

Chapter 26-5

Rigging Blocks – Selection, Use, and Maintenance

SECTION 26-5.0: SCOPE

This Chapter applies to rigging blocks. Crane blocks are covered by crane type under other ASME B30 Volumes.

SECTION 26-5.1: TYPES AND MATERIALS

26-5.1.1 Types

(a) Types include tackle, utility, rolling, and snatch blocks (see Fig. 26-5.1.1-1).

(b) Load fittings on rigging blocks may include hooks, eyes, swivels, yokes, bails, shackles, and pins (see Fig. 26-5.1.1-2).

(c) Rigging blocks other than those detailed in this Chapter shall be used in accordance with recommendations of the manufacturer or a qualified person.

26-5.1.2 Materials

(a) The rigging block shall have sufficient ductility to permanently deform before losing the ability to support the load at the temperatures that the manufacturer has specified for use.

(b) The shell or side plates shall be metal, wood, or synthetic.

(c) The sheave(s) shall be metal or synthetic.

(d) The load-bearing straps and fitting(s) shall be made of metal.

SECTION 26-5.2: DESIGN FACTOR

The design factor for rigging blocks shall be a minimum of 4.

SECTION 26-5.3: RATED LOADS

Rated load shall be in accordance with the recommendation of the rigging block manufacturer. The terms *rated capacity* and *working load limit* are commonly used to describe rated load.

NOTE: The block rated load is the maximum load applied to the primary load fitting, not the line pull (see Fig. 26-5.3-1).

SECTION 26-5.4: PROOF TEST

(15) 26-5.4.1 Proof Test Requirements

(a) Rigging blocks are not required to be proof tested unless specified by the purchaser.

(b) Proof tested rigging blocks shall be inspected after the test for the conditions stated in para. 26-5.8.5.

26-5.4.2 Proof Load Requirements

The proof load for a rigging block shall be a minimum of 1.5 and a maximum of 2 times the rated load unless approved by the manufacturer or a qualified person.

SECTION 26-5.5: IDENTIFICATION

26-5.5.1 Marking

(15)

Each rigging block shall be durably marked by the manufacturer to show

(a) name or trademark of manufacturer

(b) rated load

(c) rope size(s)

26-5.5.2 Maintenance of Identification

Rigging block identification should be maintained by the user so as to be legible throughout the life of the block.

SECTION 26-5.6: EFFECTS OF ENVIRONMENT

26-5.6.1 Temperature

When rigging blocks are to be used at temperatures above 150°F (66°C) or below 0°F (–18°C), the rigging block manufacturer or a qualified person should be consulted.

26-5.6.2 Chemically Active Environments

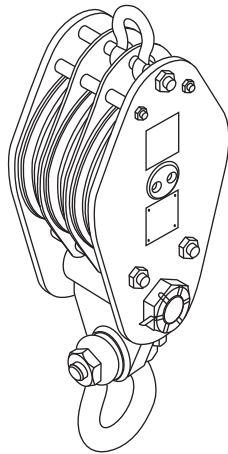
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Chemically active environments, such as caustic or acidic substances or fumes, can affect the strength, operating characteristics, or both of rigging blocks. The rigging block manufacturer or a qualified person should be consulted when rigging blocks are used in chemically active environments.

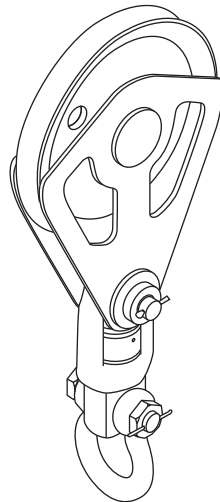
SECTION 26-5.7: TRAINING

Rigging block users shall be trained in the selection, inspection, cautions to personnel, effects of environment, and rigging practices as covered by this Chapter.

