

## REPORT ON OIL ENGINE MACHINERY.

No. 6177

2 SEP 1925

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Date of writing Report 29th Aug. 1925 When handed in at Local Office 29th Aug. 1925 Port of Gothenburg  
 No. in Survey held at Gothenburg Date, First Survey 20th Aug. 1924 Last Survey 29th Sept. 1925  
 Reg. Book 39704 on the Single Twin Triple Screw vessels "AXEL JOHNSON" Tons { Gross 4896 Net 2853  
 Master ✓ Built at Gothenburg By whom built A.B. GÖTAVERKEN Yard No. 391 When built 1925  
 Engines made at GOTHENBURG By whom made A.B. GÖTAVERKEN Engine No. 676 677 When made 1925  
 Donkey Boilers made at LONGHOBOROUGH By whom made H.W. COLTMAN & CO. L2 Boiler No. 4746 When made 1925  
 Brake Horse Power ✓ Owners FEDERIAKTIEB. NORDSTJERNAN Port belonging to STOCKHOLM  
 Nom. Horse Power as per Rule 632 623 Is Refrigerating Machinery fitted for cargo purposes YES 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 500 lb. 35 kg/cm<sup>2</sup> No. of cylinders 2x6 = 12 No. of cranks 2x6 = 12 Diameter of cylinders 590 mm [23 1/8"]  
 Length of stroke 1200 mm [47 1/4"] Revolutions per minute 120 Means of ignition Diesel system Kind of fuel used Crude oil  
 Is there a bearing between each crank Yes Span of bearings (Page 92, Section 2, par. 7 of Rules) 826 mm  
 Distance between centres of main bearings 1160 mm Is a flywheel fitted Yes Diameter of crank shaft journals as per Rule 376 mm  
 Diameter of crank pins 376 mm Thickness (parallel) of crank webs as per Rule 235 mm Thickness of metal around eyelets as per Rule 164 mm  
 Diameter of flywheel shaft as per Rule 376 mm Diameter of tunnel shaft as per Rule 253 mm Diameter of thrust shaft as per Rule 266 mm  
 Diameter of screw shaft as per Rule 279 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 Cedervall's gland Length of stern bush 1600 mm Diameter of propeller 3660 mm  
 Pitch of propeller 3490 mm No. of blades 4 state whether moveable No Total surface 2x4/8 = 8.36 m<sup>2</sup> square feet  
 Method of reversing Brown gear Is a governor or other arrangement fitted to prevent racing of the engine when declutched Yes Thickness of cylinder liner as per Rule 45 mm  
 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 a 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 2 Diameter of ditto 155 mm Stroke 175 mm  
 Can one be overhauled while the other is at work Yes No. of auxiliary pumps connected to the main bilge lines 2 How driven By electric motors  
 Sizes of pumps Diam 165 mm Stroke 230 mm No. and sizes of suction connected to both main bilge pumps and auxiliary bilge pumps: — In engine room One 3" in tunnel well  
 and in holds, etc. Two 3" in No. 1, 2, 3 & 5, four 3" in No. 4 hold No. of ballast pumps 1 How driven By electric motor Sizes of pumps 100 tons, plunger pump  
 The ballast pump is also connected to the main bilge line. Is the ballast pump fitted with a direct suction from the engine room bilges Yes State size 6" Is a separate auxiliary pump suction fitted in Yes  
 Engine Room and size Yes, two 3 1/2" 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 No, by lifting of small plates  
 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 120, 520 & 580 mm Stroke 490 mm Driven by Main engines  
 No. of auxiliary air compressors 1 No. of stages 3 Diameters 78, 285 & 318 mm Stroke 220 mm Driven by Auxil. engines  
 No. of small auxiliary air compressors 1 No. of stages 2 Diameters 35 & 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 162 mm as fitted 162 mm Are the air compressors and their coolers made so as to be easy of access Yes  
 AIR RECEIVERS: — No. of high pressure air receivers 8 Internal diameter Two 358 mm Two 197 mm Cubic capacity of each 350, 175 & 35 litres

