

## REPORT ON MACHINERY.

No. 15330.

Received at London Office

MON 15 JAN. 1917

Date of writing Report 18<sup>th</sup> Jan'y to 1917 When handed in at Local Office 11/1 1917 Port of West Hartlepool  
 No. in Survey held at West Hartlepool Date, First Survey 3<sup>rd</sup> April 1916 Last Survey 11<sup>th</sup> Jan'y 1917  
 Reg. Book. on the steel screw steamer "Robert Bruce" (Number of Visits 5) Tons { Gross 11595 Net 11595 }  
 Master By whom built Rich. R. Dixon & Co. Ltd. When built 1916  
 Engines made at Hartlepool By whom made Richardsons, Westgarth & Co. Ltd. when made 1916  
 Boilers made at Hartlepool By whom made Richardsons, Westgarth & Co. Ltd. when made 1916  
 Registered Horse Power Owners R.W. & J. Sutherland Port belonging to Candiff  
 Nom. Horse Power as per Section 28 3644 Is Refrigerating Machinery fitted for cargo purposes No. Is Electric Light fitted Yes

## ENGINES, &amp;c.—Description of Engines

Triple Expansion - InvertedNo. of Cylinders ThreeNo. of Cranks ThreeDia. of Cylinders 25, 41, 68 Length of Stroke 45 Revs. per minute 68.5 Dia. of Screw shaft as per rule 13.64 Material of Iron  
as fitted 14 1/2 screw shaftIs 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 If the liner is in more than one length are the joints burned 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 yes If two  
liners are fitted, is the shaft lapped or protected between the liners Length of stern bush 4-9Dia. of Tunnel shaft as per rule 12.42 12.41 Dia. of Crank shaft journals as per rule 12.74 13.03 Dia. of Crank pin 13 1/2 Size of Crank webs 8x19 3/4 Dia. of thrust shaft under  
as fitted 12 1/2 collars 14 1/2 Dia. of screw 16-9 Pitch of Screw 16-3 No. of Blades four State whether moveable no Total surface 88.9No. of Feed pumps Two Diameter of ditto 3 Stroke 27 Can one be overhauled while the other is at work yes  
No. of Bilge pumps Two Diameter of ditto 3 3/4 Stroke 27 Can one be overhauled while the other is at work yes  
No. of Donkey Engines Two Sizes of Pumps General Service 6x8 duplex No. and size of Suctions connected to both Bilge and Donkey pumps  
Ballast pump 10x10In Engine Room Four 3 1/2 In Holds, &c. Two 3 1/2 in each hold  
One 2 1/2 Tunnel wellNo. of Bilge Injections one size 5 1/2 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 the sluices on Engine room bulkheads always accessible none  
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 Hold bilge suction How are they protected Wood casing  
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 22.1.17 of Stern Tube 29.3.17 Screw shaft and Propeller 29.3.17  
Is the Screw Shaft Tunnel watertight yes Is it fitted with a watertight door yes worked from Top gratingBOILERS, &c.—(Letter for record S)Manufacturers of Steel J. Spencer & Sons Ltd. & Leeds Forge Co. Ltd.Total Heating Surface of Boilers 6015 Is Forced Draft fitted no No. and Description of Boilers Three single ended Lys. & Mult.  
Working Pressure 180 lbs Tested by hydraulic pressure to 360 lbs Date of test 26/9/16 No. of Certificate 31442Can each boiler be worked separately yes Area of fire grate in each boiler 53.1 No. and Description of Safety Valves to  
each boiler Two, direct spring Area of each valve 7.07 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 6'-0" Mean dia. of boilers 14-9 Length 10-6 Material of shell plates steel  
Thickness 1 5/8 Range of tensile strength 28 3/4 to 32 tons Are the shell plates welded or flanged no Descrip. of riveting: cir. seams Lap DR.  
long. seams DR. 5-7 R Diameter of rivet holes in long. seams 1 3/16 Pitch of rivets 8 1/4 Lap of plates or width of butt straps 1 1/2  
Per centages of strength of longitudinal joint 86.4 Working pressure of shell by rules 180 lbs Size of manhole in shell 13x16 1/2  
plate 85.6Size of compensating ring 7 1/4 x 15 1/2 No. and Description of Furnaces in each boiler 3 Brighton Material steel Outside diameter 44 1/2  
Length of plain part top 9 Thickness of plates bottom 16 Description of longitudinal joint weld No. of strengthening rings —  
bottom —Working pressure of furnace by the rules 198 lbs Combustion chamber plates: Material steel Thickness: Sides 19 Back 19 Top 19 Bottom 18  
Pitch of stays to ditto: Sides 8 1/4 x 7 1/2 Back 8 1/4 x 8 Top 7 1/2 x 8 1/2 If stays are fitted with nuts or riveted heads nuts Working pressure by rules 184.5 lbs  
Material of stays steel Diameter at smallest part 3 1/8 x 1 3/8 Area supported by each stay 8 1/4 x 8 Working pressure by rules 180 lbs End plates in steam space:  
Material steel Thickness 1 5/8 Pitch of stays 1 1/4 x 20 How are stays secured DN + W Working pressure by rules 181.5 lbs Material of stays steel  
Diameter at smallest part 2 5/8 Area supported by each stay 1 1/4 x 20 1/2 Working pressure by rules 182 lbs Material of Front plates at bottom steel  
Thickness 13 Material of Lower back plate steel Thickness 13 Greatest pitch of stays 13 1/2 x 8 Working pressure of plate by rules 185 lbs  
Diameter of tubes 3 1/4 Pitch of tubes 4 1/2 x 4 3/8 Material of tube plates steel Thickness: Front 13 Back 13 Mean pitch of stays 10 15/16 x 9  
Pitch across wide water spaces 14 1/2 Working pressures by rules 218 lbs Girders to Chamber tops: Material steel Depth and  
thickness of girder at centre 13 1/4 x 13 1/4 Length as per rule 29 1/2 Distance apart 8 1/2 Number and pitch of stays in each Three 7 1/2Working pressure by rules 188.5 lbs Superheater or Steam chest; how connected to boiler — Can the superheater be shut off and the boiler worked  
separately — 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 —



