

REPORT ON OIL ENGINE MACHINERY.

No. 1686

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Writing Report 9th Sep. 29 When handed in at Local Office 9th Sep. 29 Port of NAGASAKI.

Survey held at NAGASAKI.

Date, First Survey 6th Nov. 1928. Last Survey 20th Aug. 1929.

Book.

Number of Visits 147.

on the ^{Single} ~~Twin~~ ^{Triple} ~~Quadruple~~ Screw vessel "HEIYO MARU".Tons { Gross
Net

t at Osaka. By whom built Osaka Iron Works. Yard No. 1127. When built
ines made at Nagasaki. By whom made Mitsubishi Zosen Kaisha, Engine No. 464. When made 1929.
key Boilers made at By whom made Boiler No. When made
ke Horse Power 8000. Owners Nippon Yusen Kabushiki Kaisha. Port belonging to
e Horse Power as per Rule 2004. Is Refrigerating Machinery fitted for cargo purposes Is Electric Light fitted
de for which vessel is intended

ENGINES, &c.—Type of Engines Mitsubishi-Sulzer. 2 or 4 stroke cycle 2 Single or double acting Single.
mum pressure in cylinders 40 atm. Diameter of cylinders 680 m/m. Length of stroke 1000 m/m. No. of cylinders 16. No. of cranks 16.
of bearings, adjacent to the Crank, measured from inner edge to inner edge 890 m/m. Is there a bearing between each crank Yes.
utions per minute 120. Flywheel dia. 2100 m/m. Weight 8 tons. Means of ignition Temp due to Compression Kind of fuel used Heavy fuel oil.
k Shaft, dia. of journals as per Rule 442.4 m/m. Crank pin dia. 450 m/m. Crank Webs Mid. length breadth Thickness parallel to axis 280 m/m.
as fitted 450 m/m. 343.5 Mid. length thickness shrunk Thickness around eyehole 204 m/m.
rheel Shaft, diameter as per Rule 442.4 m/m. Intermediate Shafts, diameter as fitted 350.9 m/m. Thrust Shaft, diameter at collars as per Rule 368.4 m/m.
as fitted 450 m/m. 147/18(?) as fitted 450 m/m.
e Shaft, diameter as per Rule Screw Shaft, diameter as fitted Is the { tube
as fitted screw } shaft fitted with a continuous liner { no liner }

ize Liners, thickness in way of bushes as per Rule Thickness between bushes as per rule Is the after end of the liner made watertight in the
as fitted If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner
ller boss e 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
o liners are fitted, is the shaft lapped or protected between the liners Is an approved Oil Gland or other appliance fitted at the after
of the tube shaft Length of Bearing in Stern Bush next to and supporting propeller.

29 peller, dia. 15'-0" Pitch 16'-1 1/2" No. of blades 4. Material N.M. whether Moveable Yes. Total Developed Surface 67.5 sq. feet
hod of reversing Engines Direct. Is a governor or other arrangement fitted to prevent racing of the engine when declutched Yes. Means of lubrication
ced. 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
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
ling Water Pumps, No. Is the sea suction provided with an efficient strainer which can be cleared within the vessel

e Pumps worked from the Main Engines, No. Diameter Stroke Can one be overhauled while the other is at work
ps connected to the Main Bilge Line { No. and Size
How driven

st Pumps, No. and size Lubricating Oil Pumps, including Spare Pump, No. and size
o independent means arranged for circulating water through the Oil Cooler Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge
s, No. and size:—In Machinery Spaces
lds, &c.

