

Rpt. 4b

21 MAY 1958

LIVERPOOL

A3

Date of writing report Received London Port No. 149260
Survey held at No. of visits In shops 36 First date 9/9/57 Last date 12/2/58
On vessel

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. Name HEATH COCK Gross tons 193
Owners North West-Lugs limited Managers Port of Registry Liverpool
Hull built at Birkenhead By Cammell Laird (S.E.) Ltd Yard No. 1296 Year 1958 Month 2
Main Engines made at Lincoln By Ruston Hornsby limited Eng. No. 422558 When
Gearing made at Slough Bucks By Modern Wheel Drive Ltd
Donkey boilers made at By Blr. Nos. When
Machinery installed at Birkenhead By Cammell Laird & Co (Shipbuilders & Engineers) Ltd. When 1958
Particulars of restricted service of ship, if limited for classification limited by safety equipment to within limits Mersey Bar.

Particulars of vegetable or similar cargo oil notation, if required
Is ship to be classed for navigation in ice? no Is ship intended to carry petroleum in bulk? no
Is refrigerating machinery fitted? no If so, is it for cargo purposes? Type of refrigerant
Is the refrigerating machinery compartment isolated from the propelling machinery space? Is the refrigerated cargo installation intended to be classed?

The following particulars should be given as fully and as clearly as possible. Where the answer is "No" or "None", say so! Ticks and other signs of doubtful meaning are not to be used. Where the wording is not applicable to the installation, a black line may be inserted. If the main engines have been constructed at another port and are covered by a separate report, the particulars given in that report need not be repeated below, but the port and report number should be stated.

No. of main engines One No. of propellers One Brief description of propulsion system Holset-flexible coupling & reversing gear box
MAIN RECIPROCATING ENGINES. Licence Name and Type No. Ruston & Hornsby limited, 6 V.L.B.X.M. (supercharged)
No. of cylinders per engine 6 Dia. of cylinders 15" stroke(s) 20" 2 or 4 stroke cycle 4 Single or double acting single
Maximum approved BHP per engine 1170 at 375 RPM of engine and 123 RPM of propeller.
Corresponding MIP 141 lbs. (For DA engines give MIP top & bottom) Maximum cylinder pressure 775 +/- 3 lbs. Machinery numeral 234
Are the cylinders arranged in Vee or other special formation? no If so, number of crankshafts per engine

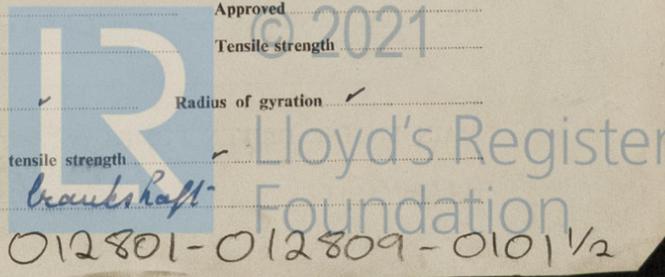
TWO STROKE ENGINES. Is the engine of opposed piston type? If so, how are upper pistons connected to crankshaft?
Is the exhaust discharged through ports in the cylinders or through valve(s) in the cylinder covers? No. and type of mechanically driven scavenge pumps or blowers per engine and how driven
No. of exhaust gas driven scavenge blowers per engine Where exhaust gas driven blowers only are fitted, can the engine operate with one blower out of action?
If a stand-by or emergency pump or blower is fitted, state how driven No. of scavenge air coolers Scavenge air pressure at full power. Are scavenge manifold explosion relief valves fitted?

FOUR STROKE ENGINES. Is the engine supercharged? Yes Are the undersides of the pistons arranged as supercharge pumps? no No. of exhaust gas driven blowers per engine One No. of supercharge air coolers per engine none Supercharge air pressure Can engine operate without supercharger? Yes.

TWO & FOUR STROKE ENGINES-GENERAL. No. of valves per cylinder: Fuel One Inlet One Exhaust One Starting One Safety One
Material of cylinder covers C.I. Material of piston crowns C.I. Is the engine equipped to operate on heavy fuel oil? no
Cooling medium for: Cylinders Water Pistons Fuel valves Overall diameter of piston rod for double acting engines
Is the rod fitted with a sleeve? no Is welded construction employed for: Bedplate? no Frames? no Entablature? no Is the crankcase separated from the underside of pistons? no Is the engine of crosshead or trunk piston type? Trunk Total internal volume of crankcase 302 cu ft. No. and total area of explosion relief devices 24 x 5.70 sq ins. Are flame guards or traps fitted to relief devices? no Is the crankcase readily accessible? Yes If not, must the engine be removed for overhaul of bearings, etc? no Is the engine secured directly to the tank top or to a built-up seating? To ship's girders How is the engine started? Compressed air
Can the engine be directly reversed? no If not, how is reversing obtained? Reverse & reduction gear through Holset-Flexible Coupling.

