

27 MAR 1957

Rpt. 4b

Date of writing report 7.8.56. Received London 21 AUG 1956 Port Ipswich. No. 133770
Survey held at Colchester No. of visits In shops 6 On vessel First date 8.2.56. Last date 13.8.56.

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. Name Diesel Electric Paddle Tug *System* Gross tons
Owners Admiralty Managers Port of Registry Year Month
Hull built at Glasgow By Yarrow & Co. Ltd., Yard No. 2089 When
Main Engines made at Colchester By Davey, Paxman & Co. Ltd. Eng. No. 53921/2/3/4 When 1956
Gearing made at - By
Donkey boilers made at - By Blr. Nos. When
Machinery installed at - By When

Particulars of restricted service of ship, if limited for classification
Particulars of vegetable or similar cargo oil notation, if required
Is ship to be classed for navigation in ice? Is ship intended to carry petroleum in bulk?
Is refrigerating machinery fitted? 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 4 No. of paddles Brief description of propulsion system Diesel Electric Propulsion
MAIN RECIPROCATING ENGINES. Licence Name and Type No. Type 12 YHAXM. Vee formation 60° angle. *Supercharged*
No. of cylinders per engine 12 Dia. of cylinders 7" stroke(s) 7 1/2" 2 or 4 stroke cycle 4 Single or double acting single
Maximum approved BHP per engine 495 at 1000 RPM of engine and RPM of propeller.
Corresponding MIP 136 lb/sq. ins. (For DA engines give MIP top & bottom) Maximum cylinder pressure 1150 lb. Machinery numeral $\frac{495 \times 4}{5} = 396$.
Are the cylinders arranged in Vee or other special formation? Vee formation If so, number of crankshafts per engine one

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 2
No. of supercharge air coolers per engine 2 Supercharge air pressure 3lb/sq. ins. Can engine operate without supercharger? yes

TWO & FOUR STROKE ENGINES—GENERAL. No. of valves per cylinder: Fuel 1 Inlet 2 Exhaust 2 Starting 0 Safety 0
Material of cylinder covers Aluminium Material of piston crowns Aluminium Is the engine equipped to operate on heavy fuel oil? No.
Cooling medium for: Cylinders Water Pistons None Fuel valves Water Overall diameter of piston rod for double acting engines
Is the rod fitted with a sleeve? 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? T.P. Total internal volume of crankcase 26.5 cu. ft. No. and total area of explosion relief devices 6 at 9 = 54 sq. ins. Are flame guards or traps fitted to relief devices? yes Is the crankcase readily accessible? yes If not, must the engine be removed for overhaul of bearings, etc? yes Is the engine secured directly to the tank top or to a built-up seating? How is the engine started? Air Motor

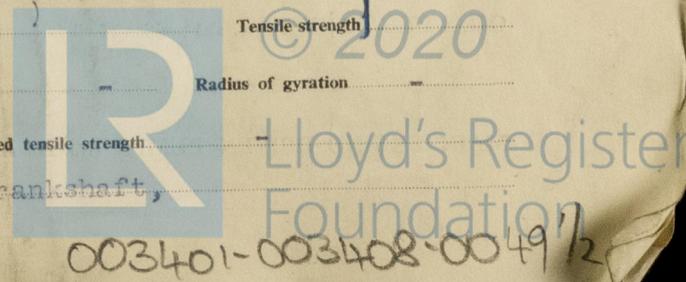
Can the engine be directly reversed? No If not, how is reversing obtained? Electric drive
Has the engine been tested working in the shop? yes How long at full power? 6 hours

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 26.5.55. State barred speed range(s), if imposed for working propeller - For spare propeller - Is a governor fitted? yes Is a torsional vibration damper or detuner fitted to the shafting? yes

Where positioned? free end of crankshaft Holset Viscuous No. of main bearings 7 Are main bearings of ball or roller type? no Distance between inner edges of bearings in way of crank(s) 7.6" 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 5" Diameter of crankpins Centre 4 1/2" Breadth of webs at mid-throw 7" Axial thickness of webs 1.25/32"
If shrunk, radial thickness around eyeholes - Are dowel pins fitted? - Crankshaft material Journals E N 26U Approved 55 tons/sq. ins. Pins Webs Tensile strength 2020

Diameter of flywheel 2' - 6 1/2" Weight 353 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



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 4 KW per generator 339 at 1000 RPM AC or DC? 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.)

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.

Can the main engine be used for purposes other than propulsion when declutched? _____ If so, what? _____

STRAIGHT SHAFTING. Diameter of thrustshaft _____ Material _____ Minimum approved tensile strength _____

Shaft separate or integral with crank or wheel shaft? _____ Diameter of intermediate shaft _____ Material _____

Minimum approved tensile strength _____ Diameter of screwshaft cone at large end _____ Is screwshaft fitted with a continuous liner? _____

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 _____ Minimum approved tensile strength _____

Is an approved oil gland fitted? _____ If so, state type _____ Length of bearing next to and supporting propeller _____

Material of bearing _____ 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 _____ Pitch _____ Built up or solid _____ Total developed surface _____

No. of blades _____ Blade thickness at top of root fillet _____ Blade material _____ Moment of inertia of dry propeller _____

