

GGG-B-500C
11 October 1983
SUPERSEDING
GGG-B-500B
December 7, 1966

FEDERAL SPECIFICATION
BLOCK, TACKLE (WIRE ROPE)

This specification was approved by the Assistant Administrator
Federal Supply and Services, General Services Administration for
the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers single-sheave snatch and single- and multiple-sheave ordinary wire rope tackle blocks for regular and heavy duty use.

1.1.1 Federal specification coverage. Federal specifications do not include all varieties of the commodity indicated by the title of the specification, but cover only those most generally used by the Federal Government.

1.2 Classification. Tackle blocks shall be of the following types, grades, and styles, as specified (see 6.2):

Type I - Snatch blocks single sheave, safety locking.

Type II - Ordinary blocks.

Grade A - Regular duty.

Grade B - Heavy duty.

Style 1 - Single sheave.

Style 2 - Double sheave.

Style 3 - Triple sheave.

FSC 3940

GGG-B-500C

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal form a part of this specification to the extent specified herein:

Federal Standards

- | | |
|-------------|---|
| FED-STD-H28 | - Screw Thread Standards for Federal Services |
| FED-STD-123 | - Marking for Shipment (Civil Agencies) |

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

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

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

Military Specifications

- | | |
|------------|---|
| MIL-B-3865 | - Block, Rope, Tackle: Packaging of |
| MIL-B-5687 | - Bearing, Sleeve, Washers, Thrust, Sintered, Metal Powder, Oil Impregnated |

Military Standards

- | | |
|--------------|--|
| MIL-STD-105 | - Sampling Procedures and Tables for Inspection by Attributes |
| MIL-STD-129 | - Marking for Shipment and Storage |
| MIL-STD-130 | - Identification Marking of US Military Property |
| MIL-STD-889 | - Dissimilar Metals |
| MIL-STD-1188 | - Commercial Packaging of Supplies and Equipment |
| MS15003 | - Fitting, Lubrication (Hydraulic) Surface Check; 1/8 Pipe Thread, Steel, Type III |

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

Federal Regulations

41 CFR 1-1.25

- Recovered Materials

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

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

American Society for Testing and Materials (ASTM)

A36	- Structural Steel
A148	- High Strength Steel Castings for Structural Purposes
A153	- Zinc Coating (Hot Dip) on Iron and Steel Hardware
A675	- Steel Bars, Carbon, Hot Wrought, Special Quality, Mechanical properties

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

American National Standards Institute, Inc. (ANSI)

B46.1	- Surface Texture Surface Roughness, Waviness and Lay
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(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.)

National Motor Freight Traffic Association, Inc., Agent

National Motor Freight Classification

(Application for copies should be addressed to the ATA Traffic Department, 1616 P Street, N.W., Washington, D.C. 20036.)

GGG-B-500C

Uniform Classification Committee, Agent

Uniform Freight Classification

(Application for copies should be addressed to the Tariff Publishing Office; Suit 1106, 222 South Riverside Plaza, Chicago IL 60606.)

3. REQUIREMENTS

3.1 Description. The blocks shall consist of a shell, one or more sheaves and straps combined with all necessary interconnecting fittings to form a complete unit assembly.

3.2 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 4.3 and 6.3).

3.3 Material. Material shall be as specified herein. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification.

3.3.1 Regulatory requirements. The offeror/contractor is encouraged to use recovered materials in accordance with Public Law 94-580 (41 CFR 1-1.25) to the maximum extent practical.

3.3.2 Material deterioration and control. The block shall be fabricated from compatible materials, inherently corrosion resistant or treated to provide protection against the various forms of corrosion and deterioration that may be encountered in any of the applicable storage and operating environment to which the item may be exposed.

3.3.2.1 Dissimilar metals. Dissimilar metals shall not be used in intimate contact with each other unless protected against galvanic corrosion. Dissimilar metals and methods of protection are defined and detailed in MIL-STD-889.

3.3.2.2 Identification of materials and finishes. The contractor shall identify the specific material, material finish or treatment for use with components and sub-components, and shall make information available, upon request to the contracting officer or designated representative.

3.4 Screw threads. All screw threads shall conform to Fed. Std. No. H28.

3.5 Strength.

3.5.1 Proof load. When subjected to a proof load of twice the safe working load (SWL) specified in Tables I and II, the block shall show no evidence of deformation, distortion, cracks or permanent set of any component.

