INCH-POUND
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SUPERSEDING
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MILITARY SPECIFICATION

PROPULSION SYSTEMS, BOAT AND SHIP; MAIN SHAFTING, PROPELLERS, BEARINGS, GAUGES, SPECIAL TOOLS, AND ASSOCIATED REPAIR PARTS; PACKAGING OF

This specification is approved for use by the Naval Sea Systems Command, Department of the Navy, and is available for use by all departments and agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the cleaning, drying, preservation, packing and marking of main propulsion shafting, line shaft bearings, stern tube and strut bearings, boat and ship propellers, propeller devices including controllable pitch propellers, shafting and accessories thereto. It also covers repair parts, tools and independently mounted main propulsion thrust bearings.

1.2 Levels of protection.

1.2.1 Preservation.

Level A (see 3.8.1.1 and 6.5.1.1)
Commercial (see 3.8.2 and 6.5.1.4)

1.2.2 Packing.

Level A (see 3.9.1 and 6.5.1.1)
Commercial (see 3.9.2 and 6.5.1.4)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 55Z3, Department of the Navy, Washington, DC 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A AREA PACK

2. APPLICABLE DOCUMENTS

2.1 Government documents.

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

SPECIFICATIONS

FEDERAL

NN-P-530	Plywood, Flat Panel
PPP-B-566	Boxes, Folding, Paperboard
PPP-B-585	Boxes, Wood, Wirebound
PPP-B-591	Boxes, Shipping, Fiberboard, Wood-Cleated
PPP-B-601	Boxes, Wood, Cleated-Plywood
PPP-B-621	Boxes, Wood, Nailed and Lock-Corner
PPP-B-636	Boxes, Shipping, Fiberboard
PPP-B-640	Boxes, Fiberboard, Corrugated, Triple-Wall
PPP-B-665	Boxes: Paperboard, Metal Edged and Components
PPP-B-676	Boxes, Setup
PPP-B-1055	Barrier Material, Waterproofed, Flexible
PPP-C-843	Cushioning Material, Cellulosic
PPP-C-1120	Cushioning Material, Uncompressed Bound Fiber for Packaging
PPP-T-60	Tape: Packaging, Waterproof
TT-W-571	Wood Preservative: Treating Practices
TT-W-572	Wood Preservative: Water-Repellent
UU-P-268	Paper, Kraft, Wrapping

MILITARY

MIL-C-104	Crates, Wood; Lumber and Plywood Sheathed, Nailed and Bolted
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-B-197	Bearings, Antifriction; Associated Parts and Subassemblies; Preparation for Delivery of
MIL-B-233	Boxes, Supply Support Items, Stowage and Storage
MIL-B-3106	Board, Composition, Water-Resistant, Solid (for Filler or Cushioning Pads)
MIL-C-3774	Crates, Wood; Open, 12,000- and 16,000-Pound Capacity
MIL-R-5001	Rubber Cellular Sheet, Molded and Hand Built Shapes; Latex Foam
MIL-R-6130	Rubber, Cellular, Chemically Blown
MIL-C-6799	Coatings, Sprayable, Strippable, Protective, Water Emulsion
MIL-C-9897	Crates, Slotted Angle, Steel or Aluminum, for Lightweight Airframe Components and Bulky Item (for Maximum Loads of 3000 Pounds)
MIL-L-10547	Liners, Case, and Sheet, Overwrap; Water-Vaporproof or Waterproof, Flexible
MIL-P-16789	Pumps (Including Prime Movers and Support Items); Packaging of
MIL-E-17555	Electronic and Electrical Equipment, Accessories, and Provisioned Items (Repair Parts); Packaging of
MIL-R-20092	Rubber or Plastic Sheets and Assembled and Molded Shapes, Synthetic, Foam or Sponge, Open Cell
MIL-T-22085	Tapes, Pressure-Sensitive, Adhesive, Preservation and Sealing
MIL-B-22191	Barrier Materials, Transparent, Flexible, Heat-Sealable
MIL-C-23760	Coating, Sprayable, Strippable, Protective, for Packaging of Weapons Systems and components: Application of
MIL-C-26861	Cushioning Material, Resilient Type, General
MIL-C-52950	Crates, Wood, Open, and Covered
MIL-F-87090	Foam, Combustion Retardant, for Cushioning Supply Items Aboard Navy Ships

STANDARDS

FEDERAL

FED-STD-313	Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities

MILITARY

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-731	Quality of Wood Members for Containers and Pallets
MIL-STD-758	Packaging Procedures for Submarine Support Items
MIL-STD-1186	Cushioning, Anchoring, Bracing, Blocking, and Waterproofing; With Appropriate Test Methods

(Unless otherwise indicated, copies of federal and military specifications and standards are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government drawing and publication. The following other Government drawing and publication form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

DRAWING

NAVSHIPS

NY-9-800-B-2095021	Propeller Air-Lift Frame

(Application for copies should be addressed to Commander, Mare Island Naval Shipyard (Code 564B), Vallejo, CA 94592.)

MANUAL

NAVAL SEA SYSTEMS COMMAND (NAVSEA)

S1460-AA-HBK-010	Handbook for Inspection, Packaging, Handling, Storage, and Transportation

(Applications for copies should be addressed to the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

PUBLICATIONS

NATIONAL BUREAU OF STANDARDS

PS-1	Construction and Industrial Plywood

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

DEPARTMENT OF LABOR (OSHA)

Code of Federal Regulations (CFR),
29 CFR, Part 1910,
Sections 145 and 1010, Hazard Communication Standards

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

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

ASSOCIATION OF AMERICAN RAILROADS

Association of American Railroads Rules

(Application for copies should be addressed to the Association of American Railroads, American Railroads Building, 1920 L Street, NW, Washington, DC 20036.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 3951 Standard Practice for Commercial Packaging; (DOD adopted)

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

HARDWOOD PLYWOOD MANUFACTURERS ASSOCIATION (ANSI/HPMA)

HP 1983 American National Standard for Hardwood and Decorative Plywood

(Application for copies should be addressed to Hardwood Plywood Manufacturers Association, 1825 Michael Faraday Drive, PO Box 2789, Reston, Va 22090-2789.)

(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 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 6.4) in accordance with 4.3).

3.2 Definitions or explanation of packaging terms. Definitions or explanation of packaging terms applicable to this specification shall be as defined in the applicable referenced specification (see 6.5).

3.3 Materials. Packaging materials shall be as specified herein and in the applicable referenced specifications.

3.3.1 Recovered materials. Unless otherwise specified herein, all equipment, material, and articles incorporated in the products covered by this specification shall be new and may be fabricated using materials produced from recovered materials to the maximum extent practicable without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification unless otherwise specifically specified.

3.3.2 New materials. The use of newly developed packaging materials or procedures is encouraged and recommended and will be permitted under the conditions specified herein, provided they are equal to or better than the specified materials or procedures.

3.3.2.1 Certification of new materials. Materials or procedures other than those specified herein shall equal or exceed the requirements specified herein (see 6.3). If, after a review of the material or procedure and the related documented evidence, or the witnessing of the stipulated tests, it is the opinion of the contracting activity that the material or procedure meets or exceeds the requirements specified herein, authorization for use will be granted.

3.4 Asbestos (see 6.6).

3.4.1 Packaging material. Asbestos or material and items containing asbestos shall not be used in the packaging of material covered by this specification (see 6.6).

3.4.2 Packaged items. Asbestos and separately packaged components containing asbestos shall be packaged in sealed, dust, and siftproof packages. Flexible packages shall be heat sealed.

3.4.3 Dusting material. Talc or talcum, when used in the packaging process, for example, dusting of items, shall be asbestos-free (see 6.3).

3.5 Cushioning and wrapping materials. The use of excelsior, newspaper, shredded paper (all types) and similar hygroscopic or nonneutral materials and all types of loose fill materials for applications such as cushioning, fill, stuffing, and dunnage is prohibited. Materials selected for cushioning and wrapping shall have properties resistant to fire.

3.6 Technical data. Complete descriptive packaging details on drawings, test results, and packaging, and transportation data requirements are not required when such were previously submitted and accepted by the contracting activity (see 6.3).

3.6.1 Material safety data sheet (MSDS). The contracting activity shall be provided a material safety data sheet at the time of contract award. The MSDS shall be provided in accordance with the requirements of FED-STD-313. The MSDS shall be included with each shipment of the material covered by this specification (see 6.9).

3.7 Disassembly, matchmarking, and lubrication.

3.7.1 Disassembly. System, equipment, or item disassembly shall be the minimum necessary to make accessible for cleaning, drying, and preservation of equipment and its critical surfaces. Removal of secondary assemblies, accessories, or projecting parts which will facilitate protection of the equipment or item from damage, pilferage, loss, or reduction of cube is permitted where such removal will not affect permanent settings or alignments, and where the removed items can be readily reassembled at the installation site without the need for special tools or gauges. Removed hardware (bolts, nuts, pins, screws, washers, and others) shall be reinstalled in the mating parts and secured to prevent loss. Removed items or parts, other than hardware, shall be packaged to the same level of protection as the basic or prime equipment.

3.7.2 Matchmarking. Removed parts or items, except hardware, shall be matchmarked to facilitate reassembly. Removed parts or items shall be tagged and marked and the tags shall be attached to each mating part or item. The tags and printing thereon shall be resistant to water, oil, and fading.

3.7.3 Lubrication. Rotating joints, bearings, and similar moving parts shall be thoroughly lubricated. The lubricant shall be as specified in the equipment specification or as approved by the contracting activity. Excess lubricants shall be removed before packing operations.

3.8 Levels of protection (see 6.5.1).

3.8.1 Preservation. Preservation shall be level A or commercial as specified (see 6.2).

3.8.1.1 Level A. Cleaning, drying, preservatives, preservative application criteria, and methods of preservation (unit protection) shall be in accordance with MIL-P-116, and as specified herein. Requirements in table I are assigned by item; methods and sub-methods of unit protection are assigned on the basis of the type of unit protection most commonly required for a specific component or item. Preservatives specified herein and identified by "P" numbers shall conform to the corresponding "P" number and specification specified in MIL-P-116. Unless otherwise specified (see 6.2), the selection of the sub-method under a particular method unit protection is at the option of the contractor. The contractor may provide any additional protection he considers necessary.

TABLE I. *Preservation*

Item	Cleaning process (MIL-P-116)	Preservatives (MIL-P-116)	Method of preservation (MIL-P-116)	Remarks
Accessories				See 3.8.1.2
Sleeves shrunk on shaft	C-1	None	III	
Certification form for propeller			IC	See 3.14
Devices				See 3.8.1.2 and 3.9.1.1.3
Electrical and electronic items				See 3.8.1.6.7 and MIL-E-17555
Finish machined:				
Steel shaft surfaces	C-5	P-1 or P-19	I	See 3.8.1.3.4
Bronze shafts	C-1	None	III	
Nickel-copper alloy shafts	C-1	None	III	
Full molded rubber or laminated phenolic	C-1	None	III	See 3.8.1.5 and 3.8.1.8[1]
Line shaft and main thrust bearings	C-3	P-2	I	See 3.8.1.3 and 3.8.1.7
Technical manuals	C-1	None	III	See 3.11
Miscellaneous finished bronze, brass, and nickel-copper alloy castings (stern tube stuffing box and gland)	C-1	None	III	
Miscellaneous finished forged and rolled brass, bronze and nickel-copper alloy parts (studs, rings, and keys)	C-1	None	III	See 3.8.1.3.4
Miscellaneous finished forged and rolled steel parts (coupling bolts, nuts, washers, keys, and coupling flanges)	C-1	P-1, P-19, or P-18	I IC	
Miscellaneous finished steel and iron castings bulkhead stuffing box	C-1	P-1, P-19, or P-18	I IC	
Propeller caps	C-1			See 3.9.1.2.7

TABLE I. *Preservation.*

Item	Cleaning process (MIL-P-116)	Preservatives (MIL-P-116)	Method of preservation (MIL-P-116)	Remarks
Propeller gauges	C-1	None	III	See 3.8.1.8.3 and Figure 3
Propellers, fixed pitch				
Ship	C-1		Method IB or modified	See 3.8.1.6
Boat	C-1		I	See 3.8.1.6.4
Propellers, controllable pitch				See 3.8.1.6.8
Pumps				See MIL-B-197
Roller and ball bearings		P-1 or P-19	I	
Rough machined steel shaft forgings	C-1			See 3.8.1.2 and MIL-S-196
Repair parts (support items and accessories)				
Rubber or fiberglass - covered shaft areas	C-1	For rubber dust with talc	III 8-ounce canvas	See 3.8.1.5.1[1] 8-ounce canvas
Stern tube and strut bearing bushings	C-1	None	III	
Stern tube and strut bearing staves:		None	III	-[1]
Laminated phenolic	C-1	None	III	
Rubber, brass backed	C-1	None	III	
Tube from stern tube and strut bearings	C-1			

[1]Rubber items and surfaces covered with rubber shall be covered with an opaque or kraft wrapping paper conforming to UU-P-268 type I, grade optional to prevent direct exposure to sunlight.

3.8.1.2 Devices and accessories. Unless otherwise specified (see 6.2), devices and accessories accompanying equipment, preserved as specified herein shall be packed in separate containers and secured within the complete or main (number one) equipment container.

3.8.1.2.1 Devices. Devices shall be individually preserved and unit protected in opaque packaging materials in accordance with MIL-S-196.

3.8.1.2.2 Accessories. Except as specified in table I, and in order to facilitate packaging, accessories such as thermometers, sight glasses and route connectors shall be individually preserved in accordance with MIL-S-196 or the applicable component specification.

3.8.1.3 Preservative application. Immediately after product cleaning and drying, surfaces of the equipment or part shall be treated with a preservative in accordance with table I, or as specified herein. During and after preservative application, the product shall be handled in such a manner as to produce a uniform protective film. The protective film shall remain untouched for a period of time to allow the film to set before wrapping and packing are undertaken. Preservative shall not be applied to items or surfaces which are vulnerable to damage by the preservative and as required by MIL-P-116. Excessive use of preservatives shall be avoided.

3.8.1.3.1 Strippable compound. The strippable compound shall conform to MIL-C-6799, type II, multi-coat system. The coating shall be applied directly, except as otherwise specified herein, to the propeller. The finished coat system shall consist of three separately applied coats: black, grey, and a white top coat, having a 12- to 15-mil total dry film thickness. The material can be sprayed in passes to a 4- to 5-mil dry thickness per coat without sagging. The compound application shall be in accordance with MIL-C-23760. Prior to the compound application, propellers incorporating as air emitter system shall have the air emitter holes covered with tape (see 3.8.1.6.1). In addition, an acrylic or transparent protective coating or covering shall be applied over the propeller hub identification markings to maintain these markings in a fully visible and readily readable condition.

3.8.1.3.1.1 Alternate procedure – strippable compound. The strippable compound shall conform to MIL-C-6799, type II, multi-coat system. The coating shall be applied directly, except as otherwise specified herein, to the propeller. The finished coat system shall consist of two separately applied coats: type II, class 1 black, and type II, class 5 white top coat, having a 12- to 25-mil total dry film thickness. The material may be sprayed or brushed on in passes to a 4- to 5-mil dry thickness per coat without sagging. The compound application shall be in accordance with MIL-C-23760. Prior to the compound application, propellers incorporating an air emitter system shall have the air emitter holes covered with tape (see 3.8.1.6.1). In addition, an acrylic or transparent protective coating or covering shall be applied over the propeller hub identification markings to maintain these markings in a fully visible and readily readable condition.

3.8.1.3.2 External metal surfaces. Except for propellers protected with a strippable coating and other items preserved as specified in table I, preservatives for external metal surfaces shall conform to MIL-P-116. Use of type P-1 or P-19 shall be limited to surfaces where it will not have to be removed to place the equipment in operation, or where its removal by scraping or solvent action would not damage the part or equipment.

3.8.1.3.3 Internal metal surfaces. Except for controllable pitch propeller hubs (see 3.8.1.6.4), internal metal surfaces which normally are in contact with oil shall be coated with type P-2 preservative. Internal metal surfaces normally in contact with water shall be coated with either a type P-3, or P-21 preservative. The P-21 preservative shall be used when chemical boil-out cannot be used for compound removal, or where removal by hot water or steam is desired. The shaft bore shall be coated with type P-1 or P-19 preservative.

3.8.1.3.4 Finished machined surfaces. External finished machined steel surfaces protected with a preservative (see table I) shall be wrapped with barrier material conforming to MIL-B-121, type I, grade A, class 2, followed by an overwrap with type I, grade C, class 1 or 2, with class selection at the contractor's option.

3.8.1.4 Closure of openings. Except for the closure of openings as specified in MIL-C-23760, propellers and shaft bores, openings shall be sealed with tape conforming to type III or IV of PPP-T-60, or waterproof barrier conforming to class E-2 or L-4 of PPP-B-1055 and secured with tape as specified herein. When the covering is vulnerable to damage (puncture, tearing, and so forth) the covering shall be further protected by use of weather-resistant hardboard, wood, plywood, or metal covers. Pipe and fitting ends may be sealed with metal or plastic caps or plugs. Propeller bore openings greater than 12 inches fitted with hardboard wood or plywood shall have a 6-inch hole cut into the center. The 6-inch hole shall be covered with hardwood, wood or plywood overlapping approximately 1 inch, secured by four 1-1/4 inch long brass wood screws, for easy removal and replacing during propeller shipment (see 3.9.1.2.3.5).

3.8.1.5 Shafting. After application of the preservative, each end of hollow shafts shall be sealed to prevent entry of water and other foreign material. Finished shaft bores shall be sealed with watertight steel or other suitable metal plugs as required on the applicable drawing for pitch propeller shafting system without prairie air. For controllable pitch propeller system and prairie air systems the bores shall be sealed. Unfinished shaft bores shall be sealed with wood plugs.

3.8.1.5.1 Shaft sleeves. Shaft sleeves or shafting areas and dimensioned machined surfaces such as keyways, threads, tapers, and polished bearing areas shall be provided a preliminary wrap of greaseproof material conforming to MIL-B-121, type I, grade A, class 2. Covered surfaces such as rubber or plastic shall be securely wrapped with a minimum of three layers of not less than 8-ounces canvas or equivalent. The above protected surfaces shall then be provided physical protection by either of the following procedures:

a. Application of approximately 0.0179 ± 0.005-inch thick (26 gauge) steel wrap secured by means of galvanized, flat, nailless type steel bands.

b. Application of nominal 1- by 2-inch wood strip lagging (as shown on figure 1) running the entire length of the protected surface.

