M U S T A N G A E R O N A U T I C S , I N C .

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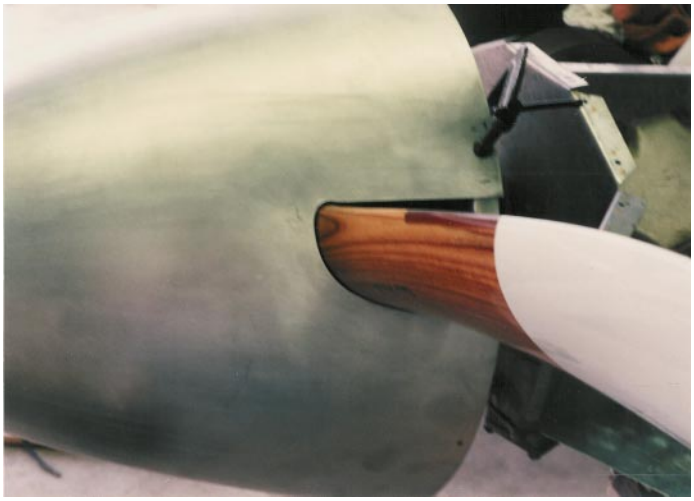
Mustang II Service Bulletin - MSB Spinner 1-24-96

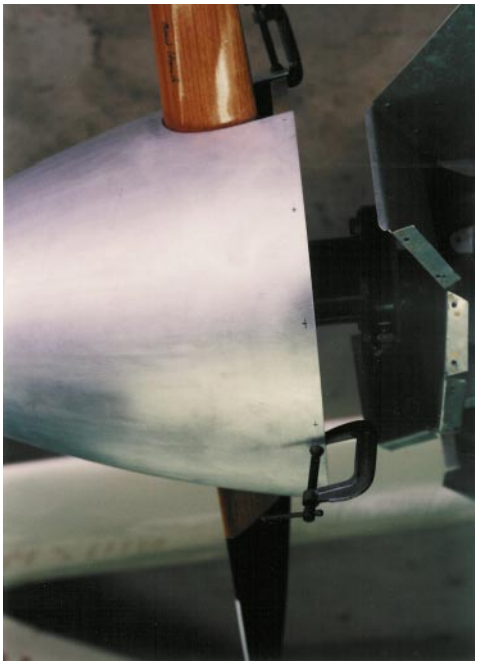
Date: 1/24/96

Subject: 16” Spinner Installation, fixed pitch propeller (p/n 010.010)

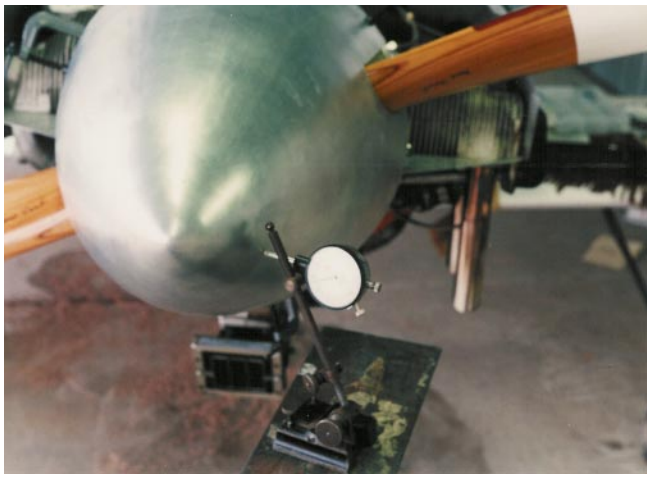
The first step for installing the spinner is to make the propeller cut outs. A tight fit to the propeller blade contour is desired. A gap of 3/16” should be used between the prop and spinner. Make a paper or cardboard template of the prop blade 8” out from the center. The template should fit over the propeller sitting in place on the spinner backplate flat on a table. The bottom edge of the template should be against the table to give the proper reference for the blade angle in relation to the back of the spinner. This template is then used to mark the spinner for removing the prop cut outs. Reference marks should be placed on the aft edge of the dome equal distances apart measured around in both directions. Using the template, align the trailing edge of the prop cut outs with the marks on the dome. In order to get the spinner dome in place the areas aft of the prop blades will need to be removed as well. Cut along the marks from the template and later file in the 3/16” clearance gap fitting the prop in place occasionally for comparison. Using another template make a filler piece to cover the gap aft of the prop. If care is taken the filler pieces can be made from material removed from the spinner for the cut out. The filler pieces are attached to the backplate in the same way as the dome using 2, #8 screws. Backup plates should be riveted to the sides of the filler pieces to fit under the dome. They need to be shimmed accordingly for a doubler around the prop cut out (see below). The filler pieces can now be attached to the dome and backplate in 4 spots.



