

REPORT ON OIL ENGINE MACHINERY.

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Date of writing Report 6th Nov 1940 when handed in at Local Office 6th Nov 1940 Port of BELFAST
No. in Survey held at BELFAST Date, First Survey 4th Aug 1939 Last Survey 24th Oct. 1940
Reg. Book. Number of Visits 150

on the Single Screw vessel "ARAYBANK" Tons Gross 7258
Triple
Quadruple Net 5247

Built at BELFAST By whom built HARLAND & WOLFF, LD. Yard No. 1034 When built 1940-10
Engines made at BELFAST By whom made HARLAND & WOLFF, LD. Engine No. 1034 When made 1940
Donkey Boilers made at BELFAST By whom made HARLAND & WOLFF, LD. Boiler No. 1034 When made 1940
Brake Horse Power 3200 Owners ANDREW WEIR & CO. LD. Port belonging to BELFAST
Nom. Horse Power as per Rule 490 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted YES
Trade for which vessel is intended OCEAN GOING CARGO

OIL ENGINES, &c.—Type of Engines H&W. AIRLESS INJECT. UNDER PISTON ^{SUPERCHARGE} stroke cycle 4 Single or double acting S.A.
Maximum pressure in cylinders 700 LB/0" Diameter of cylinders 740^M Length of stroke 1500^M No. of cylinders 6 No. of cranks 6
Mean Indicated Pressure 128 LB/0" Span of bearings, adjacent to the Crank, measured from inner edge to inner edge 972^M Is there a bearing between each crank YES
Revolutions per minute 101 ^{TURNING} wheel dia. 2489^M Weight 2590 Kgs Means of ignition COMP. Kind of fuel used HEAVY OIL
Crank Shaft, ^{Solid forged} dia. of journals As App. ^{Summit built} as per Rule As App. Crank pin dia. 505^M Crank Webs ^{Mid. length breadth} 840^M ^{shrink} Thickness parallel to axis 310^M
^{All built} as fitted 505^M ^{Mid. length thickness} 310^M ^{shrink} Thickness around eye-hole 222.5^M
TURNING Wheel Shaft, diameter as per Rule As App. Intermediate Shafts, diameter as per Rule As App. Thrust Shaft, diameter at collar as per Rule As App.
as fitted 454^M as fitted 137/8" as fitted 454^M
Tube Shaft, diameter as per Rule As App. Screw Shaft, diameter as per Rule As App. Is the ^{turn} screw shaft fitted with a continuous liner YES
as fitted 15 1/2" as fitted 21/32"
Bronze Liners, thickness in way of bushes as per Rule 13/16" Thickness between bushes as per Rule 21/32" 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 ONE LENGTH
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 5'-5"
Propeller, dia. 17'-6" Pitch 13'-0" No. of blades 4 Material MANG BRONZE whether Moveable SOLID Total Developed Surface 92 sq. feet
Method of reversing Engines COMP. AIR Is a governor or other arrangement fitted to prevent racing of the engine when detached YES Means of lubrication FORCED
Thickness of cylinder liners 53^M Are the cylinders fitted with safety valves YES 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 ✓
Cooling Water Pumps, No. 1 S.W. & 1 F.W. WITH STAND 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. NONE Diameter ✓ Stroke ✓ Can one be overhauled while the other is at work ✓
Pumps connected to the Main Bilge Line { No. and Size 1 BILGE @ 80 T.P.H., 1 BALLAST @ 200 T.P.H., 1 G.S.P. @ 140 T.P.H.
How driven STEAM
Is the cooling water led to the bilges No If so, state what special arrangements are made to deal with this water in addition to the ordinary bilge pumping arrangements ✓
Ballast Pumps, No. and size 1 @ 200 T.P.H. ALSO G.S.P. @ 140 T.P.H. Power Driven Lubricating Oil Pumps, including Spare Pump, No. and size 1 ENG. DRIV. @ 80 T.P.H. 1 INDER @ 60 T.P.H. (SPARE) LINE
Are two independent means arranged for circulating water through the Oil Cooler YES Suctions, connected to Main Bilge Pumps and Auxiliary Bilge Pumps, No. and size:—In Machinery Spaces 2 @ 3 1/2", 2 @ 2 1/2" TUNNEL WELL - 1 @ 3 1/2" In Pump Room ✓
In Holds, &c. Nos. 1, 2 & 3 Holds - 1 @ 3" P. & S. IN EACH. DEEP TKS. (4) - 1 @ 2 1/2" IN EACH. Nos. 4 & 5 Holds - 1 @ 3" P. & S. IN EACH
Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size 1 @ 5" P., 1 @ 5" S.
Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes YES Are the Bilge Suctions in the Machinery Spaces led 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 YES
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 NONE How are they protected ✓
What 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 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. 2 No. of stages 2 Diameters 280^M x 245^M Stroke 130 Driven by STEAM
Auxiliary Air Compressors, No. ✓ No. of stages ✓ Diameters ✓ Stroke ✓ Driven by ✓
Small Auxiliary Air Compressors, No. ✓ No. of stages ✓ Diameters ✓ Stroke ✓ Driven by ✓
What provision is made for first Charging the Air Receivers COMPRESSORS ARE STEAM DRIVEN
Scavenging Air Pumps, No. ✓ Diameter ✓ Stroke ✓ Driven by ✓
Auxiliary Engines crank shafts, diameter as per Rule No OIL ENGINE AUXILIARIES No. 2 STEAM DRIVEN AUXILIARY Position DYNAMO SETS ON STARBO. SIDE
as fitted ✓ Is a report sent herewith ✓

