HARTZELL PROPELLER INC.

SERVICE BULLETIN

TRANSMITTAL SHEET

HC-SB-61-287

Propeller - E10950 Blade Inspection, Rework, and Thrust Bearing Replacement

June 5, 2009

This page transmits a revision to Service Bulletin HC-SB-61-287.

- Original Issue, dated May 11/06
- Revision 1, dated Jun 01/06
- Revision 2, dated Oct 24/06
- Revision 3, dated Jun 26/08
- Revision 4, dated Jun 05/09

FAA approval has been obtained on technical data in this publication that affects type design.

Some of these changes that do not affect technical content may not be highlighted in this transmittal sheet.

Changes are shown by a change bar in the left margin of the revised pages.

This revision is issued to change the following in this Service Bulletin:

- Adds CAUTION for use of most current revision.
- Changes the compliance interval to 4,000 hours.
- Updates reporting requirements.
- Updates Figure 3 for latest revision of the overlay.
- Clarifies machining instructions for blades with the Delrin® seal installed.
- Clarifies requirement for shoulder height inspection following rework.
- Deletes the Appendix.

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1. Planning Information

   A. Effectivity

      (1) HC-E4A-3( )/E10950( ) propellers installed on Raytheon Beechcraft 1900D aircraft are affected by this Service Bulletin.

      CAUTION: DO NOT USE OBSOLETE OR OUTDATED INFORMATION. PERFORM ALL INSPECTIONS OR WORK IN ACCORDANCE WITH THE MOST RECENT REVISION OF THIS SERVICE BULLETIN. INFORMATION CONTAINED IN THIS SERVICE BULLETIN MAY BE SIGNIFCANTLY CHANGED FROM EARLIER REVISIONS. USE OF OBSOLETE INFORMATION MAY RESULT IN DEATH, SERIOUS BODILY INJURY, AND/OR SUBSTANTIAL PROPERTY DAMAGE. REFER TO THE SERVICE BULLETIN INDEX FOR THE MOST RECENT REVISION LEVEL OF THIS SERVICE BULLETIN.

   B. Concurrent Requirements

      (1) Hartzell Service Bulletins HC-SB-61-276 and HC-SB-61-283 are also applicable.

   C. Reason

      WARNING: A THRUST BEARING FRACTURE AND RESULTING HUB DAMAGE OR FAILURE MAY RESULT IN AN IN-FLIGHT BLADE SEPARATION. FAILURE MAY RESULT IN DEATH, SERIOUS BODILY INJURY, AND/OR SUBSTANTIAL PROPERTY DAMAGE. UNUSUAL OR ABNORMAL VIBRATION DEMANDS IMMEDIATE INSPECTION FOR POSSIBLE THRUST BEARING FRACTURE.

      (1) Hartzell has received reports of damaged or broken C-792-(1) and D-7745 blade thrust bearings. Some of these fractures have resulted in hub damage and/or blade damage. A damaged hub, damaged blade, or broken blade thrust bearing may cause fractures in the propeller pitch change mechanism, resulting in a loss of pitch control and/or the inability to feather the propeller.

      (2) The cause of the blade thrust bearing fractures is currently uncertain. A contributing factor may be insufficient support of the blade side bearing race.

(3) The blade retention radius rework and blade thrust bearing replacement specified in this Service Bulletin are considered a significant improvement to the blade thrust bearing fractures. The blade thrust bearing replacement interval will be increased as service experience permits.

(a) Hartzell Service Bulletin HC-SB-61-258 required all blade thrust bearings to be replaced at every overhaul.

(4) The original issue of this Service Bulletin required blade thrust bearing replacement at intervals not to exceed 3000 hours TSN or TSO.

(5) Service Bulletin HC-SB-61-258 was made obsolete by Revision 1 of this Service Bulletin.

(6) FAA Airworthiness Directive 2007-08-02 was issued to address this issue.

D. Description

(1) Revision 4 to this Service Bulletin increases the replacement interval for the D-7745 blade thrust bearing to 4,000 flight hours from previous thrust bearing replacement and changes reporting requirements.

