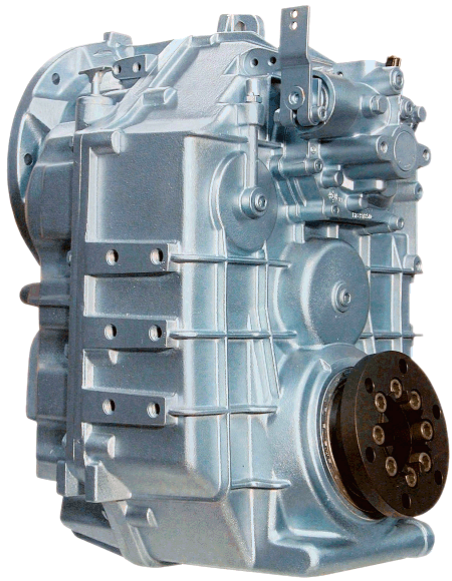


ZF 85 IV

12° V-drive, direct mount marine transmission.

Maximum rated input: 367kW (492hp)

Available for Pleasure, Light, Medium and Continuous Duty applications.

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 .
- "SUPERSHIFT" clutch control .

Options

- Classification by all major Classification Societies on request .
- Control cable bracket for mounting of push-pull cable to the control lever .
- Engine-matched dual stage coupling .
- Mounting brackets .
- Oil cooler complete with fittings and flexible oil hoses .
- Propeller shaft flange .
- SAE «A» Power Take Off .
- SAE 2 and SAE 3 bell housings .
- Thermostatic valve for better performance of trolling valve in cold sea water .
- Trolling valve (mechanical) for slow-speed drive .
- Electric Trolling .
- Supershift (with Autotroll and Easidock) .

ZF 85 IV
Ratings

Pleasure Duty

RATIOS		MAX. TORQUE		POWER/RPM		SAMPLE POWER CAPACITIES						MAX. RPM
'A' Pos	'B' Pos	Nm	ftlb	kW	hp	kW	hp	kW	hp	kW	hp	
						2800 rpm		3000 rpm		3300 rpm		
1.644	1.638	1064	785	0.1114	0.1494	312	418	334	448	368	493	3300
2.008	1.996	1064	785	0.1114	0.1494	312	418	334	448	368	493	3300
2.493	2.468	1064	785	0.1114	0.1494	312	418	334	448	368	493	3300

Light Duty

RATIOS		MAX. TORQUE		POWER/RPM		SAMPLE POWER CAPACITIES						MAX. RPM
'A' Pos	'B' Pos	Nm	ftlb	kW	hp	kW	hp	kW	hp	kW	hp	
						2100 rpm		2500 rpm		2800 rpm		
1.644	1.638	996	735	0.1043	0.1399	219	294	261	350	292	392	3300
2.008	1.996	996	735	0.1043	0.1399	219	294	261	350	292	392	3300
2.493	2.468	996	735	0.1043	0.1399	219	294	261	350	292	392	3300

Medium Duty

RATIOS		MAX. TORQUE		POWER/RPM		SAMPLE POWER CAPACITIES						MAX. RPM
'A' Pos	'B' Pos	Nm	ftlb	kW	hp	kW	hp	kW	hp	kW	hp	
						2100 rpm		2500 rpm		2800 rpm		
1.644	1.638	849	626	0.0889	0.1192	187	250	222	298	249	334	3300
2.008	1.996	849	626	0.0889	0.1192	187	250	222	298	249	334	3300
2.493	2.468	800	590	0.0838	0.1123	176	236	209	281	235	315	3300

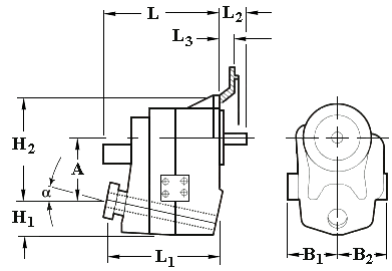
Continuous Duty

RATIOS		MAX. TORQUE		POWER/RPM		SAMPLE POWER CAPACITIES						MAX. RPM
'A' Pos	'B' Pos	Nm	ftlb	kW	hp	kW	hp	kW	hp	kW	hp	
						1800 rpm		2100 rpm		2400 rpm		
1.644	1.638	693	511	0.0726	0.0973	131	175	152	204	174	234	3200
2.008	1.996	693	511	0.0726	0.0973	131	175	152	204	174	234	3200
2.493	2.468	665	490	0.0696	0.0934	125	168	146	196	167	224	3200

"A" POS = continuous running position (normally AHEAD). "B" POS = reverse position. B/W = Borg Warner adaptor.

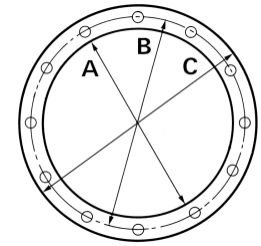
* Special Order Ratio

ZF 85 IV
Dimensions



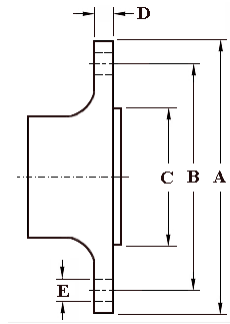
mm (inches)										
Angle	A	B_1	B_2	H_1	H_2	L	L_1	L_2	L_3	Bell Hsg.
12.0	246 (9.69)	190 (7.48)	190 (7.48)	132 (5.20)	389 (15.3)	370 (14.6)	375 (14.8)	76.0 (2.99)	11.0 (0.43)	3
Weight kg (lb)						Oil Capacity Litre (US qt)				
86.0 (189)						7.00 (7.40)				

SAE Bell Housing Dimensions



SAE No.	A		B		C		Bolt Holes		
							No.	Diameter	
	mm	in	mm	in	mm	in		mm	in
2	447.68	17.625	466.73	18.375	488.95	19.25	12	10.32	13/32

Output Coupling Dimensions



A		B		C		D		Bolt Holes		
								No.	Diameter (E)	
mm	in	mm	in	mm	in	mm	in		mm	in
146	5.75	121	4.75	76.2	3.00	16.0	0.63	6	13.0	0.51

Refer to the Installation Drawing for detail.

Duty Definitions

PLEASURE DUTY DEFINITION	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.
Typical applications:	Private, non-commercial, non-charter sport/leisure activities.
LIGHT DUTY DEFINITION	Intermittent operation with large variations in engine speed and power
Average engine operating hours limit:	2500 hours/year (for hydraulic gearboxes smaller than the ZF 650 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 DEFINITION	Intermittent operation with some variations in engine speed and power
Average engine operating hours limit:	4000 hours/year. 3500 hours/year for gearboxes smaller than ZF 2000 series and workboat ZF W2700 series.
Typical hull forms:	Semi-displacement and displacement
Typical applications:	Charter and commercial craft (example: crew boats and fast ferries), and naval and police activities.
CONTINUOUS DUTY DEFINITION	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, tugs, fishing boats.

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.

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 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 continuous 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.

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.