Certificate No.: 2505171919531247

TÜRK LOYDU

TYPE APPROVAL CERTIFICATE

This is to certify that the

INTERNAL COMBUSTION ENGINES

TL Project No	**23-2068**
Manufacturer	**MITSUBISHI HEAVY INDUSTRIES ENGINE & TURBOCHARGER LTD., MHI EQUIPMENT ALSACE SAS, MITSUBISHI TURBOCHARGER AND ENGINE EUROPE B.V.**
Address	**Mitsubishi Heavy Industries Engine& Turbocharger Ltd., Sagamihara, Japan& MHI Equipment Alsace S.A.S., Mulhouse, France& Mitsubishi Turbocharger and Engine Europe B.V., Almere, Netherlands.**
Product Type	**S12A2**
Reference Rule	**TL Rules, Part B, Chapter 4, Machinery, 01.07.2022** **TL Rules, Part B, Chapter 5, Electric, 01.07.2022** **TL Rules, Part A, Chapter 2, Material, 01.01.2023**
Expire Date of Previous Certificate	**05.04.2023**
Place and Date	**ISTANBUL / 02.06.2025**

This certificate supersedes 2503191625461247 numbered certificate.

Subject to the conditions referred to in the following pages, this certificate is valid until 05.04.2028.

Emrah SÖĞÜTÇÜ

New Building Division Manager

135351

This certificate is subject to terms and conditions described below:

- Any significant change in design or construction may render this Certificate invalid. Type Approval Certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. This certificate is not valid for products without marking above mentioned. The manufacturer should notify TÜRK LOYDU of any modifications or changes to equipment in order to obtain valid certificate. This certificate shows that tested specimens as representative of the product complies of the TÜRK LOYDU rules, and revelant international instruments that apply to it.

Product	: INTERNAL COMBUSTION ENGINES
Type of Product	: S12A2
Product Description	: Four stroke, v-engine, non-reversible, trunk-piston, with supercharging, with charge air cooling, direct injection, injection operation by cams, valve operation by cams, liquid fuel
Approval No / Date	: PAE-EPAS/019939/23-2068/VA, 07.11.2024
Application	: Mechanical & electrical propulsion, auxiliary and emergency
Number of Cylinders	: 12
Stroke	: 160 [mm]
Bore	: 150 [mm]
Method of Operation	: Four Stroke
Kind of Starting Device	: Air/ Battery
Kind of Cooling	: Water
Fuel Type	: Diesel Oil
Last Inspection Date	: 11.02.2025
Performed Tests	: - Quality& Production Quality Assurance Audit - Controls according to Approved Drawings - Subcomponent Controls (crankshaft, pistons, connecting rod etc.) - Turbocharger checks - Review of calibration certificates of measuremet and test tools - Review of endurance type test report were found satisfactory.
Test Place	: Sagamihara, Kanagawa,252-5293, Japan& Mulhouse Cedex 01 FRANCE

	Model Number	Rated Power	Rated RPM	Mean Effective Pressure	Max Firing Pressure
1	S12A2-MPTA, Auxiliary/ Emergency	545 [kW]	1200	16.06 [bar]	107.8 [bar]
2	S12A2-MPTK ; Auxiliary/ Emergency	552 [kW]	1200	16.27 [bar]	107.8 [bar]
3	S12A2-T2M(P)TK, S12A2-MPTK, S12A2-(T2)M(P)TAW ; Auxiliary/ Emergency	709 [kW]	1500	16.72 [bar]	140.0 [bar]
4	S12A2-MPTA ;Auxiliary/ Emergency	679 [kW]	1500	16.01 [bar]	112.7 [bar]
5	S12A2-MPTA ; Auxiliary/ Emergency	761 [kW]	1800	14.95 [bar]	117.6 [bar]
6	S12A2-T2M(P)TK, S12A2-MPTK, S12A2-(T2)M(P)TAW ; Auxiliary/ Emergency	828 [kW]	1800	16.27 [bar]	140.0 [bar]
7	S12A2-MPTA ; Propulsion	634 [kW]	1940	11.56 [bar]	117.6 [bar]
8	S12A2-T2M(P)TK, S12A2-(T2)M(P)TAW; Propulsion	701 [kW]	1800	13.77 [bar]	116.0 [bar]
9	S12A2-MPTK, S12A2-(T2)M(P)TAW; Propulsion	701 [kW]	1940	12.78 [bar]	140.0 [bar]

