

The background of the entire page is a technical drawing of a variable pitch propeller. The drawing is a pencil sketch on a yellowish paper, showing various views of the propeller: a top view, a side view, and a detail view of a blade. The drawing includes numerous construction lines, circles, and straight lines, along with some handwritten notes and numbers (1, 2, 3, 4) indicating different parts or stages of the design. The propeller has a central hub and two blades. The blades are curved and have a variable pitch, meaning they can change their angle relative to the plane of rotation.

ELICHE A PASSO VARIABILE
Manuale d'uso e manutenzione
VARIABLE PITCH PROPELLERS
Use and maintenance handbook



J PROP

Variable pitch propeller

Congratulations on choosing the new **"JPROP"** propeller !
We are pleased to give you some general information and the technical instructions for its assembly, use and servicing.

- **"JPROP"** has been created by the twenty-years experience of Cober, a precision mechanical industry which has come famous in its field. Every detail is built with the best materials and processed on CNC working centre.
- Thanks to its vast range of sizes and to its innovative and patented technical solutions, **"JPROP"** can satisfy most of the requirements of its most exacting customers.

Designed to measure for the sailing world, **"JPROP"** has been made to be safe, simple and always efficient:

- it can be assembled as easily as a fixed-blade propeller;
 - its pitch can be regulated with simple actions without dismantling the propeller;
 - it avoids the accidental loss of the propeller thanks to simple and effective solutions;
 - the normal servicing just consists of applying some grease through the nipple provided;
 - the servicing of the propeller shaft has been made extremely easy: the **"JPROP"** propeller can be dismantled without extractor by exploiting the features of the fixing nut.
- Our technician choose the **"JPROP"** propeller suitable for your boat on the basis of the data communicated through your order.



MARINE PROPELLER s.r.l.

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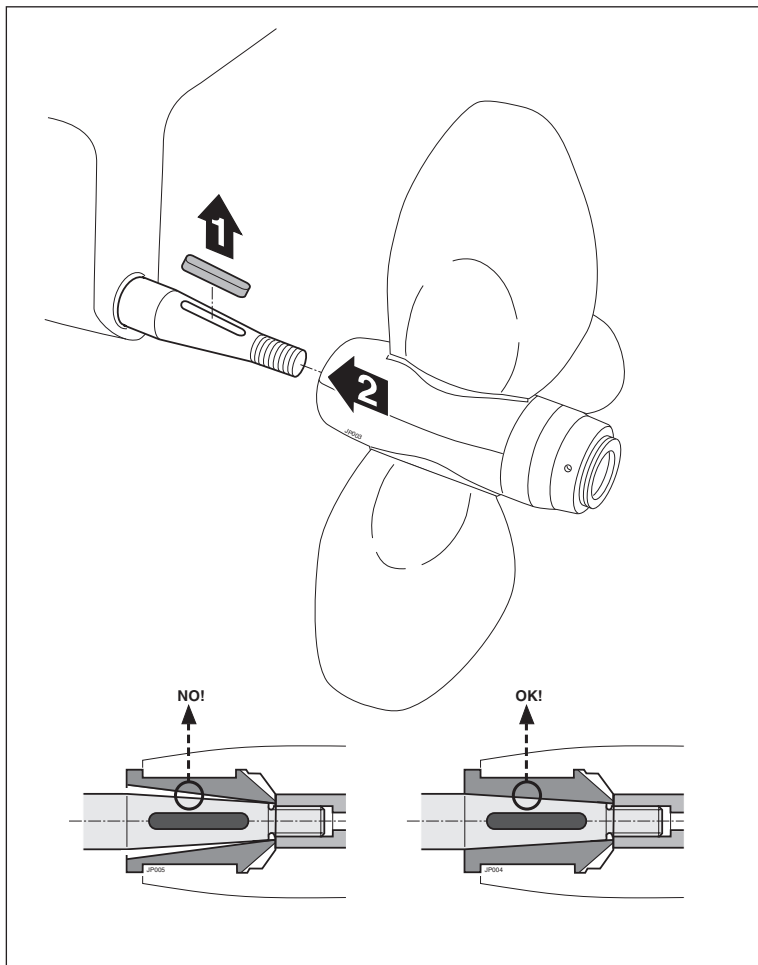
Warning

During propeller assembly and maintenance operations follow the rules of safety carefully, and in particular:

- 1 - make sure that the engine is OFF and that it cannot be started accidentally,**
- 2 - when handling the propeller do not put your hands on the hub on the points where the blades rotate.**

Section 1 - TAPER CHECK

It is very important to check that the propeller taper perfectly matches the taper of the boat's shaft. You can easily check this by removing the key before installing the propeller.

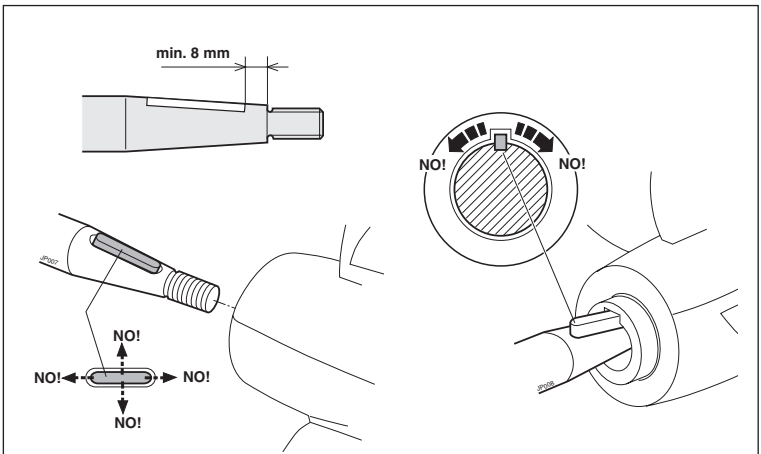
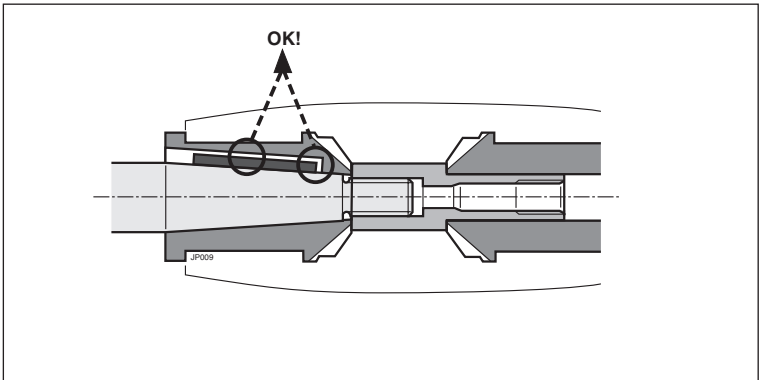


Section 2 - KEY CHECK

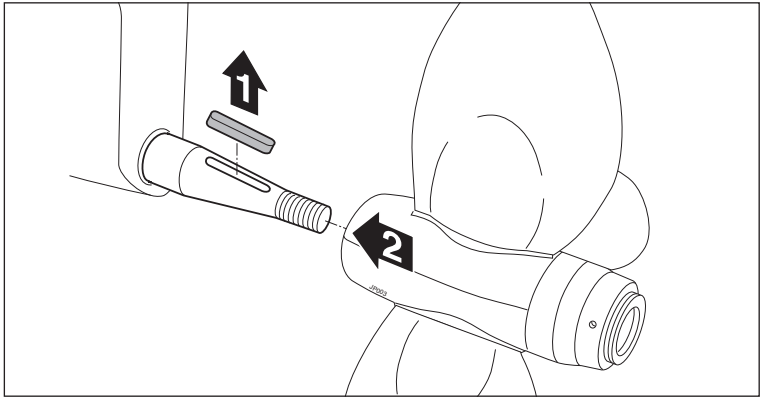
This check avoid serious damage to the propeller.

