

OO-C-2764
 SUPERSEDING
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FEDERAL SPECIFICATION

CRANES, CRAWLER MOUNTED, COMMERCIAL, DED

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers diesel powered, crawler mounted commercial cranes, mounted with a boom for use as a crane with the capability of being converted for clamshell, dragline, and pile-driving operations.

1.2 Classification. Cranes shall be of the following sizes as specified (see 6.2):

Size	Minimum Rated lifting capacity (tons)
1	15
2	30
3	40
4	60
5	70

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, 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).

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 self-addressed Standardization *

*Document Improvement Proposal (DD Form 1426) appearing at the end of this *

*document or by letter. *

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OO-C-2764

SPECIFICATIONS

MILITARY

- MIL-V-173 - Vanish , fungus resistance.
- MIL-T-704 - Treatment and Painting of Materiel.
- MIL-C-3580 - Cranes and Crane-Shovels, Truck, Crawler, and Wheel-Mounted, Full-Revolving, and Their Attachments, Packaging of.
- MIL-B-16028 - Bucket, Clamshell.
- MIL-B-16029 - Bucket, Dragline.
- MIL-T-52198 - Taglines, Crane and Crane-Shovel, Spring-Loaded Reel Type.

STANDARDS

MILITARY

- MIL-STD-209 - Slings 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.)

2.1.2 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.

Federal Regulations (OSHA)

Occupational Safety and Health Standards.

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal should apply.

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

AMERICAN NATIONAL STANDARDS INSTITUTE, INC. (ANSI)

B30.5 - Safety Code for Crawler, Locomotive, and Truck Cranes.

(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.)

POWER CRANE AND SHOVEL ASSOCIATION (PCSA)

No. 1 - Mobile Power Crane and Excavator.

OO-C-2764

(Application for copies should be addressed to the Power Crane and Shovel Association, Marine Plaza, Suite 1700, 111 East Wisconsin Avenue, Milwaukee, WI 53202).

SOCIETY OF AUTOMOTIVE ENGINEERS, INC. (SAE)

SAE J534 Lubrication Fittings
 SAE J765 Crane Load Stability Test Code
 SAE J833 USA Human Physical Dimensions
 SAE J881 Lifting Crane Sheave And Drum Sizes
 SAE J959 Lifting Crane Wire-rope Strength
 SAE J987 Rope Supported Lattice Type Boom
 Crane Structures Method Test Of
 SAE J994 Travel Alarm Audible

(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 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 Description. This specification consists of a crawler mounted fully revolving superstructure, with mounted boom for use as a crane, with the capability of being converted for clamshell, dragline, and pile-driving operations. Each crane shall be complete and ready for the specific operation. The crane shall be capable of traveling over rough ground under adverse or severe conditions. The crane shall comply with the mobile power crane and excavator standard PCSA No. 1.

3.2 First article. When specified (see 6.2), the contractor shall furnish a crane of the size as required for first article inspection and approval (see 4.2.1 and 6.3).

3.3 Standard commercial product. The crane 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 crane 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.

3.4 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

OO-C-2764

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 are allowed under this specification.

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 Maintainability. The crane design, together with component and accessory location and installation, shall permit ready accessibility to all items requiring periodic maintenance service in the field, which will be accomplished with the use of conventional general-purpose tools associated with equipment of this nature. The replacement and adjustment of components and accessories shall be accomplished with minimum drainage requirements and minimum disturbance to other elements of the crane.

3.7 Safety. The crane shall comply with OSHA regulations and ANSI B30.5. All rotating or reciprocating parts and all parts subject to high operational temperatures, that are of such a nature or are so located as to become a hazard to the operating or attending personnel, shall be substantially guarded, or insulated, to the extent necessary to eliminate the hazard. The principal platform walking surfaces shall be of an antiskid type. Ladders, steps, and handholds shall be provided in such quantity and of such size on the sides of the crane cab or super-structure that entrance thereto and exit therefrom may be unhampered and nonhazardous. Engine cooling fans shall have heavy grille or ring type guards. Crane shall be equipped with an audible alarm to alert when crane is being moved forward or backwards in accordance with SAE.J994 .

3.7.1 Hazard marking stripes. Hazard marking stripes shall be applied to the counterweight, boom point and hook block cheek plates. Stripes shall be manufacturers standard safety yellow applied over the crane paint. Stripes shall be 2 inches wide spaced 2 inches apart and extending at a 45 deg angle from the vertical.

3.8 Safe load capacities chart. A permanent chart indicating all the safe load capacities on each boom reach and radii, shall be posted in the crane cab near the operator and also on the outside of the crane. The safe load capacity chart shall reflect the manufacturer's standard commercial rating for the size and model crane furnished, and not be limited to the minimum required capacities specified.

3.9 Transportability. The crane shall be so designed and constructed that it can be conveniently disassembled into major components that come within the size and weight limitations for rail and highway transport.

3.10 Performance.

OO-C-2764

3.10.1 Lifting capacity. The crane shall have rated lifting capacities of not less than the load or loads specified (see 6.2), at the radius or radii specified (see 6.2), with the boom length or lengths specified (see 6.2), with bucket size and type as specified (see 6.2), when tested in accordance with 4.4.5.