(2) Revision 2 to this Service Bulletin added a reporting form for inspections performed during compliance with this Service Bulletin.

(3) This Service Bulletin provides blade retention radius inspection and rework criteria and procedure.

(4) This Service Bulletin provides instructions to apply and machine aluminum filled adhesive to restore lost material in the blade retention radius and blade retention shoulder. This will provide a uniform surface to support the blade thrust bearing.

(5) Blade inspection and rework intervals are determined by the blade time since new (TSN) or blade time since overhaul (TSO).

(6) This Service Bulletin provides new blade thrust bearing installation procedures.

E. Compliance

(1) Initial Compliance

(a) At next overhaul or propeller disassembly after May 11, 2006, inspect and rework the blade retention radius as required and install new D-7745 blade thrust bearings in accordance with the Accomplishment Instructions of this Service Bulletin.

1 Replacement of the blade thrust bearing, blade inspection, and rework of the blade retention radius is only required at propeller disassembly if blade TSO or time since blade thrust bearing replacement is greater than 2000 hours.

2 Propeller disassembly is identified as any repair that requires the hub halves to be separated.

(2) After initial compliance, replace the blade thrust bearing at intervals not to exceed 4,000 flight hours TSN or TSO.

F. Approval

(1) This Service Bulletin is approved by the Manager, FAA, Chicago Aircraft Certification Office, ACE 115C, by approval document dated May 6, 2009, as an alternative method of compliance with Airworthiness Directive 2007-08-02.

G. Manpower

(1) Man hours required when performed in conjunction with an overhaul.

(a) Approximately 1.0 man hour per blade is required for blade rework when performed in conjunction with an overhaul.

(2) Man hours required when performed outside the overhaul interval:

Requirement	Man Hours
Blade inspection	0.5 man hours per blade
Blade rework	1.5 man hours per blade
Propeller disassembly and reassembly	8.0 man hours per propeller

H. Weight and Balance

(1) No change.

I. Electrical Load Data

(1) No change.

J. References

(1) Hartzell Composite Blade Maintenance Manual 135F (61-13-35)

(2) Hartzell Four Blade Lightweight Turbine Propeller Maintenance Manual 143A (61-10-43)

(3) Hartzell Tool and Equipment Manual 165E (61-00-65)

(4) Hartzell Standard Practices Manual 202A (61-01-02)

(5) Airworthiness Directive 2007-08-02

K. Other Publications Affected

(1) Hartzell Composite Blade Maintenance Manual 135F (61-13-35)

(2) Hartzell Tool and Equipment Manual 165E (61-00-65)

(3) Hartzell Service Bulletin HC-SB-61-258, now obsolete

2. Material Information

A. Consumable Material

(1) Consumables

CM Number	Description
CM11	Solvent
CM19	Mold Release
CM47	Abrasive Pad
CM71	Adhesive
CM72	Talc
CM94	Adhesive
CM106	Solvent
CM110	Aluminum Powder
CM161	Sealant
CM164	Conductive Coating
N/A	Stiff bristle brush
N/A	Sand Paper
N/A	Masking Material
N/A	Tongue Depressor or equivalent
N/A	Emery Cloth

NOTE: All CM numbers or materials in this Service Bulletin refer to the Consumable Materials chapter of Hartzell Standard Practices Manual 202A (61-01-02).

(2) Aluminum Filled Adhesive

NOTE: Adhesive CM94 mixed with CM110 makes the aluminum filled adhesive used for rework of the blade retention radius and the installation of the blade thrust bearing.

(a) Mix adhesive CM94 as follows:

NOTE 1: For rework of the blade retention radius, a minimum of 50 grams of adhesive CM94 should be used This will be enough for one blade. Larger amounts may be mixed using the same proportions if a larger batch of adhesive is desired.

NOTE 2: For the installation of the blade thrust bearing, a minimum of 25 grams of adhesive CM94 must be mixed.

1 Option 1 - Required scale accuracy to 0.02

a 25g +/- 0.25g Part A to 5.75g +/- 0.25g Part B.

b Add 4 to 4.5 cc aluminum powder CM110 to the above mixture and mix thoroughly until the compound is a uniform color.

