

Rpt. 4b.

## REPORT ON OIL ENGINE MACHINERY.

No. 6698.

Date of writing Report 12<sup>th</sup> Dec. 1923 When handed in at Local Office

Received at London Office

No. in Survey held at Reg. Book.

Copenhagen

Port of

Copenhagen

Date, First Survey

24<sup>th</sup> January

Last Survey

16<sup>th</sup> Novbr

1923.

Number of Visits

85.

No. 225 on the

Single  
Twin  
TripleMotor  
Screw Vessel

"Nordbo."

Master

Built at

Copenhagen

By whom built

Akt. Burmeister &amp; Wain's

Yard No. 327

When built

4465.06

Tons

Gross

2729.88

Net

1923

Engines made at

Copenhagen

By whom made

Akt. Burmeister &amp; Wain's Maskin-og Skibbyggers

Engine No. 950

When made

1923.

Donkey Boilers made at

Copenhagen

By whom made

Akt. Burmeister &amp; Wain's Maskin-og Skibbyggers

Boiler No. 1

When made

1923.

Brake Horse Power

1950 (IHP = 2600)

Owners

Akt. Dampskibsselskabet Norden (P. Brown jun. &amp; Co)

Port belonging to

Copenhagen.

Nom. Horse Power as per Rule

482

Is Refrigerating Machinery fitted for cargo purposes

No.

Is Electric Light fitted

Yes.

OIL ENGINES, &amp;c.—Type of Engines Vertical Diesel Oil Engines.

2 or 4 stroke cycle 4 Single or double acting Single

Maximum pressure in cylinders

35 kg./cm<sup>2</sup>

No. of cylinders

2 x 6

No. of cranks

2 x 6

Diameter of cylinders

590 mm = 23 1/4"

Length of stroke

900 mm = 35 1/16"

Revolutions per minute

130

Means of ignition

Compressed air

Kind of fuel used

Crude oil (Flash point above 150° F).

Is there a bearing between each crank

yes

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

780 mm.

Distance between centres of main bearings

1180 mm.

Is a flywheel fitted

yes

Diameter of crank shaft journals

as per Rule

350 mm.

as fitted

365 mm.

Diameter of crank pins

365 mm.

Breadth of crank webs

as per Rule

466 mm.

as fitted

780 mm.

Thickness of ditto

as per Rule

199 mm.

as fitted

225 mm.

Diameter of flywheel shaft

as per Rule

350 mm.

as fitted

365 mm.

Diameter of tunnel shaft

as per Rule

9.278"

as fitted

9 1/2"

Diameter of thrust shaft

as per Rule

9.942"

as fitted

10 1/2"

Diameter of screw shaft

as per Rule

9.9

as fitted

10 1/4"

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

liners fitted in 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

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

yes.

Length of stern bush

4' - 0"

Diameter of propeller

11' - 3"

Pitch of propeller

9' - 3"

No. of blades

3

state whether moveable

no

Total surface

30

square feet

Method of reversing

Direct reversible

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

yes

Thickness of cylinder liners

48 mm.

Are the cylinders fitted with safety valves

yes.

Means of lubrication

Forced lubrication

Are the exhaust pipes and silencers water cooled or lagged with

non-conducting material or lagged If the exhaust is led overboard near the waterline, what means are arranged to prevent water from being syphoned back to the engine

The exhaust pipes are led up inside the funnel.

No. of cooling water pumps

2 off

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

1 off to each engine

Diameter of ditto

160 mm.

Stroke

130 mm.

Can one be overhauled while the other is at work

yes.

No. of auxiliary pumps connected to the main bilge lines

2 off

How driven

by electric motor.

Sizes of pumps Diam. 6 1/2" Stroke 7 and 1/2" No. and sizes of suction connected to both main bilge pumps and auxiliary bilge pumps:—In engine room 2 off 3 1/2" to main bilge line.

in No. 1, 2 &amp; 3 holds 2 off 3 1/2" in No. 4 &amp; 5 holds 3 off 3 1/2" in deep tank 2 off 3 1/2" and 2 off 4 1/2"

and in holds, etc. in F.P. &amp; A.P. 1 off in each 2 1/2" in fuel tank 1 off 3 1/2" No. of ballast pumps 1 off How driven by electric motor

in double bottom tanks arranged as per approved plan.