3.10.2 Operational requirements. The crane shall be capable of starting and maintaining constant performance characteristics as specified herein under any of the following conditions or combination of conditions:

- a. Temperature conditioning. In any stabilized temperature from +120 deg Fahrenheit (F) to -20 deg F, except as specified in 3.10.2(b).
- b. Elevation conditions. At any elevation from sea level (barometric pressure 29.92 inches mercury), and a maximum stabilized temperature of 120 deg F to 3,000 feet elevation and a temperature of 107 deg F without adding turbocharger.

Documentation from the engine manufacturer stating that the engine will meet these requirements will be satisfactory with approval of the contracting officer.

3.10.3 Operating characteristics. All operational functions for crane shall operate independently and simultaneously for maximum performance. These functions include hoisting, swinging, and booming. When specified (see 6.2) the crane shall have independent crawler traction.

3.10.3.1 Maneuverability. The crane shall be capable of traveling in a forward or backward direction, with the revolving superstructure in any position, and capable of being steered either to the right to left with controls from the operator's position. The completely equipped crane shall be capable of ascending or descending a 30 percent grade on smooth, firm, dry ground with the applicable front-end attachment located either to the front or back of the crane. Ground clearance shall be not less than 9-1/2 inches, exclusive of the drive chains.

3.10.3.2 Ground bearing pressure. The ground bearing pressure shall be not greater than 11 pounds-force per square inch (psi) for size 1 crane; not greater than 15 psi for all other sizes. Ground bearing pressure shall be determined in accordance with 4.4.2.

3.10.4 Engine power and speed ratings. The maximum governed speed shall be between 110 and 175 percent of the peak torque speed. Torque converter or fluid-coupling equipped engine shall have a maximum governed speed appropriate for the torque converter used, but not more than 2,600 revolutions per minute (rpm). Engines including accessories, shall be capable of developing intermittent brake horsepower (hp) of not less than 130 percent of the drum power required to meet all operating requirements specified herein, at full load governed speed at an elevation up to 3,000 feet.

3.10.5 Crane load stability. Crane stability under loads shall be in accordance with SAE J765. Load rating chart shall be not more than 75 percent of the stability established.

3.10.6 Stress requirements. Design of the completely assembled crane shall

OO-C-2764

be such that the maximum stress imposed will not exceed the minimum strength margins contained in SAE J987. Tests in accordance with SAE J987, shall have been performed on the model crane being provided, and tests results shall be made available for Government inspection at the time of first article tests.

3.11 Superstructure. The superstructure shall consist essentially of a cab enclosing the machinery and operator's position, mounted on a full revolving platform. All operating machinery shall be mounted on and attached to the rotating platform. The boom and machinery shall be attached to the principal members of the platform frame. The principal platform walking surfaces and ladders shall be of an antiskid type. Ladders and steps, when furnished, and handholds shall be provided in such number and of such size on the sides of the superstructure so that entrance thereto may be unhampered and nonhazardous. A ladder shall be attached to the superstructure cab to facilitate accessibility to the gantry and A-frame sheave. Counterweights as required for the crane shall be furnished.

3.11.1 Cab. The cab shall be of sheet metal having sufficient windows and glazed doors to permit approximately 180 deg vision for the operator. Maximum unobstructed visibility of the work, including the point sheaves of the basic boom at operating radii, shall be visible to the operator seated upright and with an eye height of 33.5 inches from the seat. All glass shall be of the safety type, and held in place by rubber channels or other suitable means for easy replacement. Windows shall be arranged for easy opening or removal. A powered windshield wiper shall be furnished, with the control within the reach of the operator. All cab doors, whether of the sliding or swinging type, shall be adequately restrained from accidentally opening or closing while traveling or operating the crane. The seat shall be mounted on a pedestal and base to provide adjustment, without the use of tools, comfortable seating for (95 percentile group SAE J833) any operator in the SAE range of sizes. The adjustments, vertical and horizontal, shall be in increments of not more than 1 inch. The location of the seat shall provide the operator with maximum vision of the work area and access to hand controls and foot pedals. The cab shall be furnished with a commercial heater and a defroster having the adequate heat output for the applicable voltage system. The defroster shall be capable of defrosting not less than 75 percent of the front window area. Both the defroster and heater shall be mounted and positioned to permit routine maintenance and to allow for quick removal. A large heater, used as a combination heater and defroster, is acceptable.

3.11.2 Gantry. The crane shall be provided with a gantry capable of withstanding stresses induced by lifting the entire extended boom from the ground to operating position. The length of boom to be lifted shall be as specified (see 6.2). The principal compression and tension members shall be securely connected to the main structural members of the rotating platform or to other machinery parts capable of sustaining full gantry loading.

3.11.3 Powered load lowering. For crane operations, the primary load hoisting drum shall be equipped with a powered reversing drive and suitable control features to provide precision controlled power lowering of loads by the main hook. The powered load lowering mechanism shall be controlled by a lever conveniently located within the revolving superstructure and shall be capable of lowering all rated loads with the manufacturer's recommended reeving. The powered load lowering mechanism shall be capable of lowering the loads at a

OO-C-2764

smooth, steady controlled rate of speed; and a smooth variable, controlled rate of speed; dependent on engine speed, without jerking, binding, or slipping the load. A braking device may be used to assist the power lowering mechanism. Extended use of the powered load lowering mechanism shall not result in clutch or brake failure by fading, grabbing, cracking, internal rupture, breakage, permanent deformation, or any malfunction. Clutch and brake lining temperatures shall not exceed the maximum recommended by the manufacturer of the lining. The powered load lowering mechanism shall be capable of being disengaged, when not in use, so as not to interfere with normal crane operations. When specified (see 6.2), power load lowering shall be furnished on the primary and secondary load hoist drums.