2 Option 2 - Required scale accuracy to 0.05

a 50g +/- 0.5g Part A to 11.5g +/- 0.5g Part B.

b Add 8 to 9 cc aluminum powder CM110 to the above mixture and mix thoroughly until the compound is a uniform color.

3 Option 3 - Required scale accuracy to 0.1

a 100g +/- 1.0g Part A to 23g +/- 1.0g Part B.

b Add 16 to 18 cc aluminum powder CM110 to the above mixture and mix thoroughly until the compound is a uniform color.

B. Special Tooling

(1) Tools identified with a TE number refer to the Hartzell Tool and Equipment Manual 165A (61-00-65).

Part Number	TE Number	Description	Vendor
DST-2934	TE93	Blade Bearing Press	Hartzell Propeller Inc.
101736	TE450	"E" Shank Potting Mold	Hartzell Propeller Inc.
101679	TE449	"E" Shank Form Tool	Hartzell Propeller Inc.
GT-3669	TE451	Comparator Overlay	Hartzell Propeller Inc.
N/A	N/A	Height Gauge	Locally procured
N/A	N/A	Dial Indicator	Locally procured
N/A	N/A	Lathe	Locally procured
N/A	N/A	4.0 - 5.0 in. Hose Clamp (101.6 - 127.0 mm)	Locally procured

C. Materials

(1) Parts per blade

CAUTION: NEW D-7745 BLADE THRUST BEARING MUST BE INSTALLED AT THE TIME OF BLADE REWORK.

Hartzell Part Number	Keyword	Qty
D-7745	Blade thrust bearing	1
B-1041	Blade retaining ring	A/R
B-7071	Blade retaining ring	A/R

