STEAMSHIP MUTUAL

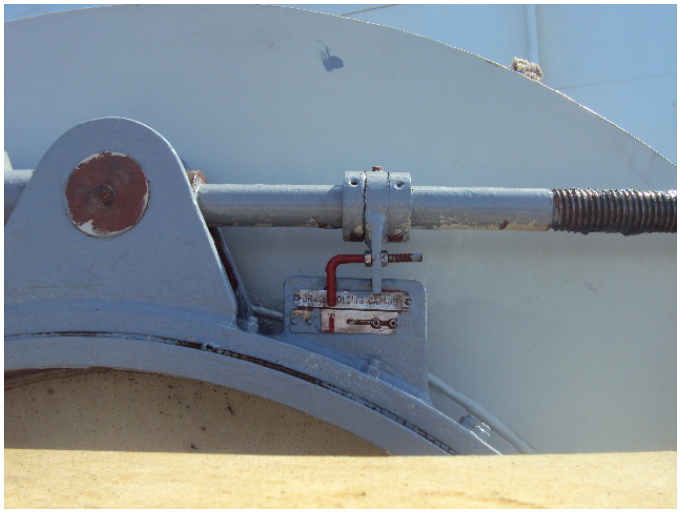
Risk Alert

Mooring Winch Brake Holding Capacity

Introduction

Recently the Club's Managers have become aware of a number of incidents including one that involved a fatality, resulting from mooring line failure where it appears the cause was not attributable to poor condition of equipment but rather the incorrect usage of the mooring winches.

This Risk Alert seeks to highlight the importance of ships' crews fully understanding the correct operation and maintenance of mooring winch brakes.



Mooring Winches

Many modern vessels are fitted with powered mooring winches with lines being stored on a rotating drum which can be either of the single or 'split-drum' type. Power is usually provided by steam, hydraulic or electrical motor, while the drum brake can be either manually or automatically applied.

Mooring winch capacity is determined at the ship design stage when factors such as the vessel's size, number of mooring lines to be deployed, anticipated maximum wind area and anticipated effect of tidal conditions are considered, together with the mooring lines' Mean Breaking Load (MBL). After selection of the MBL of the mooring lines the winch heaving load will be set to a lower value than the MBL to prevent the winch motor from applying excessive load.

Self-tensioning mooring winches are no longer favoured by many because of the possibility of a vessel 'creeping' along docksides and jetties as a winch pays out and heaves when the ship is affected by some external force. Instead, many vessels now apply rotating drum style winch brakes while secured alongside.

Winch Brake Rendering

Winch brake rendering can be considered as a 'slipping' of the brake band at the points of contact between the brake band lining and the drum. As a result of rendering the brake band can be expected to wear and is a part that should be replaced whenever its condition dictates.

A common misunderstanding is that ships' crews appear to test mooring winch brakes for holding capacity rather than rendering capacity. The brake is an important feature of the winch that secures the drum, and consequently the mooring line, to the ship. Testing for holding capacity will only confirm that the brake will hold at the given load. An important safety function of the brake is to render, allowing the line to release any excessive load rather than retaining it and leading to the line ultimately parting if or when the load applied becomes excessive.

Mooring Winch Brake Settings

After mooring it is standard practice to apply the winch brake and to take the winch motor out of gear, leaving friction between the brake lining and the winch drum to prevent rotation of the drum. Typically, mooring winch brakes are designed to hold up to 80% of the MBL with the capability of adjusting these to 60% of the MBL to allow for a margin of safety.

Winch Brake Setting and Testing

The setting chosen will be proportional to the amount of pressure (tension or 'torque') applied to the brake drum, either by hand, spring or hydraulic activation when the brake is engaged. The effectiveness of the brake will also be determined by the condition of the brake lining and brake drum, as well as the rope being correctly reeled onto the drum. Regardless of the brake type fitted, testing and direction of reeling the mooring line on the drum in accordance with manufacturer's instructions is important to ensure that the brake will hold or render at the correct load.

For further information please contact the Loss Prevention Department
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Each winch should be tested individually when the ship is new and thereafter following the manufacturer's recommendation. Individual winch brakes should also be tested after completion of any modification or repair involving the winch brakes, or upon any evidence of unexpected rendering or wear. Records of testing should be maintained that are 'auditable' and can be used to obtain early signs of brake wear. Markings applied to the winch drum that show the design holding capacity and in the case of manual 'screw down' brakes, the torque required to hand wheel or lever to achieve this are considered by the Club to be of some benefit.

Recommendations

- Mooring winch brakes should be tested in accordance with winch brake manufacturer's or ship-builder's guidance or following repair or modification of associated parts. The Club recommends tests are conducted at least annually.
- If not carried as part of ships' equipment, Members should consider making a brake testing kit available or arrange for testing to be carried out by experienced contractors.
- Procedures for testing mooring winch brakes should be made available on board.
- Ships crews should be offered guidance, or on board training in the correct type specific procedures to be followed for testing and operating mooring winch brakes.
- The designed maximum heaving load of mooring winch motors, rendering capacity of winch brakes and direction of heave and lowering should be clearly marked on the mooring winch.
- The torque that is to be applied to the hand wheel or handle of the brake should be clearly marked on the winch. An alternative to this may be to fit readily adjustable stops on the winch brakes screw- thread, but this method should retain the capability of over-ride which should only be used with extreme care.
- Records of winch brake testing, including the torque required to achieve the correct rendering load, if required, should be maintained on board.
- Visiting superintendents should verify that winch brake testing is completed in accordance with company procedures at internal audits.

For further information on this or other Loss Prevention topics please contact the Loss Prevention Department, Steamship Insurance Management Services Ltd.

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