3.11.4 Boom hoist and power lowering. The crane boom hoist shall be power controlled and shall raise the boom with capacity load. The boom hoist, equipped with a positive holding device shall safely suspend the boom with recommended reeving without attention from the operator, shall provide for power lowering under the operator's control, and shall make gravity lowering (free spooling) of the boom cable impossible under any circumstance. The boom hoist clutch shall be of the friction or electromagnetic type, readily accessible for adjustment and repair, sufficiently large to eliminate slippage under 133 percent of rated load, and shall be controlled by either mechanical linkage, air, manual effort applied through hydraulic linkage, or full power hydraulics.

3.11.5 Drums. The drums shall be independently driven, convertible, suitable for use with any of the different front-end operating equipment, and shall be arranged so as to reduce eccentric pull to a minimum in order to prevent chafing of the rope. Pitch diameters of drums or drum laggings shall comply with the requirements of SAE J881. Unless otherwise specified (see 6.2), the complete drum assembly and mounting shall be designed for free rotation, when clutches and brakes are not engaged, to allow gravity lowering of the hook block. The drum shall be equipped with an adequately constructed socket and a wedge for dead ending the drum rope. Lubricating fittings or other forms of lubricating devices shall be provided and so arranged to permit lubrication without unspooling cable.

3.11.5.1 Drum Lagging. The pitch diameters of the primary or secondary drums or drum laggings shall be not less than 18 times the largest diameter of the rope used, and not less than 15 times the largest diameter of rope used for boom hoist drum, conforming to SAE J881. The drums shall have sufficient rope capacity to accommodate the boom length specified herein.

3.11.5.2 Drum brakes. Load brakes shall be capable, when properly adjusted, of holding, without slipping, or lowering the rated loads on recommended reeving. The brakes shall be capable of being locked in the set position.

3.11.5.3 Drum clutches. Drum clutches shall be of the friction or electro-magnetic type, capable of withstanding rated speed, continuous operation without fading, accessible for adjustment and repair, and sufficiently large to eliminate slippage under 133 percent of rated load with recommended reeving. The primary and secondary load hoist drums shall be operated by clutches controlled by levers and shall be designed so that once the clutch is engaged, it shall be held in place by an over-center lock (knuckle in) on the control linkage; if air controls are used, the valve lever must be capable of latching in place to hold the clutches in engagement and be able to perform the power lowering tests

OO-C-2764

specified in 4.4.9. The clutches shall be unlocked by pulling or pushing forward on the control lever. Clutches shall be controlled by mechanical linkage, air, manual effort applied through hydraulic linkage, or by full power hydraulics.

3.11.5.4 Auxiliary drum. When specified (see 6.2), an auxiliary drum, used for pile-driving operation, shall be provided for the crane. The drum shall be engaged by a clutch operable from a control lever in a position within easy reach of the operator while seated.

3.11.6 Rollers.

3.11.6.1 Supporting rollers. The rotating frame shall be supported by large fixed rollers or by a live ball or roller ring. The rollers shall be heat-treated steel and shall be accurately machined. Fixed rollers shall be fitted with antifriction or bronze bearings, with grease fittings. When the revolving superstructure is tested in accordance with 4.4.7, the temperature rise of the supporting balls or rollers shall be not more than 175 deg F. The balls or rollers shall be accessible and shall be removable.

3.11.6.2 Hook rollers. Where the holddown function is performed by hook rollers, the rollers may be of the dual-purpose type in which one set of rollers performs both the supporting and holddown functions or they may be of the holddown type only. Hook rollers may operate singularly or in pairs of tandem bogies and shall be provided with grease fittings. Hook rollers shall be provided with means for vertical or horizontal adjustment.

3.11.7 Swing. When the revolving superstructure is tested in accordance with 4.4.8, the swing speed shall be not less than 2 rpm for size 1, 2 rpm for size 2, and 2 rpm for the remaining sizes.

3.11.7.1 Swing mechanism. The swing gear pinion shall have accurately machined or ground teeth of alloy steel. The swing gear pinion shall operate in antifriction or bronze bearings equipped with means for lubrication. The rotation of the rotating frame shall be controlled by a hydrostatic drive system or through friction or electromagnetic type clutches designed for fast cycling, craning, and other operations, and with a clutch capable of transmitting not less than 75 percent of the maximum engine torque. The temperature of the swing clutches shall not exceed the maximum temperature recommended by the clutch lining manufacturer. Clutches shall be of the friction or electromagnetic type, and shall be controlled by mechanical linkage, air, or manual effort applied through hydraulic linkage, or by full power hydraulics.

3.11.7.2 Swing lock or brake. A swing brake, controlled from a position within easy reach of the operator while seated, shall be provided to hold the superstructure in any desired position. When specified (see 6.2), a separate superstructure lock shall be furnished to prevent the swing of the revolving superstructure.

3.11.8 Power transmission. Unless otherwise specified (see 6.2), the engine shall be connected to the transmission through either friction clutch or friction disengaging clutch and fluid coupling. When specified (see 6.2), friction disengaging clutch and a hydraulic torque converter of commercial standard design, which has been proven satisfactory in extensive crane use,

OO-C-2764

shall be furnished. The clutch shall be controlled from the operator's position and be arranged to engage and disengage instantly while the engine is running.

3.11.9 Electrical system. The electrical system for the revolving superstructure shall include the equipment as specified herein. Power shall be supplied by a 12- or 24-volt (V) alternator.

