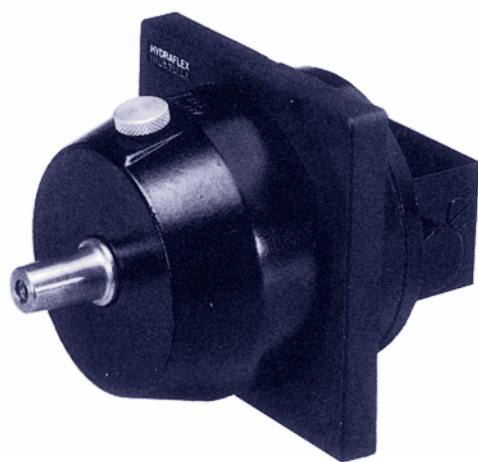


# Steering systems, rudders and stocks



## Hydraulic steering

### The Helm Pump

Smooth operating, high efficiency axial piston pumps provide the 'Power' to the steering cylinder when the steering wheel is turned. They are matched to cylinder size to give suitable number of wheel turns according to the rudder torque. The helm pumps are combined with a back mounted or separate lockvalve which 'blocks' rudder feedback and isolates each pump in a multiple station. The system is filled simply by pouring the recommended oil into the helm pump filler - no external pressurisation is required.

Any number of steering stations may be used in a single system. Each helm pump operates independently without station transfer and each has full control of rudder. Wheels not in use do not turn.

Optional power steering and autopilot pump sets are connected in the same manner as additional stations.

### The Steering Cylinder

Cylinders are double acting, fully balanced, to give an equal number of turns of the wheel in each direction. Suitable end fittings are provided, according to application, but usually a ball joint on the end of the rod, and a swivel base on the cylinder. 32mm cylinders have aluminium bodies and larger cylinders all have brass bodies. Compression fittings and nylon piping complete the kits.



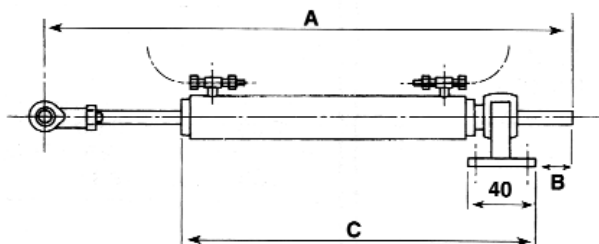
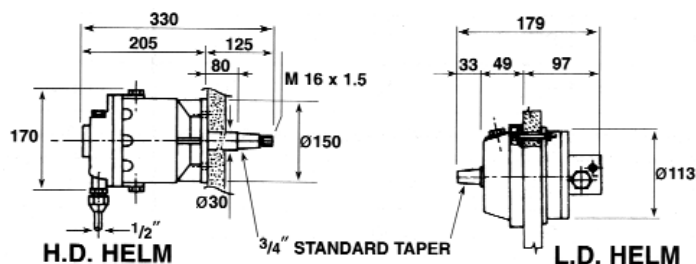
### General characteristics

Lock valve at each steering station  
High overall efficiency  
All components repairable  
Ideal for multi stations and autopilot  
No pressurisation required  
Suitable for most boats 4m to 20m

Special attachments available for Sternpower 80, Mercruiser, Autopilot and through tube outboards

### Dimensions (mm) and Torque (Kg-Met)

Cylinder	32 x 178	40 x 178	40 x 222	50 x 178	50 x 222
A	566	612	713	629	729
B (Max)	151	175	225	163	207
C	348	366	416	396	466
Max Torque	80	121	155	205	263



### Lancing Marine standard rudder dimensions (cms)

A cm	B cm	C cm	SD ins	SL cm	MAX kts @ 30°
8	20	30	1	20	25
10	25	38	1	25	18
10	25	38	1 1/4	23	25
12	30	46	1 1/4	23	18
12	30	46	1 1/2	25	25
15	38	56	1 1/2	25	18
15	38	56	1 3/4	28	27
15	38	56	2	30	28

Rudder torque must be carefully calculated as follows:-

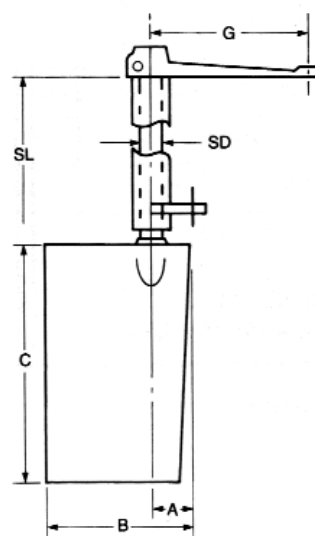
$$\text{Torque forward (Kg-Met)} = \frac{(0.37B-A) C.B. V_f^2}{71460}$$

$$\text{Torque astern (Kg-Met)} = \frac{(0.63B-A) C.B. V_r^2}{71460}$$

A = Balance length, cms  
B = Total length, cms  
C = Rudder height, cms  
V<sub>f</sub> = Max. forward speed, knots  
V<sub>r</sub> = Max. astern speed, knots