Lagging strips shall be spaced a maximum of 1 inch apart and shall be secured in place by means of corrosion-resistant or treated steel strapping which shall be nailed to each lagging strip with a 3/4-inch maximum length roofing nail, or strapping may be stapled to the lagging strip. The point of the nail or staple shall not penetrate the inside surface of the lagging strips.

3.8.1.5.2 Flange faces. Shaft flange faces including peripheries shall be protected by means of a 2-inch nominal thick wood disk of greater diameter than the flange, which shall be secured to the flange faces. A layer of barrier material conforming to MIL-B-121, type I, grade A, class 2, shall be placed between the wood disks and metal surfaces.

3.8.1.5.3 **Surface contact.** Shafting surfaces in direct contact with wood cradles shall be wrapped with a minimum of three thicknesses of barrier material conforming to MIL-B-121, type I, grade A, class 2. Threaded or machined shafting ends shall be protected as specified in 3.8.1.3.4.

3.8.1.6 **Propellers and hubs.** Propellers are categorized as controllable-pitch, monobloc and bolted-on blades. Hubs for propellers consist of two types, controllable-pitch and hubs for bolted-on blades. Ships' propellers and hubs, except controllable-pitch hubs, shall be preserved (unit protected) by the strippable compound method (see 3.8.1.3.1). Unless otherwise specified (see 6.2), boat propellers shall be preserved with P-1 or P-19 preservative in accordance with MIL-P-116.

3.8.1.6.1 **Air emitter system.** Prior to the application of strippable compound, ships' propellers incorporating an air emitter system shall have the air emitter openings covered with minimum 3/4-inch wide pressure sensitive tape conforming to MIL-T-22085, type II. Acrylic or transparent protective coatings or coverings shall not be applied.

3.8.1.6.2 **Blade edge protectors.** Blade edge (including tips) protectors shall be applied over the protective coating and be applicable only to ships' propellers. The edge of each propeller blade shall be covered with a minimum of two thicknesses of not less than 8-ounce canvas or equal, over which shall be placed a preformed, galvanized metal edge protector. The edge guard shall be fabricated of sheet metal, 14 to 18 gauge, 0.0747 to 0.0478 inch respectively, depending upon blade size. A minimum of two, but not exceeding four corrosion-resistant or treated steel straps shall be secured to the metal edge protector. Strapping shall be applied on both sides of each blade following the blade surface contour, and positioned to prevent the edge protector from loosening or becoming dislodged during handling, shipment and storage.

3.8.1.6.3 **Special marking.** Each propeller shall be marked with the following:

"DO NOT REMOVE BLADE EDGE PROTECTORS UNTIL PROPELLER INSTALLATION IS COMPLETE".

The marking information shall be stenciled on the top (white) coating. Letters shall be a minimum of 1 inch in height. When propellers are shipped without the strippable coating, the marking information shall be placed on a greaseproof, waterproof tag of appropriate size and securely affixed to the edge protector, steel strap, or lifting eye bolt.

3.8.1.6.4 **Controllable pitch propellers.** Preservatives used shall be as specified herein providing the required protection and shall be easily removable upon reassembly and installation of the equipment. For internal surfaces of mechanical components, the normal operating hydraulic fluid shall be used as the preservative.

3.8.1.6.5 **Hubs.**

3.8.1.6.5.1 **Preservation.** Each hub shall be filled with the system's normal operating hydraulic fluid. An expansion tank shall be provided to protect the hub against temperature changes and to

ensure that the fluid completely fills the hub at all times. Hub openings shall be sealed to prevent leakage during handling, shipment, and storage. Moving parts shall be secured or cushioned in a manner to prevent damage during handling, shipment, and storage. External preserved surfaces and areas shall be protected with a greaseproof barrier. Each hub shall be tagged stating that the hub is filled with the normal operating lubricant, its identification (for example, specification type), including precautionary information necessary for hub handling, shipment, and storage. See figure 2 for additional details and recommended procedures for packing of controllable pitch propeller hubs.

3.8.1.6.6 **Propeller blades.** Propeller blades incorporating a prairie air system shall have the prairie air holes protected as specified in 3.8.1.6.1 prior to application of strippable compound. The propeller blade serial number shall be stenciled on the top (white) coating on the pressure face and the suction face of each blade packed in hub sets (see 3.9.1.2.3.1). Blade bolts and other detached components of propeller blades shall be packed with the appropriate blade.

3.8.1.6.7 Electrical and electronic equipment. Preservation, packing, and marking shall be in accordance with MIL-E-17555.

3.8.1.6.8 Pumps and associated parts. Preservation, packing, and marking shall be in accordance with MIL-P-16789.

3.8.1.6.9 Accessories and detached parts. Accessories and detached parts shall be preserved in accordance with table I or as specified in 3.8.1.2. Consolidation of accessories and detached parts in common shipping containers shall be applied where feasible.

3.8.1.6.10 Incorporated equipment. For systems, assemblies, and components acquired for incorporation into a ship or assembly prior to delivery to the Government, the requirements of 3.8.1.6.1 through 3.8.1.6.9 do not apply. In lieu thereof, preservation, packing, and marking of these systems, assemblies, or components shall be sufficient to provide protection from damage and deterioration until incorporation.

3.8.1.7 **Bearings.** Ball or roller bearings shall be preserved in accordance with MIL-B-197. Lubricating systems, sleeve bearings (except prelubricated bearings), and housings shall be flushed with type P-2 preservative and thoroughly drained. Surfaces of sleeve bearings and journals shall receive a preservative coating. Barrier material conforming to type I, grade A, class 2 of MIL-B-121 shall be used between the upper half linings of split sleeve bearings and journal to prevent vertical movement of the shaft or rotor after the bearing caps have been seated and bolted in place. The barrier material shall be projected beyond the assembly to permit easy detection. Each journal so prepared shall be plainly marked with a suitable waterproof tag marked with the following:

"BEFORE OPERATING MACHINE, REMOVE BARRIER MATERIAL
BETWEEN THE JOURNAL AND UPPER HALF LINING".

3.8.1.8 Repair parts and tools (accompanying equipment or for stock). Repair parts and tools shall be cleaned, preserved, and packaged in accordance with table I, except as specified herein. Unless otherwise specified (see 6.2), repair parts and tools shall be packaged one part per unit package, except that all parts comprising a single set or assembly shall be packaged together. When unit is packaged as a set, assembly, or in quantities greater than one, each item shall be wrapped or cushioned to prevent direct surface contact with the surface of adjacent parts.

3.8.1.8.1 Other repair parts. Repair parts not specifically covered in table I shall be cleaned, preserved, and packaged as specified in the contract or order (see 6.2).

3.8.1.8.2 Submarine repair parts. Repair parts for submarine usage shall have special reduced cube packaging in accordance with MIL-STD-758.

3.8.1.8.3 Special tools. Special tools shall be cleaned, preserved, and packaged in accordance with MIL-P-116 as follows:

a. Tools made of ferrous metal with non-critical surfaces shall be cleaned by process C-1, dried as required, coated with type P-2 or P-6 preservative and packaged in accordance with method I of MIL-P-116. In lieu of the greaseproof wrap required, tools may be wrapped in transparent flexible greaseproof film conforming to type II or MIL-B-22191.

b. Tools made of ferrous metal with critical surfaces shall be cleaned by process C-5, dried as required, coated with type P-9 preservative, and packaged in accordance with method IC of MIL-P-116. Selection of the sub-method of preservation shall be at the contractors' option. Transparent flexible greaseproof film conforming to type II of MIL-B-22191 may be used in lieu of wrapping material conforming to MIL-B-121 for a preliminary wrap.

c. Tools fabricated completely of non-ferrous materials or ferrous materials that are plated or otherwise treated to resist corrosion shall be packaged in accordance with method III of MIL-P-116.

d. Propeller blade gauges and thread gauges shall not be coated with a preservative and each set shall be packed vertically in a laminated (partitioned) container (see figure 3). Containers for blade gauges and thread gauges shall conform to 3.8.1.10 and, unless otherwise specified (see 6.2), shall be type W boxes in accordance with MIL-B-233.

3.8.1.9 Unit and intermediate containers. Unit containers, except those required by MIL-P-116 for the applicable method of preservation, and intermediate containers shall be folding paperboard, fiberboard, paperboard, metal stayed or set-up paperboard boxes in accordance with PPP-B-566, PPP-B-636, PPP-B-665, or PPP-B-676 at the option of the contractor. The gross weight of paperboard boxes shall not exceed 10 pounds. Fiberboard boxes shall not exceed 20 pounds. Unless otherwise specified (see 6.2), box closure shall be as specified in the applicable box specification or appendix thereto. When the gross weight exceeds 20 pounds, unit and intermediate containers shall conform to the containers specified in 3.9 for the level specified subject to the limitations specified herein.

3.8.1.10 Repair parts boxes. Unless otherwise specified (see 6.2), repair parts boxes shall not be required. When required, on board repair parts shall be packed in type M (steel) or type W (nonmagnetic) repair parts boxes conforming to MIL-B-233, as specified (see 6.2).

3.8.1.11 Index listing of repair parts and tools. An index list of repair parts and tools shall be inserted in each shipping container containing repair parts. The list shall be inserted in the index list support located on the interior side of the repair parts box cover, or shall be placed within the box for quick accessibility. The list shall give a complete itemized list of the container contents including stock numbers, nomenclatures, and quantities. The list shall be enclosed in a waterproof bag or shall be so treated as to be resistant to water, oil, and fading.

3.8.1.12 Cushioning and wrapping materials. Equipment or parts shall be cushioned, as required, to prevent damage to the item as specified in MIL-P-116, and to prevent puncture or tearing of the barrier materials used in packaging. Excessive use of cushioning within the unit package shall be avoided since an unnecessary increase in tare weight and cube will otherwise result. Cushioning materials which have not been chemically refined for noncorrosiveness shall only be used when contained in a sealed waterproof barrier conforming to PPP-B-1055. Cushioning materials used within the unit pack shall conform to any of, or combination of, the following specifications, at the contractor's option, which will provide the required protection.

Specification	Material	Special requirements
PPP-C-843	Cellulosic	
PPP-C-1120	Bound fiber	For Navy, use class A, grade 1, type optional
UU-P-268	Paper, kraft, wrapping	For Navy, use type II, grade C or D
MIL-B-3106	Board, composition, water-resistant, solid	
MIL-R-5001	Rubber, latex foam	For Navy, use grade A, type and class optional
MIL-R-6130	Rubber, cellular	For Navy, use grade A
MIL-R-20092	Rubber sheets and assembled and molded shapes, cellular, synthetic, open cell	For Navy, use class 5
MIL-C-26861	Resilient type, general	
MIL-F-87090	Foam, combustion retardant, for cushioning supply items aboard Navy ships	

3.8.1.13 **Barrier materials.** When using barrier materials conforming to MIL-B-121, the following precautions shall apply:

a. The greaseproof side of grade A materials shall be in contact with the part or surface.

b. Grade C material shall not be in contact with metal surfaces or be used as an intimate wrap.

3.8.2 Commercial. Commercial preservation of equipment, accessories, components, and repair parts shall be in accordance with ASTM D 3951.

3.8.2.1 Special requirements. Propeller blade edges shall be protected (see 3.8.1.6.2). Air emitter holes shall be covered with a neutral material. If pressure sensitive tape is used, there shall be no adhesive transfer upon tape removal that will restrict or obstruct the air emitter holes. Marking shall be as specified in 3.8.1.6.3.

3.9 Packing. Packing shall be level A or C as specified (see 6.2).

3.9.1 Level A.

3.9.1.1 General requirements. Shipping containers shall be of similar construction, of uniform size, and of minimum cube and tare consistent with required protection. Special tools, when furnished, shall be packed with the equipment for which they are intended. Contents of the shipping container shall fit in such a manner that the packed unit forms a compact, nonshifting load. Wood, plywood, or wood-cleated boxes shall be modified by the addition of skids. Unless otherwise specified herein, application of skids shall be in accordance with PPP-B-601, PPP-B-621, or the applicable crate specification when used. Except where otherwise specified herein, crates shall be used for the shipment of individual items exceeding the weight limitations of the wood, plywood, or wood-cleated boxes. Unless otherwise specified (see 6.2), selection of the shipping container shall be at the contractor's option. The reference preservation, packing, and car loading figures herein are intended for general guidance use. Container figures applicable to propellers will require modification to accommodate propeller eye bolts. Wherever reference is made to wood, wood sheathing, or wood boxes, plywood sheathing (see 3.9.1.1.2) and plywood boxes in accordance with PPP-B-601 are acceptable alternates.

3.9.1.1.1 Anchoring, blocking, bracing, and cushioning. Except as otherwise specified herein, equipment, accessories, and repair parts shall be anchored, blocked, braced, and cushioned, as applicable, in accordance with MIL-STD-1186 and the appendix to the applicable container specification. Cushioning materials shall conform to materials specified in 3.8.1.12.

3.9.1.1.2 Plywood. Plywood sheathing, including container tops (crates), shall conform to NN-P-530. Unless otherwise specified (see 6.2), plywood selection for container use shall be as follows:

a. *Multiple trip containers (see 6.5.2).* Multiple trip plywood containers shall be in accordance with ANSI/HPMA HP 1983, group A, type I (exterior, exterior type), grade 3-4, or PS-1, group B, exterior type, minimum A-C grade veneer.

b. *Single trip containers.* Single trip plywood containers shall conform to ANSI/HPMA HP 1983, group A, type II (interior, interior type), grade 3-4 or PS-1, interior type, standard with exterior glue, veneer grade C-D (plugged).

3.9.1.1.3 Devices. Propeller and hub devices shall be unit packed by opaque flexible or rigid covers that will protect the integrity of the propeller shew, number of blades or attributes of the hub regardless of the mode of transportation or type storage/stowage to be utilized (see 3.9.1.2.3.6.1 and 3.9.1.2.3.6.2).

3.9.1.2 Detailed requirements.

3.9.1.2.1 Shafting, 3 inches in diameter and over, and propellers, 30 through 108 inches in diameter.

3.9.1.2.1.1 Wood and plywood containers.

3.9.1.2.1.2 Multiple trip containers. Containers including interior packing media shall be fabricated and assembled to certify re-use. For wood or plywood boxes, the box cover (sides, ends, and top) may be assembled and fastened with nails; however, the assembled cover shall be fastened to the container platform or base by screws or bolts as shown on figure 4. Additional guidance for the application, selection, and spacing requirements for fasteners is contained in the applicable container specification.

3.9.1.2.1.3 Preservative treatment. Unless otherwise specified (see 6.2), all multiple trip (re-usable) containers or all of the finished wood or plywood members and parts shall be preserved for a minimum of 1 minute in preservative conforming to composition B or C of TT-W-572. When containers are painted, preservation shall be accomplished prior to the painting application. Alternatively, shipping containers or all of the finished wood and plywood members or parts shall be pressure treated in accordance with TT-W-571, using preservatives ACA, CCA, or ACC, at retentions "For use above ground" or greater. Water added by treatment shall be removed before painting or final acceptance. Fasteners (nails, bolts, screws, washers, nuts, and so forth) for containers treated in accordance with TT-W-571 shall be galvanized or corrosion treated.

3.9.1.2.2 Main propulsion shafting.

3.9.1.2.2.1 Three inches in diameter and less. Shafting, 3 inches in diameter and less, shall be packed in wood boxes conforming to PPP-B-621, style 1, modified as shown on figure 1 herein. Table II specifies sizes of members for boxes depending on shaft diameter, shaft length, and shaft weight. Container sides, ends, top, and bottom shall be one piece or Linderman jointed and without end butt joints for lengths up to 16 feet. For lengths over 16 feet, end butt joints are acceptable. Butt joints shall be alternated and located only in the end one-third area of the length.

TABLE II. *Size of members for wood containers, shafting not exceeding 3 inches in diameter.*[1,2]

Shafting			Member sizes			Maximum spacing of cradles (inches)
Maximum diameter (inches)	Maximum length (feet)	Maximum weight (pounds)	Sides (inches)	Ends (inches)	Cross skids (inches)	
1-1/2	12	100	1 by 4	Two 2 by 4	2 by 3	16
1-1/2	14	200	2 by 4	Two 2 by 4	2 by 3	16
2	20	200	2 by 6	Two 2 by 6	2 by 3	18
3	25	300	2 by 8	Three 2 by 8	2 by 4	20
3	16	400	2 by 6	Three 2 by 6	2 by 4	20
3	20	400	2 by 8	Three 2 by 8	2 by 4	20

[1]For tops and bottoms, nominal 1-inch lumber shall be used. When the width of top and bottom is over 7-1/2 inches, 1 by 2-inch battens spaced approximately 3 feet apart shall be used; or 3/4-inch plywood, end spliced when required, shall be used in place of lumber.

[2]Cradles shall be of 2-inch material with 1/4-inch plywood backing when shafts exceed 2-inch diameter.

3.9.1.2.2.2 Finished shafting and rough machined shaft forgings, over 3 inches in diameter. One shaft complete with accessory parts, when applicable, shall be cradled on a skid-type base (see figures 5 and 6 and MIL-C-104 for construction guidance). Unless otherwise specified (see 6.2), table III shall apply for skid base size members. Shafts and accessory parts where applicable shall be so cradled, mounted, and secured on the skid base to prevent shaft deflection, shifting, and damage that may result from storage, handling, and shipment. Skids less than 16 feet in length shall not be spliced. Laminating and splicing of skids shall be in accordance with MIL-C-104. End headers shall be placed flush with skid ends and bolted in place. To protect the bottom of the flange, a nominal 2-inch thick wood member the width of the flange box shall be secured to the skids directly beneath the flange box.

TABLE III. *Sizes of members in skid assemblies for shipment of propulsion shafting, over 3 inches in diameter.*

Item	Size of members for shafts with diameters of:			
	Greater than 3 inches but less than 8 inches (inches)	8 inches to less than 16 inches (inches)	16 to 24 inches (inches)	Over 24 inches (inches)
Skids	4 by 4 or two 2 by 3's (flat)	4 by 6 (flat) or two 2 by 6's (flat)	4 by 8 (flat)	6 by 8
End headers	4 by 4	4 by 6 (flat)	4 by 8 (flat)	4 by 8 (flat)
Cross skids[3]	3 by 4 (flat)	4 by 4	4 by 4	4 by 4
Cradles[1] (cutout)	Two 4 by 6's to 4 by 8	Two 4 by 8's to 4 by 12	Two 4 by 12's to 4 by 16 laminate with 3/4-inch plywood	Two 4 by 16's and larger laminate with 3/4-inch plywood
Cradle[2] spacing (maximum)	20	36	2-1/2 times diameter	2 times diameter
Lagging	1 by 2	2 by 2	2 by 2	2 by 2

[1]Cradles shall be fabricated in two equal parts, the bottom and top halves cut to fit the shaft snugly with allowance for preservation, wrapping, lagging or other protection. Laminated cradles shall be used for shafts exceeding 16 inches in diameter.

