

REPORT ON OIL ENGINE MACHINERY.

No. 33668

Received at London Office

5 APR 1943

Date of writing Report

19

When handed in at Local Office

6th April 1942 Port of

Sunderland.

No. in Survey held at
Reg. Book.

Sunderland

Date, First Survey

11th Feb 42

Last Survey

5th April 1943

Number of Visits 42

Single
on the ~~Triple~~ Screw vessel**"EMPIRE COMMERCE"**Tons Gross 3722
Net 1993

Built at Sunderland

By whom built

Sir J. Laing & Sons L^{td}

Yard No. 448

When built 1943

Engines made at Sunderland

By whom made

Wm. Harford & Sons L^{td}

Engine No. 226

When made 1943

Donkey Boilers made at Sunderland

By whom made

N.E. Mar. 24th Stockton Chem. Works & Riley B^{rs} L^{td}

Boiler No. 4042

When made 1943

Brake Horse Power 2500

Owners

Ministry of War Transport

Port belonging to

Sunderland

Nom. Horse Power as per Rule 516

Is Refrigerating Machinery fitted for cargo purposes

No.

Is Electric Light fitted

Trade for which vessel is intended

No.

OIL ENGINES, &c. Type of Engines *Approved piston airless injection* 2 or 4 stroke cycle *2* Single or double acting *Single*

Maximum pressure in cylinders *640 lb/sq. in.* Diameter of cylinders *600 mm* Length of stroke *upper 980 mm lower 1340 mm* No. of cylinders *3* No. of cranks *3 (3 throws)*

Mean Indicated Pressure *88 lb/sq. in.* Span of bearings, adjacent to the Crank, measured from inner edge to inner edge *940 mm* Is there a bearing between each crank *Between each 3 throws.*

Revolutions per minute *108* Flywheel dia. *2300 mm* Weight *45 cwt.* Means of ignition *Compression* Kind of fuel used *-*

Crank Shaft, { Solid forged *app^d* dia. of journals *418 mm* as fitted *450 mm* Crank pin dia. *450 mm* Crank Webs *app^d* Mid. length breadth *650 mm* Thickness parallel to axis *255 mm*
Semi built *app^d* as fitted *450 mm* Mid. length thickness *255 mm* Thickness around eye hole *200 mm*
All built *app^d* as fitted *450 mm*

Flywheel Shaft, diameter *app^d* *418 mm* as fitted *450 mm* Intermediate Shafts, diameter *app^d* *308 mm* as fitted *430 mm* Thrust Shaft, diameter at collars *app^d* *418 mm* as fitted *450 mm*

Tube Shaft, diameter *app^d* *341 mm* as fitted *430 mm* Is the tube screw shaft fitted with a continuous liner *Yes.*

Bronze Liners, thickness in way of bushes *app^d* *18 mm* as per Rule *13.5 mm* as fitted *21 mm* Thickness between bushes *app^d* *16.5 mm* as fitted *16.5 mm* 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 *-*

If two liners are fitted, is the shaft lapped or protected between the liners *-* Is an approved Oil Gland or other appliance fitted at the after end of the tube *-*

shaft *No* If so, state type *-* Length of Bearing in Stern Bush next to and supporting propeller *4'-11"*

Propeller, dia. *15'-0"* Pitch *13'-9"* No. of blades *4* Material *Bronze* whether Moveable *No.* Total Developed Surface *84.8* sq. feet

Method of reversing Engines *Hand lever* Is a governor or other arrangement fitted to prevent racing of the engine when detached *Yes.* Means of lubrication *Hand forced*

Thickness of cylinder liners *28 mm* Are the cylinders fitted with safety valves *Yes.* 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 *-*

Cooling Water Pumps, No. *one engine driven one steam driven* Is the sea suction provided with an efficient strainer which can be cleared within the vessel *(Mr. Casling)*

Bilge Pumps worked from the Main Engines, No. *none* Diameter *-* Stroke *-* Can one be overhauled while the other is at work *-*

Pumps connected to the Main Bilge Line { No. and Size *2 - 5 1/2" - 6" - 15"* How driven *Steam* Ballast pump.