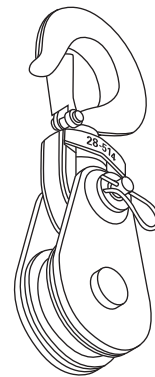
Fig. 26-5.1.1-1 Rigging Block Types



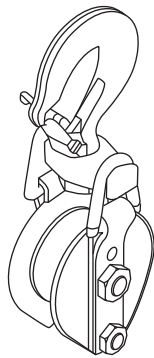
Tackle Block



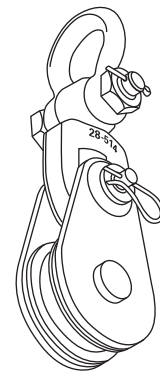
Rolling Block



Snatch Block

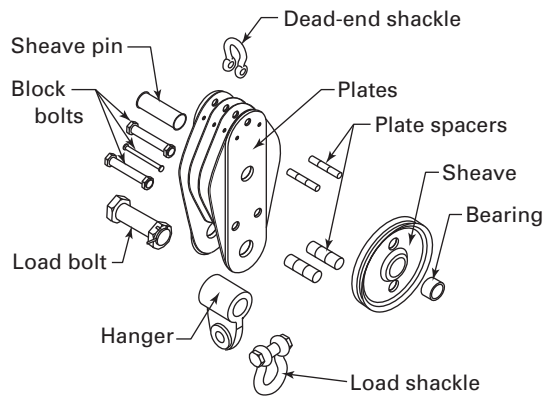


Utility Block

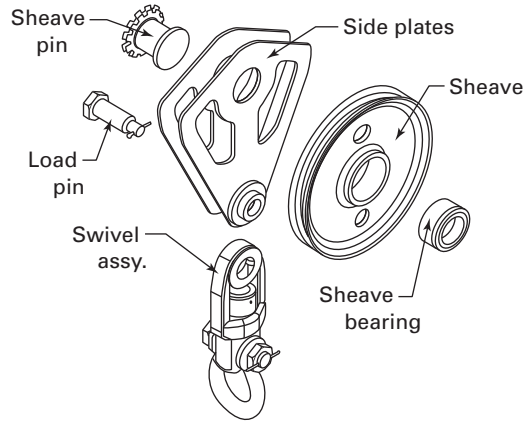


Snatch Block

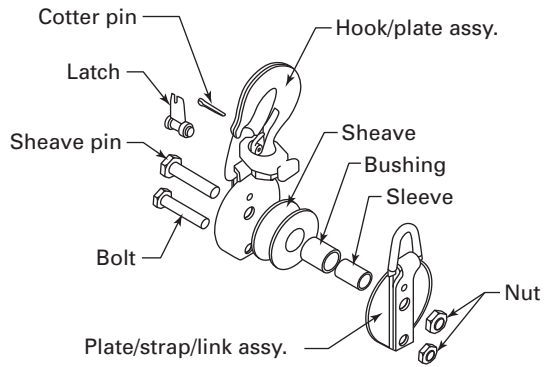
Fig. 26-5.1.1-2 Typical Rigging Block Components



