

REPORT ON OIL ENGINE MACHINERY.

No. 7373

Received at London Office 8 JAN 1929

Survey Report 4th Jan 1929 When handed in at Local Office 5th Jan 1929 Port of **GOTHENBURG**
Survey held at **GOTHENBURG** Date, First Survey 9th March 1928 Last Survey 29th Dec. 1928
Number of Visits 74

on the ^{Single} Twin ^{Triple} ^{Quadruple} Screw vessel **"GLARONA"** Tons { Gross 9912 Net 5221
GOTHENBURG By whom built **AB GÖTAVERKEN** Yard No. 414 When built 1928
made at **GOTHENBURG** By whom made **AB GÖTAVERKEN** Engine No. 1789 When made 1928
Boilers made at **GOTHENBURG** By whom made **AB LINDHOLMEN-MOTALA** Boiler No. 2411/2412 When made 1928
Horse Power Owners **H. TSCHUDIS TANKREDERIA/S** Port belonging to **OSLO.**

Horse Power as per Rule 724 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes
for which vessel is intended **General**

ENGINES, &c.—Type of Engines **Two Diesel Oil Engines** 2 or 4 stroke cycle 4 Single or double acting **single**
pressure in cylinders 35 kg/cm² Diameter of cylinders 550Z [21 7/8"] Length of stroke 600Z [39 3/8"] No. of cylinders 16 No. of cranks 16
bearings, adjacent to the Crank, measured from inner edge to inner edge 724Z Is there a bearing between each crank Yes
Revolutions per minute 154 Flywheel dia. None Weight Means of ignition **Diesel system** Kind of fuel used **Diesel oil**
Crankshaft, dia. of journals as per Rule 347Z Crank pin dia. 350Z Crank Webs Mid. length breadth 680Z Thickness parallel to axis 197-213Z
as fitted 350Z Mid. length thickness 813Z Thickness around eyehole 171Z
Propeller Shaft, diameter as per Rule Intermediate Shafts, diameter as fitted 255Z Thrust Shaft, diameter at collars as fitted 300Z
as fitted None as per Rule 288Z Is the shaft fitted with a continuous liner Yes
as fitted None as fitted 288Z

Liners, thickness in way of bushes as per Rule 16.4Z Thickness between bushes as per rule 12.3Z Is the after end of the liner made watertight in the
as fitted 17.19Z as fitted 16.7Z
boss Yes If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner **Liner in one length.**
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 Yes
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
No If so, state type Length of Bearing in Stern Bush next to and supporting propeller 1345Z

Propeller, dia. 3658Z Pitch 2489Z No. of blades 4 Material **Bronze** Whether Moveable No Total Developed Surface 2465-93 sq. feet
Kind of reversing Engines **Direct reversible with compound air** Is a governor or other arrangement fitted to prevent racing of the engine when de-clutched Yes Means of lubrication
oil Thickness of cylinder liners 38Z Are the cylinders fitted with safety valves Yes Are the exhaust pipes and silencers water cooled or lagged with
insulating material **Both** If the exhaust is led overboard near the waterline, what means are arranged to prevent water from being syphoned back to the engine **Sea funnel**

Water Pumps, No. **Rotary, 175 tons each** Is the sea suction provided with an efficient strainer which can be cleared within the vessel Yes
Pumps worked from the Main Engines, No. 2 Diameter 150Z Stroke 175Z Can one be overhauled while the other is at work Yes
Pumps connected to the Main Bilge Line No. and Size **2 direct driven pumps, 22 tons each, 1 suction bilge pump, 22 tons, 1 after ballast pump, 1 bilge ballast pump**
How driven **By main engines, Electric, Electric, Steam**

Oil Pumps, No. and size **The forward 50 tons steam piston pump, The after 100 tons electric rotary pump, Lubricating Oil Pumps, including Spare Pump, No. and size 2 rotary pumps, 70 tons each**
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 **Three 3 1/2" and two 2 1/2" [Two 2" from cofferdams in way of same]**
Cocks, &c. **None [Two 2 1/2" in hold connected to the forward bilge & ballast pump]**

Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size **One 3 1/2" from bilge pump & one 6" from ballast 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
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 Yes Are they fitted with Valves or Cocks **Both**
Are they fixed sufficiently high on the ship's side to be seen without lifting the platform plates Yes 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
Are all pipes pass through the bunkers **No bunkers** How are they protected Yes
Are all pipes pass through the deep tanks **Main cargo lines** 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 Yes worked from Yes
On 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. 2 No. of stages 3 Diameters 120, 540 & 600Z Stroke 440Z Driven by **Main engines**
Auxiliary Air Compressors, No. 2 No. of stages 3 Diameters 68, 225 & 280Z Stroke 220Z Driven by **Auxil. engines**
Small Auxiliary Air Compressors, No. 1 No. of stages 2 Diameters 34 & 106Z Stroke 80Z Driven by **Steam engine**
Suctioning Air Pumps, No. None Diameter Stroke Driven by
Auxiliary Engines crank shafts, diameter as per Rule 170Z **Stroke and Centre engine out. ANT. 1347**
as fitted 170Z **replaced by two 4cyl. Allais at TAI PING YANG.**

R RECEIVERS:—Is each receiver, which can be isolated, fitted with a safety valve as per Rule Yes
Are the internal surfaces of the receivers be examined Yes What means are provided for cleaning their inner surfaces **of caustic soda solution.**
Is there a drain arrangement fitted at the lowest part of each receiver Yes
High Pressure Air Receivers, No. 8 Cubic capacity of each 3 of 350 litres Internal diameter 450Z thickness 25.5Z
as per Rule 3 of 175Z 3 of 35Z 377-387 kg/cm² Working pressure by Rules 79.5 kg/cm²
Material **Steel** Range of tensile strength, seamless 896-3116 kg/cm²
Seamless, lap welded or riveted longitudinal joint 3 seamless
Low Pressure Air Receivers, No. 2 Total cubic capacity 2 x 15.5 = 31 cubic feet Internal diameter 1800 & 1850Z thickness 25 & 25.5Z
as per Rule 44.2-50.0 kg/cm² Working pressure by Rules 85.6 kg/cm²
Material **Steel** Range of tensile strength 44.2-50.0 kg/cm²
Seamless, lap welded or riveted longitudinal joint Riveted

IS A DONKEY BOILER FITTED? *Yes, two Donkey boilers* If so, is a report now forwarded? *Yes*

PLANS. Are approved plans forwarded herewith for Shafting *29/4/27, 12/5/27, 27/11/27 Receivers 21/4/27* Separate Tanks *30/1/28*

Donkey Boilers *30/6/27* General Pumping Arrangements *25/10/27, 27/11/27* Oil Fuel Burning Arrangements *✓*

SPARE GEAR *For the main engines with compressors & pumps:*
 1 cylinder cover, complete set of all valves, valve castings & springs etc for 1 cylinder cover and, in addition, sets of exhaust valves with 4 extra valves & seats for same, 1 complete set of air inlet valve with 1 extra valve for same, 1 set of starting air valve & 7 complete sets of fuel valves with 8 extra valves & seats for same, 1 cylinder cooling gasket, 1 piston & piston rings & in addition 3 sets of piston rings for one piston, telescopic cooling pipes for one piston, 1 spare link for 2 chain, 1 set of cylinder cover studs & nuts, 1 gudgeon pin, 4 halves of brasses for same, 4 crank pin bolts & nuts & 2 halves of crank bearing, 4 main bearing bolts & nuts & 2 halves of main bearings, 1 set of bolts & nuts for a crank shaft coupling, 1 set of intermediate shaft coupling, 1 propeller shaft with nut, 2 cast iron propellers, 1 cam roller with pin of each size, 1 set of used in the compressor, 2 halves of gudgeon brasses for the compressor, 2 compressor crank pin bolts & nuts & 2 halves of pen brasses, 4 compressor main bearing bolts & nuts & 2 halves of main bearing brasses, 1 set of all working parts for a fuel pump, 1 set of compressor cooling coils, 10 tubes for the HP air cooler, 10 tubes for the LP cooler, 8 bursting covers for the starting air piping, 2 sets of valves & seats for a bilge pump.
For the auxiliary engines with compressors & pumps: 1 complete set of valves for one cylinder with their springs & other fittings, 1 set of studs & nuts for one cylinder cover, 1 gudgeon pin, 1 bush for same, 2 crank pin bolts & nuts & 2 halves of brasses & 4 main bearing bolts & nuts & 4 halves of main bearing brasses, 1 piston, 3 sets of piston rings for one piston, 1 cam roller with pin of each size used in the compressor, 2 sets of valves for the cooling water pump, 1 HP air cooling coil, 2 bursting covers for the cooling gaskets, 1 set of suction & delivery valves for the cooling gaskets, 1 set of suction & delivery valves for the bilge & sanitary pump.
For the donkey boilers: 2 valves, 2 safety valve springs, 12 ordinary & 8 stay tubes, 1 number of open parts for the oil fuel and steam & air power cylinders & the delivery for the main & aux. compressors to the receivers with unions & flanges suitable for use.
 The foregoing is a correct description.

