

## REPORT ON MACHINERY.

No. 41562

Date of writing Report 5.12.21 When handed in at Local Office 5.12.21 Port of Glasgow  
 No. in Survey held at Glasgow Reg. Book. s/s "Madura" Date, First Survey 14/3/1920 Last Survey 26/11/1921  
 on the (Number of Visits 4)  
 Master Built at Glasgow By whom built Barclay Curle & Co. Ltd. (58%) When built 1921  
 Engines made at Glasgow By whom made Barclay Curle & Co. Ltd. (58%) when made 1921  
 Boilers made at ditto By whom made ditto (58%) when made 1921  
 Registered Horse Power 1008 Owners British India S.S. Co. Ltd. Port belonging to Glasgow  
 Shaft Horse Power at Full Power 4320 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

URBINE ENGINES, &c.—Description of Engines 6 Turbines geared to 2 shafts No. of Turbines 6 Brown Curtis  
 Diameter of Rotor Shaft Journals, H.P. 3" 9/32" L.P. 7" Diameter of Pinion Shaft 5 1/2" Red L.P. 7 1/2" 2" Red  
 Diameter of Journals 4 3/4" Red 9 1/2" Red Distance between Centres of Bearings 25 1/2" 64" Diameter of Pitch Circle 107 107 1/2 55 56  
 Diameter of Wheel Shaft 13" Distance between Centres of Bearings 5' 8 3/4" Diameter of Pitch Circle of Wheel 80 39 1/2  
 Width of Face 3 1/2" Diameter of Thrust Shaft under Collars 13 1/8" as approved Diameter of Tunnel Shaft as per rule 12 3/8  
 No. of Screw Shafts 2 Diameter of same as fitted 14" Diameter of Propeller 16' 3" Pitch of Propeller 18' 3"  
 No. of Blades 3 State whether Moveable Yes Total Surface 136 # Diameter of Rotor Drum, H.P. — L.P. — Astern  
 Thickness at Bottom of Groove, H.P. — L.P. — Astern Revs. per Minute at Full Power, Turbine 3540 Propeller 86

## PARTICULARS OF BLADING. Brown Curtis Blading

H.P.			L.P.			ASTERN.		
HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
ST EXPANSION .....								
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No. and size of Feed pumps 3 2 WEIRS 10 x 13 1/2 x 21 one 5 1/2 x 7 1/2 x 15  
 No. and size of Bilge pumps 2 7 x 8 x 12 (1) 12 x 8 x 10 (2) Hel Service 10 x 7 1/2 x 21 Ball 9 x 10 x 10 Smorg Bilge 5 Motor Drain  
 No. and size of Bilge suction in Engine Room 2 3 1/2" Stokehold 2 3 1/2"  
 In Holds, &c. all Holds - 2 3 1/2" Tunnel Drill 1 2 1/2"

No. of Bilge Injections 2 sizes 10" Connected to engine circulating pump pump Is a separate Donkey Suction fitted in Engine Room & size Yes 5'  
 Are all the bilge suction pipes fitted with roses Yes Are the roses in Engine room always accessible Yes  
 Are all connections with the sea direct on the skin of the ship Yes Are they Valves or Cocks both Yes  
 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 below  
 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  
 Are all pipes carried through the bunks Bilge Suction How are they protected Steel Casings  
 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  
 Is the Screw Shaft Tunnel watertight Yes Is it fitted with a watertight door Yes worked from UER Platform

