.6 Truck roadability. The roadability and gradeability of the truck shall verify conformance to all the requirements set forth in the Federal specification KKK-T-2110 for a type III (stake truck), class C (24,000 lb GVW) vehicle.

4.6.1 Low speed test. The truck and auger unit shall be driven at low speed for 1/2 mile, with the truck engine operating at not less than 35 percent of the maximum rating. An average speed of less than 3 miles per hour (mph) shall constitute failure of the low speed test (see 3.7).

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4.6.2 Road speed test. The truck and auger unit shall be driven at engine governed speed for not less than 5 miles on not less than a 2.5 percent grade. Failure to reach or maintain a speed of 45 mph shall constitute failure of the road speed test (see 3.7).

4.7 Auger ability. The testing for auger ability shall include the transmission speed test of 4.7.1, the drilling test of 4.7.2, and the drawbar pull test of 4.7.3.

4.7.1 Transmission speed test. Operate the auger with the auger bit above the ground and with the engine at full-load governed speed. All forward speeds and all reverse speeds shall be used. Measure the revolutions per minute of the auger bar while operating in the lowest gear and in the highest gear. Rotation of the auger bar at speeds other than those specified in 3.4.3 shall constitute failure of this test.

4.7.2 Drilling test. The auger shall bore holes as listed in table II. All vertical holes shall be bored to a depth of at least 10 feet. All angled holes shall be bored to the depth that results when the auger bar is extended the same distance that it was extended to drill the vertical holes. The soil in which the holes are to be bored shall be well-compacted, coarse-grained, well-graded, gravel-sand-clay mixture with an excellent binder and medium-to-high dry strength (see 3.5.1(b) and 6.4). Inability to perform any of the tests listed in table II shall constitute failure of this test (see 3.5.1).

4.7.2.1 Drilling speed test. Test 1 of table II shall be repeated with the hole depth not less than 5 feet. The time required to drill each hole shall be measured and recorded. An average time of more than 85 seconds shall constitute failure of this test (see 3.5.1(b)).

4.7.2.2 Spoil throw off test. Failure of the auger to clear spoil from the auger bits and prevent spoil from falling back into the hole, or spoil throw off requiring transmission shift, shall constitute failure of this test (see 3.5.6).

TABLE II. Boring test.

* Test #	* Auger position	* Bit size	* # of holes	*
* 1	* Vertical	* 18 in	* 20	*
* 2	* 10o from vertical toward truck	* 18 in	* 10	*
* 3	* 20o from vertical away from truck	* 18 in	* 10	*
* 4	* 90o to the left	* 18 in	* 10	*
* 5	* 90o to the right	* 18 in	* 10	*
* 6	* Same as test 1	* 24 in	* 10	*
* 7	* Same as test 2	* 24 in	* 5	*
* 8	* Same as test 3	* 24 in	* 5	*
* 9	* Same as test 4	* 24 in	* 5	*
* 10	* Same as test 5	* 24 in	* 5	*
* 11	* Repeat tests 6-10	* 8 in	* 5	*
* 12	* Repeat tests 6-10	* 12 in	* 5	*

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4.7.3 Drawbar pull test. The auger shall be operated so as to apply a downward force of not less than 5,000 lb. This shall be done 50 times. The auger shall then be anchored to the ground, the auger bar control placed in the raised position, and the auger operated to exert not less than 5,000 lb raising effort at the auger bar. Afterwards, the auger assembly shall be visually inspected for evidence of any structural failure. Inability to apply the required downward or raising force or evidence of any structural failure shall constitute failure of this test (see 3.5.1(d) and 3.5.1(e)).

#### 4.8 Pole setting and winch operational test.

4.8.1 Pole setting. Set a power or a telephone pole of the I-treated, 75-foot class in a vertical hole using the pole grabber and auger bar housing or derrick as a boom. Inability to set the pole in a vertical position or damage or permanent deformation to the auger or pole-setting equipment shall constitute failure of this test (see 3.6 and 3.6.1).