[2]The number and location of cradles shall be adjusted so that they are located at the quarter points for sling lifting.

[3]Cross skids shall be located at each cradle and shall be bolted to the skids with the same bolts used to fasten the cradle.

3.9.1.2.3 Propellers.

3.9.1.2.3.1 Controllable-pitch and bolted-on blades. Controllable-pitch and bolted-on blades preserved as specified shall be packed in hub sets. References to eye bolts and propeller diameters specified herein shall be disregarded. When multiple containers are required for a single hub set, the exterior of each container shall be marked with the propeller blade serial numbers to ensure that the complete set is furnished or issued when required. Packing of controllable-pitch and single bolted-on blades is shown on figures 7 and 8.

3.9.1.2.3.2 Monobloc. Propellers, 40 pounds and over, shall be individually packed and provided with lifting eye bolts to facilitate propeller handling, including placement and removal from its shipping and storage container. Each propeller shall be marked or tagged with the following information: "HANDLE BY EYE BOLTS". Marking information shall be applied in accordance with 3.8.1.6.3.

3.9.1.2.3.3 **Propellers, 30 inches in diameter and less.** Propellers, 30 inches in diameter and less, shall be multiple or individually packed (see 6.2) as follows:

a. *Multiple pack.* Propellers shall be packed in wood boxes (see figure 9) conforming to PPP-B-621, class 2, style 2, for type 3 load. Sheathing, ends and cleats shall be minimum 1-inch lumber. A diagonal cleat to the same size as the regular cleats shall be used on each end of the box. One intermediate set of inside cleats or battens of not less than nominal 1- by 4-inch lumber shall be nailed and clinched to the sides, top and bottom midway between the ends. Hubs of propellers shall be fitted with suitable wood cones with drilled centers to fit a suitable tie bolt on which propellers shall be strung. Tie bolts shall be securely suspended between the ends of the box by use of nominal 2- by 10-inch members securely cleated to the inside of the box ends. The size of the box shall be such as to ensure not less than approximately 1 inch clearance on top, sides, and ends. Boxes over 48 inches long shall be provided with an intermediate saddle midway between the ends which firmly supports the tie bolt from all sides. The saddle support shall be securely attached to the sides, top, and bottom of the box. Suitable blocking which will not injure or mar the blades shall be provided to prevent propellers from turning on the tie bolt. Boxes shall be provided with skids in accordance with the applicable box specification. The gross weight of each box shall not exceed 600 pounds.

b. *Individual packs.*

(1) Propellers shall be packed in wood boxes conforming to PPP-B-621, class 2, style 2 (reinforced), type 3 load as shown on figure 10. Blocking shall be cut from nominal 2- by 6- or 2- by 8-inch lumber with a minimum 10-inch length. Blocking shall be cut in pairs with the angle of cut conforming to the blade angles as shown on figure 11. Blocks shall be covered with at least three thicknesses of type 1, grade A, class 2 material conforming to MIL-B-121 at areas of contact with the blades.

(2) When specified (see 6.2), propellers shall be individually packed in corrugated fiberboard boxes conforming to PPP-B-636, class weather-resistant, full overlap style as shown on figure 12. Blocking, bracing, and filters shall be of the same material as the box except liners at blade contact area shall be solid fiberboard. Fillers, as required, shall be used under and over the hub areas and cut to fit snugly within the blocking sleeve. Propeller edges and finished faces of the hub shall be covered with barrier material conforming to type I, grade A, class 2 of MIL-B-121. Interior blocking, bracing, and fillers as shown on figure 12 shall be used for two- and three-bladed propellers. Method V requirements of the appendix to PPP-B-636 shall apply for box closure, waterproofing, and reinforcing.

3.9.1.2.3.4 Propellers, 30 to 60 inches in diameter. Propellers shall be individually packed in wood boxes conforming to PPP-B-621, class 2, style 2, (reinforced), type 3 load as shown on figure 13. Joists shall span the box width. Table IV specifies joist sizes, as required, for various loads and spans. The joist supports shall be at least 2 inches wider than the depth of the joists, for example 2- by 4-inch joists require a 2- by 6-inch support.

TABLE IV. *Sizes of double joists require to support propellers in nailed wood box.*

Weight of propeller (pounds)	Size of joists[1] required for span of:					
	30 (inches)	36 (inches)	42 (inches)	48 (inches)	54 (inches)	60 (inches)
Up to 400	Two 2 by 4	Two 2 by 4	Two 2 by 4	Two 2 by 4	Two 2 by 4	Two 2 by 6
400 to 600	Two 2 by 4	Two 2 by 4	Two 2 by 4	Two 2 by 6	Two 2 by 6	Two 2 by 6

[1]Joists are used in pairs as shown.

Propellers exceeding 600 pounds shall be packed in a container consisting of a skid type base and a container cover as shown on figure 14. The skid base and member sizes shall conform to MIL-C-104. The container cover shall be a modified class 2, style 2 (reinforced), type 3 load box conforming to PPP-B-621 consisting of ends, sides, and a top. The ends of the cover shall become the sides and shall be fastened to the base skids. The sides shall become the ends and shall be fastened to the base headers. The cover ends (sides) shall be reinforced on the interior with nominal 1- by 4-inch battens and diagonals. A blot spacing member supported by side bracing members of not less than nominal 2- by 10-inch lumber extending the full width of the box shall be nailed to the top and bottom of the box, midway between the ends. The hub of the propeller shall be fitted with a suitable wood cone with drilled centers to fit a suitable 3/4-inch tie bolt on which the propeller shall be strung. The 3/4-inch tie bolt shall be suspended between the 2- by 10-inch bolt spacing members. A hole shall be drilled in the sheathing, top, and bottom to accommodate the bolt head and nut, so that counter-sinking will not be necessary in the bolt spacing member. The size of the box shall be such as to ensure not less than approximately 2 inches clearance on top, sides, and ends. Blocking which will not injure or mar the blades shall be provided to prevent the propeller from turning on the tie bolt. Boxes shall be strapped in accordance with PPP-B-621.

3.9.1.2.3.5 Propellers, 60 to 108 inches in diameter. Propellers, 60 to 108 inches in diameter shall be individually packed in an open-type crate with a skid-type base as shown on figures 14, 15, and 16. Container (cover and base) member sizes, fastening, and assembly shall be in accordance with the requirements of MIL-C-3774, MIL-C-104, or MIL-C-52950 as applicable. The crate size shall be such as to allow approximately 2 inches of clearance between the propeller and the interior surfaces of the container top, sides, and ends. The maximum size propeller packed in a crate shall not exceed the common carriers' dimensions for such cargo. When crates exceed rail shipment limitations, propellers shall be shipped uncrated and in accordance with the requirements for propellers exceeding 108 inches in diameter (see 3.9.1.2.3.6). The base of the crate shall be reinforced with at least 6- by 10-inch wood, load-bearing members. Blocking that will not mar or injure the blades, protective coating, and edge guards shall be provided to prevent propeller movement and shifting within the crate during handling, shipment, and storage.

3.9.1.2.3.6 Propellers exceeding 108 inches in diameter.

3.9.1.2.3.6.1 Rail shipment. Figures 17, 18, 19, 20, and 21 show loading for rail shipments. Similar loading procedures may be used for barge shipments. Propellers shall be blocked with timber cribbing and topped by a rounded timber shaft which shall support the propeller as shown on figure 21. The wood members shall be of 10- by 10- or 12- by 12-inch timber, in accordance with group (species) III or IV of MIL-STD-731. The support member shall be covered to prevent propeller hub damage. Cleats shall be used to align and fasten the crib members together. Steel rods, threaded at each end, shall be used to fasten the timbers to the car floor. Steel tie rods, minimum 1-inch diameter, shall be fastened to the timber shaft and to the car floor to provide longitudinal bracing. Blocking and bracing shall be applied between the crib walls to prevent side movement. To prevent propeller rotation (see figure 20), either blocking between the propeller blades and crib walls or holddown rods shall be installed. The propeller blades shall not be used to support the propeller weight or to block, brace or prevent shifting of the propeller and shall not extend through an orifice or any opening in the car floor. Loading on open cars shall meet the requirements of the Association of American Railroads Rules governing car loading.

3.9.1.2.3.6.2 Truck shipments. The carrier vehicle shall transport the propeller in a tilted position either on a separate shipping frame (see 3.9.1.2.3.6.3) or securely mounted on the carrier (see 6.3). The carrier shall contain a propeller centering and securing system consisting of, but not limited to:

a. A steel, threaded, centering shaft secured to the carrier.

b. A wood plug, clamps or braces at the base of the propeller hub to center the propeller on the centering shaft.

c. A metal centering plate of minimum 1/2-inch thickness, predrilled, to accommodate the propeller centering shaft and lifting eyebolts (see 3.9.1.2.3.2).

Metal plates shall be provided by the activity shipping the propeller hub. A non-metallic gasket-type barrier shall be placed between the metal plate and the propeller hub. Chains or other metallic holddown devices that are added, when required for shipment and safety purposes, shall be covered with a heavy duty covering such as a fire hose. Holddown devices shall be arranged and secured to the carrier and propeller in a manner so that no contact with the propeller blade and blade edges shall ensue during shipment.

3.9.1.2.3.6.3 Propeller shipping frame. Five or seven-blade propellers, not exceeding 15 feet in diameter, may be shipped on metal frames as shown on figure 7. Drawing NY-9-800-B-2095021 and instructions thereon shall be used for construction and propeller mounting guidance.

3.9.1.2.4 Storage packs. Each propeller shall be placed on wood skids of sufficient size to support the propeller above the ground level. Alternatively, each propeller may be supported on a skid-type base. In addition, each propeller shall be provided with an open-type cover consisting of sides, ends, and top. The cover may be of the nailed or demounted type, and of wood or metal construction. A clearance of not less than 2 inches shall be allowed between the propeller and closest member of the container cover. When in open storage, a flexible, waterproof cover shall be placed over the container. The following specifications may be used for guidance for material selection, fabrication, and assembly of the skid-type base and cover:

Base – MIL-C-104
Cover – MIL-C-3774, MIL-C-9897, or MIL-C-52950

3.9.1.2.5 Stern tube and strut bearing. Bearings or bearing staves shall be packed in wood or wood-cleated plywood boxes conforming to PPP-B-621, class 2, or PPP-B-601, overseas type, respectively, at the contractor's option. Full molded or stave bearings not in excess of 90 pounds need not be strapped and shall be packed in wood-cleated fiberboard boxes conforming to PPP-B-591, class II. Staves in excess of 1000 pounds shall be packed in sheathed or covered crates conforming to MIL-C-104, type I, class 1 or 2, or MIL-C-52950. Unless otherwise specified (see 6.2), selection of the crate type and style shall be at the contractor's option.

3.9.1.2.6 Line shaft and thrust bearings. Oil and grease lubricated line shaft and thrust bearings of the conventional roller, ball, or babbitt type shall be packed in containers as specified in 3.9.1.2.5.

3.9.1.2.7 Hubs and caps. Each hub or cap over 200 pounds shall be cradled and secured to a skid-type base. Other hub or cap boxes shall conform to PPP-B-601 (overseas type) or PPP-B-621, class 2. The skid-type base shall be of a design and construction format similar to the skid bases specified in MIL-C-104. Anchoring of the hub or cap shall be in accordance with MIL-STD-1186 or the appendix to MIL-C-104. A neutral barrier material shall be applied to all wood surfaces that come in direct contact with the hub or cap. For hubs and caps mounted on skid-type bases, further protection shall be provided by an open-type, bolted, wood constructed cover (sides, ends, and top) similar to MIL-C-3774, type II, except that MIL-C-104 shall be used for guidance for selection of sizes of members and hardware for the cover assembly and fastening to the skid-type base. To facilitate crate handling, the special markings specified in 3.10.1.2 for multiple trip containers, center of balance, sling points, and structural characteristics shall be applied. The markings specified in 3.10.1.1 regarding container damage shall also be applied. Hub and cap attachment bolts and other attached components of hub or cap assemblies shall be packed within the hub or cap container. When multiple containers are required for a hub assembly, each container shall be marked with serial numbers to ensure that the complete hub assembly is furnished or issued as required.

3.9.1.2.8 Associated repair parts. Associated repair parts shall be packed in containers conforming to any one of the following specifications at the option of the contractor:

ability requirements through the selection and implemen

Specification	Container	Type or class
PPP-B-585	Wood, wirebound	Class 3
PPP-B-591	Fiberboard, wood-cleated	Class weather-resistant
PPP-B-621	Wood, nailed, and lock-corner	Class 2
PPP-B-636	Fiberboard	Weather-resistant
PPP-B-640	Fiberboard, corrugated, triple-wall	Class 2
MIL-C-104	Crates, wood, lumber, and plywood sheathed	
MIL-C-3774	Crates, wood, open	
MIL-C-52950	Crates, wood, open and covered	

Shipping containers, except PPP-B-636 fiberboard boxes, shall be closed and reinforced in accordance with the applicable container specification or appendix thereto. PPP-B-636 fiberboard boxes shall be closed, waterproofed, and reinforced in accordance with method V, appendix to PPP-B-636. The gross weight of wood or wood-cleated boxes shall not exceed 200 pounds, except when a single item exceeds 200 pounds. Fiberboard boxes shall not exceed the weight limitations of the applicable fiberboard box specifications. Shipping containers, except crates and PPP-B-636 fiberboard boxes, shall have caseliners conforming to MIL-L-10547. Caseliners shall be closed in accordance with MIL-L-10547. Barrier material conforming to PPP-B-1055 may be used to fabricate the caseliner. Caseliners are not required when boxes are packed with items or interior packages meeting the following:

a. Items which are completely painted and have no unprotected critical surfaces

b. Large items which are completely coated with preservative type P-1 or P-19, with critical interior item surfaces preserved and all openings sealed with authorized material

c. Method IC or IA packages, in accordance with MIL-P-116

d. Interior packages which conform to weather-resistant types or classes and are waterproofed in accordance with the applicable interior package container specification.

3.9.1.2.8.1 Repair parts boxes. Repair parts boxes conforming to MIL-B-233 (see 3.8.1.10) shall be overpacked in containers specified in 3.9.1.2.6. The gross weight of parts shall not exceed 200 pounds in any one box. Where the combined weight of a set exceeds 200 pounds, such parts shall be grouped and packed in two or more boxes numbered consecutively to show the number of boxes in a complete set. Unless otherwise specified (see 6.2), an exception will be made when an individual part weighs in excess of 200 pounds, in which case the part shall be packed in an individual repair parts box.

3.9.2 Commercial. Equipment preserved as specified in 3.8 shall be packed in accordance with ASTM D 3951.

3.10 Marking. In addition to any special marking required (see 6.2), level A interior (unit and intermediate) packages and exterior shipping containers shall be marked for shipment in accordance with MIL-STD-129. Commercial packages and shipping containers shall be marked in accordance with ASTM D 3951.

3.10.1 Special marking.

3.10.1.1 Shafting and propeller containers. Container markings shall include the following: "IF CONTAINER IS DAMAGED, NOTIFY COMMANDER, NAVAL SEA SYSTEMS COMMAND, SEA 56XF, WASHINGTON, DC 20362-5101. CONTAINER TO BE OPENED ONLY BY THE INSTALLATION ACTIVITY". For propeller containers, the following additional marking shall be applied:

CAUTION

THIS SIDE UP (with arrows pointing up) STOW FLAT ON CONTAINER SKIDS.

For shaft containers, the following additional markings shall be applied:

CAUTION

Store on level concrete or steel surface only. Transport by rail or vehicle in a manner that the skid system is fully supported. Overhang is not permitted. For ocean transport, the container must be stowed in/on a flat level hold or deck. Lift container at sling points only. Do not lift from one end.

Above marking shall be plainly stenciled and placed on two adjacent container sides.

3.10.1.2 Multiple trip containers. Multiple trip containers (see 3.9.1.1.2.a. and 6.5.2) shall be marked "REUSABLE". Instructions shall be provided for container disassembly and content removal. Instructions shall be enclosed in a heat sealed, waterproof envelope, pouch, or bag, and firmly affixed to the outside of the shipping container in a protected location (preferably between cleats and adjacent to the identification markings).

3.10.1.2.1 Center of balance. The center of balance of packed crates and boxes shall be indicated by a plainly marked vertical line on the lower portion of each container side, and the words "CENTER OF BALANCE" plainly stenciled. Letters shall be not less than 1-3/4 inches in height.

3.10.1.2.2 Sling points. Sling points shall be legibly marked "SLING HERE".

3.10.1.2.3 Structural markings. Structural markings shall be applied in accordance with MIL-STD-129.

3.11 Technical manuals. Manuals which accompany shipments shall be packaged in transparent, waterproof, plastic bags, minimum 4 mils thick and heat sealed. Manuals, when shipped in bulk quantities, shall not be individually wrapped, but shall be packed in accordance with the requirements of the applicable manual specification or packed in containers conforming to the requirements for

the level specified. Shipment of equipment which includes technical data shall have location of the information annotated on packing list. In addition, the shipping container housing the manuals shall be marked, "MANUALS ENCLOSED".

3.12 Air shipment. Items required for movement by air shipment shall be handled for transportability in accordance with the procedures specified by the Military Airlift Command Air Base receiving the item for airlift.

3.13 Storage. Unless otherwise specified (see 6.2), or directed by NAVSEA, propellers, propeller blades, inspection gauges, and ships' propulsion shafting shall be placed in storage in accordance with NAVSEA SL460-AA-HBK-010.

3.14 Propeller certification form. The certification form shall be enclosed in a minimum 0.004-inch thick transparent, waterproof, greaseproof bag, prominently marked "Certification Form" and the bag shall be heat sealed. The bag shall be attached or secured to the propeller hub or blade so that it is visible, readily available, and will remain with the propeller until propeller use. When propellers are boxed or crated, the bag shall be firmly affixed to the outside of the shipping container in a protected location, preferably between the cleats on the end of the container adjacent to the identification markings.

