

REPORT ON OIL ENGINE MACHINERY.

No. 15217.

Date of writing Report 7th October, 1952. When handed in at Local Office 30th October, 1952. Port of MANCHESTER.
 No. in Survey held at MANCHESTER. Date, First Survey 6.3.50. Last Survey 10.7.1952.
 Reg. Book. Single on the Twin Triple Quadruple Screw vessel TUG "ESSO GREENWICH"
 Built at Northwich, Cheshire. By whom built W.J. Yarwood & Sons. Yard No. 879. When built 1952.
 Engines made at Manchester. By whom made Crossley Bros. Ltd. Contract 12023. Engine No. 140971. When made 1952.
 Donkey Boilers made at Manchester. By whom made Esso Petroleum Co. Ltd., Boiler No. 140971. When made 1952.
 Brake Horse Power 580. Owners Esso Petroleum Co. Ltd., Port belonging to London.
 M.N. Power as per Rule 116. Is Refrigerating Machinery fitted for cargo purposes Is Electric Light fitted
 Trade for which vessel is intended 70 Ft. River Tug for Service on the Thames.

OIL ENGINES, &c.—Type of Engines Vertical Solid Injection Heavy Oil HGN.5. 2 or 4 stroke cycle 2. Single or double acting Single.
 Maximum pressure in cylinders 950 lbs/sq.inch. Diameter of cylinders 10½" Length of stroke 13½" No. of cylinders 5. No. of cranks 5.
 Mean Indicated Pressure 92 lbs/sq.inch. Ahead Firing Order in Cylinders 1.5.2.3.4. Span of bearings, adjacent to the crank, measured from inner edge to inner edge 14.11/16" Is there a bearing between each crank Yes. Revolutions per minute 500.
 Flywheel dia. 37½" Weight 2166 lbs Moment of inertia of flywheel (lbs.in²) 500,000. Means of ignition Compression. Kind of fuel used Diesel
 Crank Shaft, Solid forged dia. of journals 7½" as per Rule Approved. Crank pin dia. 7½" Crank webs Mid. length breadth 9½" Thickness parallel to axis 3.23/32" shrunk
 Flywheel Mounted on end of Crankshaft. Intermediate Shafts, diameter as per Rule. Thrust Shaft, diameter at collars as fitted.
 Tube Shaft, diameter as per Rule. Screw Shaft, diameter as fitted. Is the tube shaft fitted with a continuous liner Yes.
 Bronze Liners, thickness in way of bushes as per Rule. Thickness between bushes as fitted. 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 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. Is an approved Oil Gland or other appliance fitted at the after end of tube shaft Yes. If so, state type Length of bearing in Stern Bush next to and supporting propeller
 Propeller, dia. 37½" Pitch 14. No. of blades 3. Material Cast Iron. whether moveable Yes. Total developed surface 14.11/16" sq. feet
 Moment of inertia of propeller (lbs.in² or Kg.cm.²) Non-Reversing. Kind of damper, if fitted Yes.
 Method of reversing Engines Forced. Is a governor or other arrangement fitted to prevent racing of the engine when declutched Yes. Means of lubrication Manifold Watercooled. Thickness of cylinder liners 7/8" Are the cylinders fitted with safety valves Yes. Are the exhaust pipes and silencers water cooled Yes.
 If the exhaust is led overboard near the waterline, what means are arranged to prevent water from being syphoned back to the engine 1 - 4½" dia. x 3" Stroke. Is the sea suction provided with an efficient strainer which can be cleared within the vessel Yes.
 Bilge Pumps worked from the Main Engines, No. 1. Diameter 4½" Stroke 3" Can one be overhauled while the other is at work Yes.
 Pumps connected to the Main Bilge Line No. and size How driven Chain Driven from Main Engine. 1 - 1470 G.P.H.
 Is the cooling water led to the bilges Yes. If so, state what special arrangements are made to deal with this water in addition to the ordinary bilge pumping arrangements Power Driven Lubricating Oil Pumps, including spare pump, No. and size 1 - 2400 G.P.H.
 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 1 - 1470 G.P.H. In pump room 1 - 2400 G.P.H.
 In holds, &c. Independent Power Pump Direct Suctions to the engine room bilges, No. and size 1 - 1470 G.P.H.
 Are all the bilge suction pipes in holds and tunnel well fitted with strum-boxes Yes. Are the bilge suction pipes in the machinery spaces led from easily accessible mud-boxes, placed above the level of the working floor, with straight tail pipes to the bilges Yes.
 Are all Sea Connections fitted direct on the skin of the Ship Yes. Are they fitted with valves or cocks Yes. Are they fixed sufficiently high on the ship's side to be seen without lifting the platform plates Yes. Are the overboard discharges above or below the deep water line Yes.
 Are they each fitted with a discharge valve always accessible on the plating of the vessel Yes. Are the blow off cocks fitted with a spigot and brass covering plate Yes.
 What pipes pass through the bunkers Yes. How are they protected Yes.
 What pipes pass through the deep tanks Yes. Have they been tested as per Rule 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 Yes. Is it fitted with a watertight door Yes.
 If a wood vessel, what means are provided to prevent leakage of either fuel oil or of lubricating oil from saturating the woodwork Yes.
 Main Air Compressors, No. 1. No. of stages 2. diameters 2½" & 5½" stroke 4" driven by Engine.
 Auxiliary Air Compressors, No. 1. No. of stages 2. diameters 2½" & 5½" stroke 4" driven by Engine.
 Small Auxiliary Air Compressors, No. 1. No. of stages 2. diameters 2½" & 5½" stroke 4" driven by Engine.
 What provision is made for first charging the air receivers Yes.
 Scavenging Air Pumps, No. 1. diameter 20½" stroke 7½" driven by Engine.
 Auxiliary Engines crank shafts, diameter as per Rule. Position as fitted.
 Have the auxiliary engines been constructed under special survey Yes. Is a report sent herewith Yes.