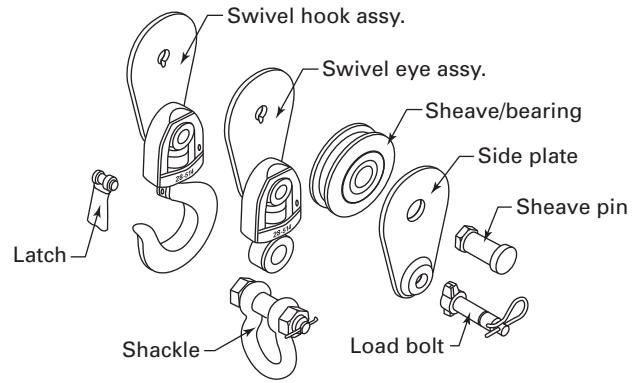
Tackle Block



Rolling Block

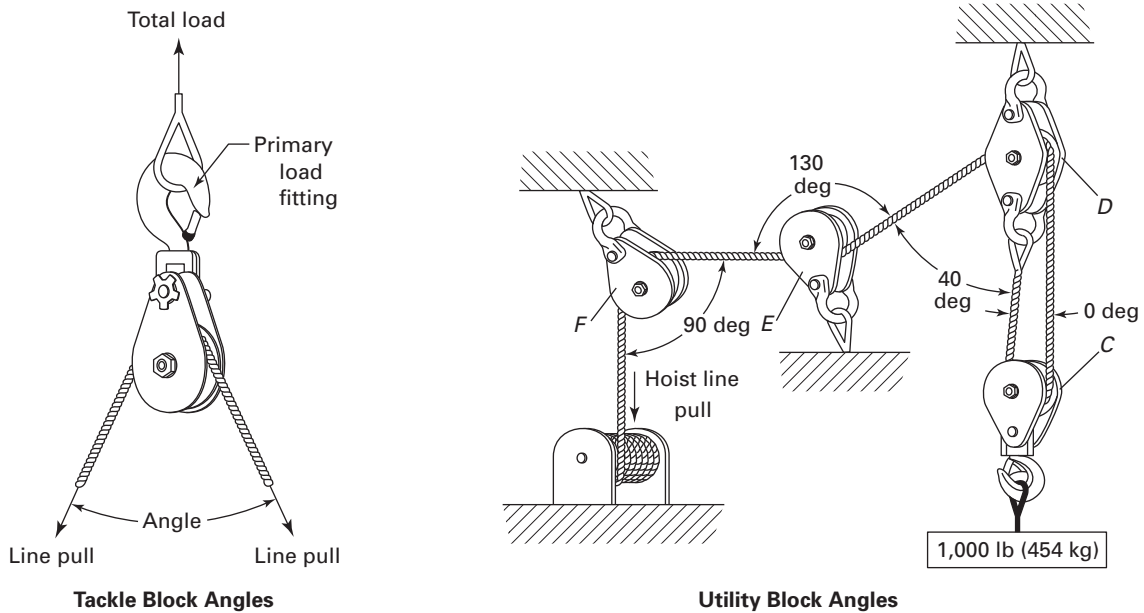


Utility Block



Snatch Blocks

Fig. 26-5.3-1 Block Load Factor Multipliers



Multipliers

Angle, deg	Factor	Angle, deg	Factor
0	2.00	100	1.29
10	1.99	110	1.15
20	1.97	120	1.00
30	1.93	130	0.84
40	1.87	135	0.76
45	1.84	140	0.68
50	1.81	150	0.52
60	1.73	160	0.35
70	1.64	170	0.17
80	1.53	180	0.00
90	1.41

Block Load = Line Pull × Multiplier Factor

Example: Load = 1,000 lb (454 kg)

Line pull: 1,000 lb (454 kg) ÷ 2 = 500 lb (227 kg)

Load block C = 500 lb (227 kg) × 2 = 1,000 lb (454 kg)

(line pull × factor for 0-deg angle)

Load block D = 500 lb (227 kg) × 1.87 + 500 lb (227 kg) = 1,435 lb (651 kg)

(line pull × factor for 40-deg angle + dead-end load)

Load block E = 500 lb (227 kg) × 0.84 = 420 lb (190 kg)

(line pull × factor for 130-deg angle)

Load block F = 500 lb (227 kg) × 1.41 = 705 lb (320 kg)

(line pull × factor for 90-deg angle)

(15) SECTION 26-5.8: INSPECTION, REPAIR, AND REMOVAL**26-5.8.1 General**

All inspections shall be performed by a designated person. Any deficiencies identified shall be examined and a determination made by a qualified person as to whether they constitute a hazard.

26-5.8.2 Initial Inspection

Prior to use, all new, altered, modified, or repaired rigging blocks shall be inspected to verify compliance with the applicable provisions of this Chapter. Written records are not required.

26-5.8.3 Frequent Inspection

(a) A visual inspection shall be performed each shift before the rigging block is used. Rigging hardware in semi-permanent and inaccessible locations where frequent inspections are not feasible shall have periodic inspections performed.

(b) Conditions such as those listed in para. 26-5.8.5, or any other condition that may result in a hazard, shall cause the rigging block to be removed from service. Rigging blocks shall not be returned to service until approved by a qualified person.

(c) Written records are not required.

