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Date of writing report 16/7 -58. Received London Gothenburg No. 24300
In shops 26
No. of visits 42
First date 16.12.57. Last date 4.7.58.
On vessel 42
Last date 10.7.58.

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

R.B. 44708 Name "S I G N E I N G E L S S O N" Gross tons 12615
A/B Transmarin Managers Erik Larsson Port of Registry Hälsingborg
Gothenburg By A/B Götaverken Yard No. 728 Year Month 1958 - 7
Gothenburg By A/B Götaverken Eng. No. 3023 When 1958 - 7
Gothenburg By A/B Lindholmens Varv Blr. Nos. 3223/24 When 1957 - 10
Gothenburg By A/B Götaverken When 1958 - 7

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

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 1 No. of propellers 1 Brief description of propulsion system Direct driven propeller.

MAIN RECIPROCATING ENGINES. Licence Name and Type No. DM 760/1500 VGS 9
No. of cylinders per engine 9 Dia. of cylinders 760 mm. stroke(s) 1500 mm. 2 or 4 stroke cycle 2 SC Single or double acting S A
Maximum approved BHP per engine 8200 at 112 RPM of engine and 112 RPM of propeller.
Corresponding MIP 6.5 kg/cm² (For DA engines give MIP top & bottom) Maximum cylinder pressure 49 kg/cm² Machinery numeral 1640
Are the cylinders arranged in Vee or other special formation? No If so, number of crankshafts per engine

NO STROKE ENGINES. Is the engine of opposed piston type? No If so, how are upper pistons connected to crankshaft?
Is the exhaust discharged through ~~separate exhaust~~ valve(s) in the cylinder covers? Yes No. and type of mechanically driven scavenge pumps or blowers per engine and how driven Two separate pumps to each cylinder driven by levers from the crossheads.
No. of exhaust gas driven scavenge blowers per engine None Where exhaust gas driven blowers only are fitted, can the engine operate with one blower out of action?
Is a stand-by or emergency pump or blower is fitted, state how driven None fitted No. of scavenge air coolers None Scavenge air pressure at full power 0.15 kg/cm² Are scavenge manifold explosion relief valves fitted? Yes

FOUR STROKE ENGINES. Is the engine supercharged? Are the undersides of the pistons arranged as supercharge pumps? No. of exhaust gas driven blowers per engine
No. of supercharge air coolers per engine Supercharge air pressure Can engine operate without supercharger?

TWO & FOUR STROKE ENGINES—GENERAL. No. of valves per cylinder: Fuel 2 Inlet None Exhaust 1 Starting 1 Safety 1
Material of cylinder covers Cast iron Material of piston crowns S.M. Steel forced Is the engine equipped to operate on heavy fuel oil? Yes
Cooling medium for:—Cylinders Fresh water Pistons Lubr. oil Fuel valves Fuel oil Overall diameter of piston rod for double acting engines
Is the rod fitted with a sleeve? No Is welded construction employed for: Bedplate? Yes Frames? Yes Entablature? Yes Is the crankcase separated from the underside of pistons? Yes Is the engine of crosshead ~~rod~~ type? Yes Total internal volume of crankcase 140 m³ No. and total area of explosion relief devices 20x725=14500 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? Is the engine secured ~~to a built-up seating~~ to a built-up seating? Yes How is the engine started? By compr. air
Can the engine be directly reversed? Yes If not, how is reversing obtained?

Has the engine been tested working in the shop? Yes How long at full power? Seven hours
CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 17.6.57. 381 Q mit ~~ohne~~ ~~mit~~ ~~ohne~~ ~~mit~~ State barred speed range(s), if imposed
For working propeller None For spare propeller None Is a governor fitted? Yes Is a torsional vibration damper or detuner fitted to the shafting? No
Where positioned? Type No. of main bearings 11 Are main bearings of ball or roller
No Distance between inner edges of bearings in way of crank(s) 974 mm. Distance between centre lines of side cranks or eccentrics of opposed piston engines

Crankshaft type: Built, semi-built, solid. (State which) Semi - built
Diameter of journals 520/130 Diameter of crankpins Centre 520/105 Breadth of webs at mid-throw 1050 mm. Axial thickness of webs 320 mm.
Side Are dowel pins fitted? No Crankshaft material Journals S.M. Steel Approved 44 kg/mm²
Pins Cast steel Minimum 44 kg/mm²
Webs Cast steel Tensile strength 44 kg/mm²
Diameter of flywheel 2392.5 mm. Weight 3170 kg. Are balance weights fitted? No Total weight Radius of gyration
Diameter of flywheel shaft None fitted Material Minimum approved tensile strength
Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) Integral with thrustshaft.

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28/8/58

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

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

minute at full power Gas delivery pressure Gas delivery temperature Have the turbines and attached equipment been tested 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.)

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 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? Are gear bearings of ball or roller type?

