

## REPORT ON STEAM TURBINE MACHINERY. No. 109742.

Received at London Office 19/10/37 Port of *Liverpool.*

Date of writing Report 19 When handed in at Local Office 19/10/37 Date, First Survey 17/7/36 Last Survey 15/10/1937

No. in Survey held at *Birkenhead* Reg. Book. *Twin S.S. 'City of Cape Town'* on the *Birkenhead*

Built at *Birkenhead* By whom built *Cammell Laird & Co* Yard No. *1023* When built *1937*

Engines made at *Birkenhead* By whom made *Cammell Laird & Co* Engine No. *1023* When made *1937*

Boilers made at *Birkenhead* By whom made *Cammell Laird & Co* Boiler No. *1023* When made *1937*

Shaft Horse Power at Full Power *9750* Owners *The Ellerman Lines Ltd* Port belonging to *Liverpool*

Nom. Horse Power *1867* Is Refrigerating Machinery fitted for cargo purposes *no* Is Electric Light fitted *yes*

Trade for which Vessel is intended

STEAM TURBINE ENGINES, &c.—Description of Engines *Single Reduction geared turbines*

No. of Turbines Ahead *6* Direct coupled, single reduction geared to *2* propelling shafts. No. of primary pinions to each set of reduction gearing *3*

direct coupled to Alternating Current Generator ☒ phase ☒ periods per second ☒ rated ☒ Kilowatts ☒ Volts at ☒ revolutions per minute;

for supplying power for driving ☒ Propelling Motors, Type ☒

rated ☒ Kilowatts ☒ Volts at ☒ revolutions per minute. Direct coupled, single or double reduction geared to ☒ propelling shafts.

TURBINE  
LOADING.

	H.P.			I.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.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
1ST EXPANSION	<i>1'9 1/8"</i>	<i>1'-6 1/2"</i>	<i>11</i>	<i>1'9 1/8"</i>	<i>1'-11"</i>	<i>7</i>	<i>3 1/4"</i>	<i>3'-2 1/2"</i>	<i>3</i>	<i>2'13 1/8"</i>	<i>2'-7"</i>	<i>2</i>
2ND	<i>1'3 1/16"</i>	<i>1'-6 7/8"</i>	<i>11</i>	<i>2"</i>	<i>1'-11 1/4"</i>	<i>7</i>	<i>4 1/8"</i>	<i>3'-4 1/4"</i>	<i>3</i>	<i>2'13 1/16"</i>	<i>2'-8 7/8"</i>	<i>2</i>
3RD	<i>2'1/8"</i>	<i>1'-7 1/2"</i>	<i>11</i>	<i>2 1/2"</i>	<i>2'-0 3/4"</i>	<i>6</i>	<i>5"</i>	<i>3'-6"</i>	<i>2</i>	<i>4"</i>	<i>2'-11"</i>	<i>2</i>
4TH				<i>3 1/16"</i>	<i>2'-1 7/8"</i>	<i>6</i>	<i>6"</i>	<i>3'-8"</i>	<i>2</i>	<i>4"</i>	<i>2'-11"</i>	<i>2</i>
5TH				<i>4"</i>	<i>2'-3 3/4"</i>	<i>6</i>	<i>6 1/2"</i>	<i>3'-9"</i>	<i>1</i>	<i>4"</i>	<i>2'-11"</i>	<i>2</i>
6TH							<i>7 7/8"</i>	<i>3'-11 1/4"</i>	<i>1</i>			
7TH							<i>7 7/8"</i>	<i>3'-11 1/4"</i>	<i>1</i>			
8TH							<i>7 7/8"</i>	<i>3'-11 1/4"</i>	<i>1</i>			
9TH							<i>7 7/8"</i>	<i>3'-11 1/4"</i>	<i>1</i>			
10TH												
11TH												
12TH												

Shaft Horse Power at each turbine { H.P. *1505* I.P. *1590* L.P. *1780* } Revolutions per minute, at full power, of each Turbine Shaft { H.P. *2721* I.P. *2721* L.P. *2401* }

Rotor Shaft diameter at journals { H.P. *6"* I.P. *6"* L.P. *6 1/2"* } Pitch Circle Diameter { 1st pinion *4' 3 1/2" 64273"* 2nd pinion *4' 7 1/2" 7284"* } main wheel *152.755"* Width of Face { 1st reduction wheel *33"* main wheel *33"* }

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings { 1st pinion *2'-2 3/4"* 2nd pinion *2'-9 1/8"* }

Flexible Pinion Shafts, diameter { 1st *5 1/2"* 2nd *1 1/2"* } Pinion Shafts, diameter at bearings { External *5 1/2"* Internal *1 1/2"* } Generator Shaft, diameter at bearings *20 11/16"* (mean) Propelling Motor Shaft, diameter at bearings *14.65"*