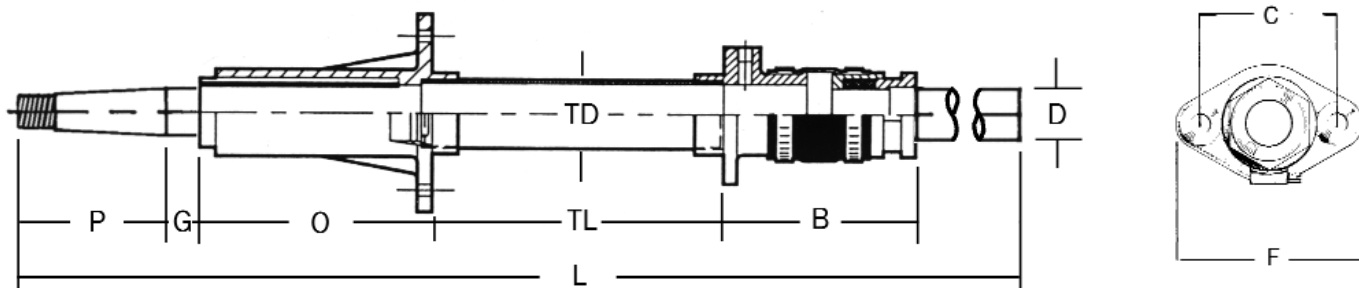
Detailed calculations can be done using the Lancing Marine Boatspeed and Propeller Program, available for PC operating systems.

### Rudder and tube assembly

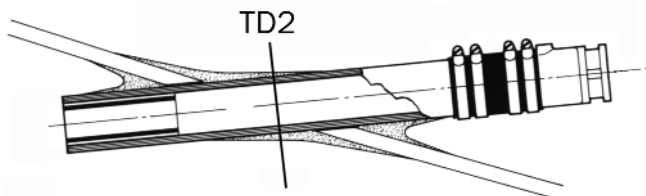


# Sterngear dimensions

## Bolt-in Sterntube installation



## Glass-in and weld-in Sterntube installation



## Dimensions

Shaft diameter	D ins	3/4"	1"	1 1/4"	1 1/2"	1 3/4"	2	2 1/4"	2 1/2"
Tube diameter **	TD/TD2	1 1/2"/1 1/2"	1 1/2"/1 3/4"	2"/2"	2 1/4"/2 1/4"	2 1/2"/2 5/8"	2 7/8"/3"	3"	3 1/2"
Shaft length	L	TO ORDER							
Tube length, min/max	TL cm	3/120	3/150	3/180	3/180	3/210	3/210	3/240	3/240
Seal length	B mm	DEPENDS ON TYPE OF SEAL USED (131 FOR DEEP SEA)							
Overhang length	O cm	8	10	13	15	18	20	23	25
Prop seat to Tip length	P mm	79	95	121	140	159	184	203	216
Rope-cutter gap	G mm	38	38	41	41	51	51	57	57
Flange size	F cm	10x5	13x6	14x8	14x9	16x9	17x9	18x10	23x15
Drilling centres*	C mm	79	102	111	114	133	140	149	178x57

\* Bolt-in style only

\*\* Other diameters available in G.R.P., aluminium and steel

For "Short Stand-Proud" Cutless Bearing Housings, dimensions "O" and "TL, min" are interchanged

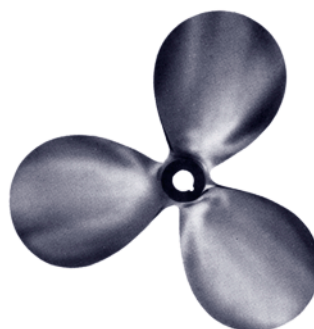
## Propellers

## Propeller styles

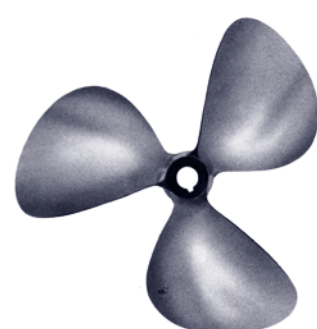
### Data required for propeller calculation and manufacture

- Hull shape (sail boat, round bilge, hard chine, etc.)
- Total laden weight (including crew, gear and stores)
- Maximum useable propeller diameter
- Waterline length
- Number of engines
- Maximum horsepower and R.P.M.
- Gearbox reduction ratio
- Shaft diameter
- Shaft taper (1 in 10, 12 or 16)
- Propeller boss length
- Keyway size

### Turbine, 50% B. A. R.



### Equipoise, 65% B. A. R.



## Deep sea seal applications

Size	Shaft diameters	Sterntube O/D	Std. Speed	HS	Insert required
2	25mm - 30mm 1" - 1 1/4"	35mm - 43mm	1800	2950	25mm, 1" - 1 1/8"
3	25mm - 30mm 1" - 1 1/4"	43mm - 51mm	1800	2950	25mm, 1" - 1 1/8"
4	30mm - 35mm 1 1/4" - 1 3/8"	43mm - 51mm	1740	2850	All sizes
5	30mm - 35mm 1 1/4" - 1 3/8"	51mm - 60mm	1740	2850	All sizes
6	35mm - 40mm 1 3/8" - 1 5/8"	51mm - 60mm	1670	2750	35mm, 1 3/8" - 1 1/2"
7	35mm - 40mm 1 3/8" - 1 5/8"	60mm - 70mm	1670	2750	35mm, 1 3/8" - 1 1/2"
10	40mm 1 5/8" - 1 3/4"	70mm - 80mm	1560	2600	All sizes
8	45mm 1 3/4" - 2"	70mm - 80mm	1560	2600	All sizes
9	50mm 2"	70mm - 80mm	1560	2600	None