Inboard Propeller Catalog

Michigan Wheel Marine

Michigan propellers

FEDERAL PROPELLERS

Hy Torq Propellers

COMMERCIAL PROPELLERS


Michigan Wheel manufactures propellers with particular emphasis on tolerance specifications.
Each Propeller meets exacting tolerances, and is fully inspected.

WHO WE ARE

Since 1903, Michigan Wheel Marine has been the world leader in propulsion and marine manueverability systems. We are the go-to propeller supplier to custom yacht manufacturers, production boat builders, commercial shipyards and goverments around the world. For those that seek to optimize performance and efficiency, Michigan Wheel has the expansive propeller design and analysis capabilities to increase speeds, improve cruising range, and provide exceptional passenger comfort levels.

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WHAT WE DO

QUALITY.

Michigan Wheel Marine is committed to the pursuit of quality excellence. We have ongoing training for all of our personnel and suppliers. Engineering support is continually upgraded. Through this effort, we seek to continually reduce product and process variation. Michigan Wheel operates on the philosophy that quality is the cornerstone of economic growth and stability. Therefore, quality is the responsibility of every individual in our organization. With the cooperation and input from our suppliers and customers, we are commited to continuous improvement.

ENGINEERING.

With decades of experience as the Marine Propulsion Industry Leader, the Engineering Department at Michigan Wheel and select Michigan Distributors have the knowledge and experience to suggest propellers for your boat. Our Naval Architects, Engineers, and many of our Distributors are available to review your vessel data and your performance expectations. Specialized proprietary software programs can determine the best propeller match, in size and style, for your boat's engine and gear ratio combination.

Key to Alloys: BR Manganese Bronze NI NiBrAl (Nickel, Bronze, Aluminum) SS Stainless Steel

For those that seek to optimize performance and efficiency, Michigan Wheel has the expansive propeller design and analysis capabilities to increase speeds, improve cruising range, and provide exceptional passenger comfort levels.

Photo Courtesy of Hatteras Yachts

Michigan propellers

Photo Courtesy of Tiara Yachts

"X" SERIES

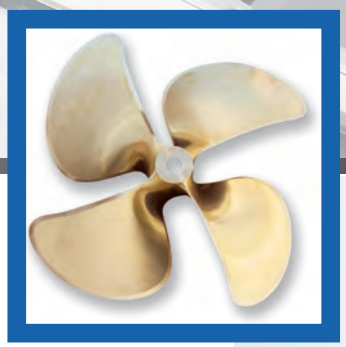
Available Alloys

BR NI

The "DJX" and "DQX" are evolutions of the classic Dyna-Jet and Dyna-Quad propeller designs, respectively, and are more closely optimized for modern marine craft. "X" Series propellers are the benchmark standard for high quality, performance-oriented propellers.

DJX

Specifications
0.61 E.A.R.
Diameter Range: 12" - 21"
21° of Skew



DQX

Specifications
0.835 E.A.R.
Diameter Range: 17" - 22"
21° of Skew

DQX

Specifications
0.935 E.A.R.
Diameter Range: 23" - 32"
21° of Skew

All "X" Series propellers are designed to efficiently use the higher engine power boating production by modern boat engines, both gas and diesel. With higher blade areas, the "X" propellers can better convert extra power into additional thrust. The increased blade area and refined blade chord distributions help minimize vibration for common high horsepower, limited tip-clearance applications. All "X" Series propellers are manufactured utilizing modern CNC machine finishing technology. This results in high quality propellers meeting stringent tolerance requirements at competitive prices.

Michigan Wheel offers a 4-blade DQX, which will result in smoother operation when compared to a 3-blade DJX. As boat size increases, larger engines will require the DQX to maximize thrust potential. Michigan Wheel also offers a 4-blade DQX with extra blade area (0.81 E.A.R.). This propeller can excel on performance applications where the propulsion system must accommodate various combinations of high engine power, propeller diameter constraints, and high boat speed.

DJX Specifications (0.61 E.A.R.)

Diameter		Hub Dimensions (Inches)			Standard Taper Bore (Inches)			Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	*WR² (lbs.-in²)
Inches	MM	Aft End	Forward End	Length	Minimum Bore	Maximum Bore	Pilot Bore				
12	*305*	1-5/8	1-3/4	2-3/8	7/8	1-1/8	7/8	5-7/16	22.7	5	41
13	*330*	1-5/8	1-7/8	2-3/4	7/8	1-1/8	7/8	6	26.8	6	61
14	*356*	1-7/8	2	2-3/4	1	1-1/4	1	6-1/2	31	8	90
15	*381*	1-7/8	2	2-3/4	1	1-1/4	1	6-7/8	35.8	10	126
16	*406*	2-1/8	2-3/8	3-1/4	1-1/8	1-1/2	1-1/8	7-3/8	40.5	12	172
17	*432*	2-1/4	2-1/2	3-1/4	1-1/4	1-1/2	1-1/4	7-7/8	45.4	14	232
18	*457*	2-3/8	2-5/8	3-3/4	1-1/4	1-3/4	1-1/4	8-5/16	51.3	16	307
19	*483*	2-3/8	2-5/8	3-3/4	1-1/4	1-3/4	1-1/4	8-3/4	57.3	19	401
20	*508*	2-3/8	2-5/8	3-3/4	1-1/4	2	1-1/4	9-1/4	63.8	21	516
21	*533*	2-3/4	3	4-1/8	1-3/8	2	1-3/8	9-3/4	69.9	26	660

*WR2 = ±10% in Air (inch squared lbs.) M.W.R. = 0.37 B.T.F. = 0.048

DQX Specifications (0.735 E.A.R.)

Diameter		Hub Dimensions (Inches)			Standard Taper Bore (Inches)			Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	*WR² (lbs.-in²)
Inches	MM	Aft End	Forward End	Length	Minimum Bore	Maximum Bore	Pilot Bore				
17	*432*	2-1/4	2-1/2	3-1/4	1-1/4	1-1/2	1-1/4	7-3/16	41.4	16	279
18	*457*	2-3/8	2-5/8	3-1/4	1-1/4	1-3/4	1-1/4	7-5/8	46.4	18	370
19	*483*	2-3/8	2-5/8	3-3/4	1-1/4	1-3/4	1-1/4	8	51.9	21	482
20	*508*	2-3/8	2-5/8	3-3/4	1-1/4	1-3/4	1-1/4	8-7/16	57.7	24	621
21	*533*	2-3/4	3	4-1/8	1-3/8	2	1-3/8	8-7/8	63.2	29	794
22	*559*	2-3/4	3	4-1/8	1-3/8	2	1-3/8	9-5/16	69.6	33	997

*WR2 = ±10% in Air (inch squared lbs.) M.W.R. = 0.33 B.T.F. = 0.046

DQX Specifications (0.81 E.A.R.)

Diameter		Hub Dimensions (Inches)			Standard Taper Bore (Inches)			Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	*WR² (lbs.-in²)
Inches	MM	Aft End	Forward End	Length	Minimum Bore	Maximum Bore	Pilot Bore				
23	*406*	3	3-1/4	Full Taper	1-1/2	2	1-1/2	10-5/8	83.7	45	1,392
24	*432*	3	3-1/4	Full Taper	1-1/2	2	1-1/2	11-1/16	91.4	50	1,714
25	*457*	3-3/8	3-3/4	Full Taper	1-3/4	2-1/4	1-3/4	11-9/16	98.6	60	2,111
26	*483*	3-3/8	3-3/4	Full Taper	1-3/4	2-1/4	1-3/4	12	106.9	65	2,557
27	*508*	3-3/4	4-1/8	Full Taper	2	2-1/2	2	12-1/2	114.8	77	3,099
28	*533*	3-3/4	4-1/8	Full Taper	2	2-1/2	2	12-15/16	123.8	83	3,700
30	*559*	4-1/4	4-5/8	Full Taper	2	3	2	13-7/8	141.5	110	5,240
32	*584*	4-1/4	4-5/8	Full Taper	2	3	2	14-3/4	161.8	126	7,176

*WR2 = ±10% in Air (inch squared lbs.) M.W.R. = 0.37 B.T.F. = 0.046

Photo Courtesy of Sea Ray Corporation

Photo Courtesy of Tiara Yachts

Photo Courtesy of Silverton Marine Corp.

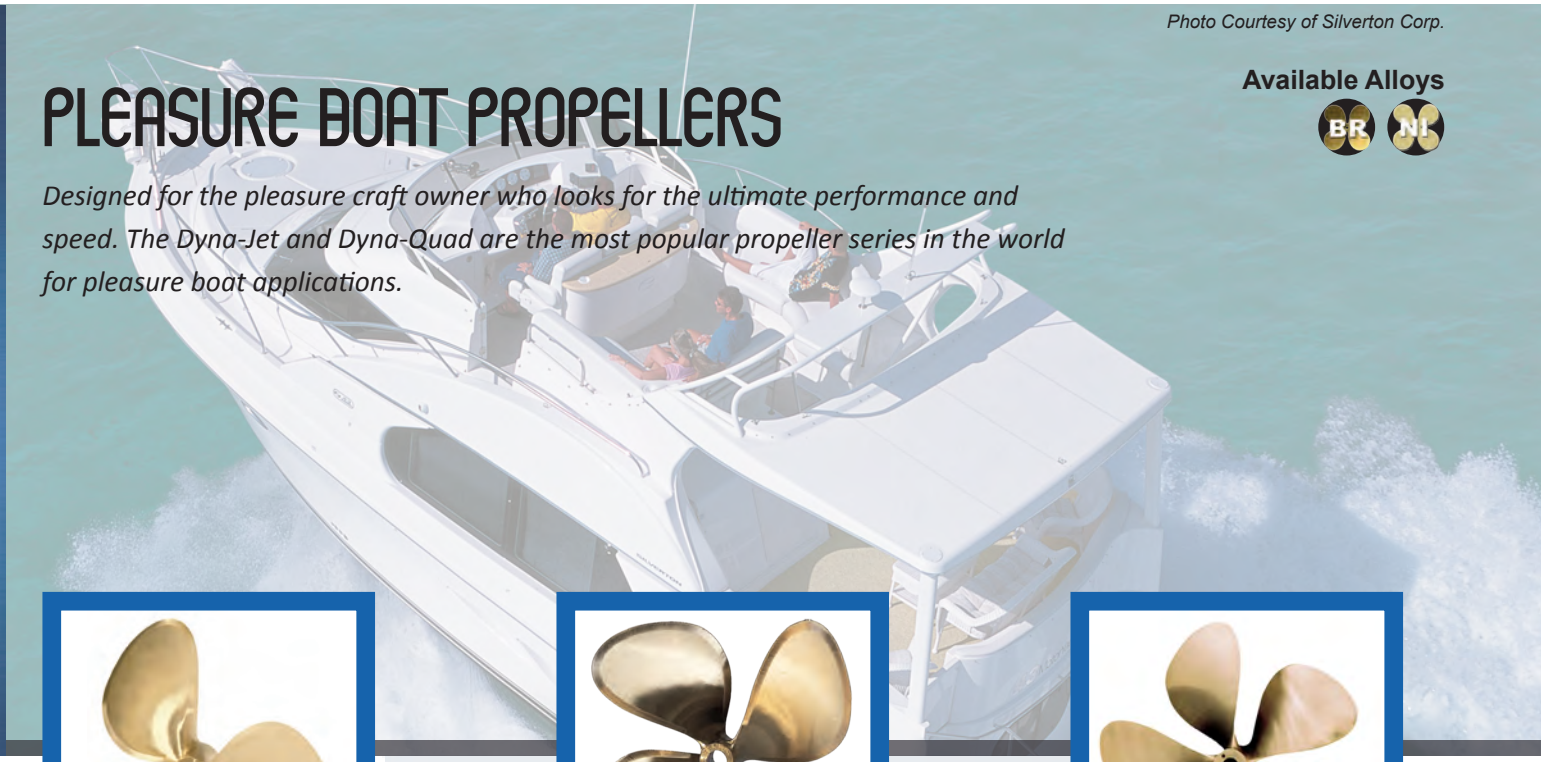


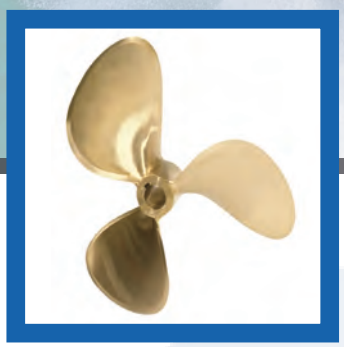
Photo Courtesy of Silverton Corp.

Available Alloys

BR NI

PLEASURE BOAT PROPELLERS

Designed for the pleasure craft owner who looks for the ultimate performance and speed. The Dyna-Jet and Dyna-Quad are the most popular propeller series in the world for pleasure boat applications.



DYNA-JET

Specifications

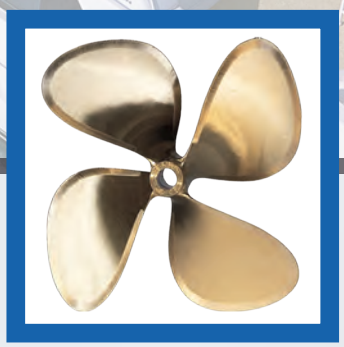
0.56 E.A.R.

Diameter Range: 9” - 46”

Pitch Range: 0.7 - 1.1

(Pitch/Diameter Ratio)

The 3-blade Dyna-Jet provides outstanding speed and performance for moderately-sized boats. It has been the most popular propeller in the world for the past 50 years, and is still a standard for many 3-blade uses. Each Dyna-Jet is carefully hand-crafted and inspected to meet today’s performance demands.



DYNA-QUAD

Specifications

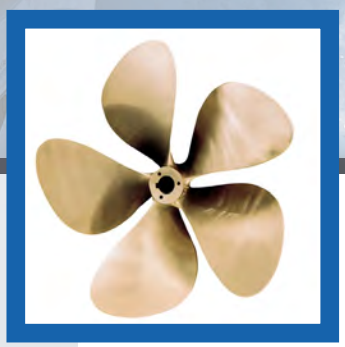
0.69 E.A.R.

Diameter Range: 17” - 46”

Pitch Range: 0.7 - 1.1

(Pitch/Diameter Ratio)

As popular as the Dyna-Jet model, the Dyna-Quad may offer a more comfortable ride, reducing the vibrations of a 3-blade, while providing more thrust via greater blade area. This makes the Dyna-Quad an excellent choice for the performance-minded commercial boat operator.



