

# REPORT ON OIL ENGINE MACHINERY.

No. 12993  
AUG 17 1940

Received at London Office

Date of writing Report 18<sup>th</sup> June 1940 When handed in at Local Office 18<sup>th</sup> June 1940 Port of Gothenburg  
No. in Survey held at Gothenburg Date, First Survey 28<sup>th</sup> Feb 1939 Last Survey 18<sup>th</sup> June 1940  
Reg. Book Supt. 39780 on the Single Screw vessel BELLONA Number of Visits 104

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/cm<sup>2</sup> 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/cm<sup>2</sup>  
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, dia. of journals as per Rule Appd. Crank pin dia. 465/150 Crank Webs Mid. length breadth shrunk Thickness parallel to axis 390  
Flywheel Shaft, diameter as per Rule 427 Intermediate Shafts, diameter as fitted 470 Thrust Shaft, diameter at collars as per Rule 450  
Tube Shaft, diameter as per Rule 466 Screw Shaft, diameter as fitted 473 Is the shaft fitted with a continuous liner Yes  
Bronze Liners, thickness in way of bushes as per Rule 21.9 Thickness between bushes 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 Yes

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 Yes Is an approved Oil Gland or other appliance fitted at the after end of the tube shaft no  
Propeller, dia. 5610 Pitch 4630 No. of blades 4 Material Bronze whether Moveable no. Total Developed Surface 18.1 m<sup>2</sup>

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  
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  
Bilge Pumps worked from the Main Engines, No. 1 Diameter 160 Stroke 240 Can one be overhauled while the other is at work Yes  
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 200 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" 9 1 @ 3 1/2" to cp's. In Pump Room main 3 @ 3 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 fitted 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 plates) 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 How are they protected Yes  
What pipes pass through the deep tanks Heating coils 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 Yes

If a wood vessel, what means are provided to prevent leakage of either fuel oil or of lubricating oil from saturating the woodwork Yes  
Main Air Compressors, No. none No. of stages 2 Diameters 320, 280/320 Stroke 150 Driven by Elect. motors  
Auxiliary Air Compressors, No. 2 No. of stages 2 Driven by  
Small Auxiliary Air Compressors, No. none No. of stages 2 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 141 Stroke 3 Driven by main engine  
Auxiliary Engines crank shafts, diameter as per Rule 141 as fitted 160 Position E.R. platform, Diesel 2 P. 915. Steam 1 P.  
the Auxiliary Engines been constructed under special survey Yes Is a report sent herewith Yes for diesel engines

**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 *✓*  
**Starting Air Receivers, No.** *2* Total cubic capacity *2 x 13.5 m<sup>3</sup>* Internal diameter *1850* thickness *25, 25.5*  
 Seamless, lap welded or riveted longitudinal joint *Riveted* Material *S.M. Steel* Range of tensile strength *44/50 kg/mm<sup>2</sup>* Working pressure *25.8 kg/cm<sup>2</sup>* Actual *25 kg/cm<sup>2</sup>*

**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 scavenge 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 braces & 1 set of main bearing braces for valve gear crankshaft, 1 set of main bearing braces, 6 sets of working parts for fuel pumps, 2 impellers for scavenge air blowers, 1 propeller shaft with nut.*

The foregoing is a correct description,

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 Mar. 4, 5, 7, 8, 9, 11, 12, 13, 14, 15, 18, 19, 20, 21, 27, 28, 30 April 2, 11, 18		
Dates of Survey while building	During progress of work in shops--	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
	During erection on board vessel--	<i>1034</i>
Total No. of visits		<i>1034</i>
Dates of Examination of principal parts—Cylinders		<i>(29/9, 2, 3, 4, 5, 6, 7, 14/10/39) 29/9/39</i>
Crank shaft <i>28/12/39</i>	Flywheel shaft <i>✓</i>	Thrust shaft <i>14/10/39</i>
Screw shaft <i>9/3/40</i>	Propeller <i>28/3/40</i>	Stern tube <i>5/12/39</i>
Completion of filling sea connections <i>18/12/39</i>		Completion of pumping arrangements <i>1/5/40</i>
Crank shaft, Material <i>S.M. Steel</i>		Identification Mark <i>LL0475 1476/7 T.W. 1/9/39</i>
Thrust shaft, Material <i>S.M. Steel</i>		Identification Mark <i>LL0475 1478 T.W. 1/9/39</i>
Tube shaft, Material <i>✓</i>		Identification Mark <i>✓</i>
Identification Marks on Air Receivers		<i>No. 557 9 558 LLOYDTEST 40kg W.P. 25kg 14-12-39 HBS</i>
Identification Marks on Air Receivers		<i>Value gear crankshaft LL0475 NOS. 2931-2-3-4-5-6 Hg P-9-39</i>
Identification Marks on Air Receivers		<i>LL0475 620 NOS 9/3/40 Unkn</i> <i>LL0475 611 NOS 9/3/40 Spare</i>

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,	<i>18th June 1940</i>
Special	£ 247 : 00	When received,	<i>24th Aug 1940</i>
Air Receivers	£ 159 : 60		
Donkey Boiler Fee	£		
Travelling Expenses (if any)	£		

*H.B. Liggers*  
 Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute *Admb. 6. 40 oil fuel oil*  
 Assigned *2 S.B. - 150 H*

Certificates (if required) to be sent to Surveyor's Office, Southampton.  
 (The Surveyors are requested not to write on or below the space for Committee's Minute.)

