

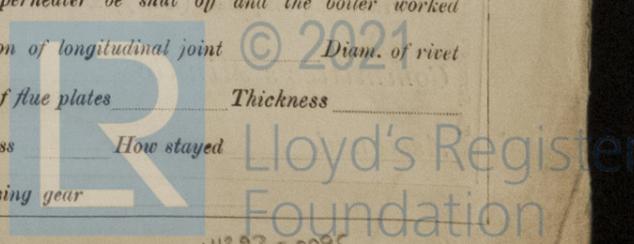
# REPORT ON MACHINERY.

Date of writing Report 3/11/1911 When handed in at Local Office 3/11/1911 Port of Greenock  
 No. in Survey held at Port Glasgow Date, First Survey 16.2.14; Last Survey 3.11.1916  
 Reg. Book. on the S.S. "ARDCRANGE." (Number of Visits 96)  
 Master John S. Swire Built at Port Glasgow By whom built Russell & Co. Ltd. Tons { Gross 4543  
 Engines made at Port Glasgow By whom made Clyde S.B. Eng. Coy. Ltd. when made 1916 Net 2875  
 Boilers made at Port Glasgow By whom made Clyde S.B. Eng. Coy. Ltd. when made 1916 When built 1916  
 Registered Horse Power 4 Owners Steamship Glasgow to Ltd. (Lang & Fulton Lines) Port belonging to Greenock  
 Nom. Horse Power as per Section 28 491 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

**ENGINES, &c.**—Description of Engines Triple Expansion No. of Cylinders Three No. of Cranks Three  
 Dia. of Cylinders 26-4 1/2-40 Length of Stroke 48 Revs. per minute 75 Dia. of Screw shaft 14.86 Material of Iron  
 Is the screw shaft fitted with a continuous liner the whole length of the stern tube Yes Is the after end of the liner made water tight  
 in the propeller boss Yes If the liner is in more than one length are the joints burned No 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 No If two  
 liners are fitted, is the shaft lapped or protected between the liners No Length of stern bush 5-0 1/2  
 Dia. of Tunnel shaft 12.98 Dia. of Crank shaft journals 13.12 Dia. of Crank pin 13 1/8 Size of Crank webs 25x8 1/2 Dia. of thrust shaft under  
 collars 13 1/8 Dia. of screw 18-0 Pitch of Screw 19-0 No. of Blades 4 State whether moveable No Total surface 102 1/2  
 No. of Feed pumps 2 Diameter of ditto 3 1/2 Stroke 24 Can one be overhauled while the other is at work Yes  
 No. of Bilge pumps 2 Diameter of ditto 4 1/2 Stroke 24 Can one be overhauled while the other is at work Yes  
 No. of Donkey Engines 2 Sizes of Pumps 9x10x10, 8x6x8, 8x9x2 No. and size of Suctions connected to both Bilge and Donkey pumps  
 In Engine Room 4 at 3 1/2" In Holds, &c. 1 @ 2 1/2" 8 @ 3 1/2" viz 2 @ 3 1/2" in No 1,  
2 at 3 1/2" in No 2, 2 @ 3 1/2" in No 3, 2 @ 3 1/2" in No 4  
 No. of Bilge Injections 1 sizes 8 Connected to condenser, or to circulating pump C.P. Is a separate Donkey Suction fitted in Engine room of size 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 No  
 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 stokehold 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 the Blow Off Cocks fitted with a spigot and brass covering plate Yes  
 What pipes are carried through the bunkers None How are they protected No  
 Are all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings 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  
 Dates of examination of completion of fitting of Sea Connections 14/6/16 of Stern Tube 5/6/16 Screw shaft and Propeller 14/6/16  
 Is the Screw Shaft Tunnel watertight Yes Is it fitted with a watertight door Yes worked from Engine room gratings

