General Cautions or Warnings

Important:

For maximum safety, tackle blocks and sheaves used within a system must be properly designed, used, and maintained. All personnel must understand the use of tackle block components and sheaves in the system. This information provides this knowledge.
Read them carefully and completely.
Some of the text within these cautions/warnings use technical words and detailed explanations.
NOTE: If you do not understand all words and definitions – DO NOT TRY TO DESIGN OR USE A TACKLE BLOCK OR SHEAVE SYSTEM!

Ratings shown in this literature apply to products that are new or in "as new" condition.
Working Load Limit ratings indicate the greatest force or load a product can carry under normal operating conditions. Shock loads and any abnormal conditions must be taken into account when selecting products for use in tackle block and sheave systems.
Shown Working Load Limit ratings are based on all sheaves of tackle block system being utilized. If all sheaves are not utilized, correct balance must be maintained, and the Working Load Limit must be reduced proportionally to prevent overloading sheave components being used.
Full sheave reeving arrangement should be changed only at the recommendation of a qualified person, and incorporate good rigging practices.
Products shown in this literature are used as parts of a system designed to accomplish a task. The Working Load Limit or Design (Safety) Factor of each product may be affected by wear, misuse, overloading, corrosion, deformation, intentional alteration, and other conditions of use. Regular inspections must be conducted to determine whether product use can be continued at the catalog assigned WLL, a reduced WLL, or having the product withdrawn from service.
Products in this catalog are intended for tension or straight line pull. Side loading must be avoided, as it exerts additional force or loading which the product is not designed to accommodate.
Always make sure the hook bowl supports the load. The latch and hook tip must never support the load.
Welding of load supporting parts or products can be hazardous. Proper knowledge of materials, heat treatment, and welding procedures are necessary for proper welding. The manufacturer should be consulted for information.
Crane component parts and wire ropes are metallic and will conduct electricity. Read and understand the OSHA standard covering crane operations (29 CFR 1926.1501 SUBPART N) before operating near power lines.

Definitions

STATIC LOAD – The load resulting from a constantly applied force or load.
WORKING LOAD LIMIT – The maximum mass or force which the product is authorized to support in general service when the pull is applied in-line, unless otherwise noted, with respect to the center line of the product. This term may also be shown as WLL; SWL; Safe Working Load; Resultant Safe Working Load.
WORKING LOAD – The maximum mass or force which the product is authorized to support in general service.
PROOF LOAD – The average force applied in the performance of a proof test or the average force to which a product may be subjected before deformation occurs.
PROOF TEST – A load test applied to a product to determine non-conforming material or manufacturing defects.
ULTIMATE LOAD – The average load or force at which the product fails, or no longer supports the load.
SHOCK LOAD – A force or load that results from the rapid application of a force (such as impacting and/or jerking). A shock load significantly adds to the static load.

DESIGN (SAFETY) FACTOR – An industry term denoting a product's theoretical reserve capability, usually computed by dividing the catalog Ultimate Load by the Working Load Limit. It is normally expressed as a ratio of 4 : 1 for blocks.

TACKLE BLOCK – An assembly consisting of side plates, sheaves, center pin and an end fitting (hook, shackle, etc.) that is used for lifting, lowering, or applying tension.

Fitting Maintenance

Fittings, including hooks and overhaul balls may become worn and disfigured from use, corrosion and abuse, which may result in nicks, gouges and worn shank threads and bearings which may produce additional stress loads and reduce the system load capacity. Grinding is the procedure recommended to restore a smooth surface on the product. Maximum allowance for reduction of a product's original dimension due to wear or repair before it should be removed from service is:

1. Any single direction - No more than 10% of original dimension;
2. Two directions - No more than 5% of each dimension.

Any greater dimensional reduction may require a reduced Working Load Limit.
Any crack or deformation in a fitting is sufficient cause to remove the product from service.

Selection Guide

Certain blocks are named for their intended use and selection is routine. Examples include "Double Rig Trawl Blocks" used in the fishing industry; "Well Loggers Blocks" used in the oil drilling industry; and "Cargo Hoisting Blocks" used in the freighter boat industry. Others blocks have a more general nature, and have a variety of uses. Examples include snatch blocks, regular wood blocks, standard steel blocks, etc.
A tackle block sheave assembly is one element of a system used to lift, change direction or drag a load. Other elements in the system include the prime mover (hoist, winch, hand); support structures; available power source, etc. All of these elements can influence the type of tackle block or sheave required. When selecting blocks or sheaves for the system you require, you should consider all elements .

To select a tackle block or sheave to fit your requirements, consider the following points:

1. Regulations which could affect your choice of blocks or sheaves (federal or state), OSHA, elevator safety, mine safety, maritime, insurance, etc.?