material S.M. Steel Seamless, lap welded or riveted longitudinal joint Lap welded & seamless Range of tensile strength As per Rule  
 thickness 25, 21 & 9 mm working pressure by Rules 65 kg/cm<sup>2</sup> No. of starting air receivers 2 Internal diameter 1850 & 1800 mm  
 Total cubic capacity 15.25 MET<sup>3</sup> Material S.M. Steel Seamless, lap welded or riveted longitudinal joint Riveted joints  
 Range of tensile strength 46.2-49.6 kg/cm<sup>2</sup> thickness 25.5 & 25 mm Working pressure by rules 25.0 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 air receivers by means of caustic soda  
 Is there a drain arrangement fitted at the lowest part of each receiver Yes



IS A DONKEY BOILER FITTED? *Yes*

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

HYDRAULIC TESTS:—

DESCRIPTION.	DATE OF TEST.	WORKING PRESSURE.	TEST PRESSURE.	STAMPED.	REMARKS.
ENGINE CYLINDERS .....					MARKS ON INJECTION AIR RECEIVERS:
" " COVERS .....	16/5/25, 27/5/25, 12/6/25	1.0 kg/cm <sup>2</sup>	5.0 kg/cm <sup>2</sup>	R	Main engine working N <sup>o</sup> 180.184 LLOYD'S TEST 1850 LBS. W.P. 985 LBS. 7.0.25.10.24
" " JACKETS .....	18/9/25	1.0 "	5.0 "	R	
" " PISTON WATER PASSAGES .....	21/4/25, 24/4/25, 27/4/25	65.0 "	130.0 "	R	Main engine spare:— N <sup>o</sup> 173.177 LLOYD'S TEST 1850 LBS. W.P. 985 LBS. 7.0.25.10.24
MAIN COMPRESSORS—1st STAGE .....	9.22.27/4/25	1.0 "	5.0 "	R	
" " 2nd " .....	21/4/25, 24/4/25, 27/4/25	5.20.0 "	10.40 "	R 10KG DATE.	
" " 3rd " .....	12/3/25, 9/4/25	95.0 "	39 "	R 112 114 LLOYD'S TEST 39 KG W.P. 985 LBS. 7.0.25.10.24	
AIR RECEIVERS—STARTING .....	25/5/25	65.0 "	130 "	R 75KG DATE.	
" " INJECTION .....	17/6/25, 29/7/25	25.65.0 "	75 & 130 "	R 130KG DATE.	
AIR PIPES .....	29/7/25	65.0 "	130 "	R	Main engine spare:— N <sup>o</sup> 186 LLOYD'S TEST 1850 LBS. W.P. 985 LBS. 7.0.25.10.24
FUEL PIPES .....	4.5/2/25	65.0 "	100 "	R	
FUEL PUMPS .....	✓	"	"		
SILENCER .....	17/4/25	1.0 "	3.0 "	R 1.0 KG	
" " WATER JACKET .....	3/6/25	✓	1.0 "	R 4.3.6.25	
SEPARATE FUEL TANKS .....					

PLANS. Are approved plans forwarded *under separate cover* for shafting *Yes*

Receivers *Yes*

Separate Tanks

23/3/25

SPARE GEAR *For the main engines:—*

1 cylinder cover complete with all valves, valve seats, springs etc. and in addition 11 complete sets of discharge valves & 3 extra valves for same, 1 air inlet valve, 1 complete set of starting air valve, 5 complete sets of fuel valves and 3 extra valves for same, 1 cylinder liner and cooling jacket with bolts & nuts for connecting to the cylinder cover, 1 piston complete with piston rings and in addition 3 sets of piston rings for one piston, 1 piston rod, 4 connecting rod top end bolts & nuts and  
To be continued.

The foregoing is a correct description,

*Cross & Veder* Manufacturer.

