

Rpt. 4b.

# REPORT ON OIL ENGINE MACHINERY.

No. 9678  
28 JAN 1927

Received at London Office

Date of writing Report

19

When made in at Local Office

27-1-1927

Port of

Belfast

No. in Survey held at Reg. Book.

Belfast

Date, First Survey

23<sup>rd</sup> July 1925

Last Survey

10<sup>th</sup> Jan 1927

Number of Visits 102

87931 on the

Single }  
Twin }  
Triple }

Screw vessel

"Apapa"

Tons }  
Gross }  
Net }

Master

Built at

Belfast

By whom built

Harland & Wolff Ltd

Yard No.

695

When built

1926

Engines made at

Belfast

By whom made

Harland & Wolff Ltd

Engine No.

695

When made

1926

Donkey Boilers made at

Amman

By whom made

Cochran & Co

Boiler No.

When made

1926

INDICATED Horse Power

9000

Owners

African S.S. Co (Ltd) (Dumfries & Glasgow)

Port belonging to

Liverpool

Nom. Horse Power as per Rule

1651

Is Refrigerating Machinery fitted for cargo purposes

no

Is Electric Light fitted

yes

## OIL ENGINES, &c.—Type of Engines

Diesel

2 or 4 stroke cycle 4 Single or double acting D.A.

Maximum pressure in cylinders

500 lbs

No. of cylinders

12

No. of cranks

12

Diameter of cylinders

680<sup>m</sup> = 26.44

Length of stroke

1100<sup>m</sup> = 55.12

Revolutions per minute

100

Means of ignition

Compression

Kind of fuel used

F.P. above 150° F

Is there a bearing between each crank

yes

Span of bearings (Page 92, Section 2, par. 7 of Rules)

920<sup>m</sup>

Distance between centres of main bearings

1350<sup>m</sup>

Is a flywheel fitted

yes

Diameter of crank shaft journals

as per Rule approved  
as fitted 460<sup>m</sup>

Diameter of crank pins

460<sup>m</sup>

Breadth of crank webs

as per Rule as approved  
as fitted 285<sup>m</sup>

Thickness of ditto

as per Rule as approved  
as fitted 205<sup>m</sup>

Diameter of flywheel shaft

as per Rule as approved  
as fitted 460<sup>m</sup>

Diameter of tunnel shaft

as per Rule 13.48  
as fitted 14.0

Diameter of thrust shaft

as per Rule 14.54  
as fitted 15.0

Diameter of screw shaft

as per Rule 15.11  
as fitted 15.54

Is the screw shaft fitted with a continuous liner the whole length of the stern tube

yes

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 joints burned

yes

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

yes

If without liners, is the shaft arranged to run in oil

yes

Type of outer gland fitted to stern tube

Logarithmic Bushed

Length of stern bush

6'-0"

Diameter of propeller

16'-0"

Pitch of propeller

16'-6"

No. of blades

3

state whether moveable

yes

Total surface

68 # square feet

Method of reversing

Air

Is a governor or other arrangement fitted to prevent racing of the engine when declutched

yes

Thickness of cylinder liners

48<sup>m</sup>

Are the cylinders fitted with safety valves

yes

Means of lubrication

forced

Are the exhaust pipes and silencers water cooled or lagged with non-conducting material

yes

If the exhaust is led overboard near the waterline, what means are arranged to prevent water from being syphoned back to the engine

Exhausts led up funnel

No. of cooling water pumps

2 fresh + 4 salt water pumps

Is the sea suction provided with an efficient strainer which can be cleared within the vessel

yes

No. of bilge pumps fitted to the main engines

none

Diameter of ditto

Stroke

Can one be overhauled while the other is at work

No. of auxiliary pumps connected to the main bilge lines

3 + 1 emergency

How driven

Electric motors

Sizes of pumps

1 Ballpp 200 hrs per hr

Emergency bilge pp 100 hrs per hr

No. and sizes of suction connected to both main bilge pumps and auxiliary bilge pumps

—In engine room

4 @ 3 1/2"

and in holds, etc.

nos 1-2-3 holds 2 @ 3 1/2" dia

2 @ 2 1/2"

No. of ballast pumps

1

How driven

Electric motor

Sizes of pumps

200 hrs per hr

Is the ballast pump fitted with a direct suction from the engine room bilges

yes

State size

4"

Is a separate auxiliary pump suction fitted in Engine Room and size

yes 2 @ 5 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

yes

Are all connections with the sea direct on the skin of the ship

yes

Are they valves or cocks

Bob

Are they fixed sufficiently high on the ship's side to be seen without lifting the floor 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 all pipes, cocks, valves and pumps in connection with the machinery 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 deck & bridge If a wood vessel, what means are provided to prevent leakage of either fuel oil or of lubricating oil from saturating the woodwork

No. of main air compressors

2 (each engine)