M-500

Specifications

0.89 E.A.R.

Diameter Range: 22” - 46”

Pitch Range: 0.75 - 1.3

(Pitch/Diameter Ratio)

For new construction, re-powers, and upgrading propellers, the 5-blade M-500 is the right choice. Its excellent design and increased blade area provide superior performance without increasing diameter, and may be the solution to problems such as: clearance or tip speed considerations; heavy vee-struts, dead wood or other hull appendages agitating the flow of water; vibration caused by resonance.

Dyna-Jet & Dyna-Quad Specifications

Diameter		Hub Dimensions (Inches)			Standard Taper Bore (Inches)			Dyna-Jet (0.56 E.A.R.)				Dyna-Quad (0.69 E.A.R.)			
Inches	MM	Aft End	Forward End	Length	Minimum Bore	Maximum Bore	Pilot Bore	Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	*WR² (lbs.-in²)	Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	*WR² (lbs.-in²)
9	*229*	1-3/8	1-1/2	2-1/8	3/4	7/8	3/4	3-7/8	11.7	2.5	10	-	-	-	-
10	*254*	1-1/2	1-5/8	2-1/4	3/4	1	3/4	4-5/16	14.5	3	17	-	-	-	-
11	*279*	1-1/2	1-5/8	2-1/4	3/4	1	3/4	4-3/4	17.7	4	26	-	-	-	-
12	*305*	1-5/8	1-3/4	2-3/8	7/8	1-1/8	7/8	5-3/16	21.1	5	40	-	-	-	-
13	*330*	1-5/8	1-13/16	2-3/4	1	1-1/4	1	5-5/8	24.8	6	60	-	-	-	-
14	*356*	1-7/8	2	2-3/4	1	1-1/4	1	6	28.7	8	86	-	-	-	-
15	*381*	1-7/8	2	2-3/4	1	1-1/4	1	6-7/16	33.1	9	120	-	-	-	-
16	*406*	2-1/8	2-3/8	3-1/4	1-1/8	1-3/8	1-1/8	6-7/8	37.5	11	167	-	-	-	-
17	*432*	2-1/8	2-3/8	3-1/4	1-1/4	1-3/8	1-1/4	7-5/16	42.8	13	224	6-3/4	38.7	14	257
17**	*432*	2-3/8	2-5/8	3-3/4	1-1/4	1-1/2	1-1/4	7-5/16	42.8	13	224	-	-	-	-
18	*457*	2-3/8	2-5/8	3-3/4	1-1/4	1-1/2	1-1/4	7-3/4	47.4	16	298	7-1/8	43.2	17	341
19	*483*	2-3/8	2-5/8	3-3/4	1-1/4	1-1/2	1-1/4	8-3/16	53.1	18	388	7-1/2	48.3	20	445
20	*508*	2-3/8	2-5/8	3-3/4	1-1/4	1-1/2	1-1/4	8-5/8	59.0	20	500	7-15/16	53.7	23	573
21	*533*	2-3/4	3	4-1/8	1-3/8	1-3/4	1-3/8	9-1/16	64.6	25	640	8-5/16	58.8	28	733
22	*559*	2-3/4	3	4-1/8	1-3/8	1-3/4	1-3/8	9-1/2	71.2	28	803	8-11/16	64.8	31	920
23	*584*	3	3-1/4	4-1/2	1-1/2	2	1-1/2	9-7/8	77.6	33	1,004	9-1/16	70.6	36	1,150
24	*610*	3	3-1/4	4-1/2	1-1/2	2	1-1/2	10-3/8	84.7	36	1,237	9-1/2	77.1	40	1,216
26	*660*	3-3/8	3-3/4	4-7/8	1-3/4	2-1/4	1-3/4	11-1/4	99.1	46	1,844	10-1/4	90.2	52	2,110
28	*711*	3-3/4	4-1/8	5-3/4	2	2-1/2	2	12-1/16	114.7	60	2,671	11-1/16	104.4	66	3,056
30	*762*	4-1/4	4-5/8	6	2	3	2	12-15/16	131.1	76	3,775	11-7/8	119.3	84	4,316
32	*813*	4-1/4	4-5/8	6	2	3	2	13-3/4	150.0	88	5,172	12-5/8	136.5	97	5,917
34	*864*	4-1/4	4-5/8	6-1/2	2-1/4	3	2-1/4	14-5/8	170.0	101	6,973	13-7/16	154.7	112	7,978
36	*914*	4-5/8	5-1/8	8	2-3/4	3-1/2	2-3/4	15-1/2	190.1	124	9,289	14-1/4	173.0	138	10,622
38	*965*	4-5/8	5-1/8	8	2-3/4	3-1/2	2-3/4	16-3/8	212.7	140	12,108	15	193.5	156	13,851
40	*1,016*	5	5-1/2	9	3	3-3/4	3	17-1/4	235.3	168	15,646	15-13/16	214.1	186	17,892
42	*1,067*	5-3/8	6	10-7/16	3	4	3	18-1/8	258.8	205	20,016	16-5/8	235.5	226	22,878
44	*1,118*	5-7/16	6-3/16	11	3	4	3	19	284.5	233	25,187	17-3/8	258.9	258	28,790
46	*1,168*	5-5/8	6-1/4	11-7/8	3	4	3	19-7/8	311.5	266	31,385	18-3/16	283.5	293	35,376

** Sizes (Dia. x Pitch) 17x16, 17x17 & 17x18 maximum bore is 1-1/2". All other 17" diameter x available pitch - maximum bore is 1-3/8". See hub dimensions for hub size detail.
*WR2 = ±10% in Air (inch squared lbs.)

For Dyna-Jet M.W.R. = 0.33 B.T.F. = 0.050
For Dyna-Quad M.W.R. = 0.33 B.T.F. = 0.047

M-500 Specifications (0.86 E.A.R.)

Diameter		Hub Dimensions (Inches)			Standard Taper Bore (Inches)			Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	*WR² (lbs.-in²)
Inches	MM	Aft End	Forward End	Length	Minimum Bore	Maximum Bore	Pilot Bore				
22	*356*	2-3/4	3	4-1/8	1-3/8	1-3/4	1-3/8	8-11/16	64.9	37	1,150
23	*381*	3	3-1/4	4-1/2	1-1/2	2	1-1/2	9-1/16	70.6	43	1,430
24	*406*	3	3-1/4	4-1/2	1-1/2	2	1-1/2	9-1/2	77.1	48	1,770
26	*432*	3-3/8	3-3/4	4-7/8	1-3/4	2-1/4	1-3/4	10-1/2	90.2	62	2,630
28	*457*	3-3/4	4-1/8	5-3/4	2	2-1/2	2	11-1/16	104.4	79	3,810
30	*483*	4-1/4	4-5/8	6	2	3	2	11-7/8	119.3	99	5,380
32	*508*	4-1/4	4-5/8	6	2	3	2	12-5/8	136.5	115	7,380
34	*533*	4-1/4	4-5/8	6-1/2	2-1/4	3	2-1/4	13-7/16	154.7	134	9,960
36	*559*	4-5/8	5-1/8	8	2-3/4	3-1/2	2-3/4	14-1/4	173.0	164	13,250
38	*584*	4-5/8	5-1/8	8	2-3/4	3-1/2	2-3/4	15	193.5	186	17,280
40	*610*	5	5-1/2	9	3	3-3/4	3	15-7/8	214.1	221	22,320
42	*660*	5-3/8	6	10-7/16	3	4	3	16-9/16	235.5	267	28,520
44	*711*	5-7/16	6-3/16	11	3	4	3	17-3/8	258.9	305	35,900
46	*762*	5-5/8	6-1/4	11-7/8	3	4	3	18-3/16	283.5	347	44,740

*WR2 = ±10% in Air (inch squared lbs.) M.W.R. = 0.37 B.T.F. = 0.046

SAILBOAT PROPELLERS

Michigan fixed pitch propellers are designed to produce performance - with or without wind.

Available Alloys

BR NI

SAILER 2-BLADE

Specifications

0.31 E.A.R.

Diameter Range: 10” - 20”

The 2-Blade Sailer fixed pitch propeller is the popular choice for sailboaters seeking to maximize speed. It offers minimum drag while under sail and the power to get you where you’re going when the wind stops blowing.

SAILER 3-BLADE

Specifications

0.46 E.A.R.

Diameter Range: 10” - 20”

The 3-Blade Sailer is the propeller of choice for the cruising sailboats. It offers superior dock handling maneuverability and the power to maintain speed in wind and waves when the weather gets nasty with a minimum increase in drag under sail.

Sailer 2 & 3 Blade Specifications

Diameter		Hub Dimensions (Inches)			Standard Taper Bore (Inches)		
Inches	MM	Aft End	Forward End	Length	Maximum Straight Bore (Inches)	Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)
10	*254*	1-7/16	1-5/8	2-1/4	3/4	7/8	3/4
11	*280*	1-7/16	1-5/8	2-1/4	3/4	7/8	3/4
12	*305*	1-9/16	1-3/4	2-3/8	1	1-1/8	1
13	*330*	1-9/16	1-3/4	2-3/4	1	1-1/8	1
14	*356*	1-3/4	2	2-3/4	1	1-1/8	1
15	*381*	1-3/4	2	2-3/4	1	1-1/8	1
16	*406*	1-15/16	2-3/16	3-1/4	1-1/8	1-1/4	1-1/8
17	*432*	2	2-5/16	3-1/4	1-1/8	1-3/8	1-1/8
18	*457*	2	2-5/16	3-1/4	1-1/8	1-3/8	1-1/8
19	*483*	2-1/8	2-7/16	3-3/4	1-1/4	1-3/8	1-1/4
20	*508*	2-1/8	2-7/16	3-3/4	1-1/4	1-3/8	1-1/4

MUD BOAT PROPELLERS

Available Alloys

BR NI

Weedless A-C Specifications

Diameter		Available Pitch	Hub Dimensions (Inches)			Maximum Straight Bore (Inches)	Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	B.T.F.
Inches	MM		Aft End	Forward End	Length					
6	*152*		1	1-11/32	1-3/8	1/2	2-5/8	6.2	1	.042
7	*178*	4L	1-1/16	1-1/2	1-1/2	5/8	3-1/8	8.5	1.5	.042
8	*203*	6L	1-1/8	1-1/2	1-1/2	5/8	3-9/16	10.8	2	.042
9	*229*	6L, 7L, 8L	1-1/4	1-11/16	1-7/8	3/4	4-1/8	13.7	3	.042
10	*254*	6L, 10L	1-7/16	1-3/4	2-1/4	3/4	4-11/16	14.7	3.5	.042

Weedless W-C Specifications

Diameter		Available Pitch	Hub Dimensions (Inches)			Maximum Straight Bore (Inches)	Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	B.T.F.
Inches	MM		Aft End	Forward End	Length					
6	*152*	4L, 5L	1	1-11/32	1-3/8	1/2" Straight No Keyway	2-5/8	6.2	1	.042
7	*178*	4L, 5L, 8L, 10L	1-1/16	1-1/2	1-1/2	1/2" Straight No Keyway	3-1/8	8.5	1.5	.042
8	*203*	4L, 5L	1-1/8	1-1/2	1-1/2	5/8" Straight No Keyway	3-9/16	10.8	2	.042
9	*229*	5L, 6L	1-1/4	1-11/16	1-7/8	5/8" or 3/4" Straight & Slot	4-1/8	13.7	3	.042
10	*254*	5L, 9L	1-7/16	1-3/4	2-1/4	3/4" Taper & Keyway	4-11/16	14.7	3.5	.042

Weedless H-D Specifications

Diameter		Available Pitch	Hub Dimensions (Inches)			Maximum Standard Taper Bore (Inches)	Maximum Straight Bore (Inches)	Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	B.T.F.
Inches	MM		Aft End	Forward End	Length						
10	*254*	6R, 8, 10, 12	1-7/16	1-5/8	2-1/4	1	1	6-11/16	21	5	.058
11	*279*	8, 10, 12	1-7/16	1-5/8	2-1/4	1	1	7-7/16	25	6	.058
12	*305*	10, 12, 14	1-9/16	1-3/4	2-5/8	1-1/8	1-1/4	8	30	7.5	.058
13	*330*	8, 10, 12, 14	1-9/16	1-3/4	2-5/8	1-1/8	1-1/4	8-13/16	36	9	.058
14	*356*	8, 10, 12L, 14, 16	1-3/4	2	3	1-1/8	1-1/4	9-7/16	41	12	.058
15	*381*	8, 10, 12, 13L, 14, 16	1-3/4	2	3	1-1/8	1-1/4	10	47	14	.058
16	*406*	8-16 Even	1-15/16	2-3/16	3-3/8	1-1/4	1-3/8	10-11/16	55	16	.058

WEEDLESS A-C
Specifications
Diameter Range: 6" - 10"
Straight Bore

The Weedless A-C Series is primarily for smaller air-cooled inboard engines.

WEEDLESS W-C
Specifications
Diameter Range: 6" - 10"
Tapered Bore

The Weedless W-C Series offers heavier blades and a larger hub for water cooled engines.

WEEDLESS H-D
Specifications
Diameter Range: 10" - 16"
Standard Taper Bores

The Weedless H-D (Heavy Duty) is designed for maximum strength and durability in weed infested waters. It is designed to take on the heaviest of weeds.

Photo Courtesy of Breaux Brothers

COMMERCIAL BOAT PROPELLERS

Commercial propellers that are modeled after the popular Dyna-Quad pleasure series.

DQ SPECIAL

Specifications
0.76 - 0.91 E.A.R.
Diameter Range: 32” - 56”

The DQ Special is an authoritative extension of the traditional Dyna-Quad design, boasting more muscle through more blade area. It is available in larger diameters, with area ratios suitable for today’s high-powered vessels. It makes for an ideal option for large super yachts, as well as commercial boats operating at higher speeds.

Available Alloys

BR NI

DURA-QUAD

Specifications
0.76 E.A.R.
Diameter Range: 24” - 36”

The Dura-Quad is ideal for applications where more durability and/or blade area is required. Dura-Quad propellers have the skewed and highly efficient blade design of the traditional Dyna-Quad series. The added blade thickness optimizes speed on high-powered commercial applications, without sacrificing durability.

Available Alloys

BR NI

PAC-MASTER

Specifications
0.69 E.A.R.
Even Diameters: 20” - 30”

Pac-Master features a durable design to ensure long running life. The increased blade-root thickness gives extra durability for any and all applications. CF3 Stainless Steel is used to ensure rugged, dependable operation. The Pac-Master is available in select even-diameters. Odd-diameters and pitch combinations are available upon request.

Available Alloys

SS

DQ Special Specifications (0.86 E.A.R.)

