

REPORT ON OIL ENGINE MACHINERY.

Received at London Office -3 JUL 1941

Date of writing Report 23rd JUNE 1941. When handed in at Local Office 27th JUNE 1941. Port of GREENOCK

No. in Survey held at GREENOCK Date, First Survey 8th OCTOBER 1940. Last Survey 20th JUNE 1941.

Reg. Book. 90954 on the Empire Spring Single Triple Quadruple Screw vessel

EMPIRE SPRING

Tons Gross 6946.46. Net 4114.30.

Built at PORT GLASGOW By whom built LITHGOWS LTD Yard No. 944 When built 1941

Engines made at GREENOCK By whom made JOHN G. KINCAID & CO LTD Engine No. 1141 When made 1941

Donkey Boilers made at GREENOCK By whom made JOHN G. KINCAID & CO LTD Boiler No. 1141 When made 1941

Brake Horse Power 3300 Owners MINISTRY OF SHIPPING Port belonging to GREENOCK.

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.

OIL ENGINES, &c.—Type of Engines Diesel Overhead injection Buchi Sup. 2 or 4 stroke cycle 4 Single or double acting Single

Maximum pressure in cylinders 650 lb. Diameter of cylinders 740.7 Length of stroke 1500.7 No. of cylinders 6 No. of cranks 6

Mean Indicated Pressure 8.725 kg/cm² Span of bearings, adjacent to the Crank, measured from inner edge to inner edge 1022.7 Is there a bearing between each crank YES

Revolutions per minute 110 Flywheel dia. 2489.7 Weight 2.5 tons Means of ignition Compression Kind of fuel used Diesel Oil

Crank Shaft, Solid forged dia. of journals as per Rule 505.7 Crank pin dia. 505.7 Crank Webs Mid. length breadth 840.7 Thickness parallel to axis 310.7 All built as fitted 505.7 Mid. length thickness 310.7 shrunk Thickness around eye hole 222.5.7

Flywheel Shaft, diameter as per Rule Intermediate Shafts, diameter as per Rule 13.287" Thrust Shaft, diameter at collars as per Rule 13.95" as fitted 13.375" as fitted 14."

Tube Shaft, diameter as per Rule Screw Shaft, diameter as per Rule 14.620" Is the tube screw shaft fitted with a continuous liner YES as fitted 14.875" as fitted 14.875"

Bronze Liners, thickness in way of bushes as per Rule .745" Thickness between bushes as per Rule .559" as fitted .75" as fitted .5625" 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 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 Is an approved Oil Gland or other appliance fitted at the after end of the tube shaft NO

Propeller, dia. 16'-0" Pitch 12'-0" No. of blades 4 Material Bronze whether Moveable NO Total Developed Surface 94 sq. feet

Method of reversing Engines Compressed Air Is a governor or other arrangement fitted to prevent racing of the engine when declutched YES Means of lubrication Forced Thickness of cylinder liners 53.7 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 YES

Cooling Water Pumps, No. Two One main engine 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 YES

Pumps connected to the Main Bilge Line No. and Size One 100 tons/hr One 170 tons/hr How driven Steam 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 YES

Ballast Pumps, No. and size One 170 tons/hr Power Driven Lubricating Oil Pumps, including Spare Pump, No. and size Two 1 Main engine 10"x10" Two Steam 10"x10"x10"

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 Two @ 3" 3 @ 2 1/2" Tunnel well 1-2 1/2" In Pump Room YES

In Holds, &c. Forepeak 1-3" N1. 2 @ 3" N2. 2 @ 3 1/2" N3. 2 @ 3" N4. 2 @ 3" Deep tank 2 @ 2 1/2" Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size Two @ 5"

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 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 YES

What pipes pass through the deep tanks Bilge pipes to fore holds 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 YES Is it fitted with a watertight door NO worked from YES

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

Main Air Compressors, No. One No. of stages two Diameters 11 1/4" & 4 3/4" Stroke 8" Driven by Steam YES

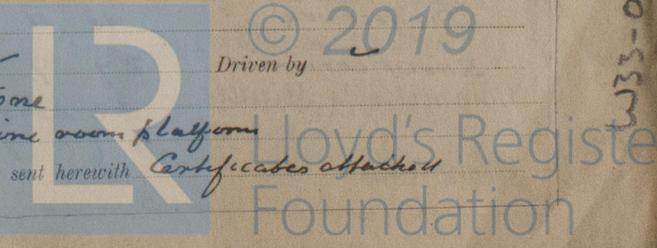
Auxiliary Air Compressors, No. No. of stages Diameters Stroke Driven by YES

