

REPORT ON OIL ENGINE MACHINERY.

No. 432444

Received at London Office

Date of writing Report 10 When handed in at Local Office 25.12.23 Port of Glasgow.
 No. in Survey held at Glasgow Date, First Survey 9.3.1921 Last Survey 20.12.1923
 Reg. Book. Number of Visits 68
 on the ^{Single} ~~Double~~ ~~Triple~~ Screw vessel M/S "GUJARAT"
 Tons { Gross 4148
 Net 2838
 Master Built at Glasgow By whom built Harland & Wolff Yard No. 610 When built 1923
 Engines made at Glasgow By whom made Harland & Wolff Ltd Engine No. 610 When made 1923
 Donkey Boilers made at Annan By whom made Cochran & Co Ltd Boiler No. 16227 When made 1923
 Brake Horse Power 1850 @ 90 R.P.M. Owners Messrs Andrew Weir & Co Ltd Port belonging to
 Nom. Horse Power as per Rule 489 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

IL ENGINES, &c.—Type of Engines Diesel 2 or 4 stroke cycle 4 Single or double acting single
 Maximum pressure in cylinders 500 lb/sq No. of cylinders 6 No. of cranks 6 Diameter of cylinders 740 mm
 Length of stroke 1500 mm Revolutions per minute 90 Means of ignition Compression Kind of fuel used above 150°F.
 Is there a bearing between each crank Yes Span of bearings (Page 92, Section 2, par. 7 of Rules) 1004 mm
 Distance between centres of main bearings 1450 mm Is a flywheel fitted Yes Diameter of crank shaft journals as per Rule 470 mm
 as fitted 485 mm
 Diameter of crank pins 485 mm Breadth of crank webs as per Rule 625 (30110) as fitted 890 mm BUILT Thickness of ditto as per Rule 263 mm
 as fitted 310 mm
 Diameter of flywheel shaft as per Rule 470 mm as fitted 485 mm Diameter of tunnel shaft as per Rule 13 1/8" as fitted 13 1/2" Diameter of thrust shaft as per Rule 13 3/4" as fitted 14 1/4"
 Diameter of screw shaft as per Rule 14" as fitted 14 3/4" Is the screw shaft fitted with a continuous liner the whole length of the stern tube Yes
 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 Yes
 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 Yes
 If two liners are fitted, is the shaft lapped or protected between the liners Yes If without liners, is the shaft arranged to run in oil Yes
 Type of outer gland fitted to stern tube Wood lined stern bush Length of stern bush 6'-0" Diameter of propeller 15'-9"
 Pitch of propeller 15'-0" (variable 13 to 9") No. of blades 4 state whether moveable Yes Total surface 78 square feet
 Method of reversing Air Is a governor or other arrangement fitted to prevent racing of the engine when disengaged Yes Thickness of cylinder liners 70 P 60 mm
 80 P 46 mm
 Are the cylinders fitted with safety valves Yes Means of lubrication Sight & Feed feed 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 Yes

No. of cooling water pumps 2 Is the sea suction provided with an efficient strainer which can be cleared
 within the vessel Yes No. of bilge pumps fitted to the main engine Two (1 WORKING 1 EMERGENCY) Diameter of ditto 7" DUPLEX Stroke 7"
 Can one be overhauled while the other is at work Yes No. of auxiliary pumps connected to the main bilge lines 5 How driven Electric Motor
 Sizes of pumps 2 Bilge 7x7" 1 Ballast 9'x9" No. and sizes of suction connected to both main bilge pumps and auxiliary bilge pumps:—In engine room 4 1/2" 2 1/2" 2 1/2" 1 1/2"
 and in holds, etc. 4 1/2" 2 1/2" 2 1/2" Emergency 6 1/2" No. of ballast pumps 1 How driven Electric Motor Sizes of pumps 9" x 9"
 Is the ballast pump fitted with a direct suction from the engine room bilges Yes State size 4 1/2" Is a separate auxiliary pump suction fitted in
 Engine Room and size — Are all the bilge suction pipes fitted with roses tail pipes 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 Yes Is it fitted with a watertight door Yes

worked from Upper Deck, ER, Bridge 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 1 No. of stages 3 Diameters 750x675x150 Stroke 460 mm Driven by Main engine
 No. of auxiliary air compressors 1 No. of stages 3 Diameters 360x315x72 Stroke 280 mm Driven by Electric Motor
 No. of small auxiliary air compressors 1 No. of stages 2 Diameters 106x34 mm Stroke 80 mm Driven by Steam
 No. of scavenging air pumps — Diameter — Stroke — Driven by —
 Diameter of auxiliary Diesel Engine crank shafts as per Rule 167 mm as fitted 170 mm Are the air compressors and their coolers made so as to be easy of access Yes

AIR RECEIVERS:—No. of high pressure air receivers Six Internal diameter 295 mm Cubic capacity of each 3 at 88 litres
 3 at 150 "
 material Steel Seamless, lap welded or riveted longitudinal joint Seamless Range of tensile strength 28-32 TONS
 thickness .57" working pressure by Rules 1350 LBS/sq No. of starting air receivers Two Internal diameter 6'-0 3/8"
 Total cubic capacity 1076 cu. ft. Material Steel Seamless, lap welded or riveted longitudinal joint T.R.D.B.S.
 Range of tensile strength 27-32 TONS thickness 1 1/2" Working pressure by rules 356 lb/sq Is each receiver, which can be isolated,
 fitted with a safety valve as per Rule Safety valve on common pipe Can the internal surfaces of the receivers be examined Yes What means are provided for cleaning their
 inner surfaces Detachable heads (small) Manhole (large) Is there a drain arrangement fitted at the lowest part of each receiver Yes