Table I. Type I, snatch blocks

Sheave size OD	Rope dia.	Minimum diameter at depth of sheave groove	SWL
Inches	Inch	Inches	(Lbs.)
6	3/8 to 1/2	4-1/2	4,000
8	1/2 to 5/8	6-1/8	6,000
10	5/8 to 3/4	7-3/4	8,000
12	3/4 to 7/8	9-3/8	10,000
14	7/8 to 1	11	12,000
16	1	13	15,000

Table II. Type II, regular blocks

Sheave size OD	Grade A				Grade B			
	Rope dia.	Style			Rope dia.	Style		
		1 SWL	2 SWL	3 SWL		1 SWL	2 SWL	3 SWL
Inches	Inch	Lbs.	Lbs.	Lbs.	Inch	Lbs.	Lbs.	Lbs.
6	3/8 to 1/2	3,000	4,000	5,000	1/2 to 5/8	4,000	4,500	6,000
8	1/2 to 5/8	4,000	5,000	6,000	5/8	5,000	7,000	9,000
10	5/8	5,000	6,000	7,000	5/8 to 3/4	7,000	9,000	10,000
12	5/8 to 3/4	6,000	9,000	11,000	3/4 to 7/8	9,000	10,000	12,000
14	3/4 to 7/8	9,000	11,000	13,000	7/8 to 1	10,000	12,000	16,000
16	--	--	--	--	1	13,000	16,000	20,000

Note: For minimum diameter at depth of sheave groove, refer to type I of table I.

3.5.2 Ultimate strength. When tested for ultimate strength, the fittings, hook, or shackle shall not fail at loads less than 4 times the SWL specified in tables I and II. The block shall then be further tested to destruction but shall not fail at loads less than 5 times the SWL specified in tables I and II.

3.6 Fastening devices. Bolts, nuts, rivets, shell pipe sleeves, cotter pins, and other items used as fasteners or spreaders, shall be made of commercial quality steel commonly used for this purpose. Such parts shall not be swaged, peened, stacked, or otherwise permanently deformed.

GGG-B-500C

3.7 Shell plates. Shell plates shall be steel conforming to ASTM A36. The shell plates shall fully shield the sheave and shall have smooth edges. Plates shall be held in position with bolts, nuts, and pins to prevent distortion or spreading. Each block shall have the shell plates held together at the bottom with a minimum of three bolts with nuts, and tubing spacers; the center bolt shall extend through each strap piece. Type I shell plates shall have an impression or indentation guard pressed into its side extending through a minimum of 180 degrees around the top of the shell in a manner to prevent the wire rope from being jammed between the shell and the sheave. Type II shell plates shall be diamond or oval pattern as specified (see 6.2).

3.8 Straps. Straps shall be steel conforming to ASTM A675. Straps shall be two-piece construction and shall extend the full length of each shell plate. Straps shall be securely welded, riveted, or bolted to the shell plates in such a manner as to securely hold the shell plates in position and to add rigidity to the block assembly. The straps shall provide bearing support for the center pin and connections to transmit loads from the sheave to the fittings.

3.9 Sheaves. Sheaves shall be cast steel conforming to ASTM A148, grade 80-40, and shall have a minimum hardness of Rockwell 34. Sheave groove depth shall be as specified in table I and shall be designed to prevent cutting action on the rope. The rim and tread section shall be grooved to fit the contour of the rope under load conditions. The sheaves shall be concentric with the bore, and shall be designed so that only the hubs bear against the shells. Side play shall not exceed 0.125 inch. Sheaves shall rotate freely when rotated by hand.

3.10 Center pin. Center pin shall be cold drawn medium carbon steel having a carbon content of 0.25 to 0.50 percent. The center pin shall be locked in position to prevent rotation. The center pin shall be fitted with key head and hex nut with cotter key. When specified (see 6.2), grease channels shall be drilled through the pin and a lubricating fitting shall be recessed into the head of the pin to provide lubrication of the bearing surfaces. Lubrication fittings shall conform to MS15003. Surface roughness of center pin bearing surfaces shall not exceed 63 microinches determined in accordance with ANSI B46.1.

3.11 Fittings. Fittings shall be forged medium carbon steel having a carbon content of 0.25 to 0.50 percent, and shall swivel freely through 360°.

3.12 Galvanizing. All metal surfaces of blocks except bearing surfaces shall be hot dipped galvanized in accordance with ASTM A153.

3.13 Identification marking. The blocks shall be identified in accordance with MIL-STD-130. Marking shall be permanently and legibly stamped on a shell plate indicating the SWL, size of wire rope to be used with the block, and the manufacturer's code.