2. Weight of the load, including any dynamics of impacts that add to load value? You must include weight of all components to determine the minimum required Working Load Limit value of the block or load on sheave.

3. How many parts of line are required? This can be determined given the load to be lifted and the line pull you have available.

4. What is the size of line to be used? Multiply the available line pull by the desired safety factor for Wireline to determine the minimum catalog Wireline breaking strength; consult a Wireline catalog for the corresponding grade and diameter of Wireline to match.

5. What is the line speed? This will help you determine the type of sheave bearing necessary.
There are several choices of bearings suitable for different applications, including:

   A. Common (Plain) Bore for very slow line speeds and very infrequent use (high bearing friction).
   B. Self Lubricating Bronze Bushings for slow line speeds and infrequent use (moderate

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bearing friction).

C. Bronze Bushing with pressure lubrication for slow line speeds and more frequent use at greater loads (moderate bearing friction).

D. Anti-friction Bearings for faster line speeds and more frequent use at greater loads (minimum bearing friction).

6. What type of fitting is required for your application? Will the block be traveling or stationary?
   Your normal choices include single or multiple hooks with or without safety latches, and shackles, which are the most secured load attachment. You should also determine whether the fitting should be fixed, swivel or swivel with lock. If it is a swivel fitting, then a thrust bearing may be necessary. There are plain fittings with no bearings for positioning at no load, bronze bushed fittings for infrequent and moderate load swiveling, and fittings with anti-friction bearings for frequent load swiveling.

7. How will the block be reeved and does it require a dead end becket?

8. If it is a traveling block, how much weight is required to overhaul the line?

9. What is the fleet angle of the Wireline? Line entrance and exit angles should be no more than 1-1/2 degrees.

10. Will the block or sheave be maintained regularly, or does your application require special considerations.

Tackle Block and Sheave Maintenance

Tackle Blocks and Sheaves must be regularly inspected, lubricated, and maintained for peak efficiency and extended service. Proper maintenance is of equal importance to other mechanical equipment. The frequency of inspection and lubrication depends on the frequency and periods of use, environmental conditions, and the user's good judgment.

Inspection: As a minimum, the following points should be considered:

1. Wear on pins or axles, rope grooves, side plates, bushing or bearings, cases, trunnions, hook shanks, and fittings. Excessive wear may be a cause to replace parts or remove block or sheave from service.

2. Deformation of any component of the block or sheave assembly. Deformation can be caused by abusive service or overload and may be a cause to remove block or sheave from service.

3. Misalignment or wobble in sheaves.

4. Securement of nuts, bolts, and other locking methods, especially after reassembly after tear down inspections. Original securement method should be used; e.g., staking, set screw, cotter pin, cap screw.

5. Pins retained by snap rings should be checked for missing or loose rings.

6. Sheave center pin nuts should be checked for proper positioning. Pins for tapered roller bearings should be tightened to remove all end play during sheave rotation.

7. Hook or shackle to swivel case clearance is set at the factory. Increased clearance can result from component wear.

8. Deformation or corrosion of hook and nut threads.

9. Loss of material due to corrosion or wear on external area of welded hook and nut may indicate thread corrosion or damage. If these conditions exist, remove from service or perform load test.

10. Surface condition and deformation of hook

11. Welded side plates for weld corrosion or weld cracking.

12. Hook latch for deformation, proper fit and operation.

13. Bushings with cracks on inside diameter or bushing end should be removed from service, as these are indications of bushing overload.

Lubrication:

The frequency of lubrication depends upon frequency and period of product use as well as environmental conditions, which are contingent upon the user's good judgment. Assuming normal product use, the following schedule is suggested when using lithium-base grease of a medium consistency.

SHEAVE BEARINGS

Tapered Roller Bearings – Every 40 hours of continuous operation or every 30 days of intermittent operation.
Roller Bearings – Every 24 hours of continuous operation or every 14 days of intermittent operation.
Bronze Bushings – (Not Self Lubricated) – Every 8 hours of continuous operation or every 14 days of intermittent operation.
Self Lubricating Bronze Bushing – are for slow line speeds and infrequent use (moderate bearing friction). Frequent inspection is required to determine the condition of bushing.

HOOK BEARINGS

Anti Friction – Every 14 days for frequent swiveling; every 45 days for infrequent swiveling.
Bronze Thrust Bushing or No Bearing Every 16 hours for frequent swiveling; every 21 days for infrequent swiveling.

Sheave Bearing Application Information

Sheaves in a system of blocks rotate at different rates of speed, and have different loads. When raising and lowering, line tension is not equal throughout the system.