Diameter		Hub Dimensions (Inches)			Standard Taper Bore (Inches)			Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	*WR² (lbs.-in²)
Inches	MM	Aft End	Forward End	Length	Minimum Bore	Maximum Bore	Pilot Bore				
32	*813*	4-1/4	4-7/8	Full Taper	2	3	2	15-11/16	173.1	128	8,250
34	*864*	4-1/2	5-1/8	Full Taper	2-1/4	3	2-1/4	16-11/16	196.3	152	11,150
36	*914*	4-7/8	5-9/16	Full Taper	2-3/4	3-1/2	2-3/4	17-11/16	219.5	184	14,850
38	*965*	4-7/8	5-9/16	Full Taper	2-3/4	3-1/2	2-3/4	18-5/8	245.5	207	19,270
40	*1,016*	4-7/8	5-11/16	Full Taper	3	3-3/4	3	19-5/8	271.6	233	24,710
42	*1,067*	5-3/8	6	Full Taper	3	4	3	20-5/8	298.8	275	31,620
44	*1,118*	5-3/8	6	Full Taper	3	4-1/4	3	21-9/16	328.5	300	39,630
46	*1,168*	6	6-3/4	Full Taper	3	4-1/2	3	22-9/16	359.6	352	46,690
48	*1,219*	6	6-3/4	Full Taper	3	4-1/2	3	23-3/8	387.5	390	61,190
50	*1,270*	6-3/4	7-1/2	Full Taper	3	5	3	24-7/16	420.5	460	75,570
52	*1,321*	6-3/4	7-1/2	Full Taper	3	5	3	25-7/16	456.2	505	91,460
54	*1,372*	6-3/4	7-1/2	Full Taper	3	5	3	26-7/16	493.3	552	109,740
56	*1,422*	6-3/4	7-1/2	Full Taper	3	5	3	27-3/8	531.9	604	131,130

*WR2 = ±10% in Air (inch squared lbs.)

Notes:
1. Mass moment of inertia properties calculated using minimum standard bore.
2. Mass moment of inertia properties calculated using bronze.
3. Some DQ Specials have blade area other than 0.86.

Dura-Quad Specifications (0.76 E.A.R.)

Diameter		Hub Dimensions (Inches)			Standard Taper Bore (Inches)				Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	*WR² (lbs.-in²)
Inches	MM	Aft End	Forward End	Length	Minimum Bore	Maximum Bore	Pilot Bore	Pilot S.E. Bore				
24	*610*	3	3-3/8	6	1-1/2	2	1-1/2	1.172	10-7/16	85.5	52	1,780
26	*660*	3-3/8	3-7/8	6-3/4	1-3/4	2-1/4	1-3/4	1.375	11-5/16	99.9	67	2,650
28	*711*	3-3/4	4-1/4	7-1/2	2	2-1/2	2	1.578	12-3/16	115.7	85	3,830
30	*762*	4-1/4	4-7/8	9	2	3	2	1.531	13-1/16	132.1	113	5,420
32	*813*	4-1/4	4-7/8	9	2	3	2	1.531	13-15/16	151.1	129	7,420
34	*864*	4-1/4	4-7/8	9	2	3	2	1.531	14-13/16	171.4	148	9,980
36	*914*	4-5/8	5-1/4	10-1/2	2-3/4	3-1/2	2-3/4	2.164	15-5/8	191.8	176	13,260

*WR2 = ±10% in Air (inch squared lbs.)

Pac-Master Specifications (0.86 E.A.R.)

Diameter	Rotation	Hub Dimensions (Inches)			Standard Taper Bore (Inches)			Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	*WR² (lbs.-in²)
Inches		Aft End	Forward End	Length	Minimum Bore	Maximum Bore	Pilot Bore				
20 x 18	R	2-3/4	3	4-1/2	1-1/2	1-3/4	1-1/2	8-1/16	54.2	26	627
20 x 20	R	2-3/4	3	4-1/2	1-1/2	1-3/4	1-1/2	8-1/16	54.2	26	627
22 x 18	R	3	3-1/4	4-7/8	1-3/4	2	1-3/4	8-7/8	65.5	34	1,003
22 x 20	R	3	3-1/4	4-7/8	1-3/4	2	1-3/4	8-7/8	65.5	34	1,003
22 x 22	R	3	3-1/4	4-7/8	1-3/4	2	1-3/4	8-7/8	65.5	34	1,003
24 x 20	R & L	3-3/8	3-3/4	5-3/4	2	2-1/4	2	9-11/16	77.8	46	1,545
24 x 22	R & L	3-3/8	3-3/4	5-3/4	2	2-1/4	2	9-11/16	77.8	46	1,545
24 x 24	R & L	3-3/8	3-3/4	5-3/4	2	2-1/4	2	9-11/16	77.8	46	1,545
26 x 20	R & L	3-7/8	4-1/4	6	2	2-1/2	2	10-1/2	90.9	61	2,302
26 x 22	R & L	3-7/8	4-1/4	6	2	2-1/2	2	10-1/2	90.9	61	2,302
26 x 24	R & L	3-7/8	4-1/4	6	2	2-1/2	2	10-1/2	90.9	61	2,302
26 x 26	R & L	3-7/8	4-1/4	6	2	2-1/2	2	10-1/2	90.9	61	2,302
26 x 30	R & L	3-7/8	4-1/4	6	2	2-1/2	2	10-1/2	90.9	61	2,302
28 x 26	R & L	3-7/8	4-1/4	6	2	2-1/2	2	11-1/4	106.2	72	3,303
28 x 28	R & L	3-7/8	4-1/4	6	2	2-1/2	2	11-1/4	106.2	72	3,303
30 x 20	R	3-7/8	4-1/4	6-1/2	2	2-1/2	2	12-1/16	122.5	85	4,633
30 x 28	R & L	3-7/8	4-1/4	6-1/2	2	2-1/2	2	12-1/16	122.5	85	4,633
30 x 30	R	3-7/8	4-1/4	6-1/2	2	2-1/2	2	12-1/16	122.5	85	4,633

*WR2 = ±10% in Air (inch squared lbs.) M.W.R. = 0.326 B.T.F. = 0.060

Odd diameter & pitch within 2" of listed are quoted on request.

MACHINE PITCH

Specifications

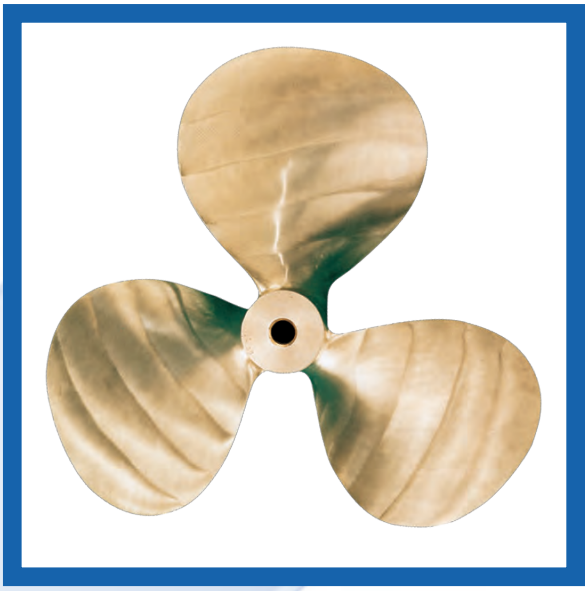
0.51 E.A.R. - Diameter Range: 9” - 60”

0.47 E.A.R. - Diameter Range: 62” - 96”

The most well-known, finest crafted 3-blade propeller for all purpose use. This style and design is primarily used on vessels with speeds less than 15 knots. The design of MP-style propellers include: semi-elliptical shape; constant pitch; and ogival blade sections.

The Heavy Duty (HD) is identical in design to the Machine Pitch, but incorporates thicker blade edges, engineered specifically for severe conditions. These edges resist abrasion and blade fracture.

Available Alloys



WORK HORSE

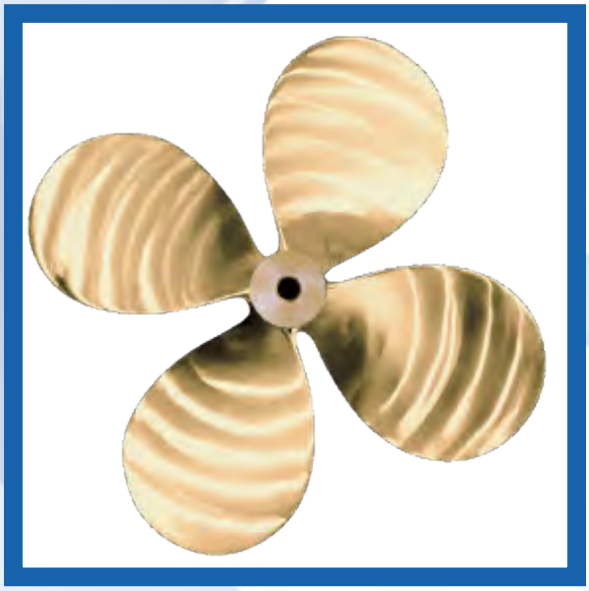
Specifications

0.71 E.A.R. - Diameter Range: 18” - 60”

0.622 E.A.R. - Diameter Range: 62” - 96”

The Work Horse is the best known commercial propeller in the world. Tug and push boat operators choose the Work Horse for its semi-elliptical shape, excellent reverse-thrust performance and ability to push hard-working boats.

Available Alloys



WORK HORSE 5

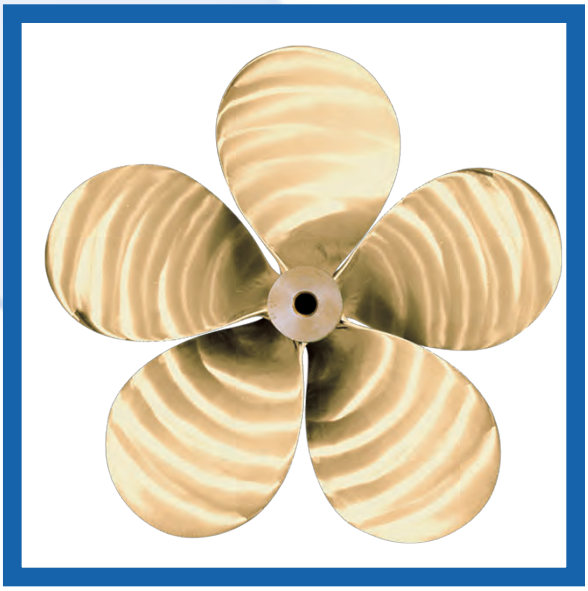
Specifications

0.8875 E.A.R.

Diameter Range: 30” x 60”

The Work Horse 5 propeller is a recent evolution of the traditional Work Horse propeller. The increased blade number provides additional blade area for commercial applications with higher horsepower and thrust requirements. Additionally, the Work Horse 5 will help to reduce vibration levels on vessels where non-uniform water flow or propeller tip clearance limitations exist.

Available Alloys



Machine Pitch & Work Horse Specifications

Diameter		Hub Dimensions (Inches)			Standard Taper Bore (Inches)			Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)	Machine Pitch		Work Horse		Work Horse 5	
Inches	MM	Aft End	Forward End	Length	Minimum Bore	Maximum Bore	Pilot Bore			Approx. Net Weight (lbs.)	*WR² (lbs.-in²)	Approx. Net Weight (lbs.)	*WR² (lbs.-in²)	Approx. Net Weight (lbs.)	*WR² (lbs.-in²)
9	*229*	1-5/16	1-7/16	2-1/8	3/4	3/4	3/4	3-7/8	11.8	2.5	13	-	-	-	-
10	*254*	1-7/16	1-5/8	2-1/8	3/4	7/8	3/4	4-5/16	14.5	3.5	21	-	-	-	-
11	*279*	1-7/16	1-5/8	2-1/8	3/4	7/8	3/4	4-5/8	17.6	4	34	-	-	-	-
12	*305*	1-9/16	1-3/4	2-5/8	7/8	1-1/8	7/8	5-1/16	20.9	5	50	-	-	-	-
13	*330*	1-9/16	1-3/4	2-3/4	1	1-1/8	1	4-15/16	22.7	6	65	-	-	-	-
14	*356*	1-3/4	2	3	1	1-1/8	1	5-5/16	26.4	8	90	-	-	-	-
15	*381*	1-3/4	2	3	1	1-1/8	1	5-5/8	30.3	9	120	-	-	-	-
16	*406*	1-15/16	2-3/16	3-3/8	1-1/8	1-1/4	1-1/8	6-15/16	34.5	11	160	-	-	-	-
17	*432*	2	2-5/16	3-3/8	1-1/8	1-3/8	1-1/8	6-7/16	38.9	12	210	-	-	-	-
18	*457*	2	2-5/16	3-3/8	1-1/8	1-3/8	1-1/8	6-7/8	43.6	14	280	17	370	-	-
19	*483*	2-1/8	2-7/16	3-3/4	1-1/4	1-3/8	1-1/4	7-1/4	48.6	16	350	20	480	-	-
20	*508*	2-1/8	2-7/16	3-3/4	1-1/4	1-3/8	1-1/4	7-1/2	53.8	18	470	23	630	-	-
21	*533*	2-7/16	2-13/16	4-1/8	1-3/8	1-1/2	1-3/8	8	59.4	22	590	28	790	-	-
22	*559*	2-7/16	2-13/16	4-1/8	1-3/8	1-1/2	1-3/8	8-3/8	65.1	25	760	32	1,020	-	-
23	*584*	2-13/16	3-3/16	4-1/2	1-1/2	1-3/4	1-1/2	8-7/8	71.2	30	940	38	1,250	-	-
24	*610*	2-13/16	3-3/16	4-1/2	1-1/2	1-3/4	1-1/2	9-1/8	77.5	33	1,140	41	1,510	-	-
26	*660*	3-3/16	3-5/8	5-1/4	1-3/4	2	1-3/4	9-7/8	91	44	1,710	54	2,280	-	-
28	*711*	3-1/2	4	5-1/4	1-3/4	2-1/4	1-3/4	10-5/8	105.5	55	2,490	68	3,320	-	-
30	*762*	3-13/16	4-3/8	6	2	2-1/2	2	11-3/8	124.7	70	3,460	87	4,590	108	6,100
32	*813*	4-1/4	4-13/16	6	2	3	2	12-3/16	141.8	97	5,960	121	7,920	150	10,526
34	*864*	4-7/16	5-1/16	6-3/4	2-1/4	3-1/4	2-1/4	12-7/8	160.1	114	7,810	142	10,380	177	13,795
36	*914*	4-3/4	5-1/2	7	2-1/2	3-1/2	2-1/2	13-5/8	179.5	136	10,350	170	13,750	211	18,274
38	*965*	5-1/16	5-13/16	7-1/4	2-1/2	3-3/4	2-1/2	14-7/16	200	159	13,200	198	17,540	246	23,311
40	*1,016*	5-1/16	5-13/16	7-3/4	2-3/4	3-3/4	2-3/4	15-3/16	221.6	177	16,600	221	22,070	275	29,331
42	*1,067*	5-1/4	6	8	2-3/4	3-3/4	2-3/4	15-15/16	244.3	211	22,620	265	30,090	329	39,990
44	*1,118*	5-1/4	6	8	2-3/4	3-3/4	2-3/4	16-3/4	268.1	232	27,820	293	37,010	364	49,186
46	*1,168*	6	6-3/4	10	3	4	3	17-7/16	293.1	285	34,170	354	45,400	440	60,337
48	*1,219*	6	6-3/4	10	3	4	3	18-1/4	319.1	309	41,290	386	54,900	480	72,962
50	*1,270*	6-9/16	7-3/8	10-3/4	3	4-1/2	3	19	346.2	362	49,820	447	66,190	556	87,967
52	*1,320*	6-9/16	7-3/8	10-3/4	3	4-1/2	3	19-3/4	374.5	390	59,370	485	78,900	603	104,858
54	*1,371*	6-9/16	7-3/8	10-3/4	3	4-1/2	3	20-1/2	408.8	420	70,320	526	93,510	654	124,275
56	*1,422*	7-5/8	8-3/8	11-1/2	3-1/4	5	3-1/4	21-1/4	434.3	498	83,470	615	110,830	764	147,293
58	*1,473*	7-5/8	8-3/8	11-1/2	3-1/4	5	3-1/4	21-7/8	465.9	533	97,700	661	129,810	822	172,517
60	*1,524*	7-5/8	8-3/8	12	3-1/2	5	3-1/2	22-3/4	498.6	572	113,880	713	151,360	886	201,157
62	*1,575*	9	10	13-1/4	4	6	4	22-1/2	492.8	737	143,870	902	190,790	-	-
64	*1,625*	9	10	13-1/4	4	6	4	23-1/8	525.1	781	165,830	961	220,060	-	-
66	*1,676*	9	10	13-1/4	4	6	4	23-15/16	558.4	828	190,420	1,024	252,850	-	-
68	*1,727*	10-1/2	11-3/4	14-1/2	5	7	5	24-5/8	592.8	987	221,140	1,199	292,710	-	-
70	*1,778*	10-1/2	11-3/4	14-1/2	5	7	5	25-3/8	628.1	1,039	251,690	1,269	333,450	-	-
72	*1,823*	10-1/2	11-3/4	14-1/2	5	7	5	26-1/8	664.5	1,094	285,590	1,342	378,650	-	-
74	*1,879*	10-1/2	11-3/4	14-1/2	6	7	6	26-7/8	702	1,159	340,800	1,436	452,320	-	-
76	*1,930*	10-1/2	11-3/4	14-1/2	6	7	6	27-9/16	740.4	1,228	388,680	1,529	516,160	-	-
78	*1,981*	10-1/2	11-3/4	14-1/2	6	7	6	28-1/4	779.9	1,301	441,530	1,626	586,630	-	-
80	*2,032*	11-1/8	12-1/2	17	6	7-1/2	6	29	820.4	1,493	503,610	1,844	668,350	-	-
82	*2,083*	11-1/8	12-1/2	17	6	7-1/2	6	29-3/4	862	1,574	568,320	1,952	754,640	-	-
84	*2,134*	11-1/8	12-1/2	17	6	7-1/2	6	30-7/16	904.5	1,659	639,650	2,064	849,740	-	-
86	*2,184*	11-1/8	12-1/2	17	6	7-1/2	6	31-3/16	948.1	1,748	718,600	2,183	955,010	-	-
88	*2,235*	11-1/8	12-1/2	17	6	7-1/2	6	31-15/16	992.7	1,842	805,280	2,308	1,070,600	-	-
90	*2,286*	11-7/8	13-1/4	18-1/4	6	8	6	32-5/8	1,038.3	2,048	903,200	2,547	1,199,900	-	-
92	*2,337*	11-7/8	13-1/4	18-1/4	6	8	6	33-3/8	1,085.0	2,150	1,003,950	2,683	1,338,260	-	-
94	*2,388*	11-7/8	13-1/4	18-1/4	6	8	6	34-1/16	1,132.7	2,256	1,119,400	2,825	1,488,200	-	-
96	*2,438*	11-7/8	13-1/4	18-1/4	6	8	6	34-13/16	1,181.4	2,263	1,238,750	2,869	1,648,600	-	-

TRAWLER

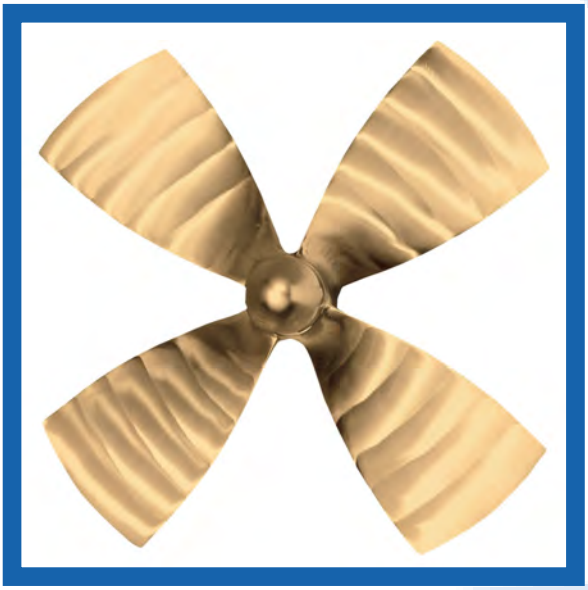
Specifications

0.44 E.A.R. - Diameter Range: 36” - 72”

The Trawler series gives four blade performance without reduced diameter, and is primarily used on shrimp boats, trawlers and similar vessels that need thrust and smooth running performance.

Available Alloys

BR NI



KAPLAN

Specifications

Standard 0.56 E.A.R.; 0.71 E.A.R.

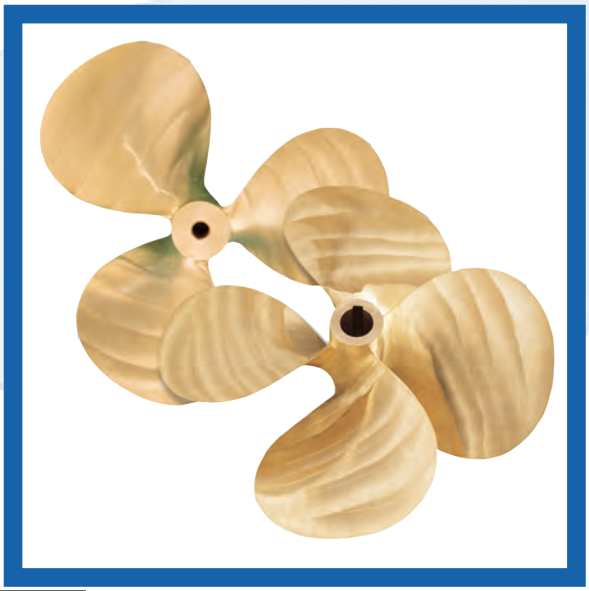
Diameter Range: 35” - 95”

Custom & Skewed Configurations Available

The Kaplan propeller is designed for hard-working trawlers, draggers and tugs. The Kaplan is manufactured to operate in a nozzle and the design includes air foil sections at inner radii, and flat face ogival sections at outer radii.

Available Alloys

BR NI SS



MAXIMA

Specifications

0.63 E.A.R. - 3 Blade

0.836 E.A.R. - 4 Blade

Diameter Range: 32” x 50”

The heavy-duty blade thickness distribution makes the Maxima the most durable commercial offering. The blade design is wider than the standard for applications that require maximum thrust, including: moderate-speed crew supply; high horsepower applications; and passenger boats requiring maximum thrust.

Available Alloys

BR NI

Trawler Specifications (0.44 E.A.R.)

Diameter		Hub Dimensions (Inches)			Standard Taper Bore (Inches)			Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	*WR² (lbs.-in²)
Inches	MM	Aft End	Forward End	Length	Minimum Bore	Maximum Bore	Pilot Bore				
36	*914*	4-7/16	5-1/16	7	2-1/2	3-1/4	2-1/2	8-1/2	108.8	145	9,900
38	*965*	4-7/16	5-1/16	7	2-1/2	3-1/4	2-1/2	9	121.2	160	12,200
40	*1,016*	4-7/16	5-1/16	7	2-1/2	3-1/4	2-1/2	9-1/2	134.4	187	15,800
42	*1,067*	4-3/4	5-1/2	8	2-3/4	3-1/2	2-3/4	10	148.2	221	20,600
44	*1,118*	4-3/4	5-1/2	8	2-3/4	3-1/2	2-3/4	10-3/8	162.6	248	25,400
46	*1,168*	4-3/4	5-1/2	8	2-3/4	3-1/2	2-3/4	11	177.6	284	31,700
48	*1,219*	6	6-3/4	9	3	4	3	11-3/8	193.6	322	39,300
50	*1,270*	6	6-3/4	9	3	4	3	11-7/8	210.0	370	49,000
52	*1,321*	6	6-3/4	9	3	4	3	12-3/8	227.4	402	57,500
54	*1,372*	6-9/16	7-3/8	10-3/4	3-1/2	4-1/2	3-1/2	12-3/4	244.8	451	69,500
56	*1,422*	6-9/16	7-3/8	10-3/4	3-1/2	4-1/2	3-1/2	13-1/4	273.2	496	82,000
58	*1,473*	6-9/16	7-3/8	10-3/4	3-1/2	4-1/2	3-1/2	13-3/4	282.8	546	97,000
60	*1,524*	6-9/16	7-3/8	10-3/4	3-1/2	4-1/2	3-1/2	14-1/4	302.2	587	112,000
62	*1,575*	7-5/8	8-3/8	11-1/2	4	5	4	14-5/8	322.4	642	130,500
64	*1,626*	7-5/8	8-3/8	11-1/2	4	5	4	15-1/8	343.9	693	150,000
66	*1,676*	7-5/8	8-3/8	11-1/2	4	5	4	15-5/8	365.8	783	181,000
68	*1,727*	8	9	13-1/4	4	5-1/2	4	16-1/8	388.0	887	217,800
70	*1,778*	8	9	13-1/4	4	5-1/2	4	16-5/8	411.8	991	257,000
72	*1,828*	8	9	13-1/4	4	5-1/2	4	17	434.9	1,110	302,000

*WR2 = ±10% in Air (inch squared lbs.) M.W.R. = 0.21 B.T.F. = 32" - 34" Dia = 0.036
36" - 60" Dia = 0.038
62" - 70" Dia = 0.042

Kaplan Specifications (0.56 E.A.R.)

Diameter		Hub Dimensions (Inches)			Standard Taper Bore (Inches)			Maximum Blade Width (Inches)	Expanded Area Per Blade (sq.in)	Approx. Net Weight (lbs.)	*WR² (lbs.-in²)
Inches	MM	Aft End	Forward End	Length	Minimum Bore	Maximum Bore	Pilot Bore				
35	*889*	4-3/4	5-1/2	7-1/2	2-1/2	3-1/2	2-1/2	10-9/16	135	117	6,650
39	*991*	5-1/16	5-13/16	8	2-3/4	3-3/4	2-3/4	11-3/4	167	154	11,300
43	*1,090*	5-1/4	6	8-1/4	2-3/4	3-3/4	2-3/4	12-7/8	203	196	18,240
45	*1,140*	6	6-3/4	10	3	4	3	13-9/16	222	246	23,220
47	*1,190*	6	6-3/4	10	3	4	3	14-3/16	243	269	28,650
51	*1,300*	6-9/16	7-3/8	10-3/4	3-1/2	4-1/2	3-1/2	15-3/8	286	341	43,110
53	*1,350*	6-9/16	7-3/8	10-3/4	3-1/2	4-1/2	3-1/2	15-7/8	309	371	51,920
55	*1,400*	7-5/8	8-3/8	11-1/2	4	5	4	16-5/8	333	445	63,600
59	*1,500*	7-5/8	8-3/8	12	4	5	4	17-3/4	383	521	89,230
63	*1,600*	9	10	13-1/4	4	6	4	19-3/16	436	701	126,330
67	*1,700*	10-1/2	11-3/4	14-1/2	5	7	5	20-5/8	494	907	175,980
71	*1,800*	10-1/2	11-3/4	14-1/2	5	7	5	21-11/16	554	1,011	231,530
75	*1,905*	10-1/2	11-3/4	14-1/2	5	7	5	22-3/4	618	1,128	300,500
79	*2,006*	11-1/8	12-1/2	17	6	7-1/2	6	24	687	1,350	391,360
83	*2,108*	11-1/8	12-1/2	17	6	7-1/2	6	25-1/16	758	1,493	495,870
87	*2,209*	11-1/8	12-1/2	17	6	7-1/2	6	26-1/8	832	1,650	621,740
91	*2,311*	11-7/8	13-1/4	18-1/4	6-1/2	8	6-1/2	27-7/16	911	1,915	780,850
95	*2,413*	11-7/8	13-1/4	18-1/4	6-1/2	8	6-1/2	28-1/2	993	2,104	961,860

*WR2 = ±10% in Air (inch squared lbs.)
Greater area ratios available and quoted upon request. For use in commercial Kort Nozzle applications, resulting in 25-50% increased thrust compared to an open wheel, on low speed trawlers, draggers, and harbor tugs.

Michigan Wheel's objective in appreciating and effecting 'state of the art' propeller design and manufacture is to provide vessel owners with propellers that meet or exceed the design objectives of the designer and builder.

Photo Courtesy of Westport Yachts

FEDERAL
PROPELLERS

FEDERAL MANUFACTURING

ENGINEERED MANUFACTURING PROCESSES ARE EMPLOYED IN MANUFACTURING FEDERAL PROPELLERS TO SPECIFIC TOLERANCES.

PROCESS

Control

Each segment of manufacture has strict control and documentation. This control assures that the end product will result in close interpretation of design. The specific design and tolerance level created for the propellers on a particular application is determined by design expectations and analytical modeling of those expectations. The control level of manufacture, particularly in the NC machine finished propeller product, calls into question the use of gages to verify aspects that are programmed into the manufacture.

Tolerance

Federal Propellers are manufactured to close tolerance. Aspects of the manufacture meet the recognizable standard of ISO-484/2, Class 1 and Class S. The intent of establishing tolerance on Federal Propellers is to address the features most critical to end performance. 100% compliance with ISO standards, including development of specific thickness and edge gages, is exceptional.