MANUFACTURERS OF STEEL Bolville  
 Heating Surface of Boilers 12420 Is Forced Draft fitted Yes No. and Description of Boilers 4 Single Ended  
 Working Pressure 215 Tested by hydraulic pressure to 375 Date of test 24.3.21 7.4.21 No. of Certificate 15760 15779  
 Can each boiler be worked separately Yes Area of fire grate in each boiler 76-16 75-16 No. and Description of Safety Valves to  
 No. of boiler Double Spring Area of each valve 11.04 Pressure to which they are adjusted 220 Are they fitted with easing gear Yes  
 Smallest distance between boilers or uptakes and bunks or woodwork 18" Mean dia. of boilers 16-6" Length 12-8" Material of shell plates S  
 Thickness 13 1/64 Range of tensile strength 31-35 tons Are the shell plates welded or flanged No Descrip. of riveting: cir. seams DRL  
 Cir. seams TR-DBS Diameter of rivet holes in long. seams 19/16" Pitch of rivets 10 1/4 32 Material of butt straps 22 3/4"  
 Percentages of strength of longitudinal joint rivets 91.1 plates 85.16 Working pressure of shell by rules 220 Size of manhole in shell 16 x 12"

No. and Description of Furnaces in each Boiler 4 Boiling tank Material S Outside diameter 3-9 1/4"  
 Top Thickness of plates crown 2 1/32 Description of longitudinal joint weld No. of strengthening rings  
 Bottom Thickness of plates bottom 2 1/32  
 Working pressure of furnace by the rules 235 Combustion chamber plates: Material S Thickness: Sides 2 1/32 Back 2 1/32 Top 2 1/32 Bottom 2 1/32  
 No. of stays to ditto: Sides 8 1/4 x 8 1/8 Back 8 x 8 Top 8 1/4 x 8 1/8 If stays are fitted with nuts or riveted heads DN Working pressure by rules 228  
 Material of stays S Area at smallest part 1.73 Area supported by each stay 67 # Working pressure by rules 226 End plates in steam space  
 Thickness 13/16 Pitch of stays 4 3/8 x 16 3/4 How are stays secured DN Working pressure by rules 218 Material of stays S  
 Area at smallest part 6.1 Area supported by each stay 290 # Working pressure by rules 214 Material of Front plates at bottom S  
 Thickness 2 1/32 Material of Lower back plate S Thickness 29/32 Greatest pitch of stays 14" Working pressure of plate by rules 218  
 Diameter of tubes 2 3/4 Pitch of tubes 4 x 37/8 Material of tube plates S Thickness: Front 3 1/32 Back 13/16 Mean pitch of stays 8 7/8"  
 Across wide water spaces 13 3/4 Working pressures by rules 218 Girders to Chamber tops: Material S Depth and  
 Thickness of girder at centre 10 x 23/32 (2) Length as per rule 2-10 1/32 Distance apart 8 1/8 Number and pitch of stays in each 3 at 8 1/4"  
 Working pressure by rules 217 Steam dome: description of joint to shell % of strength of joint Diameter  
 Thickness of shell plates Material Description of longitudinal joint Diameter of rivet holes Pitch of rivets  
 Working pressure of shell by rules Crown plates: Thickness How stayed

0500 - 529700 - 029700



SUPERHEATER. Type Schmidt Date of Approval of Plan see Rpt. attached Tested by Hydraulic Pressure to 645 lb  
Date of Test see Rpt. attached Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler yes  
Diameter of Safety Valve 1 - 2" Pressure to which each is adjusted 225 Is Easing Gear fitted yes

IS A DONKEY BOILER FITTED? No If so, is a report now forwarded? —

SPARE GEAR. State the articles supplied:— 2 sets of nuts for each one of Rotor bearings 2 sets of nuts main gear wheel bearing 2 sets of nuts pinion bearing 1 set of coupling bolts 1/20 of total No of bolts nuts for each gear case joint 1 set for turbine casing joint 2 thermometers for oil & air system 1 set of bearings for one gear shaft 1 set of bearings bushes for rotor 1 set of bearings bushes for pinion shafts one half set of packing Rings for each gland of Rotor shafts fitted 1/2 the No of Springs fitted 2 ordinary thrust washers turbine thrust adjusting bushes with Rings complete 1 set of liners for adjusting block (different medium) 1 set of Fuel - Pump valves 1 set of valves for lubricating oil pump one bucket wood for lubricating oil pump one scale valve of one of each one fitted a quantity of another bolts nuts studs and bars plates of steel 2 Purcell blades & one Propeller shaft.  
The foregoing is a correct description.

