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Rpt. 4b.

REPORT ON OIL ENGINE MACHINERY.

No. 70230

JAN 1946

Received at London Office

Date of writing Report **7th July 45** When handed in at Local Office **15-12-45** Port of **GLASGOW.**
 No. in Survey held at **GLASGOW.** Date, First Survey **22-5-45** Last Survey **27th Nov., 1945.**
 Reg. Book. Number of Visits **24**

Single **on the Tonnage** Triple **on the Tonnage** Quadruple **on the Tonnage** Screw vessel **"EMPIRE GROSVENOR"** Tons Gross **890** Net **370**

Built at **GLASGOW.** By whom built **A. & J. INGLIS LTD.** Yard No. **1302** When built **1945.**
 Engines made at **GLASGOW.** By whom made **BRITISH POLAR ENGINES, LTD.** Engine No. **574** When made **1945.**
 Donkey Boilers made at **CARFIN** By whom made **ALEX. ANDERSON & SONS LTD.** Boiler No. **3873/4** When made **1945.**
 Brake Horse Power **640** Owners **MINISTRY OF WAR TRANSPORT.** Port belonging to **GLASGOW.**
 Nom. Horse Power as per Rule **125** Is Refrigerating Machinery fitted for cargo purposes **NO** Is Electric Light fitted **YES**
 Trade for which vessel is intended **INTERNATIONAL.**

TYPE OF ENGINES, &c. Type of Engines **Heavy Oil M. 44M** 2 or 4 stroke cycle **2** Single or double acting **Single**
 Maximum pressure in cylinders **782 lbs/sq.in.** Diameter of cylinders **340 m/m** Length of stroke **570 m/m** No. of cylinders **4** No. of cranks **4**
 Mean Indicated Pressure **96 lbs/sq.in.** Span of bearings, adjacent to the Crank, measured from inner edge to inner edge **484 m/m** Is there a bearing between each crank **Yes**
 Revolutions per minute **250** Flywheel dia. **1550 m/m** Weight **4400 lbs.** Means of ignition **Compression** Kind of fuel used **Diesel**
 Crank Shaft, { Solid forged **211 m/m** as per Rule **211 m/m** as fitted **220 m/m** Crank pin dia. **220 m/m** Webs Mid. length breadth **308 m/m** Thickness parallel to axis **-**
 Flywheel Shaft, diameter as per Rule **-** as fitted **-** Intermediate Shafts, diameter as per Rule **137.7 m/m** as fitted **9 3/4"** Thrust Shaft, diameter at collars as per Rule **144 m/m** as fitted **260 m/m**
 Tube Shaft, diameter as per Rule **-** as fitted **-** Screw Shaft, diameter as per Rule **App.** as fitted **8 3/4"** Is the { tube { screw } shaft fitted with a continuous liner { **No.**

Bronze Liners, thickness in way of bushes as per Rule **-** as fitted **-** Thickness between bushes as per Rule **-** as fitted **-** Is the after end of the liner made watertight in the propeller boss **-**
 If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner **-**
 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 **-**
 Propeller, dia. **7'6"** Pitch **4'4 1/2"** No. of blades **4** Material **Br.** whether Moveable **No** Total Developed Surface **20.2** sq. feet
 Method of reversing Engines **Direct** Is a governor or other arrangement fitted to prevent racing of the engine **Yes** Means of lubrication **forced**
 Thickness of cylinder liners **25.5 m/m** Are the cylinders fitted with safety valves **Yes** 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 **-**
 Cooling Water Pumps, No. **One-90 m/m x 140 m/m** 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. **One** Diameter **90 m/m** Stroke **140 m/m** Can one be overhauled while the other is at work **-**
 Pumps connected to the Main Bilge Line { No. and Size **1 M.E. 90 m/m & 140 m/m. 1 G.S. 20 tons/hr. 1-Ballast 40 tons/hr.**
 How driven **M.E.** **St. Ford. Aux. Vert. Cent. Elect.**
 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 **1-40T/hr. 1-20T/hr** Power Driven Lubricating Oil Pumps, including Spare Pump, No. and size **1 off 3100 gallons per hour.**
 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 Machinery Spaces **3-2 1/2"** In Pump Room **1-3"**
 In Holds, &c. Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size **1-3" 1-2 1/2"**
 Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes **Yes** Are the Bilge Suctions in the Machinery Spaces **Yes**
 Are they fitted with Valves or Cocks **Valves.**
 Are all Sea Connections fitted direct on the skin of the ship **Yes** Are they fitted with Valves or Cocks **Valves.**
 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 **Below.**
 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 **-** Have they been tested as per Rule **Yes.**
 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 **-** 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 **-**
 Main Air Compressors, No. **One** No. of stages **2** Diameters **175 m/m & 350 m/m** Driven by **Main Engines**
 Auxiliary Air Compressors, No. **-** No. of stages **-** Diameters **-** Stroke **-** Driven by **-**
 Small Auxiliary Air Compressors, No. **One** No. of stages **26 cu. ft./min @ 350 lbs/sq. in.** Diameters **-** Stroke **-** Driven by **P. Aux. Engine.**
 What provision is made for first Charging the Air Receivers **Small aux. compressor above.**
 Scavenging Air Pumps, No. **One** Diameter **770 m/m** Stroke **350 m/m** Driven by **Main Engine.**
 Auxiliary Engines crank shafts, diameter as per Rule **2 1/2 & 3 1/2"** No. **1-18 Kw. 1-25 Kw. 1-6 1/2 Kw.** Position **Port St. Aft. St. Ford.**
 as fitted **2 1/2 & 3 1/2"** Is a report sent herewith **Yes**
 Have the Auxiliary Engines been constructed under special survey **Yes.**

