

REPORT ON OIL ENGINE MACHINERY.

No. 12993

AUG 17 1940

Received at London Office

Date of writing Report 18th June 1940 When handed in at Local Office 18th June 1940 Port of Gothenburg
 No. in Survey held at 39780 on the *Single* *Triple* *Quadruple* Screw vessel **BELLONA**
 Date, First Survey 28th Feb 1939 Last Survey 18th June 1940 Number of Visits 104
 Tons Gross 11267 Net 6800
 Built at Gothenburg By whom built A/B. Gotaverken Yard No. 540 When built 1940
 Engines made at do. By whom made do. Engine No. 1371 When made 1940
 Donkey Boilers made at do. By whom made do. Boiler No. 2085/2086 When made 1940
 Brake Horse Power 6900 Owners Rederi A/B. ZENIT Port belonging to Gothenburg
 Nom. Horse Power as per Rule 1236 Is Refrigerating Machinery fitted for cargo purposes no Is Electric Light fitted Yes
 Trade for which vessel is intended Tanker.

OIL ENGINES, &c.—Type of Engines Heavy oil 2 or 4 stroke cycle 2 Single or double acting D.A.
 Maximum pressure in cylinders 49 kg/cm² Diameter of cylinders 620 mm (24 3/8") Length of stroke 1400 (55 1/8") No. of cylinders 6 No. of cranks 6
 Mean Indicated Pressure 6.85 kg/cm²
 Span of bearings, adjacent to the Crank, measured from inner edge to inner edge 946 mm. Is there a bearing between each crank Yes
 Revolutions per minute 107 Flywheel dia. 2240 mm. Weight 3640 kg Means of ignition Compression Kind of fuel used Diesel oil
 Crank Shaft, {Solid forged dia. of journals as per Rule Appd. as fitted 465/150 Crank pin dia. 465/150 Crank Webs Mid. length breadth ✓ shrunk Thickness parallel to axis 390
 {Solid forged All built as fitted 465/150 Mid. length thickness ✓ Thickness around eyehole 262.5
 Flywheel Shaft, diameter as per Rule ✓ Intermediate Shafts, diameter as per Rule 427 as fitted 470 Thrust Shaft, diameter at collars as per Rule 450 as fitted 460
 Tube Shaft, diameter as per Rule ✓ Screw Shaft, diameter as per Rule 466 as fitted 473 Is the tube screw shaft fitted with a continuous liner Yes
 Bronze Liners, thickness in way of bushes as per Rule 21.9 as fitted 22, 24 Thickness between bushes as per Rule 16.5 as fitted 21.5 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 fits tightly
 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 1950
 Propeller, dia. 5610 Pitch 4630 No. of blades 4 Material Bronze whether Moveable no. Total Developed Surface 18.1 m² sq. feet
 Method of reversing Engines Comp. air Is a governor or other arrangement fitted to prevent racing of the engine when disengaged Yes Means of lubrication Forced Thickness of cylinder liners 42 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. 2 @ 4500 lit/min F.W. Is the sea suction provided with an efficient strainer which can be cleared within the vessel Yes
 2 @ 5000 lit/min S.W.
 Bilge Pumps worked from the Main Engines, No. 1 Diameter 160 Stroke 240 Can one be overhauled while the other is at work ✓
 Pumps connected to the Main Bilge Line {No. and Size 1 Ballast 100 ton/hour 1 Bilge 20 ton/hour 1 Bilge 25 ton/hour 1 Condenser 20 ton/hour
 {How driven Elect. motor main engine Elect. motor Steam
 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 @ 100 ton/hour Power Driven Lubricating Oil Pumps, including Spare Pump, No. and size 2 @ 4583 lit/min
 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 1/2", 4 @ 2 1/2", 2 @ 2 1/2" & 1 @ 3 1/2" to C.P.s. In Pump Room main 3 @ 3 1/2"
 In Hold, Fd Pump room 1 @ 2 1/2", 1 @ 5" from C.P., 1 @ 4" from F. Peak. Dry cargo hold 2 @ 2 1/2"
 Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size 1 @ 5" from Ballast pump. 1 @ 5" from Condenser pump
 Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes Yes 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 Some. Others on riveted compartments between floors 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 By lifting small plate Are the Overboard Discharges above or below the deep water line Above
 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 no coal bunkers Heating coils How are they protected ✓
 What pipes pass through the deep tanks Have they been tested as per Rule Yes
 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 no tunnel 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. none No. of stages ✓ Diameters ✓ Stroke ✓ Driven by ✓
 Auxiliary Air Compressors, No. 2 No. of stages 2 Diameters 320, 240/320 Stroke 150 Driven by Elect. motors
 Small Auxiliary Air Compressors, No. none No. of stages ✓ Diameters ✓ Stroke ✓ Driven by ✓
 What provision is made for first Charging the Air Receivers Current supplied to main air compressors by steam driven generator
 Scavenging Air Pumps, No. 2 Diameter ✓ Stroke ✓ Driven by main engine
 Auxiliary Engines crank shafts, diameter as per Rule 141 as fitted 160 No. 3 Position E.R. platform, Diesel 2 P. & S. Steam 1 P.
 the Auxiliary Engines been constructed under special survey Yes Is a report sent herewith Yes for diesel engines