Is the cooling water led to the bilges *No.* If so, state what special arrangements are made to deal with this water in addition to the ordinary bilge pumping arrangements *-*

Ballast Pumps, No. and size *1 @ 10 1/2" x 12" x 24"* Power Driven Lubricating Oil Pumps, including Spare Pump, No. and size *one engine driven 8 1/2" x 6 1/2" one steam driven 5 1/2" x 6 1/2"*

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 Machinery Spaces *3 @ 3" in E.R. (2 @ 3" in full way fore end of E.R. Camelsia to transfer pump only)* In Pump Room *1 @ 3"*

In Holds, &c. *(Lanter)* Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size *1 @ 8" (Ballast pump) 1 @ 5" (Cam. Suction) 1 @ 1/2" (Main Engine Cooling pump)*

Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes *Yes.* Are the Bilge Suctions in the Machinery Spaces *Yes.*

led from easily accessible mud-boxes, placed above the level of the working floor, with straight tail pipes to the bilges *Yes.* Are they fitted with Valves or Cocks *Both.*

Are all Sea Connections fitted direct on the skin of the ship *Yes.* Are the Overboard Discharges above or below the deep water line *Below.*

Are they fixed sufficiently high on the ship's side to be seen without lifting the platform plate *Yes.* Are the Blow Off Cocks fitted with a spigot and brass covering plate *Yes.*

Are they each fitted with a Discharge Valve always accessible on the plating of the vessel *Yes.* How are they protected *-*

What pipes pass through the bunkers *none* Have they been tested as per Rule *Yes.*

What pipes pass through the deep tanks *Yes.* Are all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times *Yes.*

Is the arrangement of valves and their connections such as to prevent the possibility of water passing from the sea or from water tanks into the cargo or machinery spaces, or from one compartment to another *Yes.* Is the Shaft Tunnel watertight *none* Is it fitted with a watertight door *-* worked from *-*

If a wood vessel, what means are provided to prevent leakage of either fuel oil or of lubricating oil from saturating the woodwork *-*

Main Air Compressors, No. *two* No. of stages *3* Diameters *11 1/2", 11 1/2" - 9 1/2", 2 1/2"* Stroke *6 1/2"* Driven by *Steam Engine 11 1/2" x 6 1/2"*

Auxiliary Air Compressors, No. *-* No. of stages *-* Diameters *-* Stroke *-* Driven by *-*

Small Auxiliary Air Compressors, No. *one* No. of stages *-* Diameters *-* Stroke *-* Driven by *-*

What provision is made for first Charging the Air Receivers *Steam driven Compressor.* Driven by *Levers from Main Engine*

Scavenging Air Pumps, No. *one* Diameter *1400 mm* Stroke *610 mm*

Auxiliary Engines crank shafts, diameter *app^d* as fitted *-* No. *-* Position *-*

Have the Auxiliary Engines been constructed under special survey *-* Is a report sent herewith *-*

AIR RECEIVERS: - Have they been made under survey *Yes.*
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 and cleaned *Yes.*
Injection Air Receivers, No. *none.* Cubic capacity of each *-* Internal diameter *-* thickness *-*
Seamless, lap welded or riveted longitudinal joint *-* Material *-* Range of tensile strength *-* Working pressure by Rules *-* Actual *-*

Starting Air Receivers, No. *Two.* Total cubic capacity *220 cu ft.* Internal diameter *3' 6"* thickness *1"*
Seamless, lap welded or riveted longitudinal joint *Riveted* Material *M. Steel* Range of tensile strength *28 3/32* Working pressure by Rules *603* Actual *600*

IS A DONKEY BOILER FITTED? *Yes.* If so, is a report now forwarded? *Yes.*
Is the donkey boiler intended to be used for domestic purposes only *no.*

PLANS. Are approved plans forwarded herewith for Shafting (If not, state date of approval) *Yes.* Receivers *-* Separate Fuel Tanks *-*
Donkey Boilers *Yes.* General Pumping Arrangements *Retained for Sister Vessel.* Pumping Arrangements in Machinery Space *Retained for Sister Vessel.*
Oil Fuel Burning Arrangements *Retained for Sister Vessel.*

SPARE GEAR.