Make sure that the key:

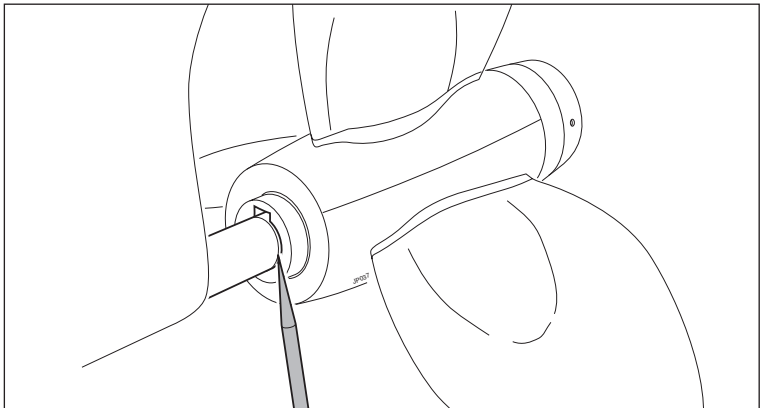
- 1 - is at least 8 mm (5/16") away from the aft side of cone;
- 2 - does not touch the upper or the aft side of keyway of the propeller ;
- 3 - does not have too much clearance in the keyway of the shaft or sideways in the keyway of the propeller.



Put the propeller on the shaft without the key.



1 - Screw on the main nut (see point 5.6)



2 - mark the front limit of the propeller on the shaft.

After final installation the propeller must reach the same mark.

Section 3 - THREADING'S LENGTH OF THE SHAFT

While tightening the retaining nut make sure that:

- 1 - it doesn't meet with a strong resistance
- 2 - the threading of the shaft doesn't bottom out in retaining nut
- 3 - the cones of the shaft and of the propeller match perfectly

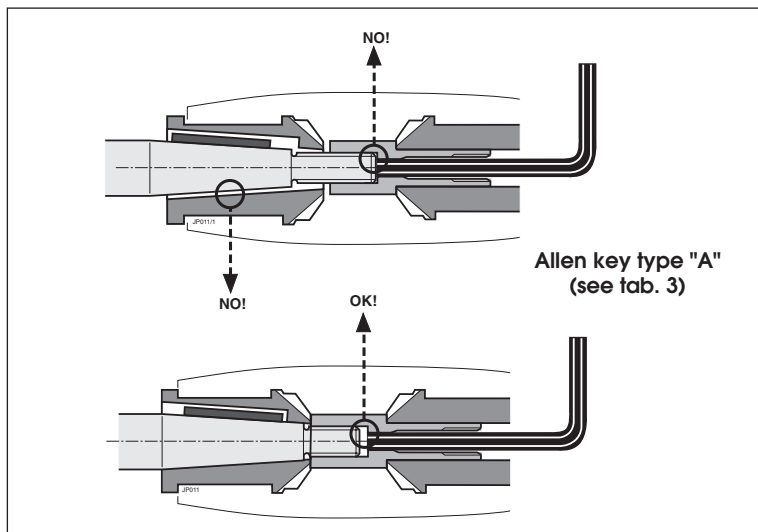


TABLE 1

The size of the thread of the shaft must be within the values listed below:

hub dia	min. th. lenght	max. th. lenght	max. dia thread
mm	mm (")	mm (")	mm
63	18 (3/4)	25 (1)	20,00
83	20 (1)	27 (11/16)	24,00
93	25 (1)	35 (13/8)	31,75
116	35 (13/8)	45 (x/x)	40,00

Section 4 - TIGHTENING THE LOCK NUT

For a good working of the lock nut system it is necessary to take some precautions. While tightening the lock nut make sure that it turns:

- 1 - not less than the minimum figure listed in the table
- 2 - not more than the maximum figure listed in the table

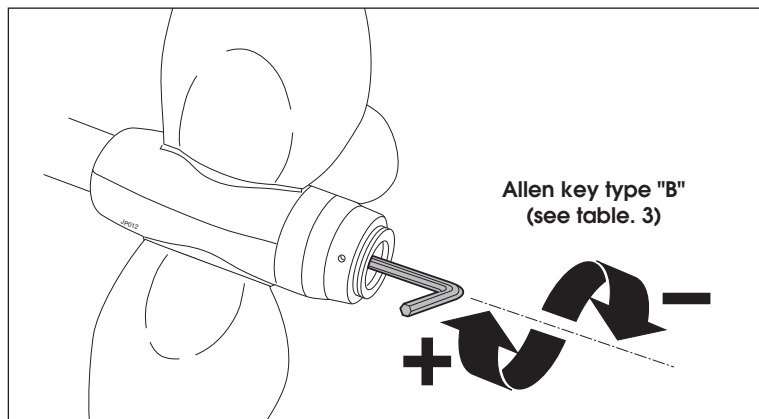


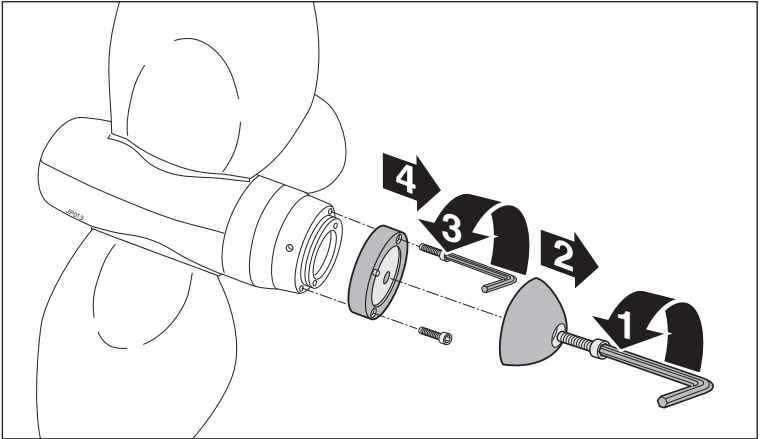
Table 2

The next table lists the min. and max. number of turns depending on the threading.

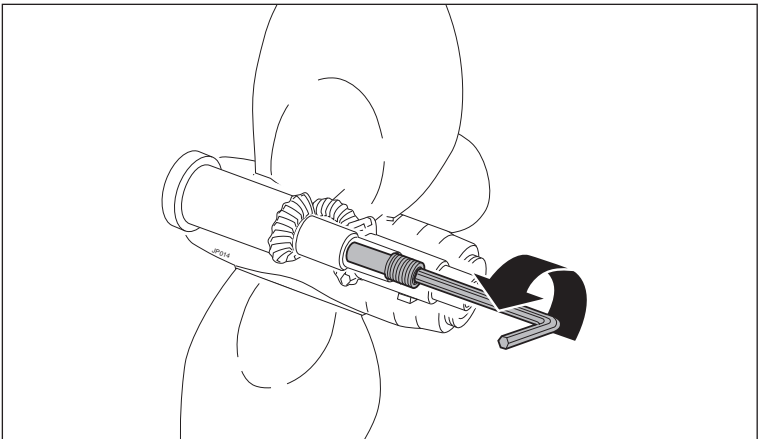
hub dia	thread	minimum	maximum
mm	dia - pitch	N. of turns	N. of turns
63	16 x 1,5	6	15
83	16 x 1,5	6	15
93	18 x 1,5	7	18
116	24 x 2,0	7	18

