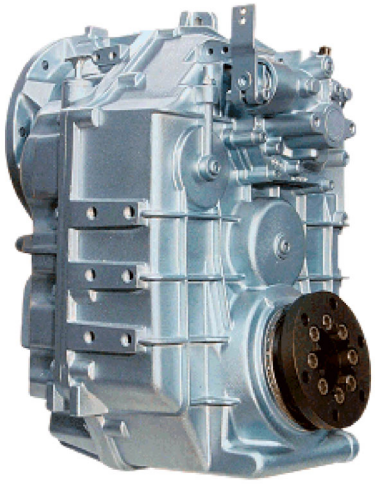
ZF 85 IV

TECHNICAL DATA SHEET

ZF 85 SERIES
PRODUCT DETAILS



Description

- Reverse reduction marine transmission with hydraulically actuated multi-disc clutches
- Suitable for high performance applications in luxury motoryachts, sport fishers, express cruisers etc
- Compatible with all types of engines and propulsion systems, including waterjets and surface- piercing propellers, as applicable
- Robust design also withstands continuous duty in workboat applications
- Fully works tested, reliable and simple to install
- Design, manufacture and quality control standards comply with ISO 9001

Features

- B/W connection integrated with casing
- Case hardened and precisely ground gear teeth for long life and smooth running
- Smooth and reliable hydraulic shifting with control lever for attachment of push-pull cable
- Suitable for twin engine installations (same ratio and torque capacity in ahead or astern mode)
- Compact, space saving design; 12° vee-angle and beveloid gear
- Output shaft thrust bearing designed to take maximum propeller thrust astern and ahead
- Oil drain plug
- Lightweight and robust aluminum alloy casing (sea water resistant)
- Replaceable oil filter
- Integrated bosses for speed pick-up installation at output flange

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RATINGS

Ratios		Power Factor		Input Power Capacity						Max. kW	Max. hp	Max. RPM
'A' Pos	'B' Pos	kW/RPM	hp/RPM	kW	hp	kW	hp	kW	hp			
Pleasure Duty - Diesel				2800 RPM		3000 RPM		3300 RPM				
1.644	1.638	0.1114	0.1494	312	418	334	448	368	493	390	523	3500
2.008	1.996	0.1114	0.1494	312	418	334	448	368	493	390	523	3500
2.493	2.468	0.1114	0.1494	312	418	334	448	368	493	390	523	3500
Light Duty - Diesel				2100 RPM		2500 RPM		2800 RPM				
1.644	1.638	0.1043	0.1399	219	294	261	350	292	392	365	490	3500
2.008	1.996	0.1043	0.1399	219	294	261	350	292	392	365	490	3500
2.493	2.468	0.1043	0.1399	219	294	261	350	292	392	365	490	3500
Medium Duty - Diesel				2100 RPM		2500 RPM		2800 RPM				
1.644	1.638	0.0889	0.1192	187	250	222	298	249	334	311	417	3500
2.008	1.996	0.0889	0.1192	187	250	222	298	249	334	311	417	3500
2.493	2.468	0.0838	0.1124	176	236	210	281	235	315	293	393	3500
Continuous Duty - Diesel				1800 RPM		2100 RPM		2400 RPM				
1.644	1.638	0.0726	0.0974	131	175	152	205	174	234	232	312	3200
2.008	1.996	0.0726	0.0974	131	175	152	205	174	234	232	312	3200
2.493	2.468	0.0696	0.0933	125	168	146	196	167	224	223	299	3200

* Special Order Ratio
'A' Pos: Continuous running position
'B' Pos: Reverse position

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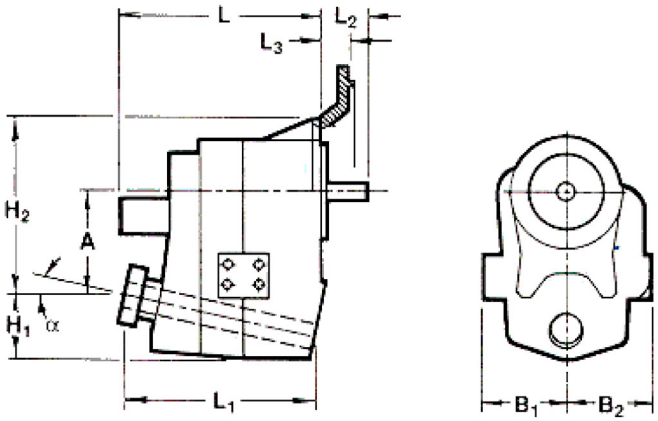
DIMENSIONS