FOR BARCLAY, CURLE & CO., LTD.

Manufacturer.

John Alexander Manager

Dates of Survey while building  
During progress of work in shops -- 1920 Mar 4. 9. 29. 30 Apr 6. 7. 15. 17. 22. 23 May 12. 18 Jun 1 Jul 8. 14 Aug 5. 25 Sep 15 Oct 5. 12. 16. 15. 28 Nov 2. 15  
During erection on board vessel --- 25. 26. 30 Dec 7. 13. 15. 22. 29. 30 1921 Jan 11. 14. 18. 28 Feb 28. 11. 14. 17. 18. 21. 23. 24. 25. 28 Mar 24. 7. 8. 9. 15. 18. 21. 22. 24. 29  
Total No. of visits 91  
Is the approved plan of main boiler forwarded herewith yes

Dates of Examination of principal parts—Casings 28. 3. 21 Rotors 15. 3. 21 Blading 5. 4. 21 Gearing 29. 3. 21

Rotor shaft 15. 3. 21 Thrust shaft 8. 2. 21 Tunnel shafts 8. 2. 21 Screw shaft 8. 2. 21 Propeller 7. 3. 21

Stern tube 21. 4. 21 Steam pipes tested 16/9/21 5. 7. 10. 21 Engine and boiler seatings 5. 9. 21 Engines holding down bolts 28. 10. 21

Completion of pumping arrangements 26. 11. 21 Boilers fired 13. 10. 21 Engines tried under steam 26. 11. 21

Main boiler safety valves adjusted 10. 11. 21 Thickness of adjusting washers S 3/8 P 13/32 P 3/8 S 15/32 P 3/8 S 3/8 P 3/8 S 3/8 P 1/16 S 1/16

Material and tensile strength of Rotor shaft S 34-38 tons Identification Mark on Do. LR 7903/4 7896/9 7891/2 W

Material and tensile strength of Pinion shaft S 40-44 tons Identification Mark on Do. LR 8836 8830/1 8831 W

Material of Wheel shaft S Identification Mark on Do. 8786.7 AFWGM Material of Thrust shaft S Identification Mark on Do. LL0YDS

Material of Tunnel shafts S Identification Marks on Do. LL0YDS WGM 585 Material of Screw shafts S Identification Marks on Do. 585 WGM

Material of Steam Pipes Steel Test pressure 645 lb

Is an installation fitted for burning oil fuel yes Is the flash point of the oil to be used over 150°F. yes

Have the requirements of Section 49 of the Rules been complied with yes

Is this machinery a duplicate of a previous case No If so, state name of vessel —

General Remarks (State quality of workmanship, opinions as to class, &c.) These Engines & Boilers have been

built under Special Survey in accordance with the approved plan

& the workmanship & material are of good quality & they have been

securely fitted on board & tried under steam & found satisfactory

& are in my opinion eligible for the record of LMC 11.21

fitted for oil fuel 11.21 F.P. above 150°F

Not Superheated fitted to 3 after main boilers only.

this vessel is eligible for

THE RECORD. F.L.M.C. - 11.21. F.D. C.L. 1008 N.H.P.

Fitted for Oil Fuel, 11.21, F.P. above 150°F.

4 steam turbines geared to 2 screw shafts.

L.J. 9/12/21.

The amount of Entry Fee ... £ 6 : : When applied for, 57/12/21.

Special ... £ 25 : : Wm Gordon-Mitchell

Donkey Boiler Fee ... £ 15 : : When received, 28.12.21

Travelling Expenses (if any) £ — : : Engine Surveyor to Lloyd's Register of Shipping.

Committee's Minute GLASGOW - 6 DEC 1921

Assigned + LMC 11.21. F.D.

Fitted for oil fuel 11.21 F.P. above 150°F.

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