Section 5 - INSTALLING THE PROPELLER ON THE SHAFT

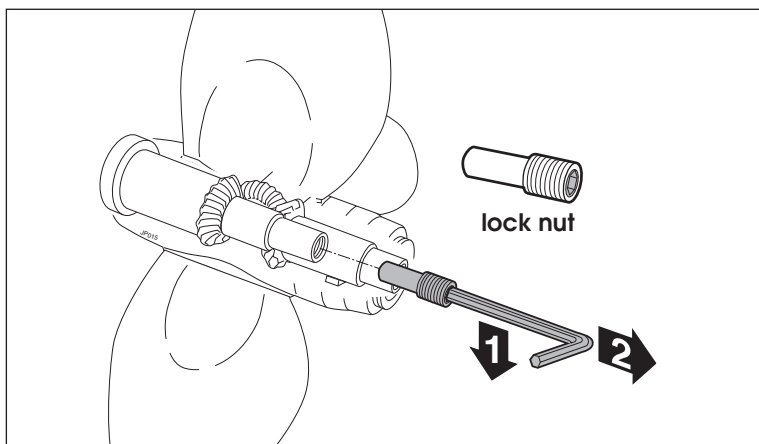
To install the propeller on the shaft proceed as follows:



1 - remove the zinc anode with the Allen key type "B" and the bronze ring with the Allen key type "C" (see table 3 of section 6).

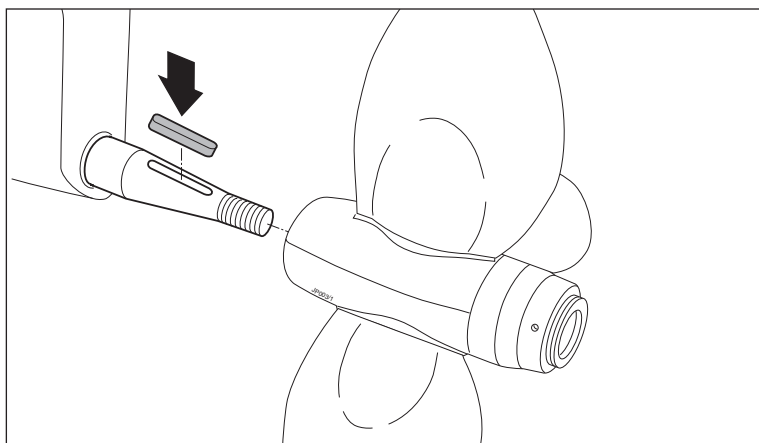


2 - insert the Allen key type «B» in the lock nut and turn it counter-clockwise until it's completely free.

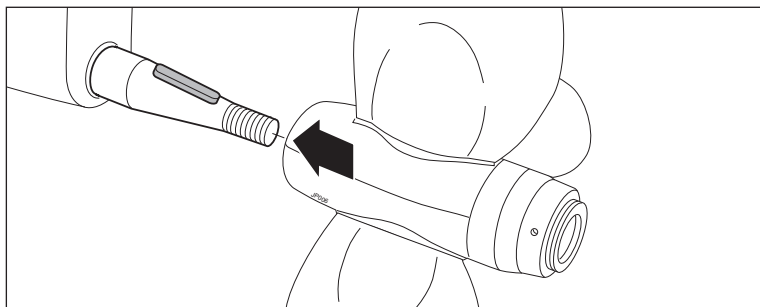


3 - pull down the Allen key and pull out the lock nut.

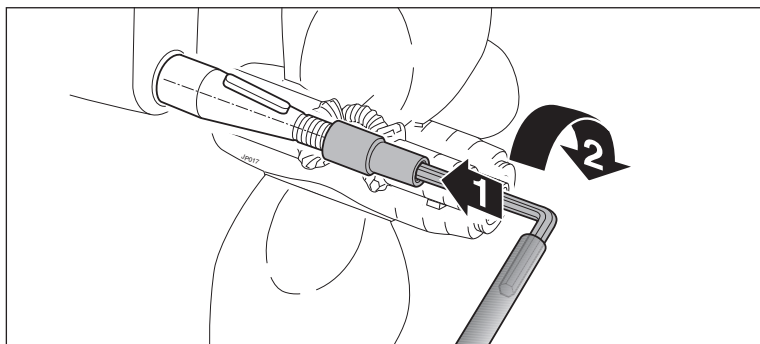
4 - check the cone, the key and the thread as suggested in section 1 - 2 - 3



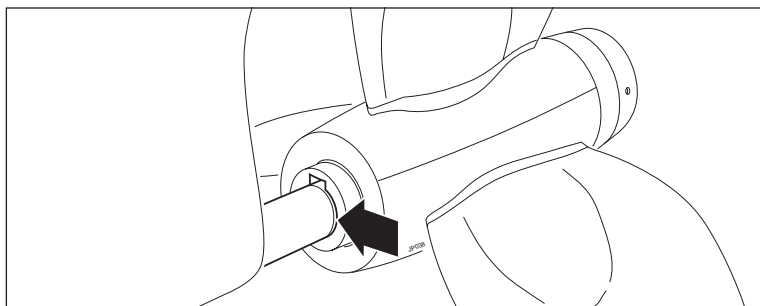
5 - insert the key on the shaft



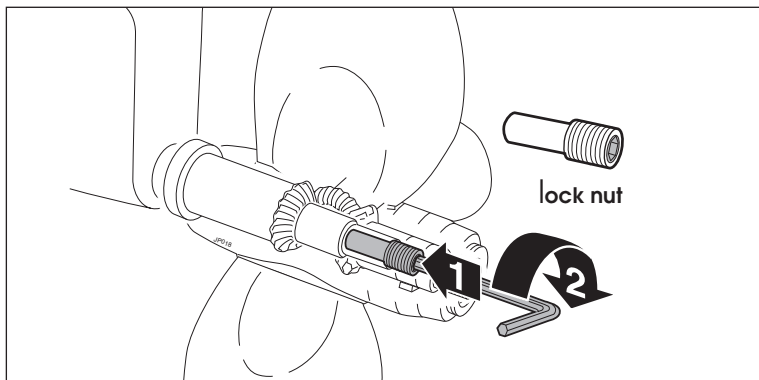
6 - put the propeller on a shaft.
(We advise to use locktite on a thread)



7 - tighten the retaining nut with the Allen key type "C" and with the help of a metal tube 30/40 cm (12/16") long.

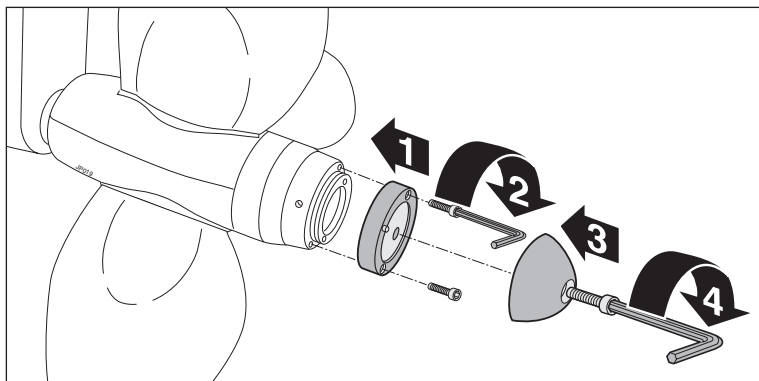


8 - check that the propeller reaches the same position on the shaft as marked before (see section 1).



