

Rpt. 4b

Date of writing report 15th April, 1958
Survey held at GothenburgReceived London
In shops 32
No. of visits On vessel 20Port Gothenburg
19/6 1957
First date 13/2 1958No. 24060
13/2 1958
Last date 27/3 1958

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. 02776 Name "AXEL JOHNSON"
Owners Rederi A-B. Nordstjernan Managers Axel Axelson Johnson Jr.
Hull built at Gothenburg By A-B. Götaverken
Main Engines made at Hamburg/Gothenburg By Henschel Maschinenbau G.m.b.H.
Gearing made at Bremen By and A-B. Lindholms Varv
Donkey boilers made at By A.G. Weser
Machinery installed at Gothenburg By A-B. Lindholms Varv

Particulars of restricted service of ship, if limited for classification
Particulars of vegetable or similar cargo oil notation, if required
Is ship to be classed for navigation in ice? Yes
Is refrigerating machinery fitted? Yes
Is the refrigerating machinery compartment isolated from the propelling machinery space? No
Is ship intended to carry petroleum in bulk? No
If so, is it for cargo purposes? Yes
Type of refrigerant Freon 12
Is the refrigerated cargo installation intended to be classed? Yes

The following particulars should be given as fully and as clearly as possible. Where the answer is "No" or "None", say so! Ticks and other signs of doubtful meaning are not to be used. Where the wording is not applicable to the installation, a black line may be inserted. If the main engines have been constructed at another port and are covered by a separate report, the particulars given in that report need not be repeated below, but the port and report number should be stated.

No. of main engines 2 No. of propellers 2 Brief description of propulsion system Single Reduction Hydraulic Coupling
MAIN RECIPROCATING ENGINES. Licence Name and Type No. Pielstick Type 6 L - 6 PC. Supercharged.

No. of cylinders per engine 6 Dia. of cylinders 400 mm. stroke(s) 460 mm. 2 or 4 stroke cycle 4 Single or double acting Single
Maximum approved BHP per engine 1920 at 425 RPM of engine and 150 RPM of propeller.
Corresponding MIP 13.07 kg/cm² (For DA engines give MIP top & bottom) Maximum cylinder pressure 75 kg/cm² Machinery numeral 768
Are the cylinders arranged in Vee or other special formation? No If so, number of crankshafts per engine

TWO STROKE ENGINES. Is the engine of opposed piston type? No If so, how are upper pistons connected to crankshaft?
Is the exhaust discharged through ports in the cylinders or through valve(s) in the cylinder covers? No No. and type of mechanically driven scavenge pumps or blowers per engine and how driven
No. of exhaust gas driven scavenge blowers per engine Where exhaust gas driven blowers only are fitted, can the engine operate with one blower out of action?
If a stand-by or emergency pump or blower is fitted, state how driven No. of scavenge air coolers Scavenge air pressure at full power

FOUR STROKE ENGINES. Is the engine supercharged? Yes Are the undersides of the pistons arranged as supercharge pumps? No No. of exhaust gas driven blowers per engine 1 No. of supercharge air coolers per engine 1 Supercharge air pressure 0.58 kg/cm² Can engine operate without supercharger? Yes
Exhaust 2 Starting 1 Safety 1

TWO & FOUR STROKE ENGINES—GENERAL. No. of valves per cylinder: Fuel 1 Inlet 2 Exhaust 2 Starting 1 Safety 1
Material of cylinder covers Cast Iron Material of piston crowns Aluminium Is the engine equipped to operate on heavy fuel oil? No
Cooling medium for :—Cylinders Water Pistons Fuel valves Fuel oil Overall diameter of piston rod for double acting engines
Is the rod fitted with a sleeve? (One piece) Is welded construction employed for: Bedplate? Yes Frames? Yes Entablature? Yes Is the crankcase separated from the underside of pistons? No Is the engine of crosshead or trunk piston type? Trunk Total internal volume of crankcase 5.7 M³
No. and total area of explosion relief devices 6 x 117 cm² Are flame guards or traps fitted to relief devices? Yes Is the crankcase readily accessible? Yes If not, must the engine be removed for overhaul of bearings, etc? No Is the engine secured directly to the tank top or to a built-up seating? Built-up seating How is the engine started? Compressed air