Has the engine been tested working in the shop? Yes How long at full power?
CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 12-8-57 386 H.I. State barred speed range(s), if imposed for working propeller none For spare propeller none Is a governor fitted? Yes Is a torsional vibration damper or detuner fitted to the shafting? no

Where positioned? Type No. of main bearings 8 Are main bearings of ball or roller type? Distance between inner edges of bearings in way of crank(s) 18" Distance between centre lines of side cranks or eccentrics of opposed piston engines
Crankshaft type: Built, semi-built, solid. (State which) Solid.
Diameter of journals 11 3/4" Diameter of crankpins Centre 9 1/4" Breadth of webs at mid-throw 15 1/4" Axial thickness of webs 5 1/4"
Side Pins Minimum
If shrunk, radial thickness around eyeholes Are dowel pins fitted? Crankshaft material Journals Approved
Webs Tensile strength
Diameter of flywheel 66" Weight 6300 lbs. Are balance weights fitted? no Total weight Radius of gyration
Diameter of flywheel shaft Material Minimum approved tensile strength
Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) Integral with crankshaft.



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MAIN GAS TURBINES. Name and Type No. ....

No. of sets of turbines ..... Open or closed cycle ..... BHP per set ..... at ..... RPM of output shaft .....

How is drive transmitted to propeller shaft? .....

ARRANGEMENT OF TURBINES. HP drives ..... at ..... RPM HP gas inlet temperature ..... pressure .....  
(A small diagram should be attached showing gas cycle.)  
IP drives ..... at ..... RPM IP gas inlet temperature ..... pressure .....  
LP drives ..... at ..... RPM LP gas inlet temperature ..... pressure .....

No. of air compressors per set ..... Centrifugal or axial flow type? ..... Material of turbine blades ..... Material of compressor blades .....  
No. of air coolers per set ..... No. of heat exchangers per set ..... How are turbines started? .....

How is reversing effected? ..... Are the turbines operated in conjunction with free piston gas generators? .....

Total No. of free piston gas generators ..... Diameter of working pistons ..... Diameter of compressor pistons ..... No. of double strokes per minute at full power .....  
Gas delivery pressure ..... Gas delivery temperature ..... Have the turbines and attached equipment been tested working in the shop? .....  
How long at full power? .....

ELECTRIC PROPULSION (Reciprocating engines or gas turbines. Electrical particulars to be reported on Form 4d.)

No. of generators ..... KW per generator ..... at ..... RPM AC or DC? ..... Position .....  
No. of propulsion motors ..... SHP per motor ..... at ..... RPM Position .....  
How is power obtained for excitation of generators? ..... Motors? .....

REDUCTION GEARING (Reciprocating engines or gas turbines. A small line sketch should be attached showing arrangement of gearing.) See London Report.

Is gearing of single or double helical type? ..... If single, position of gear thrust bearing ..... Is gearing of epicyclic type? .....  
PCD of pinions: First reduction ..... Second reduction ..... PCD of wheels: First reduction ..... Main .....  
Material of pinions ..... Tensile strength ..... Material of wheel rims ..... Tensile strength .....  
Are gear teeth surface hardened? ..... How are teeth finished? ..... Diameter of pinion journals ..... Wheel shaft journals .....  
Are the wheels of welded construction? ..... Is gearcase of welded construction? ..... Has the wheel/gearcase been heat treated on completion of welding? .....  
Where is the propeller thrust bearing located? ..... Are gear bearings of ball or roller type? .....

CLUTCHES, FLEXIBLE COUPLINGS, ETC. If a clutch or other flexible connection is fitted between engine/turbine and gearing or between engine and line shafting give brief description and, for clutches, state how operated.

description and, for clutches, state how operated. *Holzer-Flexible Coupling*  
Can the main engine be used for purposes other than propulsion when declutched? *no* If so, what? .....

STRAIGHT SHAFTING. Diameter of thrustshaft *In Gear Box* ..... Material ..... Minimum approved tensile strength .....

Shaft separate or integral with crank or wheel shaft? *Gear box output shaft* Diameter of intermediate shaft *8 3/8"* Material *Seimens steel*  
Minimum approved tensile strength *28 tons sq* Diameter of screwshaft cone at large end *10 1/2"* Is screwshaft fitted with a continuous liner? *no*

Diameter of tube shaft. (If these are separate shafts) ..... Is tube shaft fitted with a continuous liner in way of stern tube? ..... Thickness of screw/tube shaft liner at bearings .....  
Thickness between bearings ..... Material of screw/tube shaft *Seimens Steel* Minimum approved tensile strength *28 tons sq*

Is an approved oil gland fitted? *Yes* If so, state type *Newark* Length of bearing next to and supporting propeller *3'-8 1/4"*  
Material of bearing *Gummetal with metal lined* In multiple screw vessels is the liner between stern tube and A bracket continuous? ..... If not, is the exposed length of shafting between liners readily visible in dry dock? .....

