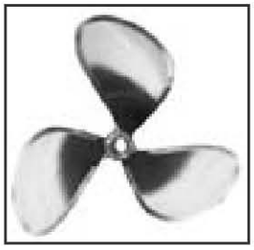
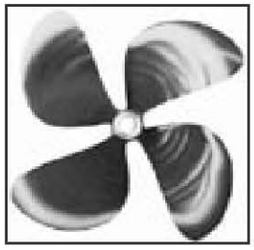
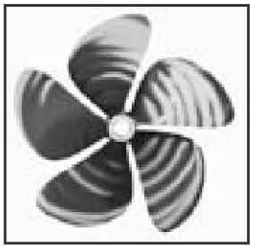
Fixed Pitch Propeller Specifications TD08







Propeller Repair Facilities.
The Company maintains full propeller repair facilities, using TIG and MIG welding and highly accurate repitching methods and standard practices. Recognising that a quick turnaround is vital for our clients, we can normally respond within a 24 or 36 hour timescale. Pitch checking ensures that the vessels' speed requirements are maintained.

Introduction to Propellers
All Clements' high performance propellers are manufactured from high integrity castings and a full range of designs are available with a three, four or five blade configuration suitable for all types of semi and deep V planing hulls. Sizes range up to 1.2 metres in diameter, in accordance with ISO standard 484/2 and, if required, to meet the demands of classification society inspection.

Our unique *Hyperform* blade propellers are acknowledged as having the ability to provide optimum speed and acceleration under vibration-free operation for all hull designs lifting the hull up on to the plane in the shortest possible time.

The careful analysis and design of propellers for an individual hull is essential, requiring close liaison between Clements Marine and the customer. This is particularly important, for example, for a new boat which is designed for series production with several engine options and alternative gearbox reduction ratios. Only by strict attention to detail can the customer expect maximum efficiency in terms of ultimate speed and smoothness from the propeller design.

All propellers are cast from pure ingot using specialised mould design, and certification can be supplied on request detailing full mechanical characteristics and chemical composition. Castings are normally made from EN1982,CB333G 'AB2' nickel aluminium bronze, but EN1982CB765S 'HTB1' high tensile brass is often used for certain commercial and leisure applications. All propellers are precision balanced to ensure maximum smoothness and can be finished to ISO Classification. Our range of three, four and five bladed high performance propellers are based upon blade area ratios designed to suit individual hull application

The Company also manufactures ranges of standard propellers for displacement leisure and commercial craft, and we design custom propellers for 'special service' commercial vessels.

If alterations have been made to engine output or gearbox reduction ratios, the required pitch alterations can be made following the repair process. Repaired propellers are then carefully balanced and finally inspected before despatch to ensure vibration free operation.

Design and Quality Control
Our design department will always help with difficult propeller applications, particularly with the choice of optimum gearbox reduction ratio(s) and the most efficient propeller design, so that the hull achieves its optimum performance potential.

Design Criteria
When designing a propeller, its performance is not totally dictated by its own geometry, but is also dependant upon hydrodynamic considerations which must be taken into account to produce the most efficient shape for its intended application.

Propeller Blade Designs can therefore be divided into three categories: subcavitating, transcavitating and super-cavitating.

For fully planing and semi-displacement hull forms with speeds up to around 35 knots, subcavitating propellers are normally used. This conventional blade form has an aerofoil section (Ogival) using a flat blade face and curved back face.(continued pto)

Trans-cavitating propellers produce thrust with the blade face whilst the back remains in total cavitation. This type of propeller also offers good propulsion efficiency at intermediate speeds.

For ultra high performance boat installations, supercavitating propellers should be fitted. The latest developments in supercavitating propeller technology have resulted in these designs being available for certain high performance applications where physical restriction and PRM are constricting factors.

Propeller Installation Considerations

Please use TD Sheet 12 and 13 to submit your boat data for anlysis and quotation, and refer to the drawing opposite in discussion with our technical staff.

