

Rpt. 4b

29 DEC 1956

Date of writing report 28-12-56. Received London Port MILFORD HAVEN No. 8137. Survey held at Pembroke Dock. No. of visits In shops On vessel 12. First date 19-7-56. Last date 10-12-56.

FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

No. in R.B. 90925. Name Motor Trawler "NORRARD STAR!" Gross tons 167.02 Owners Norrard Trawlers Ltd. Manager F.W. Ingram. Port of Registry Milford Haven. Hull built at Pembroke Dock. By R.S.Hayes(Pembroke Dock)Ltd., Yard No. 505. When 1956 10. Main Engines made at Keighley. By W. Widdop & Co. Ltd. Eng. No. 5432. When 1955. Gearing made at - By - Donkey boilers made at - By - Blr. Nos. - When - Machinery installed at Pembroke Dock. By R.S.Hayes(Pembroke Dock)Ltd. When 1956.

Particulars of restricted service of ship, if limited for classification - Particulars of vegetable or similar cargo oil notation, if required - Is ship to be classed for navigation in ice? No. Is ship intended to carry petroleum in bulk? No. Is refrigerating machinery fitted? No. If so, is it for cargo purposes? - Type of refrigerant - Is the refrigerating machinery compartment isolated from the propelling machinery space? - Is the refrigerated cargo installation intended to be classed? -

The following particulars should be given as fully and as clearly as possible. Where the answer is "No" or "None", say so! Ticks and other signs of doubtful meaning are not to be used. Where the wording is not applicable to the installation, a black line may be inserted. If the main engines have been constructed at another port and are covered by a separate report, the particulars given in that report need not be repeated below, but the port and report number should be stated.

No. of main engines 1. No. of propellers 1. Brief description of propulsion system Direct Reversing Diesel Oil Engine.

MAIN RECIPROCATING ENGINES. Licence Name and Type No. Widdop GMB4.

No. of cylinders per engine 4. Dia. of cylinders 12.5" stroke(s) 18.5". 2 or 4 stroke cycle 2. Single or double acting Single.

Maximum approved BHP per engine 440. at 320. 300 RPM of engine and 320. RPM of propeller.

Corresponding MIP 85 lbs/sq". (For DA engines give MIP top & bottom) Maximum cylinder pressure 800 lbs/sq". Machinery numeral 88

Are the cylinders arranged in Vee or other special formation? No. If so, number of crankshafts per engine -

TWO STROKE ENGINES. Is the engine of opposed piston type? No. If so, how are upper pistons connected to crankshaft? -

Is the exhaust discharged through ports in the cylinders or through valve(s) in the cylinder covers? Ports In Line, and type of mechanically driven scavenge pumps or blowers per engine and how driven Two Double Acting in V Formation Multi-Strand Chains.

No. of exhaust gas driven scavenge blowers per engine - Where exhaust gas driven blowers only are fitted, can the engine operate with one blower out of action? -

If a stand-by or emergency pump or blower is fitted, state how driven - No. of scavenge air coolers - Scavenge air pressure at full power 1. lb. Are scavenge manifold explosion relief valves fitted? Yes.

FOUR STROKE ENGINES. Is the engine supercharged? - Are the undersides of the pistons arranged as supercharge pumps? - No. of exhaust gas driven blowers per engine - No. of supercharge air coolers per engine - Supercharge air pressure - Can engine operate without supercharger? -

TWO & FOUR STROKE ENGINES-GENERAL. No. of valves per cylinder: Fuel 1. Inlet - Exhaust - Starting 1. Safety 1.

Material of cylinder covers Cast Steel. Material of piston crowns Cast Iron. Is the engine equipped to operate on heavy fuel oil? No.

Cooling medium for :-Cylinders Fresh Water Pistons Oil. Fuel valves - Overall diameter of piston rod for double acting engines -

Is the rod fitted with a sleeve? - Is welded construction employed for: Bedplate? No. Frames? No. Entablature? No. Is the crankcase separated from the underside of pistons? No. Is the engine of crosshead or trunk piston type Trunk Type. Total internal volume of crankcase 95 cub. ft. No. and total area of explosion relief devices 3. 20.4 sq. inch. Are flame guards or traps fitted to relief devices? Yes. Is the crankcase readily accessible? Yes. If not, must the engine be removed for overhaul of bearings, etc? - Is the engine secured directly to the tank top or to a built-up seating Built Up Seating How is the engine started? Compressed Air.

