

No. 1832

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. 2131 No. in Register Book 3486

" TRENDRA " KEYSHEY
S.S. GLEAR WATER

Makers of Engines Carter & Co. Ltd.

Works No. 314
Makers of Main Boilers North Eastern Marine Eng. Co. Ltd.

Works No. 2660

Makers of Donkey Boiler

Works No.

MACHINERY.



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No.

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. No. in Register Book

Received at Head Office

9th November 1928

Surveyor's Report on the Neto Engines, Boilers, and Auxiliary Machinery of the ~~Single Triple~~ Steam ~~Twin Quadruple~~ Clearwater

Official No.

147798

Port of Registry

Middlesbrough

Registered Owners

Water Transport Co. Ltd.

Engines Built by

at

Quintin Dock Co. Ltd.
South Quay-on-Tees

Main Boilers Built by

at

North Eastern Marine Eng. Co. Ltd.
Cumbria

Donkey

at

Date of Completion

3-28

First Visit

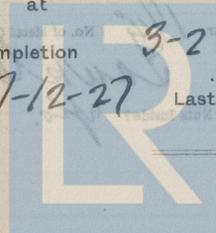
7-12-27

Last Visit

20-3-28

Total Visits

40



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RECIPROCATING ENGINES.

Works No. *314* No. of Sets *1* Description *Wipac Schaubert
L.C. 3 Cyls.*

No. of Cylinders each Engine *3* No. of Cranks *3*
Diars. of Cylinders *16"-26"-44"* Stroke *33"*
Cubic feet in each L.P. Cylinder *29.03*

Are Spring-loaded Relief Valves fitted to Top and Bottom of each Cylr? *Yes.*

" " " each Receiver? *Yes.*

Type of H.P. Valves,

" 1st L.P. "

" 2nd L.P. "

" L.P. "

" Valve Gear

" Condenser

Diameter of Piston Rods (plain part)

Material "

Diar. of Connecting Rods (smallest part)

" Crosshead Gudgeons

No. of Crosshead Bolts (each)

" Crank Pin " "

" Main Bearings

" Bolts in each

" Holding Down Bolts, each Engine

Cooling Surface *1200* sq. ft.

Screwed part (bottom of thread) *3.03*

Material

Material

Material

Material

Material

Material

Material

No. of Metal Chocks *53*

Are the Engines bolted to the Tank Top or to a Built Seat? *Lauktoh.*

Are the Bolts tapped through the Tank Top and fitted with Nuts Inside? *Yes.*

If not, how are they fitted?

Connecting Rods, Forged by *Brown Bros.*

Piston " "

Crossheads,

Connecting Rods, Finished by *Smiths & Co.*

Piston " "

Crossheads,

Date of Harbour Trial *16-3-28*

" Trial Trip *20-3-28*

Trials run at *In Les Baer.*

Were the Engines tested to full power under Sea-going conditions? *Yes.*

If so, what was the L.H.P.? *986*

Revs. per min. *114*

Pressure in 1st L.P. Receiver, *60* lbs., 2nd L.P.,

lbs., L.P., *10.8* lbs., Vacuum, *25* ins.

Speed on Trial *no check taken.*

If the Conditions on Trial were such that full power records were not obtained give the following estimated

data:—

Builders' estimated L.H.P.

Revs. per min.

Estimated Speed



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SHAFTING.

Are the Crank Shafts Built or Solid?

built.

No. of Lengths in each

3

Angle of Cranks

120°

Diar. by Rule

Actual

8 13/16"

In Way of Webs

9 1/2"

" of Crank Pins

8 13/16"

Length between Webs

9"

Greatest Width of Crank Webs

16 1/2"

Thickness

5 7/16"

Least " "

13 1/2"

" "

4"

Diar. of Keys in Crank Webs

1 1/2"

Length

4"

" Dowels in Crank Pins

1"

Length

3 1/2"

Screwed or Plain

plain.

No. of Bolts each Coupling

6

Diar. at Mid Length

2 1/8"

Diar. of Pitch Circle

13 1/4"

Greatest Distance from Edge of Main Bearing to Crank Web

4 1/8"

Type of Thrust Blocks

Wedge shoe.

