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Anchor Points

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- **Especially on slow airplanes, always use ALL the potential diameter available!**
- **More climb – larger prop, smaller pitch**
- **More cruise speed – smaller prop, larger pitch**

- **50-HP engines (503) with a 3.47: THREE-bladed 70" F-model;**
  for faster craft: 3b 65-inch 'B'

- **65-HP engines (582) with a 2.60 (2.58-2.62): TWO-bladed 70" F-model**
  for faster craft: 3b 66-inch 'F'

- **Ideal blade tip RPM is 75% the speed of sound**

- **Larger blades ('F' & 'B') will cause more drag at idle / engine out –giving a higher descent rate**

- **...two blades have more slip at low airspeed and power loading, so they are not as good at climb or low cruise speeds. Once airspeed increases the combined drag of three blades kicks in and makes them less efficient.**
  This does not include blade stall due to higher pitch angles for a two blade that is the same diameter.
  Roger

- **THRUST: According to client; our 3-blade 'B' w/48" at 6200RPM and GB 2.34 is developing 160lbs of static thrust**

- **AIR-SPEED:** You need to set a top speed limit for the F-model at about 110-120 mph. The CB10 is WAY too fast to prop with the F-model, or the B.
  The reason is the twist. If you look at a prop for an RV or anything else that fast you'll see the prop has far more twist in it than the F-model. That twist allows air to go through the prop at high airframe speeds. Without enough twist, the inner sections of the prop will not have positive AOA at high airframe speeds. When that happens the inner sections of the prop will make drag instead of thrust. High twist allows the air to go through the prop and not make drag.

Engines: Rotax

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20-hp 4-cyc

w/RPM of 2000 at blades, recommended 3/50" (Adam Gibson)

Rotax 277: 26 HP <> 6250 Max Rpm

Reduction RATIO	MAX PROP RPM *(with Eng RPM: 6250)*	**'B'** Blade *(#Blades/Dia)*		**'E'** Blade *(#Blades/Dia)*	
2	**3125**			**3/42**	
2.24	**2970**	**2/53**		**3/47**	
2.58	**2422**	**2/56** **3/52**		**3/51**	

Earlier versions produced 26 hp (19 kW) at 6250 rpm or 38 hp (28 kW) with a tuned exhaust at 6450 rpm. The current production engine is rated at 27.5 hp (21 kW) at 6250 rpm. Reduction ratios available are 1.84, 2.05, 2.14, 2.24 and 2.34 to 1

MZ 34/35: 27 HP <> 6250 Max Rpm

Reduction RATIO	MAX PROP RPM *(with Eng RPM: 6250)*	**'B'** Blade *(#Blades/Dia)*	**'C'** Blade (#Blades/Dia)	**'E'** Blade *(#Blades/Dia)*	
1.84	**3397**			**3/39**	
2.05	**3038**			**3/45**	
2.14	**2920**			**3/46**	
2.24	**2970**	**2/53**		**3/47**	

2.34	**2670**	**2/55** **3/51**		**3/50**	

HIRTH F33: 28 HORSEPOWER <> 6500 MAX RPM

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Reduction RATIO	MAX PROP RPM *(with Eng RPM: 6000)*	**'B'** Blade *(#Blades/Dia)*	*C*	**'E'** Blade *(#Blades/Dia)*	
1.8 Belt	**3500**	2/50		**3/40**	
2.2 Belt	**2900**	**2/54**		**3/48**	
2.5 Belt	**2500**	**2/56** **3/52**		**3/53**	
	1800	**2/60** **3/57**			

Generac: 33 HP <> 3200 Max Rpm

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Reduction RATIO	MAX PROP RPM *(with Eng RPM: 3200)*	**'B'** Blade *(#Blades/Dia)*	**'C'** Blade *(#Blades/Dia)*	**'E'** Blade *(#Blades/Dia)*	F
1.69	**1900-2100**	3/54 BowFishing 3/63			

		PPC Dragonfly			

Briggs & Stratton: 35 HP <> 3600 or 4200 Max Rpm

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Reduction RATIO	MAX PROP RPM *(with Eng RPM: ?)*	**'B'** Blade *(#Blades/Dia)*	**'C'** Blade *(#Blades/Dia)*	**'E'** Blade *(#Blades/Dia)*	F *(#Blades/Dia)*
1.69	**IF 4200 RPM…2485**	**2/62-64** **3/55-58**	**2/62-64** **3/55-58**	**3/53**	3/55-58
1.69	**IF 3600 RPM…2130**	**2/64-66** **3/57-60**	**2/64-66** **3/57-60**	**-**	3/57-60 4/53-57 5/48-53