Certifications


ABS

CERTIFICATE OF
CASTING FACILITY AND PROCESS APPROVAL

MICHIGAN WHEEL CORPORATION,
GRAND RAPIDS, MICHIGAN

| ABS Certification

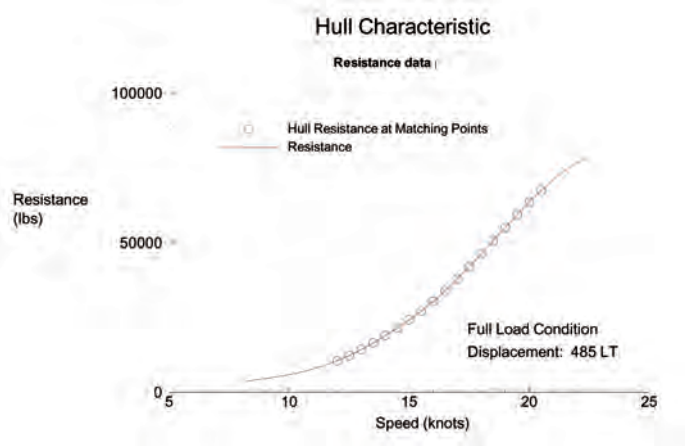
| Lloyd's Register

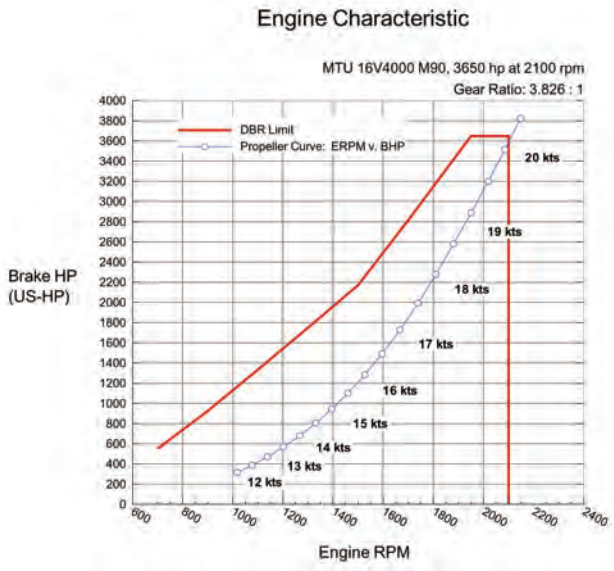
Photo Courtesy of Westport Yachts

DESIGN CONSIDERATIONS

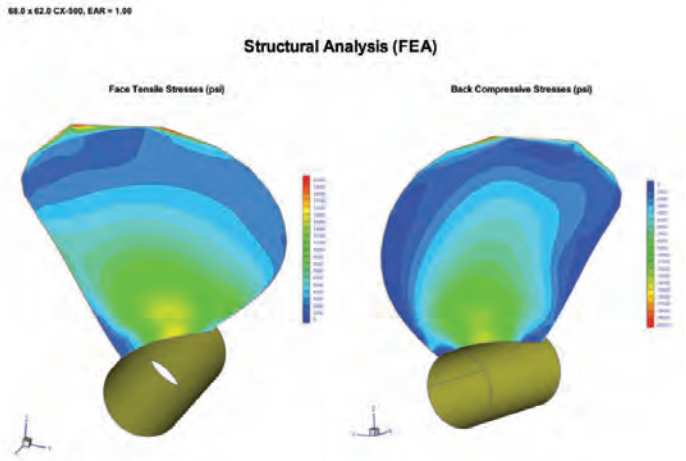
In working with builders, the Federal design team utilizes a number of tools and programs to optimize suggested propeller design.

Hull and Engine characteristics are plotted against data provided by the builder/boat designer and the engine companies:





Consideration is given to the stresses on the propeller, in design:



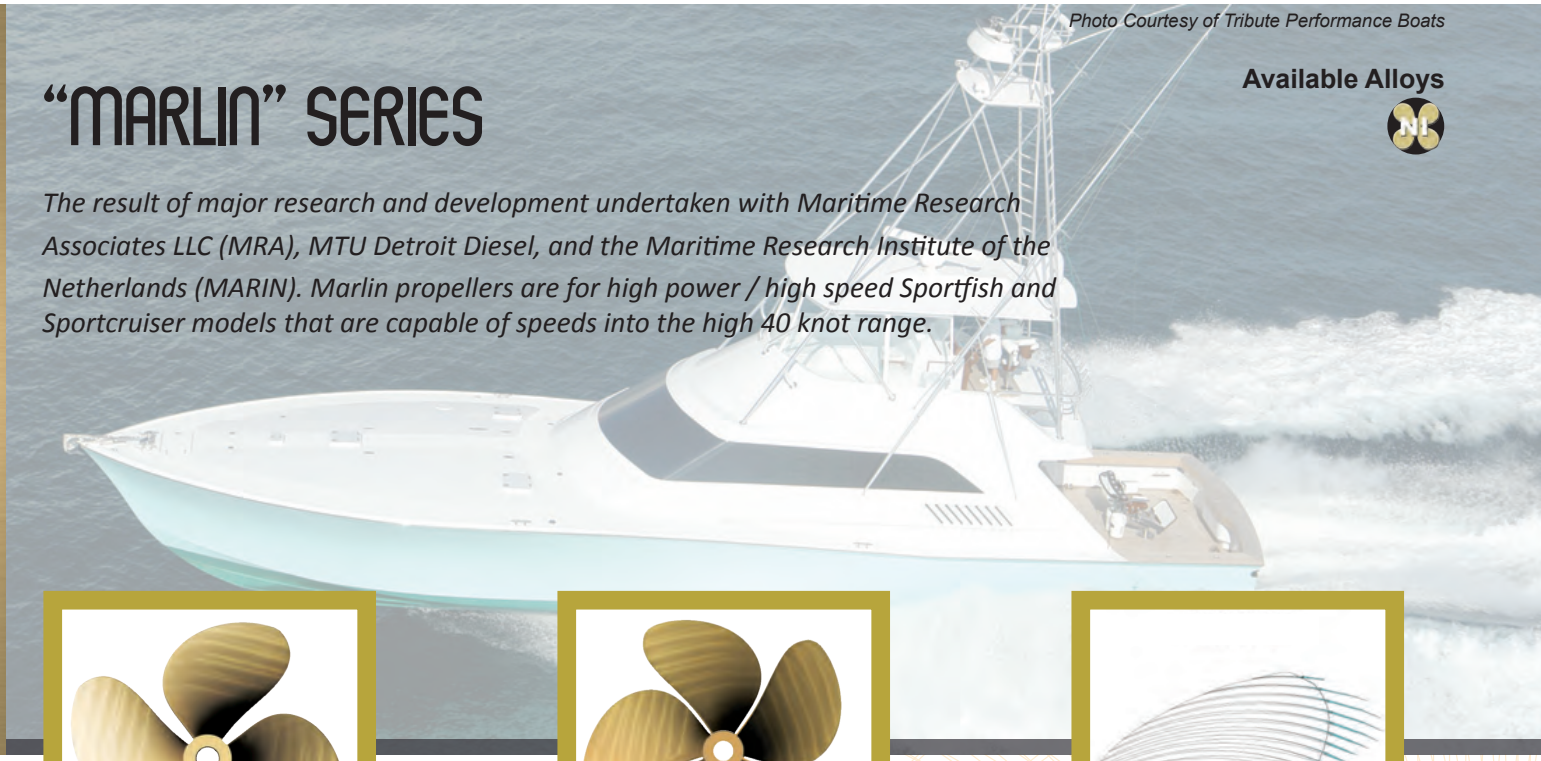
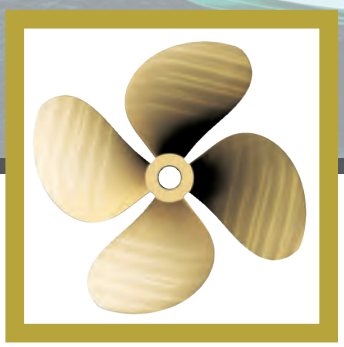


Photo Courtesy of Tribute Performance Boats

"MARLIN" SERIES

Available Alloys

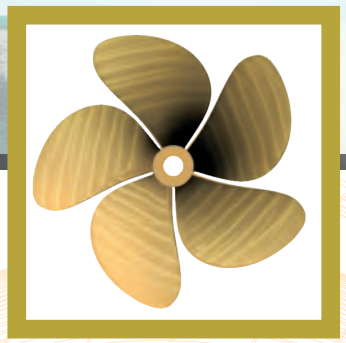
The result of major research and development undertaken with Maritime Research Associates LLC (MRA), MTU Detroit Diesel, and the Maritime Research Institute of the Netherlands (MARIN). Marlin propellers are for high power / high speed Sportfish and Sportcruiser models that are capable of speeds into the high 40 knot range.



MARLIN 4

Specifications

0.825 - 0.90 E.A.R.



MARLIN 5

Specifications

0.90 - 1.05 E.A.R.

DESIGN CAVITATION PATTERN

(Looking Spanwise: Hub to Tip)

The Marlin Series is the result of a major research and development program undertaken with the Maritime Research Associates LLC (MRA), MTU Detroit Diesel, and the Maritime Research Institute of the Netherlands (MARIN). The applications are for high power / high speed Sportfish and Sportcruiser models that are capable of speeds into the high 40 knot range.

This series is primarily for new construction, involving Michigan Wheel at design, where consideration can be given to best appreciate of MARLIN configuration. The Marlin propellers in 4-blade will range from 0.825 to 0.90 E.A.R., and 0.90 to 1.05 E.A.R. in 5-blade.

The Marlin Series design features variable pitch, camber, skew, and a degree of rake. All Marlin propellers are fully CNC machine finished to high tolerance. The purpose of the series, beyond optimizing performance, is to manage cavitation.

Photo Courtesy of Tiara Yachts

"Y" SERIES

Available Alloys

Semi-custom series that offers many features and benefits of a full-custom propeller with the economics of series manufacture.

The "Y" is evolved from years of custom propeller design experiences. All "Y" propellers are fully CNC machine finished.

EPY

Specifications
0.66 E.A.R.

EQY

Specifications
0.835 E.A.R.

CY5

Specifications
0.935 E.A.R.

The chosen combination of blade area and skew in this series, along with variable pitch and camber, make for a close efficiency match throughout the entire engine power curves. Years of propeller design experience have allowed Michigan Wheel naval architects to optimize the "Y" design to maximize the performance of virtually all planing hulls. Increasingly, boat builders are choosing to install the "Y" series as standard equipment after appreciating the difference in sea trials compared to less sophisticated product.

Each EPY, EQY, and CY5 propeller is manufactured to exacting specifications, and inspected using the latest digital technology. Each propeller is given a serial number, permitting design and inspection data to be retrieved and reviewed for field service.

Photo Courtesy of Trinity Yachts LLC

"CX" SERIES

Available Alloys

BR NI

The best possible choice for propeller performance - Better cruise speed, better acceleration, improved fuel economy, and smoother, quieter operation.

The use of CNC machining and inspection technology ensures that every CX propeller is manufactured as designed. This process results in consistent and repeatable propeller manufacture, so replacement sets or spares will match the original.

Michigan Wheel naval architects can design a custom propeller for your specific application. Using vessel data and performance targets provided by the custom, a propeller with the optimum combination of diameter, pitch, blade count, blade area, and camber is designed to maximize the performance of each yacht that is evaluated. All CX propellers are completely CNC machined to exacting specifications.

Michigan Wheel design and sales teams work closely with designers, yacht builders, propeller shops and owners to qualify optimal propellers for any given application. Michigan Wheel engineers use the latest in propeller design technology to design each propeller, including custom propeller geometry design code and sophisticated hydrodynamic analysis software. This allows the designer to maximize propeller efficiency while minimizing the performance robbing effects of cavitation. This is particularly important as engine horsepower and boat speeds continue to increase.

Every new CX Series propeller is given a 5-digit serial number, which gives customer service and repair agents a detailed history for a particular propeller. Field service requires sophisticated computerized propeller measurement equipment, i.e. Hale MRI, which can appreciate the original design and apply to any rework necessary. Michigan Wheel representatives work with repair facilities providing the necessary assistance to resolve propeller related issues.

"HX" SERIES

The Federal HX Series offers high tolerance hand finished propeller manufacture in a variety of design configurations. This series is primarily constant pitch, with expanded area ratios. High horsepower pleasure and commercial applications require specific propellers to achieve maximum thrust, speed, and smoothness. The proven pitch geometry yields exceptional performance without the additional cost associated with custom, CNC machined propellers.

"X" SERIES

EPX and EQX are an evolution of the tried and true Equi-Poise and Equi-Quad Series propellers. The designs have been modified to be better suited to highly loaded, limited tip clearance applications. New manufacturing technologies, such as machine finishing, are utilized in manufacture to facilitate accurate and repeatable product. Availability will be size specific, in a range of bores, without or with all degrees of cup.

EQUI-POISE & EQUI-QUAD

The Federal Equi-Poise three blade and Equi-Quad four blade propeller series are for applications that benefit from traditional propeller geometry held to a close tolerance. The proven performance of these designs is enhanced through strict manufacturing controls. Those controls result in closely matched sets that are a step above standard line series propellers. By utilizing a traditional design, Michigan Wheel can supply a vast range of sizes, at good value, with a minimal lead time.

Our commitment to quality begins long before the receipt of your order. Our raw materials are inspected and certified prior to acceptance and our personnel complete extensive training programs. This combination ensures that HyTorq Propellers exhibit the quality, value and dependability that has become the standard.