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

yes.

State size

6"

Is a separate auxiliary pump suction fitted in

Engine Room and size 2 off 3" each, and 2 off connected to the cooling water pumps 5" each.

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

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

above

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

The engine grating at worked from upper deck level. 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 off

No. of stages

3

Diameters

4P = 580 mm  
HP = 520 mm  
LP = 400 mm

Stroke

300 mm

Driven by the main engines.

No. of auxiliary air compressors

1 off

No. of stages

2

Diameters

4P = 350 mm  
HP = 350 mm  
LP = 106 mm

Stroke

250 mm

Driven by electric motor.

No. of small auxiliary air compressors

1 off

No. of stages

2

Diameters

HP = 34 mm

Stroke

80 mm

Driven by a steam engine.

No. of scavenging air pumps

yes

Diameter

154 mm.

Stroke

yes

Driven by

Diameter of auxiliary Diesel Engine crank shafts

as per Rule

154 mm.

as fitted

154 mm.

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

yes.

IR RECEIVERS:—No. of high pressure air receivers

I - 2 off  
II - 2 off  
III - 3 off

Internal diameter

I - 19 3/4"  
II - 3 1/2"  
III - 190 mm.

Cubic capacity of each

I - 300 litres.  
II - 150 "  
III - 25 "

Material Siemens Martin Steel.

Seamless, lap welded or riveted longitudinal joint

I - Seamless.  
II - Lap welded.  
III - Seamless.

Range of tensile strength

22.4 - 25.6 Tons.

Thickness

I = 5/8"  
II = 1/2"  
III = 15 mm.

working pressure by Rules

65 Atm.

No. of starting air receivers

2 off

Internal diameter

1800 mm.

Total cubic capacity

800 Cubic feet

Material Siemens Martin Steel.

Seamless, lap welded or riveted longitudinal joint

Riveted.

Range of tensile strength

Shell - 28-32 Tons  
Ends - 26-30 "

thickness

Shell = 24.6 mm.  
End plates = 27.8 mm.

Working pressure by Rules

25 Atm.

Is each receiver, which can be isolated,

yes.

What means are provided for cleaning their

yes.

Is the internal surfaces of the receivers be examined

yes.

The starting air receivers are fitted with man holes.

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

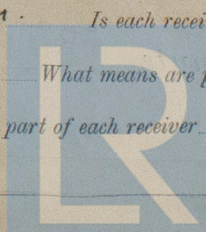
yes.

high pressure air receivers to be cleaned internally by means of steam and caustic soda.

yes.

What means are provided for cleaning their

yes.



Lloyd's Register  
Foundation



IS A DONKEY BOILER FITTED? *yes for heating purpose* If so, is a report now forwarded? *yes.*

HYDRAULIC TESTS:-

DESCRIPTION.	DATE OF TEST.	WORKING PRESSURE.	TEST PRESSURE.	STAMPED.	REMARKS.
ENGINE CYLINDERS	21/4, 17/5, 24/6, 27/6. 23	15 lbs. per sq. in.	20 lbs. per sq. in.	LLOYD'S TEST 30 lbs. & 21.4.23. LLOYD'S TEST 30 lbs. & 19.5.23. LLOYD'S TEST 30 lbs. & 28.4.23. LLOYD'S TEST 30 lbs. & 14.5.23.	
COVERS	28/4, 14/5, 20/9, 23.	15 " "	30 " "		
JACKETS					
PISTON WATER PASSAGES					The pistons are oil cooled.
MAIN COMPRESSORS—1st Stage		15 lbs. per sq. in.	30 lbs. per sq. in.	440YD'S TEST 30 lbs. & 15.5.23.	
2nd " Water	15/5. 23.				
3rd " Jackets					
AIR RECEIVERS—STARTING	31/10. 20 at Hamburg.	25 Atm.	50 Atm.	No. 49. LLOYD'S TEST 50 Atm. F.W. 30.10.20. 50.51.52 No. 48. 11. 50.51.52 LLOYD'S TEST 50 Atm. WP. 65 Atm. K 31.10.23.	No. 50. LLOYD'S TEST 50 Atm. F.W. 30.10.20. 50 Atm. No. 49. 60 LLOYD'S TEST 50 Atm. WP. 65 Atm. K 7.11.23.
INJECTION	31/10. 7/11. 23.	65 Atm.	130 Atm.		
AIR PIPES	21/6, 8/10, 9/11, 23.	65 Atm.	130 Atm.		
FUEL PIPES	28/4. 23.	25 Atm.	130 Atm.	R.	
FUEL PUMPS	28/4. 23.	15 lbs. per sq. in.	130 Atm.	R.	
SILENCER	6/6. 23.	15 lbs. per sq. in.	30 lbs. per sq. in.	R.	
Exhaust				LLOYD'S TEST 10 lbs. & 22.8.23. LLOYD'S TEST 10 lbs. & 25.8.23.	
WATER JACKET	22/8 & 25/8.	0	10 lbs. per sq. in.		
SEPARATE FUEL TANKS					