Can the engine be directly reversed? Yes If not, how is reversing obtained? P = 13 hours S = 11 hours
Has the engine been tested working in the shop? P = 62 S = 62 How long at full power? 17.5.1956 7.7.1956 State barred speed range(s), if imposed

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 17.5.1956 7.7.1956
for working propeller For spare propeller Is a governor fitted? Yes Is a torsional vibration damper or detuner fitted to the shafting? Yes
Where positioned? Forward end of Crankshaft Type Pendulum No. of main bearings 7 Are main bearings of ball or roller type? No Distance between inner edges of bearings in way of crank(s) 559 mm. Distance between centre lines of side cranks or eccentrics of opposed piston engines

Crankshaft type: Built, semi-built, solid. (State which) Solid
Diameter of journals 270 mm. Diameter of crankpins Centre 260 mm. Side Breadth of webs at mid-throw 430 mm. Axial thickness of webs 124 mm.
If shrunk, radial thickness around eyeholes Are dowel pins fitted? Crankshaft material Journals Pins Minimum Yield point
Tensile strength 35 kg/mm² Approved not less than

Diameter of flywheel 1480 mm. Weight 560 kgs. Are balance weights fitted? Yes Total weight 1512 kgs. Radius of gyration 183.6 mm.
Diameter of flywheel shaft Minimum approved tensile strength
Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) Integral with crank shaft

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MAIN GAS TURBINES. Name and Type No.

No. of sets of turbines Open or closed cycle BHP per set at RPM of output shaft
 How is drive transmitted to propeller shaft?
 ARRANGEMENT OF TURBINES. HP drives at RPM HP gas inlet temperature pressure
 (A small diagram should be attached showing gas cycle.) IP drives at RPM IP gas inlet temperature pressure
 LP drives at RPM LP gas inlet temperature pressure
 No. of air compressors per set Centrifugal or axial flow type? Material of turbine blades Material of compressor blades
 No. of air coolers per set No. of heat exchangers per set How are turbines started?
 How is reversing effected? Are the turbines operated in conjunction with free piston gas generators?
 Total No. of free piston gas generators Diameter of working pistons Diameter of compressor pistons No. of double strokes per minute at full power Gas delivery pressure Gas delivery temperature Have the turbines and attached equipment been tested working in the shop? How long at full power?

ELECTRIC PROPULSION (Reciprocating engines or gas turbines. Electrical particulars to be reported on Form 4d.)

No. of generators KW per generator at RPM AC or DC? Position
 No. of propulsion motors SHP per motor at RPM Position
 How is power obtained for excitation of generators? Motors?

REDUCTION GEARING (Reciprocating engines or gas turbines. A small line sketch should be attached showing arrangement of gearing.)

Vulcan Reduction Gears Nos. 570 and 571. Certificate attached.
 Is gearing of single or double helical type? If single, position of gear thrust bearing Is gearing of epicyclic type?
 PCD of pinions: First reduction Second reduction PCD of wheels: First reduction Main
 Material of pinions Tensile strength Material of wheel rims Tensile strength
 Are gear teeth surface hardened? How are teeth finished? Diameter of pinion journals Wheel shaft journals
 Are the wheels of welded construction? Is gearcase of welded construction? Has the wheel/gearcase been heat treated on completion of welding? Where is the propeller thrust bearing located? Inside gearing Are gear bearings of ball or roller type? No

CLUTCHES, FLEXIBLE COUPLINGS, ETC. If a clutch or other flexible connection is fitted between engine/turbine and gearing or between engine and line shafting give brief description and, for clutches, state how operated

Can the main engine be used for purposes other than propulsion when declutched? If so, what?