3.15 Asbestos items. An asbestos caution label shall be affixed to each interior (unit and intermediate) and exterior pack. The caution label shall conform to the OSHA Regulation, Part 1910, Section 145 and 1001 (yellow background with black letters). The caution label shall state the following:

CAUTION

Contains Asbestos Fibers.
Avoid Creating Dust.
Breathing Asbestos Dust May
Cause Serious Bodily Harm.

3.16 Workmanship. Workmanship shall be such that, when the proper procedures are followed, materials, and equipment being processed, cleaned, preserved, packed and marked, will receive protection against corrosion and deterioration during shipment and prolonged periods of storage, and will require minimum reprocessing for service for further storage.

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 shall 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 ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of the 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.

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

a. First article (see 4.3)
b. Quality conformance (see 4.4).

4.3 First article.

4.3.1 First article inspection. The contractor shall inspect one complete package, packed for shipment, to ascertain that the cleaning, drying, preservation, packaging, packing, and marking of the equipment or item conforms to this specification (see 6.3 and appendix B). The first article sample will not be required when such a pack has previously been inspected and accepted for the same method for an identical or similar item by the same contractor and satisfactory evidence can be furnished to the Government that the equipment or items have been prepared identically with the previously approved pack. First article inspection shall be repeated when changes in preservation, packaging, and packing materials, or processes or designs are made.

4.3.2 First article testing. When specified (see 6.2), the sample first article pack of the equipment or item shall be subjected to the examination and tests in accordance with MIL-P-116 and the tests as specified herein. A first article test will not be required when one of the following applies:

a. Commercial packaging is specified
b. Commercial packing is specified
c. Detailed packing instructions are furnished by the contracting activity.

4.3.2.1 Rough-handling tests. When specified (see 6.2), rough-handling tests shall be conducted (see 6.3). Tests shall be as specified in MIL-P-116. For packs exceeding 200 pounds (or 100 pounds where equipment is secured to the base of the container) the railroad car test method as specified in 4.3.2.1.1 may be used in place of the pendulum-impact test or incline-impact test specified in MIL-P-116 at the option of the contractor.

4.3.2.1.1 Railroad car test method. The pack shall be securely blocked to prevent movement on the car. Anti-skip plates shall not be used for this test. The car shall be impacted at approximately 10 miles per hour.

4.4 Quality conformance inspection.

4.4.1 Sampling for quality conformance inspection. Sample items, packages, and packs shall be selected and inspected to determine conformance with the requirements of section 3 herein and with MIL-P-116.

4.5 Examination.

4.5.1 Preservation. Examination of the preservation and marking requirements not covered by referenced specifications shall be performed on the basis of the sampling procedures and inspection levels being used to determine examination requirements in accordance with MIL-P-116.

4.5.1.1 Packing and marking. Examination of packing and marking requirements not covered by MIL-P-116 or any specification referenced herein shall be performed on sample packs selected in accordance with MIL-STD-105 at inspection level I. Any pack having one or more defects shall be cause for rejection (see 6.8).

5. PACKAGING

This section is not applicable.

6. NOTES

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

6.1 Intended use. The cleaning, drying, preservation, packing, and marking requirements specified herein are intended to ensure proper and safe transportation and storage of equipments and associated repair parts and tools, and for use in preparing packaging requirements in contracts or orders.

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of this specification

b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2)

c. When first article inspection is required (see 3.1)

d. Level of preservation and packing required (see 3.8.1 and 3.9)

e When sub-method selection is not the contractor's option (see 3.8.1.1)

f. When accessories are not included in equipment container (see 3.8.1.2)

g. Preservation of boat propellers, if other than specified (see 3.8.1.6)

h. Quantity of repair parts in each pack (see 3.8.1.8)

i. Preservation requirements of repair parts not covered (see 3.8.1.8.1)

j. Propeller gauge boxes, if other than type W (see 3.8.1.8.3.d)

k. Box closure, if other than specified (see 3.8.1.9)

l. Type of repair parts boxes, if required (see 3.8.1.10)

m. Shipping container required, if other than contractor's option (see 3.9.1.1)

n. Plywood selection, if other than specified (see 3.9.1.1.2)

o. Wood preservative, if required (see 3.9.1.2.1.3)

p. If table III applies to skid base size members (see 3.9.1.2.2.2)

q. Required packing quantity (see 3.9.1.2.3.3)

r. When fiberboard box is required (see 3.9.1.2.3.3.b.(2))

s. Crate type and style, if other than contractor's option (see 3.9.1.2.5)

t. Gross weight exception for repair parts boxes (see 3.9.1.2.8.1)

u. Special marking, if required (see 3.10)

v. Storage, if other than specified (see 3.13)

w. When the sample first article pack or item is to be subjected to the examination and tests of MIL-P-116 or this specification (see 4.3.2)

x. When rough handling tests are required (see 4.3.2.1).

6.3 Consideration of data requirements. The following data requirements should be considered when this specification is applied on a contract. The applicable Data Item Descriptions (DID's) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DID's are tailored to reflect the requirements of the specific

acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DOD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

Reference Paragraph	DID Number	DID Title	Suggested Tailoring
3.3.2.1 and 3.4.3	DI-E-2121	Certificate of Compliance	–
3.6 and appendix A	DI-DRPR-80651	Engineering drawings	–
	DI-PACK-80120	Preservation and Packing data	–
	DI-PACK-80121	Special Packaging Instruction (SPT)	When required
	DI-PACK-80877	Transportation Plan	Plan must be tailored to applicable system
	UDI-T-23765	Report, Gauge Inspection and Application	–
3.9.1.2.3.6.2	DI-A-3020	Contract Change Proposal/ Task Change Proposal	–
4.3.1 and appendix B	DI-MISC-80653	Test Reports	–
4.3.2.1	DI-MISC-80678	Certification Data/Report	10.3.2

The above DID's were those cleared as of the date of this specification. The current issue of DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID's are cited on the DD Form 1423.

6.4 First article. When first article inspection is required, the contracting officer should provide specific guidance to offerors whether the items should be a first production item and the number of items to be tested as specified in 4.3. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract. Bidders should not submit alternate bids unless specifically requested to do so in the solicitation.

6.5 Definitions. Definitions of preservation, packaging, and packing terms, including materials, processes, methods, and equipment will be found in ANSI MH15.1.

6.5.1 Levels of protection. To help determine the extent of preservation required to protect an item against specific hazards of storage, transportation, and handling, the Department of Defense (DOD) has established three levels of protection; whose main objectives are to provide uniform, efficient, and economical protection to supplies and equipment. The levels of protection are based upon the performance expected of the package. The performance criteria are summarized as:

6.5.1.1 Level A. This package provides maximum protection. It is needed to protect material under the most severe worldwide shipment, handling, and storage conditions. Preservation and packing will be designed to protect material against direct exposure to extremes of climate, terrain, and operational and transportation environments, without protection other than that provided by the pack. The conditions to be considered include, but are not limited to, the following:

a. Multiple handling during transportation and intransit storage from point of origin to final user

b. Shock, vibration, and static loading during shipment

c. Loading on shipdeck, transfer at sea, helicopter delivery, and offshore or over-the-beach discharge, to final user

d Environmental exposure during shipment or during intransit operations where port and warehouse facilities are limited or nonexistent

e. Outdoor storage in all climatic conditions for a minimum of 1 year

f. Static loads imposed by stacking.

For packing (exterior containers), it has been determined and agreed upon by the joint DOD packaging administrators that fiberboard and paperboard are not an acceptable material for use under level A packing.

6.5.1.2 Level B. This packaging provides intermediate protection. It is needed to protect material under anticipated favorable environmental conditions of worldwide shipment, handling, and storage. Preservation and packing will be designed to protect material against physical damage and deterioration during favorable conditions of shipment, handling, and storage. The conditions to be considered include, but are not limited to, the following:

a. Multiple handling during transportation and intransit storage

b. Shock, vibration, and static loading of shipments worldwide by truck, rail, aircraft, or ocean transport

of the report shall be furnished to the contracting activity (packaging

c. Favorable warehouse environment for a minimum of 18 months

d. Environmental exposure during shipment and intransit transfers, excluding deck loading and offshore cargo discharge

e. Stacking and supporting superimposed loads during shipment and extended storage.

For packing (exterior containers), weather-resistant grades of fiberboard and paperboard are permitted under level B. Domestic type or grade (non-weather resistant) fiberboard and paperboard are not acceptable under level B packing. Level B packing as defined in 6.5.1.2.b. covers shipments worldwide by all types of transportation.

6.5.1.3 Level C. This packaging provides minimum protection. It is needed to protect material under known favorable conditions. The following criteria determine the requirements for this degree of protection:

a. Use or consumption of the item at the first destination
b. Shock, vibration, and static loading during the limited transportation cycle
c. Favorable warehouse environment for a maximum of 18 months
d. Effect of environmental exposure during shipment and intransit delays
e. Stacking and supporting superimposed loads during shipment and temporary storage.

6.5.1.4 Commercial. Although not specifically defined by any Government regulation or instruction, commercial packaging (preservation and packing) is understood to be those practices by manufacturers and suppliers to protect and identify material and items packaged for retail and wholesale distribution purposes. ASTM D 3951 provides guidance in the application of commercial packaging. It has been determined by joint DOD instructions that commercial (also in some areas addressed as industrial packaging) should only be used or specified when such packaging is known to satisfy the DOD needs. Such use should be determined before a contract for supplies is awarded or within the life cycle of the contract when substantial savings to the Government may result. Commercial (industrial) packaging should not be specified where multiple shipments and handlings are anticipated or desired.

6.5.2 Multiple trip container. The design features of a multiple trip container are such that, subject to simple replacement of components, the container can be employed for more than one round trip from initial supply source to the consumer and return. A typical example is a demountable wooden box or crate equipped with fasteners permitting ready assembly, disassembly, and reassembly.

6.6 Asbestos. It is the intent of the Government to eliminate the use of asbestos except in those cases that a suitable alternative material cannot be used to obtain the desired results. In those cases in which components or materials being packaged contain asbestos predominantly in their make-up, such items are to be separately packaged and marked (see 3.4 and 3.15).

6.7 Detailed information. Supplemental information on preservation and packing may be found in the following manuals:

DSAM 4145.2, Vol. I, TM38-230-1, NAVSUP PUB 502, AFP 71-15, MCO P4030.31B, Preservation and Packaging (Volume I) (National Stock Number 0530-LP-050-2073).

DSAM 4145.2, Vol. II, TM38-230-2, NAVSUP PUB 503, Vol. II, AFR 71-16, MCO P4030.21C, Packing (Volume II) (National Stock Number 0530-LP-050-3211).

DSAM 4145.7, TM38-236, NAVSUP PUB 504, AFP 15-01-3, AFP 71-8, MCO P4030.30B, Preparation of Freight for Air Shipment (National Stock Number 0530-LP-050-4001).

DSAM 4145.3, TM38-250, NAVSUP PUB 505, AFR 71-4, MCO P4030.19D, Preparation of Hazardous Materials for Military Air Shipment (National Stock Number 0530-LP-050-5007).

(Copies of these manuals may be obtained upon application to the Superintendent of Documents, US Government Printing Office, Washington, DC 20402.)

6.8 Packing and marking. Lots may be accepted or rejected in accordance with an Acceptable Quality Level (AQL) of 2.5 percent defective.

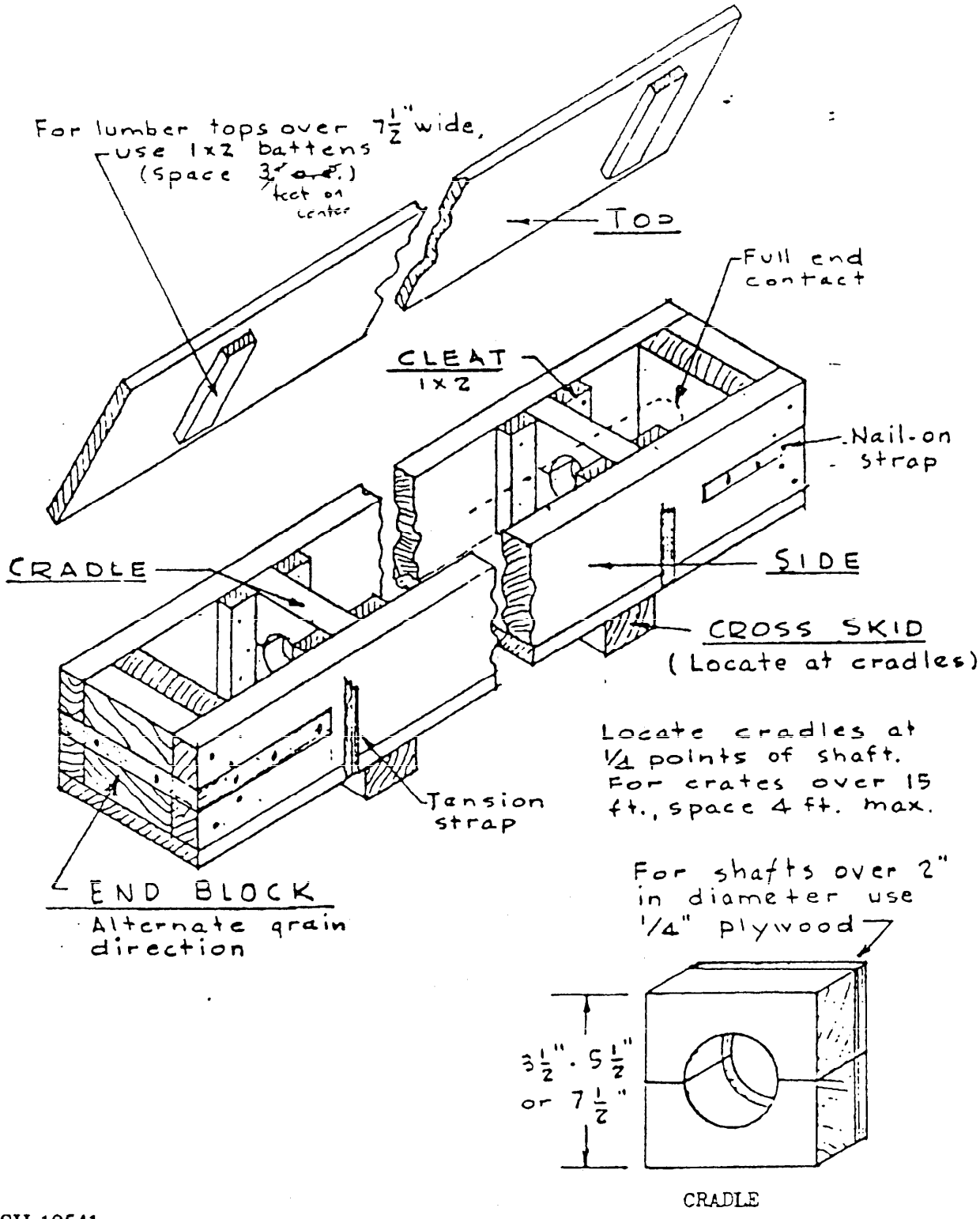
6.9 Material safety data sheet (MSDS). Contracting officers must identify those activities requiring copies of MSDS's. Additional required Government information is contained in FED-STD-313. In order to obtain the MSDS, FAR clause 52.223-3 must be in the contract.

6.10 Subject term (key word) listing.

Controllable pitch propeller
Monobloc
Multiple trip container
Packing, commercial
Packing, level A
Preservation, commercial
Preservation, level A

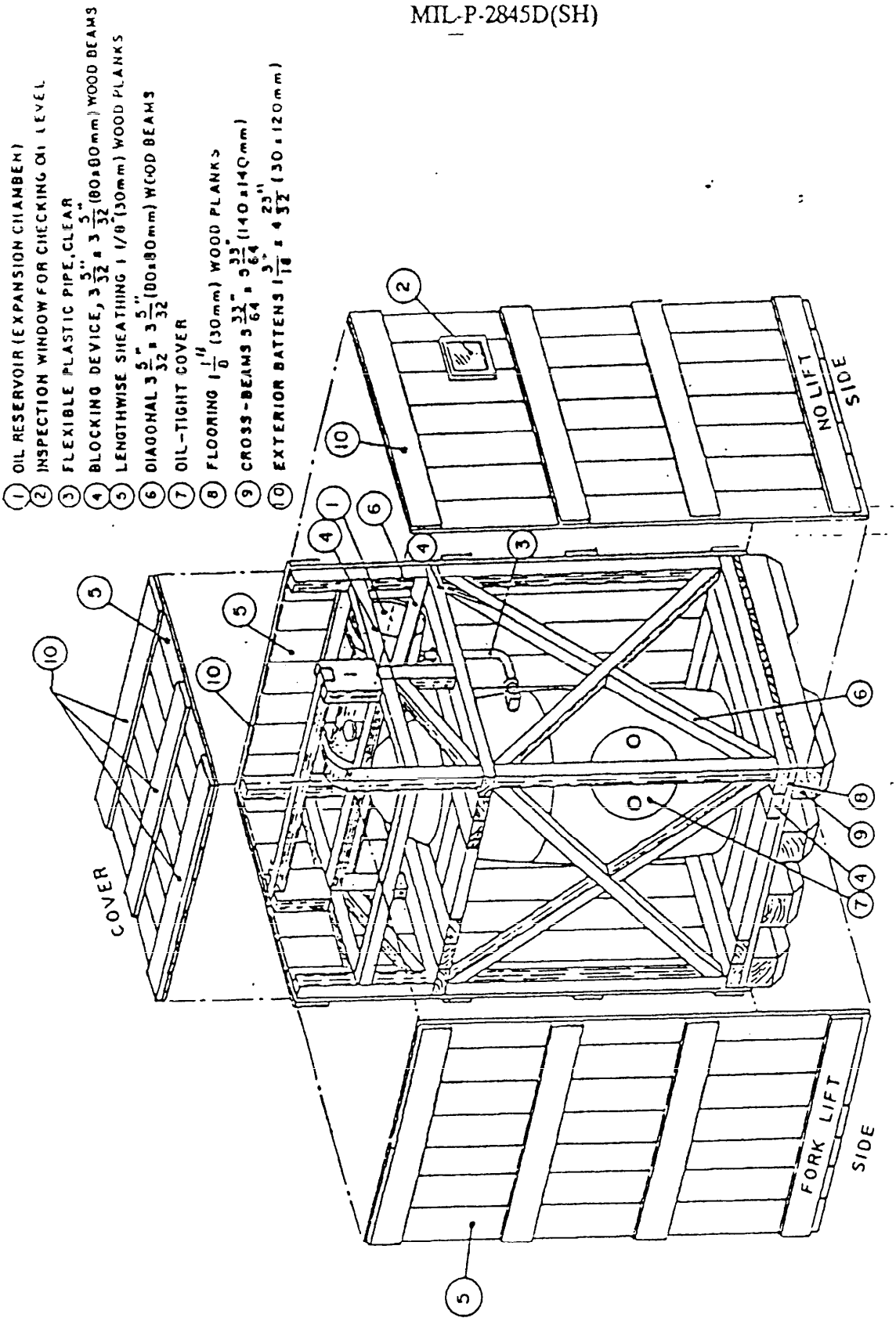
6.11 **Changes from previous issue.** Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Preparing activity:
Navy – SH
(Project PACK-N051)