Can the engine be directly reversed? Yes. If not, how is reversing obtained? -

Has the engine been tested working in the shop? - How long at full power? -

CRANK & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 8-12-55. State barred speed range(s), if imposed for working propeller 320 RPM. No. For spare propeller - Is a governor fitted? Yes. Is a torsional vibration damper or detuner fitted to the shafting? No.

Where positioned? - Type - No. of main bearings 5. Are main bearings of ball or roller type? No. Distance between inner edges of bearings in way of crank(s) 16 3/8". Distance between centre lines of side cranks or eccentrics of opposed piston engines -

Crankshaft type: Built, semi-built, solid. (State which) Solid. Diameter of journals 7 3/4". Diameter of crankpins 7 3/4". Breadth of webs at mid-throw 10 1/4". Axial thickness of webs 4 1/2".

If shrunk, radial thickness around eyeholes - Are dowel pins fitted? - Crankshaft material Journals Approved - Webs Tensile strength -

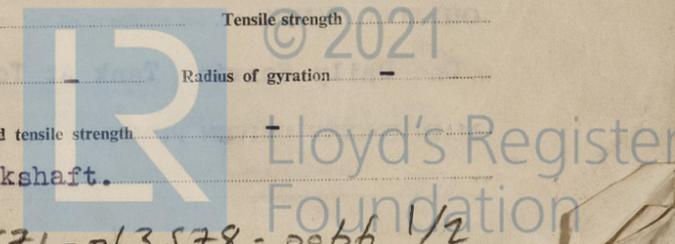
Diameter of flywheel 36 3/4". Weight 2144 lbs. Are balance weights fitted? No. Total weight - Radius of gyration -

Diameter of flywheel shaft - Material - Minimum approved tensile strength -

Flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) Integral With Crankshaft.

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Handwritten signature and date 18/11/57



MAIN GAS TURBINES. Name and Type No.

No. of sets of turbines _____ Open or closed cycle _____ BHP per set _____ at _____ RPM of output shaft _____
 How is drive transmitted to propeller shaft? _____
 ARRANGEMENT OF TURBINES. HP drives _____ at _____ RPM HP gas inlet temperature _____ pressure _____
 (A small diagram should be attached showing gas cycle.) IP drives _____ at _____ RPM IP gas inlet temperature _____ pressure _____
 LP drives _____ at _____ RPM LP gas inlet temperature _____ pressure _____
 No. of air compressors per set _____ Centrifugal or axial flow type? _____ Material of turbine blades _____ Material of compressor blades _____
 No. of air coolers per set _____ No. of heat exchangers per set _____ How are turbines started? _____
 How is reversing effected? _____ Are the turbines operated in conjunction with free piston gas generators? _____
 Total No. of free piston gas generators _____ Diameter of working pistons _____ Diameter of compressor pistons _____ No. of double strokes per minute at full power _____ Gas delivery pressure _____ Gas delivery temperature _____ Have the turbines and attached equipment been tested working in the shop? _____ How long at full power? _____

ELECTRIC PROPULSION (Reciprocating engines or gas turbines. Electrical particulars to be reported on Form 4d.)

No. of generators _____ KW per generator _____ at _____ RPM AC or DC? _____ Position _____
 No. of propulsion motors _____ SHP per motor _____ at _____ RPM Position _____
 How is power obtained for excitation of generators? _____ Motors? _____

REDUCTION GEARING (Reciprocating engines or gas turbines. A small line sketch should be attached showing arrangement of gearing.)

Is gearing of single or double helical type? _____ If single, position of gear thrust bearing _____ Is gearing of epicyclic type? _____
 PCD of pinions: First reduction _____ Second reduction _____ PCD of wheels: First reduction _____ Main _____
 Material of pinions _____ Tensile strength _____ Material of wheel rims _____ Tensile strength _____
 Are gear teeth surface hardened? _____ How are teeth finished? _____ Diameter of pinion journals _____ Wheel shaft journals _____
 Are the wheels of welded construction? _____ Is gearcase of welded construction? _____ Has the wheel gearcase been heat treated on completion of welding? _____ Where is the propeller thrust bearing located? _____ Are gear bearings of ball or roller type? _____

CLUTCHES, FLEXIBLE COUPLINGS, ETC. If a clutch or other flexible connection is fitted between engine/turbine and gearing or between engine and line shafting give brief description and, for clutches, state how operated **Wigglesworth consisting of sleeve and four connecting links.**
 Can the main engine be used for purposes other than propulsion when declutched? **Yes.** If so, what? **Driving generator or winch from extension shaft forward.** **Pneumatic operated.**