AKTEBOLAGET GOTAVÄRKEN
 Umeå, Sweden
 Manufacturer.

Dates of Survey while building: During progress of work in shops - *1928 March 31, July 7, 19, 23, 26, 27, 30, 31 Aug 1, 3, 7, 8, 10, 10, 13, 14, 15, 17, 16, 16, 17, 20, 21, 23, 28, 29, 29, Sept 3, 8, 11, 12, 13*
 During erection on board vessel - *1928 Oct 10, 20, Nov 6, 23, 29, 30 Dec 4, 5, 6, 8, 11, 13, 17, 17, 19, 20, 21, 21, 27, 28, 29*
 Total No. of visits *94*

Dates of Examination of principal parts - Cylinders *28/8, 29/8, 29/8, 29/8* Covers *29/8, 29/8, 29/8, 29/8* Pistons *29/8, 29/8* Rods *29/8* Connecting rods *29/8*
 Crank shaft *18/28* Flywheel shaft *✓* Thrust shaft *24/10* Intermediate shafts *21/12* Tube shaft *✓*
 Screw shaft *24/10* Propeller *8/9* Stern tube *20/10* Engine seatings *10/10* Engines holding down bolts *20/10*
 Completion of fitting sea connections *6/12* Completion of pumping arrangements *27/12* Engines tried under working conditions *28/8, 29/8, 29/8, 29/8*
 Crank shaft, Material *Steel* Identification Mark *LLOYD 4724973 487857-53 29.8.28 25.1.28* Flywheel shaft, Material *None* Identification Mark *✓*
 Thrust shaft, Material *"* Identification Mark *LLOYD 771402116 EB 24.10.28* Intermediate shafts, Material *Steel* Identification Marks *✓*
 Tube shaft, Material *None* Identification Mark *✓* Screw shaft, Material *Steel* Identification Marks *LLOYD 2799 PK 10.5.28 572, 573 & 574*
 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 *✓*

General Remarks (State quality of workmanship, opinions as to class, &c. *The Main & Auxiliary engines of this vessel have been built under Special Survey and all the requirements of the Rules have been complied with. The workmanship is good and the material fulfils the requirements of the Rules. The shafting as per forging reports attached. Material of starting air receivers as per test sheets attached. The dimensions are as specified and in accordance with the Rules & approved plans. The auxiliary machinery of this vessel consists of one 1-cylinder & two 2-cylinder 4-stroke cycle acting Dual oil engines with cyl. diam 310 mm & stroke 350 mm, manufactured by Messrs AB Gotaverken of this port. The 1-cyl. engine is working a dynamo of 33 KW and the 2-cyl engines engines a dynamo of 66 KW each. The main & auxiliary engines have been tested under full working power on a nine day trial trip & found to work satisfactorily.*

The Machinery of this vessel is eligible in our opinion to be classed in the Register Book of this Society with notation of *+ LHC 12.28.*
 Working pressure of donkey boilers *150 lbs/sq"*

The amount of Entry Fee ... *Rs 109.20*
 Special ... *Rs 2093.84*
 Starting air receivers Donkey Boiler Fee ... *Rs 152.88*
 Travelling Expenses (if any) £ *11.2.29*

V. Paulow G. Snander E. Berner
 Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute
 Assigned *L. M. C. 12.28 Oil Engines*
L.S.P. - 150 lbs/sq"



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