No. of stages

3

Diameters

860, 475, 202

Stroke

560<sup>m</sup>

Driven by main engines

No. of auxiliary air compressors

Two

No. of stages

2

Diameters

460, 405

Stroke

260<sup>m</sup>

Driven by electric motors

No. of small auxiliary air compressors

one

No. of stages

2

Diameters

106, 34

Stroke

80<sup>m</sup>

Driven by steam cylinders

No. of scavenging air pumps

none

Diameter

Stroke

Driven by

Diameter of auxiliary Diesel Engine crank shafts

as per Rule see separate report  
as fitted

Are the air compressors and their coolers made so as to be easy of access

yes

## AIR RECEIVERS:—No of high pressure air receivers

4

Internal diameter

416<sup>m</sup>

Cubic capacity of each

290 litres

material

Steel

Seamless, lap welded or riveted longitudinal joint

Seamless hot drawn

Range of tensile strength

28 to 32 tons

thickness

14.5<sup>m</sup>

working pressure by Rules

1180 lbs

No. of starting air receivers

4

Internal diameter

6'-8"

Total cubic capacity

2800 #

Material

Steel

Seamless, lap welded or riveted longitudinal joint

riveted

Range of tensile strength

28 to 32 tons

thickness

14.5<sup>m</sup>

Working pressure by rules

3700 lbs

Is each receiver, which can be isolated, fitted with a safety valve as per Rule

yes

Can the internal surfaces of the receivers be examined

yes

What means are provided for cleaning their inner surfaces

Manhole in end

Is there a drain arrangement fitted at the lowest part of each receiver

yes

IS A DONKEY BOILER FITTED? *yes*

If so, is a report now forwarded? *yes*

HYDRAULIC TESTS:-

DESCRIPTION.	DATE OF TEST.	WORKING PRESSURE.	TEST PRESSURE.	STAMPED.	REMARKS.
ENGINE CYLINDERS					
COVERS	27.4.26 & 9.4.26	500 lbs & 15 lbs	900 lbs & 50 lbs	date & W.B.	
JACKETS	26.3.26 & 4.5.26	15 lbs	50 lbs	W.B.	
PISTON WATER PASSAGES	10.5.26 & 27.7.26	15 lbs	50 lbs	W.B.	
MAIN COMPRESSORS—1st Stage.. L.P.	19.3.26 & 22.6.26	41 lbs	150 lbs	date & W.B.	
" 2nd " .. MP.	19.3.26 & 30.6.26	220 lbs	500 lbs	date & W.B.	
" 3rd " .. H.P.	18.3.26 & 30.6.26	1000 lbs	2000 lbs	date & W.B.	
AIR RECEIVERS-STARTING	27.4.26, 28.4.26, 26.26 5-12-25	356 lbs	585 lbs	27.4.26 W.B., 26.26 W.B. 5-12-25 W.B.	Nos 35, 36, 37 + 2
INJECTION	10.6.26, 16.6.26	1000 lbs	2000 lbs	date & W.B.	Nos H-5-6-7 T.
AIR PIPES	28.5.26 to 30.9.26	356 lbs	450 lbs	W.B. R.L.A.	
FUEL PIPES	8.10.26	15	100 lbs	✓	
FUEL PUMPS	4.5.26 & 4.6.26	1070	2000	date & W.B.	
SILENCER		✓	✓	✓	
EXHAUST WATER JACKETS	26.5.26 & 5.4.26	5 lbs	15 lbs	W.B.	
SEPARATE FUEL TANKS	16.6.26	8 lbs	15 lbs	W.B.	

PLANS. Are approved plans forwarded herewith for shafting (If not, state date of approval) 5.12.26 Receivers 11.12.26 Separate Tanks 17.11.26 + 3

SPARE GEAR as attached

The foregoing is a correct description, For HARLAND AND WOLFF, LIMITED,

*F. Hebbek*

Manufacturer.

Dates of Survey while building: During progress of work in shops - 1925 July 23, 1926 Jan 13, 14, 15, 19, 21, 22, 25, 26, 28 Feb 5, 11, 16, 17, 22 Mar 1, 5, 8, 11, 15, 18, 19, 20, 21, 2, 10, 20, 22, 23, 27, 28, 30 May 3, 4, 5, 6, 7, 10, 11, 14, 17, 25, 26, 27, 28, 31 June 7, 8, 9, 10, 11, 14, 15, 16, 18, 22, 23, 24, 28, 29, 30 July 1, 2, 3, 5, 9, 26, 27, 29, 30 Aug 3, 4, 20, 25, 31 Sept 1, 3, 16, 20, 23, 30 Oct 1, 4, 5, 8, 13, 22 Nov 4, 12 Dec 9, 12, 16, 21 Jan 1927