Vanguard: 35 HP <> ? Max Rpm

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Reduction RATIO	MAX PROP RPM *(with Eng RPM: ?)*	**'B'** Blade *(#Blades/Dia)*	**'C'** Blade *(#Blades/Dia)*	**'E'** Blade *(#Blades/Dia)*	F *(#Blades/Dia)*
1.69	**IF 4200 RPM…2485**	**2/62-64** **3/55-58**	**2/62-64** **3/55-58**	**3/53**	3/55-58
1.69	**IF 3600 RPM…2130**	**2/64-66** **3/57-60** **4/53-57** **5/50-54**	**2/64-66** **3/57-60**	**-**	3/57-60 4/53-57 5/48-53

Rotax 377: 35 HP <> 6500 Max Rpm

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Reduction RATIO	MAX PROP RPM *(with Eng RPM: 6500)*	**'B'** Blade *(#Blades/Dia)*	**'C'** Blade *(#Blades/Dia)*	**'E'** Blade *(#Blades/Dia)*	F
2	**3250**	**2/52**		**3/45**	
2.24	**2901**	**2/56**		**3/50**	
2.45	**2800**	**2/58** **3/54**		**3/52**	
2.58	**2519**	**2/60** **3/55**	**2/62-64** **3/55-58**	**3/53**	

Kawasaki 440: 38 HP <> 5000 Max Rpm

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Reduction RATIO	MAX PROP RPM *(with Eng RPM: 5000/6500)*	**'B'** Blade *(#Blades/Dia)*	**'C'** Blade *(#Blades/Dia)*	**'E'** Blade *(#Blades/Dia)*	F
2.2	**2272** if 5000	**2/60** **3/56**	**2/61** **3/57**	**3/53 ?**	
2.48	2016 if 5000	**2/61** **3/57**	**2/62** **3/58**		
2.58	1937 if 5000	**2/63** **3/60** **4/56** **5/53**	**2/65** **3/62**		
2.2	**2954** if 6500				

2.48	2621 if 6500				
2.58	2519 if 6500	2/62 3/58			
2.66	2256 if 6000 2444 if 6500	2/63 3/60			

HIRTH 2702: 40 HORSEPOWER <> 5500 MAX RPM

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Reduction RATIO	MAX PROP RPM *(with Eng RPM: 5500)*	**'B'** Blade *(#Blades/Dia)*	*C*	**'E'** Blade *(#Blades/Dia)*	**'F'** Blade *(#Blades/Dia)*
1.8	**3055**	2/58 3/51		**3/52**	
2.0	**2750**	2/60 3/53		**3/53**	
2.16	**2546**	2/61 3/56		**3/53**	
2.29	**2401**	**2/62**		-	
2.59	**2123**	**2/64** **3/58**		-	
3.16	**1740**	**3/62** **4/59**			**2/68** **3/62**

3.65	1506	3/65			2/70 3/66

Rotax 447: 40 HP <> 6500 Max Rpm

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Reduction RATIO	MAX PROP RPM (with Eng RPM: 6500)	'B' Blade (#Blades/Dia)	'C' Blade (#Blades/Dia)	'E' Blade (#Blades/Dia)	'F' Blade (#Blades/Dia)
2	3250	2/56		3/48	
2.24	2901	2/59	2/61 3/55	3/53	
2.58 2.62	2500	2/62 3/57	2/64 3/58		
3	2166	2/65 3/61-62	2/65-67 3/61-63		
3.47	1873	3/64			2/68
4	1625				2/71 3/66

Rotax 503 SC: 46 HP <> 6250 Max Rpm

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Reduction RATIO	MAX PROP RPM (with Eng RPM: 6250)	'B' Blade (#Blades/Dia)	'C' Blade (#Blades/Dia)	E	'F' Blade (#Blades/Dia)

2	3125	3/52 Joe G			
2.24	2970				
2.58 2.62	2405	2/63 3/59	3/59		
3	2083	3/64 4/60			2/68
3.47	1801	4/63 5/60			2/72 3/68
4	1562				3/72

Hirth F23: 50 HP <> 6150 Max Rpm

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Reduction RATIO	MAX PROP RPM (with Eng RPM: 6150)	'B' Blade (#Blades/Dia)	'C' Blade (#Blades/Dia)	E	F
1.8 Belt	2555	2/59	3/57		
2.0 Belt	2500	2/60	2/62 3/58 4/54		
2.5 Belt	2200	2/63 3/61 4/57 5/54			