Wheel Shafts, diameter at bearings { 1st *18 1/2"* main *13.96"* } diameter at wheel shroud, { 1st *20 11/16"* (mean) main *14.65"* }

Intermediate Shafts, diameter { as per rule *13.96"* as fitted *14 1/4"* } Thrust Shaft, diameter at collars { as per rule *15.35"* as fitted *15"* }

Tube Shaft, diameter { as per rule *25/32"* as fitted *25/32"* } Screw Shaft, diameter { as per rule *16"* as fitted *16"* } Is the tube screw shaft fitted with a continuous liner *yes*

Bronze Liners, thickness in way of bushes { as per rule *27/32"* as fitted *27/32"* } Thickness between bushes { as per rule *23/32"* as fitted *23/32"* } Is the after end of the liner made watertight in the propeller boss *yes*

If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner *one length*

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 *light*

If two liners are fitted, is the shaft lapped or protected between the liners *yes* Is an approved Oil Gland or other appliance fitted at the after end of the tube shaft *no* Length of Bearing in Stern Bush next to and supporting propeller *7'-4"*

Propeller, diameter *16'-9"* Pitch *15'-9"* No. of Blades *4* State whether Moveable *yes* Total Developed Surface *95* square feet. Can the H.P. or I.P. Turbine exhaust direct to the Condenser *yes*

No. of Turbines fitted with astern wheels *4* Feed Pumps { No. and size *2 main 17x12 1/2 x 24" stroke, 1 Aux. 8 1/2 x 6 x 18"* How driven *steam* }

Pumps connected to the Main Bilge Line { No. and size *1 ballast 10 1/2 x 14 x 24" stroke, 2 bilge & sanitary 7 1/2 x 9 x 15"* How driven *steam* }

Ballast Pumps, No. and size *one 10 1/2 x 14 x 24"* Lubricating Oil Pumps, including Spare Pump, No. and size *3- each 11000 gal per hour*

Are two independent means arranged for circulating water through the Oil Cooler *yes* Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge Pumps, No. and size: In Engine and Boiler Room *2- 3 1/2" 15-20"* In Pump Room *yes*

In Holds, &c. *17 hold 2-3", 12 hold 2-3 1/2", 13 hold 2-3", 14 hold 2-2 1/2", 15 hold 2-3" 15-20", 16 hold 2-2 1/2", 17 hold 2-2 1/2", 18 hold 2-2 1/2", 19 hold 2-2 1/2", 20 hold 2-2 1/2", 21 hold 2-2 1/2", 22 hold 2-2 1/2", 23 hold 2-2 1/2", 24 hold 2-2 1/2", 25 hold 2-2 1/2", 26 hold 2-2 1/2", 27 hold 2-2 1/2", 28 hold 2-2 1/2", 29 hold 2-2 1/2", 30 hold 2-2 1/2", 31 hold 2-2 1/2", 32 hold 2-2 1/2", 33 hold 2-2 1/2", 34 hold 2-2 1/2", 35 hold 2-2 1/2", 36 hold 2-2 1/2", 37 hold 2-2 1/2", 38 hold 2-2 1/2", 39 hold 2-2 1/2", 40 hold 2-2 1/2", 41 hold 2-2 1/2", 42 hold 2-2 1/2", 43 hold 2-2 1/2", 44 hold 2-2 1/2", 45 hold 2-2 1/2", 46 hold 2-2 1/2", 47 hold 2-2 1/2", 48 hold 2-2 1/2", 49 hold 2-2 1/2", 50 hold 2-2 1/2", 51 hold 2-2 1/2", 52 hold 2-2 1/2", 53 hold 2-2 1/2", 54 hold 2-2 1/2", 55 hold 2-2 1/2", 56 hold 2-2 1/2", 57 hold 2-2 1/2", 58 hold 2-2 1/2", 59 hold 2-2 1/2", 60 hold 2-2 1/2", 61 hold 2-2 1/2", 62 hold 2-2 1/2", 63 hold 2-2 1/2", 64 hold 2-2 1/2", 65 hold 2-2 1/2", 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hold 2-*



BOILERS, &c.—(Letter for record *S*) Total Heating Surface of Boilers *19800 sq*  
 Is Forced Draft fitted *Yes* No. and Description of Boilers *6 mult. cylindrical* Working Pressure *265 lb*  
 Is a Report on Main Boilers now forwarded? *Yes*

Is *a Donkey* Boiler fitted? *No* If so, is a report now forwarded? *✓*  
*an Auxiliary*

Is the donkey boiler intended to be used for domestic purposes only? *✓*

Plans. Are approved plans forwarded herewith for Shafting *Yes* Main Boilers *Yes* Auxiliary Boilers *✓* Donkey Boilers *✓*  
 (If not state date of approval)

Superheaters *✓* General Pumping Arrangements *Yes* Oil Fuel Burning Arrangements *Yes*  
 SPARE GEAR.