Dates of Survey while building  
During progress of work in shops:—  
1994: Sept 20, Oct 3, 19, 23, 27 Nov 28. 1995: Jan 24, 30, 31, Feb 4, 4, 5, 10, 12, 23, March 2, 4, 5, 7, 11, 12, 13, 14, 18.  
April 6, 8, 9, 14, 16, 17, 21, 22, 23, 24, 25, 27, 28, 30 May 14, 15, 16, 25, 27, June 12, 13, 15, 16, 17, 18, July 29.  
During erection on board vessel:—  
1995: April 9, 15, 27 May 12, 20, 26, June 3, 5, 17, 18, 20, 23, Aug 4, 5, 7, 10, 15, 20, 21, 22.  
Total No. of visits 70

Dates of Examination of principal parts—Cylinders 16.27/5/25, 12/6/25 Covers 12/3/25 Rods 27/10/25 Connecting rods 2/3/25, 18/6/25  
Crank shafts 14/10/24 Thrust shafts 5/6/25, 15/6/25 Tunnel shafts 1/25, 25/25 Screw shaft 18/5/25 Propeller 17/4/25 Stern tube 9/4/25 Engine seatings 9/4/25  
Engines holding down bolts 4/3/25 Completion of pumping arrangements 15/8/25 Engines tried under working conditions 22/8/25  
Completion of fitting sea connections 12/5/25 Stern tube 27/4/25 Screw shaft and propeller 12/5/25

Material of crank shaft *S.M. Steel* Identification Mark on Do. *LLOYD'S 75.55.25.29 N<sup>o</sup> 58.19.5620* Material of thrust shaft *S.M. Steel* Identification Mark on Do. *LLOYD'S 75.55.25.29 N<sup>o</sup> 58.19.5620*  
Material of tunnel shafts *S.M. Steel* Identification Marks on Do. *See below* Material of screw shafts *S.M. Steel* Identification Marks on Do. *LLOYD'S 75.55.25.29 N<sup>o</sup> 58.19.5620*

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 vessel *"AGRA"*

General Remarks (State quality of workmanship, opinions as to class, &c.) Identification marks on shafting:—  
Port tunnel shafts:—  
Starboard tunnel shafts:—  
Stern prop. shaft:—

LLOYD'S	LLOYD'S	LLOYD'S	LLOYD'S	LLOYD'S	LLOYD'S	LLOYD'S	LLOYD'S	LLOYD'S	LLOYD'S	LLOYD'S	LLOYD'S	LLOYD'S	LLOYD'S	LLOYD'S	LLOYD'S
N <sup>o</sup> 915	N <sup>o</sup> 914	N <sup>o</sup> 912	N <sup>o</sup> 12195	N <sup>o</sup> 12121	N <sup>o</sup> 874	N <sup>o</sup> 910	N <sup>o</sup> 12099	N <sup>o</sup> 12097	N <sup>o</sup> 12130	N <sup>o</sup> 1559	N <sup>o</sup> 1647	N <sup>o</sup> 1635	N <sup>o</sup> 12126	N <sup>o</sup> 12124	N <sup>o</sup> 12122
GA. 15.5.25	GA. 30.4.25	GA. 5.5.25	GA. 30.4.25	GA. 21.4.25	GA. 20.5.25	GA. 15.5.25	GA. 25.4.25	GA. 25.4.25	GA. 21.4.25	GA. 17.2.25	GA. 21.4.25	GA. 13.2.25	GA. 13.2.25	GA. 13.2.25	GA. 13.2.25

The main and 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 materials fulfils the requirements of the Rule.

This vessel is worthy in our opinion to be classed in the Register Book of this Society with the notation of *LHC 8.25*

Working pressure of the Donkey boiler 85 lbs/p<sup>2</sup>

The amount of Entry Fee ... *Rs 109 : 20* When applied for, ...

Special ... *Rs 1938 : 30* When received, ...

Donkey Boiler Fee ... £ : : When received, ...

Travelling Expenses (if any) £ : : When received, ...

Committee's Minute

Assigned

Oil Signes

CERTIFICATE



Machinery of the Motorship "AXEL JOHNSON" N<sup>o</sup> 37904 in the Supplement.

The dimensions are as specified and in accordance with the Rules and approved plans. The main engines were tested under full working power on a seven hours trial trip and found to work satisfactorily both ahead and astern. The auxiliary engines have also been tested under full working power and found in good order.