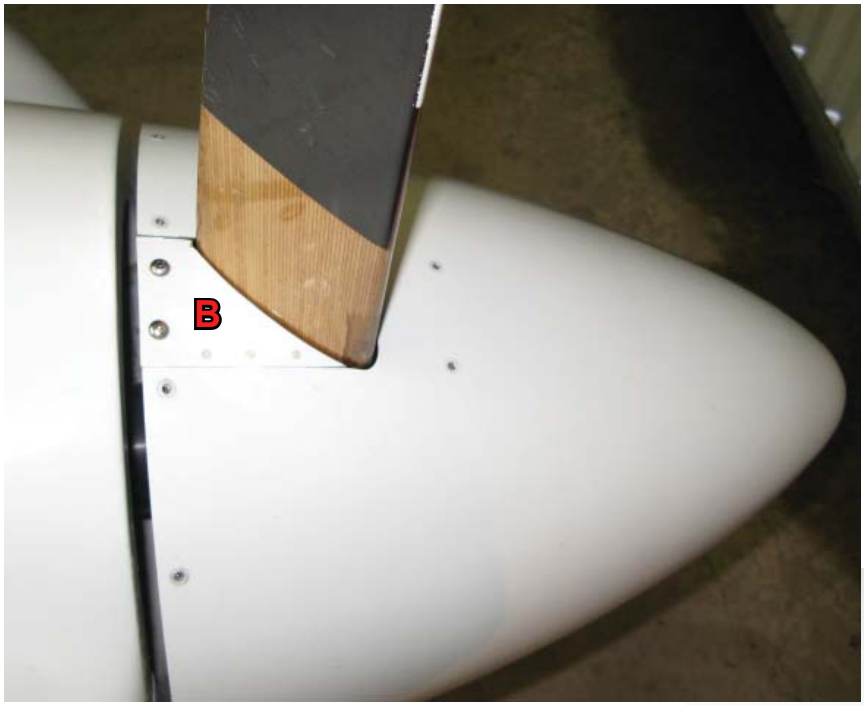
The prop cut outs in the spinner are where most cracking problems occur. This is why it should be reinforced with a doubler riveted to the inside. These spinners are much heavier than those supplied in the past and are therefore much less susceptible to cracking. However, we do still recommend installing an .040 doubler around the cut out. The doublers need to stop short of where the backplate fits on the inside edge of the dome. It is very important that the edges around the cut outs be polished to remove all nicks and other possible stress risers. We recommend using emery paper followed by Scotch Brite for a final finish.