Rotax 503 DC: 52 Hp <> 6500 Max Rpm

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Reduction RATIO	MAX PROP RPM (with Eng RPM: 6500)	'B' Blade (#Blades/Dia)	'C' Blade (#Blades/Dia)	E	'F' Blade (#Blades/Dia)
2	3250				
2.24	2901				
2.58 2.62	2500	2/65 3/60-64 4/58	3/63-66		2/66 3/67 WSC

3	2166	3/65 4/62			2/68
3.47	1873	4/65 5/63			2/74 3/70 4/67
4	1625				3/74 4/70* **confirmed good* 12°* *So 72 may be BETTER!* 5/66

HIRTH 2703: 55 HORSEPOWER <> 6200 MAX RPM

Reduction RATIO	MAX PROP RPM *(with Eng RPM: 6200)*	'B' Blade *(#Blades/Dia)*	'C' Blade *(#Blades/Dia)*	E	'F' Blade *(#Blades/Dia)*
2.16	2870	2/58			
2.29	2707	2/60			
2.59	2393	2/63 3/60	3/61		
3.16	1962	3/65			2/70 3/68

3.65	1698				3/72

Hirth 2704 / 3202: 55 HP <> 5500 Max Rpm

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Reduction RATIO	MAX PROP RPM *(with Eng RPM: 5500)*	'B' Blade *(#Blades/Dia)*	'C' Blade *(#Blades/Dia)*	E	'F' Blade *(#Blades/Dia)*
2.16	2314	2/65 3/61	3/65		2/67 3/62
2.29	2183	3/65			2/70 3/65
2.59	1930	3/65			2/74 3/68
3.16	1582				3/74
3.65	1369				

MZ 202: 60 HP <> 6250 Max Rpm

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Reduction RATIO	MAX PROP RPM *(with Eng RPM: 6250)*	'B' Blade *(#Blades/Dia)*	C	E	'F' Blade *(#Blades/Dia)*
2.18	2860	3/62 4/59	3/63		2/67 3/63

2.55	2450	3/65 4/62	3/66		2/70 3/66
2.88	2170				
3.11	2010				
3.66	1707				

HKS 700E (4-cycle - *but turns like Rotax a 2-cycle*?): 60 HP <> 6200 Max Rpm

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Reduction RATIO	MAX PROP RPM *(with Eng RPM: 6250)*	'B' Blade *(#Blades/Dia)*	C	E	'F' Blade *(#Blades/Dia)*
2.47	2510	3/64 4/61	3/65		2/69 3/65
2.58	2400	3/65 4/62	3/66		2/70 3/66
3.48	1781	5/65			3/70 4/67

Hirth 3502: 60 HP <> 6000 Max Rpm

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Reduction RATIO	MAX PROP RPM *(with Eng RPM: 6000)*	'B' Blade *(#Blades/Dia)*	C	E	'F' Blade *(#Blades/Dia)*
2.16	2777				

2.29	2620	3/63 4/60			2/68
2.59	2316	3/65 4/62			3/66
3.16	1898	5/65			3/70 4/67
3.65	1643				3/74 4/70 5/67

Rotax 582/532: 65 HP <> 6500 Max Rpm

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Reduction RATIO	MAX PROP RPM (with Eng RPM: 6500)	'B' Blade (#Blades/Dia)	'C' Blade (#Blades/Dia)	E	'F' Blade (#Blades/Dia)
2	3250				
2.24	2901				
2.58 2.62	2500	3/65 4/62	2/69 3/66 4/63		2/70 3/66 4/62 5/58
3	2166	4/64 5/61	3/68		2/74 3/68

					4/65
3.47	1873	4/65 5/63	4/69 5/66		3/72 4/69 5/66
4	1625	5-65	5/69		3/75 4/72 5/69

Hirth 2706 & 3203: 65 HP <> 6200 Max Rpm

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Reduction RATIO	MAX PROP RPM *(with Eng RPM: 6200)*	'B' Blade *(#Blades/Dia)*	'C' Blade *(#Blades/Dia)*	E	'F' Blade *(#Blades/Dia)*
2.16	2870	2/63 3/58 *3/60			
2.29	2707	2/65 3/61			2/66
2.59	2393	3/64	3/64		2/70 3/65
3.16	1962				2/75 3/72 4/69

