

VERNAL UTAH
PRECISION PROPELLERS, INC.
U.S.A.

ART BY
VERNAL UTAH

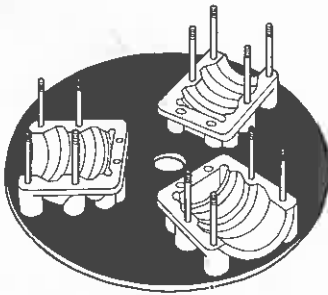
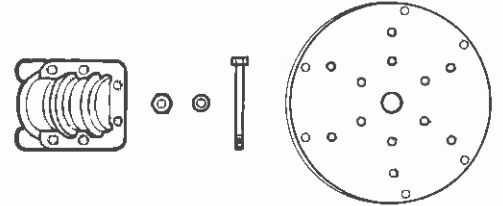
Assembly Instructions for your Adjustable Pitch Propeller

There is more than one way to skin a cat and there is also more than one way to assemble your Precision prop. We have found that the following method is the easiest for us.

First, let's check and see if we have all the parts

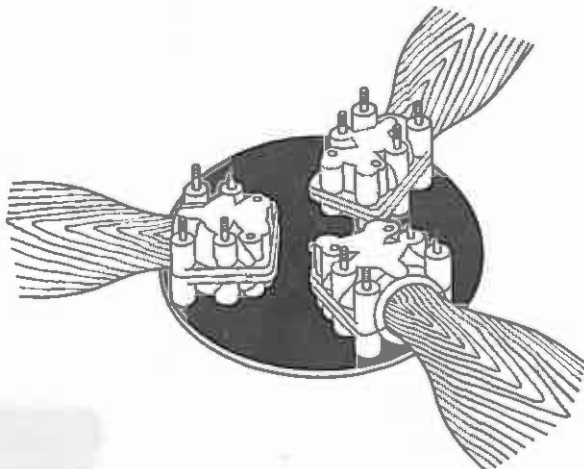
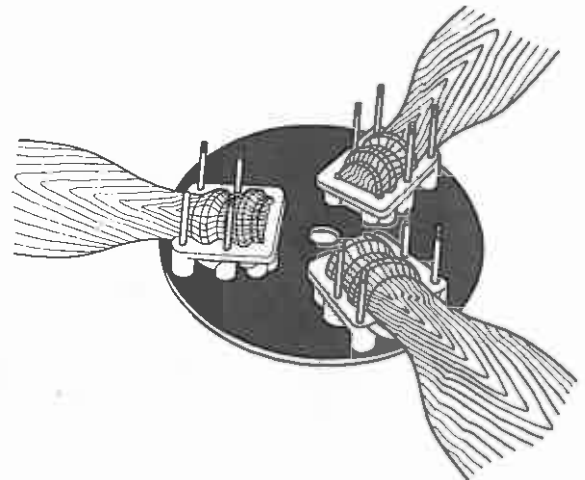
1. Propeller Blades ... 2 for 2 blade, 3 for 3 blade, 4 for 4 blade
2. Nylon Retainers 2 for each blade
3. Aluminum Plates 2 for each prop assy.
4. Bolts with flat washer and safety nut 4 for each blade

To determine if your Aircraft Engine combination requires a Left Hand (Counter clockwise rotation or a Right Hand (Clockwise rotation) Prop, stand behind the aircraft or air boat where you will be in the airstream of the prop. Now, as you look at the prop, if the top blade moves to your left, then you need a Left Hand prop. If the top blade moves to your right, then you need a Right Hand prop.

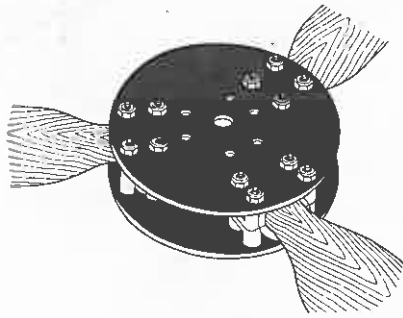


Pick up one of the aluminum plates. You will notice that one side looks as though it has been machined and is much more pleasant to look at. This is the side of both plates that you want showing on the outside of your assembled prop. First, insert all 12 bolts through the plate from the "Pretty side." Leave the 6 center holes empty. Lay the plate down on a flat surface with the bolt ends (threads) sticking up. Take one of the nylon retainers and with the cupped side up and the open end facing outward, press it down onto one of the groups of 4 bolts. Now do the same for the other two retainers.

Next lay the butt ends of the prop blades down in the retainers. **Note.** . . If your vehicle is a Pusher, then lay the blades down with the flat side up. But, if your vehicle is a tractor, then lay the blades so the flat side is down. We do this so that the nuts which hold the prop together are facing out so that adjusting the pitch of the prop is made easier.

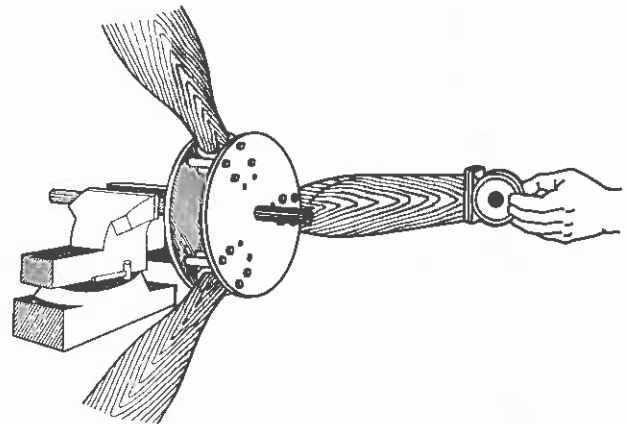


Press the remaining 3 retainer cups down onto the others which are holding the blades.