PROPELLER. Diameter of propeller *10'-0"* Pitch *8'-8" RED at Root* Built up or solid *Solid* Total developed surface *48 sq ft*

No. of blades *4* Blade thickness at top of root fillet *6 1/8"* Blade material *Cast-iron* Moment of inertia of dry propeller *16849 lbs. in. sec<sup>2</sup>*  
If propeller is of special design, state type *no* Is propeller of reversible pitch type? *no* If so, is it of approved design? .....

State method of control ..... Material of spare propeller *Cast-iron* Moment of inertia *16849 lbs. in. sec<sup>2</sup>*

AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine *none* Can they be declutched? .....

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) *Two: One electrically driven 26 cu ft/min @ 300 lbs. sq*  
*One clutch operated from 10KW Diesel Generator 9 cu ft. min at 300 lbs. sq*  
*One upper + one lower*

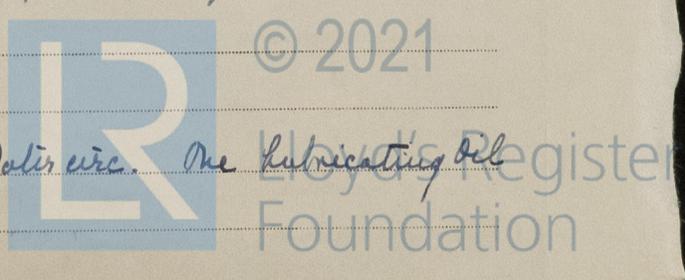
No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) *Two @ 23 1/2 cu ft. port side aft engine room*  
*Hittingham Certs 27265 + 27268 One 11.2 cu ft. port side aft engine room hittingham Cert 27080*  
How are receivers first charged? *Stand by Diesel compressor could start* Maximum working pressure of starting air system *300 lbs. sq* Are the safety devices in accordance with the Rules? *Yes*

Has the starting of the main engines been tested and found satisfactory? *Yes*

COOLERS. No. of main engine fresh water coolers *One* No. of main engine lubricating oil coolers *One main engine + one gear box cooler*

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure .....

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) *One fresh water circ. One salt-water circ. One lubricating oil scavenge. One lubricating oil pressure.*



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INDEPENDENT PUMPS Name below essential pumps, state position and how driven. Give capacity of bilge pumps.	Service for which each pump is connected to be marked thus X																
	SUCTION								DELIVERY								
	Bilge Main	Bilge Direct	Ballast Main	Oil Fuel	Fresh Water Cooling	Sea	Feed Tanks	Lub. Oil	JALVAGE	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cooling	OVER BOARD
<u>ENGINE ROOM STARBOARD</u>																	
Stand by Fresh/Salt water circulating 13400 gals @ 40 ft		X			X	X					X	X					
Fire Bilge 20 tons hr 25 lb sq	X	X				X								X			
Stand by Lub. Oil Scavenge or Pressure 1500/2400 gals hr @ 50/10 lb								X							X		
Oil Fuel Transfer 450 gals per hour @ 40 lbs. sq				X								X					X
Stand by Gear Box Lub Oil 3900 gals hr @ 75 lbs. sq								X							X		
Daily Bilge Pump (Hand)																	
<u>ENGINE ROOM PORT</u>																	
Fire Bilge 20 tons hr @ 25 lb. sq	X					X			X					X			X

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room. One - 2" Bore in Forward Hold

No. and size connected to main bilge line in main engine room One 2 1/2" In tunnel One 1 1/2"

In aux. engine room One 2 1/2" Size and position of direct bilge suction in machinery spaces One 1 1/2"

Size and position of emergency bilge suction in machinery spaces One starboard side 5"

Is the bilge or ballast system fitted with means for separating oily water on the overboard discharge side? Yes connected to Hand pump. Do the piping arrangements comply with the Rules including special requirements for ships carrying petroleum in bulk, cargo oil or classed for navigation in ice? (strike out words not applicable). Yes

STEAM & OIL ENGINE AUXILIARIES

Position of each	Type	Made by	Port and No. of Rpt. or Cert.	Driven Machinery (For electric generators, state output)
Port-outboard	2 Y.C.Z.	Ruston Hornsby	Hittingham 27603	10KW Generator & Compressor
Port-inboard	Y.E.Z.	Ruston Hornsby	Hittingham 27336	30KW Generator
Starboard side	Y.E.Z.	Ruston Hornsby	Hittingham 27336	30KW Generator

Is electric current used for essential services at sea? Yes If so, state the minimum No. and capacity of generators required in order that the ship may operate at sea 2 @ 30KW. 220 Volts

Is an electric generator driven by Main Engine? No.

