3-Bladed Ground Adjustable Installation Instructions

SAE-2, SAE-5, SAE-6

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RECORD OF REVISION

Revision Number	Issued Date	Inserted By
R-0	Jan 1, 2024	Catto Propellers

LIST OF EFFECTIVE PAGES

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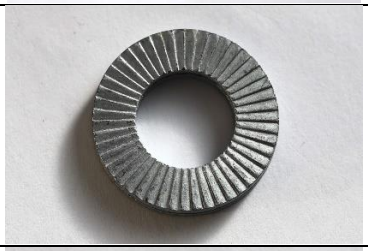
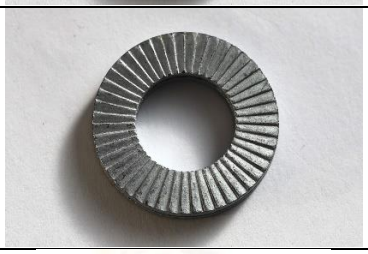
EQUIPMENT LIST

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 GAH3-2-I1-R1-T, or GAH3-5-I1-R1-T, or GAH3-6-I1-R1-T		
REF-2	1	Bottom Hub GAH3-2-I1-R1-B, or GAH3-5-I1-R1-B, or GAH3-6-I1-R1-B		
REF-3	3	Blades		
REF-4	1	Balancing Plate/ Spinner Bulkhead		

REF-5	1	Compression Cap		
REF-6	1	¼” Compression Bolt		
REF-7	1	¼” Nord-Lock Zinc-Flake Coated Steel Wedge Lock Washer. 0.28” ID, 0.53” OD.		
REF-8		.005 Shim .010 Shims .020 Shim .050 Shim		
REF-9	6	3/8”x2” “Hub to hub” bolts		
REF-10	3	“Bottom hub to engine” bolts		

REF-11	3	“Top hub to engine” bolts		
REF-12	6	Nord-Lock Zinc- Flake Coated Steel Wedge Lock Washer “Bottom Hub to Engine” “Top Hub to Engine”		
REF-13	6	3/8” Nord-Lock Zinc- Flake Coated Steel Wedge Lock Washers 3/8" Screw Size, 0.41" ID, 0.83" OD For “Hub to Hub”		
REF-14	1	Loctite Threadlocker 242 - Blue		

TOOLS REQUIRED

Calibrated torque wrench
9/16” Socket for 3/8” Bolt
5/8” Socket for 7/16” Bolt
3/4” Socket for ½” Bolt
7/16” Nut driver or socket for ¼” Compression Bolt
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 (REF-4).

3. Install the back half of the hub (REF-2).

4. Using three short "bottom hub to engine bolts" (REF-10) with a provided Nord-lock washer (REF-12) under bolt head and Blue Loctite 242 (REF-14) on threads. Hand tighten with socket. Using calibrated torque wrench torque bolts, alternating between bolts, torque will depend on bolt size:

    - 3/8": Start at 20 ft lbs on all three, incrementally increase to 25 ft lbs, final torque set to 30 ft lbs
    - 7/16": Start at 30 ft lbs on all three, incrementally increase to 35 ft lbs, final torque set to 40 ft lbs.
    - 1/2": Start at 40 ft lbs on all three, incrementally increase to 45 ft lbs, final torque set to 50 ft lbs.

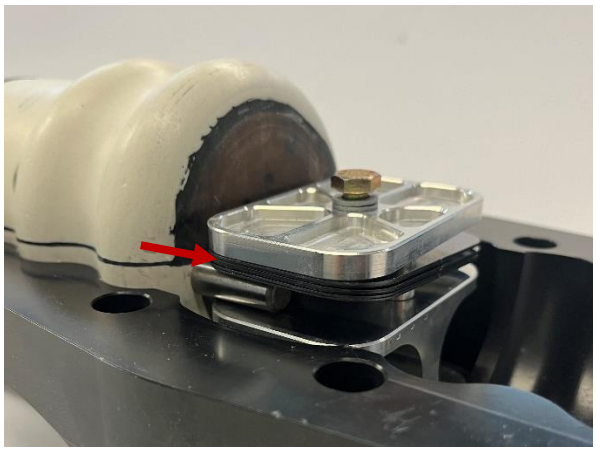
    NOTE: Bolts will break if there is a gap between engine flange/ spacer and hub. Confirm the hub is seated flush against the mounting flange and confirm bolt threads are not bottomed out on lug. This will prevent proper torque. Do not use anti-seize on bolt threads. Prior to installation ensure bolt threads are clean and dry before applying Blue Loctite.

5. The "pitch block" is built into this hub. It is the center where the pitch pin in the root of the blade rests on. Stack shims (REF-8) and compression cap (REF-5) on top of the pitch block. Engage the ¼" compression bolt (REF-6) with ¼" Nord-lock washer under the head (REF-7). Keep it loose so you can slide the pitch pin of the blade under compression cap.