STRAIGHT SHAFTING. Diameter of thrustshaft **6 1/2"** Material **Forged Steel.** Minimum approved tensile strength _____
 Shaft separate or integral with crank or wheel shaft? **Integral with Wheel Shaft.** Diameter of intermediate shaft **6 1/4"** **Forged Steel.** **1 3/4" in plate material see mil. letter 2311/27**
 Minimum approved tensile strength **28 Tons.** Diameter of screwshaft cone at large end **7 1/2"** Is screwshaft fitted with a continuous liner? **No.**
 Diameter of tube shaft. (If these are separate shafts) _____ Is tube shaft fitted with a continuous liner in way of stern tube _____ Thickness of screw/tube shaft liner at bearings _____
 Thickness between bearings _____ Material of screw/tube shaft **Forged Steel.** Minimum approved tensile strength _____
 Is an approved oil gland fitted? **Yes.** If so, state type **Newark.** Length of bearing next to and supporting propeller **2'5"**
 Material of bearing **White Metal.** In multiple screw vessels is the liner between stern tube and A bracket continuous? _____ If not, is the exposed length of shafting between liners readily visible in dry dock? _____

PROPELLER. Diameter of propeller **5'8"** Pitch **47"** Built up or solid **Solid** Total developed surface **11 sq.ft.**
 No. of blades **4** Blade thickness at top of root fillet _____ Blade material **Cast Iron.** Moment of inertia of dry propeller **560 lbs.inches**
 If propeller is of special design, state type _____ Is propeller of reversible pitch type? **No.** If so, is it of approved design? _____
 State method of control _____ Material of spare propeller _____ Moment of inertia _____

AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine **1.** Can they be declutched? **No.**
 No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate) _____
 No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate) **2-11 Cubic Ft. capacity each, Starboard Side Amidships, Leads, Certificate Nos. 024986 & 024990.**
 Auxiliary A/C driven By Hand Starting. **Auxiliary Diesel Engine.** Maximum working pressure of starting air system **350 lbs. sq. in.** Are the safety devices in accordance with the Rules? **Yes.** Has the starting of the main engines been tested and found satisfactory? **Yes.**

COOLERS. No. of main engine fresh water coolers **One.** No. of main engine lubricating oil coolers **One.**
OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure _____
One Daily Service Tank At Top Of Engine Room Against After Bulkhead.
MAIN ENGINE DRIVEN PUMPS (No. and Purpose) **One Bilge Pump. 1 Lub. Oil Pump.**

INDEPENDENT PUMPS Name below essential pumps, state position and how driven. Give capacity of bilge pumps.	Service for which each pump is connected to be marked thus X														
	SUCTION						DELIVERY								
	Bilge Main	Bilge Direct	Ballast Main	Oil Fuel	Fresh Water Cooling	Sea	Feed Tanks	Lub. Oil	Boiler Feed	Salt Water Cooling	Fresh Water Cooling	Oil Fuel Tanks	Fire Main	Lub. Oil	Piston Cooling
General Service Pump.	X	X				X							X		
Fresh Water Pump.					X	X				X	X				X

BILGE SUCTIONS. No. and size in each hold, deep tank or pump room **1 - 2 1/2" diam. aft in Fish Room.**
 No. and size connected to main bilge line in main engine room **2 - 2 1/2" diam aft in Engine Room.** In tunnel _____
 In aux. engine room _____ Size and position of direct bilge suction in machinery spaces _____
 Size and position of emergency bilge suction in machinery spaces _____
 Is the bilge or ballast system fitted with means for separating oily water on the overboard discharge side? **No.** Do the piping arrangements comply with the Rules **marked in special requirements for ships carrying petroleum in bulk, except as regards to pumps in use? (strike out words not applicable).**

STEAM & OIL ENGINE AUXILIARIES				
Position of each	Type	Made by	Port and No. of Rpt. or Cert.	Driven Machinery (For electric generators, state output)
Port Side Amidships.	20 BHP. Diesel Engine.	Petter McLaren.	No. 2B7982.	Serial No. 10461/01. 12KWDC Generator, Gilkes No. 14057 Type 26. G.S. Pump, Hamworthy A/C No. 116395.

