



Certificate No. 02-002803/024756

TYPE APPROVAL CERTIFICATE

This is to certify that this product complies with the Rules for the classification of ships, Part 1 - General requirements, Chapter 3 - Type approval of products.

TYPE AND DESCRIPTION OF PRODUCT:

Marine Reduction Gearboxes for Diesel Engine Propulsion ZF 76xx family

MANUFACTURER:

ZF Friedrichshafen AG
Marine & Special Driveline Technology
Ehlersstraße 50
88046 Friedrichshafen
Germany

THE PRODUCT MEETS FOLLOWING RULES/REGULATIONS:

Rules for the Classification of Ships, Part 9-Machines

FURTHER DETAILS OF THE PRODUCT AND CONDITIONS FOR CERTIFICATION ARE GIVEN OVERLEAF.

APPROVAL IS VALID UNTIL: **2023-08-26**

Place and date: Split, 2019-08-26

Seal

Marinko Popović, dipl.ing.

NOTE: This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Croatian Register of Shipping of any modification or changes to the product in order to obtain a valid certificate.

DETAILED PRODUCT DESCRIPTION:

Marine reduction gearboxes ZF 7600 and ZF 7650 with parallel offset and built-in hydraulic clutches.

Versions: Reversing (3 shaft configuration, input above output), NR (non reversing, input above output), NR2 (non reversing, input above output), NR2B (non reversing, input below output), NR2H (non reversing, input horizontal output).

APPLICATION / LIMITATIONS:

Approved ratings according to ZF selection guide:

Continuous Duty, Commercial Use, multiple propulsion				
Model	Max. input power [kW]	Max. input speed [rpm]	Max. Torque [Nm]	Ratios
ZF 7600	1847 kW	1800	9800 Nm	1.485:1, 1.545:1, 1.700:1, 1.828:1, 2.037:1, 2.231:1, 2.565:1, 2.773:1
	1809 kW		9600 Nm	2.905:1
	1677 kW		8900 Nm	3.174:1
ZF 7650	2073 kW		11000 Nm	1.485:1, 1.545:1, 1.700:1, 1.828:1, 2.037:1, 2.231:1, 2.565:1, 2.773:1
	1990 kW		10560 Nm	2.905:1
	1828 kW		9700 Nm	3.174:1

Medium Duty, Commercial Use, multiple propulsion				
Model	Max. input power [kW]	Max. input speed [rpm]	Max. Torque [Nm]	Ratios
ZF 7600	2471 kW	2300	11800 Nm	1.485:1, 1.545:1, 1.700:1, 1.828:1, 2.037:1, 2.231:1, 2.565:1, 2.773:1
	2387 kW		11400 Nm	2.905:1
	2115 kW		10101 Nm	3.174:1
ZF 7650	2626 kW		12400 Nm	1.485:1, 1.545:1, 1.700:1, 1.828:1, 2.037:1, 2.231:1, 2.565:1, 2.773:1, 2.905:1
	2471 kW		11085 Nm	3.174:1

Light Duty, Commercial Use, multiple propulsion				
Model	Max. input power [kW]	Max. input speed [rpm]	Max. Torque [Nm]	Ratios
ZF 7600	2814 kW	2300	12800 Nm	1.485:1, 1.545:1, 1.700:1, 1.828:1, 2.037:1, 2.231:1, 2.565:1
	2814 kW		12750 Nm	2.773:1
	2814 kW		12400 Nm	2.905:1
	2670 kW		11085 Nm	3.174:1
ZF 7650	2946 kW		13400 Nm	1.485:1, 1.545:1, 1.700:1, 1.828:1, 2.037:1
	2902 kW		13200 Nm	2.231:1
	2836 kW		12900 Nm	2.565:1
	2803 kW		12750 Nm	2.773:1
	2770 kW		12400 Nm	2.905:1
	2670 kW		11085 Nm	3.174:1

Pleasure Duty, Private Use, multiple propulsion				
Model	Max. input power [kW]	Max. input speed [rpm]	Max. Torque [Nm]	Ratios
ZF 7600	2880 kW	2300	13100 Nm	1.485:1, 1.545:1, 1.700:1, 1.828:1, 2.037:1, 2.231:1, 2.565:1, 2.773:1, 2.905:1
	2720 kW		12315 Nm	3.174:1
ZF 7650	2946 kW		13400 Nm	1.485:1, 1.545:1, 1.700:1, 1.828:1, 2.037:1, 2.231:1, 2.565:1, 2.773:1, 2.905:1
	2814 kW		12315 Nm	3.174:1

The approval status is based on application factor 1,30.

TYPE APPROVAL DOCUMENTATION:

Drawings and calculations approved by CRS with letters: 2229/TSEv/KF/024756; (2019-08-26)

MARKING OF PRODUCT:

- *manufacturer's mark*
- *serial No.*
- *location and year of manufacturing*
- *CRS mark*

CONDITIONS FOR CERTIFICATION:

The manufacturer shall make arrangements for the CRS Surveyor to attend the relevant tests and examinations at manufacturer's works or to perform the relevant audits in case an alternative survey scheme has been approved. Relevant CRS certificate for each particular reduction gearbox will be issued after satisfactory completion of the procedure.

Measuring devices, sensors and alarms shall be subject to CRS approval in each particular case and will depend on service applied and the degree of automation of the propulsion plant.