No. " Rings

5

Diar. of Thrust Shafts at bottom of Collars

8 13/16"

No. of Collars

4

" " Forward Coupling

8 13/16"

At Aft Coupling

8 1/2"

Diar. of Intermediate Shafting by Rule

Actual

No. of Lengths

No. of Bolts, each Coupling

Diar. at Mid Length

Diar. of Pitch Circle

Diar. of Propeller Shafts by Rule

Actual

9 3/4"

At Couplings

8 13/16"

Are Propeller Shafts fitted with Continuous Brass Liners?

yes.

Diar. over Liners

10 13/16" + 10 3/4"

Length of After Bearings

3 1/2"

Of what Material are the After Bearings composed?

Aluminum Nitride.

Are Means provided for lubricating the After Bearings with Oil?

no

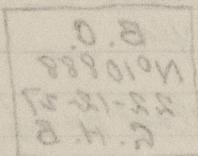
" " to prevent Sea Water entering the Stern Tubes?

no

If so, what Type is adopted?

open to sea.

SKETCH OF CRANK SHAFT.



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BOILERS.

Works No.

2660

No. of Boilers

2

Type

Cylindrical, multitubular

Single or Double-ended

single.

No. of Furnaces in each

2

Type of Furnaces

Mighton.

Date when Plan approved

Approved Working Pressure

180 lbs.

Hydraulic Test Pressure

320 "

Date of Hydraulic Test

13-2-28.

" when Safety Valves set

16-3-28

Pressure at which Valves were set

185 lbs.

Date of Accumulation Test

16-3-28

Maximum Pressure under Accumulation Test

185 lbs.

System of Draught

natural.

Can Boilers be worked separately?

Makers of Plates

D. Cobhill Sons.

" Stay Bars

" Rivets

" Furnaces

Greatest Internal Diam. of Boilers

12'-9"

" " Length "

10'-4 3/4"

Square Feet of Heating Surface each Boiler

1555 sq ft

" " Grate " "

40.5 sq ft

No. of Safety Valves each Boiler

2

Rule Diam.

Actual

2 3/4"

Are the Safety Valves fitted with Easing Gear?

y/s.

No. of Pressure Gauges, each Boiler

2

No. of Water Gauges

1

" Test Cocks

3

" Salinometer Cocks

1

Are the Water Gauges fitted direct to the Boiler Shell or mounted on Pipes?

Are the Water Gauge Pipes fitted direct to the Boiler Shell or connected by Pipes?

Are these Pipes connected to Boilers by Cocks or Valves?

Are Blow-off Cocks or Valves fitted on Boiler Shells?

No. of Stakes of Shell Flating in each Boiler

Plates in each Stakes

Thickness of Shell Plates Approved

in Boilers

Are the Rivets Iron or Steel?

Are the Longitudinal Beams Butt or Lap Joints?

Are the Butt Straps Single or Double?

Are the Double Butt Straps of equal width?

Thickness of outside Butt Straps

inside

Are Longitudinal Beams Hand or Machine Riveted?

Are they Single, Double, or Triple Riveted?

No. of Rivets in a Joint

Diam. of Rivet Heads

No. of Rows of Rivets in Centre Circumferential Beams

Are these Beams Hand or Machine Riveted?

Diam. of Rivet Heads

No. of Rows of Rivets in Front End Circumferential Beams

Are these Beams Hand or Machine Riveted?

Diam. of Rivet Heads

No. of Rows of Rivets in Back End Circumferential Beams

Are these Beams Hand or Machine Riveted?

Diam. of Rivet Heads

No. of Rivets in Joints

Diameters of Circumferential Rings



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Thickness of End Plates in Steam Space Approved

" " " " " in Boilers

Pitch of Steam Space Stays

Diar. " " " " Approved Threads per Inch

" " " " in Boilers "

Material of " " "

How are Stays Secured?

Diar. and Thickness of Loose Washers on End Plates

" " Riveted " " "

Width " " Doubling Strips "

Thickness of Middle Back End Plates Approved

" " " " " in Boilers

Thickness of Doublings in Wide Spaces between Fireboxes

Pitch of Stays at " " " "

Diar. of Stays Approved Threads per Inch

" " " " in Boilers "

Material "

Are Stays fitted with Nuts outside?