pendent Power Pump Direct Suctions to the Engine Room Bilges, No. and size
ll the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes Are the Bilge Suctions in the Machinery Spaces
om easily accessible mud-boxes, placed above the level of the working floor, with straight tail pipes to the bilges
l Sea Connections fitted direct on the skin of the ship Are they fitted with Valves or Cocks

ey fixed sufficiently high on the ship's side to be seen without lifting the platform plates Are the Overboard Discharges above or below the deep water line
ney each fitted with a Discharge Valve always accessible on the plating of the vessel Are the Blow Off Cocks fitted with a spigot and brass covering plate
at pipes pass through the bunkers How are they protected
at pipes pass through the deep tanks Have they been tested as per Rule

all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times
he 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
partment to another Is the Shaft Tunnel watertight Is it fitted with a watertight door worked from

wood vessel, what means are provided to prevent leakage of either fuel oil or of lubricating oil from saturating the woodwork
in Air Compressors, No. Four (2 each eng) No. of stages Three. Diameters 570/480/150 Stroke 400 m/m. Driven by Main engine.
xiliary Air Compressors, No. One. No. of stages Three. Diameters 340/295/75 Stroke 180 m/m. Driven by Elec. motor.
all Auxiliary Air Compressors, No. No. of stages Diameters Stroke Driven by
rbo Blower. Two. (Single). Capacity 1200 cu. m/min. (each) Driven by Elec. motor.
aving Air Pumps, No. Diameter Stroke

xiliary Engines crank shafts, diameter as per Rule
as fitted

RECEIVERS:—Is each receiver, which can be isolated, fitted with a safety valve as per Rule Yes.
a the internal surfaces of the receivers be examined Yes. What means are provided for cleaning their inner surfaces Handhole- H.P. Receivers
there a drain arrangement fitted at the lowest part of each receiver Yes.

gh Pressure Air Receivers, No. Two. Cubic capacity of each 150 litres. Internal diameter 300 m/m. thickness 16 m/m.
unless, lap welded or riveted longitudinal joint Seamless. Material S.M. Steel. Range of tensile strength 28-35 tons sq. in. Working pressure by Rules 97.2 Kg/cm²
arting Air Receivers, No. Total cubic capacity Internal diameter thickness
unless, lap welded or riveted longitudinal joint Material Range of tensile strength Working pressure by Rules

604711-007220-0126

IS A DONKEY BOILER FITTED?

PLANS. Are approved plans forwarded herewith for Shafting Crank shaft only Receivers 150 litres. Separate Tanks

Donkey Boilers

General Pumping Arrangements

Oil Fuel Burning Arrangements

SPARE GEAR

- 2 Working cylinder covers, consisting of centre & outer pieces and internal pipe fitting.
8 Combined starting air & fuel valves complete. 4 Advance starting air valves complete.
2 Safety valves complete for Working cylinder. 16 Fuel needle valves.
1 Working piston complete with rings, rods and inner cooling tube.
112 Working piston packing rings. 8 Inner cooling water pipes.
8 Outer cooling water pipes. 1 Steel gear wheel for Crank shaft.
1 Cast iron gear wheel for Counter shaft. 1 Steel bevel wheel for Counter shaft.
1 Steel bevel wheel for Vertical shaft. 2 Steel spiral wheel for Vertical shaft.
2 Bronze spiral wheel for Cam shaft. 18 Cylinder cover studs and nuts.
2 Upper connecting rod bolts and nuts. 4 Lower connecting rod bolts and nuts.
4 Main bearing bolts with double nuts. 16 Coupling bolts for Working cyl. crank shaft.
24 Piston rings for H.P. Piston. 20 Piston rings for Top L.P. Piston.
20 Piston rings for Bottom L.P. Piston. 2 H.P. suction valves.
2 H.P. delivery valves. 8 46 m/m dia. I.P. suction & delivery valves.
8 75 m/m dia. I.P. suction and delivery valves. 8 105 m/m dia. I.P. suction & delivery valves.
24 46 m/m dia. L.P. suction & delivery valves. 24 75 m/m dia. L.P. suction & delivery valves.
24 105 m/m dia. L.P. suction & delivery valves. 24 135 m/m dia. L.P. suction & delivery valves.
4 Plungers with bush for fuel pump. 4 Suction valves with spring for fuel pumps.
4 Delivery valves with spring for fuel pumps. 1 Addition scavenge blower.
1 Additional jacket cooling water pump. 1 Additional piston cooling water pump.

