

Rpt. 4b

187162

Date of writing report 30-11-1960 Received London Port Copenhagen No. 10-8-1960 30-11-1960
Survey held at Copenhagen No. of visits 31 In shops 10-8-1960 On vessel First date Last date

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. Name Gross tons
Owners Managers Port of Registry Year Month
Hull built at Gorinchem, Holland By Bijkers Aannemingsbedrijf Yard No. 163 When
Main Engines made at Copenhagen By Burmeister & Wain A/S Eng. No. 7109 When 1960-11
Gearing made at By
Donkey boilers made at By Blr. Nos. When
Machinery installed at Gorinchem, Holland By Bijkers Aannemingsbedrijf 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? yes 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 1 No. of propellers 1 Brief description of propulsion system Reversible, heavy oil eng. Direct to propeller

MAIN RECIPROCATING ENGINES. Licence Name and Type No. B&W-DM.550VTBF-110, Turbocharged, crosshead type, solid injection.

No. of cylinders per engine 5 Dia. of cylinders 500 mm stroke 1100 mm 2 or 4 stroke cycle 2 Single or double acting single
Maximum approved BHP per engine 2900 at 170 RPM of engine and 170 RPM of propeller.

Corresponding MIP 8.0 kg/cm2 For DA engines give MIP top & bottom Maximum cylinder pressure 55 kg/cm2 Machinery numeral 580
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? no 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? valve in cover No. and type of mechanically driven scavenge pumps or blowers per engine and how driven none

No. of exhaust gas driven scavenge blowers per engine 2 Where exhaust gas driven blowers only are fitted, can the engine operate with one blower out of action? yes

If a stand-by or emergency pump or blower is fitted, state how driven electrically No. of scavenge air coolers 2 Scavenge air pressure at full power 0.42 kg/cm2 Are scavenge manifold explosion relief valves fitted? yes

FOUR STROKE ENGINES. Is the engine supercharged? Are the undersides of the pistons arranged as supercharge pumps? No. of exhaust gas driven blowers per engine

TWO & FOUR STROKE ENGINES-GENERAL. No. of valves per cylinder: Fuel 2 Inlet port in cylinder Exhaust 1 Starting 1 Safety 1

Material of cylinder covers cast steel Material of piston crowns cast steel Is the engine equipped to operate on heavy fuel oil? yes
Cooling medium for: Cylinders fresh water Pistons lub. oil Fuel valves fuel oil 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? yes

Is the engine of crosshead or trunk piston type? cross-head Total internal volume of crankcase 34.5 m3 No. and total area of explosion relief devices 6-1995 cm2 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? Is the engine secured directly to the tank top or to a built-up seating? How is the engine started? by compr. air

Can the engine be directly reversed? yes If not, how is reversing obtained?
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 11-8-60 State barred speed range(s), if imposed Not to be operated continuously between 105 and 124 RPM for working propeller For spare propeller Is a governor fitted? yes Is a torsional vibration damper or detuner fitted to the shafting? no

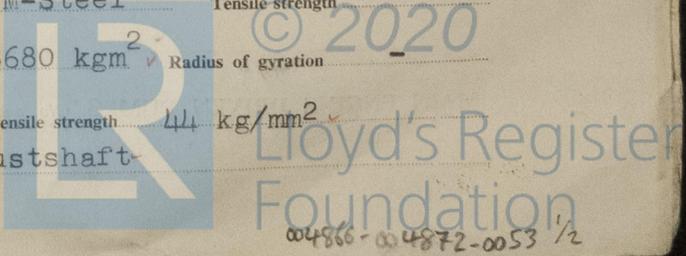
Where positioned? Type No. of main bearings 6 Are main bearings of ball or roller type? no Distance between inner edges of bearings in way of crank(s) 660 mm Distance between centre lines of side cranks or eccentrics of opposed piston engines

Crankshaft type: Built, semi-built, solid. (State which) All built
Diameter of journals 400 mm Diameter of crankpins 150 mm centr. hole Breadth of webs at mid-throw 860 mm Axial thickness of webs 224/196 mm

If shrunk, radial thickness around eyeholes Are dowel pins fitted? Crankshaft material Journals SM-Steel Pins SM-Steel Minimum approved 44 kg/mm2

Webbs SM-Steel Tensile strength
WD2 Diameter of flywheel 6600 kgm2 Weight Are balance weights fitted? yes Total weight 5680 kgm2 Radius of gyration

Diameter of flywheel shaft 380 mm Material SM-Steel Minimum approved tensile strength 44 kg/mm2
Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) Integral with thrustshaft



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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
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.)