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AIR RECEIVERS:—Have they been made under survey.....
 Is each receiver, which can be isolated, fitted with a safety valve as per Rule.....
 Can the internal surfaces of the receivers be examined and cleaned.....
 Injection Air Receivers, No..... Cubic capacity of each..... Internal diameter..... thickness.....
 Seamless, welded or riveted longitudinal joint..... Material..... Range of tensile strength..... Working pressure.....
 Starting Air Receivers, No..... One..... Total cubic capacity..... 15 Cu. Ft. Internal diameter..... 24 1/8" thickness..... 15/32" Shell 8" En
 Circumferential Welded. Material Steel. Range of tensile strength..... Working pressure.....
 Seamless, welded or riveted longitudinal joint..... Ends 26/30.

IS A DONKEY BOILER FITTED..... If so, is a report now forwarded.....
 Is the donkey boiler intended to be used for domestic purposes only.....

PLANS. Are approved plans forwarded herewith for shafting..... 31.8.51. Receivers..... Separate fuel tanks.....
 (If not, state date of approval)
 Donkey boilers..... General pumping arrangements..... Pumping arrangements in machinery space.....
 Oil fuel burning arrangements.....
 Have Torsional Vibration characteristics been approved..... Yes - Provisionally. Date of approval..... 29.2.52.

SPARE GEAR.

Has the spare gear required by the Rules been supplied..... AS PER RULE REQUIREMENTS.
 State the principal additional spare gear supplied.....

The foregoing is a correct description, and the particulars of the engine, as supplied, are as approved for
 Torsional Vibration Characteristics.

Dates of Survey while building.....
 During progress of work in shops - - 1950. March 6. Sept. 20. 1951. Nov. 26. 1952. Feb. 22, 25. April 4, 15, 24. May. 9, 14, 23, 24. June 3. July 9, 10.

During erection on board vessel - -
 Total No. of visits..... 24.4.52. 6.3.50.

Dates of examination of principal parts—Cylinders..... 9.5.52. Covers..... 9.5.52. Pistons..... 24.5.52. Liners..... 15.4.52. Connecting rods..... 26.11.51.
 Crank shaft..... 25.2.52. Flywheel shaft..... Thrust shaft..... Intermediate shafts..... Tube shaft.....

Screw shaft..... Propeller..... Stern tube..... Engine seatings..... Engine holding down bolts.....
 Completion of fitting sea connections..... Completion of pumping arrangements..... Engines tried under working conditions.....

Crank shaft, material..... O.H.Steel. Identification mark..... Flywheel shaft, material..... Identification mark.....
 Thrust shaft, material..... Identification mark..... Intermediate shafts, material..... Identification marks.....

Tube shaft, material..... Identification mark..... Screw shaft, material..... Identification mark.....
 Identification marks on air receivers..... 81/520100 LLOYD'S TEST 700 lbs W.P. 350 lbs 26.5.52. T.D.S. No. T.243.

Welded receivers, state Makers' Name..... Ruston & Hornsby Ltd., Lincoln.
 Is the flash point of the oil to be used over 150°F.....

Have the requirements of the Rules for oil fuel pipes and tank fittings been complied with.....
 Description of fire extinguishing apparatus fitted.....

Is the vessel (not being an oil tanker) fitted for carrying oil as cargo..... 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.....

Is this machinery duplicate of a previous case..... No. If so, state name of vessel.....

General Remarks (State quality of workmanship, opinions as to class, &c. This engine has been constructed under special
 survey of tested materials, in accordance with the Secretary's letters, approved plans and Require-
 ments of the Rules. The materials and workmanship are good and the engine when tested in the shop
 under full load conditions, coupled direct to a hydraulic dynamometer, showed satisfactory results.

The torsional vibration characteristics have been provisionally approved for an engine service
 speed of 500 R.P.M. and the corresponding propeller speed of 250 R.P.M., subject to gear hammer be
 investigated under working conditions (See Secretary's letter 29.2.52.).

In our opinion, the machinery is suitable for installation in a vessel to be classed with this
 Society when the particulars of the complete propulsion installation are verified to be as approved
 for torsional vibration characteristics.

2/3 of 1/5 old fee = 25/12/Od. Attached hereto B'ham Rpt. 6 No. F.3068 & N'ham Air Receiver
 4/5 new fee = £32/ 0/Od. Cert. C.14964.

The amount of Entry Fee ... £ 37 12 0
 Special ... £ : : When applied for 4/4/52
 Donkey Boiler Fee... £ : : When received 19
 Travelling Expenses (if any) £ 5 : 0

Committee's Minute..... See Minute on attached Rpt 4B
 Assigned.....



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