3.11.9.1 Wiring harness. The electrical cable shall be manufacturer's standard normally provided on commercial models. The harness shall be clipped to the frame members or installed in conduit. The circuits shall be color or number traced. Means to prevent chafing of the cable, when passing through structural members or sheet metal, shall be provided.

3.11.9.2 Floodlight mounting locations. Detachable light housings shall be located and equipped as specified herein. They shall not extend beyond the side of the cab of the revolving superstructure unless provision is made for an adjustable bracket to fold clear of the cab sides for transport. The housing shall be located so that the lenses cannot be seen by the operator when seated in a normal operating position. The floodlights shall be secured in brackets that are designed and constructed to withstand severe shock and vibration, and that will permit horizontal and vertical movement of the light beam and positive clamping of the lights in any position.

3.11.9.2.1 Revolving superstructure floodlights. The revolving superstructure cab shall be equipped with two light housings equipped with floodlights mounted to illuminate the working area. When specified (see 6.2), two additional floodlights mounted on each side of the base section of boom shall be furnished to illuminate the working area.

3.11.9.2.2 Skirt-mounted floodlights. When specified (see 6.2), two housings equipped with floodlights shall be mounted, one on each side of the superstructure and the skirt as near the sides and bottom of the skirt as practicable, but not higher than midpoint between the bottom of the skirt and the bottom of the operator's window.

3.11.9.3 Interior lights. The cab shall have three ceiling lights effectively located, with commercial fixtures for 21 candlepower, rough service lamps with bulb.

3.11.9.4 Instrument lights. Instrument lights shall be provided for the illumination of the instrument panel. The lights shall have a 12- or 24V rating and be of a quality equal to that used in good commercial practice.

3.11.9.5 Circuits, circuit breakers, and switches. Lights shall be controlled by single-pole, single-throw type, toggle switches, and be protected by reset type circuit breakers. Switches shall be located on the instrument panel in the revolving superstructure within reach of the operator when seated. One switch and associated electrical circuit shall be provided for the independent control of the following light combinations, as furnished:

- a. Revolving superstructure floodlights.
- b. Skirt-mounted floodlights, when applicable
- c. Interior cab lights.
- d. Instrument lights.

OO-C-2764

The starter button and gages for the engine shall also be mounted on or near the above panel with the light switches. Each switch, control, or gage on the instrument panel shall be identified. Arrows or any appropriate mark showing the direction the control shall be moved to operate, if pertinent, shall be provided.

3.11.10 Horn. A suitable warning horn shall be mounted on the superstructure and within the transport cube formed by the crawler and superstructure. The horn shall be operated by a control, of good commercial quality, mounted within reach of the operator.

3.11.11 Control Levers. The crane shall be controlled by the minimum quantity of hand levers and foot pedals necessary for efficient operation. All levers and pedals shall be conveniently located and arranged for easy access and operation by the operator when seated in the normal operating position without causing obstruction to the operator's view of work. All controls, wherever located, shall be directional so as not to interfere with the normal operations of the crane in accordance with ANSI B30.5. All brakes shall be capable of being easily locked and unlocked. Control levers shall be free of all latches which may seriously delay emergency operation. All levers and pedals shall be permanently marked as to the function it controls, including the following: load hoist-load lowering, boom hoist-boom lowering, swing right-swing left, throttle, service brake, and travel forward-travel backward. When the same lever controls more than one function, all such functions shall be marked.

3.12 Engine. The crane engine furnished, shall be of the diesel type having hp, torque, and speed characteristics to meet satisfactorily all the crane performance requirements specified herein. The diesel engine shall start within 5 minutes and be ready for full load operation within 15 minutes in any ambient temperature from +120 deg F to -20 deg F. When a fluid priming system is required, 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 oil gage, a cooling liquid-temperature indicator, a battery charge and discharge rate indicator, a tachometer, and an hour meter.
- b. Fuel tank(s) with sufficient capacity for 8 hours normal operation.
- c. 12- or 24V electric cranking system.
- d. Battery(s) shall be dry charged in accordance with W-B-131, furnished without electrolyte, and provided with sealed caps to prevent the intrusion of atmospheric moisture.
- e. Charging alternator with a capacity rating compatible to the system.
- f. Cooling-liquid high temperature safety device of the warning type.
- g. Lubricating oil safety device.

3.12.1 Torque converter and temperature indicating device. When a torque converter is furnished for the crane, a temperature indicating device shall be mounted on the instrument panel to register the torque converter oil temperature.

3.13 Crawler mounting.

3.13.1 Crawler base. The crawler base shall be a steel casting or shall be rigidly constructed of heavy steel, fitted and welded, and shall be constructed

OO-C-2764

to prevent permanent distortion or yielding in traveling across sharp depressions and uneven ground. The swing gear and turntable roller path shall be steel and shall be rigidly attached to or integral with the base. The swing gear shall have accurately machined or ground internal or external teeth. The turntable mounting surface shall have an accurately machined or ground surface, and shall be of sufficient size and strength to support the revolving superstructure under all conditions without permanent distortion. Where the center pin performs the holddown function to prevent tipping, the pin shall be of high-strength steel and shall have all bearing surfaces accurately machined or ground to size and shall be provided with adjusting devices accessible from the rotating frame, or the center pin may be of a separate flanged casting, or forging, bolted to the underframe. Where hook rollers perform the holddown function, the lower member of the center pivot bearing shall be integral with, shrunk into, or welded to the crawler base and shall be steel with smooth bearing surfaces. The center pin or gudgeon shall operate in bronze or antifriction bearings.