Thickness of Back End Plates at Bottom Approved

" " " " " in Boilers

Pitch of Stays at Wide Spaces between Fireboxes

Thickness of Doublings in " "

Thickness of Front End Plates at Bottom Approved

" " " " " in Boilers

No. of Longitudinal Stays in Spaces between Furnaces

Same as 1/2 inch washers

Diagonal of Stays Approved

" " " " in Boilers

Material

Thickness of Front End Plates Approved

" " " " in Boilers

Pitch of Stay Tubes at Spaces between Stacks of Tubes

Thickness of Doublings in " "

Stay Tubes at " "

Are Stay Tubes fitted with Nuts at Front End?

Thickness of Back End Plates Approved

" " " " in Boilers

Pitch of Stay Tubes in Back Tube Plates

" " " "

Thickness of Stay Tubes

" " " "

External Diam. of Tubes

Material

Thickness of Furnace Plates Approved

" " " " " in Boilers

Smallest outside Diam. of Furnaces

Centre between Tube Plates

Width of Combustion Chamber (Front to Back)

" " " " " in Boilers

Pitch of Doubling Stays in Cyl. Tube

1/2 inch washers



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Diar. of Stays Approved Threads per Inch

in Boilers

Material

Thickness of Front Tube Plates Approved

in Boilers

Pitch of Stay Tubes at Spaces between Stacks of Tubes

Thickness of Doublings in

Stay Tubes at

Are Stay Tubes fitted with Nuts at Front End?

Thickness of Back Tube Plates Approved

in Boilers

Pitch of Stay Tubes in Back Tube Plates

Plain

Thickness of Stay Tubes

Plain

External Diar. of Tubes

Material

Thickness of Furnace Plates Approved

in Boilers

Smallest outside Diar. of Furnace

Length between Tube Plates

Width of Combustion Chambers (Front to Back)

Thickness of Tops Approved

in Boilers

Pitch of Screwed Stays in C.O. Tops

Same as sps. Schwater

Threads per Inch

Diar. of Screwed Stays Approved

in Boilers

Material

Thickness of Combustion Chamber Tops Approved

in Boilers

Pitch of Screwed Stays in C.O. Tops

Thickness of Doublings in

Stay Tubes at

Are all Screwed Stays fitted with Nuts at Front End?

Thickness of Combustion Chamber Backs Approved

in Boilers

Pitch of Screwed Stays in C.O. Backs

Thickness of Stay Tubes

in Boilers

Material

External Diar. of Tubes

Are all Screwed Stays fitted with Nuts at Front End?

Thickness of Combustion Chamber Bottoms

No. of Girders over each Wing Chamber

Centre

Depth and Thickness of Girders

Material of Girders

No. of Stays in each

Thickness of Tops

No. of Tubes over Tops

Size of Lower Stays

2 1/2
2 1/2
2 1/2
2 1/2



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Diar. of Screwed Stays Approved Threads per Inch

" " " in Boilers

Material " "

Thickness of Combustion Chamber Sides Approved

" " " " in Boilers

Pitch of Screwed Stays in C.C. Sides

Diar. " " Approved Threads per Inch

" " " in Boilers

Material " "

Thickness of Combustion Chamber Backs Approved

" " " " in Boilers

Pitch of Screwed Stays in C.C. Backs

Diar. " " Approved Threads per Inch

" " " in Boilers

Material " "

Are all Screwed Stays fitted with Nuts inside C.C.?

Thickness of Combustion Chamber Bottoms

No. of Girders over each Wing Chamber

" " " Centre

Depth and Thickness of Girders

Material of Girders

No. of Stays in each

No. of Tubes, each Boiler

Size of Lower Manholes

Handwritten note: " 4 s/s sheaves"

VERTICAL DONKEY BOILERS

No. of Boilers Type

Greatest Lat. Diam. Height

Height of Boiler Crown above Fire Grate

Are Boiler Crowns Flat or Dished?