9 - tighten the lock nut with Allen key type "B" **checking the values listed in table 2.**

10 - adjust, if necessary, the pitch of the propeller.
(see section 7)

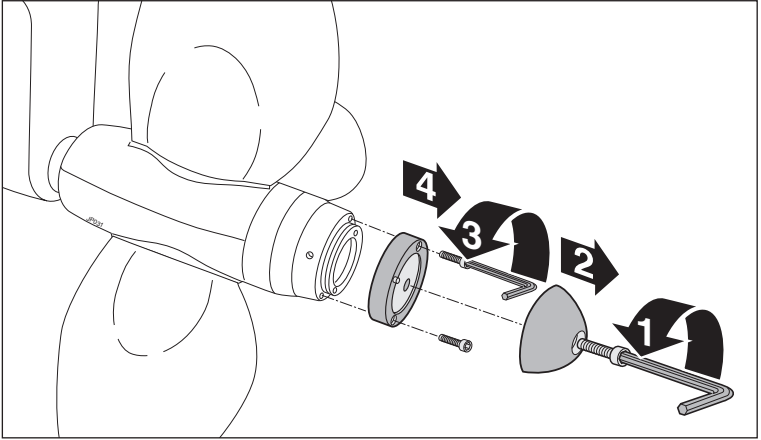


11 - install on the propeller the bronze ring (Allen key type "C") and the zinc anode (Allen key type "B").

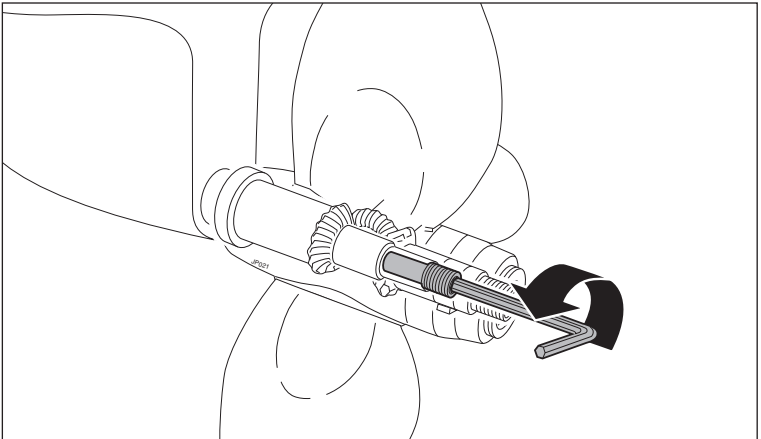
Fixing the anode on the propeller is the last step of the installation. The anode is necessary to protect the propeller from damage due to electrolytic corrosion. A regular check and replacement of the anode helps to maintain the propeller in the best possible shape.

Section 6 - REMOVING THE PROPELLER FROM SHAFT

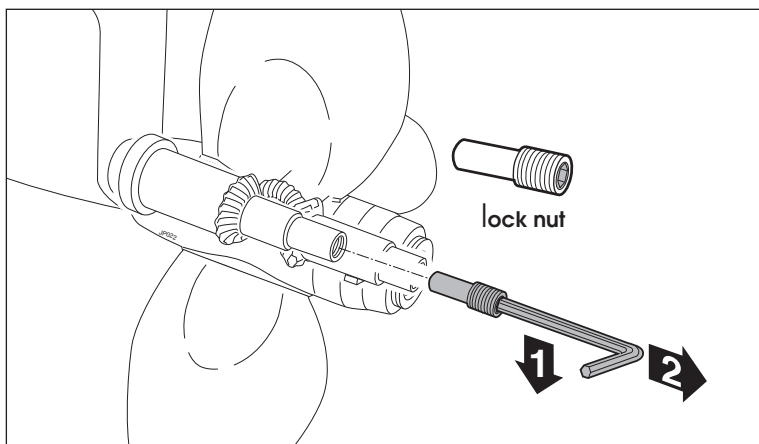
Proceed as follow in order to remove the propeller from the shaft:



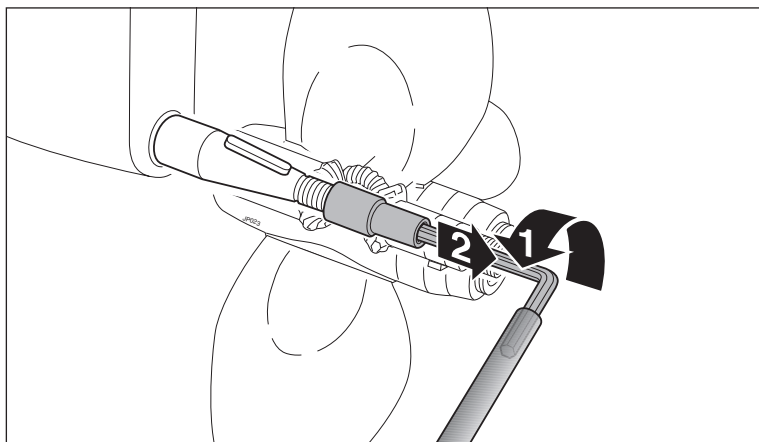
1 - remove the anode (Allen key type "B", table 3) and the bronze ring (Allen key type "C").



2 - insert the Allen key type "B" in the lock nut and turn it counter-clockwise until it's completely free.



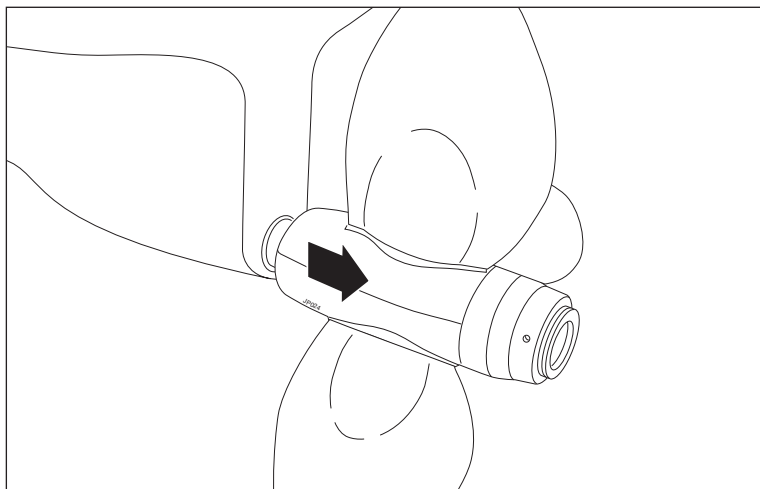
3 - pull down the Allen key and pull out the lock nut.



4 - insert the Allen key type A in the retaining nut and turn it counter-clockwise with the help of a metal tube 30/40 cm (12/16") long.

After the first movement you'll feel an increased opposition due to the extractor job of the nut.

Keep on unscrewing it till the propeller is detached from the cone of the shaft.



