

be forwarded a pt. 4b

te of writing report  
 applicable  
 tanks, tun  
 table oil

Received London 4 MAR 1958  
 No. of visits In shops 53 On vessel 23  
 Port 7  
 First date 11-10-56 Last date 14-5-57  
 16375

# FIRST ENTRY REPORT ON INTERNAL COMBUSTION MACHINERY

In R.B. Name M/V "LAUST MÆRSK"  
 Gross tons 6418,68  
 Managers A.P. Møller  
 Port of Registry Copenhagen  
 By A/S Odense Staalskibsværft  
 Yard No. 141  
 Year 1958  
 By A/S Burmeister & Wain  
 Eng. No. 5931  
 When 1957  
 By Aalborg Værft  
 Blr. Nos. 1  
 When 1957  
 By Odense Staalskibsværft A/S  
 When 1958

Boilers made at Aalborg and Birmingham  
 By Aalborg Værft &  
 Installed at Odense  
 By Odense Staalskibsværft A/S  
 of restricted service of ship, if limited for classification  
 of vegetable or similar cargo oil notation, if required Vegetable oil or fuel oil in deep tanks  
 be classed for navigation in ice? No  
 Is ship intended to carry petroleum in bulk? No  
 ating machinery fitted? No  
 If so, is it for cargo purposes? - Type of refrigerant -  
 igerating machinery compartment isolated from the propelling machinery space? Is the refrigerated cargo installation intended to be classed?

wing 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  
 s 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  
 ed not be repeated below, but the port and report number should be stated.

ain engines 1 No. of propellers 1 Brief description of propulsion system Reversible heavy oil eng. direct to pro-  
 RECIPROCATING ENGINES. Licence Name and Type No. DM 874 VTBF-160 Turbocharged crosshead type solid  
 cylinders per engine 8 Dia. of cylinders 740 mm stroke(s) 1600 mm 2 or 4 stroke cycle 2 Single or double acting single  
 n approved BHP per engine 10000 at 115 RPM of engine and 115 RPM of propeller.  
 nding MIP 7.9 kg/cm<sup>2</sup> (For DA engines give MIP top & bottom) Maximum cylinder pressure 55 kg/cm<sup>2</sup> Machinery numeral 2000  
 yinders arranged in Vee or other special formation? no If so, number of crankshafts per engine -

TROKE ENGINES. Is the engine of opposed piston type? no If so, how are upper pistons connected to crankshaft? -  
 haust discharged through ports in the cylinders or through valve(s) in the cylinder covers? Valves in cover No. and type of mechanically driven scavenge pumps or blowers per  
 nd how driven none  
 haust gas driven scavenge blowers per engine 2 Where exhaust gas driven blowers only are fitted, can the engine operate with one blower out of action? yes  
 d-by or emergency pump or blower is fitted, state how driven electrically driven No. of scavenge air coolers 2 Scavenge air pressure at full  
 0.42 kg/cm<sup>2</sup> Are scavenge manifold explosion relief valves fitted? yes

TROKE ENGINES. Is the engine supercharged? - Are the undersides of the pistons arranged as supercharge pumps? - No. of exhaust gas driven blowers per  
 No. of supercharge air coolers per engine - Supercharge air pressure - Can engine operate without supercharger? -  
 FOUR STROKE ENGINES—GENERAL. No. of valves per cylinder: Fuel 2 port in Inlet cylinder Exhaust 1 Starting 1 Safety 1  
 of cylinder covers cast steel Material of piston crowns cast steel Is the engine equipped to operate on heavy fuel oil? yes  
 edium for :—Cylinders FRESH water Pistons lub. oil Fuel valves fuel oil Overall diameter of piston rod for double acting engines -

l fitted with a sleeve? - Is welded construction employed for: Bedplate? yes Frames? yes Entablature? yes Is the crankcase separated from the  
 of pistons? yes Is the engine of crosshead or trunk piston type? cross-head Total internal volume of crankcase 156 m<sup>3</sup> No. and total area of explosion relief  
 7-9000 cm<sup>2</sup> Are flame guards or traps fitted to relief devices? no Is the crankcase readily accessible? yes If not, must the engine be removed for  
 of bearings, etc? - Is the engine secured directly to the tank top or to a built-up seating? How is the engine started? compressed air

engine be directly reversed? yes If not, how is reversing obtained? -  
 engine been tested working in the shop? yes How long at full power? 6 hours  
 & FLYWHEEL SHAFTING. Date of approval of torsional vibration characteristics of the propelling machinery system 19-12-56 State barred speed range(s), if imposed

ng propeller For spare propeller Is a governor fitted? yes Is a torsional vibration damper or detuner fitted to the shafting? no  
 ositioned? - Type - No. of main bearings 10 Are main bearings of ball or roller  
 no Distance between inner edges of bearings in way of crank(s) 958 mm Distance between centre lines of side cranks or eccentrics of opposed piston engines -

ft type: Built, semi-built, solid (State which) built  
 of journals 550 mm Diameter of crankpins Centre 550 mm Side 220 mm central hole Breadth of webs at mid-throw 1180 mm Axial thickness of webs 280/335 mm  
 220 mm central hole Pins SM Steel Minimum  
 , radial thickness around eyeholes 300/320 mm Are dowel pins fitted? no Crankshaft material Journals SM Steel Approved 44 kg/mm<sup>2</sup>  
 Webs cast steel Tensile strength