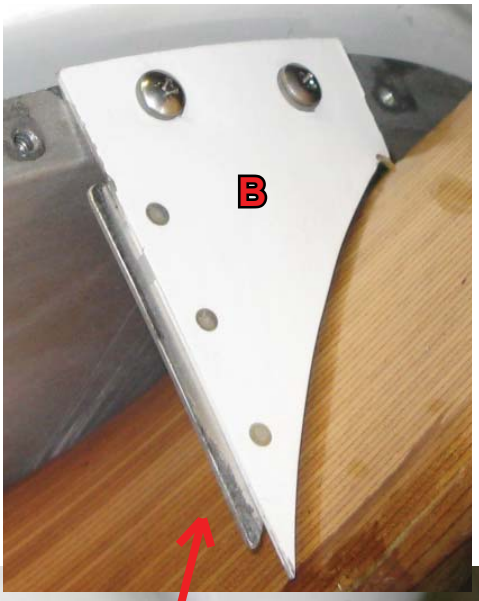


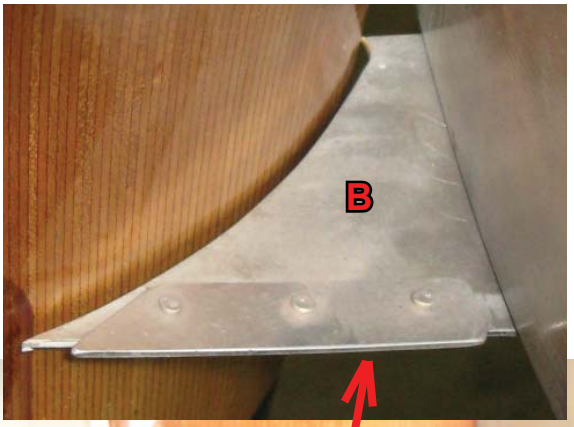
Our 16" diameter Mustang spinners are designed for installation with fixed pitch propellers. The front bulkheads will fit prop hubs of 2-3/4", 3-3/4", or 4-3/8" thickness. Shims are to be used to accommodate propellers with a different prop hub thickness. These are available from Mustang Aeronautics. The front bulkhead is a precision fit, so when installed properly it does not need to be attached to the dome with fasteners. The front bulkhead flange has a 3M Teflon fluorocarbon tape applied to it to prevent chaffing with the dome. It is **very important** that the dome fits tightly over the front bulkhead and spinner backplate. This requires proper spacing between the front bulkhead and backplate (2-3/4", 3-3/4", or 4-3/8"). Install the prop extension, then the backplate, and then the prop. To ensure that the front bulkhead rides on the dome properly, use washers as spacers between the front bulkhead and the prop when you install the front bulkhead. Now press the spinner dome in place. On the first trial fit of the dome it should not go all the way onto the aft edge backplate because of the spacers. At this point you know that the front bulkhead is hitting the dome. Now you can remove washers until the dome stops just short of flush with the aft flange on the backplate. At this point, you can remove the washers and make a permanent spacer based on the thickness of the remaining washers. After 10-15 hours of operation the spinner should be removed and inspected for excessive chaffing between the front bulkhead and the spinner dome. When the propeller cut outs are made the spinner will deform to a slightly oval shape due to the internal stresses. A little extra Teflon tape in the areas above the cut outs may be necessary to achieve a good fit. If the chaffing persists attach the front bulkhead to the spinner dome using 5 #8-32 screws into nutplates. The spinner backplate should be attached to the dome using #8-32 screws into nutplates on the backplate with 3 to 3.5” spacing.



It is also very important that the spinner be adjusted to run true so that there is no wobble. This procedure should be followed when drilling the holes for the backplate as well as every time the spinner is put on the airplane. We use a dial indicator on a horse close to the nose of the spinner. A dry marker could also be used. After removing a spark plug from each cylinder the prop is pulled through. The indicator near the spinner nose will show where the spinner is out of round to allow for adjustment before final tightening of the spinner screws. The marker placed very close to the spinner will also show where it is out of round by where it hits and where it does not. Use small c-clamps to hold the dome in place when drilling the backplate attach holes. This all needs to be done while the dome is pushed back into its proper position on the front and rear bulkheads. For a proper fit the dome should have to be pushed on and held in place to get the screws in. If the dome is not held tight to the front bulkhead, screws will need to be used to hold it in place.