5 - when the retaining nut is loose remove the propeller from the shaft

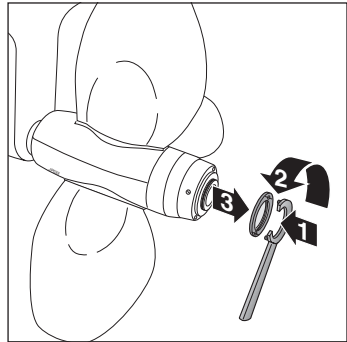
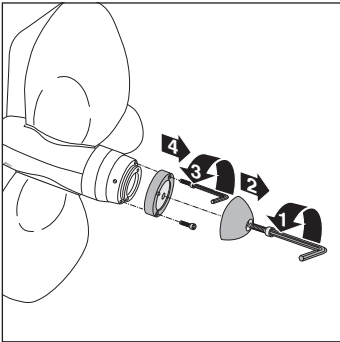
Table 3

Allen keys to be used when installing or removing a propeller:

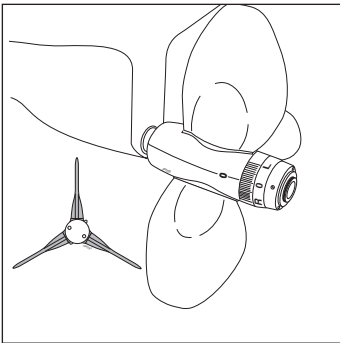
hub dia	key "A"	key "B"	key "C"	key "D"
mm	mm	mm	mm	mm
63	12	6	3	3
83	12	6	3	3
93	14	8	4	3
116	19	10	4	3

Section 7 - PITCH ADJUSTMENT

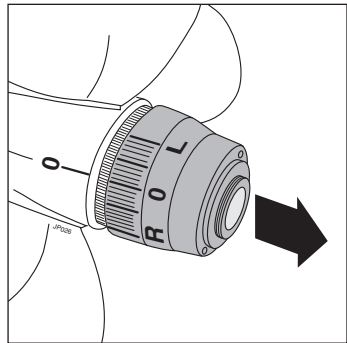
It's possible to adjust the pitch anytime following these procedure:



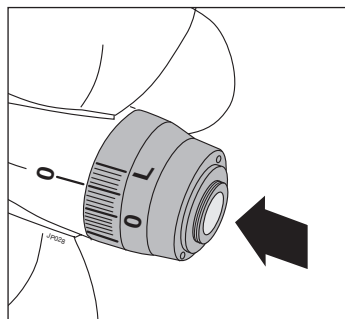
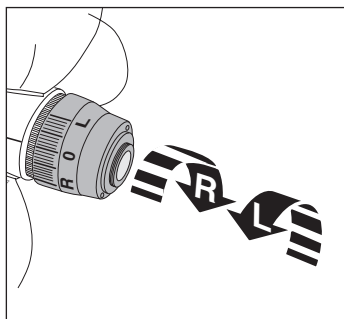
- 1 - pull the cone of the propeller backward (the 4 projecting balls help the holding of the hand) If the ogival nose doesn't move enough to be free to turn follow the next steps. If it moves go to step 4.
- 2 - remove the zinc anode and the bronze ring (Allen keys "B" and "C", see Section 6, table 3)
- 3 - remove the bronze "pitch lock" flange .



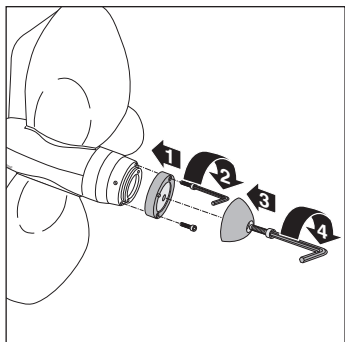
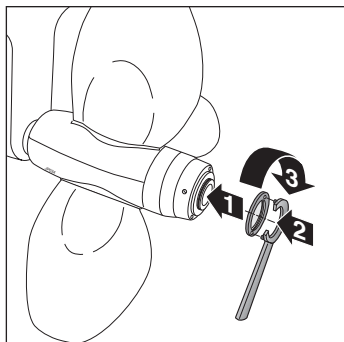
- 4 - put the propeller's blade in feathering position.



- 5 - pull the ogival nose.



- 6 - turn the ogival nose towards the "R" or "L" side depending on the type of the engine (rightway or leftway) and reach the notch of the desired pitch.
- 7 - release the ogival nose.
- 8 - make sure that the reference line "0" matches the desired notch.
- 9 - make sure that the ogival nose backs itself firmly against the props body.



- 10 - If you are sure that you reached the right pitch, reinstall the bronze "pitch lock" flange in order to lock the ogival nose, but if you plan to modify it again while the boat is in the water, do not install it now.
- 11 - put on the bronze ring and the zinc anode.

Attention : when the boat is out of the water the movement of the ogival nose is easy. When the boat is in the water it takes more time to pull the ogival nose as water has to fill the void created by the action. Drains are built into the ogival nose to allow flooding of the void.

Calculation of the slip:

The following tables give the theoretical value of the pitch.

To obtain the real value multiply the datum being examined by a reduction factor of 0.55.

E.g.: propeller body 63, Ø 16", adjusted to the 10th step.

*Theoretical pitch *24.655"/rot.*

Real pitch: 24.655 x 0.55 = 13.560 "/rot.

Hub dia 63 mm pitch (inches p. r.)

Notch N.	Propeller dia					
	13"	14"	15"	16"	17"	18"
1	1,863	2,007	2,150	2,293	2,437	2,580
2	3,735	4,022	4,309	4,597	4,884	5,171
3	5,622	6,054	6,487	6,919	7,352	7,784
4	7,533	8,112	8,692	9,271	9,851	10,430
5	9,476	10,205	10,934	11,663	12,392	13,121
6	11,462	12,343	13,225	14,107	14,988	15,870
7	13,498	14,537	15,575	16,613	17,652	18,690
8	15,597	16,797	17,997	19,197	20,397	21,596
9	17,771	19,138	20,505	21,872	23,239	24,606
10	20,032	21,573	23,114	*24,655	26,196	27,737
11	22,397	24,120	25,843	27,566	29,289	31,012
12	24,884	26,798	28,712	30,626	32,541	34,455
13	27,512	29,626	31,745	33,862	35,978	38,095
14	30,308	32,640	34,971	37,302	39,634	41,965
15	33,300	35,861	38,423	40,984	43,546	46,107
16	36,522	39,332	42,141	44,951	47,760	50,570

Calculation of the slip:

The following tables give the theoretical value of the pitch.
To obtain the real value multiply the datum being examined by
a reduction factor of 0.55.

E.g.: *propeller body 83, Ø 19", adjusted to the 10th step.*
*Theoretical pitch *25.926 "/rot.*
Real pitch: 25.926 x 0.55 = 14.259 "/rot.

Hub dia 83 mm pitch (inches p. r.)

Propeller dia

Notch N.	Propeller dia						
	16"	17"	18"	19"	20"	21"	22"
1	2,060	2,189	2,318	2,447	2,576	2,704	2,833
2	4,128	4,386	4,644	4,902	5,160	5,418	5,676
3	6,210	6,598	6,986	7,374	7,762	8,151	8,539
4	8,313	8,832	9,352	9,872	10,391	10,911	11,430
5	10,444	11,097	12,403	11,663	13,056	13,709	14,361
6	12,613	13,401	14,198	14,978	15,766	16,554	17,343
7	14,826	15,753	16,679	17,606	18,533	19,459	20,386
8	17,094	18,162	19,231	20,299	21,376	22,436	23,504
9	19,425	20,640	21,854	23,068	24,282	25,496	26,710
10	21,832	23,197	24,561	25,926	27,290	28,655	30,019
11	24,326	25,847	27,367	28,888	30,408	31,928	33,449
12	26,921	28,604	30,287	31,969	33,652	35,334	37,017
13	29,633	31,485	33,337	35,189	37,041	38,893	40,745
14	32,479	34,509	36,539	38,569	40,599	42,629	44,659
15	35,480	37,697	39,915	42,132	44,350	46,567	48,785
16	38,659	41,076	43,942	45,908	48,324	50,741	53,157

Calculation of the slip:

The following tables give the theoretical value of the pitch.
To obtain the real value multiply the datum being examined by a reduction factor of 0.55.