STRAIGHT SHAFTING. Diameter of thrustshaft Built in the gear Minimum approved tensile strength Shaft separate or integral with crank or wheel shaft? Diameter of intermediate shaft 264 mm. Material S.M. Steel Minimum approved tensile strength Diameter of screwshaft cone at large end 310 mm. Is screwshaft fitted with a continuous liner? No Diameter of tube shaft. (If these are separate shafts) Is tube shaft fitted with a continuous liner in way of stern tube? Thickness of screw/tube shaft liner at bearings Thickness between bearings Material of screw/tube shaft Minimum approved tensile strength Is an approved oil gland fitted? Yes If so, state type Cedervall's Oil Gland Length of bearing next to and supporting propeller As previously Material of bearing In multiple screw vessels is the liner between stern tube and A bracket continuous? If not, is the exposed length of shafting between liners readily visible in dry dock?

PROPELLER. Diameter of propeller 3350 mm. Pitch 2986 mm. Built up or solid Solid Total developed surface 3.53 M²
 No. of blades 4 Blade thickness at top of root fillet 98.2 mm. Blade material Bronze Moment of inertia of dry propeller 4200 Kgm²
 If propeller is of special design, state type No Is propeller of reversible pitch type? No If so, is it of approved design?
 State method of control Material of spare propeller Moment of inertia

AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine 0 Can they be declutched?

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) 2 manoeuvring air compressors, fitted previously. 1 emergency compressor driven by hand started oil engine

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) 2 main air receivers, and 1 auxiliary one (all previously fitted)

How are receivers first charged? By diesel driven compressor Maximum working pressure of starting air system 25 kg/cm² Are the safety devices in accordance with the Rules? Yes Has the starting of the main engines been tested and found satisfactory? Yes

COOLERS. No. of main engine fresh water coolers 2 No. of main engine lubricating oil coolers 2 No. of main gear oil cooler 2

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure As previously, 2 off.

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) 1 lubricating pump

INDEPENDENT PUMPS Name below essential pumps, state position and how driven. Give capacity of bilge pumps.	Service for which each pump is connected to be marked thus X											DELIVERY					
	Bilge Main	Bilge Direct	Ballast Main	Oil Fuel	Fresh Water Cooling	Sea	Feed Tanks	Lub. Oil	Gear	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cooling	Gear
NEW PUMPS																	
Main Engine Fresh Water, 2 off.					X							X					
Main Engine Salt Water, 2 off.						X					X						
Main Engine Lubricating Oil, 2 off.								X							X		
Main Engine Gear Oil, 2 off.									X								X
Fire- and Sanitary					X									X			

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room As previously

No. and size connected to main bilge line in main engine room As previously In tunnel As prev.

In aux. engine room Size and position of direct bilge suction in machinery spaces As prev.

Size and position of emergency bilge suction in machinery spaces As previously

Is the bilge or ballast system fitted with means for separating oily water on the overboard discharge side? No Do the piping arrangements comply with the Rules including special requirements for ships carrying petroleum in bulk, cargo oil or classed for navigation in ice? (strike out words not applicable). Yes

STEAM & OIL ENGINE AUXILIARIES

Position of each	Type	Made by	Previously fitted	Driven Machinery (For electric generators, state output)
Port Forward	3-cyl. 4 S.C.S.A.	Burmeister & Wain	Previously fitted	112 KW.
Port Intermediate	5-cyl. 4 S.C.S.A.	<u>LISTER</u>	Previously fitted	110 KW.
Port Aft	5-cyl. 4 S.C.S.A.	<u>See p. 19</u>	Previously fitted	110 KW.
Starboard	5-cyl. 4 S.C.S.A.	<u>"</u>	From "Annie Johnson"	110 KW.
The Starboard Auxiliary Engine has been previously fitted on board, and after having been completely overhauled installed on board this ship.				

Is electric current used for essential services at sea? Yes If so, state the minimum No. and capacity of generators required in order that the ship may operate at sea 2 (Max. current about 600 A.)

Is an electric generator driven by Main Engine? No

STEAM INSTALLATION. No. of donkey boilers burning oil fuel W.P. Type Donkey Boiler taken ashore

Position

Is a superheater fitted? Are these boilers also heated by exhaust gas? No. of donkey boilers heated by exhaust gas only? W.P.

Type Position Can the exhaust heated boilers deliver steam directly to the steam range or do they operate only as economisers in conjunction with oil fired boilers?

Port and No. of report on donkey boilers Is steam essential for operation of the ship at sea? Are any steam pipes over 3 ins. bore? If so, what is their material?

