Rpt. 4b.

REPORT ON OIL ENGINE MACHINERY.

No. 2249

Received at London Office MON. JAN. 29 1923

Date of writing Report 22 Jan. 1923 When handed in at Local Office 19 Port of Stockholm

No. in Reg. Book. Survey held at Stockholm Date, First Survey 6 Oct 1919 Last Survey 13 Jan 1923 Number of Visits 9

on the Single / Twin / Triple } Screw vessels M.S. "C.9." Tons Gross 31.44 Net —

Master Built at Bilbao By whom built Soc. Española de Const. Naval Yard No. 24 When built 1923.

Engines made at Stockholm By whom made J. & C.G. Bolinder Co. Ltd. Engine No. 15154/57 Cyl(When made 1923

Donkey Boilers made at ✓ By whom made ✓ Boiler No. ✓ When made ✓

Brake Horse Power 160 Owners Sociedad Española de Construccion Naval (Möller's order no 167) Port belonging to Bilbao

Nom. Horse Power as per Rule 1/6 ✓ Is Refrigerating Machinery fitted for cargo purposes No. Is Electric Light fitted No.

OIL ENGINES, &c.—Type of Engines Bolinder Oil Engine 2 ~~or 4~~ stroke cycle Single ~~or double~~ acting

Maximum pressure in cylinders 17 kg/sq cm. No. of cylinders 4 No. of cranks 4 Diameter of cylinders 300 m/m 11 13/16

Length of stroke 12 5/16" 310 m/m Revolutions per minute 350 r/m. Means of ignition Hot bulb Kind of fuel used Crude Oil

Is there a bearing between each crank yes ✓ Span of bearings (Page ~~82~~ 87, Section ~~2~~ 3, par. ½ of Rules) 600 m/m

Distance between centres of main bearings 600 m/m ✓ Is a flywheel fitted yes Diameter of crank shaft journals as per Rule 121 m/m as fitted 128 " ✓

Diameter of crank pins 128 m/m ✓ Breadth of crank webs as per Rule 161 m/m as fitted 170 " ✓ Thickness of ditto as per Rule 68 m/m as fitted 71.5 " ✓

The flywheel is fitted at fore end of the crank shaft

Diameter of flywheel shaft as per Rule / as fitted Diameter of tunnel shaft as per Rule / as fitted ✓ Diameter of thrust shaft as per Rule 116 m/m ✓ as fitted 118 " ✓

Diameter of screw shaft as per Rule / as fitted 102 m/m ✓ Is the screw shaft fitted with a continuous liner the whole length of the stern tube No.

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 joints burned ✓

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 No. If without liners, is the shaft arranged to run in oil ✓

Type of outer gland fitted to stern tube Guard ring Length of stern bush 490 m/m ✓ Diameter of propeller 1220 m/m ✓.

Pitch of propeller 1474 m/m. No. of blades 3. state whether moveable No. Total surface 38.09 DCM² ~~square feet~~

Method of reversing Timing Is a governor or other arrangement fitted to prevent racing of the engine when declutched yes Thickness of cylinder liners none fitted

Are the cylinders fitted with safety valves no Means of lubrication pumps Are the exhaust pipes and silencers water cooled or lagged with non-conducting material lagged If the exhaust is led overboard near the waterline, what means are arranged to prevent water from being syphoned back to the engine ~~Exhaust~~ into funnel

No. of cooling water pumps 2 Is the sea suction provided with an efficient strainer which can be cleared within the vessel

No. of bilge pumps fitted to the main engines 1 Diameter of ditto 100 m/m ✓ Stroke 50 m/m ✓

Can one be overhauled while the other is at work ✓ No. of auxiliary pumps connected to the main bilge lines None How driven ✓

Sizes of pumps ✓ No. and sizes of suctions connected to both main bilge pumps and auxiliary bilge pumps:—In engine room 1 - 1½" ✓

and in holds, etc. 1 - 1½" ✓ No. of ballast pumps ✓ How driven ✓ Sizes of pumps ✓

Is the ballast pump fitted with a direct suction from the engine room bilges ✓ State size ✓ Is a separate auxiliary pump suction fitted in Engine Room and size ✓

Are all the bilge suction pipes fitted with roses Yes. Are the roses in Engine Room always accessible Yes.

Are the sluices on Engine Room bulkheads always accessible ✓ Are all connections with the sea direct on the skin of the ship Yes.

Are they valves or cocks both. Are they fixed sufficiently high on the ship's side to be seen without lifting the floor plates Yes.

Are the discharge pipes 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 all pipes, cocks, valves and pumps in connection with the machinery accessible at all times Yes. Are the bilge suction pipes, cocks and valves arranged so as to prevent any communication between the sea and the bilges Yes. Is the screw shaft tunnel watertight ✓ Is it fitted with a watertight door ✓

worked from ✓ If a wood vessel, what means are provided to prevent leakage of either fuel oil or of lubricating oil from saturating the woodwork ✓

No. of main air compressors none fitted No. of stages ✓ Diameters ✓ Stroke ✓ Driven by ✓

No. of auxiliary air compressors one No. of stages one Diameters 3 1/8" Stroke 3" Driven by Hand wheel 3'-0" dia

No. of small auxiliary air compressors ✓ No. of stages ✓ Diameters ✓ Stroke ✓ Driven by ✓

No. of scavenging air pumps ✓ Diameter ✓ Stroke ✓ Driven by ✓

Diameter of auxiliary Diesel Engine crank shafts as per Rule / as fitted ✓ Are the air compressors and their coolers made so as to be easy of access ✓