**BOILERS, &c.**—(Letter for record S) Manufacturers of Steel Clyde S.B. Eng. Coy. Ltd. & Steel Coy. Glasgow  
 Total Heating Surface of Boilers 4400 Is Forced Draft fitted Yes No. and Description of Boilers 3: Cylindrical built Single  
 Working Pressure 180 lbs Tested by hydraulic pressure to 360 lbs Date of test 12/5/14 No. of Certificate 1185 & 1191  
 Can each boiler be worked separately Yes Area of fire grate in each boiler 49.59 sq ft No. and Description of Safety Valves to  
 each boiler 2: Relief Spring Area of each valve 8.29 sq Pressure to which they are adjusted 185 lbs Are they fitted with easing gear Yes  
 Smallest distance between boilers or uptakes and bunkers or woodwork 9-0 Mean dia. of boilers 15'-0" Length 11'-9" Material of shell plates Steel  
 Thickness 1 1/2" Range of tensile strength 28 to 35 tons Are the shell plates welded or flanged No Descrip. of riveting: cir. seams Lap & Butte  
 long. seams Butt Strap Diameter of rivet holes in long. seams 1 1/2" Pitch of rivets 8 1/2" 4 3/8" Top of plates or width of butt straps 18 1/2"  
 Per centages of strength of longitudinal joint rivets 85.6 Working pressure of shell by rules 183 lbs Size of manhole in shell 16" x 12"  
 Size of compensating ring Plate forged No. and Description of Furnaces in each boiler 3: Morrison Material Steel Outside diameter 4 1/4"  
 Length of plain part top 7.52 Thickness of plates crown 9 bottom 7 1/2 Description of longitudinal joint Weld No. of strengthening rings None  
 Working pressure of furnace by the rules 187 lbs Combustion chamber plates: Material Steel Thickness: Sides 1 1/2" Back 1 1/2" Top 1 1/2" Bottom 3/4"  
 Pitch of stays to ditto: Sides 8 1/2" x 8" Back 8 1/2" x 7 1/2" Top 8" x 8 1/4" If stays are fitted with nuts or riveted heads Nuts Working pressure by rules 185 lbs  
 Material of stays Steel Diameter at smallest part 1 1/8" Area supported by each stay 66" Working pressure by rules 180 lbs End plates in steam space:  
 Material Steel Thickness 1" Pitch of stays 15 1/2" x 15 1/2" How are stays secured By nuts Working pressure by rules 183 lbs Material of stays Steel  
 Diameter at smallest part 4 3/8" Area supported by each stay 244" Working pressure by rules 183 lbs Material of Front plates at bottom Steel  
 Thickness 3/8" Material of Lower back plate Steel Thickness 7/8" Greatest pitch of stays 13 1/4" Working pressure of plate by rules 184 lbs  
 Diameter of tubes 2 1/2" Pitch of tubes 3 1/2" x 3 1/2" Material of tube plates Steel Thickness: Front 1" Back 3/4" Mean pitch of stays 4.6"  
 Pitch across wide water spaces 15 1/2" Working pressures by rules 197 lbs 350 lbs Girders to Chamber tops: Material Steel Depth and  
 thickness of girder at centre 9 1/2" x 1 1/2" Length as per rule 36.2" Distance apart 8" Number and pitch of stays in each 3: 8 1/4"  
 Working pressure by rules 188 lbs Superheater or Steam chest; how connected to boiler None Can the superheater be shut off and the boiler worked  
 separately Yes Diameter          Length          Thickness of shell plates          Material          Description of longitudinal joint          Diam. of rivet  
 holes          Pitch of rivets          Working pressure of shell by rules          Diameter of flue          Material of flue plates          Thickness           
 If stiffened with rings          Distance between rings          Working pressure by rules          End plates: Thickness          How stayed           
 Working pressure of end plates          Area of safety valves to superheater          Are they fitted with easing gear         

If not, state whether, and when, one will be sent  
 In a Report also sent on the Hull of the Ship



IS A DONKEY BOILER FITTED?

If so, is a report now forwarded?

