VESSEL : _____ DATE : _____

Training: Mooring Winch Brake Rendering Test

OJT is to be read in conjunction with chapter Brake rendering test and Form 6.5.6 Test of Mooring Winch Brake.

Why brake rendering test?

- An excessive force on the mooring lines due to external environmental factors e.g. strong winds, tide and currents, surging due to passing vessels etc may cause a mooring line to part or damage the mooring fittings.
- Potential to serious injury or death to personnel on ship and ashore due to parting line.
- Requirement of DryBMS, Rightship Questionnaire and some terminals in Australia

When should brake render?

- Brake should render before the excessive load on the mooring line and fittings to the extent of its failure,
- Brakes should be **set to render at 60% of the ship design Minimum Breaking Load (ship design MBL)**
- Each vessel at the design stage is assigned an “EN” (Equipment Number) by Class. The EN sets a ship design MBL which then determines Mooring Rope MBL and the Minimum Number of Mooring Ropes. The mooring lines MBL is roughly equal to the ship design MBL.
- The ship design MBL for the assigned EN of your vessel is available in the document uploaded in the CFM certificate module under Cert. Code number 232.

232	Ship Design MBL certificate	Mooring

Frequency of rendering test:

- Annually
- After any modification or maintenance i.e. change of brake pad, de-rusting of brake drum
- Where there is an evidence of premature brake slippage or related malfunctions

Brake rendering test preparation & kit:

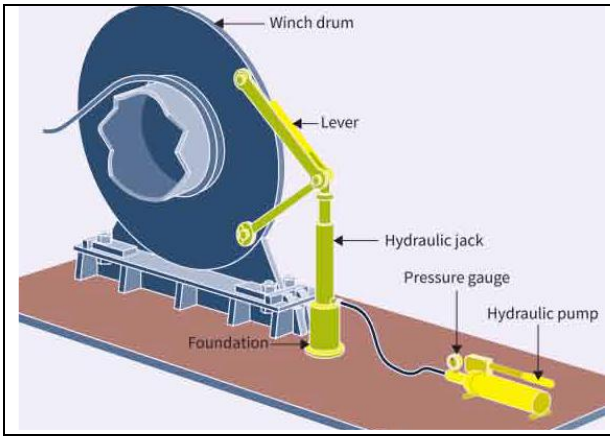
- Check the condition of the brake and the brake drum is satisfactory. Fix any damage or failure before testing.
- A test kit consisting of following items is required to carry out the brake rendering setting,
    - A lever, usually consisting of two pieces of bar and bolts for fitting it through holes provided in the drum flange. (Mooring winch drum may not have holes which are to be made only after sending proposal to Ship Manager and his approval)
    - A hydraulic jack with pressure gauge.

- A foundation may be required to place under the hydraulic jack for distributing the load into the deck structure. Check sufficient deck even area is available for placing the jack as it is not to be placed on the grating stand.

Above test kit will be supplied by Ship Manager if your vessel is required to carry out the brake test.

Safety during rendering test:

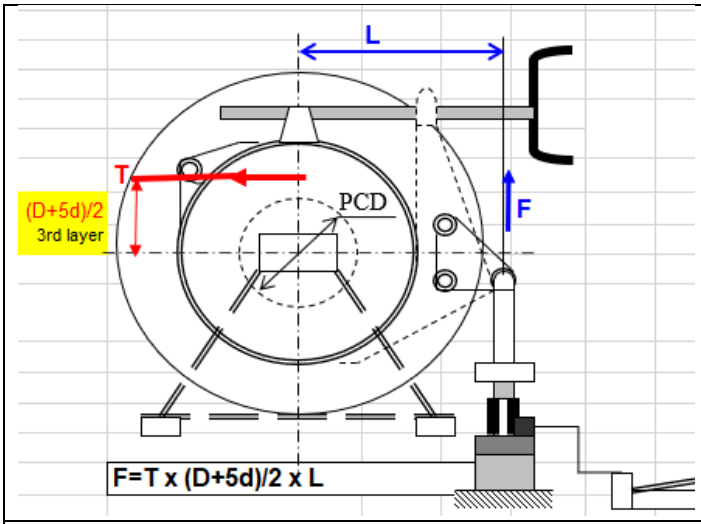
- The mooring drum, test gears, brakes are tensed during testing, conduct the Risk Assessment and Toolbox talk before brake rendering test.



Winch Test Procedure:

- The lever or brace is bolted to the flange of the winch drum with the hydraulic jack pressed under the end of the arms at the designated location and resting on foundation.
- With the winch prepared for testing, the testing gear securely in place and winch brakes set accordingly to the testing instructions, pressure is applied to the hydraulic jack. Calculate Hydraulic jack pressure at which the brake to render using Form 6.5.6 beforehand.
- At the first sign of the brake rendering, the pressure applied to the hydraulic jack is recorded and following action taken:
  - If slippage occurs at less than the design pressure, the brake should be tightened and pressure to jack reapplied.
  - If the recorded pressure corresponds to the design pressure, the jack should be released, and the test gear removed.
  - If slippage doesn't occur at the design pressure, the brake setting should be adjusted so that the brake can render at the design load.

Install an indicator at the brake tightening lever. During test adjust the brake rendering indicator to the correct threads.



Formula at 3rd layer of rope on the drum

Brake indicator marking

Records & Markings:

- Issue the test certificate (Form 6.5.6) indication mooring winch, jack pressure applied and rendering force.
- Mark the winch with design brake holding capacity, brake rendering test load, date of test and mooring line pay out direction.

Tighten the brake during mooring alongside the terminal to the marking as indicated on the brake spindle.

Above read and understood:

CO: _____

2O: _____

3O: _____

JO _____

D/C _____

2EO _____

3EO _____

4EO _____

JEO _____

E/C _____

Verified by: Master / CEO _____

Vessel: _____

Date: _____

Feedback: