

NORTH AMERICAN AVIATION, INC • MUNICIPAL AIRPORT • LOS ANGELES 45, CALIF.

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PARAGRAPH B IS
MANDATORY - MUST BE
ACCOMPLISHED BY 3-23-47

HARTZELL NO. 8628 PROPELLER BLADE TIP REWORK

Effective on all airplanes.

DELIVERED AIRPLANES AFFECTED:

NAV-4-2 thru NAV-4-550

This modification will be made at the factory on airplanes NAV-4-551 and subsequent.

Tests on the propeller blades indicate that the propeller diameter should be reduced from 86 inches to 84 inches. This reduction in diameter should help prevent cracking of the blade tipping and loss of rivets.

A. REMOVAL OF HARTZELL PROPELLER AND A-101 SERVO VALVE LEVER

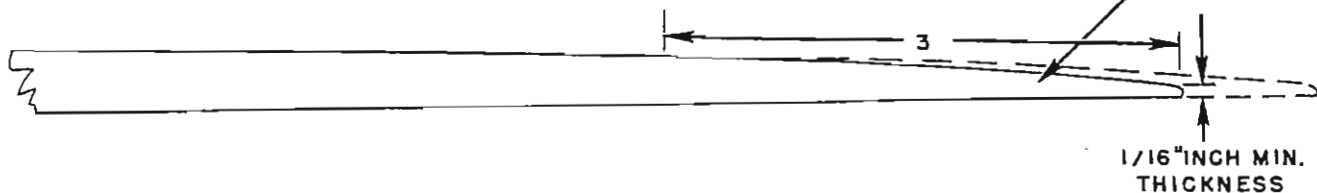
CAUTION: Be sure ignition switch is off.

1. Before removing propeller, mark the blade shanks and blade actuating links in order that propeller can be reinstalled with the blades attached to their respective actuating links.
2. Remove the two wire spring locks and Allen head bolts from ends of the blade shanks.
3. Remove the clevis pin through the propeller retaining nut.
4. Unscrew retaining nut, and remove propeller from propeller shaft.

NOTE:

BLADE DESIGN MUST BE MARKED
"8428R" WITH OPAQUE INK OR
YELLOW ENAMEL

2 REGRIND CAMBER SURFACE ONLY



3 WITH TIPPING REMOVED, SCRIBE LINE (BOTH SIDES OF BLADE) TO LOCATE HOLES. AFTER TIPPING IS INSTALLED DETERMINE EXACT LOCATION WITH DIMPLE PUNCH.

2 INCH R.

7-7/8 APPROX.

10°

6-7/8 APPROX.

3/32 RIVET

7/16
± 1/16

43 INCH R.

42 INCH R.

1 REMOVE OLD TIPPING TO THIS CUT.

4 ANCHOR TIPPING WITH TWO RIVETS AT THESE POINTS BEFORE PULLING DOWN OUTER SECTION OF TIPPING WITH SHOCK CORD.

5 THIN OUT TIPPING; UNDERLAP ON CAMBER SURFACE AND SWEAT-SOLDER.

FIGURE 1

5. Remove the bolt attaching the clevis end of the propeller control to the servo valve lever.
6. Remove the clevis pin attaching the servo lever arm to the propeller cylinder. Remove servo lever from airplane.

B. MODIFICATION OF PROPELLER BLADE TIP FROM NO. 8628 TO NO. 8428R
AS AUTHORIZED BY PROPELLER MANUFACTURER.

SEE FIGURE 1

1. Remove approximately 7-7/8 inches (to the break or file cut nearest 7-7/8 inches from the tip) of the outer section of the metal leading edge as follows:
 - a. Center-punch the rivet head on the face or thrust side of the blade. When center-punching, back the opposite side of the blade with flat metal block.
 - b. Cut out the head of the rivet with a 1/4-inch countersink or 1/4-inch drill, ground to 82 degrees.

CAUTION: Do not drill through the steel tip.

- c. Punch out old rivet with 1/8-inch punch in the case of copper rivets, or a 3/32-inch punch in the case of brass rivets. When performing this operation, back the opposite side of the blade with a flat metal block having a clearance hole or clearance slot for the rivet.
- d. File the metal at the inboard end of the 7-7/8 inch strip so the tipping will break off evenly. Remove the metal tip.

CAUTION: Do not apply excessive force that may cause the blade material to crack between the rivet holes. Draw the metal out of the countersink before attempting to remove it from the blade.

2. Lay out and cut off blade tips:
 - a. Mark off one inch from tip of each blade.
 - b. Lay out shape of tip, using template made according to figure 1.
 - c. Cut off to the layout lines, and fair in the camber side of the blade as shown.
 - d. Recountersink the holes affected by the fairing operation to the same depth as the other holes.