Photo Courtesy of Sea Ray Corporation

Hy Torq

Propellers

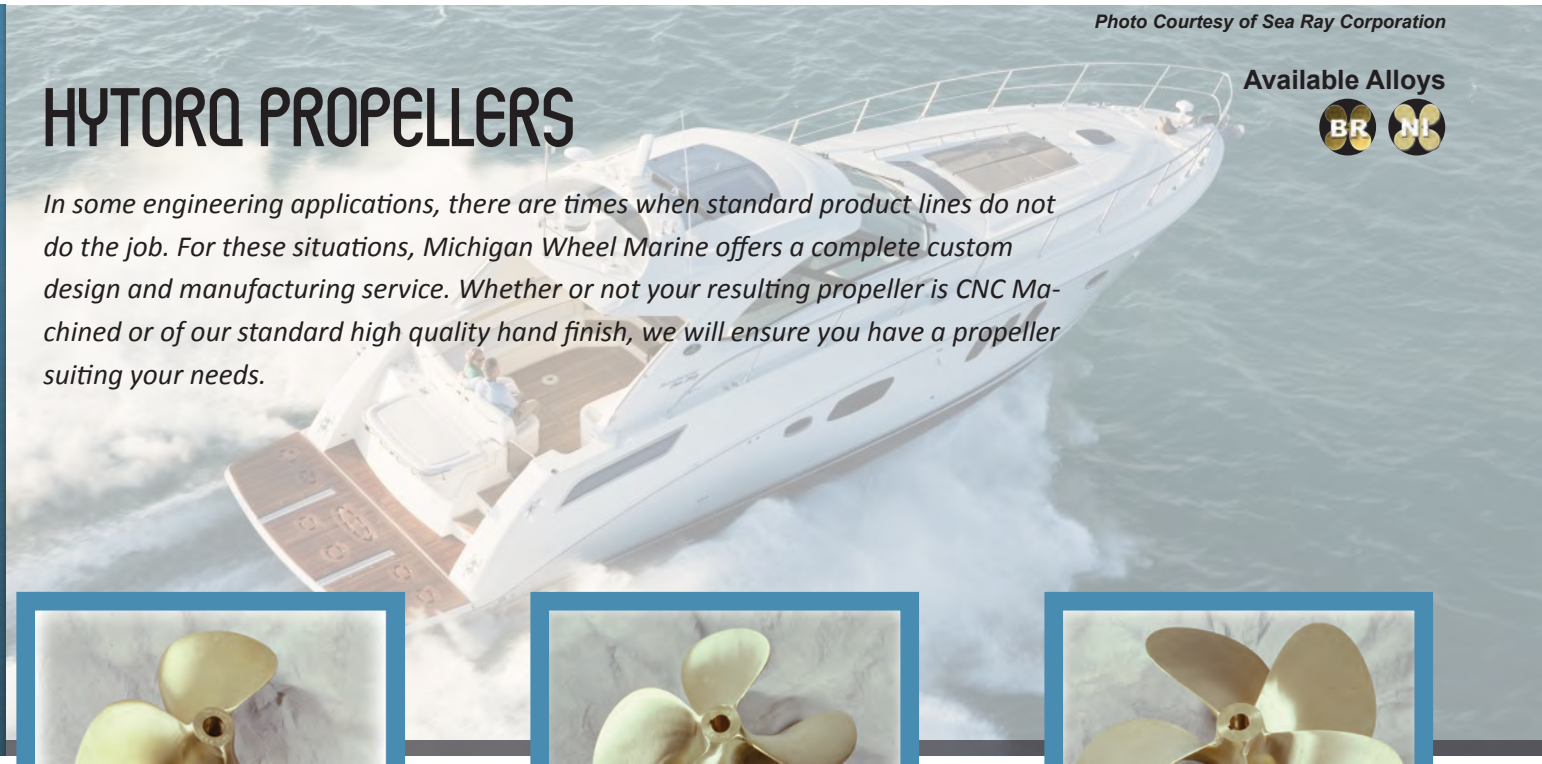


Photo Courtesy of Sea Ray Corporation

HYTORQ PROPELLERS

Available Alloys

BR NI

In some engineering applications, there are times when standard product lines do not do the job. For these situations, Michigan Wheel Marine offers a complete custom design and manufacturing service. Whether or not your resulting propeller is CNC Machined or of our standard high quality hand finish, we will ensure you have a propeller suiting your needs.

MY-T3

The HyTorq MY-T3 is designed for both hard-working fishing boats and pleasure craft captains. Designed to handle today's high-powered engines with ease, the MY-T3 has a large blade area to enhance performance and maneuverability.

MY-T4

Manufactured to the same high quality standard as the HyTorq MY-T3, the MY-T4 is the right choice where greater blade area and super smooth operation are desired.

MY-T5

Many operators are selecting the HyTorq MY-T5 propellers for new construction, repowering, and propeller upgrading. The main reason is to employ more blade area without having to increase propeller diameter, which may not be possible due to clearance or tip speed considerations. Another common reason is to improve propeller performance in installations where heavy vee struts, dead wood, or other hull appendages are agitating the water flow to the propeller.

HyTorq Specifications							HyTorq MY-T3			HyTorq MY-T4		
Propeller Diameter	Aft hub Diameter	Forward Hub Diameter	Hub Length	Standard Taper Bore (Inches)			Weight (LB.)**	Developed Area (IN^2)	WR^{2**} ($LB\text{-}IN^2$)	Weight (LB.)**	Developed Area (IN^2)	WR^{2**} ($LB\text{-}IN^2$)
				Minimum Bore	Maximum Bore	Pilot Bore						
17	2-1/4	2-1/2	3-1/2	1-1/4	1-1/2	1-1/4	16	126.6	333	19	153.1	366
18	2-3/8	2-5/8	3-1/2	1-1/4	1-3/4	1-1/4	17	141.9	392	19	171.7	429
19	2-3/8	2-5/8	3-7/8	1-1/4	1-3/4	1-1/4	19	166.2	478	21	202.7	499
20	2-3/8	2-5/8	4	1-1/4	1-3/4	1-1/4	21	175.3	553	23	212.1	622
21	2-3/4	3	4-1/8	1-3/8	2	1-3/8	27	202.4	680	28	238.6	790
22	2-3/4	3	4-1/4	1-3/8	2	1-3/8	30	212.1	810	31	256.9	940
23	3-1/8	3-1/4	4-1/4	1-1/2	2	1-3/8	35	240.6	1,070	39	288.4	1,300
24	3-1/8	3-1/4	4-5/8	1-1/2	2	1-3/8	35	252.4	1,220	41	305.4	1,450
26	3-3/8	3-5/8	5	1-3/4	2-1/4	1-1/2	50	296.3	1,770	53	358..4	2,150
28	3-3/4	4	5-3/4	1-3/4	2-1/2	1-3/4	57	343.6	2,630	66	415.6	3,240
30	4	4-1/4	6	1-3/4	2-3/4	1-3/4	78	394.4	3,520	82	477.1	4,230
32	4-1/4	4-1/2	6	2	3	2	94	448.8	4,810	100	542.9	5,960
34	4-1/4	4-1/2	6-1/2	2	3	2	107	506.6	6,460	140	612.8	8,020
36	4-3/4	5-1/4	8-1/4	2-3/4	3-1/2	2-1/2	130	567.7	8,910	146	686.7	11,230
38	5-1/4	5-1/2	8-1/4	2-3/4	3-1/2	2-1/2	-	-	-	172	765.2	13,750
40	5-1/4	5-1/2	9	3	3-3/4	3	-	-	-	192	847.8	17,180
42	5-1/2	6	10-1/2	3	4	3	-	-	-	240	930.2	24,400
44	5-1/2	6-1/4	10-1/2	3	4	3	-	-	-	282	1,025.8	31,500
46	5-1/2	6-1/4	10-1/2	3	4	3	-	-	-	304	1,121.0	37,000
48	5-1/2	6-1/4	10-1/2	3	4	3	-	-	-	340	1,121.0	45,800

HyTorq Specifications							HyTorq MY-T5		
Propeller Diameter	Aft hub Diameter	Forward Hub Diameter	Hub Length	Standard Taper Bore (Inches)			Weight (LB.)**	Developed Area (IN^2)	WR^{2**} ($LB\text{-}IN^2$)
				Minimum Bore	Maximum Bore	Pilot Bore			
24	3-1/8	3-1/4	4-5/8	1-1/2	2	1-3/8	57	384	1,990
26	3-3/8	3-5/8	5	1-3/4	2-1/4	1-1/2	72	451	3,115
28	3-3/4	4	5-3/4	1-3/4	2-1/2	1-3/4	79	523	3,967
30	4	4-1/4	6	1-3/4	2-3/4	1-3/4	109	601	6,480
32	4-1/4	4-1/2	6	2	3	2	150	683	8,847
34	4-1/4	4-1/2	6-1/2	2	3	2	180	772	11,985
36	4-3/4	5-1/4	8-1/4	2-3/4	3-1/2	2-1/2	210	864	15,676
38	5-1/4	5-1/2	8-1/4	2-3/4	3-1/2	2-1/2	240	964	19,961
40	5-1/4	5-1/2	9	3	3-3/4	3	260	1,068	23,961
42	5-1/2	6	10-1/2	3	4	3	325	1,177	33,022
44	5-1/2	6-1/4	10-1/2	3	4	3	370	1,291	41,260
46	5-1/2	6-1/4	10-1/2	3	4	3	410	1,412	49,975

Evolution of the Wheel

With over a century of history, despite several ownership and name changes, despite industry downturns and upturns, Michigan Wheel Marine has remained a reliable and dedicated supplier of marine propellers to the recreational and commercial marine industry.

Today, Michigan Wheel Marine offers tens of thousands of variations of propellers, and still retains its leadership position in original equipment and aftermarket propeller supply. The “Michigan” and “Federal” names are recognized and demanded world wide. Much credit goes to its loyal and supportive distributor and builder base, and its own dedicated employees. Our extensive history with marine propulsion has provided Michigan Wheel Marine with a solid foundation from which to continue meeting marine industry demands in the future.

Michigan Wheel Founded
1903
Michigan Wheel organized as a machine shop for the production of a variety of items, including marine propellers.

Propeller Concentration
1934
By 1934 the company’s main activity was concentrated on the marine propeller field, concentrating on commercial vessel and industrial activity.

Hall & Stavert Founded
1934
Founded in 1934 as a two-man partnership, Hall & Stavert would grow to become the largest propeller manufacturer in Canada.

War Years Growth
1940s
Real growth began with the war years, when military requirements demanded the “know-how” that Michigan Wheel had developed. After the war, recreational boating grew by leaps and bounds, and the Michigan Wheel Company was among the leaders in supplying propellers for a growth industry.

Federal Propellers
1949
Michigan Wheel Company purchased Federal Propellers, uniting the primary suppliers of recreational propellers. With a combined volume in production, Michigan Wheel Company is able to incorporate efficient manufacturing process.

1900 1910 1920 1930 1940 1950

Sea Ray · Marquis Yachts · Trinity Yachts · Tiara Yachts · Hatteras

Expansion
2010-2011

Michigan Wheel opens wholly owned facility in Dubai, United Arab Emirates. Aquires UK bearing manufacturer, Shearwater Marine, and introduces Aqualube to the American marketplace.

International Presence
1950s

Michigan Wheel expands marketing globally. Further develop international distributor network.

Michigan Wheel Corp.
1970s

In the 1970's, the Michigan Wheel Company becomes Michigan Wheel Corporation, and enters a period of acquisition to enhance the range of propeller product offered.

HyTorq Propellers
1997

Michigan Wheel acquires Canadian propeller competitor Hall & Stavert, manufacturer of the HyTorq Propeller line.

Michigan Wheel Marine
2009

Michigan Wheel Corporation is reorganized under new ownership as Michigan Wheel Marine.

Sterndrive Propulsion
1960s

In the 1960's, Michigan Wheel Company kept pace with the industry in offering propellers for the then new sterndrive propulsion packages.

Automated Finishing
1980s

Automated finishing equipment for stainless steel propellers, and computer controlled milling machines gained favor, and Michigan Wheel Corporation is among the first to take advantage of such new technologies. Michigan's CAD-CAM abilities are unsurpassed in the ranks of propeller manufacturers.

GOLD Line
2005

Michigan Wheel - Europe launches a new range of quality inboard propellers - GOLD Line.

GOLD LINE

1960 1970 1980 1990 2000 2010

WESTPORT Catalina Yachts CARVER YACHTS Henriques KVICHAK MARINE INDUSTRIES

Manufacturing Process

Michigan Wheel Marine has one goal - to produce the finest propellers possible, while maintaining the highest standards of quality.

Michigan Propeller standard series offerings are available, affordable,and readily repairable. Stocking distributors throughout North American and Europe carry a wide variety of diameter and pitch ranges.

For immediate availability worldwide, Michigan Propellers a highly successful “field needs” service at no charge. This service locates a propeller in our distributors’ stock to meet a customer’s needs. Michigan Wheel Marine also has extensive experience in handling custom orders and in product export.

No matter the desired propeller, Michigan Wheel either has an existing design and casting pattern in its extensive inventory, or is able to design a brand new propeller and tooling needed, with custom specifications if necessary. High quality propeller castings are produced in Michigan Wheel special alloys by rigorously controlling the sand molding and metal melting processes. Propeller finishing is done by CNC high speed machining and experienced hand craftsmanship.

Modern, high quality, and specially designed equipment is used throughout the machining and finishing processes of Michigan Propellers. Through every step of the propeller manufacturing process, a variety of modern inspection equipment is used to carefully measure aspects of pitch, spacing and track. All propellers receive a final inspection to insure complete compliance with Michigan Wheel’s high tolerance specifications.

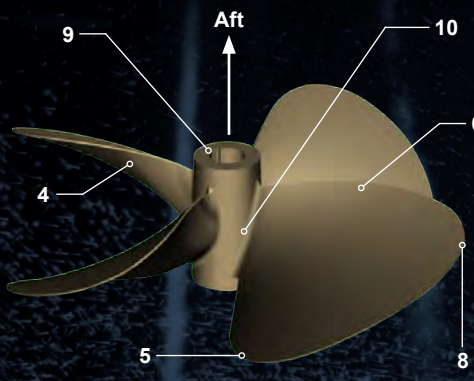
For decades, propeller repair facilities throughout North America, Europe, and other areas of the world have worked on Michigan Propellers. Authorized repair facilities have extensive knowledge on Michigan Wheel Marine's propeller designs and are experts at reconditioning and repair of Michigan Wheel Propellers. For your propeller service, be sure that the shop you choose is Michigan Wheel authorized; contact Michigan Wheel Marine for the location nearest you.

