

REPORT ON OIL ENGINE MACHINERY

No. 330

7-JUL 1954

Received at London Office

Date of writing Report 23 March 1954 When handed in at Local Office 19 Port of Shimonoseki
 No. in Survey held at Nagasaki Date, First Survey 10 March 1953 Last Survey 4 Feb 1954
 Reg. Book. Number of Visits 27

Single on the Twin Triple Quadruple } motor screw vessel
 "AKI-MARU"
 Tons { Gross 7732.60
 Net 4316.41

Built at Nagasaki By whom built Nagasaki Works, Mitsubishi Zosen K.K. Yard No. 1438 When built 1954.2.14
 Engines made at Nagasaki By whom made Nagasaki Works, Mitsubishi Zosen K.K. Engine No. 26/4.262 When made 1953.10.14
 Donkey Boilers made at Nagasaki By whom made Nagasaki Works, Mitsubishi Zosen K.K. Boiler No. 1384 When made 1953.10.14
 Brake Horse Power 2 x 4300 Owners Nippon Yusen Kaisha Port belonging to Tokyo
 M.N. Power as per Rule 1720 Is Refrigerating Machinery fitted for cargo purposes Yes Is Electric Light fitted Yes
 Trade for which vessel is intended Ocean going

OIL ENGINES, &c. — Type of Engines 6 MS 72/125 2 or 4 stroke cycle 2 Single or double acting Single

Maximum pressure in cylinders 45 kg/cm² Diameter of cylinders 720 mm Length of stroke 1250 mm No. of cylinders 6 per eng No. of cranks 6 per eng
 Mean Indicated Pressure 6.04 kg/cm² Ahead Firing Order in Cylinders pt. 6-2-4-3-5-1 Span of bearings, adjacent to the crank, measured from inner edge to inner edge 960 mm Is there a bearing between each crank Yes Revolutions per minute 128

Flywheel dia 2500 mm Weight 4480 kg Moment of inertia of flywheel (lbs. in² or Kg. cm²) 17000 kg.m² Means of ignition Compression Kind of fuel used Heavy oil

Crank Shaft, { Solid forged dia. of journals as per Rule 440.3 mm as fitted 480 mm Crank pin dia 480 mm Crank webs Mid. length breadth 830 mm shrunk Thickness parallel to axis 305 mm
 { Semi built All built Mid. length thickness 305 mm Thickness around eyehole 217.5 mm

Flywheel Shaft, diameter as per Rule 440.3 mm as fitted 480 mm Intermediate Shaft, diameter as per Rule 316.7 mm as fitted 338 mm Thrust Shaft, diameter at collars as fitted 470 mm as per Rule 440 mm

Tube Shaft, diameter as per Rule 363 mm as fitted 370 mm Is the { tube } shaft fitted with a continuous liner { Yes }
 Screw Shaft, diameter as per Rule 363 mm as fitted 370 mm

Bronze Liners, thickness in way of bushes as per Rule 18.7 mm as fitted 22 mm Thickness between bushes as per Rule 14 mm as fitted 19 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 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 1470 mm

Propeller, dia. 4400 mm Pitch 4400 mm No. of blades 4 Material Mn Br whether moveable Solid Total developed surface 6.642 sq. feet
 Moment of inertia of propeller (lbs. in² or Kg. cm²) 96400 kg.cm² Kind of damper, if fitted None

Method of reversing Engines Hand operation Is a governor or other arrangement fitted to prevent racing of the engine when declutched Yes Means of lubrication Forced Thickness of cylinder liners 25 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 Yes Cooling Water Pumps, No. 2 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. None Diameter Stroke Can one be overhauled while the other is at work Yes
 Pumps connected to the Main Bilge Line { No. and size 2-@360 m³/hr 2-@160 m³/hr 1-30 m³/hr }
 How driven Electric motor drive

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 None

Ballast Pumps, No. and size 1-160 m³/hr 1-100 m³/hr Power Driven Lubricating Oil Pumps, including spare pump, No. and size 2-@270 m³/hr

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-@90 mm dia 2-@130 mm dia 1-240 mm dia 3-@50 mm dia In pump room None
 In holds, etc. Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Independent Power Pump Direct Suctions to the engine room bilges, No. and size 2-@130 mm dia 1-240 mm dia

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 Below

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 None How are they protected None What pipes pass through the deep tanks Heating coil 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 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 None

Main Air Compressors, No. 2 No. of stages 3 diameters 100 360 360 stroke 220 mm driven by Dynamo engines

Auxiliary Air Compressors, No. None No. of stages None diameters None stroke None driven by None

Small Auxiliary Air Compressors, No. 1 No. of stages 1 diameters 93/42 stroke 70 mm driven by Manual

What provision is made for first charging the air receivers Small manual auxiliary compressor described above

Scavenging Air Pumps, No. 1 for each working cylinder diameter 600 mm stroke 1250 mm driven by Main engine

Auxiliary Engines crank shafts, diameter as per Rule 140 mm as fitted 150 mm Position Engine room flat

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 Yes ✓ State No. of report or certificate AR-10628 A+B

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 ✓ Is a drain fitted at the lowest part of each receiver Yes ✓

Injection Air Receivers, No. - Cubic capacity of each - Internal diameter - thickness -