GGG-B-500C

3.14 Type I blocks. Type I blocks shall be as shown in figure 1 (see 6.4); and shall conform to the requirements specified in table I. The locking device shall be locked into position when the fittings and crosshead are rotated 90° from its normal load position.

3.14.1 Bearings. Bearings shall conform to MIL-B-5687, type I, composition A.

3.14.2 Fittings. Fittings shall be as specified (see 6.2), and shall be as shown on figures 1 and 2 (see 6.4).

3.15 Type II blocks. Type II blocks shall be as shown in figure 3 (see 6.4), and shall conform to the requirements specified in table II. Blocks shall be supplied with a becket. Fittings shall be as specified (see 6.2), and shall be as shown on figures 3 and 4.

3.15.1 Grade A, regular duty. Bearings for grade A blocks shall conform to MIL-B-5687, type 1, composition A.

3.15.2 Grade B, heavy duty. Bearings for grade B blocks shall be pressure lubricated, phosphor-bronze. The bearing shall be pressed into the hub of the sheave with sufficient tightness to prevent slippage under any load. Blocks shall be delivered with a high grade of commercial lubricant.

3.15.3 Style 1, single sheave. Style 1 blocks shall have a single sheave.

3.15.4 Style 2, double sheave. Style 2 blocks shall have two sheaves.

3.15.5 Style 3, triple sheave. Style 3 blocks shall have three sheaves.

3.16 Workmanship. The blocks shall be free from any characteristics or defects that may render them unsuitable or inefficient for intended purposes. All parts of the assemblies shall be clean, free of dirt, sand, fins, pits, flux, and extraneous material. (Welding shall not be resorted to as a repair measure.)

4. QUALITY ASSURANCE PROVISIONS

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

GGG-B-500C

4.1.1 Component and material inspection. The contractor is responsible for insuring that components and materials used are manufactured, examined, and tested in accordance with referenced specifications and standards.

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

- a. First article inspection (see 4.3).
- b. Quality conformance inspection (see 4.4).
- c. Inspection of preparation for delivery (see 4.6).

4.3 First article inspection.

4.3.1 Examination. The first article block shall be examined as specified in 4.5.1. Presence of one or more defects shall be cause for rejection.

4.3.2 Tests. The first article block shall be tested as specified in 4.5.2.2. Failure of any test shall be cause for rejection.

4.4 Quality conformance inspection.

4.4.1 Sampling.

4.4.1.1 For examination and proof load test. Sampling for examination and proof load test shall be in accordance with MIL-STD-105.

4.4.1.2 For ultimate test. One block assembly shall be selected at random from each lot.

4.4.2 Examination. Samples selected in accordance with 4.4.1.1 shall be examined as specified in 4.5.1. AQL shall be 2.5 percent defective for major defects and 4.5 percent defective for minor defects.

4.4.3 Tests.

4.4.3.1 Proof load. Samples selected in accordance with 4.4.1.1 shall be tested as specified in 4.5.2.1. AQL shall be 2.5 percent defective.

4.4.3.2 Ultimate load. Samples selected in accordance with 4.4.1.2 shall be tested as specified in 4.5.2.2. Failure of the test shall be cause for rejection of the lot.

4.5 Inspection procedure.

4.5.1 Examination. The blocks shall be examined as specified herein for the following defects:

Major

101. Dimensions not in conformance with table I.
102. Material not as specified.
103. Materials are not resistant to corrosion or deterioration or treated to be made resistant to corrosion or deterioration for the applicable storage and operating environment.
104. Dissimilar metals as defined in MIL-STD-889 are not effectively insulated from each other.
105. Contractor does not have documentation available for identification of material, material finishes or treatments.
106. Components missing or improperly assembled.
107. Shell plate rope guard not as specified.
108. Shell plates do not fully shield the sheaves.
109. Shell plates have insufficient number of bolt and tubing spacers.
110. Shell plates twist out of line under load conditions.
111. Cast steel for the sheaves not as specified, contains blowholes, hard spots, shrinkage, or cracks.
112. Sheaves fail to turn freely by hand.
113. Sheaves side play exceeds 1/8 inch.
114. Sheave not designed to prevent cutting action on the rope.
115. Sheave score does not accommodate the rope.
116. Sheave rim not concentric with bore.
117. Bearings not tightly pressed into hub of sheaves. (Type II, grade B only.)
118. Center pin grease fitting, when specified, missing.
119. Center pin grease grooves omitted.
120. Center pin surface roughness exceeds 63 microinches.
121. Center pin rotates in shell.
122. Fittings fail to swivel freely through 360°.
123. Locking device does not function in manner specified, type I only.