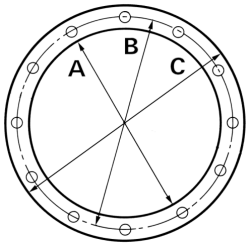


A	B1	B2	H1	H2	L0	L1	L2
Millimeter (mm)							
246.0	190.0	190.0	132.0	388.5	370.0	375.0	76.0
Inch (in)							
9.69	7.48	7.48	5.2	15.3	14.57	14.76	2.99

Angle (°)	Weight (kg)	Weight (lb)	Amount of Oil (l)	Amount of Oil (qt)
12	86	190	7.0	7.4

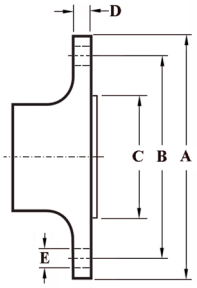
BELL HOUSING DIMENSIONS

Name	A		B		C		L3		Bolt Holes		
									No.	Diameter	
	mm	in	mm	in	mm	in	mm	in		mm	in
SAE 2	447.68	17.63	466.73	18.38	488.95	19.25	13.0	0.51	12	10.32	0.41
SAE 3	409.58	16.13	428.63	16.88	450.85	17.75	11.0	0.43	12	10.32	0.41
3 CAT											
B/W											
Volvo D4-D6											



OUTPUT FLANGE DIMENSIONS

A		B		C		D		Bolt Holes		
								No.	Diameter (E)	
mm	in	mm	in	mm	in	mm	in		mm	in
146.0	5.75	120.65	4.75	76.2	3.0	16.0	0.63	6	13.0	0.51



GENERAL INFORMATION

Duty Definitions

Pleasure Duty

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

Average engine operating hours limit:	500 hours/year 300 hours/year for mechanical gearboxes
Typical hull forms:	Planing
Applications:	Private, non-commercial, non-charter leisure activities, no racing

Light Duty

Intermittent operation with large variations in engine speed and power.

Average engine operating hours limit:	2500 hours/year (for hydraulic transmissions smaller than ZF 2000 series, 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:	4000 hours/year (for hydraulic transmissions smaller than ZF 2000 series and workboat ZF W2700 series, 3500 hours/year)
Typical hull forms:	Semi-displacement and displacement
Typical applications:	Charter and commercial craft (example: crew boats), and naval and police activities

Continuous Duty

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

Average engine operating hours limit:	Unlimited
Typical hull forms:	Displacement
Typical applications:	Heavy duty commercial vessels

Technical Notes

Duty 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.
- 1 Kg = 0.454 lb

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, 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.

NOTE: The maximum rated input power must not be exceeded (see respective ratings in the technical data sheets).

Safe Operating 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 service).

Dimensions and Weights

Dimensions and weights refer to transmissions with bell housing (where appropriate) but excluding options such as: trolling valves, power take-offs, propeller shaft companion flanges, torsional couplings etc.

Torsional Vibration and Torsional Couplings

The responsibility for ensuring torsional vibration compatibility rests with the overall propulsion system integration responsible party. Compatibility check of torsional vibration must include excitations induced by engine governor. ZF cannot accept any liability for gearbox noise or for damage to the gearbox, the flexible coupling or to other parts of the drive unit caused by torsional vibrations. Contact ZF for further information and assistance.

For single engine powered boats, where loss of propulsion can result in loss of control, ZF recommends the use of a torsional limit stop. It is the buyer's responsibility to specify this option. ZF cannot accept any 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 at commonly rated engine speeds. Consult ZF for details concerning speed limits of standard offered torsional couplings, which can be below transmission limits. Special torsional couplings may be required for Survey Society requirements.