For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? No. of oil burning pressure units No. of steam condensers No. of Evaporators

STEERING GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars) As previously

Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements Water as per Rule, Total CO₂

flooding, 4 x 100 kgs. Tempus 100, 2 x 12 kgs. portable froth, 3 x 6 kgs. CO₂ app., 1 x 3 kgs. CO₂ app.

Has the spare gear required by the Rules been supplied? Yes Has all the machinery been tried under full working conditions and found satisfactory? Yes Date and duration of full-power sea trials of main engines 19.3.1958 Does this machinery installation contain any features of a novel or experimental nature? (Give particulars) No

The foregoing description of the main engine and installation is correct and the particulars are as approved for torsional vibration characteristics (strike out words not applicable)

Builder

Builder

Builder

Builder

Builder

Builder

GENERAL REMARKS

State if the machinery has been constructed and/or installed under special survey in accordance with the Rules, approved plans and Secretary's letters. State quality of materials and workmanship and recommendations for classification, including any special notation to be assigned. Where existing machinery is submitted for classification the circumstances should be explained as fully as possible.

These main engines have been completed by A-B. Lindholmens Varv, Gothenburg, and the welded entablature re-examined and welding placed in order where necessary. After completion the engines were tested at sea under full power conditions with satisfactory results. Certificates of propellers, entablatures, new intermediate shaft, gearing and pumps attached.

The gearing examined after full load conditions and found good.

The main engine seating altered as per approved plan (21.4.1956).

This machinery is eligible, in my opinion, to be classed +LMC 3,58, +NE 3,58, and Tail Shafts (Old new 3,58.

Note:

Torsiograph records of a similar installation ("Annie Johnson") were attached to Gothenburg Report No.23392, dated the 2nd July, 1957.

N. J. J. J.
Engineer Surveyor to Lloyd's Register of Ships

PARTICULARS OF IDENTIFICATION MARKS ((Including Port of origin) of important Forgings and Castings. (Copies of certificates should be forwarded with report.)

RODS

LLOYD'S HNO 1 K.N. 5.6.56

CRANKSHAFT

Port: LLOYD'S No. 889 HS 9.1.57

Starboard: LLOYD'S No. 347 HS 20.5

FLYWHEEL SHAFT

THRUSTSHAFT

GEARING

Port: LLOYD'S NO. BMN 6220 RFM 17.4.57

Starboard: LLOYD'S No. BMN 6224 RFM 30.4.57

INTERMEDIATE SHAFTS

Port and Starboard Forward: LLOYD'S Nos. 765 - 766 NF 3.12.57 (adjusting screws)

SCREW AND TUBE SHAFTS

Port: LLOYD'S No. 1188 BJ 21.3.57

Starboard: LLOYD'S No. 1187 BJ 21.3.57

PROPELLERS

LLOYD'S
LIH 4374
8.3.57 A.T.M.LLOYD'S
RIH 4374
8.3.57 A.T.M.

OTHER IMPORTANT ITEMS

CYLINDER LINERS

Port and Starboard: 13.2.57 10 KGS. J.A.

Is the installation a duplicate of a previous case?

Yes

If so, state name of vessel

"Annie Johnson"

Date of approval of plans for crankshaft

Straight shafting

15.5.1956

Gearing

Clutch

Separate oil fuel tanks

Pumping arrangements

Oil fuel arrangements

Cargo oil pumping arrangements

Air receivers

Donkey boilers

Dates of examination of principal parts:-

Fitting of stern tube

Fitting of propeller 20.8 & 21.8.57

Completion of sea connections

Alignment of crankshaft in main bearings 14

Engine checks & bolts

14.2.1958

Alignment of gearing

14.2.1958

Alignment of straight shafting

22.11.1957

Testing of pumping arrangements

Oil fuel lines

24.3.1958

Donkey boiler supports

Steering machinery

19.3.1958

Windlass 24.3.1958

Date of Committee

Special Survey Fee
during constr.
During instal.

Kronor 12

Kronor 29

Decision

Expenses

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Date when A/c rendered

25th April

Lloyd's Register
Foundation