Has the spare gear required by the Rules been supplied? *Yes*

State the principal additional spare gear supplied *4 propeller blades (2 right & 2 left hand), one propeller shaft, 19 propeller blade studs & nuts, 1 HP & 1 LP pinion with claw coupling, one armature for lub oil pump & one ditto for drain circulating pumps, 6 safety valve springs and a number of bolts & tubes, and many other items in accordance with spare gear list attached.*

The foregoing is a correct description,

FOR AND ON BEHALF OF  
 CAMMELL KERR & Co. LIMITED

*W. H. McMenamy*

Manufacturer.

Dates of Survey while building  
 During progress of work in shops -- *1936 - July 17, 28, 31, Sept 9, 11, 14, 18, 21, 24, 28, Oct 2, 6, 8, 15, 21, 28, 29, Nov 5, 16, 19, 20, 24, 27, 30, Dec 2, 4, 8, 11, 16, 28, 1937 Jan 4, 6, 7, 8, 13, 14, 15, 18, 19, 20, Feb 1, 2, 4, 5, 9, 12, 13, 16, 17, 19, 22, 23, 24, 25, 26, Mar 1, 2, 4, 5, 10, 11, 12, 15, 17, 18, 19, 22, 23, 24, 25, 30, 31, Apr 2, 3, 5, 6, 9, 12, 14, 15, 16, 19, 20, 21, 22, 23, 26, 27, 30, May 3, 4, 5, 6, 7, 10, 11, 13, 14, 15, 19, 20, 21, 22, 25, 26, 28, 29, 31, June 1, 2, 3, 4, 7, 8, 9, 11, 14, 15, 16, 18, 21, 22, 23, 24, 25, 28, 29, 30, 30, July 1, 2, 3, 5, 6, 7, 8, 9, 10, 12, 13, 13, 15, 16, 16, 19, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, Aug 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 16, 17, 18, 20, 23, 24, 26, 30, 31, Sept 2, 3, 6, 7, 9, 14, 15, 16, 15, Oct 15.*  
 During erection on board vessel --  
 Total No. of visits *189*

Dates of Examination of principal parts—Casings *6/1/37 8/1/37 20/1/37 14/1/37 2/4 3/13 25/3/37 9/4 14/4/37 18/1/37 9/2 3/3*  
 Wheel shaft *24/1/36 2/4* Thrust shaft *9/4/37 13/5 1/6* Intermediate shafts *9/4/37 30/4 1/4 26* Tube shaft *25/3/37 9/4 14/4/37 18/1/37 9/2 3/3*  
 Propeller *25/2/37 19/5 2/5 2/6* Stern tube *25/3/37 9/4 20/4* Engine and boiler seatings *6/5/37 20/7/37* Engine holding down bolts *6/5/37*  
 Completion of fitting sea connections *3/4/37* Completion of pumping arrangements *14/9/37* Boilers fixed *6/8/37* Engines tried under steam *15/9/37 25/9/37*  
 Main boiler safety valves adjusted *14/9/37* Thickness of adjusting washers *Cent. "P" 11/32 S 11/32 1st "P" 11/32 S 11/32 2nd "P" 11/32 S 11/32 3rd "P" 11/32 S 11/32 4th "P" 11/32 S 11/32 5th "P" 11/32 S 11/32 6th "P" 11/32 S 11/32 7th "P" 11/32 S 11/32 8th "P" 11/32 S 11/32 9th "P" 11/32 S 11/32 10th "P" 11/32 S 11/32 11th "P" 11/32 S 11/32 12th "P" 11/32 S 11/32 13th "P" 11/32 S 11/32 14th "P" 11/32 S 11/32 15th "P" 11/32 S 11/32 16th "P" 11/32 S 11/32 17th "P" 11/32 S 11/32 18th "P" 11/32 S 11/32 19th "P" 11/32 S 11/32 20th "P" 11/32 S 11/32 21st "P" 11/32 S 11/32 22nd "P" 11/32 S 11/32 23rd "P" 11/32 S 11/32 24th "P" 11/32 S 11/32 25th "P" 11/32 S 11/32 26th "P" 11/32 S 11/32 27th "P" 11/32 S 11/32 28th "P" 11/32 S 11/32 29th "P" 11/32 S 11/32 30th "P" 11/32 S 11/32 31st "P" 11/32 S 11/32 32nd "P" 11/32 S 11/32 33rd "P" 11/32 S 11/32 34th "P" 11/32 S 11/32 35th "P" 11/32 S 11/32 36th "P" 11/32 S 11/32 37th "P" 11/32 S 11/32 38th "P" 11/32 S 11/32 39th "P" 11/32 S 11/32 40th "P" 11/32 S 11/32 41st "P" 11/32 S 11/32 42nd "P" 11/32 S 11/32 43rd "P" 11/32 S 11/32 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