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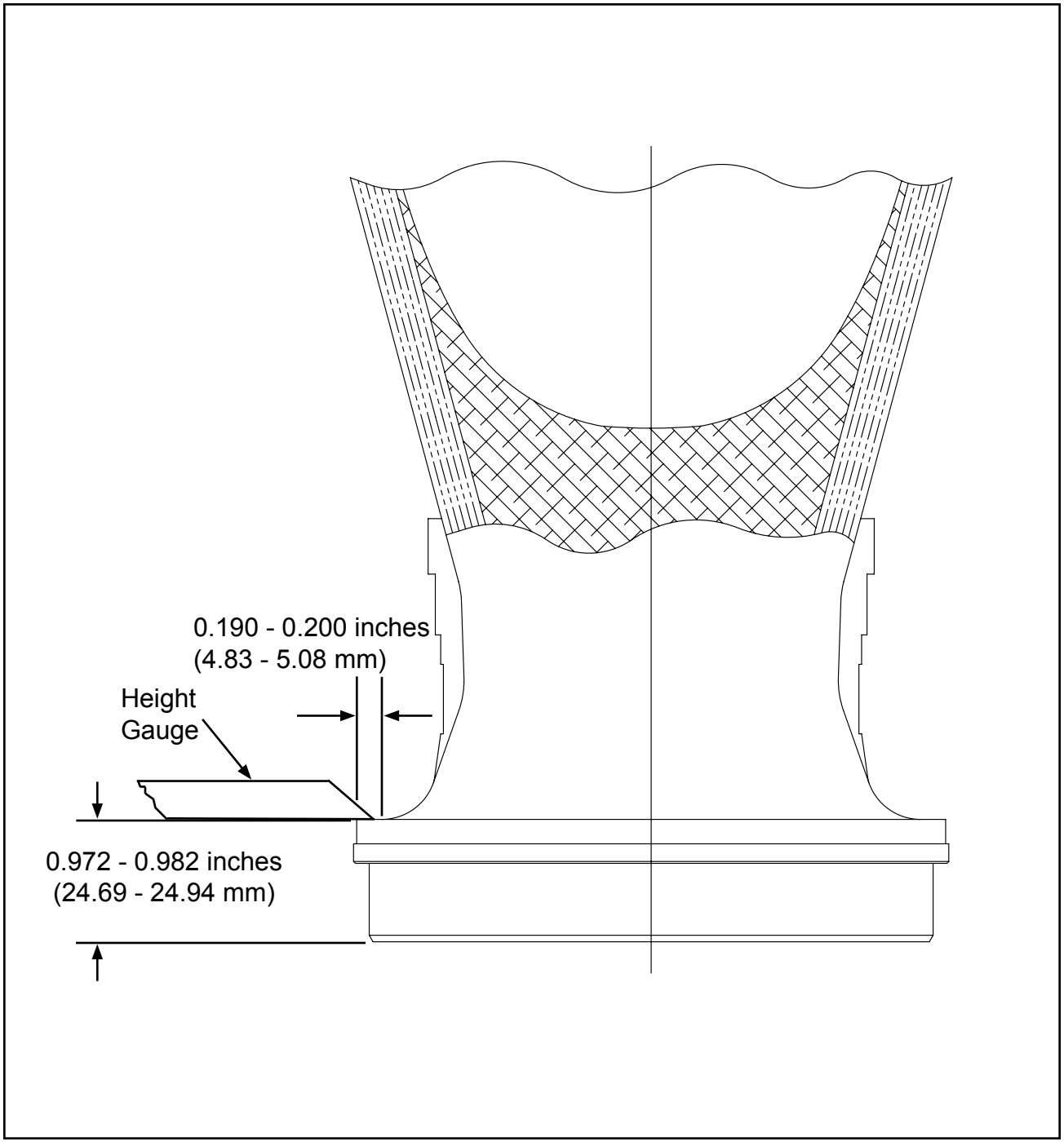
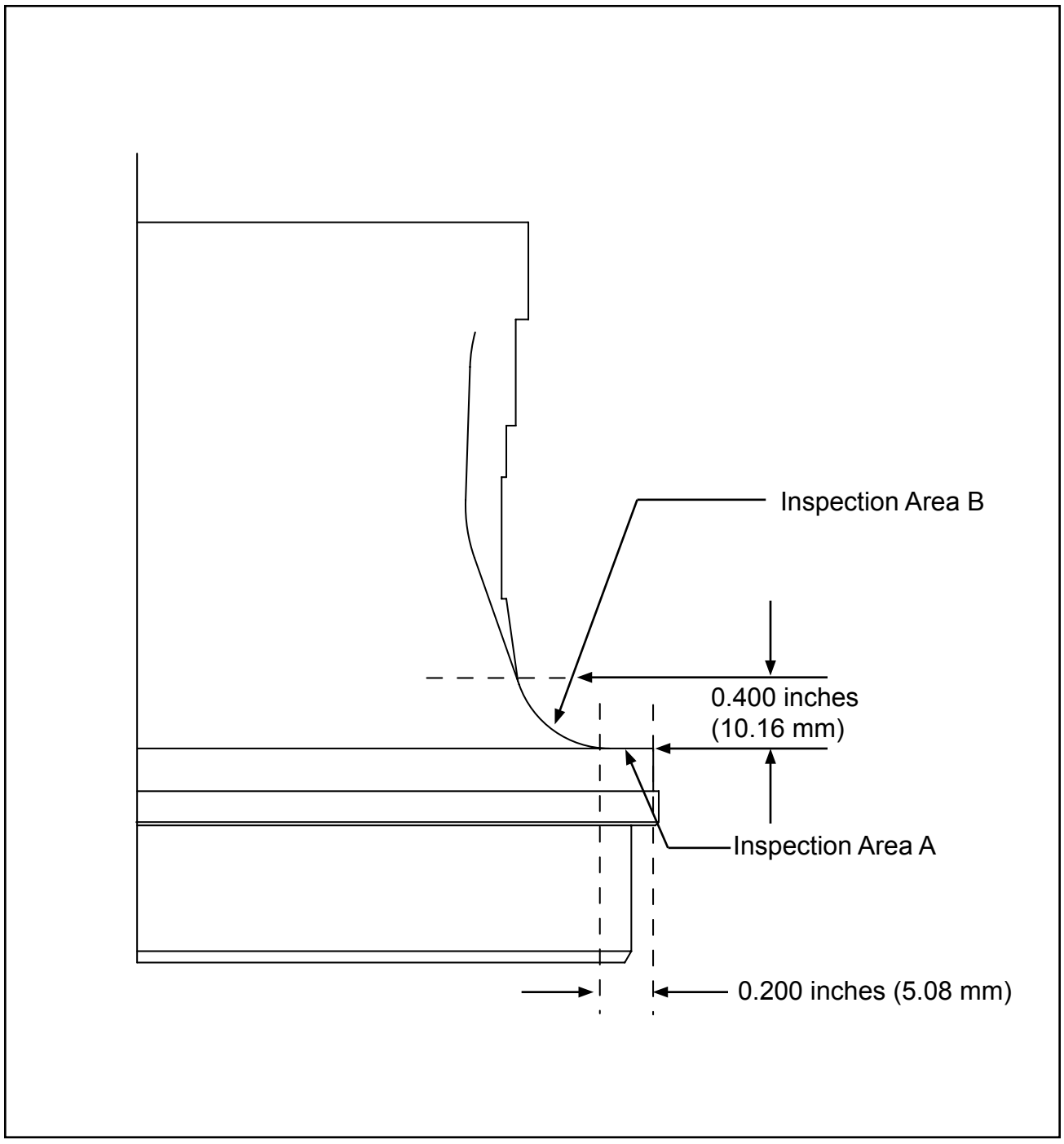


