



2-Bladed Ground Adjustable Installation Instructions

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RECORD OF REVISION

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EQUIPMENT LIST

Note* Inspect equipment upon receipt. Verify that all the following components have been received. If parts are listed below but not included in supplied kit, please contact Catto for confirmation.

Item#	Quantity	Item Description	Visual Description	Initial
REF-1	1	Top Hub		
REF-2	1	Bottom Hub		
REF-3	2	Blades- Part Number:		
REF-4	1	Balancing Plate/ Spinner Bulkhead		
REF-5	1	Pitch Block (This might look different depending on the engine)		

REF-6	1	Compression Cap		
REF-7	1	1/4" Compression Bolt		
REF-8	1	1/4" Nord-Lock Zinc-Flake Coated Steel Wedge Lock Washer.		
REF-9		Shims (These can look different depending on engine)		
REF-10	4	"Hub to hub" bolts with Nord locks Rotax 5/16"x 1.75" SAE-1 Bolt Pattern 3/8"x 2" SAE-3, SAE-2, SAE-5 and SAE-6 7/16"x3"		
REF-11	2	"Bottom hub to engine" bolts with Nord Lock		
REF-12	4	"Top hub to engine" bolts with Nord lock		

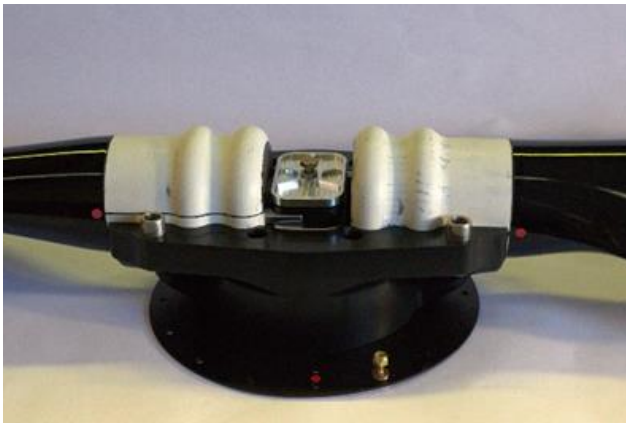
REF-13	1	Loctite Threadlocker 242		
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TOOLS REQUIRED

Calibrated torque wrench
Appropriate Sockets
7/16" Nut driver or socket
Rubber Mallet

INSTALLATION INSTRUCTIONS

1. Confirm mags are off. Clean any dirt or oil residue from engine flange or flywheel.
2. Catto does not require a specific mounting orientation between blade orientation and engine top dead center. Install spacer (if needed to clear your cowling). Install either spinner bulkhead or balancing plate with red indexing sticker (REF-4) 90 degrees perpendicular to the blades. For example, place the bulkhead on your engine or spacer with the red dot at 12 o'clock and the blades at 3 and 9 o'clock with the red dots all on the same half. The weight on the bulkhead or balance plate corrects the balance so prop indexing is important. The white dot on the spinner bulkhead is for you to match the white dot on the spinner dome for alignment. If you don't want to run this



3. Install the back half of the hub (REF-2) so blades are 90 degrees perpendicular to the red indexing dot on spinner bulkhead or balancing plate.

NOTE: Bolts will break if there is a gap between engine flange/ spacer and hub. Confirm the hub is seated flush against the mounting flange and confirm bolt

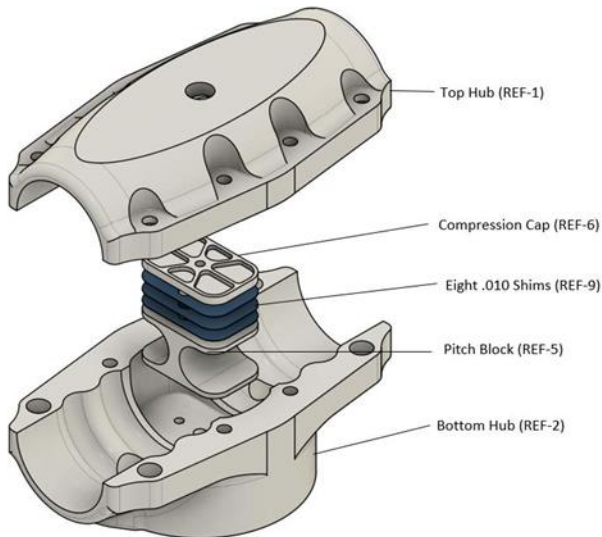
threads are not bottomed out on lug. This will prevent proper torque. Do not use anti-seize on bolt threads. Prior to installation ensure bolt threads are clean and dry before applying Blue Loctite.