Has the spare gear required by the Rules been supplied *Yes (except bearings for top & bottom ends of conn. rods).*
State the principal additional spare gear supplied *1 C.I. Propeller, 1 C.I. liner & jacket complete, 1 main piston head & 24 rings, 2 each side & center top & bottom end bearing bolts & nuts, 2 main bearing studs & nuts, 1 set coupling bolts & nuts, 2 front & 2 back fuel valves complete, 8 spray plugs, 1 N.R. air starting valve, 1 relief valve, 4 scavenger pumps, 1/2 discs, 1 fuel pump body complete & chambers, 1 set pads for Michell thrust, 3 pads for water shaft bearing, 1 set for tail shaft, 3 rubber hoses for upper piston cooling service, 6 links of roller chain for camshaft drive*

The foregoing is a correct description.
WILLIAM DOXFORD & SONS, Limited.

Wm. H. Purdie

Manufacturer.

Dates of Survey while building
During progress of work in shops - *1942. Feb. 11. Mar. 4, 12. Apr. 15, 21, 22, 23, 27, 28, 29, 30. May. 4, 11, 12, 13, 14, 15, 20, 22, 24, 27, 29. June 1, 15, 16.*
During erection on board vessel - *Dec. 16, 18, 21, 30. 1943. Jan. 6, 20, 27, 28. Feb. 12, 16. Mar. 1, 18, 22, 23, 26, 29. Apr. 5.*
Total No. of visits *42*

Dates of Examination of principal parts - Cylinders *21/4/42, 23/4/42* Covers *-* Pistons *24/4/42* Rods *24/4/42* Connecting rods *1/6/42*
Crank shaft *29/8/42* Flywheel shaft *as crank* Thrust shaft *as crank* Intermediate shafts *28/1/43* Tube shaft *-*
Screw shaft *28/1/43* Propeller *28/1/43* Stern tube *18/12/42, 21/12/42* Engine seatings (Bank top) *22/3/43* Engines holding down bolts *22/3/43*
Completion of fitting sea connections *21/12/42* Completion of pumping arrangements *5/4/43* Engines tried under working conditions *29/3/43*
Crank shaft, Material *Ingot Steel* Identification Mark *Nº 226 W.H.F. 29/8/42* Flywheel shaft, Material *as crank* Identification Mark *as crank*
Thrust shaft, Material *as crank* Identification Mark *as crank* Intermediate shaft, Material *Ingot Steel* Identification Marks *Nº 12236 F 814 W.H.F. 28/1/43*
Tube shaft, Material *-* Identification Mark *-* Screw shaft, Material *Ingot Steel* Identification Mark *Nº 12236 F 813 W.H.F. 28/1/43*
Identification Marks on Air Receivers *K 1505/6 L.Q. 21281 L.C.D. 24/2/42.*

Is the flash point of the oil to be used over 150° F. *Yes.*
Have the requirements of the Rules for oil fuel pipes and tank fittings been complied with *Yes.*
Description of fire extinguishing apparatus fitted *1 1/2" H.I. perforating pipe for steam led around E.R. & B.H. Rm. 8-2 full. Phenomena Contained.*
Is the vessel (not being an oil tanker) fitted for carrying oil as cargo *(Tanker)* If so, have the requirements of the Rules been complied with *-*
If the notation for Ice Strengthening is desired, state whether the requirements in this respect have been complied with *Standard*
Is this machinery duplicate of a previous one *Yes.* If so, state name of vessel *-*

General Remarks (State quality of workmanship, opinions as to class, &c.) *This machinery has been built under Special Survey in accordance with the approved plans, Specification & the rules of the Society. The materials & workmanship are good. It has been securely fitted on board the vessel & tried under working conditions alongside quay with satisfactory results. The donkey boiler has also been securely fixed on board, fitted to burn oil fuel (F.P. above 150° F). Section 20 of the rules has been complied with & safety valves adjusted to working pressure in accordance with rule requirements. The machinery is eligible in my opinion to have notation*
Nº L.M.C. 4.43 (oil Eng.), T. 8. (C.), 1 D.B. 150 lbs.

The amount of Entry Fee .. £ *6*
2/3 Special Specification .. £ *64* : *4*
Donkey Boiler Fee .. £ *16* : *16*
1/3 Special .. £ *12* : *12*
Traveling Expenses (if any) .. £ *33* : *127*
1/3 Special .. £ *8* : *8*

Committee's Minute

Assigned *+ L.M.C. 4.43 Ck D.B. 150 lb. Oil Eng.*

Engineer Surveyor to Lloyd's Register of Shipping.

Lloyd's Register Foundation