E.g.: *propeller body 93, Ø 24", adjusted to the 10th step.*
*Theoretical pitch *28.254 "/rot.*
Real pitch: 28.254 x 0.55 = 15.539 "/rot.

Hub dia 93 mm pitch (inches p. r.)

Notch N.	Propeller dia						
	21"	22"	23"	24"	25"	26"	27"
1	2,366	2,479	2,591	2,704	2,817	2,929	3,042
2	4,738	4,964	5,190	5,415	5,641	5,867	6,092
3	7,123	7,462	7,802	8,141	8,480	8,819	9,159
4	9,527	9,980	10,434	10,888	11,341	11,795	12,249
5	11,955	12,524	13,094	13,663	14,232	14,801	15,371
6	14,415	15,102	15,788	16,474	17,161	17,847	18,534
7	16,914	17,720	18,525	19,330	20,136	20,914	21,747
8	19,459	20,386	21,313	22,239	23,166	24,093	25,019
9	22,059	23,110	24,160	25,211	26,261	27,312	28,362
10	24,722	25,900	27,077	28,254	29,413	30,609	31,786
11	27,458	28,765	30,073	31,380	32,688	33,996	35,303
12	30,276	31,718	33,160	34,602	36,043	37,485	38,927
13	33,189	34,770	36,350	37,930	39,511	41,091	42,672
14	36,209	37,933	39,657	41,383	43,106	44,830	46,555
15	39,350	41,224	43,098	44,972	46,845	48,719	50,593
16	42,629	44,659	46,689	48,719	50,748	52,778	54,80

Calculation of the slip:

The following tables give the theoretical value of the pitch.
To obtain the real value multiply the datum being examined by a reduction factor of 0.55.

E.g.: *propeller body 116, Ø 28", adjusted to the 10th step.*
*Theoretical pitch *28.024 "/rot.*
Real pitch: 28.024 x 0.55 = 15.413 "/rot.

Hub dia 116 mm pitch (inches p. r.)

Notch N.	Propeller diameter					
	24"	25"	26"	27"	28"	29"
1	2,326	2,423	2,520	2,616	2,713	2,810
2	4,656	4,850	5,044	5,238	5,432	5,626
3	6,996	7,287	7,579	7,870	8,162	8,453
4	9,349	9,738	10,128	10,517	10,907	11,297
5	11,720	12,208	12,696	13,185	13,673	14,162
6	14,114	14,702	15,290	15,878	16,466	17,054
7	16,535	17,224	17,913	18,602	19,291	19,980
8	18,990	19,781	20,573	21,364	22,155	22,946
9	21,483	22,378	23,273	24,169	25,064	25,959
10	24,021	25,021	26,022	27,023	28,024	29,025
11	26,608	27,717	28,826	29,934	31,043	32,152
12	29,253	30,472	31,691	32,910	34,129	35,347
13	31,962	33,294	34,625	35,957	37,289	38,621
14	34,742	36,190	37,638	39,085	40,533	41,981
15	37,063	39,170	40,737	42,304	43,870	45,437
16	40,553	42,243	43,933	45,623	47,312	49,002

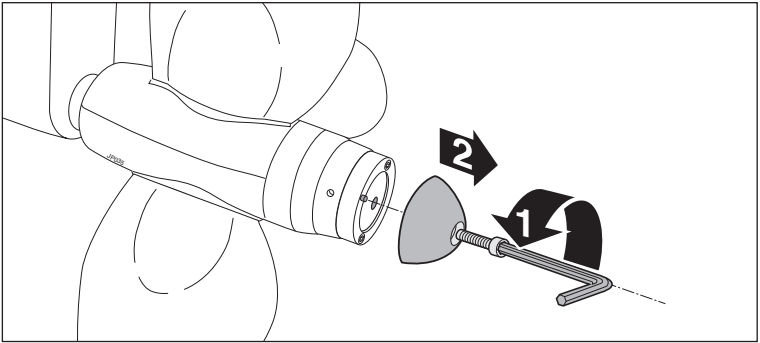
	30"	31"	32"
	2,907	3,004	3,101
	5,821	6,015	6,209
	8,745	9,036	9,328
	11,686	12,076	12,465
	14,065	15,138	15,627
	17,642	18,230	18,818
	20,669	21,358	22,047
	23,738	24,529	25,320
	26,854	27,749	28,644
	30,026	31,027	32,028
	33,260	34,369	35,478
	36,566	37,785	39,004
	39,952	41,284	42,616
	43,428	44,876	46,323
	47,004	48,571	50,138
	50,692	52,382	54,071

Section 8 - MAINTENANCE

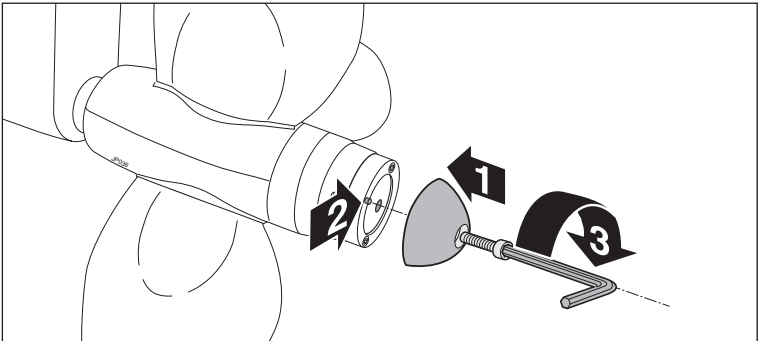
The "**JPROP**" propeller needs very little maintenance. Periodic maintenance, as described below, however will help you achieve best performance, both in efficiency as well as durability.

Regular maintenance

Periodically replace the zinc anode in order to avoid damage due to corrosion.

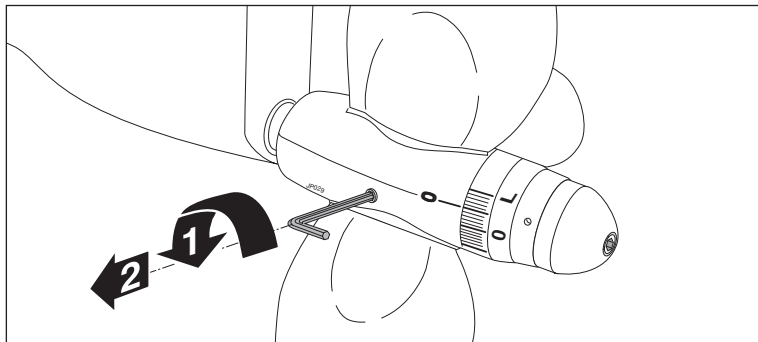


1 - Remove the old anode (Allen key type "B" - table 3).

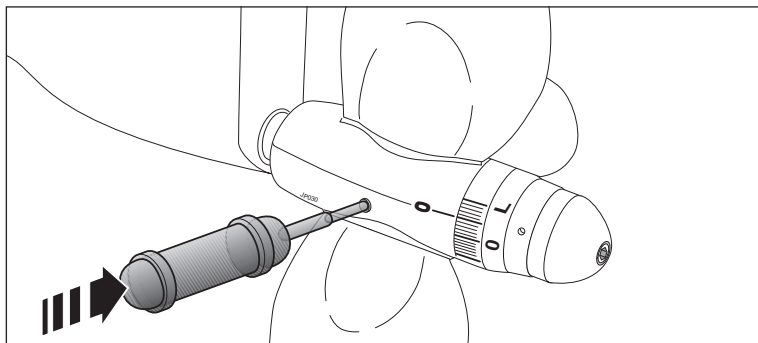


2 - install the new anode taking care that the projection on the anode fits the cavity in the bronze ring.

