

REPORT ON MACHINERY

No. 40685

Received at London Office

Date of writing Report 5.1.1921 When handed in at Local Office 5.1.1921 Port of Glasgow
 No. in Survey held at Glasgow Date, First Survey 17th Sept 1918 Last Survey 30th Dec 1920
 Reg. Book. SS MATHURA (Number of Visits 65)
 on the Tons } Gross
 Net
 Master Built at Glasgow By whom built G. Bonnell & Co. When built 1920
 Engines made at Manchester By whom made Metropolitan Vickers & Co. (No 1740 1741) when made 1920
 Boilers made at Glasgow By whom made W. Rowan & Co. Ltd (No 658) when made 1920
 Machinery installed at Glasgow by J. Brocklebank Ltd Port belonging to Liverpool
 Registered Horse Power Owners
 Shaft Horse Power at Full Power 5000 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes
 Rule H.P. 1113

TURBINE ENGINES, &c. Description of Engines Rateau Impulse H.P. & L.P. No. of Turbines 2
 with double reduction gearing made by W. Rowan & Co. Ltd
 Diameter of Rotor Shaft Journals, H.P. 4 1/2" L.P. 4 1/2" Diameter of Pinion Shaft 1st Red 6" 2nd 13"
 Diameter of Journals 6 1/2" 13" Distance between Centres of Bearings 3-1 1/2-6-8 Diameter of Pitch Circle 1st Red 8' 4" 2nd 20' 12"
 Diameter of Wheel Shaft 17 1/2" Distance between Centres of Bearings 6-3" Diameter of Pitch Circle of Wheel 99' 87"
 Width of Face 36" Diameter of Thrust Shaft under Collars 17 1/2" Diameter of Tunnel Shaft as per rule 16' 35"
 as fitted 16' 3"
 No. of Screw Shafts 1 Diameter of same as per rule 17 1/2" Diameter of Propeller 18-6" Pitch of Propeller 18-0" 18-3"
 as fitted 18-3"
 No. of Blades 4 State whether Moveable Yes Total Surface 116 ft² 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 3000 Propeller 80

PARTICULARS OF 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.		
1ST EXPANSION	15" 2 1/8"	3-2 1/2-3-4"	2	3 1/2"	3-5 1/6"	1	2' 4 3/8"	3-3 3/4-3-4 1/2"	2		
2ND "	1 7/8"	3-3 7/8"	1	3 7/8"	3-5 7/8"	1					as per rule
3RD "	1 5/8"	3-3 7/8"	1	4 3/4"	3-6 3/4"	1					
4TH "	1 3/4"	3-3 3/4"	1	5 1/2"	3-7 1/2"	1	3' 1 5/8"	3-1 1/2-3-3 3/8"	2		
5TH "	2 1/4"	3-4 1/4"	1	6 3/4"	3-8 3/8"	1					2 wheels
6TH "				8 1/4"	3-10 1/4"	1					one row on each
7TH "				10 3/8"	4-0 3/8"	1					
8TH "											

No. and size of Feed pumps (2 main) 14" x 10 1/2" x 24" (1 aux) 10 1/2" x 8" x 21"
 No. and size of Bilge pumps (1) 7" x 8" x 18" (1) 10" x 8" x 18" (1 Ballast) 10 1/2" x 12" x 24" Lubricating oil working 6" x 8" x 18" (1 spare 6 1/2" x 8" x 18"
 No. and size of Bilge suction in Engine Room (2) 3 1/2" S.W. hold (2) 3 1/2"
 In Holds, &c. Nos 1-2-3-4-5-6+7 (2 each) 3 1/2"

Tunnel well (1) 3 1/2"
 No. of Bilge Injections 1 sizes 12" Connected to condenser, or to circulating pump Pump Is a separate Donkey Suction fitted in Engine Room & size Yes 3 1/2"
 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
 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
 What pipes are carried through the bunkers None How are they protected —
 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 upper deck
 See separate Report on Single ended boilers

