

Shipbuilding - Cargo winches

1. **Scope** This Japanese Industrial Standard specifies cargo winches driven by electric or hydraulic power systems (hereinafter referred to as "winch") to be installed in ships.
2. **Definitions** For the purposes of this standard, the following definitions apply to the principal terms.
- (1) **Nominal load** A load equivalent to the maximum hook load of a cargo winch using two cargo blocks with a single derrick boom.
 - (b) Nominal load should preferably be in accordance with that given in the table of specifications of winches in 4., including the gear-shift type.
 - (2) **Nominal hoisting speed** The hoisting speed under the nominal load with the rope wound on the drum in a single layer.
 - (3) **Drum load** The maximum rope tension, measured at the drum exit when the winch is hoisting or hauling in at the nominal speed with the rope wound on the drum in a single layer.
 - (4) **Right- (Left-) hand winch** A winch is termed a right-hand winch in relation to an observer situated on the side of motor, power supply or controller, when the reduction gear or the drive for the drum is on the right-hand (left-hand) side of the drum as shown in Fig. 1.

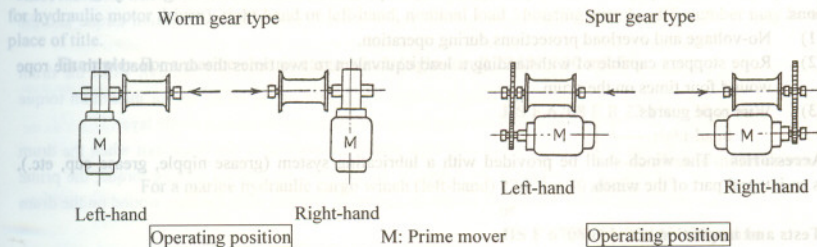


Fig. 1

3. Basic design

3.1 Strength

3.1.1 Under the drum load, stresses in any part of the winch shall be 40% or less of the yield point of the material.

3.1.2 Under the maximum torque produced by a prime mover, stresses in any part of the winch shall be 90% or less of the yield point of the material.

3.2 **Operating direction of the control handle** The operating direction of the control handle shall be such that a load is hoisted when the wheel handle is turned clockwise or when the handle stick is pulled toward the operator.

3.3 Brake system

3.3.1 The winch shall be provided with an automatic brake system capable of activating when the control handle is at the neutral position or at the braking position, or when the power is shut down.

Remark: The hydraulic block system is included in the automatic brake system. In such a case, a manual brake system shall be provided.

3.3.2 The brake system shall be capable of stopping or holding a load of 1.5 times the drum load. In addition, means shall be provided to lower the load when the power is shut down.

Related standard: JIS F 6902 Spur Part Boxes for Motors

3.3.3 A block system or a brake system capable of blocking the rotating motions of the drum that is designed to engage or disengage shall be provided.

Such a system shall be capable of holding a load equivalent to 1.5 times or more of the drum load.

3.3.4 The brake system shall not produce shock loads.

3.4 **Drum** The outside diameter of the drum flange shall have an allowance equivalent to 2.5 times the rope diameter from the outer tip of the cargo runner in the outermost layer. This requirement may be dispensed with when special devices are provided to prevent the rope from disengaging.

The diameter of the drum shall be 18 times or more of the rope diameter.

4. **Specification** Specifications of the winch shall be as given in Table 1.

Table 1

Drum load (Nominal load) kN		22	35	56	90	140	180
Minimum nominal hoisting speed m/min	A	30	19.2	12	7.2	—	—
	B	60	37.8	24	15	9.6	7.2
	C	—	—	48	30	19.2	15
Maximum landing speed m/min (Reference)		15	12	12	7.2	6	4.8

5. **Safety devices and protections** The winch shall be provided with the following safety devices and protections.

- (1) No-voltage and overload protections during operation.
- (2) Rope stoppers capable of withstanding a load equivalent to two times the drum load with the rope wound four times on the drum.
- (3) Wire rope guards

6. **Accessories** The winch shall be provided with a lubricating system (grease nipple, grease cup, etc.), which is an integral part of the winch.

7. Tests and inspection

7.1 **Factory inspection** The factory inspection should preferably be carried out at the factory of the manufacturer, with the results of the inspection recorded.

7.1.1 **Type inspection** Type inspections shall be carried out for every unit representing each type of winch in accordance with the requirements of 7.1.1(1) and 7.1.1(2), and there shall be no abnormalities.

The type inspection may be substituted with a type-approval certificate, provided that there is an agreement between the parties concerned.

(1) **Load inspection** The load inspection shall be carried out in accordance with the following requirements.

(1.1) For an effective lifting height of 10 metres or more, continuous hoisting and lowering operations shall be carried out for 30 minutes (a 20-second rest may be provided between cycles) under the drum load.

In the case of the gear-shift type, the same test shall be carried out additionally for five minutes after each gear change.

(1.2) The following items shall be measured during the inspections specified in 7.1.1(1)(1.1).

- (a) Bearing temperature rise
- (b) Hoisting and lowering speeds
- (c) Power input

(1.3) Brake inspection shall be carried out under the drum load, and the uncontrolled traveling distance of the load shall be measured.

Verification of the operation of an automatic brake system shall be carried out by shutting off the power supply during the lowering operation.

(2) **Overload inspection** Hoisting and lowering operations shall be carried out under a load equivalent to 1.25 times the drum load, and the winch shall be stopped at least three times during lowering operations.