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 380 mm Material SM-Steel Minimum approved tensile strength 44 kg/mm^2
100 mm centr. hole
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 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)
How are receivers first charged? Maximum working pressure of starting air system 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 No. of main engine lubricating oil coolers
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)

Table with columns: INDEPENDENT PUMPS, SUCTION (Bilge Main, Bilge Direct, Ballast Main, Oil Fuel, Fresh Water Cooling, Sea, Feed Tanks, Lub. Oil), DELIVERY (Boiler Feed, Salt Water Cooling, Fresh Water Cooling, Oil Fuel Tanks, Fire Main, Lub. Oil, Piston Cooling). Includes text: Name below essential pumps, state position and how driven. Give capacity of bilge pumps.

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

Table with columns: Position of each, Type, Made by, Port and No. of Rpt. or Cert., Driven Machinery (For electric generators, state output)

Is electric current used for essential services at sea? 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)



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.

The above machinery is built under special survey in accordance with the Rules, the approved plans and the Secretary's letters.

The material used has been tested as required by the Rules, the workmanship is good. Crankcase explosion relief devices fitted in accordance with the Rules.

On completion the engine was tested under full power working condition in the shop. The regulator and manoeuvring of the engine was also tested and found good.

Recommend the machinery of this vessel to have notation of +LMC when installed in the ship under special survey.

It is stated that the ship is to have "Strengthening for Navigation in Ice Class 1"

NOTICE BOARDED TO BE FITTED AT CONTROL STATION

Note: The engine is not to be operated continuously between 105 and 124 RPM.

TACHOMETER MARKED

H. V. Lane

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 Piston rods	3 off 2 off 1 off spare	Lloyd's Cpn. Nos. 5823 5824	VL 27-10-60
Connecting rods	4 off 1 off	Lloyd's Cpn. Nos. 5784-5785	VL 30-10-60
CRANKSHAFT OR ROTOR SHAFT	1 off 1/1 length	Lloyd's Cpn. No. 5789	VL 4-10-60
BEVWHEKX SHAFK			
THRUSTSHAFT	1 off	Lloyd's Cpn. No. 5790	VL 4-10-60
GEARING			
INTERMEDIATE SHAFTS			
SCREW AND TUBE SHAFTS			
PROPELLERS			
OTHER IMPORTANT ITEMS	Crossheads 5 off	Lloyd's Cpn. No. 5786	VL 30-10-60
Cylinder Covers:	5 off 2 off spare	Lloyd's Test Cpn. 10 Atm.	VL 18-10-60
Cylinder Liners & Jackets:	5 off	Lloyd's Test Cpn. 7 Atm.	VL 21-10-60
Pistons:	5 off 1 off spare	Lloyd's Test Cpn. 5 Atm.	VL 27-10-60

Is the installation a duplicate of a previous case? If so, state name of vessel

Date of approval of plans for crankshaft 15-7-1960 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

Engine chocks & bolts Alignment of gearing Alignment of straight shafting Testing of pumping arrangements

Oil fuel lines Donkey boiler supports Steering machinery Windlass

Date of Committee FRIDAY 1-DEC 1961 Construction Special Survey Fee Kr. 3480.-

Decision See Ref. 52553 Forging Kr. 510.-

Pump & Cooler Kr. 400.-

Expenses

ENTERED IN COPENHAGEN ROUGH FEE BOOK ON THE



7/20/1960

Lloyd's Register Foundation