3.65	1698				3/74

Hirth 3503: 70 HP <> 6500 Max Rpm

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Reduction RATIO	MAX PROP RPM (with Eng RPM: 6500)	'B' Blade (#Blades/Dia)	C	E	'F' Blade (#Blades/Dia)
2.16	3009	3/58-60			
2.29	2838	3/65 4/63			2/71
2.59	2509	4/65			3/69
3.16	2056				3/72 4/69
3.65	1780				4/72 5/69

Rotax 618: 75 HP <> 6500 Max Rpm

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Reduction RATIO	MAX PROP RPM (with Eng RPM: 6500)	'B' Blade (#Blades/Dia)	'C' Blade (#Blades/Dia)	E	'F' Blade (#Blades/Dia)
2	3250				

2.24	2901				
2.58 2.62	2500	3/65	3/66 4/62		2/72 3/67 4/62 5/57
3	2166	4/65 5/62	3/69 4/66		2/74 3/70 4/66 5/62
3.47	1873				3/74 4/70 5/67
4	1625				

HKS 700T: 80 HP <> 6200 Max Rpm

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Reduction RATIO	MAX PROP RPM *(with Eng RPM: 6250)*	'B' Blade *(#Blades/Dia)*	C	E	'F' Blade *(#Blades/Dia)*
2.47	2510	3/64 4/61 5/58	3/65		2/69 3/65 4/61 5/57
2.58	2400	3/65+ 4/62	3/66		2/72 3/68

		5/59			4/64 5/60
3.48	1781				3/70 4/69 5/71

Hirth F30: 80 HP <> 5500 Max Rpm

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Reduction RATIO	MAX PROP RPM *(with Eng RPM: 5500)*	'B' Blade *(#Blades/Dia)*	C	E	'F' Blade *(#Blades/Dia)*
2.03	2709	3/64			2/68 3/63
2.25	2444	3/65			2/72 3/68
2.60	2115	5/65			2/76 3/72 4/68 5/64
2.96	1858				3/75 4/69
3.33	1651				5/71

Rotax 912: 80 HP <> 5800 Max Rpm

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Reduction RATIO	MAX PROP RPM (with Eng RPM: 5800)	'B' Blade (#Blades/Dia)	'C' Blade (#Blades/Dia)	E	'F' Blade (#Blades/Dia)
2.27	2555	4/65	3/69 4/66		2/72 3/70 4/66 5/63

Hirth F30: 85 HP <> 5500 Max Rpm

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Reduction RATIO	MAX PROP RPM *(with Eng RPM: 5500)*	'B' Blade *(#Blades/Dia)*	C	E	'F' Blade *(#Blades/Dia)*
2.03	2709	3/65 4/62			2/69 3/64
2.25	2444	4/65			2/73 3/68
2.60	2115	5/65			3/73
2.96	1858				4/72
3.33	1651				5/72

Rotax 912-ULS: 100 HP <> 5800 Max Rpm

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Reduction RATIO	MAX PROP RPM (with Eng RPM: 5800)	'B' Blade (#Blades/Dia)	'C' Blade (#Blades/Dia)	E	'F' Blade (#Blades/Dia)	Notes
2.43	2386	5/65	5/67		2/75 3/73 4/70 5/66	912 ULS on a Bushcaddy R80 3blade: 72-73" dia.

HIRTH 3701/3703: 100 HORSEPOWER <> 6000 MAX RPM

Reduction RATIO	MAX PROP RPM *(with Eng RPM: 6000)*	**'B'** Blade *(#Blades/Dia)*	*C*	E	**'F'** Blade *(#Blades/Dia)*
2.16	**2777**	**4/65**			**2/72** **3/68**
2.29	**2620**	**5/65**			**2/75** **3/72** **4/68**
2.59	**2316**				**3/75** **4/70** **5/66**
3.16	**1898**				**4/74** **5/70**
3.65	**1643**				**5/74**

3.79	**1583**				**5/75**

HIRTH F30: 110 HORSEPOWER <> 6200 MAX RPM

Reduction RATIO	MAX PROP RPM *(with Eng RPM: 6200)*	**'B'** Blade *(#Blades/Dia)*			**'F'** Blade *(#Blades/Dia)*
2.03	**3054**	**4/64**			**3/66**
2.25	**2855**	**5/64**			**3/68**
2.60	**2384**				**3/74**
2.96	**2094**				**4/74**
3.33	**1861**				**5/74**