Is electric current used for essential services at sea? **No.** If so, state the minimum No. and capacity of generators required in order that the ship may operate at sea _____
 Is an electric generator driven by Main Engine? **Yes.**
STEAM INSTALLATION. No. of donkey boilers burning oil fuel **None.** W.P. _____ Type _____
 Position _____
 Is a superheater fitted? _____ Are these boilers also heated by exhaust gas? _____ No. of donkey boilers heated by exhaust gas only? _____ W.P. _____
 Type _____ Position _____ Can the exhaust heated boilers deliver steam directly to the steam range or do they operate only as economisers in conjunction with oil fired boilers? _____
 Port and No. of report on donkey boilers _____ Is steam essential for operation of the ship at sea? _____ Are any steam pipes over 3 ins. bore? _____ If so, what is their material? _____
 For oil fired boilers is the arrangement of pipes, valves, controls, etc., in accordance with the Rules? _____ No. of oil burning pressure units _____ No. of steam condensers _____ No. of Evaporators _____
STEERING GEAR. (State No. and Type of Steam Engines, Electric Motors, Hydraulic Pumps and other particulars) **Rod And Chain Steering Gear, Hand Operation.**
 Have the Rule Requirements for fire extinguishing arrangements been complied with? **Yes.** Brief description of arrangements **Fire Foam 2 Gallon Extinguishers.**
 Has the spare gear required by the Rules been supplied? **Yes.** Has all the machinery been tried under full working conditions and found satisfactory? **Yes.** Date and duration of full-power sea trials of main engines **21-11-56. 9 hrs.** Does this machinery installation contain any features of a novel or experimental nature? (Give particulars) **No.**

The foregoing description of the main engine and installation is correct and the particulars are as approved for torsional vibration characteristics by the Rules (strike out words not applicable).
R. S. HAYES (Pembroke Dock) LTD.
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GENERAL REMARKS

State if the machinery has been constructed and/or installed under special survey in accordance with the Rules, approved plans and Secretary's letters. State quality of materials and workmanship and give recommendations for classification, including any special notation to be assigned. Where existing machinery is submitted for classification the circumstances should be explained as fully as possible.

The machinery of this vessel has been built under Special Survey in accordance with the approved plans, the Secretary's letters and the requirements of the Rules. The Main Engine received from Keighley has been installed on board and subsequently satisfactory basin and sea trials witnessed.

The materials and workmanship throughout is good.

The machinery installation is in our opinion eligible for a record of **LMC 12.56** and the notation TS(OG) Oil Engine.

A notice plate has been attached to the main engine stating that Governor adjusted not to exceed 320 R.P.M. when racing.

M. Hamming & J.R. Deh

Engineer Surveyors to Lloyd's Register of Shipping.

PARTICULARS OF IDENTIFICATION MARKS (Including Port of origin) of important Forgings and Castings. (Copies of certificates should be forwarded with report.) Copies of Certificates attached

RODS -
 CRANKSHAFT OR ROTORSHAFT -
 FLYWHEEL SHAFT -
 THRUSTSHAFT Lloyd's No. ³³⁹⁴ 3374. 7-12-53. No certificate to hand.
 GEARING -
 INTERMEDIATE SHAFTS Lloyd's No. 3811 SLD.. 30-1-56.
 SCREW AND TUBE SHAFTS Lloyd's No. 3733 SLD. 11-1-56.
 PROPELLERS ~~3733 SLD. 11-1-56.~~
 OTHER IMPORTANT ITEMS Extension Shaft Lloyd's No. 4147 30-12-55.

Is the installation a duplicate of a previous case? No. If so, state name of vessel -
 Date of approval of plans for crankshaft - Straight shafting 8-12-55. Gearing - Clutch -
 Separate oil fuel tanks 13-1-56. Pumping arrangements 22-3-56. Oil fuel arrangements -
 Cargo oil pumping arrangements - Air receivers - Donkey boilers -
 Dates of examination of principal parts:-
 Fitting of stern tube 4-7-56. Fitting of propeller 31-8-56. Completion of sea connections 29-6-56. Alignment of crankshaft in main bearings 1-11-56.
 Engine checks & bolts 25-9-56. Alignment of gearing - Alignment of straight shafting 1-11-56. Testing of pumping arrangements 21-11-56
 Oil fuel lines 21-11-56. Donkey boiler supports - Steering Gear. 14-11-56. Windlass -
 Date of Committee FRIDAY - 8 FEB 1957 Special Survey Fee £24. 0. 0.
 Decision + LMC 12.56
 Expenses £3. 5. 0.
 SWB. " £6. 0. 0.
 Date when A/c rendered 28-12-56.



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