

## REPORT ON OIL ENGINE MACHINERY.

No. 5306

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No. in Survey held at Göteborg Date, First Survey 5th January 1921 Last Survey 10th March 1923

Reg. Book 79774 on the Single Twin Triple Screw vessels "LUOSSA" Number of Visits 88

Master ✓ Built at Göteborg By whom built Aktieb. Götaverken Yard No. 359 When built 1923

Engines made at Göteborg By whom made Aktieb. Götaverken Engine No. 623-24 When made 1923

Donkey Boilers made at Göteborg By whom made Aktieb. Götaverken Boiler No. 1484 When made 1923

Brake Horse Power ✓ Owners Trafikaktieb. Gångutrustning-Octörund Port belonging to Stockholm

Nom. Horse Power as per Rule 482 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

OIL ENGINES, &c. — Type of Engines Two Diesel Oil Engines 2 or 4 stroke cycle 4 Single or double acting Single

Maximum pressure in cylinders 36 kg/cm<sup>2</sup> No. of cylinders 2 x 6 = 12 No. of cranks 2 x 6 = 12 Diameter of cylinders 590 mm (23 1/8")

Length of stroke 900 mm (35 1/16") Revolutions per minute 135 Means of ignition Diesel system Kind of fuel used Texas oil

Is there a bearing between each crank Yes Span of bearings (Page 92, Section 2, par. 7 of Rules) 788 mm

Distance between centres of main bearings 1180 mm Is a flywheel fitted Yes Diameter of crank shaft journals as per Rule 356 mm as fitted 365 mm

Diameter of crank pins 365 mm Breadth of crank webs as per Rule 780 mm as fitted 780 mm Thickness of ditto as per Rule 295 mm as fitted 295 mm

Diameter of flywheel shaft as per Rule 356 mm as fitted 365 mm Diameter of tunnel shaft as per Rule 236 mm as fitted 280 mm Diameter of thrust shaft as per Rule 840 mm as fitted 295 mm

Diameter of screw shaft as per Rule 258 mm as fitted 315 mm Is the screw shaft fitted with a continuous liner the whole length of the stern tube No liner fitted

Is the after end of the liner made watertight in the propeller boss ✓ If the liner is in more than one length are the joints burned ✓

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 ✓

If two liners are fitted, is the shaft lapped or protected between the liners ✓ If without liners, is the shaft arranged to run in oil Yes

Type of outer gland fitted to stern tube Ederwall's prot. box Length of stern bush 1400 mm Diameter of propeller 3352 mm

Pitch of propeller 2820 mm No. of blades 4 state whether moveable No Total surface 3.53 square feet

Method of reversing Brown's gear Is a governor or other arrangement fitted to prevent racing of the engine when declutched Yes Thickness of cylinder liners 375-482

Are the cylinders fitted with safety valves Yes Means of lubrication Mechanical Are the exhaust pipes and silencers water cooled or lagged with non-conducting 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 The exhaust is led to the funnel

No. of cooling water pumps 2 Is the sea suction provided with an efficient strainer which can be cleared within the vessel Yes No. of bilge pumps fitted to the main engines None Diameter of ditto ✓ Stroke ✓

Can one be overhauled while the other is at work ✓ No. of auxiliary pumps connected to the main bilge lines 2 How driven By electric motor

Sizes of pumps Diam = 165 mm; Stroke = 130 mm No. and sizes of suctions connected to both main bilge pumps and auxiliary bilge pumps: — In engine room Two 3 1/2" One 3 1/2" and in holds, etc. Two 3 1/2" in each hold No. of ballast pumps 2 How driven By electric motor Sizes of pumps One 110 tons bucket pump One 300 " centrif. "

Is the ballast pump fitted with a direct suction from the engine room bilges Yes State size 8" Is a separate auxiliary pump suction fitted in ✓

Engine Room and size Yes, two 3' Are all the bilge suction pipes fitted with roses Yes Are the roses in Engine Room always accessible Yes

Are the sluices on Engine Room bulkheads always accessible None fitted Are all connections with the sea direct on the skin of the ship Yes