BOILERS, &c. — (Letter for record) ALL Manufacturers of Steel W. Beardmore & Co. Ltd Steel 60 of Scotland & Co.
 Total Heating Surface of Boilers 19266 sq ft Is Forced Draft fitted No No. and Description of Boilers 2 Single ended 2 double ended
 Working Pressure 200 lb Tested by hydraulic pressure to 350 lb Date of test 22.9.20 24.9.20 No. of Certificate 15495.15501
 Can each boiler be worked separately Yes Area of fire grate in each boiler DE 1400 SE 700 No. and Description of Safety Valves to 420 total
 each boiler 2 Spring loaded Area of each valve DE 12.560 Pressure to which they are adjusted 205 lb Are they fitted with easing gear Yes
 Smallest distance between boilers or uptakes and bunkers or woodwork 1-6" Head dia. of boilers 17-6" Length 19-6" Material of shell plates Steel
 Thickness 17 1/2" 1 3/4" Range of tensile strength 30 to 34 tons Are the shell plates welded or flanged No Descrip. of riveting: cir. seams do lap
 long. seams TR DBS Diameter of rivet holes in long. seams 1 1/2" Pitch of rivets 10 1/4" Lap of plates or width of butt straps 22 1/4"

Per centages of strength of longitudinal joint rivets 88.2 plates 85.4 Working pressure of shell by rules 200 Size of manhole in shell 19 1/2" x 15 1/2"
 Size of compensating ring 3-0 1/2 x 2-8 1/2 x 1 3/4 No. and Description of Furnaces in each Boiler DE 8 Material Steel Outside diameter 3-10 1/4"
 Length of plain part top — bottom — Thickness of plates crown 5/8 bottom 5/8 Description of longitudinal joint welded No. of strengthening rings —
 Working pressure of furnace by the rules 217 Combustion chamber plates: Material Steel Thickness: Sides 23" Back — Top 32" Bottom 16"
 Pitch of stays to ditto: Sides 9 3/4 x 9 3/8" Back — Top 9 3/4 x 9 3/8" If stays are fitted with nuts or riveted heads Both Working pressure by rules 200
 Material of stays Iron Diameter at smallest part 2.39" Area supported by each stay 89" Working pressure by rules 202 End plates in steam space
 Material Steel Thickness 1 3/2" Pitch of stays 18 1/2 x 18 How are stays secured do & Working pressure by rules 200 Material of stays Steel
 Diameter at smallest part 7.06" Area supported by each stay 341" Working pressure by rules 210 Material of Front plates at bottom Steel
 Thickness 7/8" Material of Lower back plate — Thickness — Greatest pitch of stays — Working pressure of plate by rules —
 Diameter of tubes 3" Pitch of tubes 4 1/4 x 4 1/8" Material of tube plates Steel Thickness: Front 1" Back 1" Mean pitch of stays 10 1/2"
 Pitch across wide water spaces 13 3/8" Working pressures by rules 210 Girders to Chamber tops: Material Steel Depth and
 thickness of girder at centre 13 x 1 (2) Length as per rule 50" Distance apart 9 3/4" Number and pitch of stays in each (4) 9 1/2"
 Working pressure by rules 205 Steam dome: description of joint to shell None % 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

Tested by Hydraulic Pressure to
SUPERHEATER. Type *none* Date of Approval of Plan
Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler
Date of Test
Diameter of Safety Valve
Pressure to which each is adjusted
Is Easing Gear fitted

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

SPARE GEAR. State the articles supplied:—2 bolts & nuts for main gear bearing 2 bolts & nuts for pinion bearing, 1 set coupling bolts
to bolted end bolts & nuts for gear case joint 2 thermometers for oil on system, 1 set bearings for gear wheel shaft, 1 set bearings
for 1st Red shaft, 1 set bearings for 2nd Red shaft, 2 thrust shoes, 1 set feed pump valves, 1 set bilge pump valves, 1 set valves
for lubricating oil pump, bucket & rod for lubricating oil pump, 1 escape valve for each size, 1 shuttle valve for
air pump, 1 piston bucket & rod for air pump, 1 piston bucket & rod for feed pump, 1 impeller shaft, 1 crank shaft
piston rod & con rod & bushes for circulating pump a quantity of assorted bolts and
nuts, bars and plates of steel and other articles

