Ratings
Ratings apply to marine diesel engines at the indicated speeds. At other engine speeds, the respective power capacity (kW) of the transmission can be obtained by multiplying the Power/ Speed ratio by the speed.
Approximate conversion factors:

1 kW	= 1.36 metric hp
1 kW	= 1.34 U.S. hp (SAE)
1 U.S. hp	= 1.014 metric hp
1 Nm	= 0.74 lb.ft.

Ratings apply to right hand turning engines, i.e. engines having counterclockwise rotating flywheels when viewing the flywheel end of the engine. These ratings allow full power through forward and reverse gear trains, unless otherwise stated.
Contact your nearest ZF Sales and Service office for ratings applicable to gas turbines, gasoline (petrol) engines, as well as left hand turning engines, and marine transmissions for large horsepower capacity engines.
Ratings apply to marine transmissions currently in production or in development and are subject to change without prior notice.

Safe Operation Notice
The safe operation of ZF products depends upon adherence to technical data presented in our brochures. Safe operation also depends upon proper installation, operation and routine maintenance and inspection under prevailing conditions and recommendations set forth by ZF. Damage to transmission caused by repeated or continous emergency manoeuvres or abnormal operation is not covered under warranty. It is the responsibility of users and not ZF to provide and install guards and safety devices, which may be required by recognized safety standards of the respective country (e.g. for U.S.A. - the Occupational Safety Act of 1970 and its subsequent provisions).

Monitoring Notice
The safe operation of ZF products depends upon adherence to ZF monitoring recommendations presented in our operating manuals, etc. It is the responsibility of users and not ZF to provide and install monitoring devices and safety interlock systems as may be deemed prudent by ZF. Consult ZF for details and recommendations.

Survey Society Classification
In most cases, the maximum medium and continous duty ratings permitted by ZF are accepted in full by major classification societies. If classification is required, contact ZF regarding proper procedures (also for yacht service, and ice classifications.

Torsional Responsibility and Torsional Couplings
The responsibility for ensuring torsional compatibility rests with the assembler of the drive and driven equipment.
ZF can accept no liability for gearbox noise caused by vibrations or for damage to the gearbox, the flexible coupling or to other parts of the drive unit caused by this kind of vibration. Contact ZF for further information and assistance.
ZF recommends the use of a torsional limit stop for single engine powered boats, wherein loss of propulsion power can result in loss of control. It is the buyer's responsibility to specify this option, which can result in additional cost and a possible increase in installation length. ZF can accept no liability for personal injury, loss of life, or damage or loss of property due to the failure of the buyer to specify a torsional limit stop.
ZF selects torsional couplings on the basis of nominal input torque ratings and commonly accepted rated engine governed speeds. Consult ZF for details concerning speed limits of standard offering torsional couplings, which can be less than the transmission limit. Special torsional couplings may be required for Survey Society Ice Classification requirements.

Trolling Valves
Trolling valves are available as an option on most models of marine transmissions. In most cases, trolling valves are easily retrofitted. A thermostatic oil by-pass valve and remote oil cooler may be required to maintain proper operation and recommended oil temperature. Consult ZF for details and limits.

ZF Duty Classification Definitions

Pleasure Duty
Highly intermittent operation with very large variations in engine speed and power.

Average engine operating hours limit:
- 500 hours/year.
- Typical hull forms: Planing.
- Typical applications: Private, non-commercial, non-charter sport/leisure activities.

Light Duty
Intermittent operation with large variations in engine speed and power.

Average engine operating hours limit:
- 2000 hours/year.
- Typical hull forms: Planing and semi- displacement.
- Typical applications: Private and charter, sport/leisure activities, naval and police activities.

Medium Duty
Intermittent operation with some variations in engine speed and power.

Average engine operating hours limit:
- 3500 hours/year
- Typical hull forms: Semi-displacement, and displacement.
- Typical applications: Private, charter and commercial craft (example: crew boats), and naval and police activities.

Continuous Duty
Continous operation with little or no variations in engine speed and power.

Average engine operating hours limit:
- unlimited
- Typical hull forms: Displacement.
- Typical applications: Commercial vessels, tugs, fishing, boats.