

# 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. All helm have a 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 and 40mm cylinders have aluminium bodies and larger cylinders all have brass bodies. Compression fittings and nylon or metallic piping complete the kits.

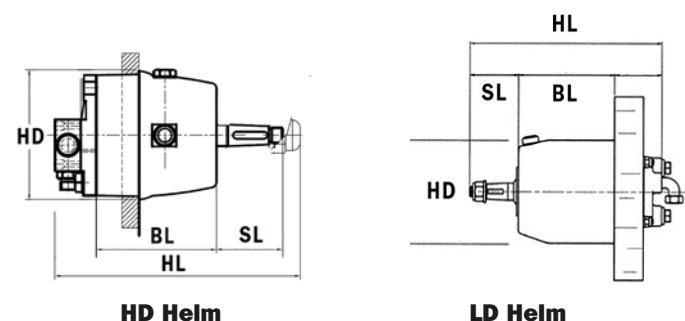


### Helm head dimensions

Helm, Cc/Rev	20	25 to 45	68
HL Total Length	228	215	314
BL Body Length	108.5	107	90
SL Shaft Length	62.5	55	97.5
HD Body Dia	127	115	142

### Cylinder dimensions (mm) and Torque (Kg-Met)

Cylinder, Bore X Stroke	32 X 178	40 X 178	40 X 222	50 X 230	50 X 300
Cc for Full Stroke	132	168	215	339	442
Max Torque Kg/Met	58	87	111	217	281
A Overall length	568	620	720	901	981
B Max sideways Projection	151	175	225	265	335
C Cylinder and mount length	348	366	416	500	570
D Base Width	60	60	60	90	90

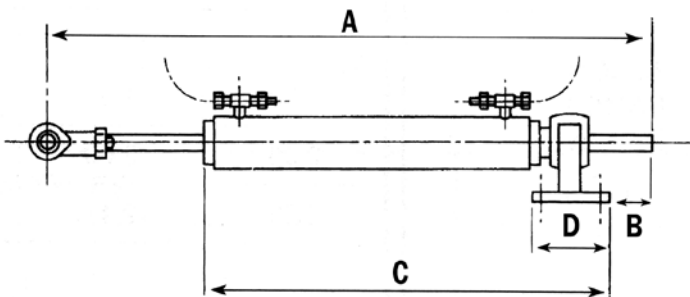


HD Helm

LD Helm

Lock valve at each steering station  
All components repairable  
No pressurisation required  
Special attachments available for Sternpower 80, Mercruiser, Autopilot and through tube outboards

High overall efficiency  
Ideal for multi stations and autopilot  
Suitable for most boats 4m to 20m



### 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	1¼	23	25
12	30	46	1¼	23	18
12	30	46	1½	25	25
15	38	56	1½	25	18
15	38	56	1¾	28	27
15	38	56	2	30	28

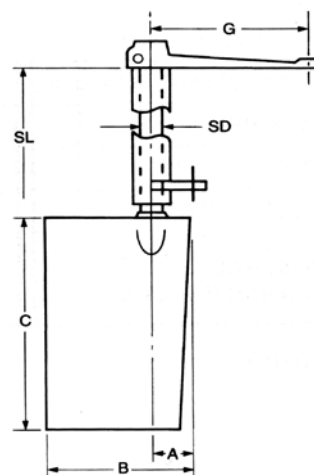
Rudder torque must be carefully calculated as follows:-

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

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

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

### Rudder and tube assembly



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