

REPORT ON OIL ENGINE MACHINERY

No. 1514

Received at London Office

22 Feb 1926

18th Jan. 26 When handed in at Local Office 18th Jan. 26 Port of NAGASAKI.

Writing Report: 18th Jan. 26 Date, First Survey 8th May 1925. Last Survey 11th Dec. 19 25.

Survey held at NAGASAKI. Number of Visits 57.

on the Single / Twin / Triple Screw vessel "SANTOS MARU". Tons { Gross 7267 / Net 4387

at Nagasaki. By whom built Mitsubishi Zosen Kaisha, Ltd. Yard No. 410. When built 1925.

Engines made at Winterthur. By whom made Sulzer Bros. Engine No. 5465 / 5471 When made 1925.

Boiler made at Nagasaki. By whom made Mitsubishi Zosen Kaisha, Ltd. Boiler No. 410 When made 1925.

Indicated Horse Power 2300 each engine Owners Osaka Shosen Kabushiki Kaisha. Port belonging to Osaka.

Net Horse Power as per Rule 1164 (2Eg) Is Refrigerating Machinery fitted for cargo purposes Yes Is Electric Light fitted Yes

ENGINES, &c. Type of Engines Sulzer Diesel Engines 2 or 4 stroke cycle 2 Single or double acting Single

Mean pressure in cylinders 38 Ats No. of cylinders 12 Total diameter of cylinders 600 m/m No. of cranks 12 Total Length of stroke 1060 m/m

bearings, adjacent to the Crank, measured from inner edge to inner edge 810 m/m Is there a bearing between each crank Yes

Revolutions per minute 112 Flywheel dia. 2100 m/m Weight 10300 Kg Means of ignition Temp. due to Comp. Kind of fuel used Heavy Fuel Oil

Shaft, dia. of journals as per Rule 386 m/m as fitted 405 " Crank pin dia. 405 m/m Crank Webs Mid. length breadth 550 m/m Mid. length thickness 225 " Kind of fuel used Heavy Fuel Oil

Steel Shafts, diameter as per Rule 386 m/m as fitted 405 " Intermediate Shafts, diameter as per Rule 292 m/m as fitted 337 " Thrust Shaft, diameter at collars as per Rule 306.6 m/m as fitted 390 m/m

Shafts, diameter as per Rule 326 m/m as fitted 381 " Is the screw shaft fitted with a continuous liner Yes

Size Liners, thickness in way of bushes as per Rule 17.5 m/m as fitted 19 " Thickness between bushes as per rule 13.5 m/m as fitted 15 " Is the after end of the liner made watertight in the

liner boss Yes If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner In one length.

Is 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 Yes

When 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 No Length of Bearing in Stern Bush next to and supporting propeller 1695 m/m

Propeller, dia. 12'-10" Pitch 15'-9" No. of blades 4 Material Mang. Bron. whether Moveable Yes Total Developed Surface 52.1 sq. feet

Method of reversing Engines Direct Is a governor or other arrangement fitted to prevent racing of the engine Yes Means of lubrication

Conducting material Yes Thickness of cylinder liners 45 m/m Are the cylinders fitted with safety valves Yes Are the exhaust pipes and silencers water cooled or lagged with

Exhausting Water Pumps, No. Five Is the sea suction provided with an efficient strainer which can be cleared within the vessel Yes

Water Pumps fitted to the Main Engines, No. None Diameter Stroke Can one be overhauled while the other is at work

Pumps connected to the Main Bilge Line No. and Size Four. 2- 50 ton Bilge. 1- 100 ton Bilge & Gen. Serv. 1- 200 ton Bilge & Ballast. How driven Motor driven.

Ballast Pumps, No. and size 1- 200 ton Lubricating Oil Pumps, including Spare Pump, No. and size 3- (2 - 25 M³ / 1 - 10 M³)

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 Engine Room 3-3 1/2" dia. to Eng. well or No.2 Cofferdam. 2-3 1/2" dia. to Engine Room. Thrust Recess Bilge Hat.

Holds, &c. 1-3" to No.1 Cofferdam. 2-3" to No.1 Hold. 2-3 1/2" to Nos.2 & 3 Holds. 1-2" to No.3 Cofferdam. 1-3" to No.4 & 5 Holds. 1-2 1/2" to Tunnel well.

Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size 1-8" dia. 3-5" dia. 3-3 1/2" dia to Eng. well or No.2 Cof.

Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes Yes Are the Bilge Suctions in the Machinery Space

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 Valves & cocks

Are they sized 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

Do that pipes pass through the bunkers None How are they protected

Do that pipes pass through the deep tanks None 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 Uppermost Cont. Dk.

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. Two each engine No. of stages 3 Diameter 640/580/140 Stroke 560 m/m Driven by Crank shaft

Auxiliary Air Compressors, No. 2 No. of stages 3 Diameters 325/290/65 Stroke 180 m/m Driven by Elec. Motors

Small Auxiliary Air Compressors, No. 1 No. of stages 2 Diameters 110/35 Stroke 120 m/m Driven by Hot Bulb Eng

Scavenging Air Pumps, No. Two turbo scavenging blowers each having an intake volume of 660 cub metres of free air per min. Driven by Elec. Motors

Auxiliary Engines crank shafts, diameter as per Rule 152.5 m/m as fitted 175 "

IR 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 Yes What means are provided for cleaning their inner surfaces By steam & Compressed air.