4.8.2 Winch operation. Operate the winch drum for 15 minutes with the engine running at approximately 1/3 governed speed and for 15 minutes at full-load governed speed. Then test the brake by lifting, lowering, stopping, and holding a load of 10,000 lb on the bare drum. Inability of the drum to turn, operate independently of the auger, or failure of the brake to stop and hold a load of 10,000 lb shall constitute failure of this test (see 3.6.2.).

4.8.3 Drum capacity. Wind a 7/16-inch diameter wire rope on the drum until the drum is filled to capacity. Measure the length of the wire rope that is wound on the drum. A length of less than 150 feet shall constitute failure of this test (see 3.6.2.).

4.8.4 Single-line pull. With the winch drum bare, raise a 10,000 lb load, using a single line. A line speed of less than 50 fpm or a line pull of less than 10,000 lb shall constitute failure of this test (see 3.6.2.).

### 5. PACKAGING

5.1 Preservation. The preservation shall be level A, B, or Commercial as specified (see 6.2).

#### 5.1.1 Level A.

5.1.1.1 Methods of preservation. Cleaning processes, drying procedures, preservatives, and methods of preservation specified in the following paragraphs are listed in MIL-P-116 and shall conform to the requirements of MIL-P-116 and any applicable specifications.

5.1.1.2 Cleaning and drying. Prior to the application of preservative compounds or paint, surfaces shall be cleaned by process C-1 and dried by any applicable procedure of MIL-P-116.

5.1.1.3 Unprotected surfaces. Unprotected exterior metal surfaces requiring the application of a contact preservative in accordance with MIL-P-116 and not specifically provided for herein shall be preserved as follows:

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5.1.1.4 Truck. The truck shall be preserved in accordance with level A (mobile) requirements of MIL-STD-281.

5.1.1.5 Gears.

5.1.1.5.1 Exposed gears. Exposed gears shall be coated with Type P-1 preservative.

5.1.1.5.2 Enclosed gears. Gear housings shall be filled to the operating level with the operational lubricant and the gears actuated to assure coating all interior parts and surfaces with the lubricant.

5.1.1.6 Clutch. With the cover plates removed and the clutch engaged, all interior components of the clutch shall be sprayed with primer conforming to TT-P-664. Coating of nonmetallic surfaces shall be kept to a minimum. Clutch control mechanisms not enclosed shall be coated with type P-1 preservative. After being sprayed, spring-loaded-type clutches shall be blocked in a partially disengaged position to prevent contact between the disk facings and pressure plated. Snap-over-center and toggle-in-type clutches shall be completely disengaged. The clutch shall not be operated after application of preservatives.

5.1.1.7 Exposed drive chains. Exposed drive chains shall be coated with enough type P-3 or P-9 preservative to insure penetration of the preservative to the inner surface of the rollers, pins, and bushings. After the excess preservative has drained, the entire chain and the unpainted surfaces of the sprocket shall be coated with type P-1 preservative.

5.1.1.8 Hydraulic systems. The hydraulic fluid supply tanks shall be filled to the operating level with hydraulic fluid required for operation. The pistons shall be retracted as far as practicable into the cylinders and secured. When the pistons cannot be fully retracted, the exposed portions of the piston rods (ramshafts) shall be coated with type P-6 preservative and the coated surfaces wrapped or covered with barrier material conforming to MIL-B-121, type I, grade A, class 2, extending the wraps approximately 2 inches onto the ram cylinders. The wraps shall be secured in place with waterproof tape conforming to PPP-T-60, type IV. When the pistons can be fully retracted, any remaining uncoated surfaces of the piston rods shall be coated with type P-1 preservative, with no wrapping required. The hydraulic control valves shall be secured in the neutral position and preserved as specified herein for piston rods. Hoses shall not be disconnected. Any other exterior metal surface of components of the system requiring the application of a contact preservative shall be coated with type P-1 preservative. A tag conforming to UU-T-81, type A, shall be attached to the control lever indicating: "The hydraulic supply tank is filled to the operating level with fluid required for operation." Markings shall be applied to the tag with a waterproof material conforming to MIL-STD-129.