PLANS. Are approved plans forwarded herewith for shafting *no, 24<sup>th</sup> April 1923* Receivers *yes.* Separate Tanks *no.*

SPARE GEAR As per accompanying list.

The foregoing is a correct description.

AKTIESELSKABET  
BURMEISTER & WAIN'S MASKIN- OG SKIBSBYGGERI

Manufacturer.

Dates of Survey	During progress of work in shops - 27.26, 31 Jan., 12.16, 24.27 Feb., 2.6, 13.18, 23.31 March, 12.16.18, 21.28 April, 2.5, 7.8, 14.18, 17.24.25 May, 2.6, 12.13, 20, 26, 29 June.
while building	During erection on board vessel - 6.13, 20, 23, 27, 30 July, 1.2, 4, 14.18, 20, 21, 22, 23, 25, 28, 29 Aug., 6.12, 14.17, 19, 20, 21, 22, 27 Sept., 1.3, 4.5, 8, 9, 14.18, 19, 22, 26, 31 October.
Total No. of visits	85.
Dates of Examination of principal parts	Cylinders 24.2, 2/3, 23/3, 12/4, 24/4, 2/5, 23/5, 12/4, 21/4, 2/5, 13/4, 4/5. 23 Rods 12/4, 23/4. 23 Connecting rods 23/4, 19/5. 23
Crank shafts	24/4, 21/4, 1/2, 12/2, 21/2 6/7, 20/7, 13/7, 27/7, 4/8, 21/8, 27/8, 6/9, 13/9, 30/9, 20/9, 6/9, 12/9, 31/9. 23 Stern tube 2/8, 25/8. 23 Engine seatings 18/9, 24/9. 23
Tunnel shafts	24/9. 23 Tunnel shafts 17/9, 21/9, 23. Screw shafts 24/9, 4/10. 23 Propeller 12/11, 13/11, 17/11, 31/11. 23
Engines holding down bolts	16/10, 17/10, 24/10, 26/10. 23. Completion of pumping arrangements 7/11. 23. Engines tried under working conditions 12/11, 13/11, 17/11, 31/11. 23
Completion of fitting sea connections	24/9. 23. Stern tube 3/10. 23. Screw shaft and propeller 31/10. 23.
Material of crank shafts	S.M. Engst. Steel Identification Mark on Do. LLOYD'S No. 6523, 6524 & 21.4.23. Material of thrust shafts S.M. Engst. Steel Identification Mark on Do. LLOYD'S No. 6714, 6715 & 21.4.23.
Material of tunnel shafts	S.M. Engst. Steel Identification Marks on Do. LLOYD'S No. 6715 & 21.4.23. Material of screw shafts S.M. Engst. Steel Identification Marks on Do. LLOYD'S No. 6714, 6715 & 21.4.23.
Is the flash point of the oil to be used over 150° F.	<i>yes.</i>

Is this machinery duplicate of a previous case *yes* If so, state name of vessel *1/5 "Lima" 1/5 "Cometa" 1/5 "Kedot".*

