Loading and unloading gear

Heavy weights are constantly being moved around a fishing vessel, and only the smallest vessels have weights that can be handled without the use of cranes and other lifting gear. In order to be able to load fishing tools or provisions on board the vessel or replace a set of trawl doors, you need the help of a winch and other deck machinery. The equipment may be supplied by the shipyard or a net maker or sailmaker which guarantees that it meets the specifications for lifting capacity and breaking strength etc. However, once the fisherman is out at sea, he should have basic knowledge about the load capacity of the equipment.

Many other iron products are used in fishing than those mentioned below: rings, turning joints, P-links, G-links, hammerlocks, split links, safety hooks and many others with different shapes, properties and functions. What they all have in common is that they are used as connecting links in the fishing tools or in hoisting and unloading systems, and that it could spell disaster if they are exposed to excessive loads.
Due to the considerable safety aspects regarding the equipment, the need has arisen for a guarantee that a particular product meets the promised breaking strengths and maximum working load. As a result, manufacturers have made the classification companies check the quality of the equipment and thereby vouch for its durability. In this context, you talk about a classed chain or a classed hammerlock.

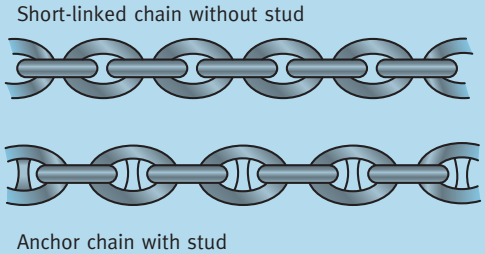
Chains

Chains are made from ship building steel of different strengths. The chains used in the unloading systems are usually chains without studs, while the chains used for the anchor are chains with studs.
The studs make the chain stronger and prevent kinks from forming; this is especially important for anchor chains that must be able to run freely out of the chain locker. Unlike ropes and wires, chains are inelastic and do not stretch. On the other hand, they become worn at every link, and a chain will therefore get longer over time.

The dimension of the chain is indicated by:
- the diameter of the rod iron it is made of
- the inside width of the links
- the inside length of the links
- the estimated number of links per metre

The strength of a chain can be read from breaking strength tables.

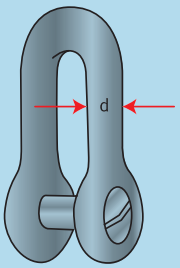
4.1·Chains



Shackles and other hammerlocks

These are made from steel. They are used to fasten and join the individual parts of the unloading system (chains and wires). A shackle consists of an iron loop with a screw bolt.
The design of both the iron loop and the shackle bolt depends on where the shackle is going to be used in the system – whether it will be unscrewed often or remain in the same position for longer periods of time.

4.2·Shackles



The dimension of a shackle is indicated by the diameter of the rod iron it is made of (if the diameter of the loop and bolt differs, both are indicated).

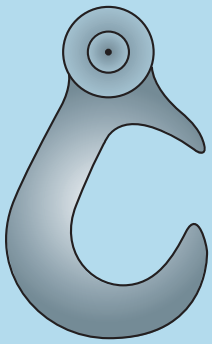
The strength of a shackle can be read from breaking strength tables.

Shackles are rarely used for the fishing tool itself, particularly trawls. When joining the foot rope or ground rope, for example, hammerlocks are often used which are two loops joined with a pin which is hammered in using a sledge hammer and removed using a sledge hammer and a punch. They are preferred to shackles where there is so much movement and shaking in the system that the shackle's screw bolt could be unscrewed from its thread.

Hooks

Hooks are often used to hoist and move large and/or heavy objects on the ship.
They are exposed to heavy loads and must therefore be designed for adequate strength. Around the opening, the hook will be affected by bending and stretching forces, and this area is often thicker than the rest of the hook. At the same time, you have to make sure that the hook does not catch on any protruding edges during lifting.

4.3·Hook



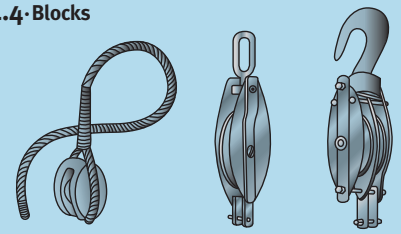
Blocks and tackles

Blocks are frequently used to reduce the force needed to lift heavy equipment. Two blocks are often used together and form a tackle. However, the direction of a pull or a lift can be changed by means of a single block.

A block consists of:
- a casing
- one or several sheaves (made from nylon or iron)
- a bolt

Blocks have many different designations depending on their design and use. Depending on the number of sheaves, a block is referred to as a single, double or treble-sheave block.

4.4 · Blocks

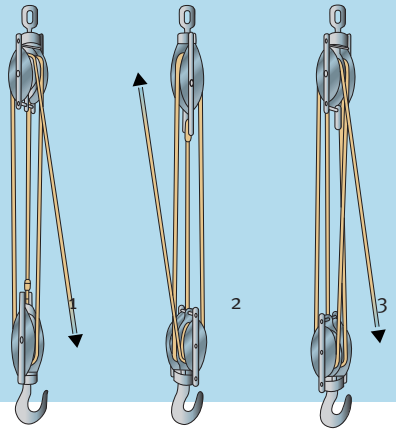


It you need to lift heavy weights or pull harder than you are immediately capable of, you can use a tackle which in practice gives you more power.
A tackle consists of two blocks through which a fall is cut. The part of the fall to which any pull is applied is called the hauling part, while the block from which the hauling part extends is called the running block.

FACT BOX

If the tackle is turned so that the running block becomes the moving block, the pull on the standing part becomes smaller.

4.5 · Tackles



1. Luff tackle, running block is the standing block.
2. Luff tackle, running block is the moving block.
3. Two-fold tackle, running block is the standing block.

If there is one sheave in each block, the tackle is called a gun tackle. If there is a sheave in one block and two in the other, the tackle is called a luff tackle. In other words, the tackle's total number of sheaves determines its name. If the two blocks of the tackle together have more than four sheaves, it is called a winding tackle. You therefore talk about five, six and seven-sheave winding tackle.

FACT BOX

The subject matter of this chapter is so important for the safety on board that there are international rules prescribing how the equipment must be constructed and used. The rules state: "Hoisting equipment and unloading gear must have the required strength, a suitable design and be kept in a good state of repair. During use, they must not be exposed to loads which exceed their maximum permitted working load." This is followed by detailed rules regarding designs, material strengths and uses.
In this context you talk about:
Breaking strength: The maximum load that an object can withstand before it breaks.
Maximum working load: The maximum load that an object is certified to be subjected to.
Safety factor: The ratio between the breaking strength and the maximum working load.

The regulations prescribe the following safety factors:

	Safety factor
Steel wire rope (wire) as a general rule	5
Chains	4, 5
Other unloading gear such as hooks, shackles, blocks, swivels, rings etc.	5
Rope	7

If you know a rope's breaking strength
– or find it in a table
– the rope must only be subjected to up to a seventh of its breaking strength.

It is important for the durability of the wires and ropes that the width of the groove in the block is equal to the diameter of the wire – it should never be smaller. It is recommended that approx. onethird of the wire's diameter rests firmly against the bottom of the groove. In the same way, the diameter of the sheave should match the diameter of the wire or the rope. This is most important in the case of wires where it is recommended that the diameter of the sheave is 25 times the wire diameter for stiff wires (for example 6x7) and 20 times for softer wires (for example 6x19).