STEAM INSTALLATION. No. of donkey boilers burning oil fuel None W.P. ✓ Type ✓

Position ✓

Is a superheater fitted? ✓ Are these boilers also heated by exhaust gas? ✓ No. of donkey boilers heated by exhaust gas only? ✓ W.P. ✓

Type ✓ Position ✓ Can the exhaust heated boilers deliver steam directly to the steam range or do they operate only as economisers in conjunction with oil fired boilers? ✓ Port and No. of report on donkey boilers ✓

Is steam essential for operation of the ship at sea? ✓ Are any steam pipes over 3 ins. bore? ✓ If so, what is their material? ✓

For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? ✓ No. of oil burning pressure units ✓ No. of steam condensers ✓ No. of Evaporators ✓

STEERING GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars) "Hyland" Hydraulic Steering Gear Unit

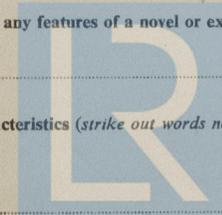
Type P.P.T. 40 Pump No 1231

Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements Two - 2 gal. one 10 gal. froth.

One Pyrene type P. one 30'-5" hose with spray jet applicator.

Has the spare gear required by the Rules been supplied? Yes Has all the machinery been tried under full working conditions and found satisfactory? Yes Date and duration of full-power sea trials of main engines 11/2/58 - 1 1/4 hours full power Does this machinery installation contain any features of a novel or experimental nature? (Give particulars) ✓

The foregoing description of the main engine and installation is correct and the particulars are as approved for torsional vibration characteristics (strike out words not applicable).


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GENERAL REMARKS

State if the machinery has been constructed and/or installed under special survey in accordance with the Rules, approved plans and Secretary's letters. State quality of materials and workmanship and give recommendations for classification, including any special notation to be assigned. Where existing machinery is submitted for classification the circumstances should be explained as fully as possible.

This machinery has been constructed under special survey in accordance with the approved Plans the Society's Rules, & Secretary's letters. The materials & workmanship are good.

It has been properly installed in the vessel, & tried under full working conditions with satisfactory results, & is eligible in my opinion to be classed with the Record of  $\boxplus$  L.M.C. 2.58 T.S. 09.

*W. Mapleson* & *E. H. Bennett*

Engineer Surveyor to Lloyd's Register of Shipping.

PARTICULARS OF IDENTIFICATION MARKS ((Including Port of origin) of important Forgings and Castings. (Copies of certificates should be forwarded with report.)

RODS

CRANKSHAFT OR ROTORSHAFT

FLYWHEEL SHAFT

THRUSTSHAFT

GEARING *Hindmarch / M.W.D. Type M2.W.R. Size 5 :- No 12149 See Enc. Rpt. M.W.D. - 1739*

INTERMEDIATE SHAFTS *E.S.C. 7139 Lloyd's H.H.S.H.F. 22-8-57 P.H.F. L.Y. 19-12-57*

SCREW ~~AND~~ SHAFTS *E.S.C. 7140 Lloyd's H.H.S.H.F. 2-9-57 C.R.M. L.Y. 18-12-57*

PROPELLERS *14-11-57 - 51*

OTHER IMPORTANT ITEMS

Is the installation a duplicate of a previous case? *No.* If so, state name of vessel

Date of approval of plans for crankshaft *30-7-56* Straight shafting *12-8-57* Gearing  Clutch

Separate oil fuel tanks  Pumping arrangements *26-11-57* Oil fuel arrangements *26-11-57*

Cargo oil pumping arrangements  Air receivers *App. Durng. 47 B. 342/3* Donkey boilers

Dates of examination of principal parts:-

Fitting of stern tube *21-12-57* Fitting of propeller *18-12-57* Completion of sea connections *20-12-57* Alignment of crankshaft in main bearings *17-1-58*

Engine checks & bolts *17-1-58* Alignment of gearing *17-1-58* Alignment of straight shafting *17-1-58* Testing of pumping arrangements *11-2-58*

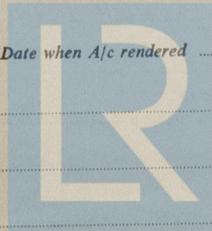
Oil fuel lines  Donkey boiler supports  Steering machinery *11-2-58* Windlass *11-2-58*

Date of Committee **LIVERPOOL 20 MAY 1958** Special Survey Fee *Installation L57-10-0.*

Decision *+ LMC 2.58 T.S. (09.)*  *AR*  *23.5.58*

Expenses

Date when A/c rendered *11/4/58 Paid 3/5/58*



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