222ND  
 9/8 Diameter of flywheel 4400 kgm<sup>2</sup> Weight - Are balance weights fitted? yes Total weight 25820 kgm<sup>2</sup> Radius of gyration -  
 Diameter of flywheel shaft 500 mm Material SM Steel Minimum approved tensile strength 44 kg/mm<sup>2</sup>  
 flywheel shaft: separate, integral with crankshaft, integral with thrustshaft. (State which) integral with thrust shaft

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# 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.....

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 stroke.....

minute at full power..... Gas delivery pressure..... Gas delivery temperature..... Have the turbines and attached equipment been tested 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.....

journals..... Are the wheels of welded construction?..... Is gearcase of welded construction?..... Has the wheel/gearcase been heat treated on cooling?.....

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 description and, for clutches, state how operated.

Can the main engine be used for purposes other than propulsion when declutched?..... If so, what?.....

## STRAIGHT SHAFTING. Diameter of thrust shaft..... 500 mm..... Material..... SM Steel..... Minimum approved tensile strength..... 44 kg/mm<sup>2</sup>.....

Shaft separate or integral with crank or wheel shaft?..... 160 mm central hole..... separate..... Diameter of intermediate shaft..... 430 mm..... Material..... SM Steel.....

Minimum approved tensile strength..... 44 kg/mm<sup>2</sup>..... Diameter of screwshaft cone at large end..... 500 mm..... 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.....

bearings..... 24 mm..... Thickness between bearings..... 220..... Material of screw/tube shaft..... SM Steel..... Minimum approved tensile strength.....

Is an approved oil gland fitted?..... No..... If so, state type..... Length of bearing next to and supporting propeller..... 200 mm.....

Material of bearing..... lignum vitae..... In multiple screw vessels is the liner between stern tube and A bracket continuous?..... If not, is the exposed length of shafting.....

liners readily visible in dry dock?.....

## PROPELLER. Diameter of propeller..... 5,600 mm..... Pitch..... Variable..... Built up or solid..... solid..... Total developed surface.....

No. of blades..... 4..... Blade thickness at top of root fillet..... Blade material..... Nikalium..... Moment of inertia of dry propeller.....

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..... bronze..... Moment of inertia..... 79150.....

## AIR COMPRESSORS & RECEIVERS. No. of main engine driven compressors per engine..... none..... Can they be declutched?.....

No. of independently driven air compressors. (State capacity, prime mover, position in ship, and Port and No. of certificate)..... 2 off electrically driven, each.....

245 m<sup>3</sup>/h. Port side of engine room.

No. of starting air receivers. (Main and Aux. State capacity of each, position in ship and Port and No. of Certificate)..... Main 1 off 23 m<sup>3</sup> Engine room.....

Port side CPN Cert. No. 1511. KL 21-1-57 Aux. 300 litres Cert. No. 7369 Nos. 20395/POS 6/10 Port.....

How are receivers first charged?..... Steam driven emergency compr. Maximum working pressure of starting air system..... 25 kg/cm<sup>2</sup>..... Are the safety devices.....

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..... 2 off..... No. of main engine lubricating oil coolers..... 2 off.....

OIL FUEL TANKS. No. and position of oil fuel settling or service tanks not forming part of hull structure..... 2 off fore end of engine room.....

MAIN ENGINE DRIVEN PUMPS (No. and Purpose)..... none.....

INDEPENDENT PUMPS Below essential pumps, state position and driven. Give capacity of bilge pumps.	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	overboard
Starboard pump elec. P.S. 150 T/H	X	X	X			X										X
Starboard pump P.S.E.R. 100 T/H						X	off-peak			aux. mach.			X			X
Water cooling		X				X				X						X
M. cooling					X						X					
Starboard pump elec. P.S.E.R. 100 T/H	X	X				X							X			X
Starboard and fire pump elec. P.S.E.R. 100 T/H	X					X							X			X
Starboard oil fuel trf. pump S.S.E.R.				X								X				
Starboard lub. oil pumps S.S.E.R.								X						X		
Starboard steam feed pumps							X			X						X
Starboard elec. fire pump						X							X			