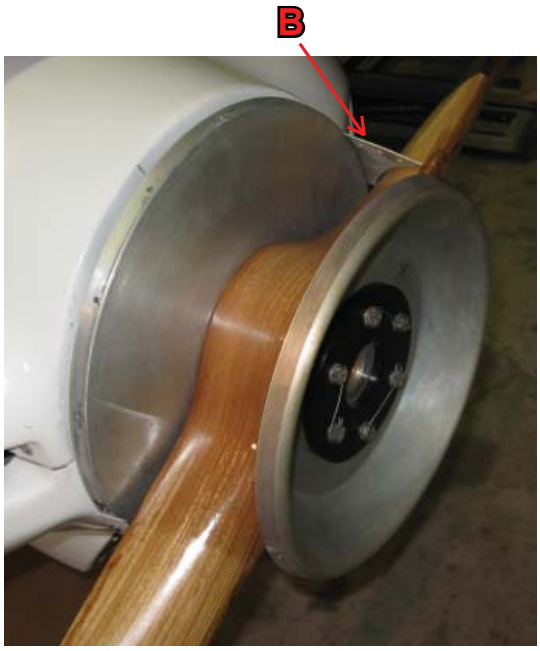

B

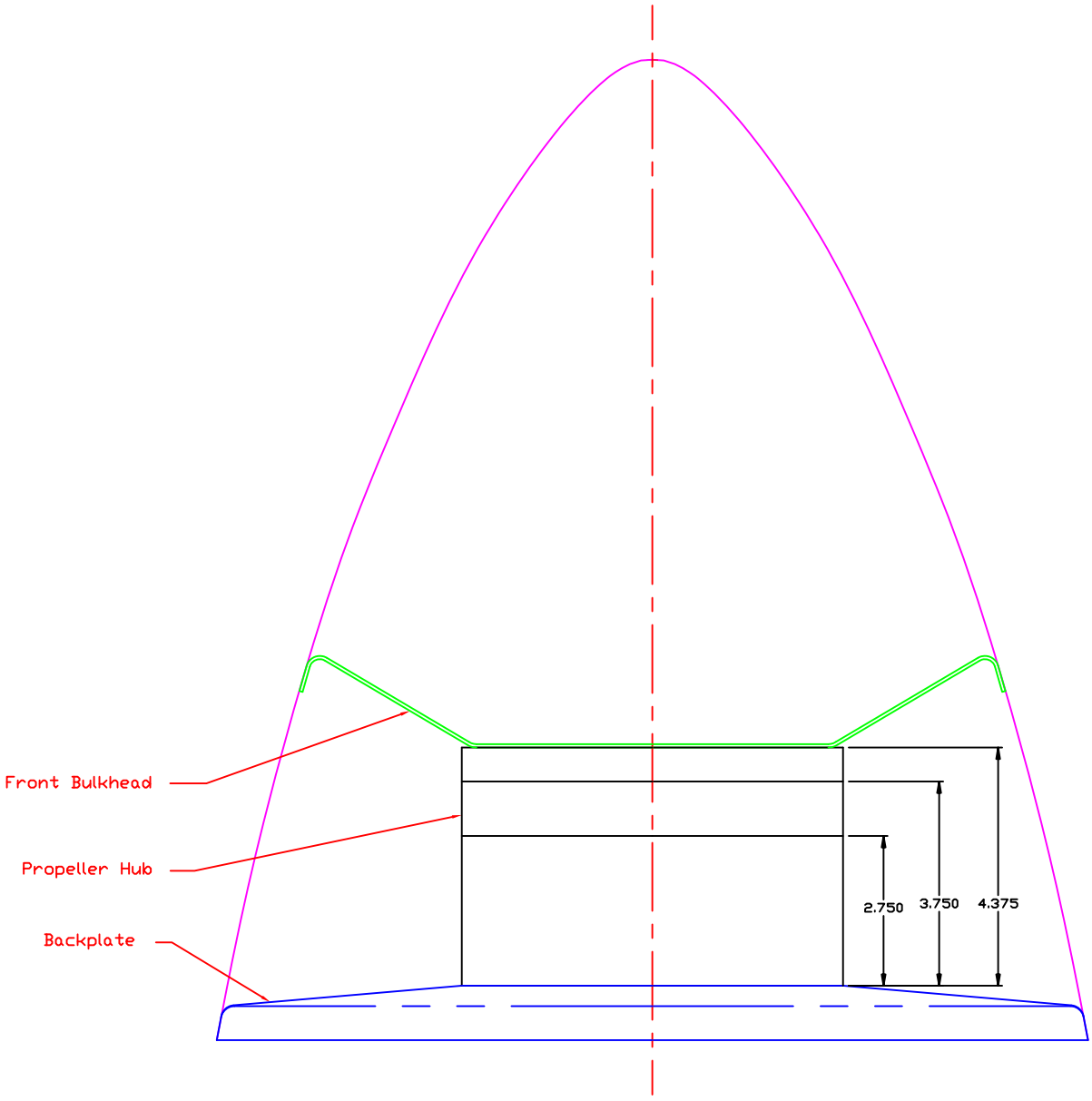

B

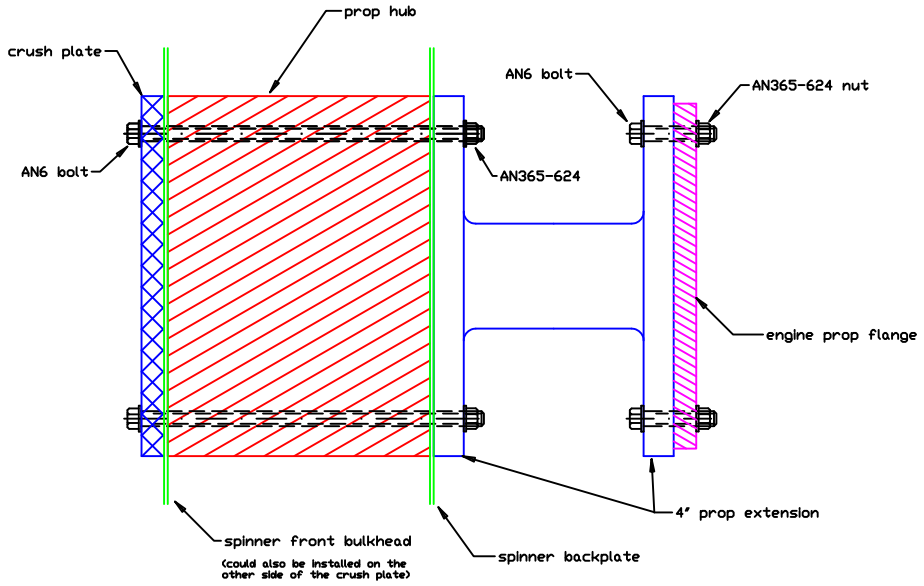

B


B


B


B


Front Bulkhead
Propeller Hub
Backplate
2.750
3.750
4.375


prop hub
crush plate
AN6 bolt
AN6 bolt
AN365-624 nut
AN365-624
engine prop flange
4" prop extension
spinner front bulkhead
(could also be installed on the other side of the crush plate)
spinner backplate

YOUR SPINNER AND YOUR ANNUAL INSPECTION

by George Linkis

When you do your annual inspection, you probably remove your spinner to inspect your propeller. Even a fixed-pitch prop should be inspected for safety, time security and no "slip" between bolts and prop (wood prop). With a constant speed prop, removing the spinner is a necessity to grease the hub (Shell Oil Co. #5 grease).

Now you folks in the warm climes like Florida and California may do your inspection at any time, but us folks that live in the climes that blows snow between November and April -- well, this subject is written because the snow is here now and this subject comes to mind -- our annual inspection.

The point of this article is to cover the importance of getting the spinner on -- centered! And secondly, torqueing the screws.