3.13.2 Track assembly . The crawler tracks shall be of a width and length suitable for the crane; constructed for operation in loose dirt, mud, and rocks; be provided with suitable adjustments for maintaining proper tension in the track belts; and be so designed that the track belts cannot be accidentally disengaged. The track shoes shall be of wear-resisting steel and of the flat self-cleaning design. The track-connecting pins shall be of steel and of sufficient size, hardness, and strength for the purpose intended, and shall be capable of being removed and replaced. The tracks shall be supported on a sufficient number of steel rollers in such a manner so as to distribute the weight of the entire crane uniformly over the ground for the entire length of the crawlers, without depending upon the tension in the track for support. All track assembly shafts and rollers shall be provided with guarded grease fittings. Where practicable, grease fittings shall be located so as to be accessible from outside the crawlers and lower base.

3.13.3 Side frames. The crawler track side frames shall be steel castings or welded steel members. When side frames are not used, large track rollers shall be used with not less than four axles supporting the lower base.

3.13.4 Crawler drive. The crawler shall be driven by machine cut or cast gears, roller chains, or hydraulic power. The travel mechanism shall have positive steering, by means of independently operated friction brakes and clutches, or positive locking lugs engaged by sliding jaw clutch member, controlled from the operator's cab. The crawler clutches shall be of a size to permit constant operation without overheating. Brakes or other locking means shall be provided to hold the crane stationary during the working cycle while the crane is on level grade, or any grade at which it will operate satisfactorily, and to prevent the crane from accidentally rolling down a 30 percent grade. Jaw clutches, when furnished, shall have a sufficient number of teeth to be readily engaged and to transmit traction power without undue wear commensurate with design as regularly employed throughout industry for cranes or shovels. The travel mechanism shall be protected against the entrance of dirt or other foreign matter. The propelling shaft shall be so arranged that it is not one of a part of the supporting axles. All shafts shall be properly bushed or provided with antifriction bearings and ball-check grease fittings.

3.13.5 Axle. Each axle or crossmember, when used, shall be either of cast,

OO-C-2764

forged, or fabricated steel. When more than one-piece fabricated steel axles are furnished, the edges to be joined shall be aligned and shall have a continuous weld so that the requisite weld penetration for transference of maximum design stress through the base metal juncture shall be provided.

3.14 Front-end attachments. Each crane shall be equipped with all necessary equipment to permit operation as a lifting crane. When specified (see 6.2), the boom point shall accommodate a piledriver lead adapter as shown in figure 2. The following attachments shall be furnished with each crane as specified (see 6.2); such attachments shall be complete with all necessary parts, including wire rope, required for satisfactory functioning.

- a. Crane boom
- b. Boom jib.
- c. Crane hook block.
- d. Swivel overhaul weight and hook.
- e. Clamshell bucket.
- f. Lagging for clamshell operation.
- g. Tagline.
- h. Dragline bucket.
- i. Lagging for dragline operation.
- j. Dragline fairlead.

3.14.1 Crane boom. The crane boom shall include the boom, boom safety stop(s), center sections, and boom angle indicator. Booms shall be of the manufacturer's standard practice, for the specific model crane involved. Unless otherwise specified (see 6.2), the boom center sections shall be furnished in accordance with the manufacturer's standard lengths having pinned connections for easy assembly. Booms shall be provided with the least number of center sections required to make up to the specified boom length in 10-foot increments. The boom point shall have at least three parallel guarded sheaves. When specified (see 6.2) an anti-two blocking switch shall be provided on main hoist with audio-visual warning and function kickout.

3.14.1.1 Boom safety stop(s). Boom stop(s) shall be furnished in order to provide a safeguard against overtopping of the boom and shall be installed so as to limit the boom angle to not more than 85 deg above the horizontal plane. The boom stop(s) shall provide a shock-absorbing action and shall remain assembled when the boom point is lowered to the ground.

3.14.1.2 Boom angle indicator. The boom angle indicator shall be of the pendulum type swinging on bearings. The pointer shall indicate the angle of the boom with the horizontal plane and shall be clearly visible to the operator. A chart located in the cab near the operator shall be provided showing rated lifting capacities at various boom angles for various boom lengths, with a statement of deductions to be made when using jibs if a jib is specified (see 6.2).

3.14.1.3 Boom hoist clutch throwout. Means shall be provided to disengage the clutch of boom hoist drum when the hoisting boom has reached the maximum angle or height and in contact with the boom stop(s).

3.14.2 Boom jib. The boom jib shall be readily attached to the crane boom (without piledriver leads in place). Minimum length of boom jibs shall be as

OO-C-2764

specified (see 6.2), and shall be of the manufacturer's standard. Boom jib shall be provided with necessary riser and holdback ropes, complete with adequate overhaul block and hook.

3.14.3 Crane hook block. The rated capacity of the crane hook block shall be not less than the rated capacity of the crane with which it is furnished. The hook block shall be of the forged steel, swivel type with an ultimate strength of four-times the maximum safe rated load and shall include a safety latch on the hook. The block and hook shall have adequate weight to insure payout of the cable without load on the hook in any position. Block assembly shall be provided for attachment to the hoist cable for not less than two part reeving. Means shall be provided to secure hook block while traveling. There shall be no voids or discontinuities in the hook when inspected in accordance with 4.4.4. The hook block shall permit disassembly for visual and nondestructive testing. The hook shall not be painted.