Photo Courtesy of Westport Yachts

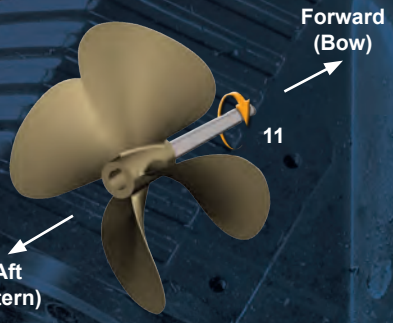
Photo Courtesy of Trinity Yachts LLC

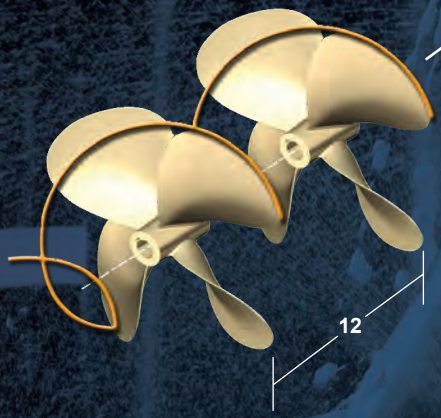
Propeller Terms & Definitions

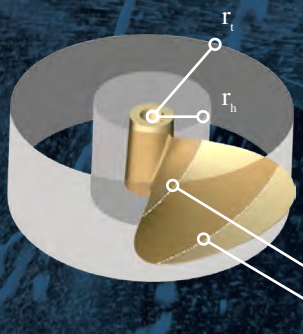
NO.	TERM	DEFINITION
1.	Diameter	The diameter of the imaginary circle scribed by the blade tips as the propeller rotates.
2.	Radius	The distance from the axis of rotation to the blade tip. The radius multiplied by two is equal to the diameter.
3.	Blade Face	Pressure side; Pitch side. Aft side of the blade (surface facing the stern).
4.	Blade Back	Suction side. Forward side of the blade (surface facing the bow).
5.	Leading Edge	The edge of the propeller blade adjacent to the forward end of the hub. When viewing the propeller from astern, this edge is furthest away. The leading edge leads into the flow when providing forward thrust.
6.	Trailing Edge	The edge of the propeller adjacent to the aft end of the hub. When viewing the propeller from astern, this edge is closest. The trailing edge retreats from the flow when providing forward thrust.
7.	Blade Number	Equal to the number of blades on the propeller.
8.	Blade Tip	Maximum reach of the blade from the center of the hub. Separates the leading and trailing edges.
9.	Hub	Solid cylinder located at the center of the propeller. Bored to accommodate the engine shaft. Hub shapes include cylindrical, conical, radius & barreled.
10.	Blade Root	Fillet area. The region of transition from the blade surfaces and edges to the hub periphery. The area where the blade attaches to the hub.
11.	Rotation	When viewed from the stern (facing forward): Right-Hand propellers rotate clockwise to provide forward thrust. Left-Hand propellers rotate counter-clockwise to provide forward thrust. (Right-Hand shown.)
12.	Pitch	The linear distance that a propeller would move in one revolution with no slippage.
13.	Cylindical Section	A cross section of a blade cut by a circular cylinder whose centerline is the propeller axis of rotation.
14.	Pitch Reference Line	Reference line used to establish the geometric pitch angle for the section. This line may pass through the leading and trailing edges of the section and may be equivalent to the chord line.
15.	Geometric Pitch Angle	The angle between the pitch reference line and a line perpendicular to the propeller axis of rotation.
16.	Controllable Pitch Propeller	The propeller blades mount separately to the hub, each on an axis of rotation, allowing a change of pitch in the blades and thus the propeller.
17.	Fixed Pitch Propeller	The propeller blades are permanently mounted and do not allow a change in the propeller pitch.
18.	Constant Pitch Propeller	The propeller blades have the same value of pitch from root to tip and from leading edge to trailing edge.
19.	Variable Pitch Propeller	The propeller blades have sections designed with varying values of local face pitch to pitch.
20.	Rake	The fore or aft slant of a blade with respect to a line perpendicular to the propeller axis of rotation.
20a.	Aft Rake	Positive rake. Blade slants toward aft end of hub.
20b.	Forward Rake	Negative rake. Blade slants towards forward end of hub.
21.	Track	The absolute difference of the actual individual blade height distributions to the other blade height distributions. Always a positive value and represents the spread between individual blade height distributions.
22.	Skew	The transverse sweeping of a blade such that viewing the blades from fore or aft shows an asymmetrical shape.
22a.	Aft Skew	Positive skew. Blade sweep in direction opposite of rotation.
22b.	Forward Skew	Negative skew. Blade sweep in same direction as rotation.
23.	Cup	Small radius of curvature located on the trailing edge of blade.



7. Blade Number = 4

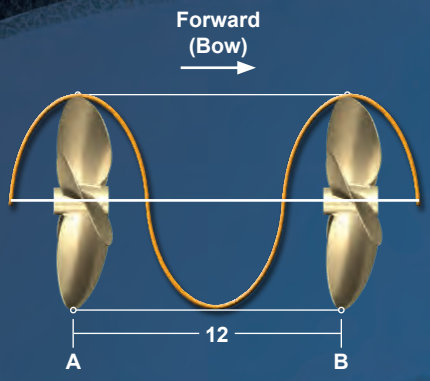


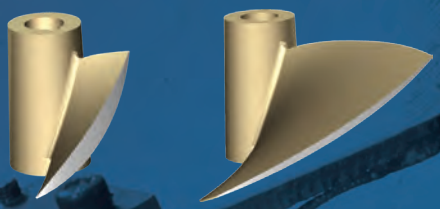


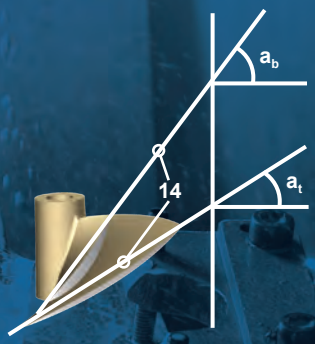


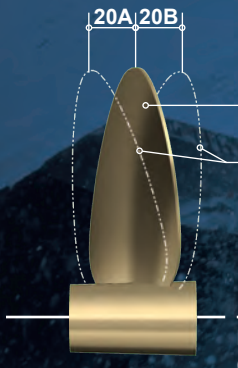
r_h = The radius of a cutting cylinder near the hub. The cylandrical section near the hub is located on the surface of this cylinder.

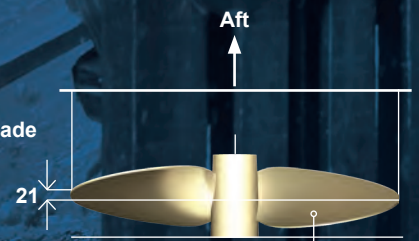
r_t = The radius of a cutting cylinder near the tip. The cylandrical section near the tip is located on the surface of this cylinder.

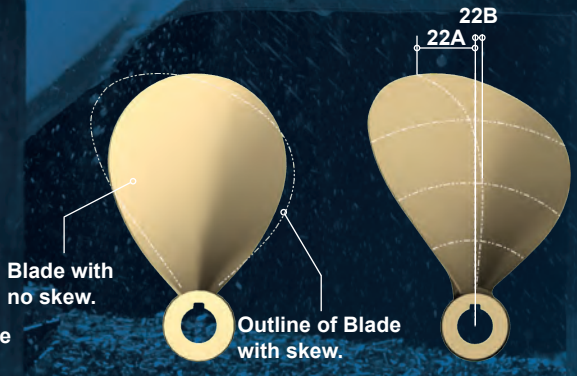








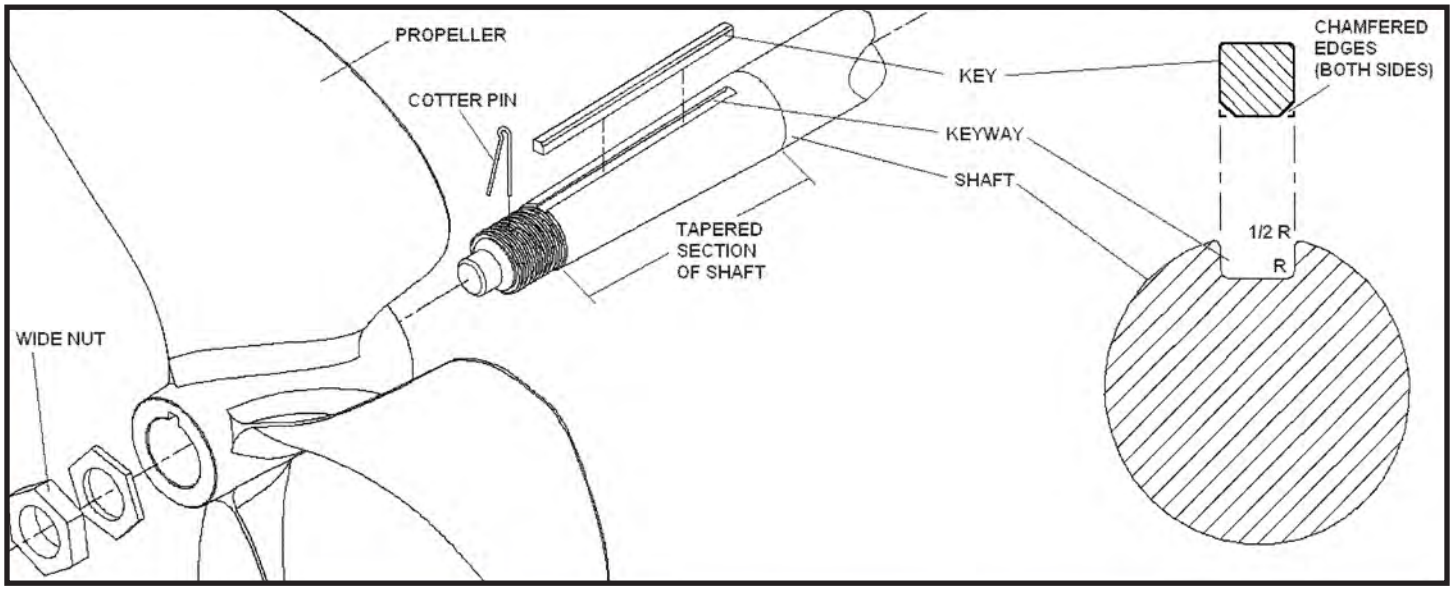




INBOARD PROPELLER INSTALLATION PROCEDURES

1. Push propeller snugly onto shaft taper WITHOUT key in either keyway (propeller or shaft).
2. Make sure the propeller is snug and there is no side to side movement by gently moving propeller back and forth.
3. Make a line on the shaft with a non-graphite marker at the forward end of the propeller where it stops up against the shaft taper.
4. Remove propeller.
5. Put key into keyway on shaft taper with radiused or chamfered corners (down) in shaft keyway (if propeller shaft keyway has radiused corners.)
6. Put propeller onto shaft taper.
7. Check to see that the propeller moves back to the forward line made in Step 3. If it does, skip to Step 8. If not, perform the following:
    a. Remove propeller from shaft.
    b. Place a file on a flat surface area or work bench.
    c. Run opposite end of chamfered key back and forth over file (to remove any burrs) with a downward pressure on key until side being filed is clean.
    d. Install cleaned key in shaft keyway with chamfered corner side down in shaft (the cleaned, filed side up in keyway).
    e. Replace the propeller on the shaft and fit snugly on taper. Check to see if it reaches the line made as in Step 7. If it does not line up, repeat Steps 7a through 7e.

    Note: A vise can be used to hold key and then filed, but care must be taken not to tighten too much, causing burrs and irregularities on key.
8. When propeller hub moves to correct position, install propeller nut on shaft and torque to seat the propeller. Install the torque jam nut also, if your shaft is so equipped.
9. Install cotter pin at end of the shaft.



Michigan propellers

APPROVED S.A.E. STANDARD DIMENSIONS FOR SHAFTS 3/4 TO 3 INCHES IN DIAMETER

Nom Shaft Diameter	Diameter Small End B		Taper Length	Keyway Width D			Keyway Side Depth (i) E			Keyway Fillet Radius (ii)	Thread (iii) F		End of Taper to End of Thread	Ext. Beyond taper	Undercut		Dia. of Pin End	Length of Pin End	Cotter-Pin Hole		Cotter-Pin Q		Nuts (iv) T	W	Keyway Length
A	Min.	Max.	C	Nom	Min	Max	Nom	Min	Max	R	Dia	Tpi	G	H	J	K	L	M	N	(Drill) P	Nom Dia	Length	Size	Plain Thick	Jamb Thick	X
3/4	0.624	0.626	2	3/16	0.1865	0.1875	3/32	0.095	0.097	1/32	1/2	13	1-1/16	1-5/16	25/64	1/8	3/8	1/4	1-9/64	9/64	1/8	3/4	1/2 - 13	1/2	5/16	1-1/2
7/8	0.726	0.728	2-3/8	1/4	0.249	0.250	1/8	0.125	0.127	1/32	5/8	11	1-1/4	1-1/2	31/64	1/8	7/16	1/4	1-21/64	9/64	1/8	3/4	5/8 - 11	5/8	3/8	1-25/32
1	0.827	0.829	2-3/4	1/4	0.249	0.250	1/8	0.125	0.127	1/32	3/4	10	1-7/16	1-3/4	19/32	1/8	1/2	5/16	1-33/64	9/64	1/8	1	3/4 - 10	3/4	7/16	2-1/8
1-1/8	0.929	0.931	3-1/8	1/4	0.249	0.250	1/8	0.125	0.127	1/32	3/4	10	1-7/16	1-3/4	19/32	1/8	1/2	5/16	1-33/64	9/64	1/8	1	3/4 - 10	3/4	7/16	2-1/8
1-1/4	1.030	1.032	3-1/2	5/16	0.3115	0.3125	5/32	0.157	0.160	1/16	7/8	9	1-5/8	2	23/32	1/8	5/8	3/8	1-23/32	11/64	5/32	1-1/4	7/8 - 9	7/8	1/2	2-13/16
1-3/8	1.132	1.134	3-7/8	5/16	0.3115	0.3125	5/32	0.157	0.160	1/16	1	8	1-13/16	2-1/4	13/16	1/8	3/4	7/16	1-29/32	11/64	5/32	1-1/2	1 - 8	1	9/16	3-3/16
1-1/2	1.233	1.235	4-1/4	3/8	0.374	0.375	3/16	0.189	0.192	1/16	1-1/8	7	2	2-7/16	29/32	3/16	7/8	7/18	2-3/32	11/64	5/32	1-1/2	1-1/8 - 7	1-1/8	5/8	3-1/2
1-3/4	1.437	1.439	5	7/16	0.4365	0.4375	7/32	0.219	0.222	1/16	1-1/4	7	2-1/4	2-3/4	1-1/32	3/16	1	1/2	2-23/64	13/64	3/16	1-3/4	1-1/4 - 7	1-1/4	3/4	4-7/32
2	1.640	1.642	5-3/4	1/2	0.499	0.500	1/4	0.251	0.254	1/16	1-1/2	6	2-5/8	3-1/8	1-1/4	3/16	1-1/4	1/2	2-47/64	13/64	3/16	2	1-1/2 - 6	1-1/2	7/8	4-15/16
2-1/4	1.843	1.845	6-1/2	9/16	0.5610	0.5625	9/32	0.281	0.284	3/32	1-3/4	5	3	3-1/2	1-3/8	3/16	1-3/8	1/2	3-9/64	17/64	1/4	2-1/4	1-3/4 - 5	1-3/4	1	5-5/8
2-1/2	2.046	2.048	7-1/4	5/8	0.6235	0.625	5/16	0.312	0.315	3/32	1-3/4	5	3	3-1/2	1-7/16	3/16	1-7/16	1/2	3-9/64	17/64	1/4	2-1/4	1-3/4 - 5	1-3/4	1	6-3/32
2-3/4	2.254	2.259	7-7/8	5/8	0.6235	0.625	5/16	0.313	0.316	3/32	2	4-1/2	3-1/2	4	1-11/16	1/4	1-11/16	1/2	3-41/64	17/64	1/4	2-1/2	2 - 4-1/2	2	1-1/8	6-21/32
3	2.460	2.462	8-5/8	3/4	0.7485	0.750	5/16	0.311	0.314	3/32	2-1/4	4-1/2	3-7/8	4-3/8	1-15/16	1/4	1-15/16	1/2	4-1/64	17/64	1/4	3	2.25 - 4.5	2-1/4	1-1/4	7-11/32