4. Using two short "bottom hub to engine bolts" (REF-11) with a provided Nord-lock washer (REF-13) under bolt head and Blue Loctite 242 (REF-15) on threads. Hand tighten with socket. Using calibrated torque wrench torque bolts accordingly.

Bolt Size	Torque Value Sequence
5/16"	5 ft lbs, 10 ft lbs, 15 ft lbs
8mm	5 ft lbs, 10 ft lbs, 15 ft lbs
3/8"	20 ft lbs, 25 ft lbs, 30 ft lbs
7/16"	30 ft lbs, 35 ft lbs, 40 ft lbs
1/2	35 ft lbs, 40ft lbs, 50 ft lb

5. Setting the pitch. The height of the pin affects the angle of the blade. Only the shims under the pitch pin affect the pitch. We recommend storing the shims you are not using on top of the pin and below the compression cap. You can insert the shims behind the pitch block or between the pitch pin and the pitch block. We recommend keeping at least one .010 shim between the pitch block and the pitch pin so the pin does not dent the pitch block. Insert pitch block (REF-5) in the bottom of the hub (REF-2). Stack shims (REF-9) and compression cap (REF-6) on top of the pitch block. Engage the 1/4" compression bolt (REF-7) with 1/4" Nord-lock washer under

the head (REF-8). Keep it loose so you can slide the pitch pin of the blade under compression cap.



Recommended Starting Points

7437

Engine	Shims Under Pin
C85 or C90	.040"
0-200	.040"
0-233	.060"
0-235	.060"

7845

Engine	Shims Under Pin
0-300	.050"
0-320	.060"
0-340	.080"
0-360	.090"

7854 Rans

Engine	Shims Under Pin
0-340	.080"

8437

Engine	Shims Under Pin
0-300	.050"
0-320	.060"
0-340	.080"
0-360	.090"

8638

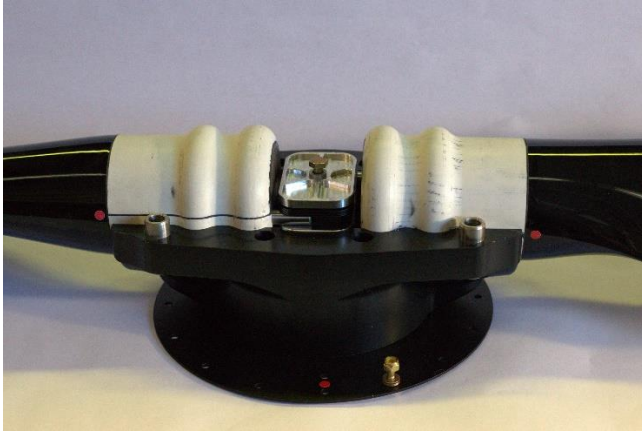
Engine	Shims Under Pin
0-340	.080"
0-360 & Variants	.090"

**** DO NOT overspeed 86". Tip speed is extremely high on this blade**

6. A .010" shim will change your static RPM 50RPM. To increase the pitch, add shims under the pin. This will decrease your static RPM but improve your cruise speed.
7. Locate the red dot on the root of one blade. Install the blade (REF-3) with red dot facing the red dot on the balancing plate or spinner bulkhead. Place pitch pin (located in the root of the blade) between pitch block and compression cap with desired shims under pitch pin. The remainder of shims will stay under the compression cap but above pitch pin.



8. Insert the second blade with red sticker facing the same direction as the red dot on the other blade. Place pitch pin over the same number of shims as the other blade. Hand tighten compression bolt (you torque to spec later).