BRONZE BUSHINGS
Bronze Bushings are used primarily for sheave applications using slow line speed, moderate load, and moderate use.

COMMON (PLAIN) BORE –
Very slow line speed, very infrequent use, low load.

ROLLER BEARING –
Faster line speeds, more frequent use, greater load. Refer to appropriate bearing manufacturer's catalog for proper bearing selection procedure.

Loads on Blocks

The Working Load Limit (WLL) for blocks indicates the maximum load that should be exerted on the block and its connecting fitting.
This total load value may be different from the weight being lifted or pulled by a hoisting or hauling system. It is necessary to determine the total load being imposed on each block in the system to properly determine the rated capacity block to be used.
A single sheave block used to change load line direction can be subjected to total loads greatly different from the weight being lifted or pulled. The total load value varies with the angle between the incoming and departing lines to the block.

The Reeving of Tackle Blocks

In reeving of tackle blocks, there are many methods. The method discussed below is referred to as "Right Angle" reeving. Please consult your rigging manual for other methods of reeving.

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RIGHT ANGLE REEVING

In reeving a pair of tackle blocks, one of which has more than two sheaves, the hoisting rope should lead from one of the center sheaves of the upper block to prevent toppling and avoid injury to the rope. The two blocks should be placed so that the sheaves in the upper block are at right angles to those in the lower one.

Start reeving with the becket or dead end of the rope. Use a shackle block as the upper one of a pair and a hook block as the lower one. Sheaves in a set of blocks revolve at different rates of speed. Those nearest the lead line revolve at the highest rate of speed and wear out more rapidly. All sheaves should be kept well lubricated when in operation to reduce friction and wear.

How to Determine Overhauling Weights

To determine the weight of the block or overhaul ball that is required to free fall the block, the following information is needed: size of Wireline, number of line parts, type of sheave bearing, length of crane boom, and drum friction (use 50 lbs. unless other information is available).

WARNING !

- Failure to design and use tackle block systems properly may cause a load to slip or fall – resulting in serious injury or death.

- Failure to design lifting system with appropriate sheave assembly material for the intended application may cause premature sheave, bearing or Wireline wear and ultimate failure - the result could be serious injury or death.

- A potential hazard exists when lifting or dragging heavy loads with tackle block assemblies.

- A tackle block system should be rigged by a qualified person as defined by ANSI/ ASME B30.26.

- Do not side load tackle blocks.

- See OSHA Rule 1926.1431(g)(1)(i)(A) and 1926.1501(g)(4)(iv)(B) for personnel hoisting by cranes and derricks, and OSHA Directive CPL 2-1.36 — Interim Inspection Procedures During Communication Tower Construction Activities.

- Instruct workers to be alert and to wear proper safety gear in areas where loads are moved or supported with tackle block systems.

- Instruct workers to keep hands and body away from block sheaves and swivels – and away from “pinch points” where the rope touches block parts or loads.

- Use only manufacturer supplied parts as replacement.

- Do not use a block or ball that does not have a legible identification and/or capacity tag.

- Read, understand, and follow these instructions to select, use and maintain tackle block systems.

Quality Control & Manufacturing Processes

Sea-Link products are designed and manufactured to the highest standard to provide excellent quality and customer satisfaction.
The Quality Control Department has the responsibility to implement procedures that insure that all the Sea-Link products meet or exceed current US and North American standards, including:

- Establishing Design & Engineering standards.
- Use of suitable raw materials.
- Control of critical variables during the manufacturing process.
- Testing of components and complete products.
- Issuing certificates and maintaining traceability standards.
- Establishing manufacturer's warranty criteria.

Some manufacturing highlights:

- Metal surfaces are either Hot Dip Galvanized or painted with Epoxy Paint.
- Wood components are lacquered to a high luster and to offer extra protection.
- Sea-Link Sheaves and Blocks include easy access grease ports.
- Many products available with either bronze bushings or roller bearings.

Product Certification

Sea-Link products are manufactured to meet or exceed current US Federal specifications / regulations, including:

- ASME B30.26 manufacturing processes.
- GGG-B-490F, GGG-B-500C, A-A-59808, A-A-59390, A-A-59809 & others.ASME B30.26 manufacturing processes.
- Manufacturer's Certificates available for each product.
- Internal testing on components regularly performed.
  o Mechanical, Chemical Composition, Molecular Structure & Others.
- Sea-Link Cargo Blocks include American Bureau of Shipping (ABS) Certification.
- Other Third Party certification available upon request.
  o ABS, Germanischer Lloyd GL, DNV, and others.
- Sea-Link products are covered by $1 Million General Liability Product Insurance.

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