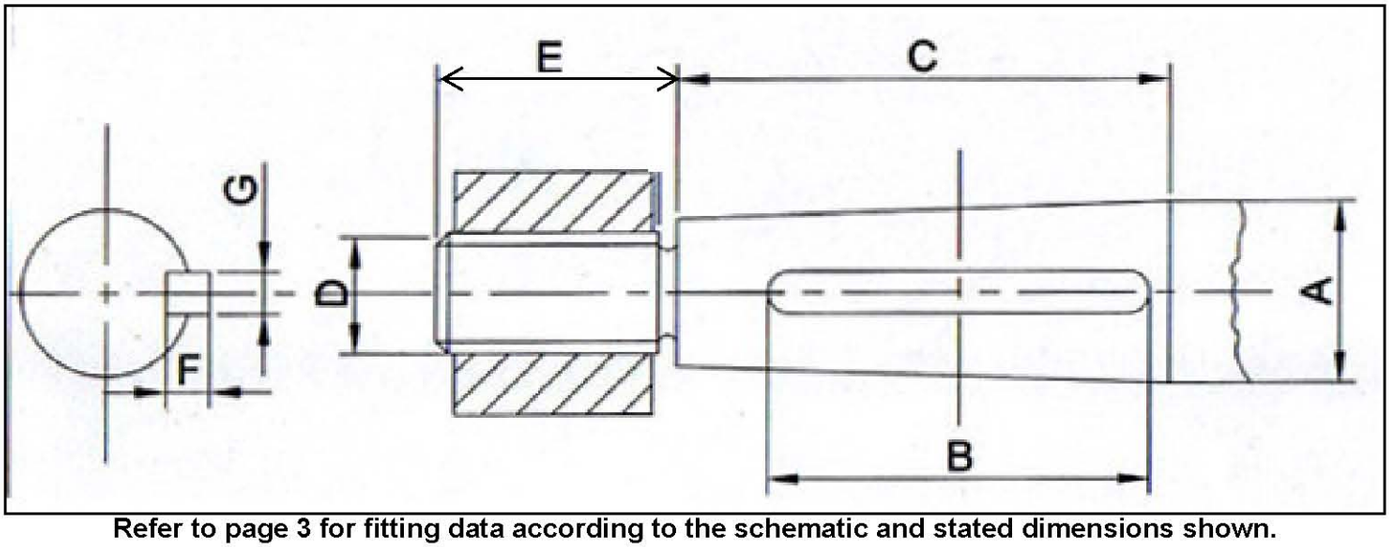
propeller tip clearance
A general guide is that there should be a tip clearance of at least 15% of the propeller diameter between the blade tips and the hull.

This clearance should normally not be less than 2" (50mm) on any hull, and as smaller propellers mean less efficiency most installations are a compromise between maximising propeller diameter and minimising the risk of vibration and noise caused by inadequate tip clearances and poor water flow to the propeller

propeller to rudder clearance
It is important that adequate clearance is maintained between rudder and propeller, and the general rule is that a minimum of 15% of the propeller diameter is usually considered adequate for this dimension.

propeller support bearing
The maximum exposed propeller shaft between inboard face of propeller boss and aft end of shaft bearing should be not greater than 1.5 x shaft diameter.

propeller to shaft relationship
It is recommended that the maximum propeller diameter should not be greater than 15 x shaft diameter.



Refer to page 3 for fitting data according to the schematic and stated dimensions shown.

Fixed Pitch Propeller Specifications

METRIC 1:16 ISO 8845 Propeller & Shaft Taper Ends							
a	b	c	d		e	f	g
Shaft Dia.	Boss Length	Shaft End Taper	Thread Dia.	Thread	Length of Thread	Key Width	Key Height
20	59	54	14	1.5	25	6	6
25	73	68	16	1.5	25	8	7
30	89	84	20	1.5	30	8	7
35	104	99	24	2	35	10	8
40	119	114	24	2	35	12	8
45	134	129	30	2	40	14	9
50	149	144	36	3	45	14	9
55	164	159	36	3	45	16	10
60	182	177	42	3	55	18	11
65	190	185	42	3	55	18	11
70	205	200	48	3	60	20	12
75	220	215	48	3	60	20	12
80	235	230	56	4	70	22	14
85	250	245	56	4	70	22	14
90	265	260	64	4	75	25	14
95	280	275	64	4	75	25	14
100	295	290	72	4	85	28	16