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 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 \checkmark 520 mm. Material S.M. Steel Minimum approved tensile strength 44 kg/mm²

Shaft separate ~~with~~ crank ~~shaft~~? Yes Diameter of intermediate shaft \checkmark 405 mm. Material 44 kg/mm²

Minimum approved tensile strength 44 kg/mm² Diameter of screwshaft cone at large end \checkmark 473.5 mm. Is screwshaft fitted with a continuous liner? \checkmark Yes

Diameter of tube shaft. (If these are separate shafts) --- Is tube shaft fitted with a continuous liner in way of stern tube --- Thickness of screwshaft bearings 23 mm. Thickness between bearings 22.5 mm. Material of screw/tube shaft S.M. Steel Minimum approved tensile strength 44

Is an approved oil gland fitted? No If so, state type --- Length of bearing next to and supporting propeller 2030 mm.

Material of bearing Lignum vitae 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 \checkmark 5650 mm. Pitch 4597 mm. Built up or solid Solid Total developed surface 13.3 m²

No. of blades 4 Blade thickness at top of root fillet 247 mm. Blade material Bronze Moment of inertia of dry propeller 282500 kg

If propeller is of special design, state type No Is propeller of reversible pitch type? --- If so, is it of approved design? ---

State method of control --- Material of spare propeller Cast iron Moment of inertia 360250 kg.cm

AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine None Can they be declutched? ---

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) 2 x 4 m³ per minute, el. driven, port forward and aft. Helsingborg No. 1226.

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) 2 x 14 m³ placed on a platform starboard forward and aft. Gothenburg No. 23546/24002.

How are receivers first charged? Power supplied by a steam driven generator. 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

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure All forming part of hull structure.

MAIN ENGINE DRIVEN PUMPS (No. and Purpose) None.

INDEPENDENT PUMPS

Name below essential pumps, state position and how driven. Give capacity of bilge pumps.

	SUCTION											DELIVERY				
	Bilge Main	Bilge Direct	Ballast Main	Oil Fuel	Fresh Water Cooling	Sea	Feed Tanks	Lub. Oil	Emergency Bilge Suction	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cooling
Ballast pump. Stbd. fwd. El. driven 150 ton/hour	X	X	X	X		X							X			
Bilge pump. Stbd. forward. El. driven 50 tons/hour	X	X														
Bilge pump. Stbd. aft. team driven 55 tons/hour	X	X														
Transfer pump heavy fuel oil stbd. fwd. El. driven			X	X									X			
Transfer pump. Diesel oil port forward. El. driven				X									X			
Feed pump. Starboard aft. Steam driven						X	X			X						
Condenser circ. pump. Stbd. aft. Steam driven						X			X							
Tank washing pump. Stbd. aft. Steam driven						X									X	
Fire & sanitary pump. Stbd. side. El. driven						X	X							X		
Main Engine cooling water pumps. Port aft inboard & outboard. El. driven					X	X					X	X				
ME lubr. oil pumps. Port aft middle & forward. El. driven								X							X	X
Emergency fire pump. Fwd pump room. Diesel driven								X							X	
Bilge pump in fwd & middle pump room. Steam driven 80 tons/hour																
Bilge pump forward pump room. Steam driven 60 tons/hour																

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room. Dry cargo hold \checkmark 2 x 2 $\frac{1}{2}$ ". Fwd. pump room 1 x 2 $\frac{1}{2}$ ". Middle & aft pump rooms \checkmark 2 x 3". Stores room 2 x 2" (hand pump). Chain locker 1 x 2" (hand pump).

No. and size connected to main bilge line in main engine room \checkmark 3x100 mm, 2 x 60 mm. Coffd. 10-12&22-23 50 mm. Coffd. 41-42 100 mm. In tunnel ---

In aux. engine room --- Size and position of direct bilge suction in machinery spaces 1 x 125 mm.

Port forward 1x100 mm. stbd. forw. Size and position of emergency bilge suction in machinery spaces 1x200 mm. centre aft.

Is the bilge or ballast system fitted with means for separating oily water on the overboard discharge side? Yes Do the piping arrangements comply with the Rules including special requirements for ships carrying petroleum in bulk, ~~etc.~~ (strike out words not applicable). Yes

STEAM & OIL ENGINE AUXILIARIES

Position of each	Type	Made by	Port and No. of Rpt. or Cert.	Driven Machinery (For electric generators, state output)
Port forward floor plate	Diesel 300-450 G6	AB Jönköpings Motorfabrik	Got. FE rpt. attached	Generator 240 kW
Stbd. " "	" - "	" - "	" " " "	" 240 "
Port aft floor plate	Compound expansion 300-430 200	Öresundsvarvet A-B.	Helsingborg 2914	" 110 "

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 One 110 kW Is an electric generator driven by Main Engine? No.

STEAM INSTALLATION. No. of donkey boilers burning oil fuel 2 w.p. 180 lbs/sq. inch Type Scotch Position on a platform aft.

