

REPORT ON OIL ENGINE MACHINERY.

No. 1808

11 JAN 1932

Received at London Office

Date of writing Report 10th Dec. 31 When handed in at Local Office 10th Dec. 31 Port of NAGASAKI.

No. in Survey held at NAGASAKI. Date, First Survey 2nd Nov. 1929. Last Survey 1st Dec. 1931. Reg. Book. Number of Visits 236.

40963 on the ^{Single} ~~Triple~~ ~~Quadruple~~ Screw vessel "KORYU MARU". Tons { Gross 6,680.10 Net 4,767.67

Built at Nagasaki. By whom built Mitsubishi Zosen Kaisha, Ltd. Yard No. 486. When built 1931. Engines made at Nagasaki. By whom made Mitsubishi Zosen Kaisha, Ltd. Engine No. 486. When made 1931. Donkey Boilers made at Nagasaki. By whom made Mitsubishi Zosen Kaisha, Ltd. Boiler No. 486. When made 1931. Brake Horse Power 3,200. Owners Hiroumi Shoji Kabushiki Kaisha. Port belonging to Kobe. Nom. Horse Power as per Rule 747. Is Refrigerating Machinery fitted for cargo purposes / Is Electric Light fitted Yes. Trade for which vessel is intended Japan - North America.

OIL ENGINES, &c.—Type of Engines Mitsubishi - Sulzer Airless Injection. 2 or 4 stroke cycle 2 Single or double acting Single. Maximum pressure in cylinders 42 Kg/cm². Diameter of cylinders 680 m/m. Length of stroke 1200 m/m. No. of cylinders 6. No. of cranks 6. Span of bearings, adjacent to the Crank, measured from inner edge to inner edge 930 m/m. Is there a bearing between each crank Yes. Revolutions per minute 115. Flywheel dia. 2200 m/m. Weight 7800 Kgs. Means of ignition Airless Injection. Kind of fuel used Heavy fuel oil. Crank Shaft, dia. of journals as per Rule 415.9 m/m as fitted 470 m/m. Crank pin dia. 470 m/m. Crank Webs Mid. length breadth 626 m/m Mid. length thickness 260 m/m. Thickness parallel to axis / Thickness around eye-hole / Flywheel Shaft, diameter as per Rule 415.9 m/m as fitted 470 m/m. Intermediate Shafts, diameter as per Rule 312.2 m/m as fitted 350 m/m. Thrust Shaft, diameter at collars as per Rule 415.9 m/m as fitted 470 m/m. Tube Shaft, diameter as per Rule / as fitted / Screw Shaft, diameter as per Rule 345 m/m as fitted 385 m/m. Is the { screw } shaft fitted with a continuous liner { Yes. Bronze Liners, thickness in way of bushes as per Rule 18.1 m/m as fitted 22 m/m. Thickness between bushes as per rule 13.6 m/m as fitted 16 m/m. Is the after end of the liner made watertight in the propeller boss Yes. If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner / If the liner does not fit tightly at the part between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive / If two liners are fitted, is the shaft lapped or protected between the liners / Is an approved Oil Gland or other appliance fitted at the after end of the tube shaft No. If so, state type / Length of Bearing in Stern Bush next to and supporting propeller 1550 m/m. Propeller, dia. 15'-6" Pitch 11.4 ft. No. of blades 4. Material Bronze whether Moveable Yes. Total Developed Surface 76.3 sq. feet. Method of reversing Engines Direct. Is a governor or other arrangement fitted to prevent racing of the engine when declutched Yes. Means of lubrication Forced. Thickness of cylinder liners 53 m/m. Are the cylinders fitted with safety valves Yes. Are the exhaust pipes and silencers water cooled or lagged with non-conducting material Yes. If the exhaust is led overboard near the waterline, what means are arranged to prevent water from being syphoned back to the engine / Cooling Water Pumps, No. Two- Jacket cooling pumps. Two- Piston cooling pumps. Is the sea suction provided with an efficient strainer which can be cleared within the vessel Yes. Bilge Pumps worked from the Main Engines, No. / Diameter / Stroke / Can one be overhauled while the other is at work / Pumps connected to the Main Bilge Line { No. and Size One- Bilge pump 50 M³/hr. One- Bilge & Ballast pump 200 M³/hr. How driven Electric Motor. Ballast Pumps, No. and size One- 200 M³/hr. Lubricating Oil Pumps, including Spare Pump, No. and size Two- Bearing Lub. 25 M³/hr. Two- Crosshead Lub. 3 M³/hr. Are two independent means arranged for circulating water through the Oil Cooler Yes. Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge Pumps, No. and size:—In Machinery Spaces 4 @ 3 1/2". 2 @ 2". 2 @ 2" in cofferdams. In Pump Room / In Holds, &c. No. 1 Hold, 2 @ 3". No. 2 Hold, 2 @ 4". No. 4 Hold 2 @ 3". No. 5 Hold 2 @ 3". Tunnel well 1 @ 2 1/2". Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size 1 @ 8". 2 @ 5". Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes Yes. Are the Bilge Suctions in the Machinery Spaces ed from easily accessible mud-boxes, placed above the level of the working floor, with straight tail pipes to the bilges Yes. Are all Sea Connections fitted direct on the skin of the ship Yes. Are they fitted with Valves or Cocks Both. Are they fixed sufficiently high on the ship's side to be seen without lifting the platform plates Yes. Are the Overboard Discharges above or below the deep water line above. Are they each fitted with a Discharge Valve always accessible on the plating of the vessel Yes. Are the Blow Off Cocks fitted with a spigot and brass covering plate Yes. What pipes pass through the bunkers / How are they protected / What pipes pass through the deep tanks / Have they been tested as per Rule / Are all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times Yes. Is the arrangement of valves and their connections such as to prevent the possibility of water passing from the sea or from water tanks into the cargo or machinery spaces, or from one compartment to another Yes. Is the Shaft Tunnel watertight Yes. Is it fitted with a watertight door Yes. worked from Upper deck. If a wood vessel, what means are provided to prevent leakage of either fuel oil or of lubricating oil from saturating the woodwork / Main Air Compressors, No. 1. No. of stages 3. Diameters 75/295/340 Stroke 180 m/m Driven by Elec. Motor. Auxiliary Air Compressors, No. 1. No. of stages 2. Diameters 70/190 m/m Stroke 120 m/m Driven by Elec. Motor. Small Auxiliary Air Compressors, No. 1. No. of stages 2. Diameters 1 1/2"/4". Stroke 3" Driven by Oil Engine. Scavenging Air Pumps, No. 1 Turbo blower Capacity, 450 M³/min. Driven by Elec. Motor. Auxiliary Engines crank shafts, diameter as per Rule Gen 177 m/m (Kob. rpt. No. 7439) No. 3 Generators. One small air comp. as fitted 185 m/m. Comp. 2 7/16". Position — Engine room.