DIMENSIONS OF SHAFTS FROM 3-1/4 TO 8 INCHES IN DIAMETER

Nom Shaft Diameter	Diameter Small End B		Taper Length	Keyway Width D			Keyway Side Depth E			Key-way Fillet Radius	Thread F		End of Taper to End of Thread	Ext. Beyond taper	Undercut		Dia. of Pin End	Length of Pin End	Cotter-Pin Hole		Cotter-Pin Q		Nuts T	W	Sleeve Drive (v) U		Clear-ance	Key-way Length
A	Min.	Max.	C	Nom	Min	Max	Nom	Min	Max	R	Dia	Tpi	G	H	J	K	L	M	N	(Drill) P	Nom Dia	Length	Size	Plain Thick	Jamb Thick	Min	Max	Z	X
3-1/4	2.663	2.665	9-3/8	3/4	0.7485	0.750	5/16	0.311	0.314	1/8	2-1/2	4	4-3/8	5-1/8	2-1/8	3/8	2-1/8	3/4	4-37/64	3/8	3/8	3	2-1/2 - 4	2-1/2	1-1/2	3.870	3.872	3/8	8-1/2
3-1/2	2.866	2.868	10-1/8	7/8	0.8735	0.875	5/16	0.310	0.313	1/8	2-1/2	4	4-3/8	5-1/8	2-1/8	3/8	2-1/8	3/4	4-37/64	3/8	3/8	3	2-1/2 - 4	2-1/2	1-1/2	4.120	4.122	3/8	9-1/4
3-3/4	3.069	3.071	10-7/8	7/8	0.8735	0.875	5/16	0.310	0.313	1/8	2-3/4	4	4-3/4	5-1/2	2-3/8	3/8	2-3/8	3/4	4-61/64	3/8	3/8	3-1/2	2-3/4 - 4	2-3/4	1-5/8	4.369	4.371	3/8	10
4	3.272	3.274	11-5/8	1	0.9985	1.000	5/16	0.309	0.312	1/8	3	4	5-1/8	5-7/8	2-1/2	3/8	2-1/2	3/4	5-21/64	3/8	3/8	3-1/2	3 - 4	3	1-3/4	4.619	4.621	3/8	10-1/2
4-1/2	3.827	3.829	10-3/4	1-1/8	1.123	1.125	3/8	0.373	0.376	5/32	3-1/4	4	5-5/8	6-3/8	2-3/4	3/8	2-3/4	3/4	-	-	-	-	3-1/4 - 4	3-1/4	1-7/8	5.243	5.245	1/2	9-5/8
5	4.249	4.251	12	1-1/4	1.248	1.250	7/16	0.434	0.437	3/16	3-3/4	4	6-3/8	7-1/8	3-1/4	3/8	3-1/4	3/4	-	-	-	-	3-3/4 - 4	3-3/4	2-1/8	5.993	5.995	1/2	10-7/8
5-1/2	4.671	4.673	13-1/4	1-1/4	1.248	1.250	7/16	0.435	0.438	3/16	4	4	6-3/4	7-3/4	3-1/2	1/2	3-1/2	1	-	-	-	-	4 - 4	4	2-1/4	6.492	6.494	1/2	12-1/8
*6	4.791	4.793	14-1/2	1-3/8	1.373	1.375	1/2	0.493	0.496	7/32	4-1/4	4	7-1/2	8-1/2	3-7/8	1/2	3-7/8	1	-	-	-	-	4-1/4 - 4	4-1/4	2-1/4	6.992	6.994	1/2	13-1/4
*6-1/2	5.187	5.189	15-3/4	1-3/8	1.373	1.375	1/2	0.494	0.497	7/32	4-1/2	4	8-1/4	9-1/4	4-3/8	1/2	4-3/8	1	-	-	-	-	4-1/2 - 4	4-1/2	2-1/2	7.492	7.494	1/2	14-3/8
*7	5.582	5.584	17	1-1/2	1.498	1.500	9/16	0.555	0.558	1/4	5	4	9	10	4-7/8	1/2	4-7/8	1	-	-	-	-	5 - 4	5	2-3/4	8.117	8.120	1/2	15-5/8
*7-1/2	5.978	5.980	18-1/4	1-1/2	1.498	1.500	9/16	0.556	0.559	1/4	5-1/2	4	9-3/8	10-3/8	5-1/8	1/2	5-1/8	1	-	-	-	-	5-1/2 - 4	5-1/2	3	8.616	8.619	1/2	16-7/8
*8	6.374	6.376	19-1/2	1-3/4	1.748	1.750	9/16	0.553	0.556	1/4	5-3/4	4	9-3/4	10-3/4	5-3/8	1/2	5-3/8	1	-	-	-	-	5-3/4 - 4	5-3/4	3-1/8	9.240	9.243	1/2	18-1/8

* 6" through 8" shaft has 1 inch per foot taper, 1/12" per inch taper. Angle with centerline is 2° 23' 9".

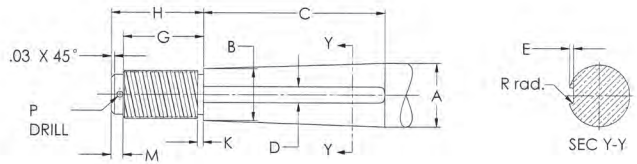
(i) Keyway shall be cut parallel to taper.

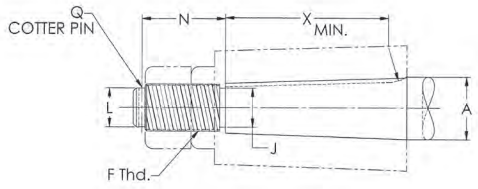
(ii) Fillets are recommended for keyways in shafts through 2" in diameter. Fillets are mandatory for shafts above 2" in diameter.

(iii) Threads are United and American Standard, Class 3A.

(iv) Nuts are to be semi-finished stock, American Standard B18.2.

(v) The shaft sleeve shown is recommended practice, but the use of a sleeve is optional.

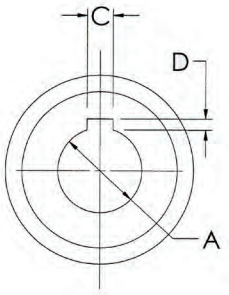


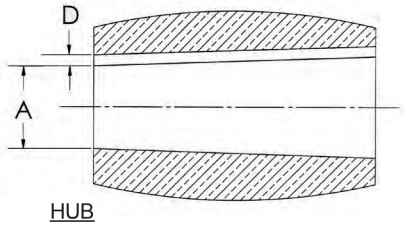


MARINE PROPELLERS HUB BORE DIMENSIONS

Taper: Per Foot = 3/4"
Per Inch = 1/18" Angle with certerline 1° 47' 24"

Std. Taper	Dia. Small End "A"		Keyway Width "C"			Keyway Side Depth "D"		
	Min.	Max.	Nom.	Min.	Max.	Nom.	Min.	Max.
3/4	0.608	0.610	3/16	0.1865	0.1875	3/32	0.098	0.100
7/8	0.710	0.712	1/4	0.249	0.250	1/8	0.129	0.131
1	0.812	0.814	1/4	0.249	0.250	1/8	0.129	0.131
1-1/8	0.913	0.915	1/4	0.249	0.250	1/8	0.129	0.131
1-1/4	1.015	1.017	5/16	0.3115	0.3125	5/32	0.162	0.165
1-3/8	1.116	1.118	5/16	0.3115	0.3125	5/32	0.161	0.164
1-1/2	1.218	1.220	3/8	0.374	0.375	3/16	0.195	0.198
1-3/4	1.421	1.423	7/16	0.4365	0.4375	7/32	0.226	0.229
2	1.624	1.626	1/2	0.499	0.500	1/4	0.259	0.262
2-1/4	1.827	1.829	9/16	0.561	0.5625	9/32	0.291	0.294
2-1/2	2.030	2.032	5/8	0.6235	0.625	5/16	0.322	0.325
2-3/4	2.233	2.235	5/8	0.6235	0.625	5/16	0.322	0.325
3	2.437	2.439	3/4	0.7485	0.750	5/16	0.323	0.326
3-1/4	2.640	2.642	3/4	0.7485	0.750	5/16	0.323	0.326
3-1/2	2.843	2.845	7/8	0.8735	0.875	5/16	0.324	0.327
3-3/4	3.046	3.048	7/8	0.8735	0.875	5/16	0.324	0.327
4	3.249	3.251	1	0.9985	1.000	5/16	0.326	0.329
4-1/2	3.796	3.798	1-1/8	1.123	1.125	3/8	0.388	0.391
5	4.218	4.220	1-1/4	1.248	1.250	7/16	0.450	0.453
5-1/2	4.640	4.642	1-1/4	1.248	1.250	7/16	0.450	0.453
*6	4.746	4.751	1-3/8	1.373	1.375	1/2	0.517	0.520
*6-1/2	5.145	5.147	1-3/8	1.373	1.375	1/2	0.516	0.519
*7	5.541	5.543	1-1/2	1.498	1.500	9/16	0.579	0.582
*7-1/2	5.937	5.939	1-1/2	1.498	1.500	9/16	0.579	0.582
*8	6.332	6.334	1-3/4	1.748	1.750	9/16	0.582	0.585





PROPELLER BORING

To insure retention of inherent factory accuracy, order your propeller factory-bored whenever possible. When bored in the field, propellers should be bored to the pilot hole, NOT to the hub or blade edges.

*6" through 8" shaft has 1 inch per foot taper, 1/12" per inch taper.
Angle with centerline is 2° 23' 9".
Overseas specifications on request.

MARINE PROPELLER SHAFT END DIMENSIONS

PROP-IT-RIGHT ANALYSIS

Type of Analysis: ❑ New Construction ❑ Evaluation ❑ Repower

VESSEL INFORMATION

Manufacturer: _____

Model: _____

Year: _____

Boat Use:	❑ Work/Commercial	❑ Towing	❑ Pleasure
Hull Type:	❑ Semi-Displacement	❑ Displacement	❑ Planing
Bottom Design:	❑ Open	❑ Tunnel	❑ Pocket
Hull Material:	❑ Fiberglass	❑ Wood	❑ Aluminum

Name: _____

Company: _____

Address: _____

City/State: _____

Zip/Country: _____

Phone: _____

Fax: _____

E-mail: _____

Date: _____

1. Vessel Data

Overall Length: _____ Loaded Weight: _____ Expected Top Speed: _____

Waterline Length: _____ Beam: _____ Draft: _____

All Engine Data Must Be Completed.

2. Current or New Engine Data*

Manufacturer: _____ Model: _____ Year: _____

Maximum Engine Rating: Brake _____ HP @ _____ RPM or Shaft _____ HP @ _____ RPM

Gear Reduction Ratio: _____ :1 Fuel Type: ❑ Gas ❑ Diesel ❑ Other _____

Number of Engines: ❑ Single ❑ Twin ❑ Triple ❑ Other _____

If no propeller size or performance data available, section 1 must be completed in detail.

Current Performance: Full Throttle (Wide-open) Engine RPM _____ RPM (Actual tachometer reading)

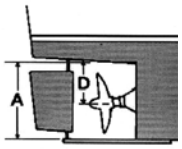
Full Throttle (Wide-open) Vessel Speed _____ ❑ MPH ❑ Knots (Actual speedometer/GPS reading)

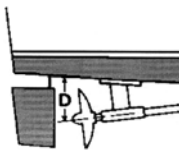
* If re-power, fill in the above with **NEW** engine data. Refer to the Section 3 for current propeller data and Section 4 for **OLD** engine information.

3. Current Propeller Data

Manufacturer: _____ Model/Style: _____ Material: ❑ Bronze ❑ Nibral ❑ Stainless Steel

Propeller Size: Diameter _____ x Pitch _____ Number of Blades: _____



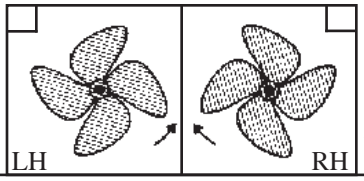


Maximum Propeller Diameter: _____

OR

Shaft to Hull Distance: D = _____

Shaft: ❑ SAE ❑ Metric Size: _____



Rotation:
Check one or both.

Viewed from behind the boat.

4. Re-power Data (Old Engine Information)

Manufacturer: _____ Model: _____ Year: _____

Maximum Engine Rating: Brake _____ HP @ _____ RPM or Shaft _____ HP @ _____ RPM

Gear Reduction Ratio: _____ :1 Fuel Type: ❑ Gas ❑ Diesel ❑ Other _____

Number of Engines: ❑ Single ❑ Twin ❑ Triple ❑ Other _____

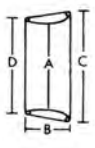
Old Performance: Full Throttle (Wide-open) Engine RPM _____ RPM (Actual tachometer reading)

Full Throttle (Wide-open) Vessel Speed _____ ❑ MPH ❑ Knots (Actual speedometer/GPS reading)

5. Vessel/Propeller/Nozzle Certification Required

❑ ABS ❑ Lloyds ❑ DNV ❑ Other

Propeller Application: ❑ Open ❑ Nozzle



If nozzle, please fill in this section.
Write in your dimensions here:

A. _____
B. _____
C. _____
D. _____

Comments: _____

Note: ***The propeller suggestion can only be as accurate as the information that you provide.***

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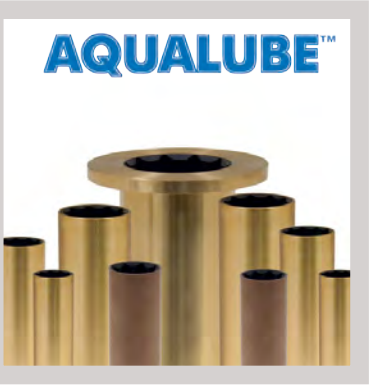

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Globally sourced, economically advantageous standard series propeller line, manufactured to Michigan Wheel tolerance and hub dimensional standards.

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