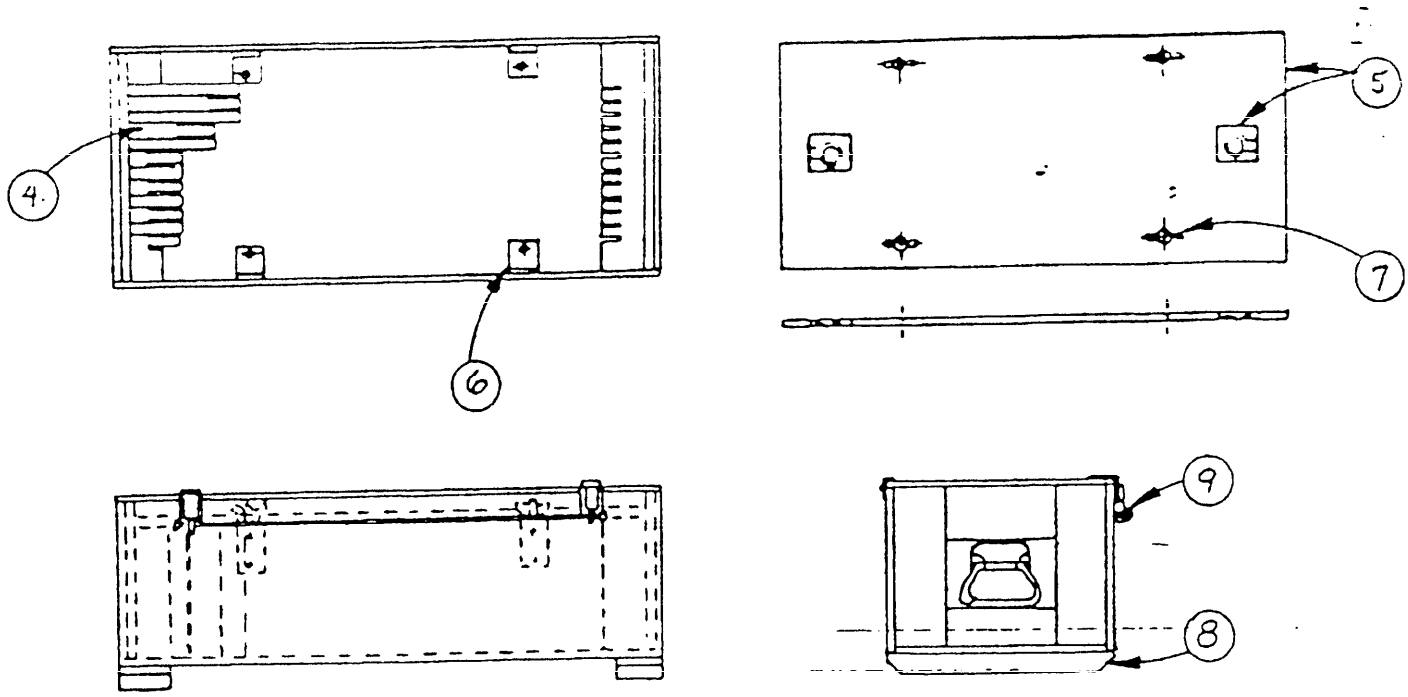
SH 10541

FIGURE 1. *Wood box for shafting under 3 inches in diameter (see 3.9.1.2.2.1).*



SH 13202928

FIGURE 2. *Hub packing (see 3.8.1.6.5 and 3.9.1.2.7).*



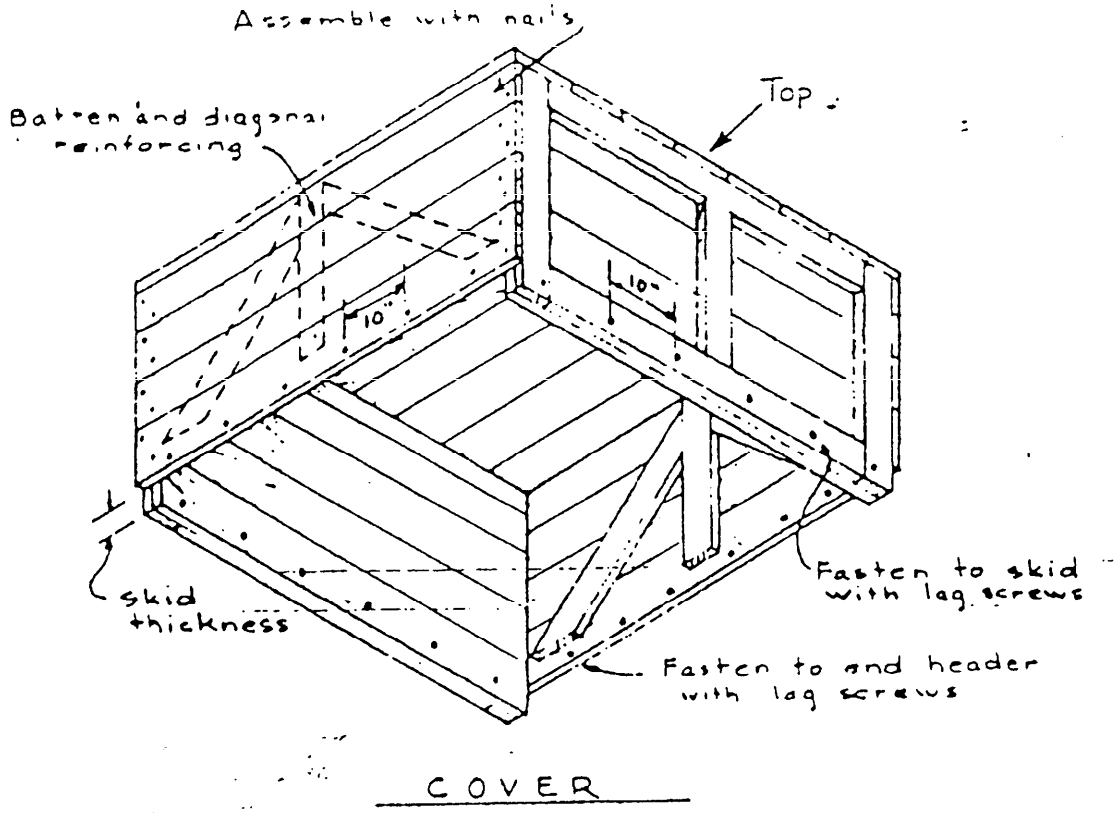
SH 13202927

4. Blade separator guides. Clearance between gauges shall permit ease of gauge removal.
5. Trays when included, shall be provided with lifting provision, handles, lift rings or drilled holes for finger access.
6. Shelf brackets depicted are of metal "L" angles. Wood interior battens (framing) are also acceptable. See MIL-B-233 covering accessory framing and trays.
7. Shelf wing nut 4) locking device shown. Battens (framing) secured to the underside of the container cover to hold the shelf in place are also acceptable.
8. Wood skids in accordance with PPP-B-621 shall be included.
9. Snap type trunk shown with locking bar.

NOTES:

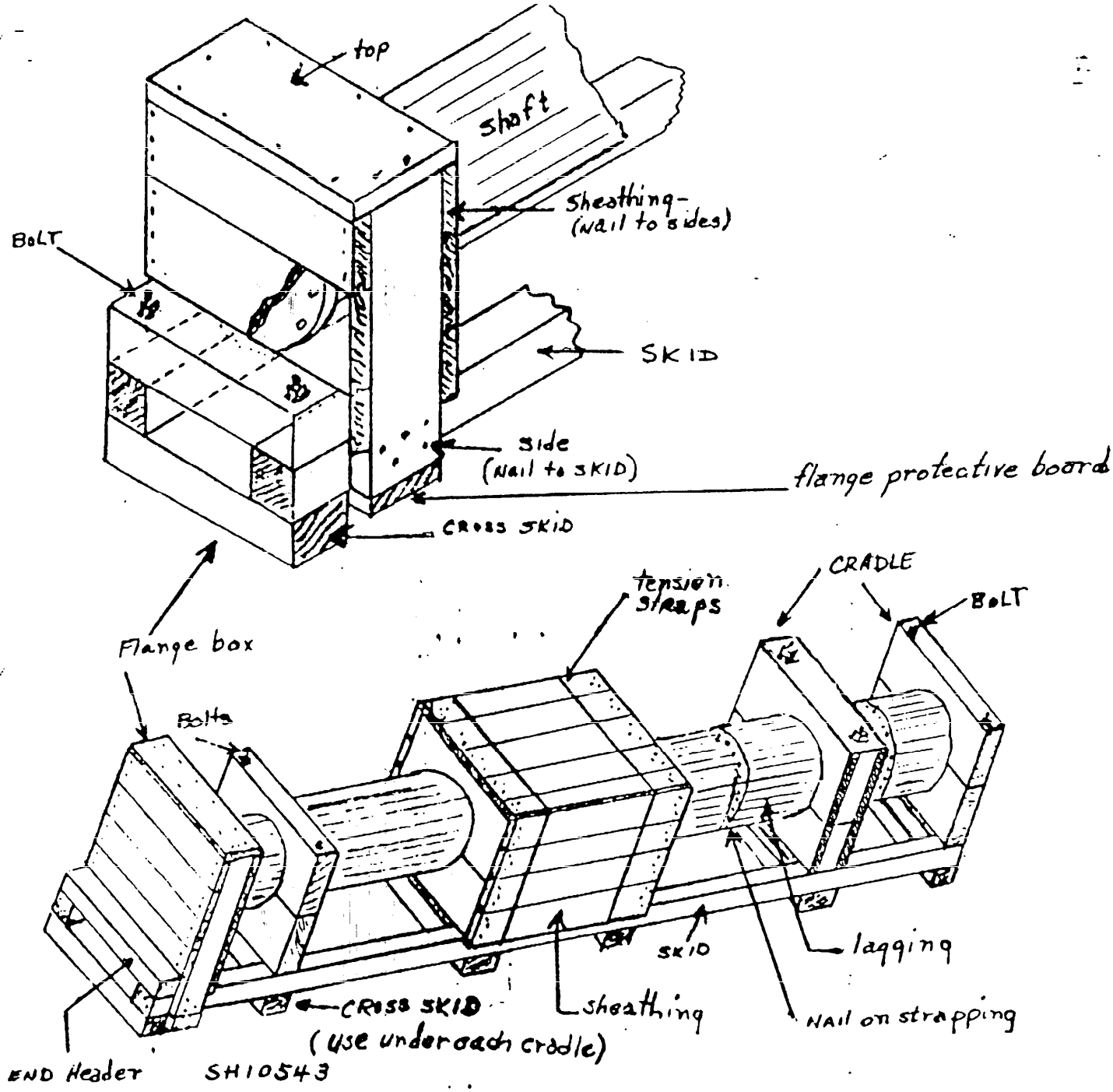
1. Construction and materials in accordance with MIL-B-233, type W, wood container in accordance with PPP-B-621, style 2, 2-1/2, or 3 with style optional.
2. Rope handles are not permitted.

FIGURE 3. *Propeller gauge reusable container (see 3.8.1.8.3 and 3.8.1.1.0).*



SH 10542

FIGURE 4. *Cover and base (modified nailed-wood box) for propellers up to 60 inches in diameter (see 3.9.1.2.3.4).*



SH 10543

FIGURE 5. *Skid assembly (composite view) for shafts over 3 inches in diameter (see 3.9.1.2.2.2).*