Minor

201. Fastening devices peened, stacked, or deformed.
202. Identification marking missing, incomplete, or illegible.
203. Workmanship is not as specified.

GGG-B-500C

4.5.2 Tests.

4.5.2.1 Proof load. Blocks shall be tested in a testing machine equipped with a dial gage which will indicate the test load. Pass wire rope or round steel bar loops around the sheave or sheaves and attach to the fixed head of the testing machine. Attach blocks and fittings to the moving head of the machine. Steadily apply load to the block until twice the applicable SWL specified in tables I and II is reached. After the test of the block has been completed, the block shall be disassembled and all component parts examined and measured. The divider method shall be used to measure for deformation and the magnetic partial inspection method shall be used to determine presence of cracks in all load carrying parts of the block. Nonconformance with 3.5.1 shall constitute failure of this test.

4.5.2.2 Ultimate load.

4.5.2.2.1 Fittings. Install the block in a testing machine as specified in 4.5.2.1. Steadily apply load to the block assembly until failure of the fitting occurs. Failure of the fittings at any load less than 4 times the SWL specified in tables I and II, shall constitute failure of this test.

4.5.2.2.2 Block. Attach the block without fittings to the moving and fixed heads of the testing machine by any suitable means. Steadily apply load to the block until failure of the block occurs. Failure of the block at any load less than 5 times the SWL specified in tables I and II, shall constitute failure of this test.

4.6 Inspection of preparation for delivery.

4.6.1 Quality conformance inspection of pack. The preservation, packaging, packing, palletization and marking shall be examined to determine compliance with the requirements of section 5 herein and the quality conformance inspection requirements for MIL-B-3865.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A or commercial (see 6.2).

5.1.1 Level A. Level A packaging shall be in accordance with the level A preservation requirements of MIL-B-3865.

5.1.2 Commercial. Commercial packaging shall be in accordance with the contractor's standard commercial practice provided such practice satisfies common carrier requirements.

5.2 Packing. Packing shall be level A, level B or commercial (see 6.2).

5.2.1 Levels A and B. Levels A and B packing shall be in accordance with the level A and B packing requirements of MIL-B-3865.

5.2.2 Commercial. Commercial packing shall be in accordance with the contractor's standard commercial practice provided such practice assures carrier acceptance, assures safe delivery at destination at the lowest applicable rate and satisfies the requirements of the Uniform Freight Classification and the National Motor Freight Classification.

5.3 Palletization. Palletization shall be as specified in MIL-B-3865.

5.4 Marking.

5.4.1 Civil agencies. In addition to any special or other identification marking required by the contract or purchase order, each container and unitized (palletized) load shall be marked in accordance with Fed. Std., No. 123.

5.4.2 Military activities.

5.4.2.1 Levels A and B. In addition to any special or other identification marking required by the contract or purchase order, each container and unitized (palletized) load shall be marked in accordance with MIL-STD-129.

5.4.2.2 Commercial. Commercial marking shall be in accordance with MIL-STD-1188.

6. NOTES

6.1 Intended use. Blocks are used to change direction of a running rope or to gain a mechanical advantage which includes hoisting and hauling operations. They are general purpose blocks recognized as a standard product by the tackle industry.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Type, grade, and style of block required (see 1.2).
- c. When a first article is required for inspection and approval and number of units required (see 3.2).
- d. Whether shell pattern shall be oval or diamond shape (see 3.7).

GGG-B-500C

- e. Whether grease groove and fitting shall be provided in the center pin (see 3.10).
- f. Type of fitting required (see 3.14.2 and 3.15).
- g. Degree of packaging and packing required (see 5.1 and 5.2).

6.3 First article. When a first article inspection is required, the item will be tested and should be a preproduction model. The first article should consist of one or more units. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, tests, and approval of the documents first article.

6.4 Figures. The figures show types of blocks which have been found acceptable; however, the figures are included for illustration only and are not intended to preclude the furnishing of other blocks which conform to this specification.

6.5 International standardization agreement. Certain provisions of this specification are the subject of international standardization agreement (QSTAG 396). When amendment, revision, or cancellation of this specification is proposed which affects or violates the international agreement concerned, the preparing activity will inform GSA so that appropriate reconciliation action may be taken through international standardization channels.