AIR RECEIVERS:—No of high pressure air receivers ✓ Internal diameter ✓ Cubic capacity of each ✓

material ✓ Seamless, lap welded or riveted longitudinal joint ✓ Range of tensile strength ✓

thickness ✓ working pressure by Rules ✓ No. of starting air receivers 2 / 1 Internal diameter 434 m/m

Total cubic capacity 280 litres Material S.M. Steel Seamless, lap welded or riveted longitudinal joint lap welded

Range of tensile strength min. 23 tons/sq inch thickness 8 m/m ✓ Working pressure by rules 257 lbs. ✓ Is each receiver, which can be isolated, fitted with a safety valve as per Rule ✓ Can the internal surfaces of the receivers be examined yes ✓ What means are provided for cleaning their inner surfaces manhole door Is there a drain arrangement fitted at the lowest part of each receiver yes

AAB 30/1/23

IS A DONKEY BOILER FITTED? No. If so, is a report now forwarded? ✓ C 2.24

HYDRAULIC TESTS:—

DESCRIPTION.	DATE OF TEST.	WORKING PRESSURE.	TEST PRESSURE.	STAMPED.	REMARKS.
Engine Cylinders	13.1.23	17 kg/sq.cm.	37 kg/sq.cm. ✓	LLOYDS TEST 37 KG AI. 13.1.23 A	
" " Covers	13.1.23	ditto	ditto		
" " Jackets	13.1.23	—	3.5 kg/sq.cm ✓		
" Piston Water Passages	(open pistons)				
Main Compressors—1st Stage	none fitted				
" 2nd "					
" 3rd "					
Air Receivers-Starting	6.10.19	15 kg/sq.cm. ✓	30 kg/sq.cm. ✓	No 2112 LLOYD'S TEST 30 ATM W.P. 15 ATM SKM 6.10.19 A	
" Injection					
Air Pipes					
Fuel Pipes					
Fuel Pumps					
Silencer	12.1.23		3.5 kg/sq.cm.	HYDR. TEST 3.5 KG AI. 12.1.23 A	
" Water Jacket	12.1.23		ditto		
Separate Fuel Tanks					

PLANS. Are approved plans forwarded herewith for shafting (If not, state date of approval) Secretary's letter E 7.11.22 Receivers starting E 8.3.16. Separate Tanks ✓

SPARE GEAR to be supplied and inspected on delivery — 2-top end bolts and nuts; 2-main bearing studs & nuts; 1-disc. and 1-suc valve for bilge pumps; 3 studs for ignition bulbs; 1-cylinder stud; 1-thrust bearing bolt; 1-bolt for lubricating apparatus; 1-bolt for fed pump eccentric; 1-bolt for oscillating lever; 1-bolt for governor weight; 2 suc. and 2-disc. valves for circulating pumps and two coupling bolts and nuts.

The foregoing is a correct description,
SOCIEDAD ESPAÑOLA DE CONSTRUCCION NAVAL
R. A. Fullerton for Erection on Board
Manufacturer.
JEFE DE MAQUINARIA

Dates of Survey while building	
During progress of work in shops	6/10 1919; 30/10, 14.22.24 & 30/11 1922; 4.10.13/1 1923
During erection on board vessel	Dec. 15/22. Jan. 23/23. Feb. 5. Mar. 2, 9, 12, 16, 21, 22/23 April 24.26/23. May 24/23. June 4.19/23. July 12.
Total No. of visits	9 in shop. 15 in vessel.

Dates of Examination of principal parts—Cylinders 4.13/1 23 Covers 4.13/1 23 Pistons 4.13/1 23 Rods ✓ Connecting rods 14.22.30/11 22, 4.13/1 23

Crank shaft 30/10 14.24/11 22 4.13/1 23 Thrust shaft 14.24/11 22 4.13/1 23 Tunnel shafts ✓ Screw shaft 9.3.23. Propeller 12.3.23. Stern tube 2.3.23. Engine seatings 2.3.23.

Engines holding down bolts 24.4.23. Completion of pumping arrangements 12.4.23. Engines tried under working conditions in shop 4.10/1 23 AT SEA 24.5.23.

Completion of fitting sea connections 22.3.23. Stern tube 9.3.23. Screw shaft and propeller 16.3.23.

Material of crank shaft S.M. Steel Identification Mark on Do. LLOYDS No 3216 AI 25.11.22 A Material of thrust shaft S.M. Steel Identification Mark on Do. LLOYDS No 3224 AI 22.11.22 A

Material of tunnel shafts / Identification Marks on Do. ✓ Material of screw shafts Steel Identification Marks on Do. 144-23.1.23. W.B.E.

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

Is this machinery duplicate of a previous case Yes If so, state name of vessel see Skm. Report no. 2247 & Bby report 6263.

General Remarks (State quality of workmanship, opinions as to class, &c.

I am of opinion, that this motor is of superior material and workmanship, and as it has been designed and constructed under my special survey, I have respectfully to submit, that it will be eligible to be classed ✠LMC, as soon as it has been fitted in a classed vessel to the satisfaction of the Society's Surveyors.

This machinery has been securely fitted on board, the materials and workmanship are good and has been tried under working conditions and found satisfactory. In my opinion it is eligible to be classed with the record of ✠LMC 7-23

		When applied for,
The amount of Entry Fee ...	£ : :	
Special survey in shop / in vessel	£ 12 : 0 : 0 / 450 pts.	19.1.1923
Donkey Boiler Fee ...	£	When received, 31/3/23
Travelling Expenses (if any)	£ 6 pts.	8/8/23

Thomas Miller. A. Isakson
Engineer Surveyor to Lloyd's Register of Shipping.
assisted by Mr. K. J. Andersson

Committee's Minute FRI. 14 SEP. 1923

Assigned + LMC. 7.23

CERTIFICATE WRITTEN

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