If propeller is of special design, state type _____ Is propeller of reversible pitch type? _____ If so, is it of approved design? _____

State method of control _____ Material of spare propeller _____ Moment of inertia _____

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) _____

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) Four at 11.2 cu. ft. each

Nottingham C. 23190. . 23191 . 23663. . 23664
 Receiver. Nos. R.1008. R.1009. VR.1028. VR.1029

How are receivers first charged? _____ Maximum working pressure of starting air system 350lb/sq. in. Are the safety devices in accordance with the Rules? _____ Has the starting of the main engines been tested and found satisfactory? _____

COOLERS. No. of main engine fresh water coolers 4 No. of main engine lubricating oil coolers 4

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) _____ Each engine, 2 FW. cooling pumps. 1 Raw water cooling and 2 lubricating oil pumps.

| 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 | Boiler Feed | Salt Water Cooling | Fresh Water Cooling | Oil Fuel Tanks | Fire Main | Lub. Oil | Piston Cooling |
| | | | | | | | | | | | | | | | |

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room _____

No. and size connected to main bilge line in main engine room _____ In tunnel _____

In aux. engine room _____ Size and position of direct bilge suction in machinery spaces _____

Size and position of emergency bilge suction in machinery spaces _____

Is the bilge or ballast system fitted with means for separating oily water on the overboard discharge side? _____ 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) _____

STEAM & OIL ENGINE AUXILIARIES

| Position of each | Type | Made by | Port and No. of Rpt. or Cert. | Driven Machinery <small>(For electric generators, state output)</small> |
|------------------|------|---------|-------------------------------|--|
| | | | | |

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 _____

Is an electric generator driven by Main Engine? _____

STEAM INSTALLATION. No. of donkey boilers burning oil fuel _____ 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) _____

Have the Rule Requirements for fire extinguishing arrangements been complied with? _____ Brief description of arrangements _____

Has the spare gear required by the Rules been supplied? _____ Has all the machinery been tried under full working conditions and found satisfactory? _____ Date and duration of full power sea trials of main engines _____ 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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 Assistant Commercial Manager
 For DAVEY PAXMAN & CO. LIMITED Register
 Builder
 0049-1-2 Foundation

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.

These four Diesel Engines, for driving main generators for electric propulsion have been built under Special Survey, in accordance with plans approved and the Requirements of the Rules. Steel used in the manufacture has been made at Works approved by the Committee, and under the supervision of the Society's Surveyors. The Workmanship is good throughout, and on completion each generating set was run on the test bed, at full load, and 10% overload, when the governors and automatic controls were operated, generator temperatures checked, and all found in order. These generating sets are in my opinion, eligible for inclusion in Class LMC, when satisfactorily installed on board.

| | | | | | |
|---------------------|-------|--------------------------|---------|------------------------------|------------|
| Engine Contract No. | 53921 | Coupled to Generator No. | R.67803 | installed on board as set N° | 4000 25/20 |
| " | " | " | " | " | " |
| " | 53922 | " | R.67802 | " | 4000 25/21 |
| " | " | " | " | " | " |
| " | 53923 | " | R.67804 | " | 4000 40/6 |
| " | " | " | " | " | " |
| " | 53924 | " | R.67805 | " | 4000 40/7 |
| " | " | " | " | " | " |

The above sets have been efficiently installed on board in accordance with the approved plans, Secretary's letters and Admiralty Specification, the materials & workmanship being found good. These sets have been tested under full working conditions and found satisfactory.

A. B. Campbell
Gls.

[Signature]
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 BB. 618. 642. 604. 618. 607. 575. 573. 578, 356, 573. 436. 591. / 587. 616. 618. 618. 618. 618. 618. 618. 618. 587. 579. 464.
BB. 572. 686. 702. 668. 668. 663. 568. 591. 468. 442. 442. 505. 594. 685. 685. 670. 671. 592. 434/430. 514. 602.
CRANKSHAFT OR ROTOR SHAFT // Lloyds IPS. 1575A. RP. 21.12.55. 1556A. RP. 21.12.55. 1578C. RP. 22.5.56. 1454C. 25.5.

FLYWHEEL SHAFT -
THRUST SHAFT -
GEARING -
INTERMEDIATE SHAFTS -
SCREW AND TUBE SHAFTS -
PROPELLERS -
OTHER IMPORTANT ITEMS

Is the installation a duplicate of a previous case? yes If so, state name of vessel Yarrow & Co. Ltd., No. 2088
Date of approval of plans for crankshaft 26.5.56. Straight shafting - Gearing - Clutch -
Separate oil fuel tanks - Pumping arrangements - Oil fuel arrangements -
Cargo oil pumping arrangements - Air receivers - Donkey boilers -

Dates of examination of principal parts:-
Fitting of stern tube - Fitting of propeller - Completion of sea connections - Alignment of crank shaft in main bearings 8.2.56.
Engine chocks & bolts - Alignment of gearing - Alignment of straight shafting - Testing of pumping arrangements 15.2.56. 30.

Oil fuel lines - Donkey boiler supports - Steering machinery - Windlass -
Date of Committee GLASGOW 26.5.56 Construction Special Survey Fee £136..0..0d.

Decision SEE ACCOMPANYING MACHINERY REPORT

Expenses £2..5..0d