MILITARY INTERESTS:

Custodians

Army - ME
Navy - YD
Air Force - 84

Review activity

Army - SM

CIVIL AGENCY COORDINATING ACTIVITIES:

DC Government - DDC
Interior - GES
GSA - FSS

Defense Supply Agency Interest

IS

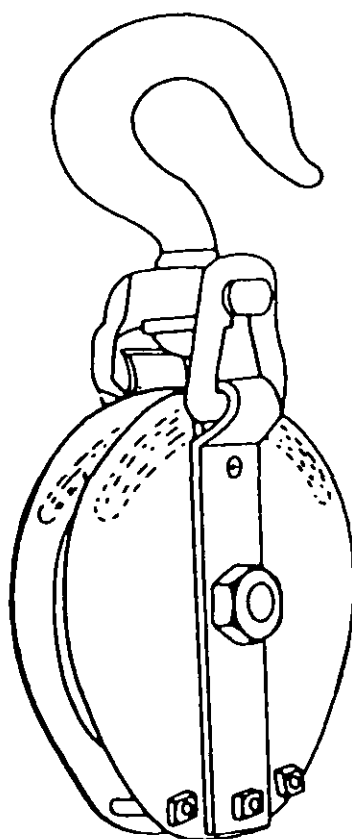
PREPARING ACTIVITY:

Army - ME

Project 3940-0169

U.S. GOVERNMENT PRINTING OFFICE : 1984 - 421-595/3665
Orders for this publication are to be placed with General Service Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other documents referenced herein.

GGG-B-500C



TYPE I.

FIGURE I. Block, tackle, snatch type I.

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GGG-B-500C

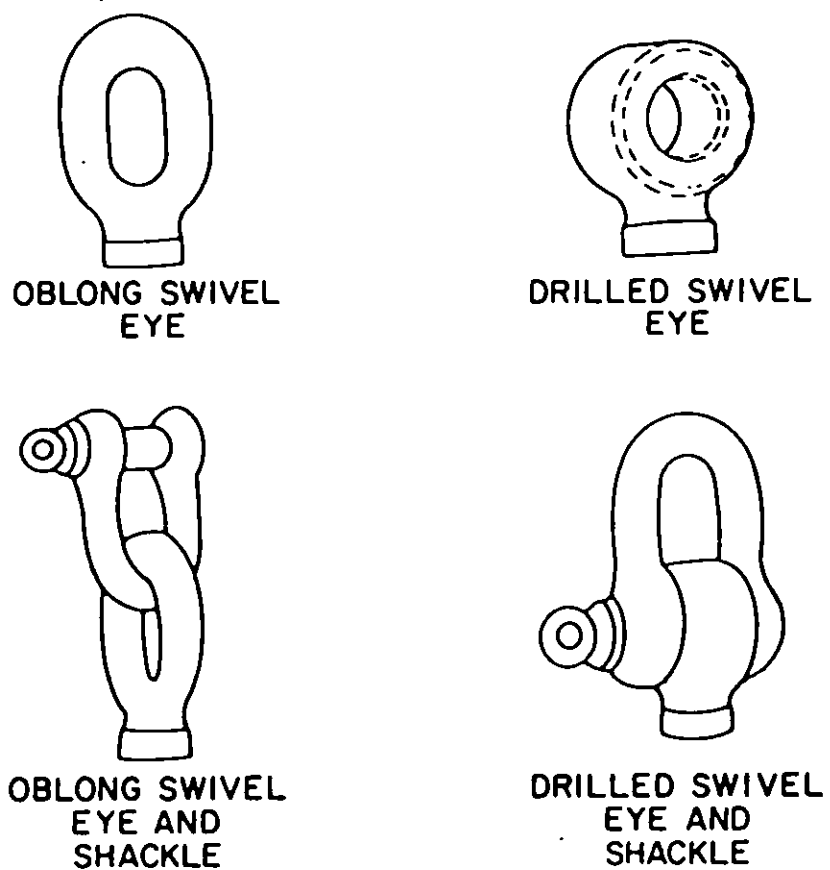


FIGURE 2. Fittings for type I.