Seamless, welded or riveted longitudinal joint - Material - Range of tensile strength - Working pressure - by Rules - Actual -

Starting Air Receivers, No. 2 ✓ Total cubic capacity 2 x 12 cub. meter Internal diameter 1800 mm thickness Shell 32 mm End 52 mm by Rules 30 kg/cm² Actual 30 kg/cm²

Seamless, welded or riveted longitudinal joint Class I Fusion welded Material Boiler quality steel Range of tensile strength (70) Shell 30 End 27.8 Working pressure 30 kg/cm² Actual 30 kg/cm²

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 and for tank heating and cargo raise ✓

PLANS. Are approved plans forwarded herewith for shafting Kob. 22 July 1953 Receivers Kob. 22 July 1953 Separate fuel tanks Kob. 30 Aug 1953

Donkey boilers Kob. 15 July 1953 General pumping arrangements Kob. 5 Dec 1953 Pumping arrangements in machinery space Kob. 6 Oct 1953

Oil fuel burning arrangements Kob. 18 Jan 1954

Have Torsional Vibration characteristics been approved Yes ✓ Date of approval Kob. 22 July 1953

SPARE GEAR.

Has the spare gear required by the Rules been supplied Yes ✓

State the principal additional spare gear supplied

Eight - Fuel oil needle valves, Six sets - Piston rings,
Five sets - Rubber rings for liner joint, Two - Main bearing bolts and nuts

The foregoing is a correct description,

J. Matsushita
NAGASAKI WORKS Manufacturer.

Dates of Survey while building
During progress of work in shops -- 1953
March 10, 13, 30, April 3, 4, 8, 9, 10, 14, 15, 16, 17, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, May 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, June 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, July 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, August 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, September 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, October 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, November 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, December 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 1954
During erection on board vessel -- 1953
Oct. 27, 28, 30, Nov. 10, 12, 19, 21, 26, 30, Dec. 3, 5, 7, 10, 15, 19, 22, 26, 29, 1954
Total No. of visits 94

Dates of examination of principal parts — Cylinders 14.7.53, 22.8.53 Covers 4.8.53, 19.9.53 pistons 9.7.53, 22.8.53 Rods - Connecting rods 4.8.53, 5.9.53

Crank shafts 10.7.53, 24.8.53 Flywheel shaft - Thrust shaft 10.7.53, 24.8.53 Intermediate shafts 5.10.53, 19.10.53 Tube shaft -

Screw shafts 19.10.53, 20.10.53 Propellers 2.10.53, 9.10.53 Stern tube 16.10.53 Engine seatings 12.1.54 Engine holding down bolts 20.1.54

Completion of fitting sea connections 2.1.10.53 Completion of pumping arrangements 22.1.54 Engines tried under working conditions 22.1.54

Crank shaft, material Forged steel Identification marks M-1053594F, M-1053694F Flywheel shaft, material, - Identification mark -

Thrust shaft, material Forged steel Identification mark M-10307, MSF-614 Intermediate shafts, material Forged steel Identification marks M-10465, M-10654

Tube shaft, material - Identification mark - Screw shafts material Forged steel Identification mark M-10466, A+B

Identification marks on air receivers Nos. 54+55 No. AR-10628 A+B M.O. R. 13.10.53, M-22, NOAR-10630 M.O. R. 29.10.53

No. A-26 No. AR-10629 M.O. R. 29.10.53

Welded receivers, state Makers' Name Nagasaki Works, Mitsubishi Zosen K.K.

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 CO₂ Extinguisher with detector; Total 69 bottles (855 litre) stored amidship between deck and opened to peak's stores mail room holds towards a meal space. Weatherproof; Total 19 x 70 mm dia water hose couplings; Bridge space & galley; Total 12 x 40 mm dia water hose couplings and 10 x 1/2 inch portable bottles. Mech space; 4 x 70 mm dia water hose couplings; 11 portable bottles; 2 bath apparatus; 27 x 20 mm nozzle openings, each 2 lengths steam smothering pipes under main engines & donkey boiler; 4 x 70 mm dia water hose couplings in shaft tunnel.

Is the vessel (not being an oil tanker) fitted for carrying oil as cargo Yes ✓ If so, have the requirements of the Rules been complied with Yes ✓

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 Yes ✓ If so, state name of vessel T.M.T. "ARITA-MARU"

General Remarks (State quality of workmanship, opinions as to class, &c.)

These machines have been constructed under Special Survey in accordance with the Rules, Approved plans and Secretary's letter.

The material and workmanship are good.

On completion, these machines were installed in the vessel in accordance with the Rules.

Appliances tested under full working condition, and eligible in our opinion for classification with the records of

+ L.M.C. 254 DBS 254 7 Kg per sq. cm. and TS (CH) 254

NOTE: Tick over speed have been noted at sea trial, Port 39 r.p.m. Starboard 41 r.p.m.

The amount of Entry Fee ... £1,151.200 :
Special ... £ :
Donkey Boiler Fee ... £ :
Travelling Expenses (if any) £ :
When applied for LOCALLY 19
When received 19

Committee's Minute TUESDAY 31 AUG 1954

Assigned + LMC 254 Oil Eng.

DB 100 lb. ch.