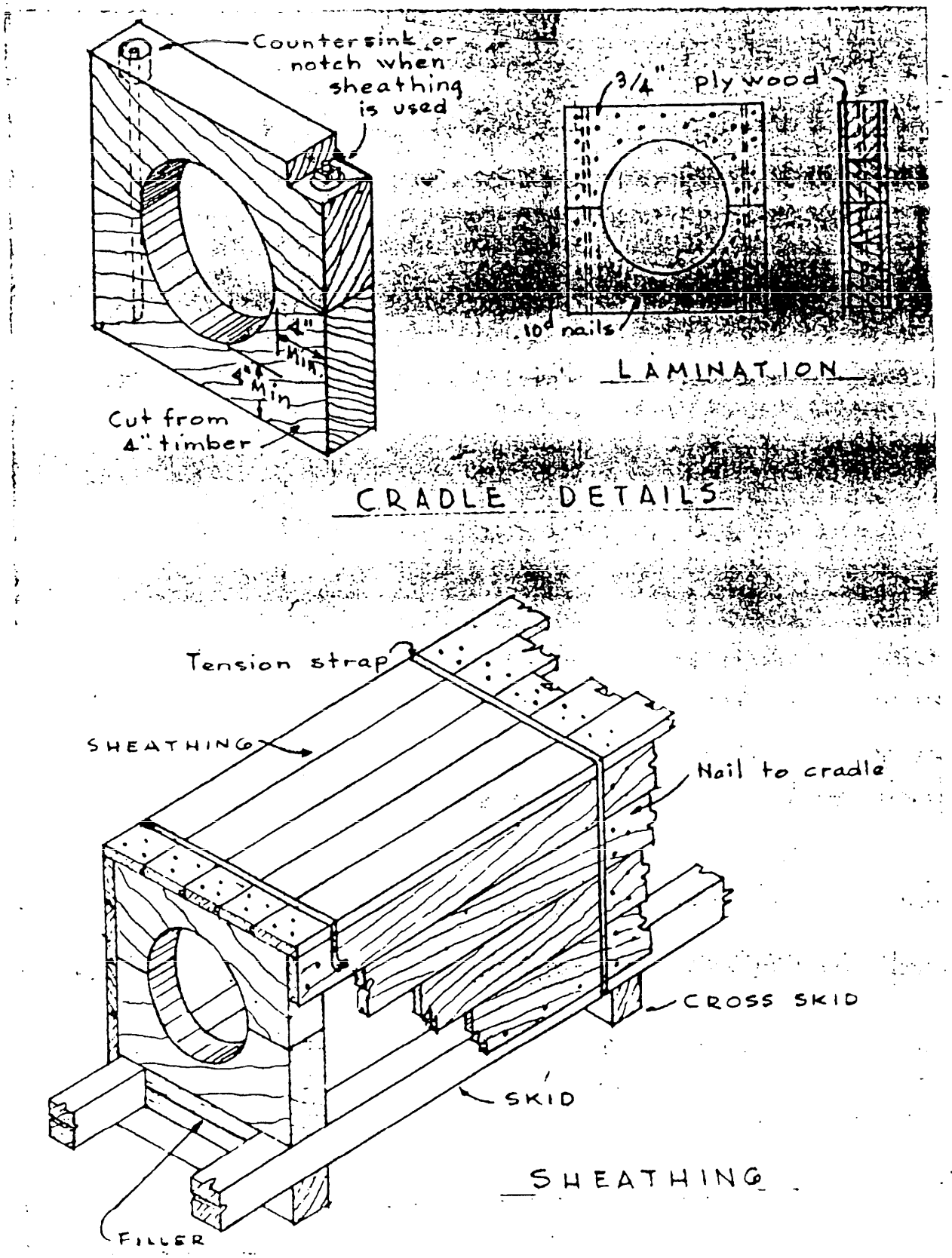


FIGURE 6. *Skid assembly details (see 3.9.1.2.2.2).*

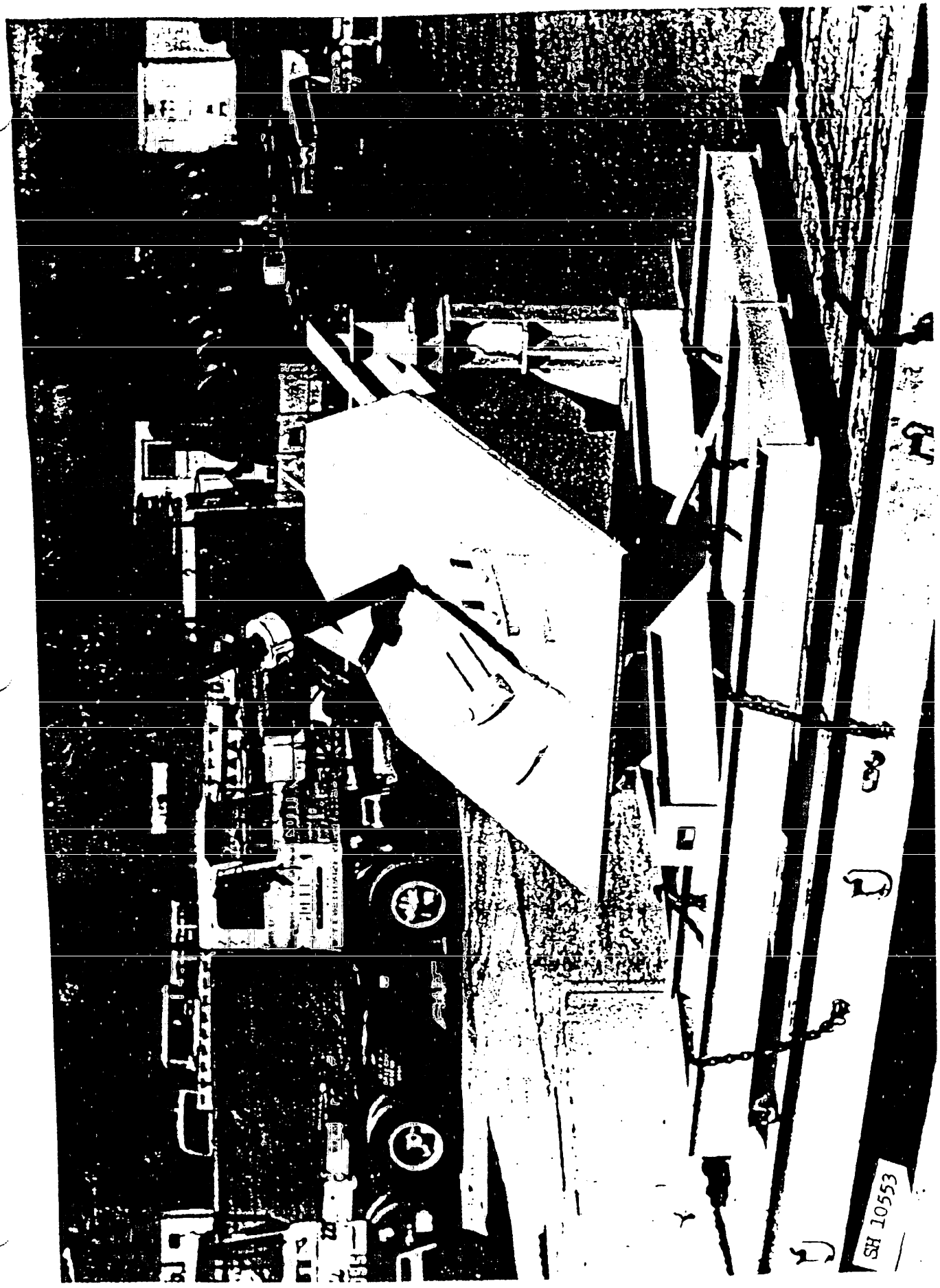
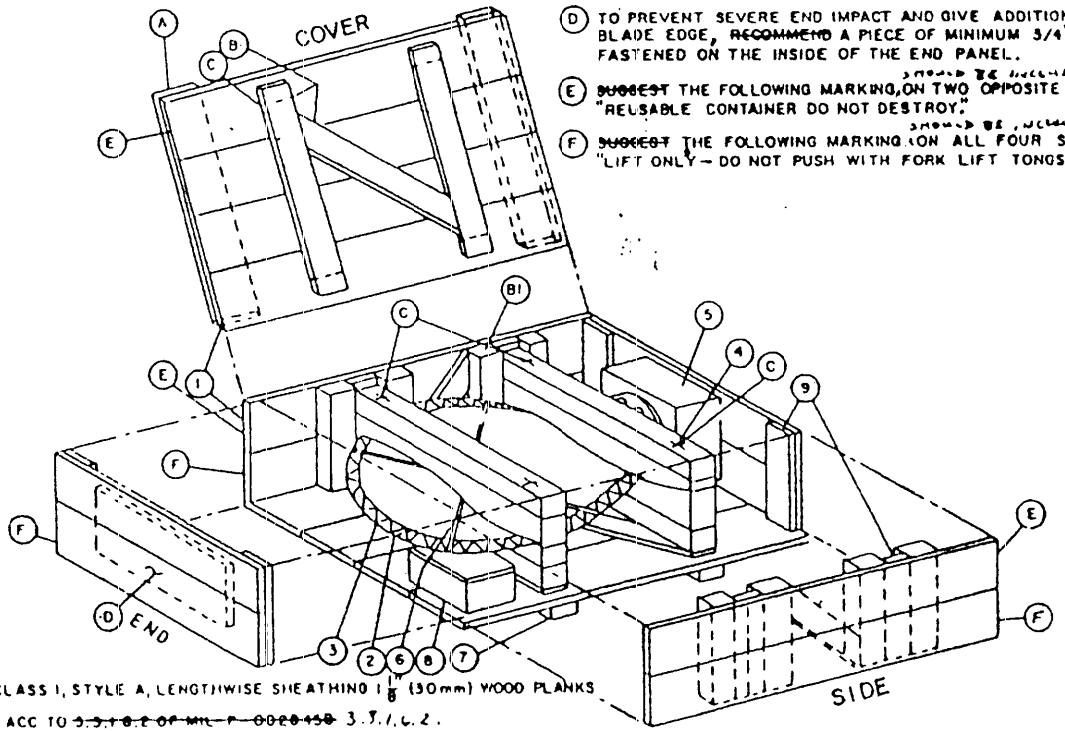


FIGURE 7. *Propeller shipping frame (see 3.9.1.2.3.6.3).*



(A) ~~ADD~~ EXTERIOR CLEATS TO PREVENT SPLITTING OF THE ENDS OF THE COVER MEMBERS.

(B) ~~APPARENTLY~~ DETAIL 4 IS HELD IN PLACE BY NAILING THRU THE SIDES AND BY PRESSURE FIT FROM THE LID, END GRAIN NAILING IS NOT RECOMMENDED, HENCE THE ~~SUGGESTED~~ USE OF POCKET CLEATS – (B1) AND THE RELOCATION OF THE DIAGONAL ON THE LID.

(C) ANOTHER ALTERNATE TO POCKET CLEATS (B1) WOULD BE THE USE OF TIE DOWN BOLTS RUNNING FROM UNDER THE SKID TO THE TOP BLOCK HOLDING THE CONTOURED SADDLE. TO MAKE CLEARANCE FOR THE BOLTS THE CROSS MEMBER UNDER THE TOP ~~WOULD HAVE~~ must TO BE CUT BACK.

(D) TO PREVENT SEVERE END IMPACT AND GIVE ADDITIONAL PROTECTION TO THE BLADE EDGE, ~~RECOMMEND~~ A PIECE OF MINIMUM 3/4" PLYWOOD (BE FASTENED ON THE INSIDE OF THE END PANEL. should be included

(E) ~~SUGGEST~~ THE FOLLOWING MARKING, ON TWO OPPOSITE SIDES AND LID; "REUSABLE CONTAINER DO NOT DESTROY." should be included

(F) ~~SUGGEST~~ THE FOLLOWING MARKING ON ALL FOUR SIDES : "LIFT ONLY – DO NOT PUSH WITH FORK LIFT TONGS." should be included

(1) BOX, TYPE I, CLASS I, STYLE A, LENGTHWISE SHEATHING 1 1/8" (30mm) WOOD PLANKS

(2) EDGE GUARD ACC TO ~~3.3.1.6.2 OF MIL-P-00828458~~ 3.9.1.6.2.

(3) CANVAS ACC TO ~~3.3.1.6.2 OF MIL-P-00828458~~ 3.9.1.6.2.

(4) CONTOURED SADDLE, CUSHIONED, 4 23/32" x 4 23/32" (120 x 120mm) WOOD BEAMS

(5) BLOCKING DEVICE, WOOD PIECE

(6) EDGE GUARD FASTENING (STEEL STRAP)

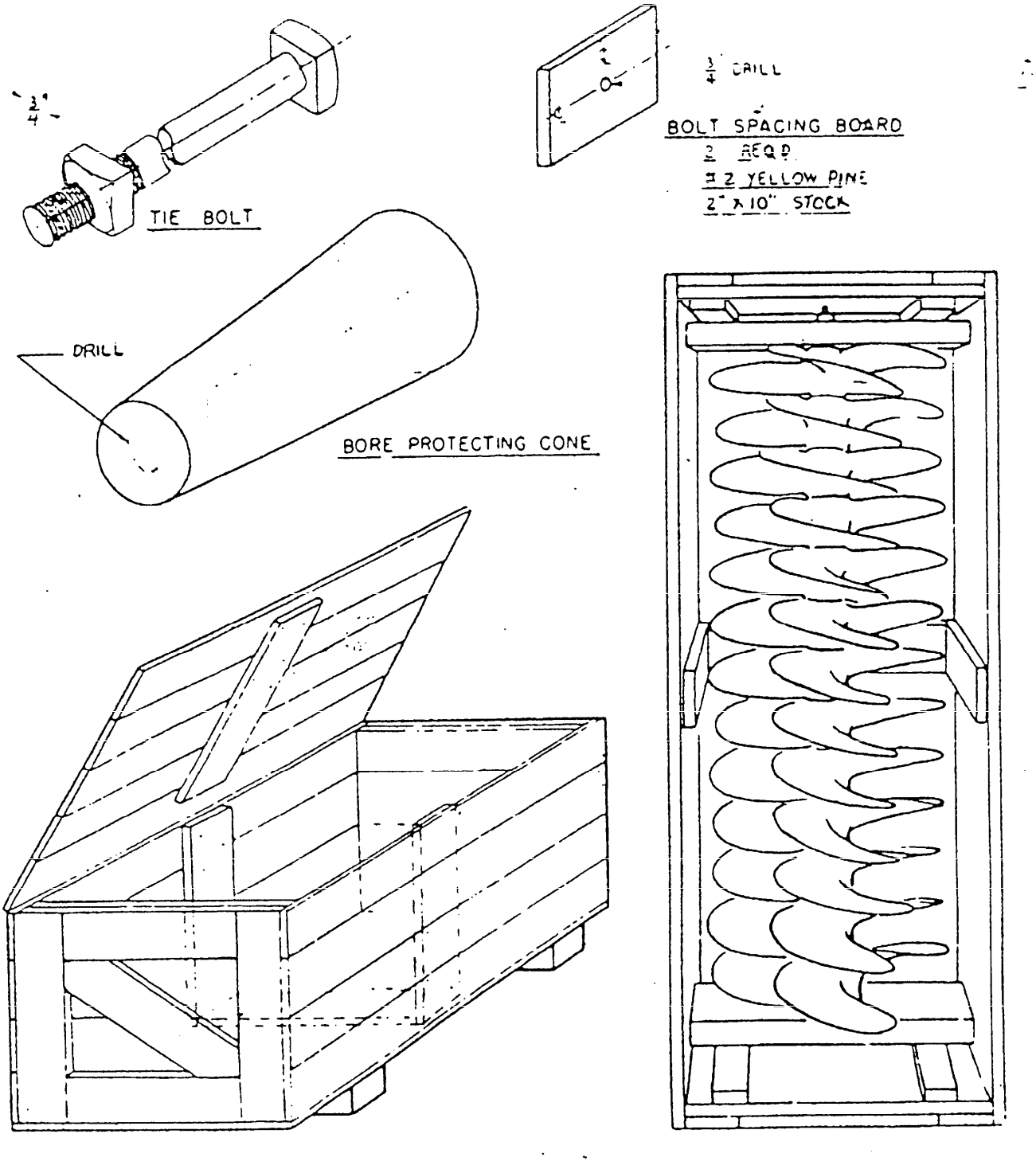
(7) SKIDS 1 31/32" x 4 23/32" (50 x 120mm) WOOD BEAMS

(8) WOOD CASE FOR ACCESSORIES, BOLTED TO THE BOTTOM

(9) WOOD CLEATS, 1 3/16" x 4 23/32" (30 x 120mm)

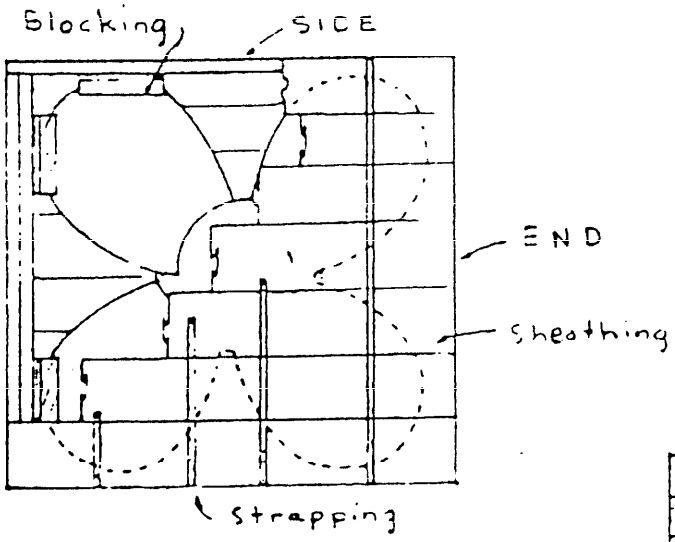
SH 13202929

FIGURE 8. *Propeller blade packing (see 3.9.1.2.3.1).*

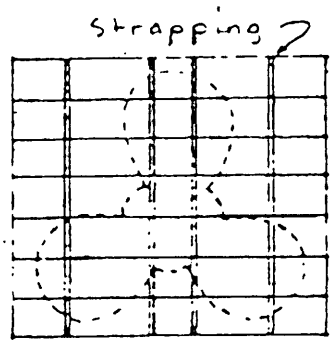


SH 8943

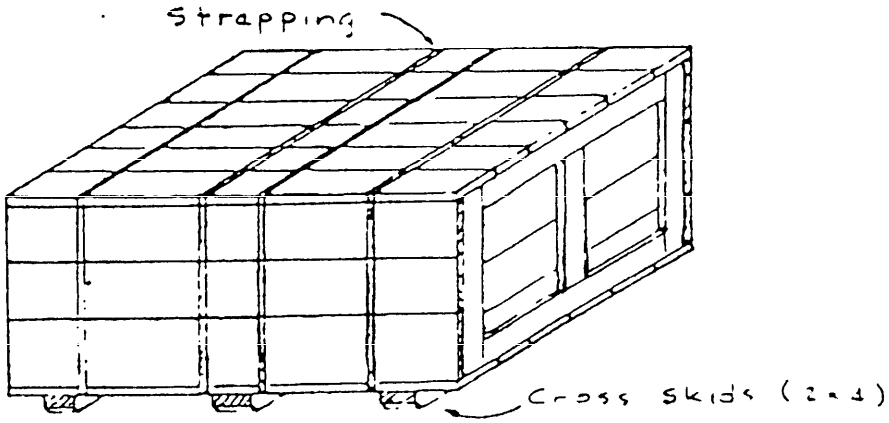
FIGURE 9. *Box for boat propellers 30 inches and under (see 3.9.1.2.3.3).*



TOP VIEW
(4-blade propeller)



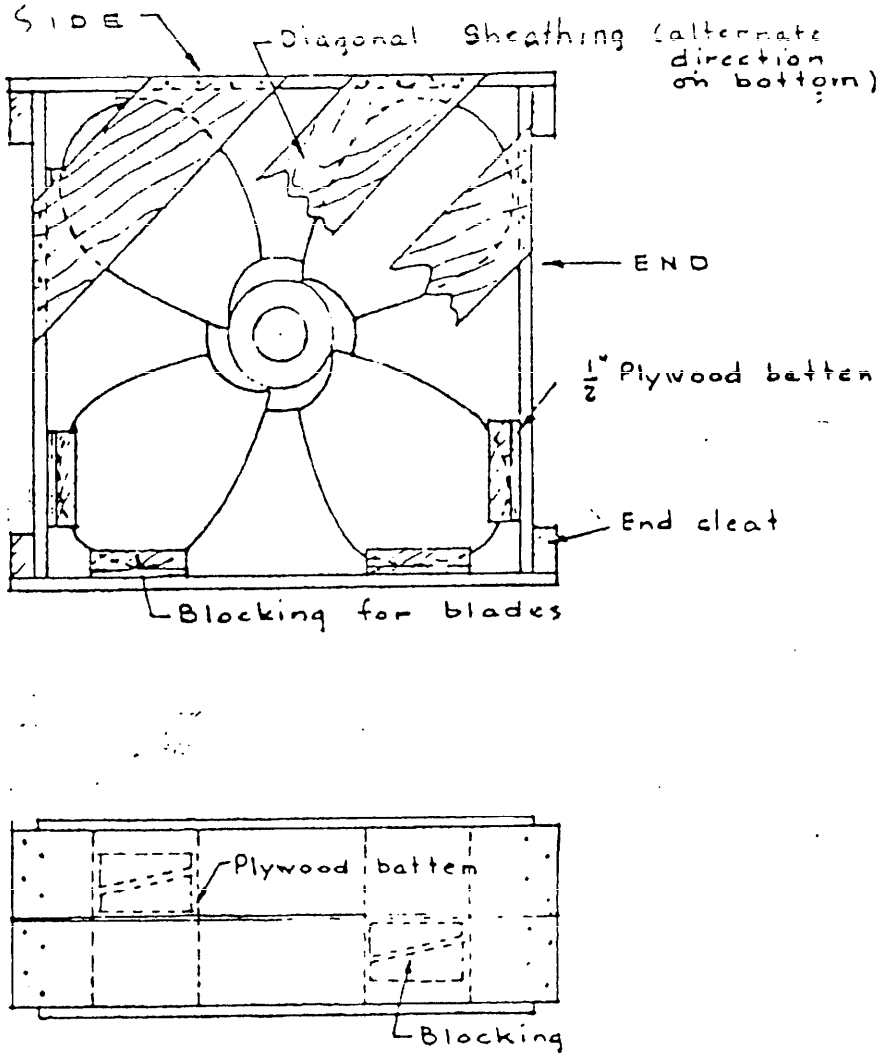
TOP VIEW
(3-blade propeller)



