

# REPORT ON OIL ENGINE MACHINERY.

No 13111

Received at London Office

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Date of writing Report 20. 11. 1941 When handed in at Local Office Port of Belfast  
 No. in Survey held at Belfast Date, First Survey 24. Sept. 1940 Last Survey 12 November 1941  
 Reg. Book. Number of Visits 157  
 on the Triple Screw vessel **EMPIRE DIAMOND** Tons Gross 8235.6 Net 4793.9  
 Built at Belfast By whom built Harland & Wolff Ltd Yard No. 1053 When built 1941  
 Engines made at Belfast By whom made Harland & Wolff Ltd Engine No. 1053 When made 1941  
 Donkey Boilers made at Belfast By whom made Harland & Wolff Ltd Boiler No. 1053/95 When made 1941  
 Brake Horse Power 3500 Owners Ministry of War Transport Port belonging to Belfast.  
 Nom. Horse Power as per Rule 502 Is Refrigerating Machinery fitted for cargo purposes no Is Electric Light fitted yes  
 Trade for which vessel is intended Carrying Petroleum in Bulk.

**IL ENGINES, &c.**—Type of Engines Harland 3 + 4 Airless Injection or 4 stroke cycle + Single or double acting Single  
 Maximum pressure in cylinders 700 lbs sq. in. Diameter of cylinders 650 7/8 Length of stroke 1400 7/8 No. of cylinders 8 No. of cranks 8  
 Mean Indicated Pressure 135 lbs sq. in. Span of bearings, adjacent to the Crank, measured from inner edge to inner edge 84 1/2 Is there a bearing between each crank yes  
 Revolutions per minute 120 Flywheel dia. 2218.5 7/8 Weight 2150 kgs Means of ignition Compression Kind of fuel used Diesel oil  
 Crank Shaft, { Solid forged dia. of journals as per Rule 460 7/8 as fitted Crank pin dia. 460 7/8 Crank Webs Mid. length breadth 800 7/8 Mid. length thickness 267 7/8 Thickness parallel to axis 267 Thickness around eye-hole 205  
 Flywheel Shaft, diameter as per Rule as fitted Intermediate Shafts, diameter as per Rule 19 as fitted Thrust Shaft, diameter at collars as per Rule 18 1/4 as fitted  
 Tube Shaft, diameter as per Rule as fitted Screw Shaft, diameter as per Rule 18 as fitted Is the screw shaft fitted with a continuous liner yes  
 Bronze Liners, thickness in way of bushes as per Rule 7/8 Thickness between bushes as per Rule 3/4 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. 15' 6" Pitch 12' 0" No. of blades 4 Material Bronze whether Moveable Fixed Total Developed Surface 75 sq. feet  
 Method of reversing Engines 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 48 7/8 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. 2 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. 2 Stroke Rotary Can one be overhauled while the other is at work yes  
 Pumps connected to the Main Bilge Line No. and Size 4, 2 @ 32 tons hr; 1 @ 80 tons hr; 1 @ 200 tons hr How driven main engine; Steam driven  
 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 tons hr Power Driven Lubricating Oil Pumps, including Spare Pump, No. and size 2 1 Main Eng. 40 tons hr 1 INDEPT 40 " "  
 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 5 3 @ 3 1/2 dia 2 @ 2 1/2 dia In Pump Rooms 2 @ 4 dia  
 In Holds, &c. Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size 2 @ 6 " 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 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 How are they protected  
 What pipes pass through the deep tanks 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 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. No. of stages Diameters Stroke Driven by  
 Auxiliary Air Compressors, No. 2 No. of stages 2 Diameters 245/280 7/8 Stroke 130 7/8 Driven by Steam Engine  
 Small Auxiliary Air Compressors, No. No. of stages Diameters Stroke Driven by  
 What provision is made for first Charging the Air Receivers as above  
 Scavenging Air Pumps, No. Diameter Stroke Driven by  
 Auxiliary Engines crank shafts, diameter as per Rule as fitted Position  
 Have the Auxiliary Engines been constructed under special survey Is a report sent herewith