3.14.4 Clamshell bucket. The clamshell bucket shall conform to MIL-B-16028, type II. When specified (see 6.2), side and corner teeth shall be furnished for the clamshell bucket.

3.14.5 Tagline. The tagline shall conform to MIL-T-52198, having sufficient capacity to operate with the size of crane specified. All necessary parts for installations shall be furnished.

3.14.6 Dragline bucket. The dragline bucket shall conform to MIL-B-16029 and, unless otherwise specified (see 6.2), shall be type II class.

3.14.7 Dragline fairlead. The fairlead shall be mounted in accordance with the manufacturer's standard practice. The fairlead shall be of the four-sheave swinging or two-sheave revolving type. The fairlead shall have either replaceable wearing plates, or replaceable guide rollers; shall have bronze-bushed or antifriction bearing-mounted sheaves with smooth cable grooves; shall be arranged to avoid chafing the drag cable in any working position; and shall be rigidly mounted with heavy structural reinforcements, in order to withstand the impact loads or maximum stresses at minimum allowable boom radii during heavy operations.

3.15 Sheaves. The pitch diameter of load hoist line sheaves at boom point shall be not less than 18 times the diameter of the largest rope used, and all other sheaves shall have pitch diameters of not less than 15 times the diameter of the largest rope used thereon conforming to SAE J881. Flanges on the boom point sheaves shall extend beyond the rope grooves not less than 1.75 times the diameter of the rope and shall have a Brinell hardness of from 229 to 321. All sheaves shall be guarded to prevent the rope from leaving the sheave groove during operation. The sheave pins shall be of medium carbon or alloy steel and shall be of sufficient size and strength to support the sheaves under maximum operating conditions.

3.16 Ropes. Ropes, other than for tagline and dipper trip lines, shall be not less than IWRC, improved plow steel, uncoated, preformed, right regular lay. All load and running ropes shall have a factor of safety of not less than 3.5. All standing parts or guy ropes shall have a factor of safety of not less than 3.0. Wire rope strength factors shall conform to SAE J959.

OO-C-2764

3.16.1 Rope sockets. Ends of standing ropes shall be secured by swaged type pendant fitting or by zinc-speltered steel-sockets. All other ropes, except tagline, shall have ends attached by wedge type sockets. Clamps, clips, and screw wedge connectors shall be permitted only on tagline.

3.16.2 Rope lengths. Rope shall be of the greatest length required to perform as a crane performing the functions specified in table I, and based on a boom length 15 feet greater than the actual boom length specified, the boom hoist shall have sufficient rope to allow the tip of the boom to be lowered to rest on level ground with three wraps of rope remaining on the boom hoist drum. In addition, pendant ropes shall be supplied for each center section of boom furnished.

TABLE I. Crane function to determine rope lengths.

* Function	Position of boom	Position of attachment	*
* Crane hook	At minimum radius	At ground level	*
* Clamshell	60 deg from horizontal	20 percent of boom length (in feet) below ground level.	*
* Dragline	40 deg from horizontal	50 percent of boom length (in feet) below ground level and 30 percent of boom length (in feet) beyond boom tip.	*
* Piledriving	At basic boom height	Two basic boom lengths +50 feet below ground level.	*
* Auxiliary drum hoisting	At maximum boom height.	Two boom lengths +20 feet.	*

3.17 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.

3.18 Lifting and tiedown attachments. When specified (see 6.2), the crane 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 crane. 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 crane on the carrier when shipped.

3.19 Identification marking. Identification plates shall be provided for each crane. An identification plate shall be securely fastened to each crane attachment furnished, including the boom, jib, and each crane boom section in a

OO-C-2764

conspicuous location. The crane attachment identification plate shall be copper or aluminum base alloy, of suitable size as determined by the contractor, and shall include the following information permanently marked thereon:

(Attachment nomenclature)
FOR USE WITH
(Name of crane manufacturer)
(Model number or numbers of crane)
(Range of applicable crane serial numbers furnished
under the applicable contract)

The range of crane serial numbers will encompass the lowest machine serial number and the highest known machine serial number designed to use the attachment without modification. When an attachment is common to more than one crane model number, all applicable model numbers shall be listed.

3.20 Instruction plates. The crane 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 thereto with nonferrous screws or bolts of not less than 1/8-inch diameter.

3.21 Stenciling. The gross weight of each crane with equipment shall be stenciled on each side of the crane in such a manner as to be readily discernible to dock and Military personnel.

3.22 Lubrication. 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 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 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. When specified (see 6.2), the unit shall be cleaned, treated, and painted in accordance with MIL-T-704, type A.

3.24 Workmanship.

3.24.1 Steel fabrication. The steel used in fabrication shall be free from

OO-C-2764

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.

3.24.2 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.

3.24.3 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.

3.24.4 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.

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

3.25 Special tools and toolbox. A clogged compartment or toolbox shall be provided to carry tools and accessories. Those specific tools that are unique to the crane furnished and are required for operation, shall be furnished. Toolbox, when furnished to hold tools and accessories, shall be made of sheet steel having a nominal thickness of 0.0299 inch (US standard gage No. 22). The toolbox shall have a hinged lid and a truck drawbolt of a type that will keep the lid closed when the toolbox is subjected to vibration. The toolbox shall be securely fastened to the unit in a protected and accessible location.