HANDLING SKIDS

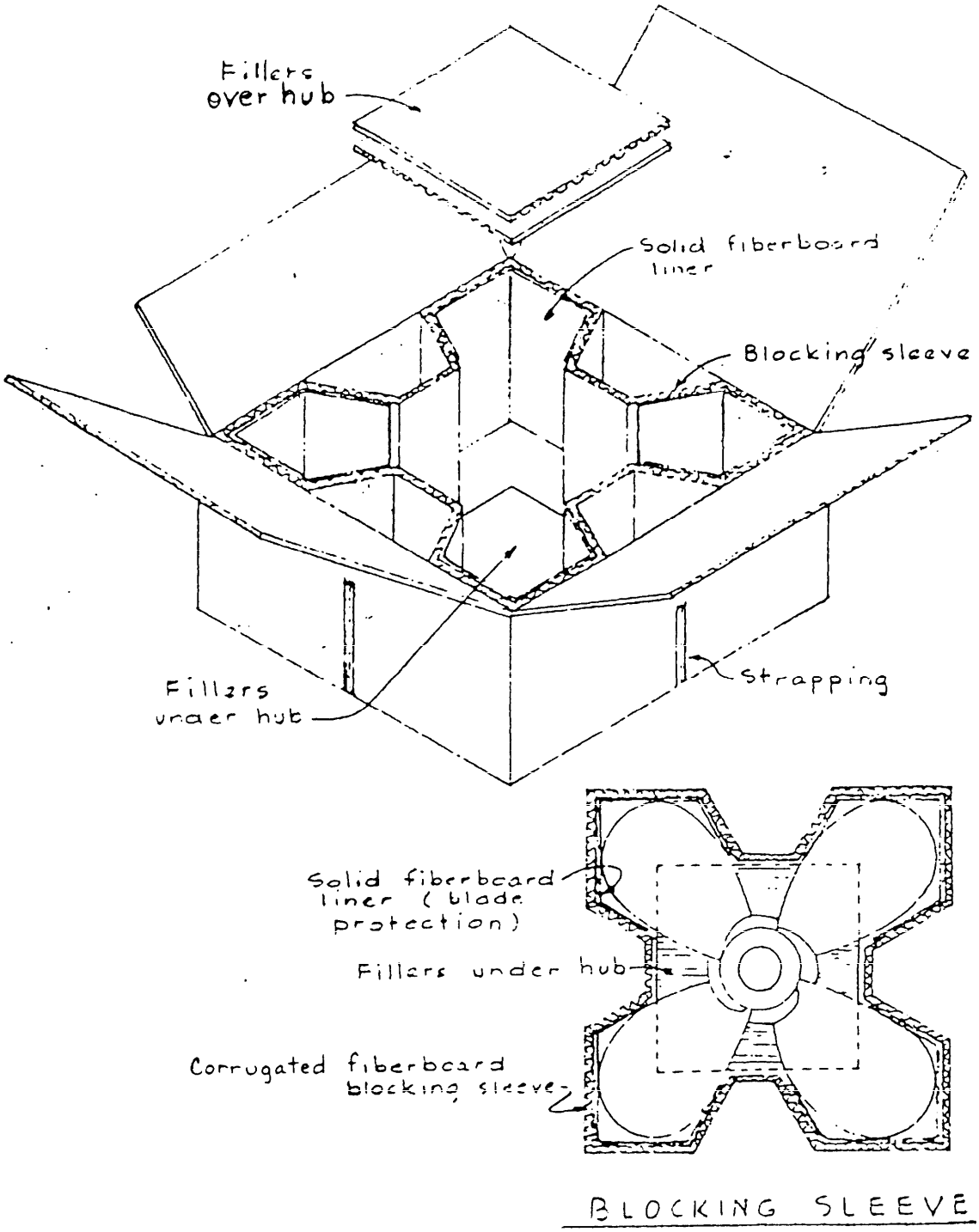
SH 10544

FIGURE 10. *Nailed wood box for propellers 30 inches in diameter and under.*



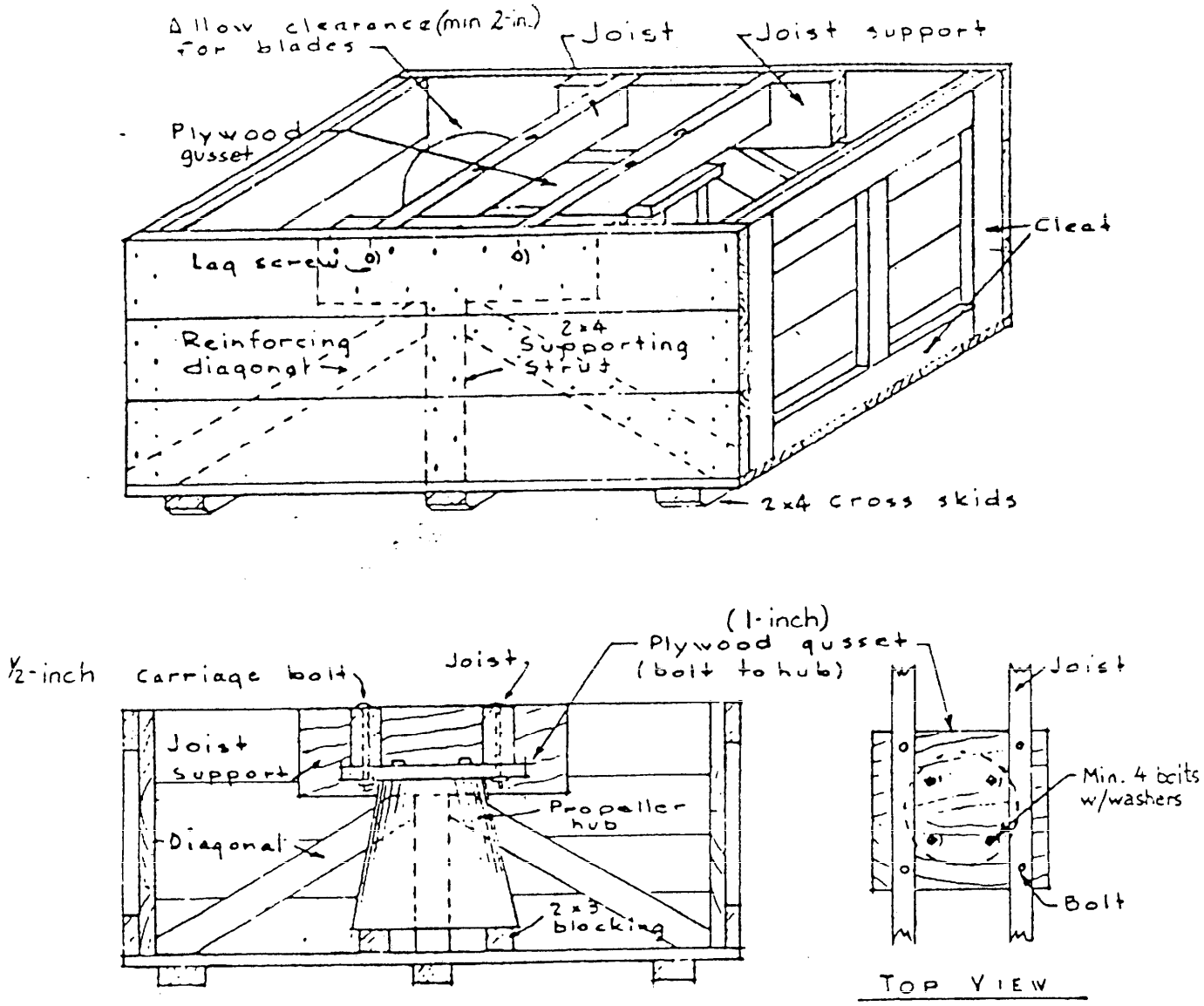
SH 10545

FIGURE 11. *Blocking for propellers 30 inches in diameter and under (see 3.9.1.2.3.3).*



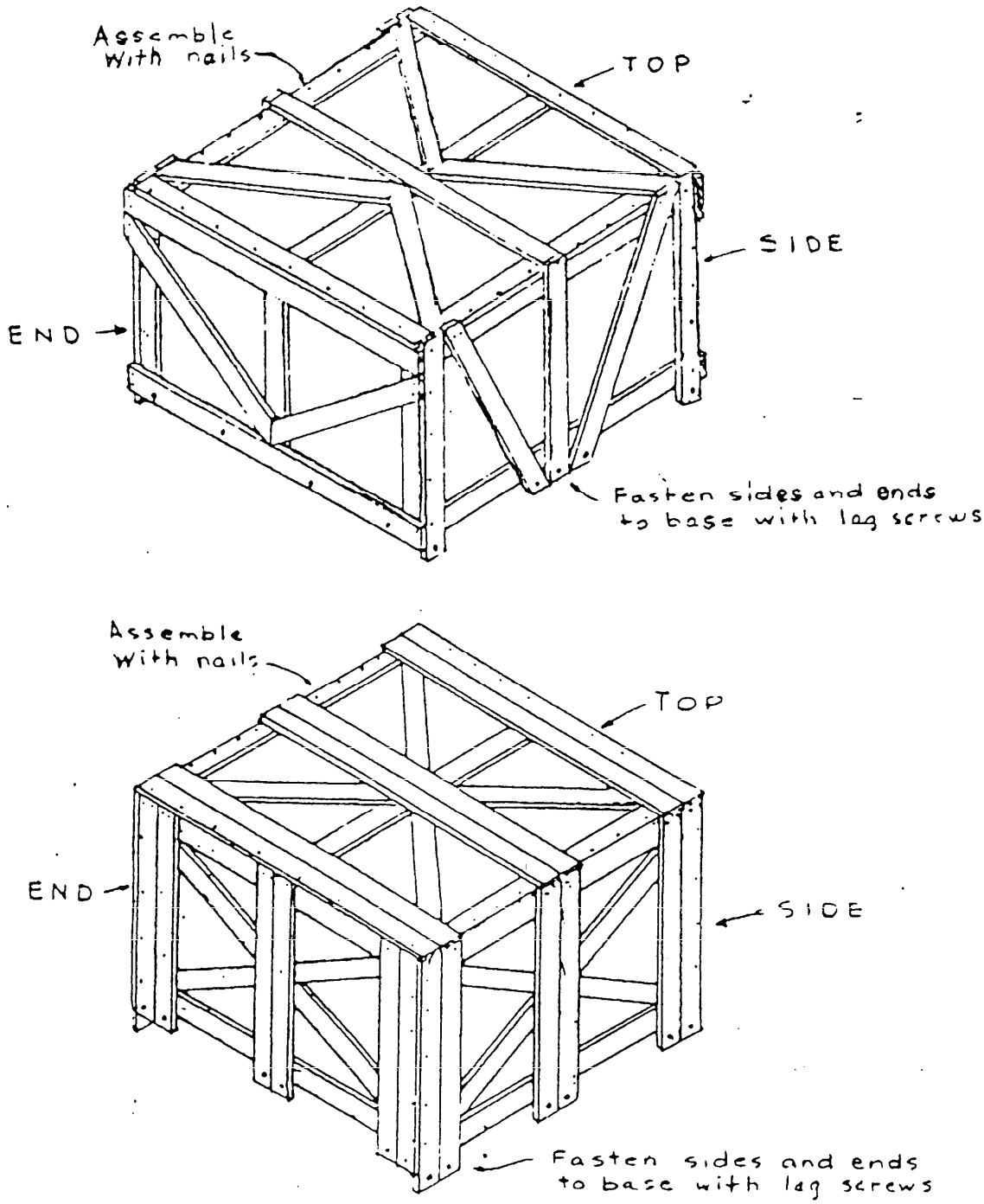
SH 10546

FIGURE 12. *Fiberboard pack for propellers 30 inches in diameter and under (see 3.9.1.2.3.3).*



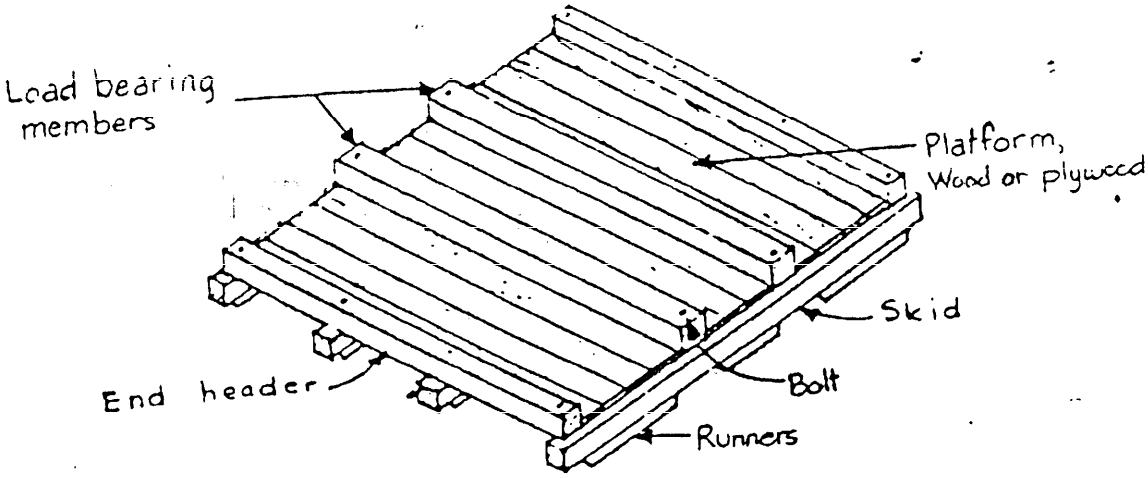
SH 10547

FIGURE 13. *Wood box for propellers 30 to 60 inches in diameter, not exceeding 600 pounds (see 3.9.1.2.3.4).*

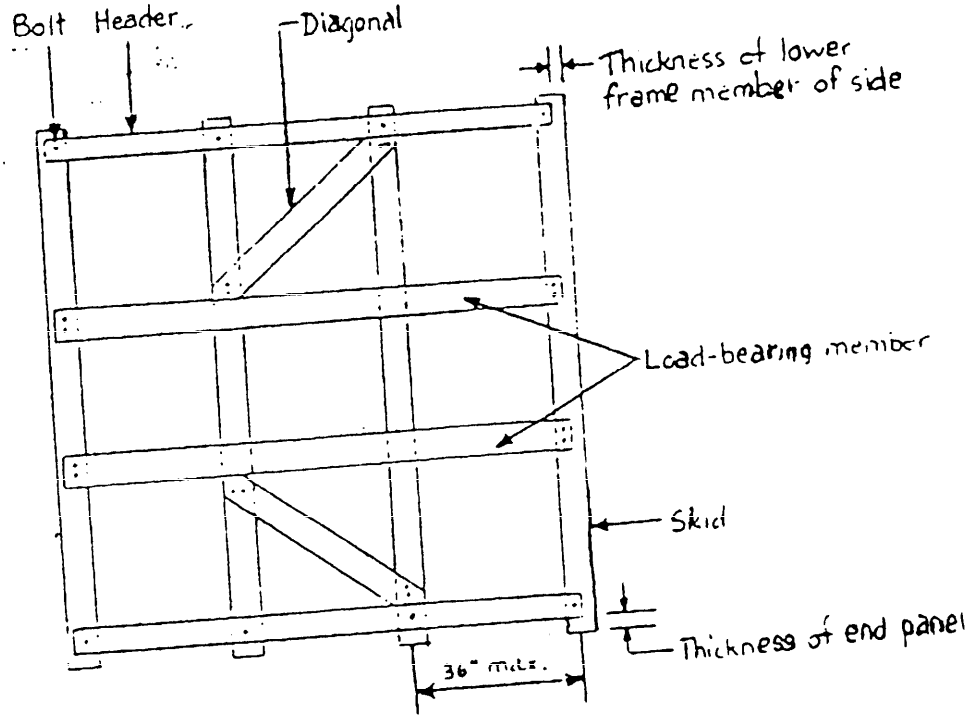


SH 10548

FIGURE 14. *Open type crate covers for propellers 60 to 108 inches in diameter (see 3.9.1.2.3.5).*



COVERED TYPE SKID



OPEN TYPE SKID

SH 10549

FIGURE 15. *Skid type bases for propellers 60 to 108 inches in diameter (see 3.9.1.2.3.5).*

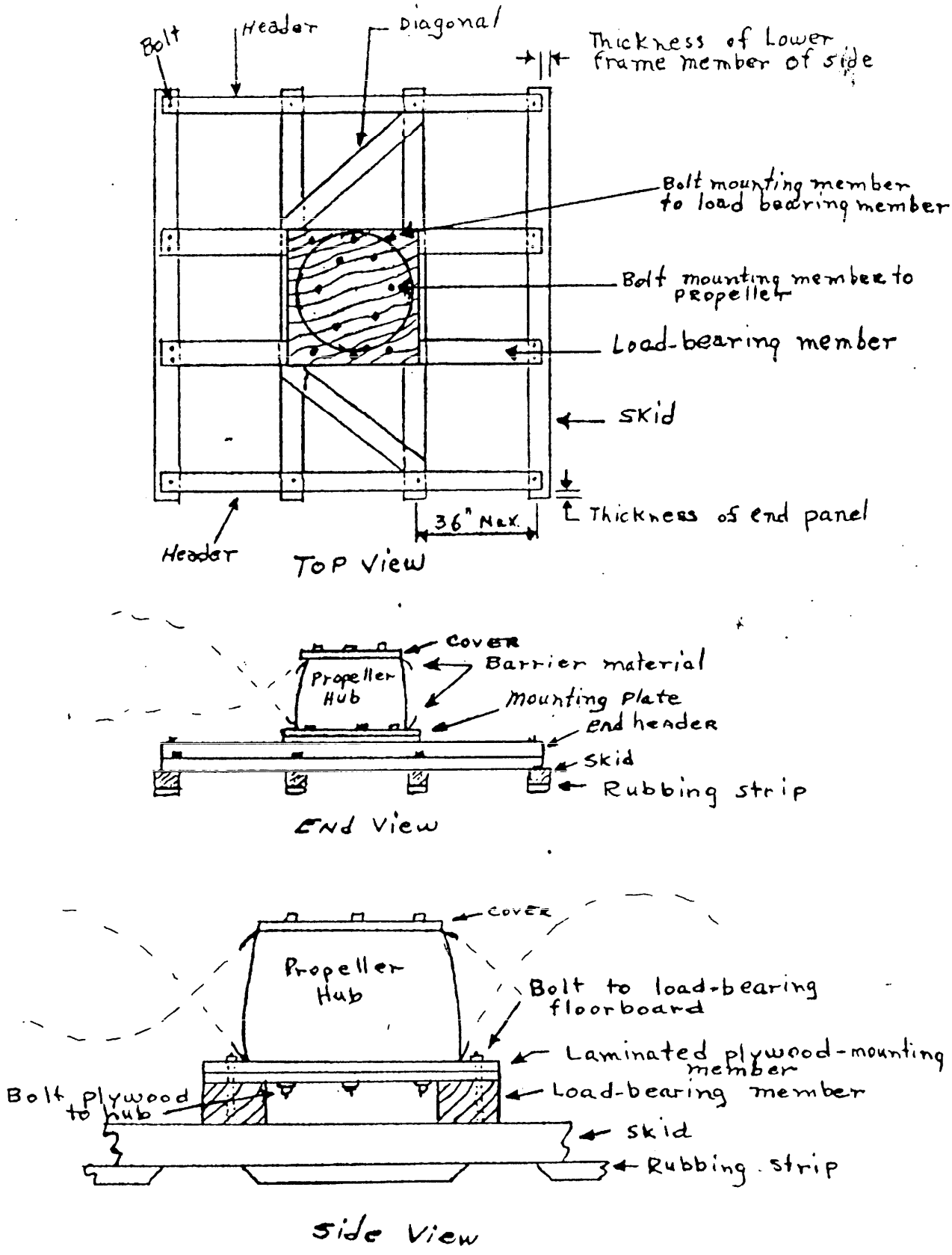


FIGURE 16. *Propeller anchoring (see 3.9.1.2.3.4 and 3.9.1.2.3.5).*

FIGURE 17. *Loading of propellers more than 108 inches in diameter (see 3.9.1.2.3.6.1).*