Are they valves or cocks Both Are they fixed sufficiently high on the ship's side to be seen without lifting the floor plates Yes

Are the discharge pipes 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 all pipes, cocks, valves and pumps in connection with the machinery accessible at all times Yes Are the bilge suction pipes, cocks and valves arranged so as to prevent any communication between the sea and the bilges Yes Is the screw shaft tunnel watertight Yes Is it fitted with a watertight door Yes

worked from Upper engine room platform If a wood vessel, what means are provided to prevent leakage of either fuel oil or of lubricating oil from saturating the woodwork ✓

No. of main air compressors 2 No. of stages 3 Diameters 36, 590, 580 mm Stroke 300 mm Driven by Main engines

No. of auxiliary air compressors 1 No. of stages 2 Diameters 350, 400 mm Stroke 260 mm Driven by Electric motors

No. of small auxiliary air compressors 1 No. of stages 2 Diameters 34, 106 mm Stroke 80 mm Driven by Steam engine

No. of scavenging air pumps None fitted Diameter ✓ Stroke ✓ Driven by ✓

Diameter of auxiliary Diesel Engine crank shafts as per Rule 154 mm as fitted 154 mm Are the air compressors and their coolers made so as to be easy of access Yes

IR RECEIVERS: — No. of high pressure air receivers 8 Internal diameter 450, 358, 182 mm Cubic capacity of each 350, 175, 30 liters

material Steel Seamless, lap welded or riveted longitudinal joint 5" Seamless (30 liters) Seamless — 36.1-40.1 kg/cm<sup>2</sup> Range of tensile strength lap welded 34.0-36.1"

thickness 25, 21, 12 mm working pressure by Rules 65 kg/cm<sup>2</sup> No. of starting air receivers 2 Internal diameter 1800 mm

Total cubic capacity 400 cubic feet (11.3 m<sup>3</sup>) Material Steel Seamless, lap welded or riveted longitudinal joint Riveted longitudinal joint

Range of tensile strength 45.7-47.3 kg/cm<sup>2</sup> thickness 25 mm Working pressure by rules 26.5 kg/cm<sup>2</sup> 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 Yes What means are provided for cleaning their inner surfaces The high pressure receivers by means of caustic soda. Is there a drain arrangement fitted at the lowest part of each receiver Yes



If so, is a report now forwarded? *Yes.*

DESCRIPTION.	DATE OF TEST.	WORKING PRESSURE.	TEST PRESSURE.	STAMPED.	REMARKS.
ENGINE CYLINDERS .....					INJECTION AIR RECEIVERS MAN
" " COVERS [COOLING WATER] SPACES	16/8/22 ✓ 4/9/22	✓ 1.0 kg/cm <sup>2</sup>	✓ 5.0 kg/cm <sup>2</sup>	✓ R	Main engine ordinary: No. 4011 LLOYDS TEST 1846 LBS/1"
" " JACKETS .....	23/30/5/22	" "	4.0 "	R	
" PISTON OIL WATER PASSAGES .....	19/7/22	" "	6.0 kg/cm <sup>2</sup>	R	30.11.21. J.C.
MAIN COMPRESSORS—1st STAGE .....	31/8/22	65.0 kg/cm <sup>2</sup>	130.0 "		Main engine spare: No. 14.16 LLOYDS TEST 1846 LBS 30.11.21. J.C.
" 2nd " COOLING WATER " SPACES	6/9/22	1.0 "	5.0 "		
AIR COOLERS 3rd " .....	8/5/22 13/5/22	50.30 kg/cm <sup>2</sup>	15.40 "	R	
AIR RECEIVERS—STARTING .....	14/5/21	25.0 "	39.0 "	R	AS. 21.22 1500 TEST 39 KG. AS. 25 KG. 21.5.1921.
" INJECTION .....	31/8/22	65.0 "	130.0 "		
AIR PIPES .....	5/12/22 19/2/22	25.65 kg/cm <sup>2</sup>	As per Rule		Auxiliary engine ordinary: No. 536.4 LLOYDS TEST 1846 LBS 30.11.21. J.C.
FUEL PIPES .....	19/12/22	65.0 "	" "		
FUEL PUMPS .....	8/3/22	65.0 "	100.10. kg/cm <sup>2</sup>	R	Auxiliary engine spare: No. 16 LLOYDS TEST 1846 LBS 30.11.21. J.C.
SILENCER .....					
" WATER JACKET .....	22/8/22	1.0 kg/cm <sup>2</sup>	4.0 kg/cm <sup>2</sup>	R	
SEPARATE FUEL TANKS .....	22/3/21		0.75 "	R	