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					
" " COVERS	30-7-23 to 12-9-23	20 LBS/SQ	50 LBS/SQ	H.M.B.	
" " JACKETS.....	10-9-23 & 17-9-23	"	"	H.M.B.	
" PISTON WATER PASSAGES.....	24-8-23 to 6-9-23	"	"	H.M.B.	
MAIN COMPRESSORS—1st STAGE.....	24-8-23	71 LBS/SQ	150 LBS/SQ	H.M.B.	
" 2nd	24-8-23	220 LBS/SQ	500 LBS/SQ	H.M.B.	
" 3rd	26-9-23	1000 LBS/SQ	2000 LBS/SQ	H.M.B.	
AIR RECEIVERS—STARTING	13-8-23	356 LBS/SQ	685 LBS/SQ	H.P.S.	
" INJECTION	21-9-23 & 2-10-23	1000 LBS/SQ	2000 LBS/SQ	H.M.B.	A.V. N ^o 511,512,532,531,6
AIR PIPES	18-10-23 to 21-11-23	356 LBS/SQ	712 LBS/SQ	H.M.B.	
FUEL PIPES SUCTIONS.....	23-11-23	-	30 LBS/SQ	-	
FUEL PUMPS	✓	✓	✓	✓	
SILENCER	✓	✓	✓	✓	
" WATER JACKET	✓	✓	✓	✓	
SEPARATE FUEL TANKS	3-10-23 &	✓	10 LBS/SQ	H.M.B.	

PLANS. Are approved plans forwarded herewith for shafting *Feb. 1921* Receivers Separate Tanks *Retained at Glasgow*

SPARE GEAR. *Supplied as per attached list*

The foregoing is a correct description,
For HARLAND & WOLFE LTD.

J. C. Green,

Manufacturer.

MANAGER FINNIESTON WORKS

Dates of Survey while building

During progress of work in shops - -	1921 Mar 9, Apr 26, May 7, 13, 23, 26, 31, Jun 6, 7, 9, 16, 23, 24, 27, 30, July 1, 4, 5, 6, Aug 9, 13, 15, 17, 20, 21, 24, 27, 28, 30, Sep 4, 5, 6, 10, 12, 14, 17, 18
During erection on board vessel - -	21, 25, 26, 27, 29, Oct 1, 2, 3, 4, 8, 10, 12, 18, 19, 23, 24, 26, Nov 2, 13, 16, 21, 23, 26, Dec 5, 6, 7, 13, 19, 20
Total No. of visits	68.

Dates of Examination of principal parts—Cylinders 10/9/23 to 17/9/23 Covers 30/8/23 to 12/9/23 Pistons 24/8/23 to 6/9/23 Rods 14/9/23 Connecting rods 14/9/23
 Crank shaft 21/8/23 Thrust shaft 6/7/23 Tunnel shafts 13/8/23, 4/9/23 Screw shaft 9/8/23 Propeller 9/8/23 Stern tube 12/9/23 Engine seatings 26/10/23
 Engines holding down bolts 23/11/23 Completion of pumping arrangements 7/12/23 Engines tried under working conditions 19/20/12/23
 Completion of fitting sea connections 8/10/23 Stern tube 1/10/23 Screw shaft and propeller 8/10/23

Material of crank shaft *S* Identification Mark on Do. *N^o 610 H.M.C. 21-8-23* Material of thrust shaft *S* Identification Mark on Do. *7.47 2026 LLOYDS 6601 J.H.*
 Material of tunnel shafts *S* Identification Marks on Do. *SEE UNDER* Material of screw shafts *S* Identification Marks on Do. *7.8.7 2023 LLOYDS 1286 L.H. P.M.C. 65 J.*

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. *M/S "ARABY"*

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

TUNNEL SHAFTS: -

<i>N^o 1</i>	<i>N^o 2</i>	<i>N^o 3</i>	<i>N^o 4</i>
<i>2318 LLOYDS 1978 P.M.C.</i>	<i>2316 LLOYDS 1973 P.M.C.</i>	<i>2337 LLOYDS 1979 P.M.C.</i>	<i>2373 LLOYDS 1998 P.M.C.</i>

This machinery has been built under special survey in accordance with the rules and approved plans, the materials and workmanship are sound and good, it has been fitted on board in an efficient manner, tried under working conditions and found satisfactory in all respects and is eligible in my opinion to be classed with record of L.M.C 12-23.

It is submitted that this vessel is eligible for THE RECORD + LMC 12.23. CL. Oil Engines 4 SC. SA. 6 Cy 29 3/8" - 59 1/16" 489 DB.1001b.

The amount of Entry Fee ... £ 5 : 0 ✓
 Special ... £ 98 : 7/- } 4/11/1924
 Donkey Boiler Fee ... £ ✓ : : }
 Travelling Expenses (if any) £ ✓ : : }

H. M. Cruick.
 Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute GLASGOW - 8 JAN 1924
 Assigned + L.M.C. 12.23



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