Internal Radius of Dished Ends Thickness of Plates

Description of Seams in Boiler Crowns

Dist. of Rivet Holes Pitch

Height of Firebox Crown above Fire Grate

Are Firebox Crowns Flat or Dished?

External Radius of Dished Crowns Thickness of Plates

No. of Crown Stays Diam. Material

External Diam. of Firebox at Top Bottom Thickness of Plates

No. of Water Tubes High Diam. Thickness

Material of Water Tubes

Size of Manhole in Shell

Dimensions of Compressing Ring

Mounting Surface each Boiler Circumference

SUPERHEATERS

Description of Superheater

Where situated?

Which Boilers are connected to superheater? Can superheater be shut off while Boilers are working?

No. of Safety Valves on each superheater

Date of Hydrostatic Test



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MAIN STEAM PIPES.

No. of Lengths

Material

Brazed, Welded or Seamless

Internal Diam.

Thickness

How are Flanges secured?

Date of Hydraulic Test

Test Pressure

4
 caplar.
 S.D.
 3 3/4"
 1/2" W.T.
 braced.
 9-3-28
 400 lbs.

No. of Lengths

Material

Brazed, Welded or Seamless

Internal Diam.

Thickness

How are Flanges secured?

Date of Hydraulic Test

Test Pressure

No. of Lengths

Material

Brazed, Welded or Seamless

Internal Diam.

Thickness

How are Flanges secured?

Date of Hydraulic Test

Test Pressure

6 1/2 x 4 x 6 Vertical Pipe
 Brown Bronze
 4 1/2 x 3 x 4 Vertical Pipe
 Water Pump
 4 x 4 x 6 Vertical Pipe
 FEED WATER HEATERS
 Pump
 9 x 13 x 10 Vertical Pipe
 Ballast Pump



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EVAPORATORS.

No.	Type	Tons per Day
✓		
Makers		
Working Pressure	Test Pressure	Date of Test
Date of Test of Safety Valves under Steam		

FEED WATER HEATERS.

No.	Type
✓	
Makers	
Working Pressure	Test Pressure
Date of Test	

FEED WATER FILTERS.

No.	Type	Size
✓		
Makers		
Working Pressure	Test Pressure	Date of Test

LIST OF DONKEY PUMPS.

6 1/2" x 4" x 6" Vertical Duplex General
Service Donkey.

4 1/4" x 3" x 4" Vertical Duplex Fresh
Water Pump.

4 x 4 x 6" Vertical Duplex Comitan
Pump.

9" x 13" x 10" Vertical Duplex
Ballast Pump.



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REFRIGERATORS.

No. of Machines Capacity of each
 Makers
 Description
 No. of Steam Cylinders, each Machine No. of Compressors No. of Cranks
 Particulars of Pumps in connection with Refrigerating Plant and whether worked by Refrigerating Machines or Independently

System of Refrigeration

,, Insulation

Are Brine and other Regulating Valves placed so as to be accessible without entering the Insulated Spaces?

Are all Pipes, Air Trunks, &c., well secured and protected from risk of damage?

Are all Bilge, Sounding, and Air Pipes in Insulated Spaces properly insulated?

Are Thermometer Tubes so arranged that Water cannot enter and freeze in them?

Date of Test under Working Conditions

RESULTS OF TRIALS.

COMPARTMENT.	Temp. at beginning of Trial.	Temp. at end of Trial.	Time required to obtain this Result.	Rise of Temp. after hours.
Machine of Pressure				
Capacity	68	350		
Current Alterations or Conditions				
Single or Double Valve System				
Position of Apparatus				
Material of Apparatus				
No. of Circles in which Valves are worked on the Trial				
Particulars of Valve System				
No. of Trials				

Articles of Spare Gear for Refrigerating Plant carried on board:—



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Line of Work	Time required to obtain this result	Temp. at Time	Temp. at End of Time	COMMENTS
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ELECTRIC LIGHTING.