Measuring the Blade Retention Shoulder Height
Figure 1



Inspection of the Blade Retention Shoulder and Retention Radius
Figure 2

3. Accomplishment Instruction

A. Blade Inspection and Rework

NOTE: If blade has previously been reworked proceed to Paragraph 3.G.

(1) If not previously accomplished, disassemble the propeller in accordance with Hartzell Four Blade Lightweight Turbine Propeller Maintenance Manual 143A (61-10-43).

(2) Inspect the blade retention shoulder height in accordance with Paragraph 3.B. of this Service Bulletin.

(3) Perform optical comparator inspection as required in accordance with Paragraph 3.C. of this Service Bulletin.

(4) When performed outside an overhaul, disassemble the blade as required in accordance with Hartzell Composite Blade Maintenance Manual 135F (61-13-35).

(a) If the facility's equipment permits, the blade thrust bearing may be removed without removal of the blade counterweight clamps.

(b) If removal of the blade counterweight clamp is required, removal and reinstallation of the blade counterweight clamp should be accomplished in accordance with the instructions in Paragraph 3.F. of this Service Bulletin.

(c) If a D-5117-1 counterweight clamp is removed, the clamp must have threaded inserts installed before reinstallation.

(5) Rework the blade retention radius as required in accordance with Paragraph 3.D. of this Service Bulletin.

(6) Inspect blade retaining ring in accordance with Hartzell Four Blade Lightweight Turbine Propeller Maintenance Manual 143A (61-10-43).

(7) If accomplished in conjunction with an overhaul, complete blade overhaul in accordance with Hartzell Composite Blade Maintenance Manual 135F (61-13-35).

NOTE: The conductive coating CM164 is applied to the aluminum filled adhesive after rework of the blade retention radius.

(8) Install a blade retaining ring and new D-7745 blade thrust bearing in accordance with Paragraph 3.E. of this Service Bulletin.

(9) If required, complete propeller overhaul in accordance with Hartzell Four Blade Lightweight Turbine Propeller Maintenance Manual 143A (61-10-43).

(10) Reassemble the propeller in accordance with Hartzell Four Blade Lightweight Turbine Propeller Maintenance Manual 143A (61-10-43).

(11) Static balance the propeller assembly in accordance with Hartzell Standard Practices Manual 202A (61-01-02).

(12) Make a logbook entry indicating compliance with this Service Bulletin.

(13) If any blade thrust bearing is cracked or chipped, complete and return the Report Form in this Service Bulletin to Hartzell Propeller.

(a) If no cracking or chipping is found, the Report Form is not required.