4B 12784

AIR RECEIVERS: - Have they been made under survey **YES** State No. of Report or Certificate **199**
 Is each receiver, which can be isolated, fitted with a safety ~~disc~~ **Disc** 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**
Injection Air Receivers, No. Cubic capacity of each Internal diameter thickness
 Seamless, lap welded or riveted longitudinal joint Material Range of tensile strength Working pressure by Rules
Starting Air Receivers, No. **2** Total cubic capacity **2 x 450 C.F.T.** Internal diameter **6'-0 5/16"** thickness **1"** Actual
 Seamless, lap welded or riveted longitudinal joint **RIVETED** Material **S.M. STEEL** Range of tensile strength **28-32T/0"** Working pressure by Rules **364 LB/0"** Actual **356 LB/0"**

IS A DONKEY BOILER FITTED? **YES - 2** 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 **24/5/39** Receivers **14/8/39** Separate Fuel Tanks **20/2/40**
 (If not, state date of approval)
 Donkey Boilers **26/7/39, 20/11/39** General Pumping Arrangements **26/9/39** Pumping Arrangements in Machinery Space **28/11/39**
 Oil Fuel Burning Arrangements **26/1/40**

SPARE GEAR.

Has the spare gear required by the Rules been supplied **YES**
 State the principal additional spare gear supplied **SEE ATTACHED LIST**

HARLAND AND WOLFF, LIMITED
 The foregoing is a correct description.

A. J. Marshall Manufacturer.

Dates of Survey while building
 During progress of work in shops - **1939** Aug 4, 7, 8, 31 Sept 14 Oct 12, 23 Nov. 1, 4, 8, 10, 13, 20 Dec 1, 5, 15 **1940** Jan 1, 2, 9, 10, 11, 13, 15, 16, 22, 24, 26, 29 Feb. 2, 3, 5, 6, 7, 8, 9, 10, 21, 28 Mar 1, 4, 11, 13, 19, 22 Apr 1, 3, 4, 6, 9, 10, 12, 15, 14, 18, 20, 23, 25, 27, 29, 30 May 2, 3, 6, 7, 8, 9, 10, 11, 13, 14, 15, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31 June 1, 3, 4, 5, 6, 7, 10, 11, 12, 13, 15, 17, 18, 21, 22, 24, 25, 26 July 9, 11, 12, 15, 22, 26, 29, 30, 31 Aug. 1, 2, 5, 6, 8, 9, 12, 16, 19, 21, 22, 23, 27, 30 Sept. 3, 4, 6, 9, 10, 11, 13, 16, 21, 23, 26, 27, 30 Oct. 1, 2, 4
 Total No. of visits **7, 8, 11, 12, 14, 16, 17, 18, 21, 25, 24 = 150.**
Dates of Examination of principal parts - Cylinders **20-27/5/40** Covers **29-4-40** Pistons **21-24/5/40** Rods **6/6/40** Connecting rods **13-5-40**
 Crank shaft **25-4-40** Flywheel shaft Thrust shaft **6-5-40** Intermediate shafts **5/12/39-22/7/40** Tube shaft
 Screw shaft **11-4-40** Propeller **28-2-40** Stern tube **31-5-40** Engine seatings **31-5-40** Engines holding down bolts **10-9-40**
 Completion of fitting sea connections **5-6-40** Completion of pumping arrangements **21-10-40** Engines tried under working conditions **24-10-40**
 Crank shaft, Material **S.M. STEEL** Identification Mark **LLOYDS 299** Flywheel shaft, Material Identification Mark
 Thrust shaft, Material Identification Mark **LLOYDS 299** Intermediate shafts, Material **S.M. STEEL** Identification Marks **LLOYDS 337**
 Tube shaft, Material Identification Mark Screw shaft, Material **S.M. STEEL** Identification Mark **LLOYDS 337**
 Identification Marks on Air Receivers **BOTH MARKED No. 199**
LLOYD'S TEST
585 LB/0"
W.P. 356 LB/0"
G.J.T. 30-5-40

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**
 Description of fire extinguishing apparatus fitted **7-PORTABLE 2 GALLON FOAM TYPE AS APPROVED**
 Is the vessel (not being an oil tanker) fitted for carrying oil as cargo **YES** If so, have the requirements of the Rules been complied with **YES**
 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.) **This machinery has been constructed under Special Survey in accordance with the Rules and to approved plans. The materials and workmanship are good. The machinery has been efficiently installed on board the vessel and tried out at sea under full working conditions with satisfactory results. In our opinion the machinery of the vessel is eligible to receive the notation of + L.M.C. 10, 40, Oil Engines, C.L., 2 D.B. - 120 LB/0"**

The amount of Entry Fee .. £ **5** : - : When applied for, **6. 11. 19. 40.**
 Special £ **98** : **10** :
 Donkey Boiler Fee £ **10** : **12** :
 WASTE HEAT BOILER £ **7** : **13** :
 Travelling Expenses (if any) £ **8** : **8** :
 AIR RECEIVERS £ **8** : **8** :
 Committee's Minute **NOV 18 1940**

J. McFee *W. Lee James*
 Engineer Surveyor to Lloyd's Register of Shipping.



Assigned **10. 40 oil fuel**
2 DB-120 LB

Certificate (if required) to be sent to the Surveyors at the office of the Registrar of Shipping, London.