

REPORT ON OIL ENGINE MACHINERY.

No 13212

Received at London Office 16 APR 1942

Date of writing Report

19

When handed in at Local Office

13. 4.

1st Port of

Belfast.

No. in Survey held at
Reg. Book.

Belfast.

Date, First Survey 11 Dec. 1939 Last Survey 1st Apr. 1942

Number of Visits 311

on the ~~Single~~
~~Twin~~
~~Triple~~
~~Quadruple~~
Screw vessel"EMPIRE GRACE"Tons Gross 13477.9
Net 9440.5

Built at Belfast.

By whom built Harland & Wolff Ltd.

Yard No. 1051 When built 1942

Engines made at Belfast.

By whom made Harland & Wolff Ltd.

Engine No. 1051 When made 1942

Donkey Boilers made at Belfast.

By whom made Harland & Wolff Ltd.

Boiler No. 1147 When made 1941

Brake Horse Power 6625 x 2 max

Owners Ministry of War Transport

Port belonging to Belfast.

Nom. Horse Power as per Rule 2465

Is Refrigerating Machinery fitted for cargo purposes

yes

Is Electric Light fitted

yes

Trade for which vessel is intended

Ocean going

OIL ENGINES, &c.—Type of Engines Harland B.W. Airless Injection 2 or 4 stroke cycle 2 Single or double acting Double

Maximum pressure in cylinders 700 lbs/sq. in. 24 1/2 Diameter of cylinders 620 7/8 Length of stroke 1400 7/8 No. of cylinders 6 x 2 No. of cranks 6 x 2

Mean Indicated Pressure 100 lbs/sq. in. Span of bearings, adjacent to the Crank, measured from inner edge to inner edge 116 1/4 7/8 Is there a bearing between each crank yes.

Revolutions per minute 115 max. Flywheel dia. 2483 7/8 Weight 2500 Kgs Means of ignition Compression Kind of fuel used Diesel oil.

Crank Shaft, ~~as per Rule~~ as fitted 485 7/8 Cast Mid. length breadth 1040 7/8 Thickness parallel to axis 250 7/8
All built as fitted 485 7/8 Crank pin dia. 485 7/8 Crank Webs Mid. length thickness 250 7/8 Thickness around eyehole 272.5 7/8Flywheel Shaft, diameter as per Rule as fitted Intermediate Shafts, diameter as per Rule as fitted 17 1/4 (see over) Thrust Shaft, diameter at collars as per Rule 429.5 7/8
as fitted as fitted 460 7/8

Tube Shaft, diameter as per Rule as fitted Screw Shaft, diameter as per Rule as fitted 19 1/4 Is the screw shaft fitted with a continuous liner yes

Bronze Liners, thickness in way of bushes as per Rule as fitted 1 1/2 approved Thickness between bushes as per Rule as fitted 27/32 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

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 6' 9"

Propeller, dia. 17' 9" Pitch 18' 9" No. of blades 3 Material Bronze whether Moveable Solid Total Developed Surface 78.5 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 42 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

Cooling Water Pumps, No. 7 2 3 1/2 1 1/2 1 1/2 Is the sea suction provided with an efficient strainer which can be cleared within the vessel yes

Large Pumps worked from the Main Engines, No. Diameter Stroke Can one be overhauled while the other is at work

Pumps connected to the Main Bilge Line No. and Size 3, 2 @ 120 tons/hr 1 @ 200 tons/hr How driven Electrically.

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 Blast Pumps, No. and size 1 @ 200 tons/hr Power Driven Lubricating Oil Pumps, including Spare Pump, No. and size 3 @ 280 tons/hr

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 2 @ 2", 4 @ 3 1/2", 2 @ 5", 1 @ 6" in Tunnel 1 @ 3 1/2" In Pump Room

Holds, &c. Nos. 1, 2, 3, 4 & 5 holds 2 @ 3 1/2" No. 6 2 @ 3"

Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size 3 2 @ 5" 1 @ 6"

all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes yes Are the Bilge Suctions in the Machinery Spaces

from easily accessible mud-boxes, placed above the level of the working floor, with straight tail pipes to the bilges yes

all Sea Connections fitted direct on the skin of the ship yes Are they fitted with Valves or Cocks valves

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 both

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

pipes pass through the bunkers none How are they protected

pipes pass through the deep tanks Have they been tested as per Rule

all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times yes

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

department to another yes Is the Shaft Tunnel watertight yes Is it fitted with a watertight door no 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. 2 No. of stages 2 Diameters 350/400 7/8 Stroke 260 7/8 Driven by Electrically

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

Small Auxiliary Air Compressors, No. 1 No. of stages 2 Diameters 88/100 7/8 Stroke 80 7/8 Driven by Steam engine

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

Scavenging Air Pumps, No. 4 3 1/2 3 M³ Capacity each at 115 Rph of main engine

Auxiliary Engines crank shafts, diameter as per Rule as approved journals 280 7/8 pins 220 7/8

Have the Auxiliary Engines been constructed under special survey yes Is a report sent herewith yes

AIR RECEIVERS: — Have they been made under survey

Is each receiver, which can be isolated, fitted with a safety valve as per Rule

Can the internal surfaces of the receivers be examined and cleaned

MAIN STARTING Air Receivers, No. 2

Cubic capacity of each

800 cu ft

Internal diameter 6' 4 1/8"

thickness 1 1/16"