25  
12  
19  
22  
6  
8

**AIR RECEIVERS:** - Have they been made under survey...

State No. of Report or Certificate

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*

**MANOEUVRING**

MANOEUVRING Air Receivers, No. *2*

Cubic capacity of each *400 cu ft*

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

Internal diameter *5' 1 7/32"* thickness *55/64"*

Seamless, lap welded or riveted longitudinal joint *Riveted*

Material *Steel*

Range of tensile strength *28/32 Lbs* Working pressure *360 lbs sq*

Actual *356 lbs sq*

Starting Air Receivers, No. *✓*

Total cubic capacity *✓*

Internal diameter *✓*

thickness *✓*

Seamless, lap welded or riveted longitudinal joint *✓*

Material *✓*

Range of tensile strength *✓*

Working pressure *by Rules ✓*

Actual *✓*

**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*

*Steam Auxiliaries, Fire Extinguishing & Heating coils.*

**PLANS.**

Are approved plans forwarded herewith for Shafting *29/4/39*

Receivers *14/12/39*

Separate Fuel Tanks *✓*

Donkey Boilers *22/2/40*

General Pumping Arrangements *20/5/40*

Pumping Arrangements in Machinery Space *30/4/40*

Oil Fuel Burning Arrangements *4/12/40*

**SPARE GEAR.**

Has the spare gear required by the Rules been supplied *yes.*

*See attached list*

State the principal additional spare gear supplied

The foregoing is a correct description.

*W. Manhall*  
Manufacturer.

Dates of Survey while building	During progress of work in shops -	1940 Sept. 24 Oct 23, 25 Nov. 6, 14, 26, 28, 29 Dec 3, 5, 10, 13, 16, 17, 23, 30	1941 Jan 1, 2, 7, 8, 24, 27, 29, 30, 31 Feb. 5, 6, 7, 8, 10, 11, 12
	During erection on board vessel -	14, 17, 19, 24, 26, 28, Mar 1, 3, 4, 14, 18, 21, 24, 25 Apr 2, 4, 5, 7, 8, 9, 10, 11, 14, 15, 19, 23, 24, 30 May 1, 2, 19, 23, 24, 31 June 2, 3, 6, 7	1, 2, 3, 4, 5, 9, 10, 11, 17, 18, 21, 22, 25, 29, 30 Aug. 1, 5, 7, 12, 13, 22, 23
	Total No. of visits	Nov. 1, 3, 4, 5, 6, 7, 8, 10, 11, 12 = 157	

Dates of Examination of principal parts - Cylinders	9.7.41	18.7.41	Covers	3.6.41	29.7.41	Pistons	7.6.41	5.9.41	Rods	10.6.41	Connecting rods	14.6.41	27.6.41
Crank shaft	2.4.41	10.4.41	Flywheel shaft	✓	Thrust shaft	19.5.41	Intermediate shafts	24.5.41	Tube shaft	✓			
Screw shaft	31.3.41	Propeller	4.4.41	Stern tube	5/7/41	Engine seatings	3/7/41	Engines holding down bolts	13/10/41				
Completion of fitting sea connections	3/7/41	Completion of pumping arrangements	10/11/41	Engines tried under working conditions	12/11/41								
Crank shaft, Material	SM Steel	Identification Mark	1028	Flywheel shaft, Material	✓	Identification Mark	✓						
Thrust shaft, Material	SM Steel	Identification Mark	1028	Intermediate shafts, Material	SM Steel	Identification Marks	440YDS						
Tube shaft, Material	✓	Identification Mark	✓	Screw shaft, Material	SM Steel	Identification Mark	342						

NO 213.  
LLOYDS TEST  
556 lbs sq  
WP. 356 lbs sq  
G.T. 19.4.41  
RETEST 23.6.41

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.*

Description of fire extinguishing apparatus fitted *Steam, Potable Chemical Extinguishers*

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 *"DERWENTDALE" yard # 1052.*

**General Remarks** (State quality of workmanship, opinions as to class, &c. *This machinery has been constructed under special survey in accordance with the Society's Rules and the approved plan. The materials and workmanship are good.*

*The machinery has been efficiently installed on board the vessel and tried under full working conditions during sea trials with satisfactory results and is eligible in our opinion to have notation in the Register Book of +LMC 11.41, 2DB 150 lbs sq TS CL. Oil Engine.*

The amount of Entry Fee	.. £ 6 : -	When applied for,	
Special	... .. £/00 : 2	20. 11. 19	41
Donkey Boiler Fee	... .. £ 8 : 8	When received,	
AIR RECEIVERS	... .. £		
Travelling Expenses (if any)	£		19.

Committee's Minute *TUE. 2 DEC 1941*  
*+ LMC 11.41*  
*2 DB - 150 lbs oil Eng. Co.*

*L Shaw & R Lee Jones*  
Engineer Surveyors to Lloyd's Register of Shipping.



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