The foregoing is a correct description,

NAGASAKI WORKS, MITSUBISHI ZOSEN KAISHA, LTD.

Manufacturer.

1928. Nov. 6. 13. 15. Dec. 11. 14. 15. 20. 21. 29. 1929. Jan. 7. 10. 17. 19. 21. 23. 24. 25. 26. 28. 29. 30. 31. Feb. 1. 4. 6. 7. 8. 15. 19. 20. 21. 22. 23. 25. 26. 27. 28. Mar. 1. 2. 4. 5. 6. 7. 8. 9. 11. 12. 13. 18. 19. 22. 23. 25. 26. 27. 28. 29. 30. Apr. 1. 2. 4. 5. 6. 8. 10. 11. 13. 15. 16. 19. 20. 22. 23. 24. 25. 26. 28. 29. 30. 31. May 1. 2. 3. 4. 6. 7. 8. 9. 13. 14. 17. 18. 20. 21. 22. 23. 24. 25. 27. 28. 29. 30. 31. June 1. 3. 4. 5. 8. 10. 11. 12. 13. 14. 15. 17. 18. 19. 21. 22. 24. 27. 28. 29. July 1. 2. 3. 6. 8. 9. 10. 11. 12. 13. 14. 20. 23. 24. 29. 30. 31. Aug. 5. 6. 8. 13. 14. 20. 147.

Dates of Survey while building

During progress of work in shops -

During erection on board vessel -

Total No. of visits

Dates of Examination of principal parts - Cylinders 8-3-29 to 28-3-29 Covers 28-3-29 to 31-3-29 Pistons 22-2-29 to 28-3-29 Rods 28-3-29 to 30-3-29 Connecting rods 6-12-28 to 11-1-29 Crank shaft 6 & 13-12-28 Flywheel shaft 11 & 18-1-29 Thrust shaft 6-12-28 Intermediate shafts Tube shaft

Screw shaft Propeller Stern tube Engine seatings Engines holding down bolts P-10.11-7-29 S-21-22 Completion of fitting sea connections Completion of pumping arrangements Engines tried under working conditions in Shop Crank shaft, Material Ingot Stl. Identification Mark P-LLOYDS No. 8041 & 8042. Flywheel shaft, Material Ingot Stl. Identification Mark P-LLOYDS No. 8039 & 8040. Thrust shaft, Material Ingot Stl. Identification Mark S-LLOYDS No. 8039 & 8040. (Spare Crank shaft) Identification Mark PK 6-12-28 Tube shaft, Material Identification Mark See Flywheel shafts. Identification Mark PK 8-2-29 Identification Mark PK 6-12-28

Is the flash point of the oil to be used over 150° F. Yes.

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 survey in accordance with the requirements of the Society's Rules and Approved plans.

The materials and workmanship are good and the machinery has been examined under working conditions on test bed in Shop, found satisfactory, and is eligible in our opinion for the notation of **LN** (with date) when installed in the vessel.

The two main engines covered by this report have been forwarded to Osaka for installation in the

Note:-

The following articles supplied by Messrs. Mitsubishi are being forwarded direct to Messrs. Iron Works from their respective makers.

Two Jacket cooling water pumps 350 cu.m/hr. Two Piston cooling water pumps 80 cu.m/hr.
Two Lubricating oil pumps (bearings) 58 cu.m/hr. Two Lubricating oil pumps (crosshead) 8 cu.m/hr.
Two Lubricating oil coolers. Twelve H.P. Air bottles (800 litres).
One Small auxiliary compressor.

The amount of Entry Fee ... £ 60:00 : When applied for, 20. 8. 1929.
Special 4/5. Fee. £ 180:20 :
Donkey Boiler Fee ... £ : : When received, 9. 9. 1929.
Travelling Expenses (if any) £ : :

Committee's Minute

Assigned

TUE. 20 APR 1930

TUE. 13 MAY 1930

FRI. 17 APR 1931

TUE. 28 OCT 1930

Engineer Surveyor to Lloyd's Register of Shipping

WED. 8 APR 1930

Lloyd's Register Foundation