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 the specification where such inspections are deemed necessary to ensure 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.

OO-C-2764

The absence of any inspection requirements in the specification 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 one crane when a first article is required (see 3.2 and 6.2). This inspection shall include the examination of 4.3, the tests of 4.4.1 through 4.4.14, 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 4.4.15, and the packaging inspection of 4.5.

4.3 Examination. Each crane shall be examined for compliance with the requirements specified in section 3 of this specification. 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. Failure to pass any phase of the following tests shall be cause for rejection.

4.4.1 Maneuverability test. The crane shall be given the tests necessary to determine that its maneuverability conforms to that specified in 3.10.3.1.

4.4.2 Ground bearing pressure test. The ground bearing pressure is derived by dividing the total working weight with complete front-end equipment, but not including load, by the bearing area in square inches. The weight shall be determined by platform scales, by calibrated hydraulic, or electronic devices and the bearing area used shall be the center-to-center distance between crawler end sprockets multiplied by twice the width of the track shoe. In lieu of this

OO-C-2764

test the ground bearing pressure may be determined by calculation in accordance with the P.C.S.A. Standard No. 1 Formula.

4.4.3 Stability-test. Crane stability test shall be conducted in accordance with the procedures in SAE J765.

4.4.4 Crane hook test. The crane manufacturer shall furnish certification, from the crane hook manufacturer, that the hook furnished with the crane is of compatible size, having the proper load capacity and safety factor, without defects or discontinuities. If the certification is not furnished, the crane hook shall be tested as follows: The crane hook shall be given a wet or dry ferromagnetic particle test for surface or subsurface cracks or discontinuities. Either method of test used shall show clearly visible particles defining existing discontinuities. Any indication of cracks or discontinuities shall be cause for rejection.

4.4.5 Lifting capacity tests. Lifting capacities of crane shall be determined by use of actual weights using the basic boom length, the maximum boom length, and one intermediate boom length as specified. The loads at the tipping point and the boom radius shall be measured as specified in SAE J765.

- a. Rope strength. The safety factor of the wire rope based on the rated load at minimum working radius and the reeving recommended by the crane manufacturer shall be checked for conformance to 3.16.
- b. Load cells. Lifting capacity tests using load cells may be substituted for the load test covered above.

4.4.6 Power and speed test. Power and speed test shall be conducted as follows:

- a. Check clutches and brakes and adjust to manufacturer's specifications.
- b. Assemble a test load to approximately 1/2 the rated load at minimum boom radius.
- c. By trial lifts, adjust the load so as to require not less than two parts of hoist line and provide steady hoisting rate near full load governed engine speed. Establish a mark on the hoisting rope at a point near the primary hoist drum when the load is 3 feet clear of ground. Establish a second mark on the rope when the load has been lifted to a point where the blocks are approximately 3 feet apart, or before interference occurs between the load and crane structure. Lower the load and measure a linear foot of rope between the two marks. Using a stopwatch accurate to +/-0.2 second in 1 minute, time the interval required for the two marks on the hoisting rope to pass a selected point while the load is being lifted with the engine operating at maximum governed speed. At least three checks shall be made for an average. Compute the hoist line speed in feet per minute.
- d. Assemble a test load equal to the hoisting drum line power divided by the applicable line speed. Determine that the crane is capable of lifting this load, with a single hoist line, and simultaneously rotating the superstructure.
- e. Using the required length of boom specified, rest the boom tip on the ground to assure three wraps of rope are left on the boom hoist drum (see 3.16.2).

OO-C-2764

4.4.7 Swing test.

- a. With the boom at minimum radius, rotate the superstructure at full throttle for 10 minutes in each direction in order to determine if excessive heat is generated in the rollers in conformance to 3.11.6.
- b. With the boom at minimum radius, continually rotate the superstructure at full throttle through an arc of 180 deg, back and forth, for 10 minutes, to determine if excessive heat is generated in swing clutches.
- c. Test the swing lock or brake at an engine speed of 600 rpm by actuating it in several positions of the base, attempting to swing the superstructure from those positions.

4.4.8 Service brake test. Inspect to see that a service brake or other locking means is provided and insures positive braking of the crawlers (see 3.13.4.).

4.4.9 Powered load lowering test for crane. General inspection of the power-down system shall be made for adequate lubrication, ease of operation of controls, safety precautions, and for good manufacturing practices. The powered load lowering system shall be tested as follows to determine conformance to 3.11.3:

- a. With the crane equipped with a boom of the maximum length, position the revolving superstructure in the most stable craning position and assemble a single line load equal to the maximum rated load divided by the recommended number of parts of hoist line reeving.
- b. Position the boom angle for the minimum working radius.
- c. Hoist the load 20 feet above the ground level, +/-3 inches, or until interference with the crane boom is obvious.
- d. Prepare the crane for power-down operation on the main load line.
- e. Operate the power load lowering system in accordance with manufacturer's instructions, and lower the load under power. Vary the speed of the load by varying the speed of the engine.
- f. When the load reaches the ground, immediately repeat the operations c., d., and e. These operations shall be repeated until 20 cycles have been completed.
- g. Check the temperatures of all linings employed in this operation with at least four thermocouples imbedded within each lining, near the working face, and uniformly spaced around the perimeter, or with a contact pyrometer placed directly on the lining.