With the pretty side up, press the other plate onto the bolts. Put the washers and then the nuts on the bolts and finger tighten them.

Take a 1 inch diameter wood or metal rod and squeeze it down horizontally in a vise. Make sure it is level. Now slide the propeller onto the rod with the nuts to the outside. Take a couple of wrenches and just barely take the slack out. If you tighten the nuts too much, you won't be able to move the blades to arrive at the proper pitch. By using your Angle finder or Bubble Protractor, you will be setting the pitch of the blades in degrees. We have found that the best spot on the blades to set the pitch is at a point representing 75% of the diameter of the prop. Make a small mark at that point on each edge of the blades. With engines of less than 50 H.P. start with 8 degrees. With engines of over 50 H.P. start at 12 to 14 degrees.



Now that you have the blades set at the initial setting you will want to tighten the nuts so as to not disturb the blades. Only tighten the two outside nuts first by turning each one alternately $\frac{1}{4}$ of a turn at a time. Don't tighten too tight, only snug leaving about $\frac{1}{16}$ of an inch space between the nylon retainers. You will only be compressing the wood if you get too heavy on the wrench. For instance, if you are using a torque wrench, a $\frac{5}{16}$ nut should be tightened to 120 inch pounds. At this point, if the pitch is still the same on all blades go ahead and snug up the other two nuts.

Arriving at the correct pitch for your particular engine and aircraft.

With the propeller properly mounted on your aircraft, start your engine and let it warm up. The next thing we want to do is to get a Static RPM reading on your engine tachometer. This is done by maintaining your aircraft, or airboat, stationary while advancing the throttle to full open. Hopefully your tachometer will indicate from 3 to 4 hundred below the recommended top RPM of your engine. You see, your engine will unload or in other words increase in RPM when your aircraft or boat gets to moving. If you find that the RPM reading is too far off, indicating that you will have to change the pitch of your propeller, do this. Leave the propeller mounted on your aircraft. First, loosen all the nuts on the face of the propeller plate by $1\frac{1}{2}$ turns. This includes the 6 mounting nuts in the center. Next, gently pry the retainers apart with a screwdriver and then change the pitch as explained previously. If you will retighten the 6 mounting nuts first, the pitch will not be disrupted.

Notes:

1. When changing the pitch of your propeller, remember, that one degree can substantially change your RPM so make adjustments in small increments.
2. After you have reset the pitch on your propeller 5 or 6 times, it is a good idea to replace the self locking nuts with new ones.
3. The chart below will give you in inches the pitch at the given degree reading. Measure the angle at a point representing 75% of the total blade diameter. Example 60" prop measure at 45" or 22.5" from center of hub.

52"		56"		60"		64"		68"	
Degrees	Inches	Degrees	Inches	Degrees	Inches	Degrees	Inches	Degrees	Inches
6	13	6	14	6	15	8	21	8	23
7	15	7	16	7	17	9	24	9	25
8	17	8	18	8	20	10	26	10	28
9	19	9	21	9	22	11	29	11	31
10	21	10	23	10	25	12	32	12	34
11	24	11	25	11	27	13	35	13	37
12	26	12	28	12	30				

PRECISION PROPELLERS, INC.

P.O. BOX 1392 - VERNAL, UTAH 84078 - (801) 789-3699

THE MANUFACTURER HAS NO CONTROL OVER THE USE AND MAINTAINANCE OF THIS PROPELLER AND PERSONS USING IT ASSUME ALL RISKS FOR DAMAGE, INJURY OR DEATH RESULTING FROM ITS USE.

ALL RESPONSIBILITY IS WITH THE OPERATOR AND ONLY THE OPERATOR.

Most persons are aware of the extreme damage and injury that will occur if you come in contact with a turning propeller. However, many forget about the dangers involved if a loose object like a rag, wrench, piece of paper, engine part, etc., should be drawn into the propeller. The object and possibly several pieces of wood may be thrown to the sides at hundreds of miles an hour. Therefore, be aware of loose objects around propellers, and never stand directly to the side of a propeller while it is turning.

BEFORE STARTING - Be sure and check the area around the prop and engine for loose objects (rags, wrenches, people, etc.) that could be drawn into the propeller. Always holler "**CLEAR**" before attempting to start your engine.

CARE - Water is the greatest enemy of a wood propeller. It will not only cause the wood and varnish to deteriorate, but can be absorbed into the wood causing the propeller to become unbalanced. Keep a good coat of furniture or car wax on the blades.

Abrasion may occur at the leading edge near the tip from water spray or small rocks and dirt thrown up by the aircraft wheels. If this happens, the damaged area may be sanded out and revarnished. Be sure and sand the same amount from all blades so the propeller will remain balanced.

Our propellers are made from the very best materials available, they are made as thin as possible to make them efficient, but not so thin that they become unsafe. If you have any problems with your propeller that would cause it to become unsafe, and you believe it to be a flaw in the manufacturing, please bring it to our attention.

Aircraft being jerked around suddenly should have their propeller checked immediately. (Such as catching a wing tip while landing.) Because of the strong gyroscopic force created by a rotating propeller; if it is forced to change direction suddenly, it can crack or split the wood fibers usually length ways.

The RPM of our propellers should not exceed the following:

32" dia. - 6250	52" dia. - 3750	66" dia. - 3075
34" dia. - 5800	54" dia. - 3600	68" dia. - 2900
36" dia. - 5400	60" dia. - 3250	70" dia. - 2800
42" dia. - 4650	62" dia. - 3275	
48" dia. - 4100	64" dia. - 3125	

To figure prop tip speed:

Prop length divided by 3.14 times prop RPM divided by 720 equals the tip speed per second.

CAUTION: NEVER EXCEED A TIP SPEED OF 900 FT/SEC.