SPARE GEAR. State the articles supplied:— 2 main bearings, 2 connecting rods top end & 2 connecting rods bottom end both & nuts, 6 coupling bolts & nuts, 1 set feed & bilge pump valves & seats, 1 set piston rings, quantities of assorted iron, 120 assorted bolts & nuts, 1 propeller shaft, 1 propeller, 1 set escape valve spring, 6 bel. cover studs & nuts, 1 main & 1 aux. check valve, 30 condenser tubes 20 boiler tubes, 6 valve chest cover studs & nuts, 6 junk ring studs & nuts, 2 half bushes top end, & 2, do bottom end, 1 valve spindle, 1 spring for safety valves, 1 set air pump valves, 1 set circulating pump valves.

The foregoing is a correct description,  
THE GLYDE SHIPBUILDING & ENGINEERING CO. LIMITED

*W. J. ...* Director. Manufacturer.

Dates of Survey while building: During progress of work in shops (1914) Feb. 16-18-24. Mar. 6-31. Apr. 3-10-13-15-20-30. May 7-12-13-19-21-26-28. June 4-5-8-11-16-19-20-22-24-30. Aug. 3-7-12-14-19-20-24-27-28-31. Sep. 3-7-16. During erection on board vessel (1915) Dec. 7-8-11-17-22-29. Jan. 8-12-19-22-25-29. Feb. 4-15. Mar. 12. June 7. July 19-26-29. Aug. 9-19 (1916). Feb. 1-7-14. Apr. 18. May 26-28. June 2-5-12-14-20-23-26-30. July 4-12-18-24-25-31. Aug. 8-22-28-30. Sep. 4-11-15. Oct. 3-6-11-19-26. Nov. 3.

Dates of Examination of principal parts—Cylinders 8/12/14 Slides 12/14 Covers 3/11/16 Pistons 29/12/14 Rods 29/12/14 Connecting rods 11/6/14 Crank shaft 7/5/14 Thrust shaft 7/5/14 Tunnel shafts 14/10/14 Screw shaft 26/8/16 Propeller 5/6/16 Stern tube 5/6/16 Steam pipes tested 2/4/15 Engine and boiler seatings 4/7/16 Engines holding down bolts 11/9/16 Completion of pumping arrangements 23/10/16 Boilers fixed 11/9/16 Engines tried under steam 3/11/16 Main boiler safety valves adjusted 23/10/16 Thickness of adjusting washers 5/8" 5/8" 5/8" 5/8" 5/8" 5/8" Material of Crank shaft Steel Identification Mark on Do. 1303 Material of Thrust shaft Steel Identification Mark on Do. 1304 Material of Tunnel shafts Steel Identification Marks on Do. 1316 Material of Screw shafts Iron Identification Marks on Do. 198 Material of Steam Pipes Steel Test pressure 540

Is an installation fitted for burning oil fuel No ✓ Is the flash point of the oil to be used over 150°F. ✓ Have the requirements of Section 49 of the Rules been complied with ✓ Is this machinery duplicate of a previous case No ✓ If so, state name of vessel -

General Remarks (State quality of workmanship, opinions as to class, &c.)  
The engines & boilers of this vessel have been built under special survey. The materials, & workmanship are good. On completion they were examined while running full power trials in the Loch & found satisfactory. The machinery throughout is now in good & efficient condition, & eligible in my opinion to have the record **L.M.C. 11-16** marked in the register book.

It is submitted that this vessel is eligible for THE RECORD + L.M.C. 11. 16. F.D. J.W.D. 10/11/16

The amount of Entry Fee ... £ 3-0-0  
Special ... £ 44-11-0  
Donkey Boiler Fee ... £ : :  
Travelling Expenses (if any) £ : :

When applied for, 4-11-1916  
When received, 21-11-1916  
*Wm. Austin*  
Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

Committee's Minute GLASGOW 7 - NOV. 1916

Assigned + L.M.C. 11, 16 F.D.

MACHINERY CERTIFICATE WRITTEN 8/11/16



Certificate (if required) to be sent to, *yes* *Greenock*

The Surveyors are requested not to write on or below the space for Committee's Minute.

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