Seamless, lap welded or riveted longitudinal joint

Riveted

Material

Steel

Range of tensile strength 28/32 tons

Working pressure by Rules

Actual 356/650

AUX Starting Air Receivers, No. 2

Total cubic capacity

360 litres

Internal diameter 2' 0 1/16"

thickness 1/2"

Seamless, lap welded or riveted longitudinal joint

welded

Material

Steel

Range of tensile strength 28/32 tons

Working pressure by Rules

Actual 356/650

IS A DONKEY BOILER FITTED? (2) yes

If so, is a report now forwarded?

yes

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

whistle, fire extinguishing, steam heating coils

PLANS. Are approved plans forwarded herewith for Shafting

(If not, state date of approval)

Receivers

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 As per attached list

State the principal additional spare gear supplied

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
1939 Dec. 11	7. 8. 11. 19. 21. 23. 24. 25. 28. 29. 31. Nov. 4. 5. 8. 9. 11. 13. 15. 20. 22. 27	1. 2. 3. 4. 5. 7. 8. 9. 10. 11. 15. 22. 23. 24. 26. 28. 29. 30	7. 8. 9. 12. 13. 14. 15. 18. 19. 20. 21. 22. 23. 25. 26. 28. 29
	3. 6. 7. 8. 15. 21. 22. 23. 24. 26. 28. 29. 31	1. 2. 3. 4. 5. 7. 8. 9. 10. 11. 15. 22. 23. 24. 26. 28. 29. 30	7. 8. 9. 12. 13. 14. 15. 18. 19. 20. 21. 22. 23. 25. 26. 28. 29
	3. 6. 7. 8. 15. 21. 22. 23. 24. 26. 28. 29. 31	1. 2. 3. 4. 5. 7. 8. 9. 10. 11. 15. 22. 23. 24. 26. 28. 29. 30	7. 8. 9. 12. 13. 14. 15. 18. 19. 20. 21. 22. 23. 25. 26. 28. 29

Dates of Examination of principal parts	Cylinders	20/8-13/0/41	Covers	25/4/41	Pistons	29/7-13/12/41	Rods	11/7-11/41	Connecting rods	1/8-19/9/41
Crank shafts	3/6/41									
Screw shafts	17/2/41	6. 3. 4. 16. 35	Propellers	11-12/6/41	Stern tubes	10/6/41	Engine seatings	6/10/41	Engines holding down bolts	16. 1. 4. 2
Completion of fitting sea connections	22/8/41		Completion of pumping arrangements	24/3/42						
Crank shaft, Material	S.M. Steel		Identification Mark	1037 RLA	Flywheel shaft, Material					
Thrust shaft, Material	S.M. Steel		Identification Mark	1037 RLA	Intermediate shafts, Material	S.M. Steel				
Tube shaft, Material			Identification Mark		Screw shaft, Material	S.M. Steel				
Identification Marks on Air Receivers	MAIN				AUX	Nº 210 E.				

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 and CO2 + Chemical as approved

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 HOPE" (1050)

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 plans. 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 4-42 2DB 100 lbs. TS. CL. Oil Engines.

Intermediate shafts. Several lengths of shafting were distorted due to enemy action, these were returned to Messrs Girth & Brown Ltd. after heat treating & fairing the shafts were machined to the following diameters PORT Nº 2 17 3/16; Nº 3 17; Nº 4 17 1/16; Nº 5 17 1/8; Nº 6 17 3/16; STD Nº 2 17 1/8; Nº 3 17 1/8; Nº 6 17 1/8. Rule size 15.70" L.F.

The amount of Entry Fee	£ 6 : -	When applied for,
Special	£ 61 : 11 : 6	14. 4. 1942
Donkey Boiler Fee	£ 8 : 8	When received,
AIR RECEIVERS	£ 8 : 8	
Travelling Expenses (if any)	£ 44 : 11	
Committee's Minute		
Assigned		

Shaw. R. Lee. Engineer Surveyors to Lloyd's Register of Shipping.



HB

11/11/11 Man hull

Manufacturer.

July 10. 11. 12. 13. 15. 19. 21. 22 Aug. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31

^M 24. 25. 26. 30. Oct. 1. 2. 3. 4. 6. 8. 9. 10. 11. 13. 14. 15. 16. 22. 24. 27. 28. 29. 30. 31. Nov. 1. 3. 4. 5. 10. 12. 13. 14. 17.
 18. 19. 20. 24. 25. 26. 27. Dec. 2. 3. 5. 8. 11. 12. 17. 18. 19. 22. 24. 29. ¹⁹⁴² Jan. 2. 3. 5. 8. 9. 12. 14. 15. 16. 20. 21. 22. 23. 26.
 29. 30 Feb. 3. 4. 9. 10. 11. 12. 16. 17. 18. 19. 23. 25. 26. 28. Mar. 1. 2. 3. 4. 5. 6. 10. 11. 12. 14. 16. 17. 19. 23. 24. 25.
 26. 27. 29. 30. 31 April. 1. = 311

 Completion of fitting sea connections 22/8/41
 C.A.S.K. 0

 Completion of pumping arrangements 24/8/41
 LLOYDS LLOYDS

1037 RLA Flue wheel shaft. Material ✓

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