AIR RECEIVERS:—Is each receiver, which can be isolated, fitted with a safety valve as per Rule Yes. Can the internal surfaces of the receivers be examined and cleaned Yes. Is a drain fitted at the lowest part of each receiver Yes. High Pressure Air Receivers, No. 3. Cubic capacity of each 2500 litres. Internal diameter 775 m/m thickness 32.5 m/m Seamless, lap welded or riveted longitudinal joint Seamless Material Steel Range of tensile strength 28-35 tons sq. in. Working pressure by Rule 91.8 Kg/cm² Actual 70 Kg/cm². Starting Air Receivers, No. 1. Total cubic capacity 7 Cub. Metres. Internal diameter 1600 m/m thickness 30 m/m Seamless, lap welded or riveted longitudinal joint Riveted Material Steel. Range of tensile strength 28-35 tons sq. in. Working pressure by Rule 36.9 Kg/cm² Actual 32 Kg/cm².

IS A DONKEY BOILER FITTED? **Yes** If so, is a report now forwarded? **Yes**
 Is the donkey boiler intended to be used for domestic purposes only **No**
 PLANS. Are approved plans forwarded herewith for Shafting **Yes** Receivers **Yes** Separate Tanks **Yes**
 (If not, state date of approval)
 Donkey Boilers **Yes** General Pumping Arrangements **Yes** Oil Fuel Burning Arrangements **/**

SPARE GEAR.

Has the spare gear required by the Rules been supplied **Yes.**
 State the principal additional spare gear supplied **See Separate List.**

NAGASAKI WORKS, LTD. (MITSUBISHI ZEPHYRUS KAISHA, LTD.)