26-5.8.4 Periodic Inspection

(a) A complete inspection of the rigging block shall be performed. The rigging block shall be examined for conditions such as those listed in para. 26-5.8.5 and a determination made as to whether they constitute a hazard.

(b) *Periodic Inspection Frequency*

(1) Periodic inspection intervals shall not exceed 1 yr. The frequency of periodic inspections should be based on

- (-a) frequency of use
- (-b) severity of service conditions
- (-c) nature of lifting or load handling activities
- (-d) experience gained on the service life of rigging blocks used in similar circumstances

(2) Guidelines for the time intervals are

- (-a) normal service — yearly
- (-b) severe service — monthly to quarterly
- (-c) special service — as recommended by a qualified person

(c) Written records are not required.

26-5.8.5 Removal Criteria

Rigging blocks shall be removed from service if conditions such as the following are present and shall only be returned to service when approved by a qualified person:

(a) missing or illegible identification

- (b) misalignment or wobble in sheaves
- (c) excessive sheave groove corrugation or wear
- (d) loose or missing nuts, bolts, cotter pins, snap rings, or other fasteners and retaining devices
- (e) indications of heat damage, including weld spatter or arc strikes
- (f) excessive pitting or corrosion
- (g) bent, cracked, twisted, distorted, stretched, elongated, or broken load-bearing components
- (h) excessive wear, nicks, or gouges
- (i) a 10% reduction of the original or catalog dimension at any point
- (j) excessive damage to load-bearing threads
- (k) evidence of unauthorized welding or modifications
 - (l) for hooks, the removal criteria specified in B30.10
 - (m) for shackles, the removal criteria specified in B30.26
 - (n) other conditions, including visible damage that cause doubt as to the continued use of the rigging block

26-5.8.6 Repairs and Modifications

(a) Repairs, alterations, or modifications shall be as specified by the rigging block manufacturer or a qualified person.

(b) Replacement parts, such as pins, hooks and sheaves, shall meet or exceed the original equipment manufacturer's specifications.

SECTION 26-5.9: OPERATING PRACTICES**26-5.9.1 Rigging Block Selection****(15)**

(a) Rigging blocks having suitable characteristics for the application, included angle, and environment shall be selected in accordance with the recommendations of the rigging block manufacturer or a qualified person.

NOTE: The included angle formed between the load lines affects the load on the block. As the included angle decreases, the load increases in the rigging block (see Fig. 26-5.3-1).

(b) The rated load of the rigging block shall not be exceeded.

(c) Rigging blocks that appear to be damaged shall not be used until inspected and accepted as usable under para. 26-5.8.4.

(d) The minimum D/d ratio between the sheave pitch diameter and wire rope diameter is 6.

26-5.9.2 Cautions to Personnel

(a) All portions of the human body shall be kept from between the rigging block, its running lines, the load, and any other rigging during lifting or load handling activities.

(b) Personnel should stand clear of the suspended load.

(c) Personnel should stand clear of rigging when it is under tension.

(d) Personnel shall not ride rigging blocks.

26-5.9.3 Storage and Work Environments

(a) Rigging blocks should be stored in an area where they will not be subjected to damage, corrosive action, or extreme temperatures.

(b) If extreme temperatures or chemically active environments are involved, the guidance provided in para. 26-5.6.1 or 26-5.6.2 shall be followed.

(15) 26-5.9.4 Rigging Practices

(a) The rigging block components shall be fully engaged, with all fasteners and retaining devices in place

and in good working order before use. Alterations or modifications shall comply with para. 26-5.8.6.

(b) Contact with sharp edges that could damage the rigging block should be avoided.

(c) Shock loading should be avoided.

(d) The load applied to the rigging block should be in-line with the sheave and load fitting(s) to prevent side loading of the block.

(e) Ensure the rope is in the sheave groove when the rigging block begins to take load.

(f) The line load multiplied by the block load factor shall not exceed the rated load of the rigging block (see Fig. 26-5.3-1).

(g) Rigging blocks should not be dragged on an abrasive surface.

(h) Load line fittings shall not contact the rigging block sheave(s).