Greasing



1 - unscrew the Allen screw under the red point (Allen key type "D", table 3, section 6).



- 2 - fill the propeller hub with marine grease (grease suggested: Polimar 400) using the grease gun.
3 - replace the Allen screw in the propeller and seal with silicon sealer.

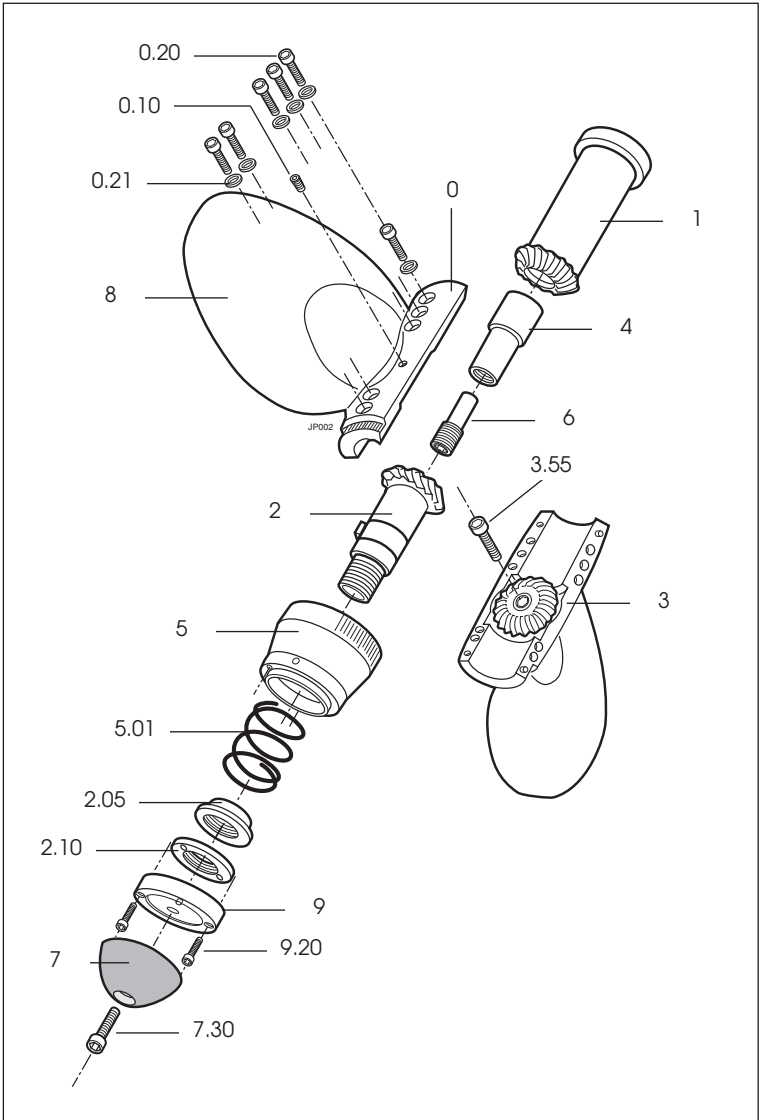
EXTRAORDINARY MAINTENANCE

For any other problem please contact your supplier.

The manufacturer assumes no responsibility for any damages due to incorrect installation, use or maintenance of the product.

Section 9 - SPARE PARTS

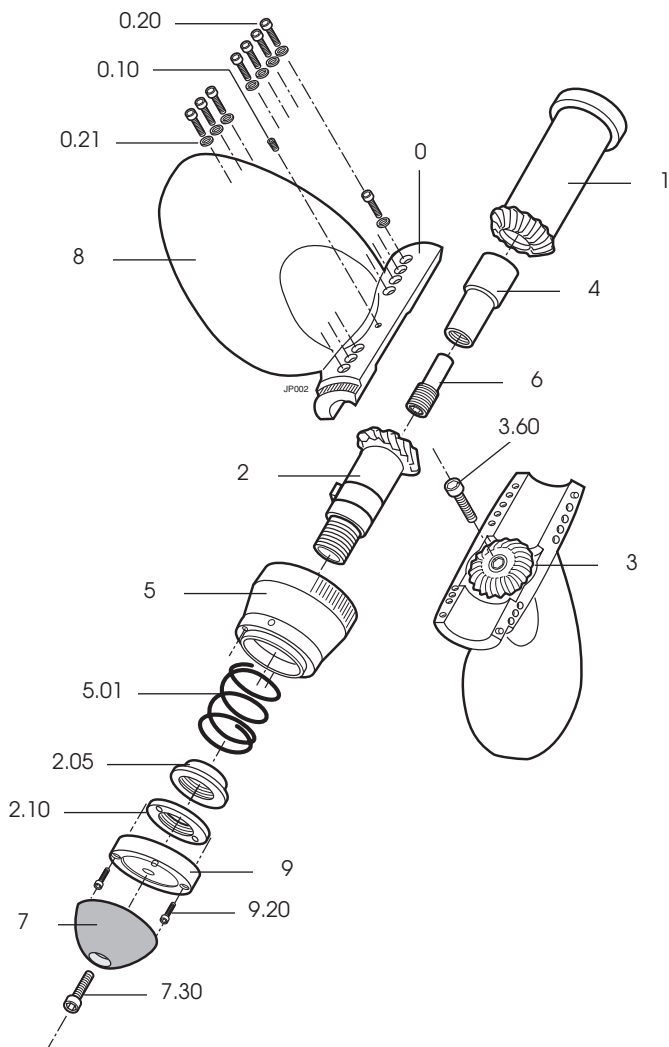
HUB dia 63 mm



Spare parts list for propeller hub dia 63 mm

Ref.	Description	Codex JP
0	Hub sector	63,00,00
0,10	Allen screw UNI 5927 M6x8 pc A4	63,00,10
0,20	Allen screw TCE UNI 5931 M6x20 A4	63,00,20
0,21	Washer DIN 7980 M6 A4	63,00,21
1	Conical junction	63,01,00
2	Lock	63,02,00
2,05	Spring lock flange	63,02,05
2,10	"Pitch lock" flange	63,02,10
3	Satellite	63,03,00
3,55	Allen screw TCE UNI 5931 M8x55 A4	63,03,55
4	Retaining nut	63,04,00
5	Ogival nose	63,05,00
5,01	Recall spring	63,05,01
6	Lock nut	63,06,00
7	Zinc anode	63,07,00
7,30	Allen screw TCE UNI 5931 M8x30 A4	63,07,30
8	Blade	63,08,00
9	Bronze ring	63,09,00
9,20	Allen screw TCE UNI 5931 M4x18 A4	63,09,20