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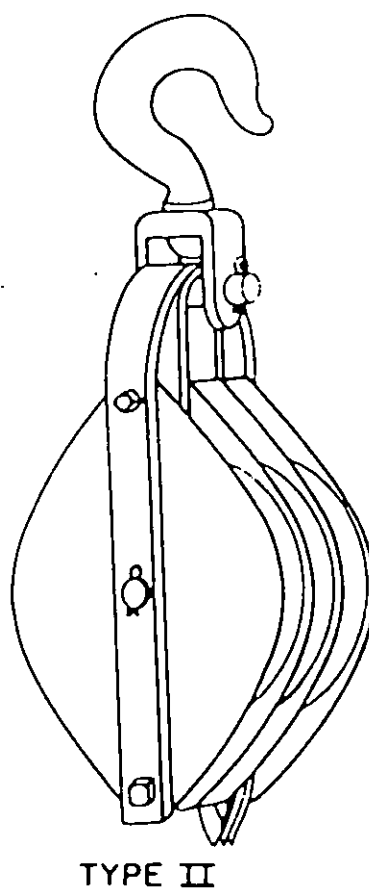


FIGURE 3. Blocks, tackle ordinary and regular type II, grades A and B.

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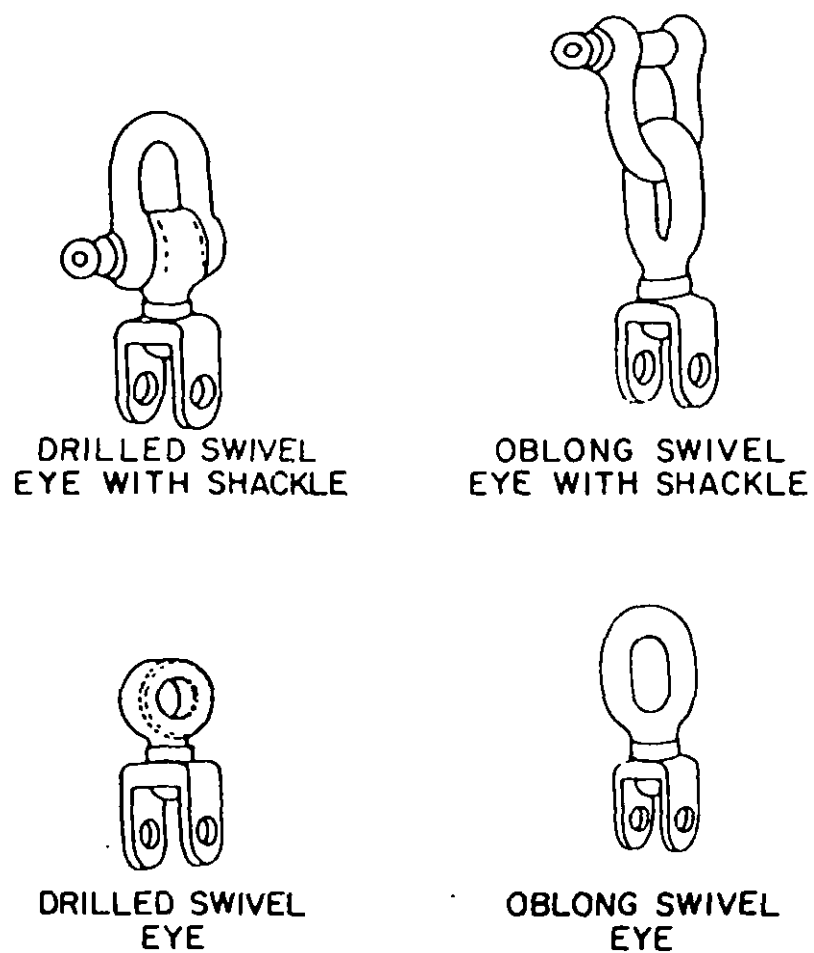


FIGURE 4. Fittings for type II, grades A and B blocks.

X-4079

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL*(See Instructions - Reverse Side)*

1. DOCUMENT NUMBER GGG-B-500C		2. DOCUMENT TITLE Block, Tackle (Wire Rope)					
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION <i>(Mark one)</i>					
b. ADDRESS <i>(Street, City, State, ZIP Code)</i>		<input type="checkbox"/> VENDOR					
		<input type="checkbox"/> USER					
		<input type="checkbox"/> MANUFACTURER					
		<input type="checkbox"/> OTHER <i>(Specify):</i> _____					
5. PROBLEM AREAS							
a. Paragraph Number and Wording:							
				b. Recommended Wording:			
				c. Reason/Rationale for Recommendation:			
6. REMARKS							
7a. NAME OF SUBMITTER <i>(Last, First, MI) - Optional</i>		b. WORK TELEPHONE NUMBER <i>(Include Area Code) - Optional</i>					
c. MAILING ADDRESS <i>(Street, City, State, ZIP Code) - Optional</i>		e. DATE OF SUBMISSION (YYMMDD)					

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NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification 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.

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