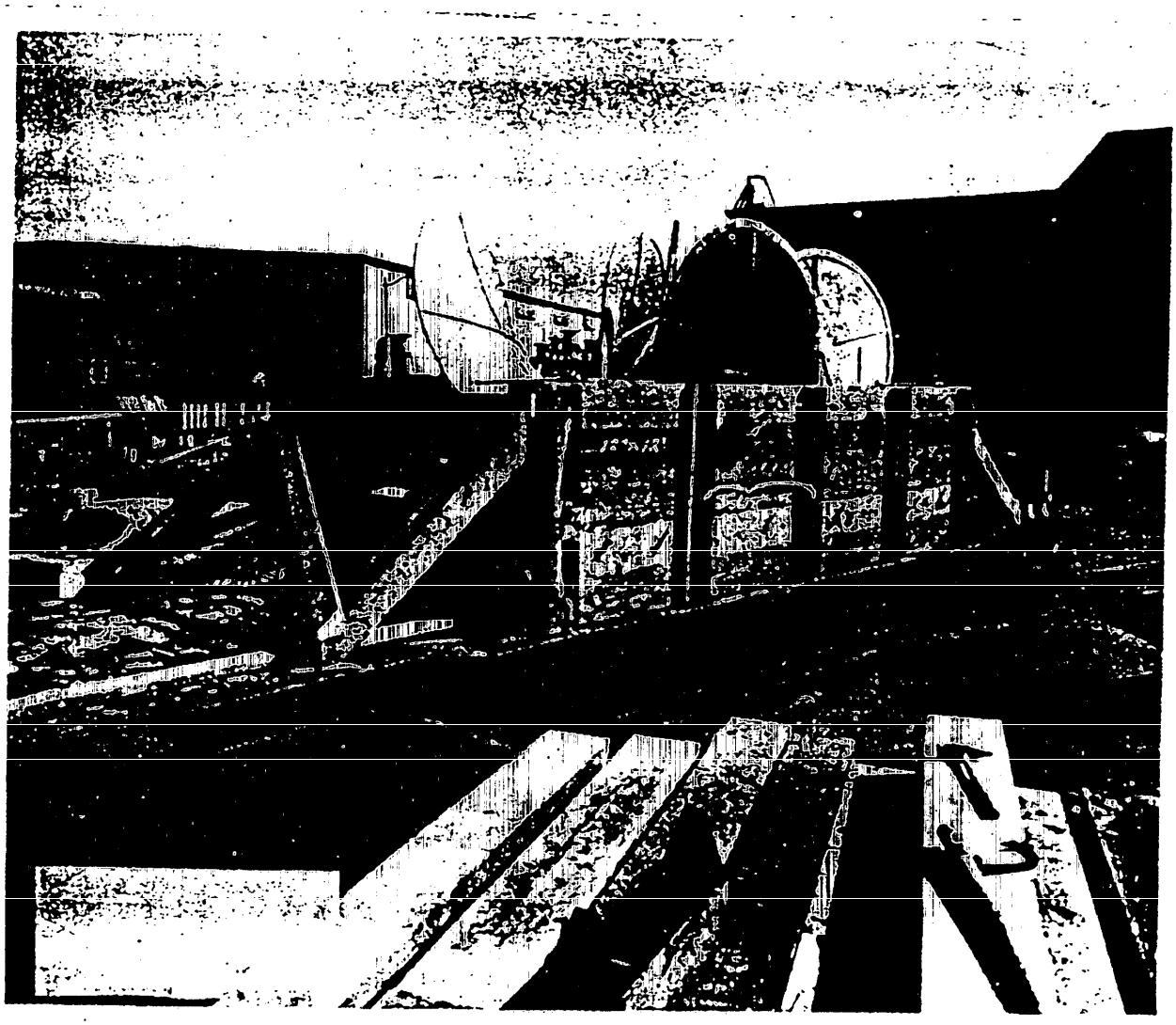


FIGURE 18. *Loading of propellers more than 108 inches in diameter (see 3.9.1.2.3.6.1).*

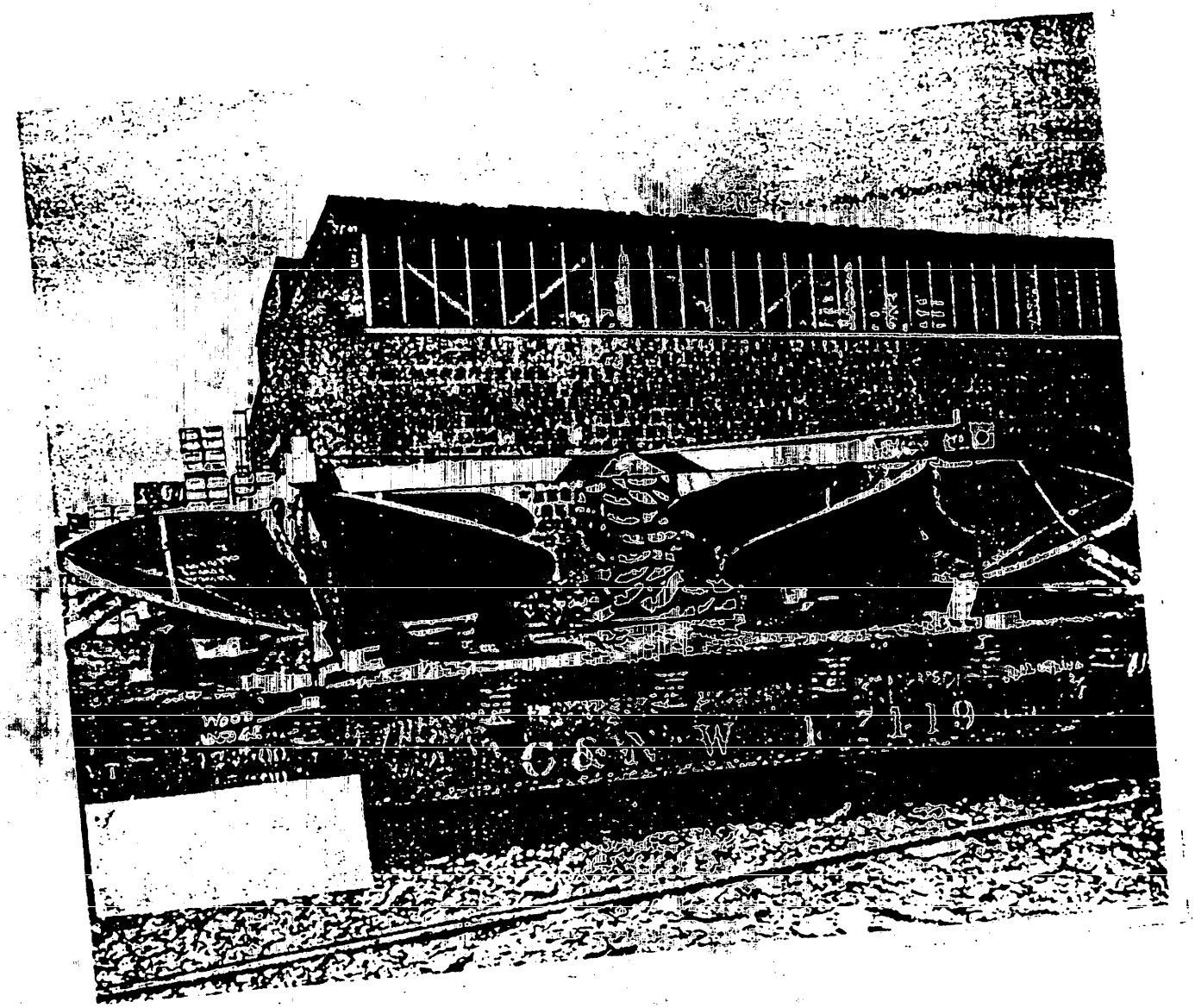


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FIGURE 19. *Vertical shipment of propellers more than 108 inches in diameter (see 3.9.1.2.3.6.1).*

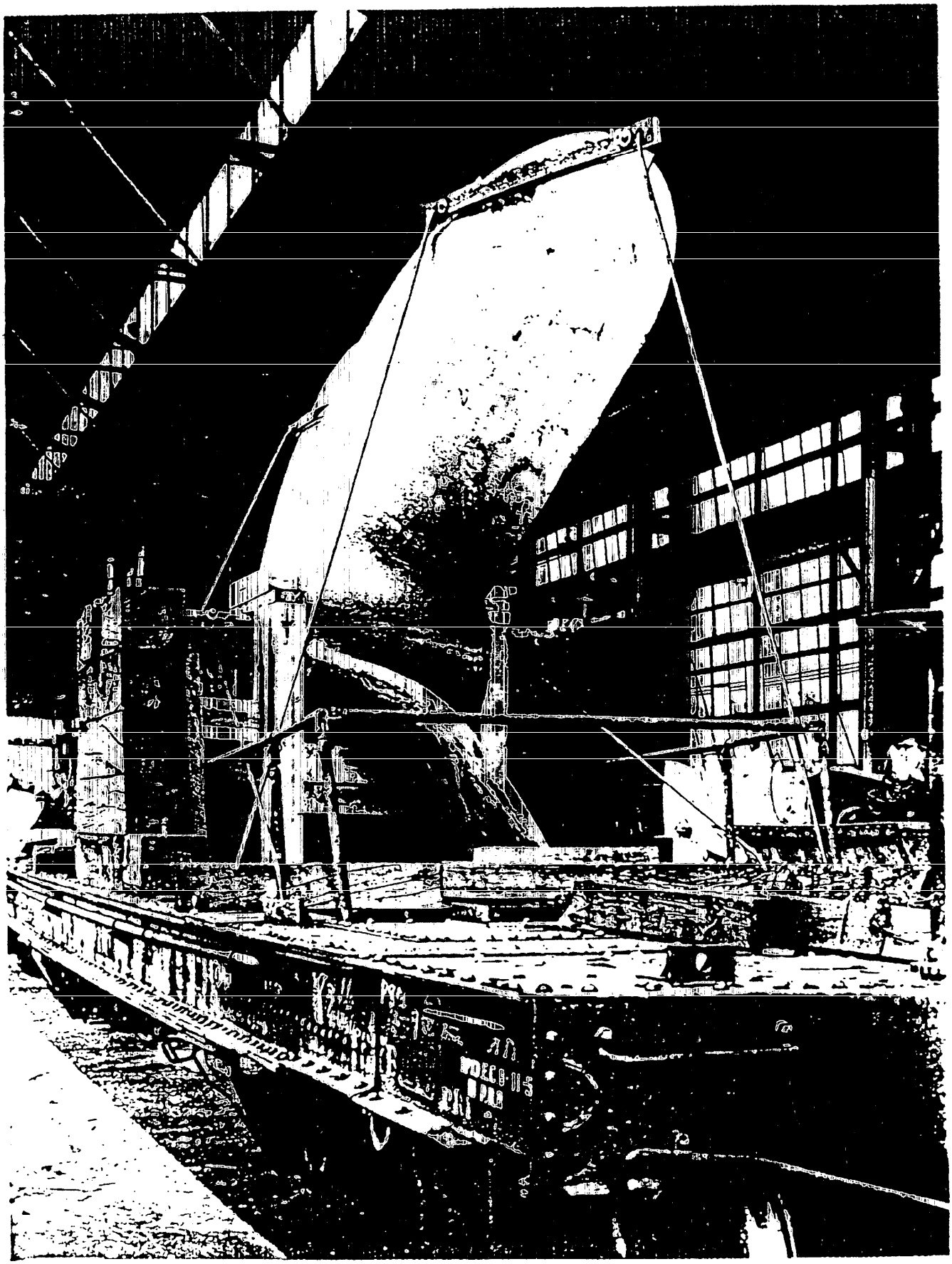
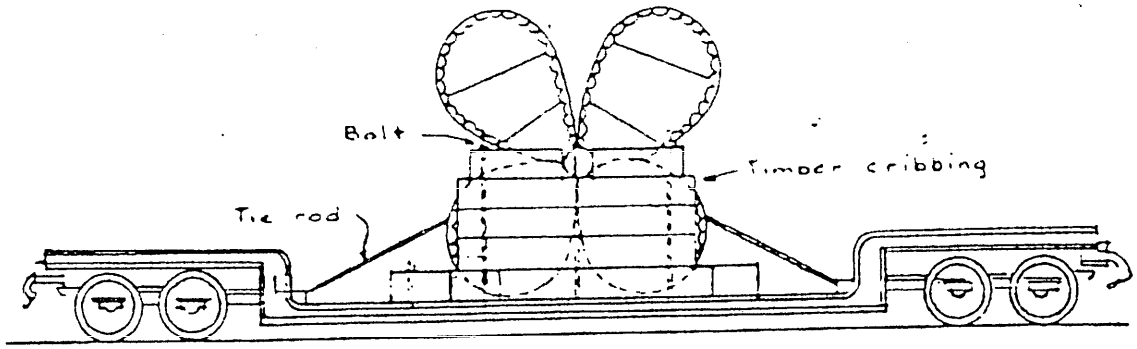
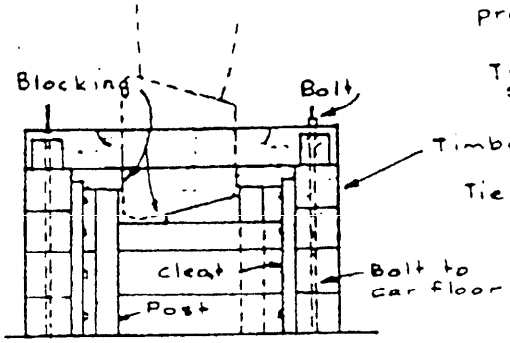


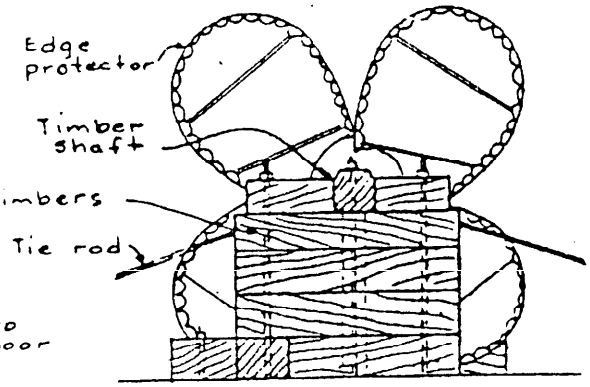
FIGURE 20. *Well car (see 3.9.1.2.3.6.1).*



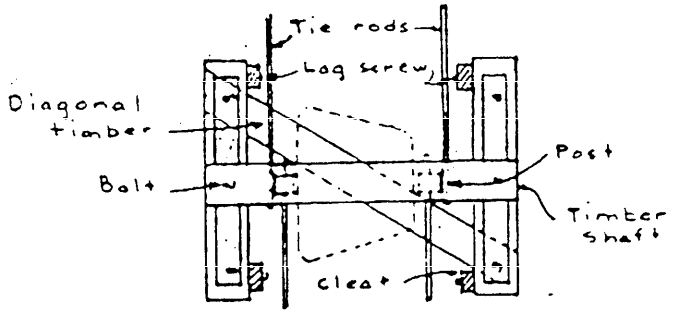
DROPPED-CENTER CAR



END VIEW



SIDE VIEW



TOP VIEW

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FIGURE 21. *Blocking of large propeller (see 3.9.1.2.3.6.1).*

APPENDIX A

ENGINEERING DRAWINGS TECHNICAL CONTENT REQUIREMENTS

10. SCOPE

10.1 Scope. This appendix covers the technical requirements that should be included or drawings when required by the contract or order. This appendix is mandatory only when data item description DI-DRPR-80651 is cited on the DD Form 1423.

20. APPLICABLE DOCUMENTS.

This section is not applicable to this appendix.

30. DRAWING CONTENT.

30.1 Drawing content. When required by the contract or order, drawings shall contain the following information:

a. Method of preservation and applicable specification

b. Level of preservation and packing

c. Weight (net, tare and gross)

d. Dimensions (interior and overall exterior of the container)

e. Dimensional location of shock mounts, anchoring, blocking, and bracing

f. Bill of material listing specifications, material, type, class, grade, or other data necessary for identification

g. Assembly or disassembly instructions including special tools, if required

h. Marking, including handling and structural markings (such as "Use no hooks", "Method II", "Center of Gravity", and so forth).

APPENDIX B

TEST REPORT TECHNICAL CONTENT REQUIREMENTS

10. SCOPE

10.1 Scope. This appendix covers the technical requirements that should be included or first article inspection reports when required by the contract or order. This appendix is mandatory only when data item description DI-MISC-80653 is cited on DD Form 1423.

20. APPLICABLE DOCUMENTS

This section is not applicable to this appendix.

30. REPORT CONTENT

30.1 Report content. When required by the contract or order, first article inspection reports shall contain the following information:

The test report shall be in accordance with the contractor's format and shall contain as a minimum: subject including contract number; references as applicable; description and summary of each pack test; test sequences; interpretation of test results including failures and corrective actions taken on the package, contents, or both, as applicable; signatures and dates of tester, inspector, and Government representatives.

STANDARDI TION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER	2. DOCUMENT DATE *(YYMMDD)*
	MIL-P-2845D(SH)	17 June 1991

3. DOCUMENT TITLE PROPULSION SYSTEMS, BOAT AND SHIP: MAIN SHAFTING, PROPELLERS, BEARINGS, GAUGES, SPECIAL TOOLS, AND ASSOCIATED REPAIR PARTS: PACKAGING OF

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*	b. ORGANIZATION	
c. ADDRESS *(Include Zip Code)*	d. TELEPHONE *(Include Area Code)* (1) Commercial (2) AUTOVON *(If applicable)*	7. DATE SUBMITTED *(YYMMDD)*

8. PREPARING ACTIVITY

a. NAME	b. TELEPHONE *(Include Area Code)* (1) Commercial	(2) AUTOVON
~~Technical Point of Contact (TPOC):~~ Mr. R. Dempsey (SEA 5143) PLEASE ADDRESS ALL CORRESPONDENCE AS FOLLOWS:	TPOC: 703-602-0146	8-332-0146
c. ADDRESS *(Include Zip Code)* Commander, Naval Sea Systems Command Department of the Navy (SEA 5523) Washington, DC 20362-5101	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	

DD Form 1426, OCT 89 *Previous editions are obsolete.* 198/290