Installation Fitted by *R. Pickering & Sons Ltd.*
 No. and Description of Dynamo *One Compound wound*
 Makers of Dynamos *Sunderland Dynamo Works Ltd.*
 Capacity *68* Amperes, at *110* Volts, *350* Revols. per Min.
 Current Alternating or Continuous *Continuous*
 Single or Double Wire System *Double*
 Position of Dynamos *Starting platform.*
 „ Main Switch Board „
 No. of Circuits to which Switches are provided on Main Switch Board *4*

Particulars of these Circuits:—

Circuit.	Number of Lights.	Candle Power.	Current Required. Amps.	Size of Conductor.	Current Density.	Conductivity of Conductor.	Insulation Resistance per Mile.
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Value as 1/2p "Beekwater"



Total No. of Lights No. of Motors driving Fans, &c. No. of Heaters
 Current required for Motors and Heaters

Positions of Auxiliary Switch Boards, with No. of Switches on each

R. Lighterage Room 14
Installation fitted by
No. and Description of Dynamos
Main or Dynamo
Capacity
Current Alternating or Continuous
Single or Double Wire System
Location of Dynamos
Main Switch Board
No. of Circuits to which Switches are connected
Location of Main Switch Board

Location of Main Switch Board	No. of Circuits to which Switches are connected	Location of Dynamos	Single or Double Wire System	Current Alternating or Continuous	Capacity	Main or Dynamo	No. and Description of Dynamos	Installation fitted by
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Are Out-outs fitted as follows?—

On Main Switch Board, to Cables of Main Circuits

On Aux. " " each Auxiliary Circuit

Wherever a Cable is reduced in size

To each Lamp Circuit

To both Flow and Return Wires of all Circuits when the Double-Wire System is adopted

Are the Fuses of Standard Sizes?

Are all Switches and Out-outs constructed of Non-inflammable Material?

Are they placed so as to be always and easily accessible?

Smallest Single Wire used, No. S.W.G., Largest, No. S.W.G.

How are Conductors in Engine and Boiler Spaces protected?

" Saloons, State Rooms, &c., " ?

What special protection is provided in the following cases?—

(1) Conductors exposed to Heat or Damp

(2) " passing through Bunkers or Cargo Spaces

(3) " " Deck Beams or Bulkheads

Approved as per specification
20-3-28
20-3-28
20-3-28

Are all Joints in Cables properly soldered and thoroughly Insulated so that the efficiency of the Cables is unimpaired?

Are all Joints in accessible positions, none being made in Bunkers or Cargo Spaces?

Are all Hull Connections for Single-Wire Systems made with Surfaces of large Surface?

Are the Dynamos, Motors, Main and Branch Cables so placed that the Compasses are not injuriously affected by them?

Have Tests been made to prove that the condition has been satisfactorily fulfilled?

Has the Insulation Resistance over the whole system been tested?

What does the Resistance amount to?

Ohms.

Is the Installation supplied with a Voltmeter?

" " an Amperes Meter?

Date of Trial of complete Installation 20-3-28 Duration of Trial

Ohms.

Have all the requirements of Section 42 been satisfactorily carried out?

Yes.



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GENERAL CONSTRUCTION.

Have the Machinery and Boilers been constructed in accordance with the requirements of the Rules and the

Approved Plans? *yes.*

If not, give details of the points of difference, and state when these were sanctioned by the Chief Surveyor.

Are the Materials used in the Construction of Engines and Boilers, so far as could be seen, sound and

trustworthy? *yes.*

Is the Workmanship throughout thoroughly satisfactory? *yes.*

The above correctly describes the Machinery of the S.S. CLEARWATER

as ascertained by ^{us}me from personal examination

J. P. Stephenson
 Engineer Surveyor to the British Corporation for the
 Survey and Registry of Shipping.

Fees—

MAIN BOILERS.		£	s.	d.
H.S.	3110 Sq. ft.	:	:	:
G.S.	81 "	:	:	:
DONKEY BOILERS.				
H.S.	" Sq. ft.	:	:	:
G.S.	" "	:	:	:
		£	:	:
ENGINES.				
L.P.C.	29.03 Cub. ft.	:	:	:
		£	:	:
Testing, &c. ...		:	:	:
		£	:	:
Expenses ...		:	:	:
Total ...		£	:	:

It is submitted that this Report be approved,

J. P. Stephenson
 Chief Surveyor.

Approved by the Committee for the Class of M.B.S.* on the 21st March 1925

Fees advised

Fees paid





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