9. Grab both blades and rotate the trailing edge back out of the hub about 1/16"-1/8" and hit them with a rubber mallet to seat blades. Torque compression bolt to 3 ft lbs or 36 inch lbs. The purpose of this is to keep pitch pin in correct position, it does not affect the retention of the blades.

10. Reach in and touch shims to confirm they are all tightened down. If they are loose and floating the blades are not seated properly. If blades are not seated probably loosen compression bolt and repeat installation from Step 7.

11. Place the top half of the hub (REF-1) on top of blades. Insert four center "top hub to engine" bolts (REF-12) using the supplied Nord-lock washer under the head of the bolt. These are the longer bolts that go through the hub into the crank or threaded extension. Using socket wrench, hand tighten bolts diagonally as shown in Figure 1.

Circled REF-12 Hub-to-Engine Bolt Installation in Step 11

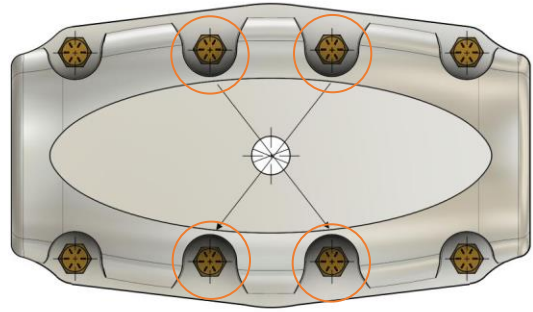


Figure 1

12. Insert 4 "hub to hub" bolts (REF-10), (circled in Figure 2), using supplied Nord-lock washer under the head of the bolt. Hand tighten with a socket wrench in a star pattern diagonally to ensure an even gap on both sides of the hub.

Circled REF-10 Hub-to-Hub Bolt Installation in Step 12

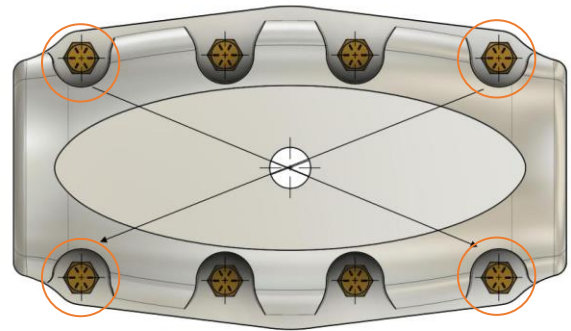


Figure 2

13. When applying torque to bolts, keep a close eye on the gap around the perimeter of the hub to confirm gap is equal all the way around. Using **calibrated torque wrench** torque "top hub to engine" bolts" (REF-12)

shown in Figure 1 using cross pattern, incrementally using values in table below

Bolt Size	Torque Value Sequence
5/16"	5 ft lbs, 10 ft lbs, 15 ft lbs
8mm	5 ft lbs, 10 ft lbs, 15 ft lbs
3/8"	20 ft lbs, 25 ft lbs, 30 ft lbs
7/16"	30 ft lbs, 35 ft lbs, 40 ft lbs
1/2	35 ft lbs, 40ft lbs, 50 ft lb

14. Using calibrated torque wrench torque "hub to hub" (REF-10) shown in Figure 2 using cross pattern, incrementally using values in table below:

Bolt Size	Torque Value Sequence
5/16"	5 ft lbs, 10 ft lbs, 15 ft lbs
8mm	5 ft lbs, 10 ft lbs, 15 ft lbs
3/8"	20 ft lbs, 25 ft lbs, 30 ft lbs
7/16"	30 ft lbs, 35 ft lbs, 40 ft lbs

15. Go back and check torque on all 8 bolts one more time to confirm they are all at proper spec and insure you have an even gap all the way around the hub.
16. Install spinner dome, if applicable. Align the white dot on the spinner dome to the white dot on the spinner bulkhead so the holes match.
17. Check torque after 10 hours of flight time. Recheck torque every six months or 50 hours whichever comes first. Change Nord-Lock washers after 15 installations or when they show signs of wear. There is additional load on the bolts of a ground adjustable compared to a fixed pitch propeller so we do recommend replacing bolts every other year or every 250 hours. They can be purchased through us or Saber (817) 326-6293.