Surveyor Name : Sezer Mahir TUGCU

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10	S12A2-MPTA; Propulsion	701 [kW]	2000	12.40 [bar]	117.6 [bar]
11	S12A2-T2M(P)TAW2; Propulsion	727 [kW]	1800	14.28 [bar]	122.0 [bar]
12	S12A2-T2M(P)TAW2; Propulsion	727 [kW]	1940	13.25 [bar]	117.0 [bar]
13	S12A2-T2M(P)TK, S12A2-(T2)M(P)TAW; Propulsion	776 [kW]	1860	14.76 [bar]	122.0 [bar]
14	S12A2-MPTK, S12A2-(T2)M(P)TAW; Propulsion	776 [kW]	2000	13.72 [bar]	128.0 [bar]
15	S12A2-MPTA; Propulsion	776 [kW]	2100	13.07 [bar]	117.6 [bar]
16	S12A2-T2M(P)TAW2; Propulsion	818 [kW]	1800	16.07 [bar]	124.0 [bar]
17	S12A2-T2M(P)TAW2; Propulsion	818 [kW]	1860	15.55 [bar]	132.0 [bar]
18	S12A2-T2M(P)TAW2; Propulsion	818 [kW]	2000	14.47 [bar]	125.0 [bar]
19	S12A2-T2M(P)TK; Propulsion	858 [kW]	1920	15.80 [bar]	122.0 [bar]
20	S12A2-MPTK; Propulsion	858 [kW]	2100	14.45 [bar]	117.6 [bar]

Approval Conditions : Application/Limitation:

1-Diesel engines intended for propulsion, incl. DEP, auxiliary and emergency application

2-Limitation

2.1-In order for these engines to be used on ships with single-engine propulsion applications, the control of the engine (in case of failure of the regulator or actuator) must be done with another independent control system. In other words, two separate engine control systems should be arranged. The main engines must be fitted with stand-by cooling pumps that operate independently. If this equipment is not on the engine, the ships should be equipped with more than one main engine.

2.2--Other Conditions;

2.2.1-Flexible hoses with couplings are to be type approved.

2.2.2-Engine safety, control and monitoring systems, including sensors and actuators are not covered by this type approval certificate. Documentation for engine safety, control including speed governing and monitoring systems shall be submitted for approval according to the TL Part B- Chapter 4-1-Section 2 (January 2022). (It is only required for Türk Loydu product certificate.)

2.2.3-Electric cables and cabling are not covered by this approval and must be verified to comply to the TL Part B- Chapter 5-Section 12 (July 2022). (It is only required for Türk Loydu product certificate.)

2.2.4-MITSUBISHI HEAVY INDUSTRIES ENGINE & TURBOCHARGER, LTD. is responsibility to inform the shipbuilders and/or their subcontractors about the installation, use, general maintenance of the approved equipment and the conditions of this approval.

Surveyor Name : Sezer Mahir TUĞCU

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2.3-Service Restriction:
2.3.1-Unit Certification (Türk Loydu product certification) is required for this product to be used on TL classed ships.
2.3.2-Equipment must be provided for enabling -turning gear engaged- signal.
3--Comments
3.1-Torsion vibration analysis is required for each propulsion installation unit.
3.2-The electrical and electronic equipment located within areas protected by local Fixed Pressure Water-spraying or water-mist Fire Extinguishing system and those with in adjacent areas exposed to direct spray are to have a degree of protection not less than IP 44.
3.3-The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.
3.4-Non-overload engines can be used for special ships and special applications, only subject to class approval. Diesel engines to drive electric generators must be able to be overloaded.

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