METRIC 1:10 ISO 4566 Propeller & Shaft Taper Ends							
a	b	c	d		e	f	g
Shaft Dia.	Boss Length	Shaft End Taper	Thread Dia.	Thread	Length of Thread	Key Width	Key Height
20	50	45	14	1.5	25	6	6
25	60	55	16	1.5	25	6	6
30	80	75	20	1.5	30	8	7
35	90	85	24	2	35	10	8
40	100	95	24	2	35	12	8
45	110	105	30	2	40	14	9
50	120	115	36	3	45	14	9
55	130	120	36	3	45	16	10
60	140	130	42	3	55	18	11
65	150	140	42	3	55	18	11
70	160	150	48	3	60	20	12
75	170	165	48	3	60	20	12
80	180	175	56	4	70	22	14
85	190	185	56	4	70	22	14
90	200	190	64	4	75	25	14
95	210	200	64	4	75	25	14
100	220	215	72	4	85	28	16

Imperial 1:12 Propeller & Shaft Taper Ends							
a	b	c	d		e	f	g
Shaft Dia.	Boss Length	Shaft End Taper	Thread Dia.	Thread	Length of Thread	Key Width	Key Height
1	2.1/8	1.7/8	5/8	BSW	1.5/16	1/4	1/4
1.1/4	3.1/8	3	3/4	BSW	1.3/8	5/16	5/16
1.1/2	3.1/2	3.3/8	1	BSF	1.5/8	3/8	1/4
1.3/4	4.3/8	4.3/16	1.1/4	BSF	1.3/4	7/16	5/16
2	5	4.3/4	1.1/4	BSF	1.3/4	1/2	5/16
2.1/4	5.1/4	5	1.1/2	BSF	1.3/4	5/8	7/16
2.1/2	6	5.3/4	1.3/4	BSF	2.1/4	5/8	7/16
2.3/4	6.1/2	6.1/4	1.3/4	BSF	2.3/8	3/4	1/2
3	6.3/4	6.1/2	2	BSF	2.3/4	3/4	1/2
3.1/4	7.1/4	7	2	BSF	2.3/4	7/8	5/8
3.1/2	7.3/4	7.1/2	2	BSF	2.3/4	7/8	5/8
3.3/4	8.1/4	8	2.1/4	BSF	3	1	3/4
4	8.3/4	8.1/2	2.1/4	BSF	3	1	3/4

Imperial 1:16 Prop & Shaft Taper Ends							
a	b	c	d		e	f	g
Shaft Dia.	Boss Length	Shaft End Taper	Thread Dia.	Thread	Length of Thread	Key Width	Key Height
1	3	2.3/4	5/8	BSW	1.5/16	1/4	1/4
1.1/4	3.3/4	3.1/2	3/4	BSW	1.3/8	5/16	5/16
1.1/2	4.1/2	4.1/4	1	BSF	1.5/8	3/8	1/4
1.3/4	5.1/4	5	1.1/4	BSF	1.3/4	7/16	5/16
2	6	5.3/4	1.1/4	BSF	1.3/4	1/2	5/16
2.1/4	6.3/4	6.1/2	1.1/2	BSF	1.3/4	5/8	7/16
2.1/2	7.1/2	7.1/4	1.3/4	BSF	2.1/4	5/8	7/16
2.3/4	8.1/4	7.7/8	1.3/4	BSF	2.3/8	3/4	1/2
3	9	8.5/8	2	BSF	2.3/4	3/4	1/2
3.1/4	9.3/4	9.3/8	2	BSF	2.3/4	7/8	5/8
3.1/2	10.1/2	10.1/8	2	BSF	2.3/4	7/8	5/8
3.3/4	11.1/4	10.7/8	2.1/4	BSF	3	1	3/4
4	12	11.5/8	2.1/4	BSF	3	1	3/4

(Refer to schematic on page 2 for size references)