003525-003532-0315

AIR RECEIVERS:—Have they been made under survey. *Yes* 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* Is a drain fitted at the lowest part of each receiver *Yes*
Injection Air Receivers, No. *None* Cubic capacity of each *✓* Internal diameter *✓* thickness *✓*
Seamless, lap welded or riveted longitudinal joint *✓* Material *✓* Range of tensile strength *✓* Working pressure by Rules *✓* Actual *✓*
Starting Air Receivers, No. *2* Total cubic capacity *2 x 13.5 m³* Internal diameter *1850* thickness *25, 16.5*
Seamless, lap welded or riveted longitudinal joint *Riveted* Material *S.M. Steel* Range of tensile strength *44/50 kg/mm²* Working pressure by Rules *25.8 kg/cm²* Actual *25 kg/cm²*

IS A DONKEY BOILER FITTED? *Yes* If so, is a report now forwarded? *Yes*
Is the donkey boiler intended to be used for domestic purposes only *no*
PLANS. Are approved plans forwarded herewith for Shafting *24-9-38, 12-12-38* Receivers *27-5-38* Separate Fuel Tanks *6-10-39*
(If not, state date of approval)
Donkey Boilers *23-5-38* General Pumping Arrangements *6-10-39* Pumping Arrangements in Machinery Space *16-8-39*
Oil Fuel Burning Arrangements *✓*

SPARE GEAR.

Has the spare gear required by the Rules been supplied *Yes.*
State the principal additional spare gear supplied *1 top exhaust belt complete, 1 bottom exhaust belt complete, 1 scavenger air belt complete, 10 top fuel valves, 10 bottom fuel valves, 6 fuel valve spindles, 1 top cylinder relief valve, 1 bottom cylinder relief valve, a number of piston rings, 1 top end bearing complete, 1 set of bottom end bearings & 1 set of main bearing bearings for valve gear crankshaft, 1 set of main bearing bearings, 6 sets of working parts for fuel pumps, 2 impellers for scavenger air blowers, 1 propeller shaft with nut.*

The foregoing is a correct description,

ARTHEMUS GOTTSBERG
Manufacturer. *by*
Dates of Survey while building
During progress of work in shops--
1939 Feb. 28 May 24, 25 June 16, 17, 19 July 31 Aug. 2 Sept 6, 9, 13, 14, 28, 29, 30 Oct 2, 3, 4, 5, 6, 7, 9, 10, 11, 16, 17, 18, 19, 20, 24, 26, Nov. 1, 3, 8, 14, 15, 20, Dec. 5, 5, 13, 14, 15, 18, 20, 22, 28, 29, 1940 Jan. 2, 9, 10, 12, 13, 16, 25, Feb. 2, 14, 27, 28
During erection on board vessel--
1939 Dec. 19, 1940 Jan 26 Feb. 6, 7, 13, 15, 19, 22, 29 Mar. 1, 12, 28, 29, 30 April 1, 9, 12, 17, 26, 27 May 7, 7, 17 June 18
Total No. of visits *1034*
Dates of Examination of principal parts—Cylinders *(29/9, 2, 3, 4, 5, 6, 7, 14/10/39) 29/9/39* (Cover 3, 4, 5, 7, 14/10/39) Pistons 3, 17, 18, 19/10/39 Rods 9, 17, 18, 19/10/39 Connecting rods 8/11/39
Crank shaft *28/12/39* Flywheel shaft *✓* Thrust shaft *14/10/39* Intermediate shafts *20/2 & 9/3/40* Tube shaft *✓*
Screw shaft *9/3/40* Propeller *28/3/40* Stern tube *5/12/39* Engine seatings *29/9/39* Engines holding down bolts *15/2/40*
Completion of fitting sea connections *18/12/39* Completion of pumping arrangements *7/5/40* Engines tried under working conditions *9/12/39*
Crank shaft, Material *S.M. Steel* Identification Mark *LL04DS 1476/7 T.W. 1/9/39* Flywheel shaft, Material *✓* Identification Mark *LL04DS 421/9 502*
Thrust shaft, Material *S.M. Steel* Identification Mark *LL04DS 1478 T.W. 1/9/39* Intermediate shafts, Material *S.M. Steel* Identification Mark *LL04DS 20/2/40 485 9/3*
Tube shaft, Material *✓* Identification Mark *✓* Screw shaft, Material *S.M. Steel* Identification Mark *LL04DS 620 485 9/3/40 485 9/3/40 485 9/3/40*
Identification Marks on Air Receivers *No. 557 9 558 LLOYDTEST 40kg W.P. 25 kg 14-12-39 485* Value gear crankshaft *LL04DS NOS. 2931-2-3-4-5-6 Hg P-9-39*

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*
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 *Not desired*
Is this machinery duplicate of a previous case *Yes* If so, state name of vessel *BERA got report no. 12581*

General Remarks (State quality of workmanship, opinions as to class, &c. *The main & auxiliary machinery of this vessel have been constructed under special survey in accordance with the Rule & approved plans.*

The materials & workmanship are good & forging reports for the shafting are attached.
The machinery has been securely fitted in the vessel under my inspection & to my satisfaction.
Doing to the international situation it was not possible to carry out a trial trip, but the main & auxiliary machinery were examined under full power conditions while the vessel was tied up at the quayside, & found satisfactory.
This machinery is eligible in my opinion to be classed + LMC 6-40 CL 203. 150 lb.

The amount of Entry Fee .. *£ 114 : 00* : When applied for, *18th June 1940*
Special ... *£ 2487 : 00* :
Air Receivers *£ 159 : 60* : When received, *24th Aug 1940 R.H. 2/9*
Donkey Boiler Fee ...
Travelling Expenses (if any) £ :
Committee's Minute *Adm. 6. 40 oil fuel*
Assigned *2 S.B. - 150 H*