Is a superheater fitted? No Are these boilers also heated by exhaust gas? No No. of donkey boilers heated by exhaust gas only? 1 w.p. 180 lbs/sq. inch

Combined silencer and exhaust gas economiser Götaverken Position In funnel Can the exhaust heated boilers operate only as economisers in conjunction with oil fired boilers? Yes Port and No. of report on donkey boilers Gothenburg 23655 Is steam essential for operation of the ship at sea? No Are any steam pipes over 3 ins. bore? Yes If so, what is their material? Copper and steel For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? Yes No. of oil burning pressure units 2 No. of steam condensers 1 No. of Evaporators 1

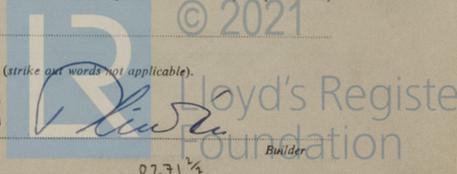
STEERING GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars) 2 Hugh. J. Scott El. motors No. 190973/4 2 Hele shaw pumps John Hastie & Co. Ltd.

Have the Rule Requirements for fire extinguishing arrangements been complied with? Yes Brief description of arrangements 8 x 12 lit. foam. 1x20 kg. CO₂ & 1x6 kg. CO₂ extinguishers. 2x2 $\frac{1}{2}$ hose pipes, 3 sand boxes and steam under Engine Room and Boiler Room floors.

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 9/7-58. Seven hours 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).

AKTIEBOLAGET GÖTAVÄRKEN



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.

This machinery has been built under Special Survey in accordance with the Rules and approved plans and has been securely fitted on board under my inspection and to my satisfaction. The workmanship and materials used are good. All important forgings and all pumps for essential services have been examined and tested as required by the Rules. The electric weldings of the main engine bedplate have been carried out to my satisfaction, and the entablatures have been made at Linköping and examined by the Stockholm Surveyors. All the parts were also examined by the undersigned when the main engine was tried under full working power and found free from visible defects. Certificates in respect of shafting, air receivers, compressors, propeller and pumps are attached. An exhaust gas economiser of A-B. Götaverken's multitubular type, as per certificate attached, has been securely fitted on board under my inspection and to my satisfaction.

Note:

The Owners wish to adopt the CS system.

Erlaud Jansson
 Engineer Surveyor to Lloyd's Register of Shipping

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

RODS Lloyd's GOT. No. 5960/1/2/3/4/5/6/7/1656 B.J. 16.12.57.
 " " " 8358/59/60/61/62/63/64/65/8508/8714 B.J. 20.1.58.
 CRANKSHAFT ~~PROPELLER SHAFT~~ Lloyd's GOT. No. 1119/20 E.J. 19.9.57.
 FLYWHEEL SHAFT ---
 THRUSTSHAFT Lloyd's GOT. No. 1121 E.J. 19.9.57.
 GEARING ---
 INTERMEDIATE SHAFTS Lloyd's GOT. No. 812 A B.J. 21.1.58. Lloyd's GOT. No. 812 B.J. 27.5.58.
 SCREW ~~PROPELLER SHAFT~~ Lloyd's GOT. No. 1682 NF 13.3.58. *spare 4824*
 PROPELLERS Lloyd's No. 42890 J.W.W. 17.12.57.
 OTHER IMPORTANT ITEMS Spare propeller: Lloyd's 10.2.58. MN.
 Spare propeller shaft: Lloyd's GOT. No. 8424 A.S. 20.3.58.

Is the installation a duplicate of a previous case? --- If so, state name of vessel ---
 Date of approval of plans for crankshaft 19/6 -57 Straight shafting 19/6 -57 Gearing --- Clutch ---
 Separate oil fuel tanks None fitted Pumping arrangements 4.4.57. Oil fuel arrangements 1.4.58.
 Cargo oil pumping arrangements 2.5.57. Air receivers 14.6.57. Donkey boilers 8/5-56, 30/4 -57
 Dates of examination of principal parts:—
 Fitting of stern tube 11/4-58 Fitting of propeller 9/4 -58 Completion of sea connections 3/6 -58 Alignment of crankshaft in main bearings 18/6 -58
 Engine checks & bolts 16/5-58 Alignment of gearing --- Alignment of straight shafting 18/6 -58 Testing of pumping arrangements 7/7
 Oil fuel lines 7/7 -58 Donkey boiler supports 16/5 -58 Steering machinery 9/7 -58 Windlass 9/7 -58.
 Date of Committee **FRIDAY - 5 SEP 1958**
 Decision *See Rpt. 1.* Special Survey Fee (Constr) Kronor 51
 " (Inst.) Kronor 28
 El. welding Bedplates Kronor 2
 Exhaust Gas Economiser Kronor 1
 Expenses Kronor

 Date when A/c rendered 9th August, 1958