Is there a drain arrangement fitted at the lowest part of each receiver Yes

High Pressure Air Receivers, No. 2 Cubic capacity of each 150 litres Internal diameter 300 m/m thickness 15 m/m

Starting Air Receivers, No. 10 Seamless Material S.M.Stl. Range of tensile strength 50-60 Kg./cm² Working pressure by Rules 102.8 Ats @ 47 Kg./m²

Starting Air Receivers, No. 2 Total cubic capacity 5 Cu.metres Internal diameter 1200 m/m thickness 7/8"

Seamless, lap welded or riveted longitudinal joint Riveted Material S.M.Stl. Range of tensile strength 28-32 tons Working pressure by Rules 427 lbs/□

Seamless, lap welded or riveted longitudinal joint

IS A DONKEY BOILER FITTED? Yes

If so, is a report now forwarded? Yes

HYDRAULIC TESTS:-

DESCRIPTION.	DATE OF TEST.	WORKING PRESSURE.	TEST PRESSURE.	STAMPED.	REMARKS.
ENGINE CYLINDERS	16-1-25 to 10-2-25.	38 Ats.	75 Ats.	LR	Tested in Winter
COVERS	16-1-25 to 10-2-25.	" "	" "	"	--do--
JACKETS	27-1-25 to 16-2-25.	1 "	6 "	"	--do--
PISTON WATER PASSAGES	27-4-25 & 11-5-25.	2 "	" "	"	--do--
MAIN COMPRESSORS—1st STAGE	27-2-25 & 7-3-25.	3 "	50 "	"	--do--
2nd "	" "	17.5 "	" "	"	--do--
3rd "	3-3-25 & 5-3-25.	70 "	150 "	"	--do--
AIR RECEIVERS—STARTING	25-8-20 to 11-9-20.	" "	" "	MB or HK.LR	Tested in Dusseldo
INJECTION	15-7-20 & 27-3-25.	" "	" "	KH & LR	Tested in Winter
AIR PIPES	30-4-25 to 29-5-25.	" "	" "	LR	--do--
FUEL PIPES	" "	" "	" "	"	--do--
FUEL PUMPS & Valves.	8-1-25 to 19-1-25.	" "	140 "	"	--do--
SILENCER	19-6-25 & 23-6-25	.05 "	2.5 "	"	--do--
WATER JACKET		14.5 lbs	14.5 lbs	RC 11-8-25	2- 10 ton F.O.Main
SEPARATE FUEL TANKS		9.0 "	9.0 "	RC 13-8-25 RC 27-8-25	

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 As per Rules and in addition:-
 See separate list.

The foregoing is a correct description,

Sign. (Sulzer Bros. Ltd)

Manufacturer.

Dates of Survey while building
 During progress of work in shops - 1925. May 8.13.23.27 June 19.24 July 1.3.7.11.18.23.27.29. Aug. 5.8.11.12.13.14.15. 19.21.25.27. Sep. 3.4.9.10.12.16.18.29. Oct. 3.17. Nov. 4.5.
 During erection on board vessel - 1925. Aug. 26.28 Sep. 14.21.23. Oct. 2.12.22.28.30. Nov. 6.12. 14.21. Dec. 1.5.8.9.11.
 Total No. of visits 57.

Dates of Examination of principal parts—Cylinders 12-9-25 Covers 12-9-25 Pistons 12-9-25 Rods 12-9-25 Connecting rods 12-9-25
 Crank shaft 25-8-25 & 3-9-25. Flywheel shaft 25-8-25 & 3-9-25 Thrust shaft 25-8-25 & 3-9-25. Intermediate shafts 24-6-25 & 12-8-25 Tube shaft /
 Screw shaft 8-5-25 & 17-8-25 Propeller 12-9-25 & 2-10-25 Stern tube 13-8-25 & 26-8-25 Engine sealings While Buildg Engines holding down bolts 14-9-25.
 Completion of fitting sea connections 28-8-25 Completion of pumping arrangements 2-10-25 Engines tried under working conditions 14-11-25
 Crank shaft, Material M.S. (E.No. 5465 Lyd No. 12055 or 876. & thrust (E.No. 5465 Lyd No. 12056. 25-10-25 or 10-24 or 21-10-24. Flywheel shaft, Material M.S. (LR 16-1-25 or 12-8-25. E.No. 5471 Lyd No. 12054. 25-10-24 LR 19-2-25.
 Thrust shaft, Material / Identification Mark / Intermediate shafts, Material M.S. Identification Marks R.C. No. 211
 Tube shaft, Material / Identification Mark / Screw shaft, Material M.S. Identification Mark R.C. No. 211

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. This Machinery together with three Auxiliary Engines Nos. 14177-81+85. Type 4 RH 31. one auxiliary engine No. 14213 Type 2 RH 24. two auxiliary compressors Nos. 165 & 167 Type C 100. and one auxiliary compressor No. 268 Type MC 6, with their accessories have been securely fitted on board and have been satisfactorily tried under full power. The machinery of this vessel is eligible, in my opinion, for the record of LMC, 12-25, in the Register Book.

Mean Speed on trial 15.75 knots. Half load. Plans sent under separate cover of:- Donkey Boiler. Low Press. air Vessel. Pipe diagram of bilge ballast & F.O. Connection. Pipe diagram of F.O. connection 10 ton F.O. service tank for Main Eng. 8/10 ton F.O. settling tank for D.B. Arrangement of shafting. Stern tube & propeller shaft. Intermediate shafts, plummer block & bulk head stuffing box.

The amount of Entry Fee ... £ :
 Special Air Receivers 438:30 :
 Donkey Boiler Fee 71:30 :
 Travelling Expenses (if any) £ :
 When applied for, 10. 12. 1925
 When received, 17. 12. 1925

B. Crawford
 Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute

FRI. 26 FEB 1926

Assigned

+ L.M.C. 12.25
 Oil Engines
 B.L.



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