5.1.1.9 Engine. The engine and engine accessories shall be preserved in accordance with level A requirements of MIL-E-10062, type II, method I.

5.1.1.10 Winch. Components of the winch shall be preserved as specified herein for parts and assemblies having similar characteristics.

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5.1.1.11 Wire rope. Wire rope shall be preserved method I by coating with type P-1 preservative. The preservative shall be applied to all surfaces of the wire rope. Excess preservative shall be allowed to dry (at least 4 hours). The wire rope shall be bundled or coiled and wrapped with a barrier material conforming to MIL-B-121, type I, grade A, class 2 or grade C and secured.

5.1.1.12 Technical publications. Technical publications for each piece of equipment shall be preserved method IC-1 or IC-3.

5.1.1.13 Repair parts. The preservative application criteria and applicable methods of preservation of MIL-P-116 shall be used to preserve repair parts. When specified (see 6.2), the engine repair parts shall be preserved and packaged in accordance with level A of MIL-R-196.

5.1.1.14 Maintenance tools. Maintenance tools shall be preserved in accordance with level A requirements of PPP-P-40 and placed in the toolbox.

5.1.1.15 Consolidated packaging. Loose components such as auger bits mounting accessories, repair parts, and technical publications shall be packed in close-fitting boxes conforming to PPP-B-621, class 1, style optional, or PPP-B-601, domestic type, style optional. Cushioning and blocking to prevent movement and damage to the contents shall be provided. Strapping shall not be required.

5.1.2 Level B. Level B preservative shall be the same as level A with the following exceptions:

5.1.2.1 Truck. The truck shall be preserved in accordance with the level B (mobile) requirements of MIL-STD-281.

5.1.2.2 Clutch. Spring-loaded-type clutches shall be blocked in a partially disengaged position to prevent contact between the disk facings and pressure plates. Snap-over-center and toggle-in type clutches shall be completely disengaged. Preservation of the clutch components shall not be required.

5.1.2.3 Exposed drive chains. Exposed drive chains shall be coated with enough type P-3 or type P-9 preservative to assure penetration of the preservative to the inner surfaces of the rollers, pins, and bushings.

5.1.2.4 Wire rope. The wire rope shall be wound on the winch drum and secured to prevent unwinding. Preservation of the wire rope shall be as specified in 5.1.1.11.

5.1.3 Commercial. The equipment shall be preserved in accordance with the contractor's standard practice in a manner to prevent deterioration and damage during shipment. Preservation procedures and containers shall comply with applicable carrier rules and regulations.

5.2 Marking. Marking shall be in accordance with MIL-STD-129.

## 6. NOTES



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6.1 Intended use. The earth auger is intended for use in the rapid boring of holes in earth and may be used as a maintenance unit on communication lines and power lines.

6.2 Ordering information. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. When contractor is to furnish first production vehicle (see 3.2, 4.2, and 6.3).
- c. If means for lubrication shall be other than the manufacturer's standard practice (see 3.9.2).
- d. If auger shall be treated and painted other than with the manufacturer's standard practice (see 3.11).
- e. Level of preservation required (see 5.1).
- f. When engine repair parts are to be preserved and packaged (see 5.1.1.13).

6.3 First production vehicle. When a first production vehicle inspection is required, the vehicle shall be tested and should be a first production vehicle or a standard vehicle from the contractor's current inventory. The contracting officer should include specific instructions in the contract regarding arrangements for examination, test, and approval of the first production vehicle (see 3.2 and 4.2).

6.4 Soil classification. The soil specified herein is of the type designated as GW-GS on the Soil Classification Chart adopted by the Bureau of Reclamation and the Office, Chief of Engineers, January 1952 (see 3.5.1 (b)).

6.5 Supersession data. This specification replaces military specification MIL-A-29247(YD) dated 24 October 1986.

Preparing Activity:

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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.