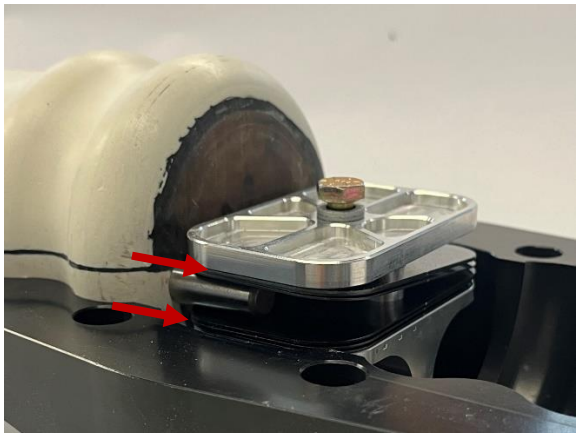
6. To set pitch, insert the blade (REF-3) with desired number of shims under the pin. We recommend to start with about .040" under the pin and adjust accordingly. The pin directly on the block with no shims under the pitch pin would be the flattest setting. Inserting shims under the pitch pin will increase the pitch resulting in a lower static RPM. Inserting one .010" shim under the pitch pin will increase the pitch around 2" of pitch, resulting in a decrease of about 60 RPM static. Adding 5-7 shims correlates to a cruise configuration.

The visual change in pitch can be observed via the arrows pointing to the location of shims below:

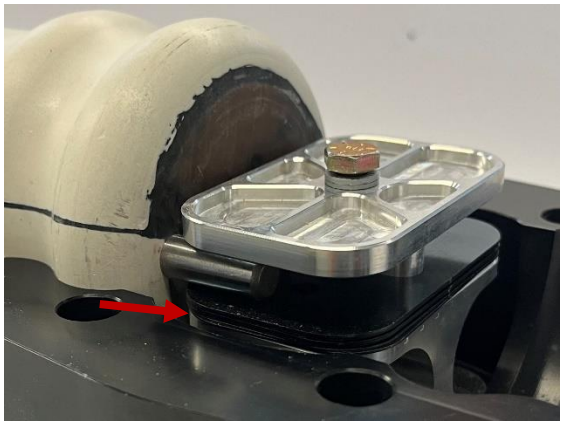
Flattest Pitch Setting:



Climb/ Cruise:



Cruise:



7. Blades (REF-3) should be inserted clockwise while standing in front of the plane looking towards the propeller. Insert blade -1, -2 and -3 clockwise. Dash number can be found on the propeller tag after the serial number. Hand tighten compression bolt (REF-6).

8. Twist the trailing edge of blades up, out of the hub, about 1/16”-1/8”. Torque compression bolt (REF-6) to 3 ft lbs or 36 inch lbs. The purpose of this is to keep pitch pin in correct position, this step does not affect the retention of the blades. Using a rubber mallet hit the blade back into the hub socket.

9. Reach in to touch shims to confirm they are 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.

10. Place the top half of the hub (REF-1) on top of blades. Insert 6 outside bolts, (circled in Figure 1), 3/8”x2” “hub to hub” bolts (REF-9) using a Nord-lock washer (REF-13) 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.

Hub-to-Hub Bolts (REF-9/REF-13) are circled in Figure 1.

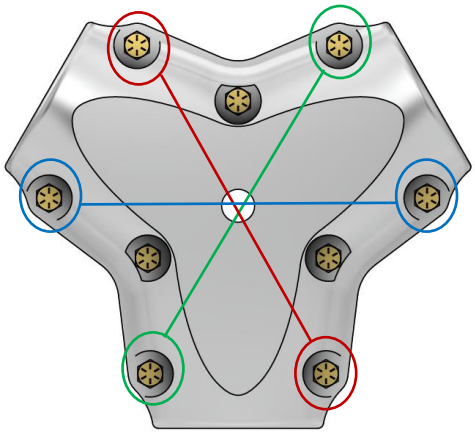


Figure 1

11. Insert three center “top hub to engine” bolts (REF-11) using a Nord-lock washer (REF-12) 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 as shown in Figure 2.

Hub-to-Engine Bolts (REF-11/REF-12) are circled in Figure 2.

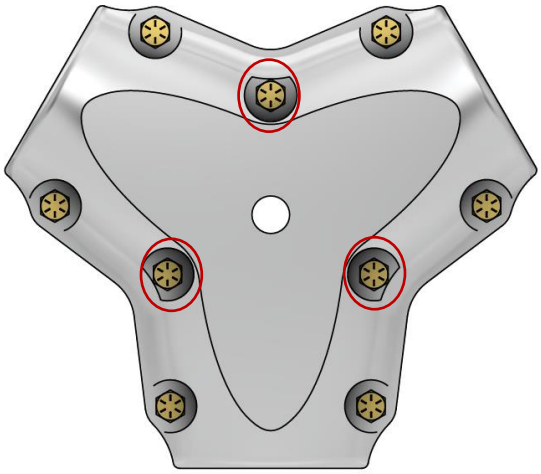


Figure 2

12. 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 outer 3/8”x 2” “hub-to-hub” bolts (REF-9) shown in Figure 1, incrementally starting at 20 ft lbs, increasing to 25 ft lbs to set final torque at 30 ft lbs.

Note: Do not use anti-seize on bolt threads. Prior to installation ensure bolt threads are clean and dry.

13. Torque inside “top hub to engine bolts” (REF-11) shown in Figure 2, incrementally starting at:
    - 3/8” Bolts: 20 ft lbs, 25 ft lbs and 30 ft lbs.
    - 7/16” Bolts: 30 ft lbs, 35 ft lbs and 40 ft lbs.
    - 1/2” Bolts: 40 ft lbs, 45 ft lbs and 50 ft lbs.

    Note: Do not use anti-seize on bolt threads. Prior to installation ensure bolt threads are clean and dry.

    Check torque on all 9 bolts to confirm they are all torqued to spec.

14. Install spinner dome, if applicable.

15. Check torque after 10 hours of flight time. Recheck torque every six months if you’re not removing the hub to change pitch more frequently. Change Nord-Lock washers after 30 installations or at annual.