The foregoing is a correct description,

T. Goto
 GENERAL MANAGER,

Manufacturer.
 1929:- Nov. 2. 12. 16. 1930:- Feb. 25. 26. Mar 3. 4. 11. 13. 14. 19. 20. 22. 26. 29. Apr 7. 16. 24. May 1. 2. 3. 15. 20. 21. 22. 23. 26. 27. 28. 29. Jun 5. 9. 16. 19. 21. 24. 27. 28. 30. July 2. 3. 4. 9. 10. 23. 26. 28. 31. Aug 2. 4. 5. 6. 7. 8. 9. 14. 16. 18. 19. 20. 22. 26. 27. 28. 29. Sep 1. 2. 3. 4. 5. 8. 10. 11. 12. 13. 15. 16. 22. 25. 29. 30. Oct 1. 4. 11. 14. 15. 17. 18. 22. 24. 25. 28. 29. 30. 31.
 Dates of Survey while building: During progress of work in shops - Nov 4. 5. 7. 8. 10. 12. 13. 14. 15. 17. 18. 21. 22. 24. 27. Dec 3. 5. 6. 9. 10. 11. 16. 17. 18. 19. 22. 29.
 During erection on board vessel - 1931:- Jan 6. 7. 8. 9. 10. 12. 15. 22. 29. Feb 5. 10. 13. 21. 25. 26. 27. Mar 16. 19. Apr 20. May 2. 6. 9. 11. 26. 29. 30. June 2. 16. 24. 25. 27. July 1. 2. 3. 4. 7. 8. 11. 14. 15. 16. 17. 18. 20. 23. 24. 28. 29. 30. 31.
 Total No. of visits: Aug 1. 3. 4. 5. 6. 8. 10. 11. 12. 17. 19. 20. 25. 26. 27. 28. 29. 30. Oct 2. 3. 5. 6. 12. 14. 16. 19. 20. 21. 22. 23. 24. 26. 27. 28. 29. Nov. 2. 4. 5. 6. 7. 9. 12. 14. 18. 20. 24. 25. 28. Dec 1. (Total No. visits, 236).

Dates of Examination of principal parts - Cylinders 7-11-30 Covers 28-7-31 Pistons 28-10-31 Rods 12-11-30 Connecting rods 26-8-30
 Crank shaft 1-4-30 to 17-4-30 (Dusseldorf) Flywheel shaft and Thrust shaft 21-2-30 to 16-6-30 (Hakodate) Intermediate shafts 30-6-30 Tube shaft /
 Screw shaft 4-11-30 Propeller 8-8-31 Stern tube 11-8-31 Engine seatings 25-8-31 Engines holding down bolts 29-10-31
 Completion of fitting sea connections 25-8-31 Completion of pumping arrangements 29-10-31 Engines tried under working conditions 20-11-31
 Crank shaft, Material Ingot steel Identification Mark L.No. 7461 J.L. 1-4-30. Flywheel shaft, Material Ingot steel Identification Mark L.No. 682 ZS 16-17-4-30.
 Thrust shaft, Material " " Identification Mark See Flywheel shaft. Intermediate shafts, Material Ingot steel Identification Marks L.No. 330. TK 22-10-30. GA 3-8-31.
 Tube shaft, Material / Identification Mark / Screw shaft, Material Ingot steel. Identification Mark L.No. 326. GA 3-8-31.

Is the flash point of the oil to be used over 150° F. **Yes**
 Have the requirements of the Rules for oil fuel pipes and tank fittings been complied with **Yes**
 Is the vessel (not being an oil tanker) fitted for carrying oil as cargo **No.** If so, have the requirements of the Rules been complied with **/**
 If the notation for Ice Strengthening is desired, state whether the requirements in this respect have been complied with **/**
 Is this machinery duplicate of a previous case **No** If so, state name of vessel **/**

General Remarks (State quality of workmanship, opinions as to class, &c.)
 The machinery has been constructed under Special Survey and installed in the vessel in accordance with the Rules and Approved Plans.
 The materials and workmanship are good and the machinery has been examined under working condition and found satisfactory.
 The Machinery of this vessel is eligible in my opinion to have the record **LMC, 12, - '31**
 Mean speed on trial 15.558 knots, at mean draught, 10'-8 $\frac{1}{2}$ ".
 Certificates of Castings and Forgings herewith.

Certificate (if required) to be sent to the Surveyor not to write on or below the space for Committee's Minute.

The amount of Entry Fee	£ 60:00	When applied for,	2. 12. 1931
Special	£ 1686:00	When received,	29. 3. 1932
Donkey Boiler Fee	£ 63:00		
Air Vessel.	£ 47:25		
Travelling Expenses (if any)			

Committee's Minute **TUE. 19 JAN 1932**
 Assigned **+ L.M.C. 12.31** **C.L.**
Oil Eng. **D.B. 100lb.**

George Anderson T. Kunishi
 Engineer Surveyor to Lloyd's Register of Shipping.