After you have finished your airplane including getting the spinner in place, removing the spinner requires that centering is done each time it is removed. Just because you have located the spinner "true" when you completed the airplane does not mean it goes on "true" each time you put the screw back in place. Each screw hole has a few thousandths clearance. If not deliberate during construction, then with "time". (i.e., wear by removal and re-insertion of the screws of slippage due to inadequate torquing of the screws.)

You might think this is not possible with just a few thousandths in the holes and that tight-fitting front hub bulkhead. Wrong! It is a fact. Aluminum as you know by now has "give" and "spring back", so you can push the spinner on tight and off center. Figure 1 illustrates how a few thousandths can give an off center line condition. Mustangs have large spinners so the multiplication factor is also large.

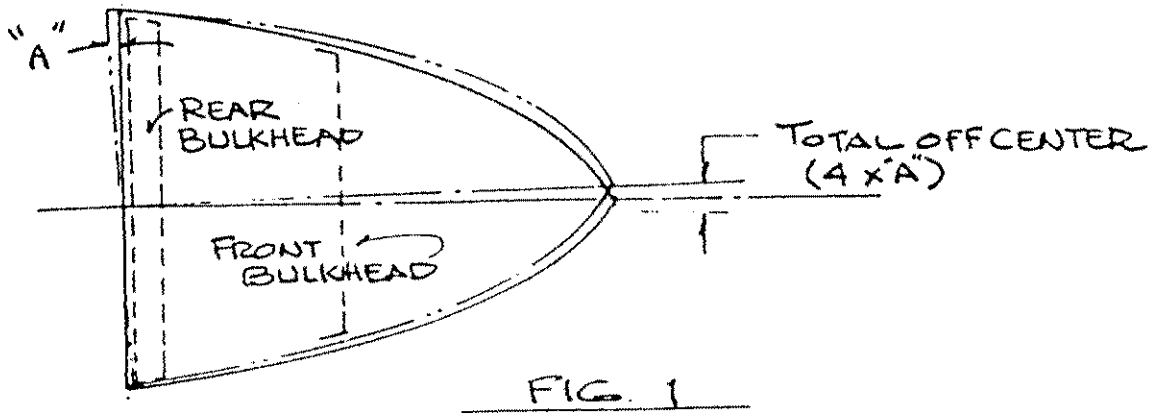


FIG. 1

Here is a tip on how to get the spinner on center:

1. Get the aircraft horizontal. Put the tail on a box . . . or a chair and box.
2. Get a broom, a tripod or some vertical device to which you can tape a felt tip marker horizontally.
3. Remove one plug from each cylinder. (After the compression test for your annual is the time to do a spinner alignment.) Refer to Figure 2.