3. Install new A86 metal tipping:
 - a. Mark off location of the holes as shown.
 - b. If holes in the blade are larger than $1/8$ inch, fill with plastic wood and redrill with $1/8$ -inch drill.
 - c. Mate the end of the new A86 tipping, with the end of the tipping still on the blade. There should be no gap on the radius of the leading edge.
 - d. Hold the tipping in place with rubber inner-tube bands or shock cord, and dimple on both sides of the blade the two inboard rivet holes with an 80-degree dimpler.
 - e. Drill $1/8$ -inch holes in the metal.
 - f. Insert $1/8$ -inch copper rivets with the head on the face side. Cut off rivets on the camber side leaving $3/16$ inch to $1/4$ inch extending beyond the metal. Head rivets with bucking iron, and hammer, using very light tapping strokes.
 - g. Work on out to the tip of blade with the same procedure as outlined above. Keep the metal down tight on the plastic with rubber bands. Form metal to the blade before dimpling and drilling.
 - h. Form the tip lap as shown before putting in the last two outboard rivets. Locate last rivet, which is $3/32$ inch in diameter. Drill and dimple the metal just slightly. The dimple may be improved by light countersinking. This rivet is to hold the loose end of metal from vibrating; a full head is not necessary.
 - i. Hammer the metal down tight on the plastic with a metal bucking block and hammer.
 - j. File smooth, and solder in cavities where necessary.
4. Balance and finish:
 - a. Balance propeller as described in Hartzell Maintenance Manual. If necessary, file the tipping to improve balance, but do not file the metal too thin. The blades may be leaded in the shank for balance if absolutely necessary.
 - b. Repaint a 3-inch yellow band on tip with quick-drying enamel. Touch up black portion of the blade with black enamel. Remark design "8428R" with opaque ink or yellow enamel. Rebalance propeller.
 - c. Refinish in the same manner as wood propellers. "Hartzite" blade material is a special plastic composition through and through. If the varnish finish is worn off or stones have nicked the surface, the blade

need not be refinished immediately, as water will not affect the material.

NOTE: This rework is a major alteration and must conform with C A A. Regulations for Approved Repair Stations.

C. INSTALLATION OF PROPELLER AND NEW 145-44054 SERVO VALVE LEVER

1. Coat propeller shaft splines with a thin coat of light engine oil. Apply a thin coat of antiseize compound to propeller shaft threads.
2. Slide propeller on shaft, aligning the wide hub spline with the blind spline (if used) on the shaft.

NOTE: Be sure each blade connects to the correct blade actuating link as previously marked.

3. Install front cone and retaining nut on shaft. Tighten nut with a force of 180 pounds on the end of a 3-foot bar.
4. Safety retainer nut with removed clevis pin and new AN380-2-2 cotter pin.
5. Attach blade actuating links to respective blade shanks, using removed Allen head bolts and wire safety locks.
6. Adjust stop bolt on new servo lever so that approximately $5/16$ inch of the threaded end of the bolt extends through the elastic stop nut.

NOTE: This will give an approximate low pitch setting before running engine.

7. Install new servo lever, using previously removed bolt, nut, clevis pin, washers, and two new AN380-2-2 cotter pins.

NOTE: When the lever is in place, the head of the bolt will be aft. The forward end of the bolt will strike the propeller cylinder, providing a low pitch (high rpm) stop.

D. ADJUSTMENT OF HARTZELL PROPELLER, HUB MODEL HC-12 X 20-1, BLADE MODEL 8428R

1. Be sure that low pitch stop bolt is adjusted as explained in paragraph C. (6)
2. Adjust clevis end of propeller control to provide approximately $1/8$ inch spring-back in control when knob in cockpit is pushed in and low pitch stop bolt is striking the propeller cylinder.

3. Run up engine and check for 1975 (± 15) ground (static) rpm. Adjust maximum (static) rpm by turning low pitch stop bolt in to decrease or out to increase rpm. One turn of bolt equals 20 to 25 rpm.

NOTE: When the above correct ground rpm is obtained, the full throttle rpm in a 95 mph IAS climb will fall within the authorized 2250-2300 rpm.

4. After obtaining correct static rpm, check for clearance of $5/64$ ($\pm 1/16$) inch between propeller hub and actuating cylinder jack plate.

NOTE: Clearance at this point is necessary to prevent preloading the engine thrust bearing

5. When all adjustments are complete, recheck the propeller control for $1/8$ inch spring-back.

NOTE: Time required to complete this rework should be approximately 4 man-hours.

Notice of compliance with this bulletin must be entered in the airplane log book. The placard restricting engine rpm required by North American Aviation letter to NAVion owners, dated 1-22-47, may be removed when this bulletin is complied with.

On page 17 of C.A.A. approved Airplane Operating Limitations, Equipment List, mark out the last three lines of Item 1(a). Write in with ink "Blade Model No. 8428R."

JOHN W. CASEY
FIELD SERVICE MANAGER

NOTE: Return the removed servo lever to N.A.A. Attention: NAVion Spares Receiving, for credit. If you have sold your airplane, please return this kit to factory with name and address of new owner.