General Remarks (State quality of workmanship, opinions as to class, etc.) In accordance with the Rules for Special Survey we have examined material and workmanship from the commencement of construction until the final test of the main and auxiliary machinery under full power working condition and found it good in every respect. The starting air receivers are constructed by Deutsche Wapf A.G. Hamburg as per certificate produced. The material used in the construction of the machinery has been tested as required by the Rules, either by us or as per certificates produced. The dimensions are as specified and in accordance with the Rules the approved plans and the requirements contained in London letter E dated 4<sup>th</sup> Jan. 23 addressed to Burmeister & Wain and letters E dated 13<sup>th</sup> March, 24<sup>th</sup> April (24<sup>th</sup>), 19<sup>th</sup>, 22<sup>nd</sup> October 1923. On the trial trip the main engines and the whole auxiliary machinery have been tested under full power working condition and found to work satisfactorily, - the manoeuvring of the main engines tested under working condition and found satisfactory.

Recommend the Vessel's machinery to have notation in the Register Book of **L.M.C-11-23** Oil Engines & Co.

The amount of Entry Fee	Rs. 122. 50	When applied for,
Special	Rs. 2383. 85	7. 12. 1923
Donkey Boiler Fee	Rs. 102. 70	When received,
Electric Installation	Rs. 833. 01	17. 12. 1923
Travelling Expenses (if any)		
1/8 = Rs. 24.50		
Committee's Minute	FRIDAY 21.12.23	

Assigned

+ L.M.C. 11.23  
C.L.

CERTIFICATE WRITTEN

Rpt. 9a.

Port of Copenhagen

Continuation of Report No. 6678 dated 12<sup>th</sup> Decr. 1923 on the

Steel Twin Screw Motor Vessel "Nordbo" of Copenhagen

Burmeister & Wain's Yard No. 327

No. in Reg. Book 40225.

" " " " Eng. No. 949 & 950.

The auxiliary machinery comprising.

- One - 150 Tons rotary wing pump for the ballast purpose.
- One pump with two separate plungers, the one being for bilge purpose and the other for sanitary purpose, each of 15 Tons capacity.
- Two - 120 Tons rotary wing pumps for the cooling water purpose.
- Two - 30 Tons rotary cog wheel pumps for the forced oil lubrication purpose.
- One - 15 Tons rotary cog wheel pumps for the oil fuel transfer purpose.
- One vertical two stage auxiliary air compressor.

All driven by electro motors.

Three - 2 cylinders, four stroke cycle single acting Diesel oil engines, each of 75 E.H.P. fixed on port side of the engine room, each working a compound wound dynamo of 50. K.W. - 220 Volts and 227 Amperes, - supplying electric current for motive to the following:-

- One - 15 H.P. shunt wound electro motor, working the ballast pump.
- One - 7.5 H.P. " " " working the bilge and sanitary pump.
- Two - 25 H.P. " " " working the cooling water pumps and forced oil lubrication pumps.
- One - 4 H.P. " " " working the oil fuel transfer pump.
- One - 90 H.P. " " " working the auxiliary air compressor.
- Two - 6 H.P. serie " " " working the turning gear to the main engines.
- One - 1 H.P. shunt " " " working the turning lathe and drilling machine.
- One - 7 H.P. compound " " " working the CO<sub>2</sub> compressor to the provision refrigerating appliance.
- One - 2 H.P. shunt " " " working the brine pump to the provision refrigerating appliance.
- One - 1 H.P. " " " working the fresh water pump.
- One - 1.8 H.P. " " " working the oil separator.
- One - 48 H.P. Compound " " " working the windlass.
- One - 12 H.P. shunt " " " working the electro hydraulic starting gear.
- Ten - 15 H.P. serie " " " working the 3 Tons cargo winches.
- One - 22 H.P. serie " " " working the warping winch.

And supplying current for the electric lighting purpose with the voltage reduced from 220 to 110 Volts after having passed the transformer. -

(Manufacturers) AKTIESELSKABET BURMEISTER & WAIN'S MASKIN- OG SKIBSBYGGERI

A.O. JENSEN.  
SURVEYOR TO LLOYD'S REGISTER OF SHIPPING

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