Small Auxiliary Air Compressors, No. No. of stages Diameters Stroke Driven by YES

What provision is made for first Charging the Air Receivers Steam air compressor

Scavenging Air Pumps, No. Diameter Stroke Driven by YES

Auxiliary Engines crank shafts, diameter as per Rule ENGINE N° 1837, SHEFFIELD CER N° No. One as fitted COMP N° 65876 IPSWICH CER N° C4154 Position Engine room platform Is a report sent herewith Certificates attached



W33-0049

AIR RECEIVERS:—Have they been made under survey Yes State No. of Report or Certificate 110
 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. 1 Cubic capacity of each 1 Internal diameter 1 thickness 1
 Seamless, lap welded or riveted longitudinal joint ✓ Material ✓ Range of tensile strength ✓ Working pressure ✓
Starting Air Receivers, No. One Total cubic capacity 750 cu ft. Internal diameter 6'-4" thickness 1/32" & 1/16"
 Seamless, lap welded or riveted longitudinal joint TR. 203 Material S Range of tensile strength 29/33 Working pressure 365 lb
 Actual 356 lb

IS A DONKEY BOILER FITTED? Yes 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 2-1-40 Receivers 30-1-40 Separate Fuel Tanks 12-3-41
 (If not, state date of approval)
 Donkey Boilers 22-1-40 General Pumping Arrangements 12-2-40 Pumping Arrangements in Machinery Space 8-3-40
 Oil Fuel Burning Arrangements 28-5-40

SPARE GEAR.

Has the spare gear required by the Rules been supplied
 State the principal additional spare gear supplied

See separate list attached!

The foregoing is a correct description,
 For JOHN G. KINCAID & CO. LIMITED.

W. Cantor Director, Manufacturer.

Dates of Survey while building
 During progress of work in shops-- (1940) Oct. 8-11-22-25-29. Nov. 1-7-26-28. Dec. 4-9-19-24-30 (1941) Jan. 13-16-21-22-24. Feb. 3-5-6-7-12-19-21-28.
 During erection on board vessel-- MAR. 4-5-6-14-17-20-31. APR. 2-4-9-15-16-17-18-19-21-22-25-26-29. MAY 1-13-14-20-24-28. JUNE 2-9-12-16-18
 Total No. of visits 59

Dates of Examination of principal parts—Cylinders 7-19 Feb 41 Covers 7-9 Feb 41 Pistons 20-3-41 Rods 1-5-41 Connecting rods 1-5-41
 Crank shaft 1-5-41 Flywheel shaft ✓ Thrust shaft 21-2-41 Intermediate shafts 21-2-41 Tube shaft ✓
 Screw shaft 6-3-41 Propeller 6-3-41 Stern tube 19-12-41 Engine seatings 17-3-41 Engines holding down bolts 9-6-41
 Completion of fitting sea connections 21-2-41 Completion of pumping arrangements 20-6-41 Engines tried under working conditions 20-6-41
 Crank shaft, Material S Identification Mark 9588 CNH Flywheel shaft, Material ✓ Identification Mark ✓
 Thrust shaft, Material S Identification Mark 9588 CNH Intermediate shafts, Material S Identification Marks 9588 CNH
 Tube shaft, Material ✓ Identification Mark ✓ Screw shaft, Material S Identification Mark 9588 CNH
 Identification Marks on Air Receivers N° 1663
LL0408 TEST
556 lb
W.R. 356 lb
C.N.H. 12-2-41

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 No 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 EMPIRE RAINBOW GRK R² NO 21433
Empire Comet

General Remarks (State quality of workmanship, opinions as to class, &c.) These engines have been built under special supervision in accordance with the Rules & approved plans. The materials & workmanship are sound & good. The machinery has been efficiently installed on board & tested under full working conditions on a short sea trial with satisfactory results.
This machinery is eligible in my opinion to be Classed in the Society's Register Book with Record
+ LMC 6-41 and Notation Screw Shaft (L. 20B150 lb)
The plans and specifications have been supervised and a copy of the report issued is enclosed herewith

The amount of Entry Fee .. £ 5 : 0 : When applied for,
 Special £ 98 : 10 : 25th JUNE 1941.
 Donkey Boiler Fee £ 15 : 0 : When received,
 AIR RECEIVER £ 4 : 4 : 27th JUNE 1941.
 Travelling Expenses (if any) £
 SPECIFICATION 29 9.
 Committee's Minute **GLASGOW 1 JUL 1941**

Charles J. Hunter
 Engineer Surveyor to Lloyd's Register of Shipping.



Assigned 1-1-41 air log
20B150 lb

GLASGOW

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

For S.S.O.F. see