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002656-008668-0213

AIR RECEIVERS:—Have they been made under survey **Yes** State No. of Report or Certificate **No. 55233.**

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 and cleaned **Yes**

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

Injection Air Receivers, No. **None**

Cubic capacity of each **-**

Internal diameter **-**

thickness **-**

Seamless, lap welded or riveted longitudinal joint **-**

Material **-**

Range of tensile strength **-**

Working pressure **-**

Starting Air Receivers, No. **Two**

Total cubic capacity **1600 litres**

Internal diameter **650 m/m**

thickness **14 m/m**

Seamless, lap welded or riveted longitudinal joint **riveted**

Material **Steel**

Range of tensile strength **ends 26/30 tons**

Working pressure **355 lbs**

Actual **355 lbs**

IS A DONKEY BOILER FITTED? **-**

If so, is a report now forwarded? **-**

Is the donkey boiler intended to be used for domestic purposes only **-**

PLANS. Are approved plans forwarded herewith for Shafting **Thrust 12-2-37**

(If not, state date of approval)

2-12-35

Receivers **25-6-34**

20-7-34

Separate Fuel Tanks **-**

Donkey Boilers **-**

General Pumping Arrangements **-**

Pumping Arrangements in Machinery Space **-**

Oil Fuel Burning Arrangements **-**

SPARE GEAR.

Has the spare gear required by the Rules been supplied **Yes**

State the principal additional spare gear supplied **As per attached list.**

The foregoing is a correct description,

Manufacturer.

Dates of Survey while building

During progress of work in shops--

During erection on board vessel--

Total No. of visits **24**

1945 May 22 Jun 19. 21. 28 29 Jul 6. 11. 18. 23. 31 Aug 7. 20 Sep 19 Oct 4. 15. 22. 28 Nov 2. 12. 14. 19. 26 17

Dates of Examination of principal parts—Cylinders **21-6-45.** Covers **25-6-45.** Pistons **21-6-45** Rods **21-6-45** Connecting rods **21-6-45**

Crank shaft **22-5-45.** Flywheel shaft **22-5-45.** Thrust shaft **22-5-45.** Intermediate shafts **18:7:45.** Tube shaft **-**

Screw shaft **18:7:45** Propeller **18:7:45** Stern tube **18:7:45** Engine seatings **11:7:45** Engines holding down bolts **19:9:45**

Completion of fitting sea connections **11:7:45** Completion of pumping arrangements **27:11:45** Engines tried under working conditions **27:11:45**

Crank shaft, Material **Steel** Identification Mark **No. 3116 F.H. 11-1-45.** Flywheel shaft, Material Identification Mark

Thrust shaft, Material **Steel** Identification Mark **No. 642 T.T. 4158** Intermediate shafts, Material **SM steel** Identification Marks **LLDS. 9310.**

Tube shaft, Material Identification Mark Screw shaft, Material **S.M. steel** Identification Mark **LLDS. 9309.**

Identification Marks on Air Receivers **No. 55233**

LLOYD'S TEST

555 lbs.

W.P. 355 lbs.

P.W. 17-3-45.

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**

Is the vessel (not being an oil tanker) fitted for carrying oil as cargo **-** If so, have the requirements of the Rules been complied with **-**

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 **Yes** If so, state name of vessel **M.V. "EMPIRE BELGRAVE" Glasgow**

Report No: **69670**

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

This engine has been built under special survey in accordance with the Rules and approved plans, and the specification.

The materials and workmanship are good. On completion it has been tried on the bench at full power with satisfactory results. (Torsional Vibration Characteristics proved satisfactory on Sister Vessel.)

This machinery has been securely fitted on board the vessel and tried under working conditions and found satisfactory and is eligible in our opinion to be classed with record

-I.L.M.C. 11,45 and notation 2 D.B. 180 lbs, subject to the torsional vibration characteristics of the Auxiliary generator engines proving satisfactory.

Note:- The torsional vibration characteristics of the auxiliary generator engines have not yet been submitted for approval in accordance with circular No. 1803. Generator Engines

made by Messrs. **Davy Paxman & Russell Newbury & Co. Ltd., IPSWICH & MANCHESTER. Reports Attached.**

The amount of Entry Fee **£ 3 : 0 : 0** When applied for,

Special **£ 31 : 5 : 0** **19/14 1945**

Specification. **£ 7 : 16 : 3** When received,

Donkey Boiler Fee **£ :**

Travelling Expenses (if any) **£ :**

Committee's Minute **GLASGOW 28 DEC 1945**

Assigned **-/- LMC 11.45**

2 AB 180lb.

Thos. P. Gibbeson & J. R. Dale
Engineer Surveyor to Lloyd's Register of Shipping.



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