The auxiliary machinery consists of:-

Two 3-cylinders and one 2-cylinders, 4-stroke cycle, single acting, Diesel oil engines of cylinder diam 310<sup>mm</sup> & stroke 350<sup>mm</sup>. The 3-cyl. engines working dynamo of 100 Kw. 220 volts and 455 amp and the 2-cyl engine a dynamo of 66 Kw. 220 volts and 300 amp. which have to supply the electric motive power to the following:-

One 40 ~~HP~~ shunt wound motor working the ballast pump.

Two 8" " " motors " " bldg. sanitary pumps.

Two 45 " " " " " " {cooling water pumps and the  
lubricating oil pumps combined.

One 6 " " " motor " " oil pumps to the daily fuel tanks.

Two 40 " " motor " " Refrigerating machines.

Three 4 " " " " " " feed. circulating pumps.  
Two 3 " }

Two 3 " }  
Two 4.5 " } " " " " " " fans.  
Two 2 " }

Two 9. " } fans

One 9 " " motor " " " (stores) machinery

Two 1.5 " " " motors " " " " feed & circulating pumps.

Two 6 " screw " " " " Main engine turning gear.

One 3 " shunt " motor " " Drilling machine & turning lathe.

Cone 60 " " " " " " windlass

One 20 " " " " " " steering engine.

Ten 25 " serie " motors " " windlass.

Cue 17 " " motor " " moving winch.

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

The vessel is also fitted with wireless telegraphy of the Telefunken system.

One 100 tons plunger pump for the ballast, bilge pumps.

Two 3x20 tons trunk-piston pumps for the bilge and sanitary pumps.

These pumps have three pistons each of cyl. diam 165 $\frac{3}{4}$  in stroke 230 $\frac{3}{4}$  in.

Two 150 tons centrifugal pumps for the cooling water.

Two 60 ton rotary pumps " " lubricating oil.

One 20 " " pump " " oil to the daily fuel service tanks.

Spare gear continued:

4 halves of top-end brasses, 4 connecting rod bottom end bolts and nuts and 3 halves of bottom brasses, 4 main bearing bolts & nuts,

2 halves of main bearing brasses, 4 compressor connecting rod bottom end  
To be continued.

To be continued.

REMOVED 4.47.  
2, 5 cyl Diesel eng.  
@ 110 kw. and  
One 3 cyl Diesel eng.  
@ 112 kw fitted.  
(See Slip attached  
to Rpt. 13).



## Machinery of the Motorship "AXEL JOHNSON" No 37904 in the Supplement.

bolts and nuts and one half of bottom end brasses for same, 1 set of coupling bolts for the crank shaft, 1 set of coupling bolts for the intermediate shafts, 1 propeller shaft with nut, 2 propellers, 1 set of all working parts for one fuel pump, 1 set of springs for one engine, 1 set of piston rings for one compressor, 1 set of valves for one compressor, 1 cam roller with pin of each size, 1 HP air cooling coil for the compressor, 6 bursting covers for the starting air piping, 1 spindle for the fuel valve overflow valve.

For the auxiliary engines:—

4 complete sets of discharge valves which also can be used as air inlet valves, and 2 extra valves for same, 2 complete sets of fuel valves and 2 extra valves for same, 1 complete set of starting air valve, 2 sets of piston rings for one piston, 1 set of connecting rod top end brasses, 2 connecting rod bottom end bolts and nuts and 1 set of bottom end brasses, 4 main bearing bolts and nuts and 2 halves of main bearing brasses, 1 set of all working parts of a fuel pump, 1 set of springs for one engine, 1 set of valves for one compressor, 1 set of piston rings for one compressor, 1 HP compressor air cooling coil 1 spindle for the fuel valve overflow valve.

1 set of valves for the bilge & sanitary pumps,  
 1 set of valves " " ballast pump.  
 1 safety valve spring for the donkey boiler,  
 1 check valve " " " " "  
 1/2 set of valves " " " " " feed pump.

6 water glasses " " " " "

A quantity of assorted bolts and nuts and lengths of pipes with unions and flanges for the fuel and air delivery for both main and auxiliary engines and compressors.

V. Nilow

L. Mander.