SPARE GEAR For the main engines:—

*The foregoing is a correct description*

AKTIEBOLAGET GÖTAVERKEN  
Russ. A. Neshin

Dates of Examination of principal parts—Cylinders 16/8/99, 4/9/99 Covers 23.30/99 Pistons 19/7/99 Rods 13/5/99 Connecting rods 13/5/99  
Crank shaft Thrust shaft Tunnel shafts Screw shaft 18/9/99 Propeller 2/9/99 Stern tube 19/9/99 Engine seatings 4/9/99

Engines holding down bolts	Completion of pumping arrangements	19/12/22	Engines tried under working conditions	10/3/23
Completion of fitting sea connections	Start tube (Stern tube) (port)	14/9/22	Screw shaft and propeller	22/9/22

Material of crank shafts	Steel	Identification Mark on Do.	6110, 6105 5.21 CK	6108, 6107 5.21 CK	Material of thrust shafts	Steel	Identification Mark on Do.	5.21 CK
Material of tunnel shafts	Steel	Identification Marks on Do.	See below	Material of screw shafts	Steel	Identification Mark on Do.	See below	

Is the flash point of the oil to be used over 150° F. *Yes* ✓

Is this machinery duplicate of a previous case Yes ✓ If so, state name of vessels "HEMLAND," "STRASSA," "LAPONIA" & "LULEÅ"

*General Remarks* (State quality of workmanship, opinions as to class, etc.) *Identification marks:*—

*Standard tunnel shafts:*

LLOYDS N <sup>o</sup> 3069, 3065, 3063, 3064 + 3061 W.G.H. (H)	Port tunnel shafts: LLOYDS N <sup>o</sup> 2957, 2947, 2948, 2949 + 2950 W.G.H. (H)	Small engine crank shafts: B 5116 A.S. 19.390 E 5135 A.S. 9.480 LLOYDS N <sup>o</sup> 5375 W.G.H. 64-18.5.88	Spare prop. shafts: LLOYDS N <sup>o</sup> 3059 W.G.H. (H)
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The main and auxiliary engines of this vessel have been built under special survey and all the requirements of the Rules have been complied.

To be continued.

The machinery of this vessel is worthy in our opinion to be  
 classed in the Register Book of this Society with the notation of  
 +LNC 3.93, being in a good and safe working condition.

The amount of Entry Fee	...	£	91.00	✓	When applied for.
Special	...	£	1,770.86	9th March 1992	
Donkey Boiler Fee	...	£	:	:	When received.
Travelling Expenses (if any)	...	£	:	:	2nd Nov 1992

Committee's Minute FRI. 23 MAR. 1973

*Assigned*

+dumb 3.23 Oil Engines O.G.  
SP-100th

W. Bulow

A Sundén, Engineer Surveyor to Lloyd's Register of Shipping.

Port of Göthenburg Continuation of Report No. 5306 dated 14<sup>th</sup> March 1923 on the

Machinery of  $\frac{4}{5}$ " "LUOSSA." No 79774 in Supplement.

The workmanship is good and the material fulfils the requirements of the Rules. The dimensions as specified and in accordance with the Rules and approved plans. Please see Secretary's letter initialed E of the 6<sup>th</sup> September 1920, 2<sup>nd</sup> and 13<sup>th</sup> May 1921 and Gothenburg letter initialed E of 30<sup>th</sup> Aug. 1920, 21<sup>st</sup> February and 4<sup>th</sup> May 1921.