B. Blade Retention Shoulder Height Inspection

(1) Before measuring, use a polishing stone to remove any raised areas on the blade butt.

(2) Put the blade in a vertical position with the blade butt down on a smooth, flat surface such as a propeller inspection table or surface plate.

(3) Using a height gage, with a reading resolution of 0.001 inches (0.025 mm) or better and inspect the blade retention shoulder.

NOTE: The intent of the inspection is to determine if there are low spots that will prevent the blade thrust bearing from being properly seated on the blade retention shoulder.

(a) Measure the blade retention shoulder in 45 degree increments on the outer 0.195 +/- 0.005 inches (4.95 +/- 0.12 mm) of the laminate diameter. Refer to Figure 1.

1 If no area measures less than 0.972 inches (24.69 mm), perform the optical comparator inspection in accordance with Paragraph 3.C. of this Service Bulletin.

2 If any part of the shoulder height measures less than 0.972 inches (24.69 mm) but more than 0.949 inches (24.10 mm), rework the blade retention radius in accordance with Paragraph 3.D. of this Service Bulletin.

3 If any part of the shoulder height measures less than 0.949 inches (24.10 mm), return the blade to Hartzell Propeller Inc. for evaluation.

(b) Inspect the blade shoulder, Area A, for damage. Refer to Figure 2.

1 If the damage is visible and reaches or extends into the base metal of the blade shank, return the blade to Hartzell Propeller Inc. for evaluation.

2 If damage is visible, measure the shoulder height at the bottom of the damage. If the shoulder height measures less than 0.949 inches (24.10 mm), return the blade to Hartzell Propeller Inc. for evaluation.

3 If no area measures less than 0.949 inches (24.10 mm) in height:

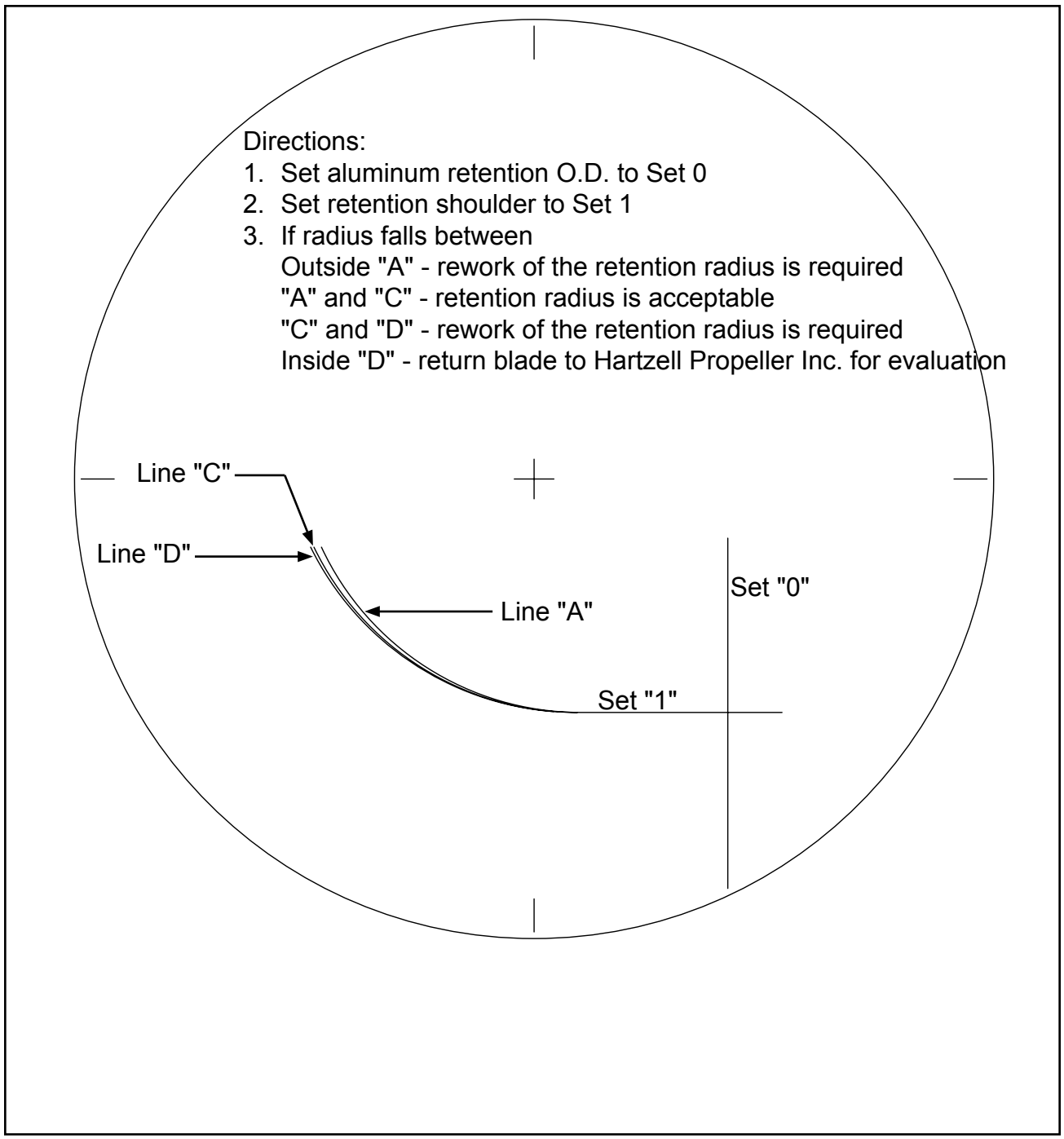
a If each area of damage is less than 0.250 inches (6.35 mm) in length, rework the blade retention radius in accordance with Paragraph 3.D. of this Service Bulletin.