## SUCTIONS. No. and size in each hold, deep tank or pump room

1. No. 1 hold P & S 3". No. 2 hold P & S 3". No. 3 hold P & S 3". No. 4 hold P & S 3". No. 5 hold P & S 2 1/2". Deep tank F.P.C.S. 2 1/2". Deep tank aft. P & S 2 1/2". No. 6 hold P & S 2 1/2". No. 7 hold P & S 2 1/2". No. 8 hold P & S 2 1/2". No. 9 hold P & S 2 1/2". No. 10 hold P & S 2 1/2". No. 11 hold P & S 2 1/2". No. 12 hold P & S 2 1/2". No. 13 hold P & S 2 1/2". No. 14 hold P & S 2 1/2". No. 15 hold P & S 2 1/2". No. 16 hold P & S 2 1/2". No. 17 hold P & S 2 1/2". No. 18 hold P & S 2 1/2". No. 19 hold P & S 2 1/2". No. 20 hold P & S 2 1/2". No. 21 hold P & S 2 1/2". No. 22 hold P & S 2 1/2". No. 23 hold P & S 2 1/2". No. 24 hold P & S 2 1/2". No. 25 hold P & S 2 1/2". No. 26 hold P & S 2 1/2". No. 27 hold P & S 2 1/2". No. 28 hold P & S 2 1/2". No. 29 hold P & S 2 1/2". No. 30 hold P & S 2 1/2". No. 31 hold P & S 2 1/2". No. 32 hold P & S 2 1/2". No. 33 hold P & S 2 1/2". No. 34 hold P & S 2 1/2". No. 35 hold P & S 2 1/2". No. 36 hold P & S 2 1/2". No. 37 hold P & S 2 1/2". 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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 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.

This machinery has been built and installed under Special Survey in accordance with the rules, approved plans and the Secretary's letters. The material has been tested as required by the Rules, and the workmanship is good.

The whole installation has been examined under full power conditions during a sea trial and found satisfactory and in eligible in my opinion to be classed with the notation +LMC 1.58 - Oil engines CL 2 DB 100 lbs.

*[Signature]*  
*[Signature]*  
 Engineer Surveyor 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.)

RODS Piston Rods 9 off Lloyd's CPN 3005-3008-3009 VL 5-4-57.

Connecting rods 8 off Lloyd's CPN 3010-3011-3012 VL 5-4-57

CRANKSHAFT OR ROTORSHAFT Forward 1/2 length Lloyd's CPN Nos. 2094 VL 27-3-57.

FLYWHEEL SHAFT Aftermost 1/2 length Lloyd's CPN Nos. 2095 VL 27-3-57.

THRUSTSHAFT Lloyd's CPN Nos. 2096 VL 27-3-57

GEARING

INTERMEDIATE SHAFTS 5 off Lloyd's CPN 2084-85-86 VL 25-3-57. 2093 VL 27-3-57. 3023 VL 11-4-57.

SCREW AND TUBE SHAFTS 1 off Lloyd's CPN 3022 VL 10-4-57 1 off Lloyd's CPN 3048 VL 15-4-57.

PROPELLERS

OTHER IMPORTANT ITEMS Crossheads: 8 off Lloyd's CPN 3018-3019 VL 9-4-57.

Cylinder Liners & Jackets Lloyd's CPN 7 Atm. 7 off KH 26-2-57. 1 off KH 14-3-57 2 off Sp 26-3-57.

Cylinder covers Lloyd's CPN 10 Atm. 9 off VL 28-2-57. 1 off VL 3-4-57.

Pistons 10 off Lloyd's CPN 5 Atm. VL 1-2-57.

Is the installation a duplicate of a previous case? yes If so, state name of vessel "LEDA MÆRSK"

Date of approval of plans for crankshaft 19/12-55 Straight shafting 19/12-55 Gearing Clutch

Separate oil fuel tanks Pumping arrangements 12/7-56 Oil fuel arrangements 12/7-56

Cargo oil pumping arrangements 12/7-56 Air receivers 6/6-55 Donkey boilers 1/4-55

Dates of examination of principal parts:—

Fitting of stern tube 22/4-57 Fitting of propeller 13/5-57 Completion of sea connections 12/4-57 Alignment of crank shaft in main bearings 4/6-57

Engine chocks & bolts 18-6-57 Alignment of gearing — Alignment of straight shafting 18-6-57 Testing of pumping arrangements 18-6-57

Oil fuel lines 18-11-57 Donkey boiler supports 10-9-57 Steering machinery 23-11-57 Windlass 23-11-57

Date of Committee

Decision

*See Rpt. 1.*

Special Survey Fee

Construction

kr. 5800.00

Forgings " 1080,-

welding " 355,-

start.air rec.200,-

Pumps & coolers 820,-

Entered in Cpn.R.F.B.

29/5/1957

18/1/1957

Date when A/c rendered

for pumps & coolers 22/5/1957

(Entered in R.F.B. 25/5/1957)