The main engines were tested under full working power on a six hours trial trip and proved to work satisfactorily both ahead and astern.

The auxiliary engines were tested under full working power and found in good working conditions.

The auxiliary machinery consists of:-

Three two cylinders, 4-stroke single acting Diesel Oil Engines of cyl. diam 295 mm and stroke 330 mm each working a dynamo of 50 KW, 220 volts and 298 amperes, which have to supply the electric current motive power to the following:-

One 23 HP shunt wound motor for working the ballast pump,  
One 40 HP " " " " " " and bilge pump.  
Two 6.5 HP " " motors " " " bilge and sanitary pumps,  
Two 15 HP " " " " " " cooling water pumps,  
Two 10 HP " " " " " " lubrication oil pumps,  
Two 6 HP serie " " " " " " main engine turning gears,  
One 15 HP shunt " motor " " " oil pump to the daily service oil tank,  
One 90 HP compound " " " " " auxiliary air compressor,  
One 5 HP shunt " " " " " drilling machine & turning lathe,  
One 46 HP compound " " " " " windlass,  
Eight 12.5 HP serie " motors " " " winches,  
Two 21 HP " " " " " " — " —  
One 26.8 HP shunt " motor " " " steering engine.

Also electric current for the lighting purpose with the voltage reduced from 220 volts to 110 volts after having passed the transformer.

Two 120 tons centrifugal pumps for the cooling water, ✓  
One 110 " bucket pump for the bilge and ballast purpose, ✓  
One 300 " centrifugal ballast pump, ✓  
Two 15 " rotary oil pump for the forced lubrication, ✓  
One 50 " " " " " " daily service tanks, ✓

Two 8x20" plunger pumps for bilge discharging and sanitary purpose. Three pumps have two plungers each Diam. 6 1/2", Stroke - 9".

This vessel is fitted with wireless telegraphy of Telefunken system.

Spare gear continued:

4 connecting rod top-end bolts and nuts and 4 lower halves of bearings,  
4 connecting " bottom-end " " " " 3 upper " " " "  
8 main bearing studs and nuts and 2 halves of main bearings,  
1 set of coupling bolts for the crank shaft, 1 set of coupling bolts for the  
intermediate shafts, 1 set of piston rings for one main compressor, 1 complete set of  
all working parts for a fuel pump, and 12 extra plungers for same, 1 set of



Machinery of "1/5 LUOSSA" No 79774 in supplement.

cylinder cover studs and nuts, 1 cylinder liner, 1 complete set of all springs for one engine and compressor, 3 cam rollers with pins for exhaust valves, 1 ditto for the starting air valves and 13 ditto for the fuel valves, 1 high pressure air cooling spiral for the compressors, 12 brass tubes for the compressor air coolers, 1 propeller shaft with nut, 2 propellers, 2 stopping rings for the bedwalls protecting boxes, and 1 set of springs for the same, A quantity of bolts and nuts and different lengths of spare pipes with unions and flanges for each.

For the auxiliary engines:-

4 complete sets of discharge valves with springs etc. which can be used as air suction valves and 2 extra valves and spindles for the same, 4 complete sets of fuel valves and 2 extra valves for the same, 1 starting air valve, 2 sets of piston rings for one piston, 2 halves of connecting rod top-end bearings, 2 connecting rod bottom-end bolts and nuts and 2 halves of bearings for the same, 3 sets of piston rings for one compressor, 3 sets of valves for one compressor, 1 complete set of working parts for one fuel pump, 1 set of cylinder cover bolts and nuts, 1 complete set of springs for one engine, 1 safety valve spring of each size, 2 halves of connecting rod top-end bearing for the auxiliary electric driven compressor,  
 2 " " " " " " " " " " " "  
 1 set of piston rings and 1 set of valves " " " " " " "  
 2 sets of valves for the bilge pumps, A quantity of bolts and nuts and different lengths of pipes with unions and flanges suitable for each.

For the Donkey boiler:-

1 safety valve spring, 1 set of feed check valve, 1/2 set of feed pump valves.

A Sundin Ap. Snander



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