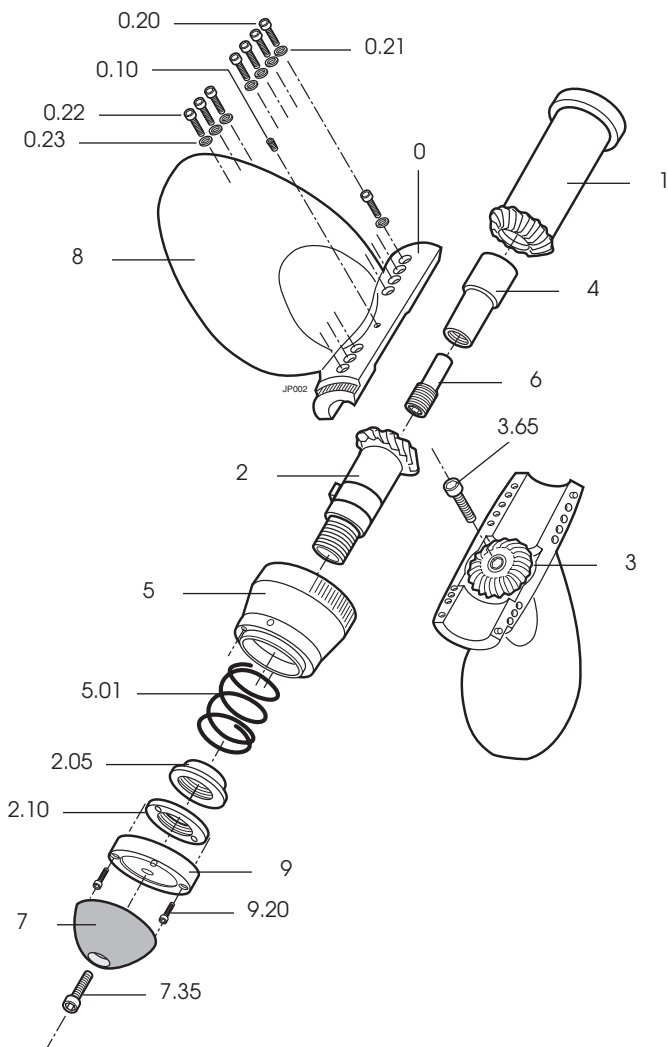
HUB dia 83 mm



Spare parts list for propeller hub dia 83 mm

Ref.	Description	Codex JP
0	Hub sector	83,00,3P
0,10	Allen screw UNI 5927 M6x8 pc A4	83,00,10
0,20	Allen screw TCE UNI 5931 M6x20 A4	83,00,20
0,21	Washer DIN 7980 M6 A4	83,00,21
1	Conical junction	83,01,00
2	Lock	83,02,00
2,05	Spring lock flange	83,02,05
2,10	"Pitch lock" flange	83,02,10
3	Satellite	83,03,00
3,60	Allen screw TCE UNI 5931 M8x60 A4	83,03,60
4	Retaining nutt	83,04,00
5	Ogival nose	83,05,00
5,01	Recall spring	83,05,01
6	Lock nut	83,06,00
7	Zinc anode	83,07,00
7,30	Allen screw TCE UNI 5931 M8x30 A4	83,07,30
8	Blade	83,08,00
9	Bronze ring	83,09,00
9,20	Allen screw TCE UNI 5931 M4x18 A4	83,09,20

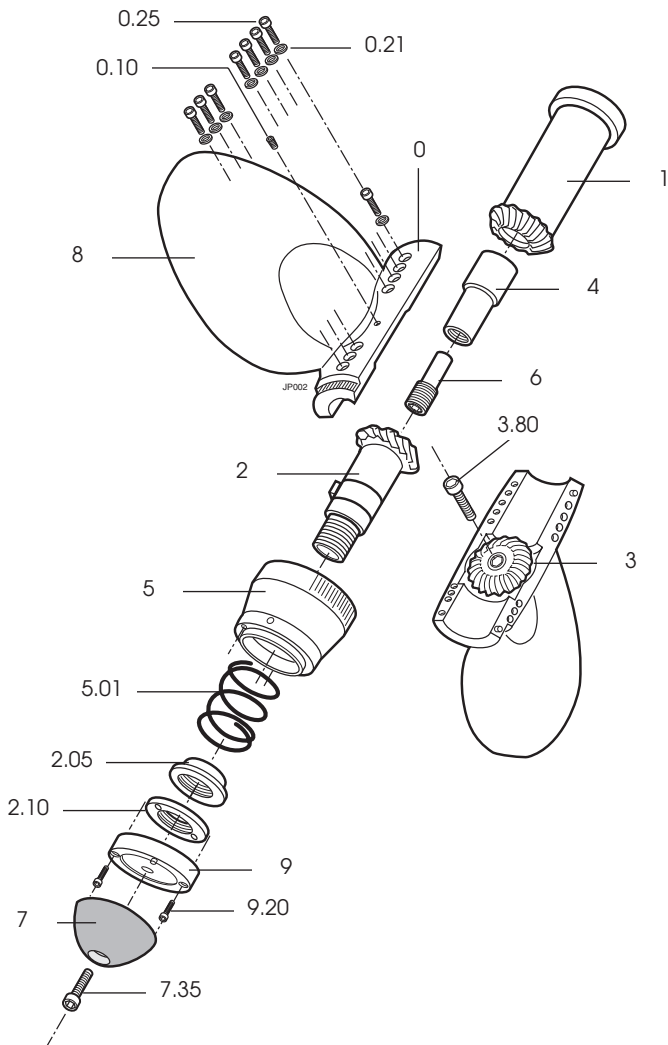
HUB dia 93 mm



Spare parts list for propeller hub dia 93 mm

Ref.	Description	Codex JP
0	Hub sector	93,00,3P
0,10	Allen screw UNI 5927 M6x8 pc A4	93,00,10
0,20	Allen screw TCE UNI 5931 M6x20 A4	93,00,20
0,21	Washer DIN 7980 M6 A4	93,00,21
0,22	Allen screw TCE UNI 5931 M8x22 A4	93,00,22
0,23	Washer DIN 7980 M8 A4	93,00,23
1	Conical junction	93,01,00
2	Lock	93,02,00
2,05	Spring lock flange	93,02,05
2,10	"Pitch lock" flange	93,02,10
3	Satellite	93,03,00
3,65	Allen screw TCE UNI 5931 M8x60 A4	93,03,65
4	Retaining nut	93,04,00
5	Ogival nose	93,05,00
5,01	Recall spring	93,05,01
6	Lock nut	93,06,00
7	Zinc anode	93,07,00
7,35	Allen screw TCE UNI 5931 M10x35 A4	93,07,35
8	Blade	93,08,00
9	Bronze ring	93,09,00
9,20	Allen screw TCE UNI 5931 M5x20 A4	93,09,20

HUB dia 116 mm



Spare parts list for propeller hub dia 116 mm

Ref.	Description	Codex JP
0	Hub sector	116,00,3P
0,10	Allen screw UNI 5927 M6x8 pc A4	116,00,10
0,21	Washer DIN 7980 M8 A4	116,00,21
0,25	Allen screw TCE UNI 5931 M8x25 A4	116,00,25
1	Conical junction	116,01,00
2	Lock	116,02,00
2,05	Spring lock flange	116,02,05
2,10	"Pitch lock" flange	116,02,10
3	Satellite	116,03,00
3,80	Allen screw TCE UNI 5931 M12x80 A4	116,03,80
4	Retaining nut	116,04,00
5	Ogival nose	116,05,00
5,01	Recall spring	116,05,01
6	Lock nut	116,06,00
7	Zinc anode	116,07,00
7,35	Allen screw TCE UNI 5931 M10x35 A4	116,07,35
8	Blade	116,08,00
9	Bronze ring	116,09,00
9,20	Allen screw TCE UNI 5931 M5x20 A4	116,09,20

Pitch regulation:

notch number	pitch	maximum R.P.M.	maximum speed

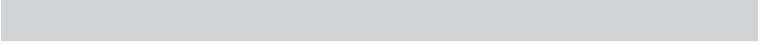
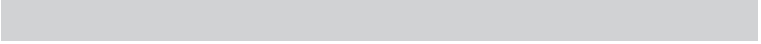
NOTE:

(Take note on these pages the regulations and the servicing maturities of Your **"JProp"** propeller)

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NOTE:

(Take note on these pages the regulations and the servicing maturities of Your "**JProp**" propeller)





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