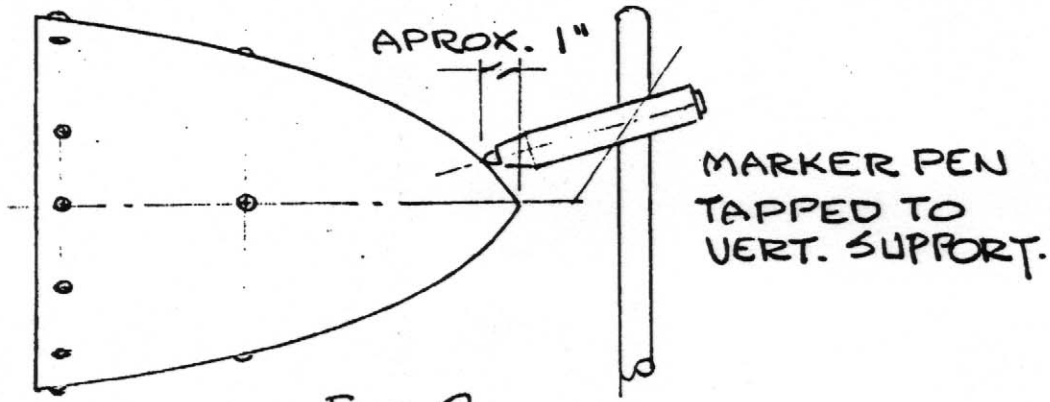


FIG. 2

Slowly, so that you do not apply incorrect pressures that permit the engine to move on the motor mounts, turn the prop. At least four of the screws at 90 degree intervals should be "slightly" snug. The marker will trace a path on the spinner. If you get an arc of 180 degrees or less, adjust the spinner by a slight "rap" of your palm in the appropriate direction. Do not wipe away the trace, but move the marker to say, 7/8" or 1-1/8" from the tip. Rotate the spinner again and note the trace. If unchanged, your screws are snugged too tight or your "rap" was too light.

Several tries will be required. When you get an arc of 270 degrees or more, your spinner is within a few thousandths of center. Refer to Figure 3.

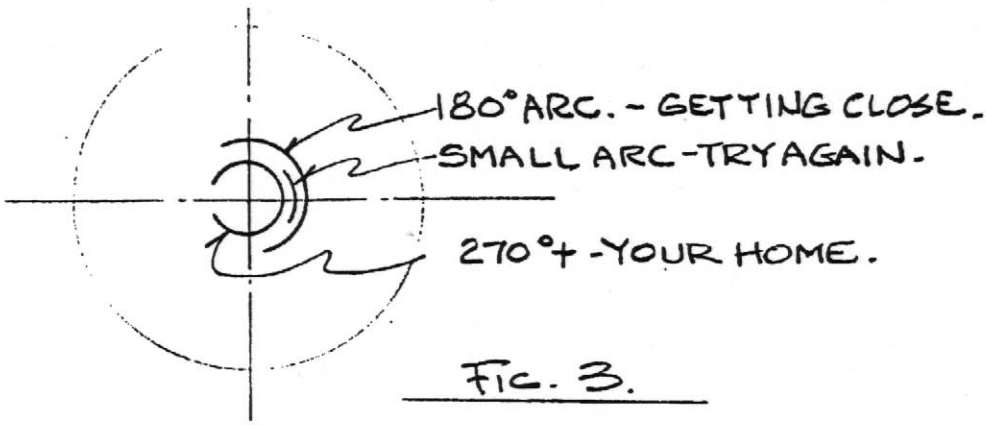


FIG. 3.

CAUTION! A trace of 360 degrees is no proof of being on center. The spinner may be pushing the felt tip pen away. A trace of 355 degrees is proof that the "pen" is free!

Satisfied you're centered? One more repeat wouldn't hurt. When completed, tighten the four screws, then insert and tighten the remaining screws.

To avoid cracks and "countersinking wear" be sure you use a nylon washer under each screw head. The nylon washer acts as a cushion against vibration wear and pressure compensator during temperature changes. If you have not been using these washers and find a black residue under the heads when your remove the screws -- your spinner is wearing away under the heads. Refer to Figure 4.

Your best insurance against wear is the nylon washer. Don't go flying without them. This works for new installations too. For you machinists out there, you can use a dial indicator in lieu of the felt pen (take care not to scratch the spinner).

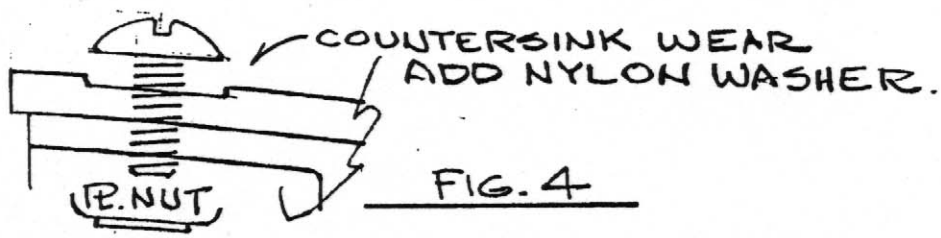


FIG. 4