4.4.10 Load holding test. Suspend load; stop the engine; jam lock a meshing pair of gears; positively apply the primary hoist drum clutch and release the brake holding the load. As the brake is released, inspect the clutch for slippage. The clutch shall have adequate capacity to hold this load without slipping. Suspend a capacity load; stop the engine; positively engage primary drum clutches; disengage the master clutch and lower the load on the brake backing down the hoist machinery without raising the boom. An inspection shall be made for ease of control operation, smoothness of load lowering, and machinery operation. This operation shall be performed without binding, chattering of machinery, slipping at the clutches, or unusual effort of the operator.

OO-C-2764

4.4.11 Measurement of electromagnetic radiation. When required to determine conformance to 3.17, electromagnetic radiation shall be measured in accordance with SAE J551. When suppressed to conform to 3.17, the manufacturer may, upon approval of the contracting officer, furnish a certification in lieu of the test that the crane 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.

4.4.12 Lifting and tying down attachments tests. When furnished, the lifting and tying down attachments shall be tested to conform to 3.19.

4.4.13 Test records. Contractor's records of all first article tests and inspections, giving the results of said tests and inspections to determine compliance with the requirements of this specification, shall be kept complete and available to the Government's representative and the contracting officer. Test and inspection records shall be signed and approved by a person specifically assigned by the contractor. Contractors not having laboratory testing facilities satisfactory to the Government shall engage the services of a commercial testing laboratory, satisfactory to the Government, capable of conducting required tests to determine compliance with all the requirements of this specification.

4.4.14 Production sample. Upon acceptance of the first article, the first article shall remain at the manufacturing facility as a production sample, and shall be the last crane delivered on the contract. The first article shall be reconditioned, including replacement of abnormally worn parts and paint touch-up or repainting, prior to delivery to enable it to be accepted as a contract item. The contractor shall maintain the first article in a serviceable condition for the duration of the contract.

4.4.15 General acceptance tests. Operational acceptance tests shall be made on production units and shall be the manufacturer's standard test procedure conducted prior to shipping.

4.5 Packaging inspection. The inspection of the preservation, packing, and marking shall be in accordance with the requirements of section 4 of MIL-C-3580. 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. PACKAGING

5.1 Preservation packing, and marking. Preservation, packing, and marking shall be in accordance with the requirements of MIL-C-3580 with the level of preservation and the level of packing as specified (see 6.2).

6. NOTES

6.1 Intended Use. Hook work, dragline and clamshell work.

6.2 Ordering data. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Specify size of crane required (see 1.2).

OO-C-2764

- c. When first article is required for first article inspection and approval (see 3.2, 4.2.1, and 6.3).
- d. Lifting capacity required at specific radius or radii, and boom length required (see 3.10.1).
- e. Bucket type and size required (see 3.10.1).
- f. When crane shall have independent crawler traction (see 3.10.3).
- g. Specify the length of boom to be lifted (see 3.11.2).
- h. When power load lowering on both primary and secondary drums are required (see 3.11.3).
- i. When free rotation of drum assembly and mounting is not required (see 3.11.5).
- j. When auxiliary drum is required (see 3.11.5.4).
- k. When separate superstructure lock is required (see 3.11.7.2).
- l. When power transmission shall be other than that specified (see 3.11.8).
- m. When two additional floodlights on base of boom are required (see 3.11.9.3.1).
- n. When skirt mounted floodlights are required (see 3.11.9.3.2).
- o. When piledriver lead adapter is required (see 3.14).
- p. Specify the type of attachments required (see 3.14).
- q. When boom center sections are not manufacturer's standard (see 3.14.1).
- r. Specify the minimum length of boom jib when jib is required (see 3.14.1.2 and 3.14.2).
- s. When clamshell bucket with side and corner teeth is required (see 3.14.4).
- t. When dragline bucket is other than that specified (see 3.14.6).
- u. When electromagnetic interference characteristics are required (see 3.17).
- v. When fungus resistance is required (see 3.18).
- w. When lifting and tying down attachments are required (see 3.19).
- x. When cleaning, treatment, and painting is to conform to MIL-T-704 (see 3.24).
- y. Specify the color of finish coat (see 3.24).
- z. When a preproduction pack inspection is required and time frame required for submission (see 4.2.1 and 4.5). aa. Level of preservation and level of packing required (see 5.1).

6.3 First article. When a first article inspection is required, the item will be tested and should be a first production item consisting of one complete crane 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.

6.4 Key Word Listing

- 1. Crawler Mounted
- 2. Dragline
- 3. Clamshell
- 4. Piledriving
- 5. Lattice Boom

OO-C-2764

MILITARY INTERESTS

Military Coordinating Activity

Custodians:

Navy - YD

Air Force - 99

Preparing activity:

Navy - YD

(3810-0108)

Review activity

DLA - CS Air

Force - 84

User activity

Navy - MC

* INCH-POUND *

OO-C-2764
AMENDMENT-1
22 October 1991

FEDERAL SPECIFICATION

CRANES, CRAWLER MOUNTED, COMMERCIAL, DED

This amendment, which forms a part of OO-C-2764, dated 19 March 1991, is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

PAGE 1

1. Add measurement statement and change document identifier to read:

* INCH-POUND *

OO-C-2764
19 March 1991
SUPERSEDING
MIL-C-15467F
14 November 1983

2. Change preamble to read:

"This specification is approved by the General Services Administration, for use by all Federal agencies."

3. At bottom left of page, delete "NO AMSC."

PAGE 22

Add the following statement at the end of the document:

"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."

Preparing Activity:
Navy - YD

(Project 3810-0114)

FSC 3810

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