Total No. of visits = 102

Dates of Examination of principal parts—Cylinders 27.4.26, 15.6.26 Covers 27.4.26 & 9.4.26 Pistons 15.6.26 Rods 20.4.26 Connecting rods 5.5.26, 20.4.26 Crank shaft 14.5.26 & 14.6.26 Thrust shaft 14.6.26 Tunnel shafts 4.5.26-26.26 Screw shaft 27.6.26 Propeller 28.6.26 Stern tube 26.5.26 Engine seatings 30.4.26 Engines holding down bolts 4.10.26 Completion of pumping arrangements 25.11.26 Engines tried under working conditions 16.12.26 Completion of fitting sea connections 30.7.26 Stern tube 30.6.26 Screw shaft and propeller 30.4.26 Material of crank shaft H Steel Identification Mark on Do. 695 W.B. Material of thrust shaft H Steel Identification Mark on Do. 695 W.B. Material of tunnel shafts H Steel Identification Marks on Do. 1234, 1164, 1734, 1209, 1183, 1230, 1217 dates 1239 W.B. Material of screw shafts H Steel Identification Marks on Do. 1156, 1146, Is the flash point of the oil to be used over 150° F. *yes*

Is this machinery duplicate of a previous case *yes* If so, state name of vessel *M.V. Aceda*

General Remarks (State quality of workmanship, opinions as to class, &c.)  
 The machinery of this vessel has been built under special survey. The materials and workmanship are found satisfactory. Satisfactory hydraulic tests have been applied. The engines were tried under full working conditions at morning + a deep sea trials. They were tested for manoeuvring as required by the rules. The machinery of this vessel is now in good order + eligible, in our opinion for classification with notations + L.M.C. 1.27, C.L., fitted for oil fuel 1.27 F.P. above 150° F., Electric light.

The vessel was subsequently examined in Dry Dock. The propellers outside fastenings were found to be in order.

Certificate (if required) to be sent to (The Surveyors are requested not to write on or below this space for Committee's Minutes.)

The amount of Entry Fee ... £ 6 : 0 : 0  
 Special ... £ 141 : 5 : 6  
 Air Receivers ... £ 16 : 16 : 0  
 Donkey Boiler Fee ...  
 Electric Light ...  
 Travelling Expenses (if any) ...  
 See S.L. Report.

When applied for: 24<sup>th</sup> Jan 1927  
 When received: 4.2.27

*William Bates & R. Lee Ames*  
 Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute TUES. 1 FEB 1927

Assigned  
*L.M.C. 1.27 Oil Engines*



Belfast

Continuation of Report No. 9678 dated 27-1-27 on the

New Steel M.V. "Apapa"  
Spare Gear

REMARKS.

in connecting rod bushes lower end with bolts  
 " " " " upper " " "  
 2 main bearing bushes & 4 bolts + nuts for same  
 kind of lines, 1 Piston & rod complete with sleeve & studs.  
 2 piston rings, 1 piston rod stuffing box complete with 4 sets of packing rings  
 2 cylinder covers complete (one top & one bottom)  
 5, 36, 34 + 2  
 5-6-4 T. Studs & nuts for inlet, exhaust, fuel, starting & safety valves  
 " " " " each top & bottom cylinder cover.  
 6 valves with casings, springs etc for top cover & 2 ditto for bottom cover.  
 12 " " " " " " " " " " 3 " " " "  
 " spindles with seating rings complete for top valves & 12 ditto for bottom valves  
 " seating rings for top valves & 12 ditto for bottom valves.  
 1. 25 + 3  
 12 valves with casings & springs complete for top covers.  
 " " " " " " " " " " bottom "  
 " spindles complete " " top "  
 " " " " " " " " " " bottom "  
 6 valves with casings & springs complete for top covers & 3 ditto for bottom covers.  
 " spindles for top valves & 6 ditto for bottom valves.  
 " body seats for top valves & 3 ditto for bottom valves.  
 2 cylinder safety valves complete for top & bottom covers.  
 2 pairs of rollers of each size with pins.  
 1 set of chain of largest & each size fitted + 10 chain links of each size.  
 1 set of air compressor valves & cages complete. 1 safety valve for each stage air comp.  
 1 set of piston rings for air compressors & 1 set of springs for one in engine  
 compressor top & bottom ends on rods. 1 pair bushes with bolts  
 1 set of additional springs for each size exhaust valves  
 1 set of delivery air compressor valve springs, 10 HP, 5 MP, & LP.  
 1 set of inlet pipes & fittings for piston cooling gear complete with nuts & washers  
 1 set of centre cooling pipes for piston cooling gear.  
 1 set of complete cooling coil for HP air compressor, 12 MP & LP cooler tubes  
 1 set of 1/2 inch pipe for fuel oil delivery, valve box air & blast air bottles.  
 1 set of fuel oil plungers & one complete set of parts for same top & bottom  
 1 set of assorted bolts & nuts & iron, joints & jointing material of all kinds.  
 1 set of measuring air compressors: 1 complete set valves & 1 set cages.  
 1 set of packing rings 12 cooler tubes for HP & LP coolers.  
 1 set of propeller shaft complete, 1 set coupling bolts.  
 1 set of propeller blades & 1 set studs & nuts for same  
 1 set of parts for one face of each thrust block.  
 1 set of crank shaft coupling bolts & nuts.

William D. Bates



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Foundation

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