The foregoing is a correct description,

David Rowan & Co Ltd Manufacturer.
per ams *David*

Dates of Survey while building
During progress of work in shops -- 1918 Sep 17 Oct 4 Dec 11 (1919) Feb 11 Apr 1.16 Jun 3.16 July 14 Aug 29 Sep 10.16.25 Oct 1.9.15.16 Nov 3.5.20 Dec 1.24 (1920)
During erection on board vessel -- Jan 12.26.28.30 Feb 10.12 Mar 1.8.12.17.19.25 Apr 2.8.9.19.22.29 May 14.16.17.24.26.27.31 Jun 8 July 2.13 Aug 4.11.16 Sep 7.8.13
Total No. of visits 65

Is the approved plan of main boiler forwarded herewith

Dates of Examination of principal parts—Casings — Rotors — Blading — Gearing 1.9.20

Rotor shaft — Thrust shaft 13.5.20 Tunnel shafts 3.6.20 Screw shaft 22.4.20 Propeller 13.5.20

Stern tube 2.4.20 Steam pipes tested 26.1.20 - 6.12.20 Engine and boiler seatings 8.4.20 Engines holding down bolts 16.11.20

Completion of pumping arrangements 17.12.20 Boilers fired 3.11.20 Engines tried under steam 13.12.17.12.20

Main boiler safety valves adjusted 14.12.20 Thickness of adjusting washers: Pt DE P⁵/₁₆ Sta P⁵/₁₆ Sta P³/₈ S¹/₄ P¹/₈ SEP¹/₈ S¹/₁₆ Sta P¹/₁₆ S¹/₈

Material and tensile strength of Rotor shaft Identification Mark on Do.

Material and tensile strength of Pinion shaft 1st Red 40 ton 2nd Red 34 3/8 ton Identification Mark on Do. * See Below

Material of Wheel shaft Steel Identification Mark on Do. J.P. Material of Thrust shaft Steel Identification Mark on Do. TM 13.5.20

Material of Tunnel shafts Steel Identification Marks on Do. * See Below Material of Screw shafts Steel Identification Marks on Do. TM 22.4.20

Material of Steam Pipes Iron Test pressure 600 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 Yes If so, state name of vessel Mangalore Gls Rpt 40065

General Remarks (State quality of workmanship, opinions as to class, &c.)

* H.P. Pinion Shaft 658 H.P. 658 L.P. Pinion Shaft 637.9836 A 319 H.P. 2nd Shaft J.P. L.P. 2nd Shaft T.4.6

T 897 L.R. T 11 L.R. T 881 L.R. T 879 L.R. T 872 L.R. T 866 L.R. T 866 L.R. T 866 L.R.

3468 3959 J.P. 932 930 R.F.M. 3504 J.P. 3443 3609

Δ: - TM 3.6.20. TM 3.6.20. TM 3.6.20. TM 3.6.20. TM 3.6.20. TM 3.6.20. TM 3.6.20. TM 3.6.20

The machinery and boilers of this vessel have

been constructed under special survey in accordance with the Rules and

approved plans, the materials and workmanship are good, the machine

has been tried under working conditions and found to work satisfactorily

and is eligible, in our opinion, to be classed with records of + LMC 12.

and fitted for oil fuel 12.20 F.P. above 150°F

The amount of Entry Fee ... £ 3 : 0 : 0

Special Balance of £ 12.12.9

Donkey Boiler Fee

Charged at Manchester

Travelling Expenses (if any) £

When applied for, 15.12.19.20

When received, 17.12.19.20

Committee's Minute GLASGOW 5 - JAN 1921

Assigned + LMC 12.20

72

Fitted for oil fuel 12.20 F.P. above 150°F

MACHINERY CERT
WRITTEN
6.1.21

Lloyd's Register Foundation