IS A DONKEY BOILER FITTED? *No*

If so, is a report now forwarded? *✓*

SPARE GEAR. State the articles supplied:— *Two top + two bottom end connecting rod bolts + nuts. Two main bearing bolts + nuts. One set of coupling bolts + nuts. One set of feed + bilge pump valves. Main + donkey feed check valves. Assorted bolts + nuts etc.*

The foregoing is a correct description,

FOR RICHARDSONS, WESTGARTH & CO., LIMITED

*E. P. Hargreave*

ASSISTANT GENERAL MANAGER

Manufacturer.

Dates of Survey while building { During progress of work in shops - - 1916. Apr 3. 7. 14. 20. May 1. June 5. 7. 23. 26. 28. 29. July 13. 18. 20. 26. 31. Aug 1. 8. 9. 10. 15  
During erection on board vessel - - 21. 28. Sep 12. 13. 14. 19. 20. 23. 25. 26. 28. Oct 10. 11. 16. 19. 24. 25. 27. Nov 1. 2. 5. 6. 7. 13. 15. 19. 22. Dec 1. 4. 21. 27. 30. 1917. Jan 8. 11.  
Total No. of visits *55 + 12 = 67.*

Is the approved plan of main boiler forwarded herewith. *Yes*

*at Mdb 1917. Jan 12. 22. Mar 29. Apr 4. 13. 18. 26. 27. May 2. 8. 18. 24.*

Dates of Examination of principal parts—Cylinders *1/8/16 19/10/16* Shafts *20/7/16 5/25/16* Covers *3/7/16* Pistons *20/9/16* Rods *12/10/16*  
Connecting rods *3/4/16* Crank shaft *2/4/16 3/11/16* Thrust shaft *18/10/16 21/11/16* Tunnel shafts *23/9/16* Screw shaft *7/11/16* Propeller *7/11/16 27/10/16*  
Stern tube *17/11/16 11/12/16 30/1/17* Steam pipes tested *27.4.17* Engine and boiler seatings *22.1.17* Engines holding down bolts *26.4.17*  
Completion of pumping arrangements *2.5.17* Boilers fixed *26.4.17* Engines tried under steam *2.5.17*  
Main boiler safety valves adjusted *2.5.17* Thickness of adjusting washers *PRPV 3/4 SV 3/4 CRPV 1/4 SV 1/4 SBPV 3/4 SV 3/4*  
Material of Crank shaft *steel* Identification Mark on Do. *(5800 28/7/16)* Material of Thrust shaft *steel* Identification Mark on Do. *(5800 16/11/16)*  
Material of Tunnel shafts *iron* Identification Marks on Do. *5800* Material of Screw shafts *steel* Identification Marks on Do. *(307 1/11/17 5800 21/11/17)*  
Material of Steam Pipes *Lap welded Steel* Test pressure *540 lbs.*

Is an installation fitted for burning oil fuel

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. If so, state name of vessel

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

*Evaporator only tested to 50 lbs, main coils to 400 lbs. (269 50th 14/11/16)*

*The Engines & Boilers of this vessel have been constructed under special survey, the material & workmanship sound & good, the Boilers have been tested by Hydraulic pressure in accordance with the Rules rendering this vessel eligible in my opinion to have the notation \*LMC in the Register Book when the survey is complete.*

*The whole of the machinery has been sent to Middlesbrough to be fitted on board.*

*The Engines and Boilers of this vessel have now been fitted and secured on board in accordance with the Rules. They are now in good working condition and in our opinion eligible to have the notation of +LMC 5.17 in the Register Book.*

*It is submitted that this vessel is eligible for THE RECORD + LMC 5.17.*

The amount of Entry Fee ... £ 3 : 0 :  
Special *WH&C* £ 25 : 9 : 4  
Donkey Boiler Fee ... £ 12 : 14 : 8  
Travelling Expenses (if any) £

When applied for, *10/11/1917*

When received, *15/5/1917*

*Per. Lon. Advice Mdb.*

Committee's Minute

Assigned

*AWD. 8/6/17. A. Hargreave & J. Kerr*  
Engineer-Surveyor to Lloyd's Register of British & Foreign Shipping.



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MACHINERY CERTIFICATE  
WRITTEN.