b If any area of damage is greater than 0.250 inches (6.35 mm) in length, return the blade to Hartzell Propeller Inc. for evaluation.

(c) Inspect the blade retention radius, Area B, for damage. Refer to Figure 2.

1 A gouge or loss of composite material less than 0.250 inches (6.35 mm) in length, 0.250 inches (6.35 mm) in width, and 0.020 inches (0.508 mm) in depth anywhere on the retention radius Area B is permitted.

2 If any gouge or loss of composite material is more than 0.250 inches (6.35 mm) in length, 0.250 inches (6.35 mm) in width or 0.020 inches (0.508 mm) in depth anywhere on the retention radius Area B, return the blade to Hartzell Propeller Inc. for evaluation.



Optical Comparator Overlay GT-3669, Rev. A
Figure 3

C. Optical Comparator Check

(1) Use optical comparator overlay GT-3669, Rev. A TE451 to inspect the blade retention radius on the face and camber sides of the blade using an optical comparator.

NOTE: Inspection procedures are detailed on the optical comparator overlay. See Figure 3.

(a) Determine serviceability/repairability by comparing the projected image with the overlay. Make sure that the projected image is within the "A" and "D" lines. See Figure 3.

1 If projection is outside line "A", rework the retention radius in accordance with Paragraph 3.D. of this Service Bulletin.

NOTE: This rework will remove composite material.

2 If projection is between lines "A" and "C" retention radius is acceptable.

3 If projection is between lines "C" and "D", rework retention radius in accordance with Paragraph 3.D. of this Service Bulletin.

4 If projection is inside line "D", retention radius laminate repair is required. Return the blade to Hartzell Propeller Inc. for evaluation.

(b) Deviations of the radius area are not permitted.

(c) The transition between the area where the optical comparator inspection ends and the blade shank just outboard of the retention radius must maintain a smooth blend with no steps or irregularities. If steps or irregularities are found, contact Hartzell Product Support.

D. Blade Retention Radius Rework

(1) Before performing the retention radius rework:

(a) Visually inspect the blade seal ring. Replacement may be required. Replace as needed in accordance with Hartzell Composite Blade Maintenance Manual 135F (61-13-35).

(b) Unless previously removed, remove blade counterweight clamp before reworking blade retention radius.

(2) Using solvent CM11 or CM106 and a stiff bristle brush clean the blade retention bearing radius and shoulder.

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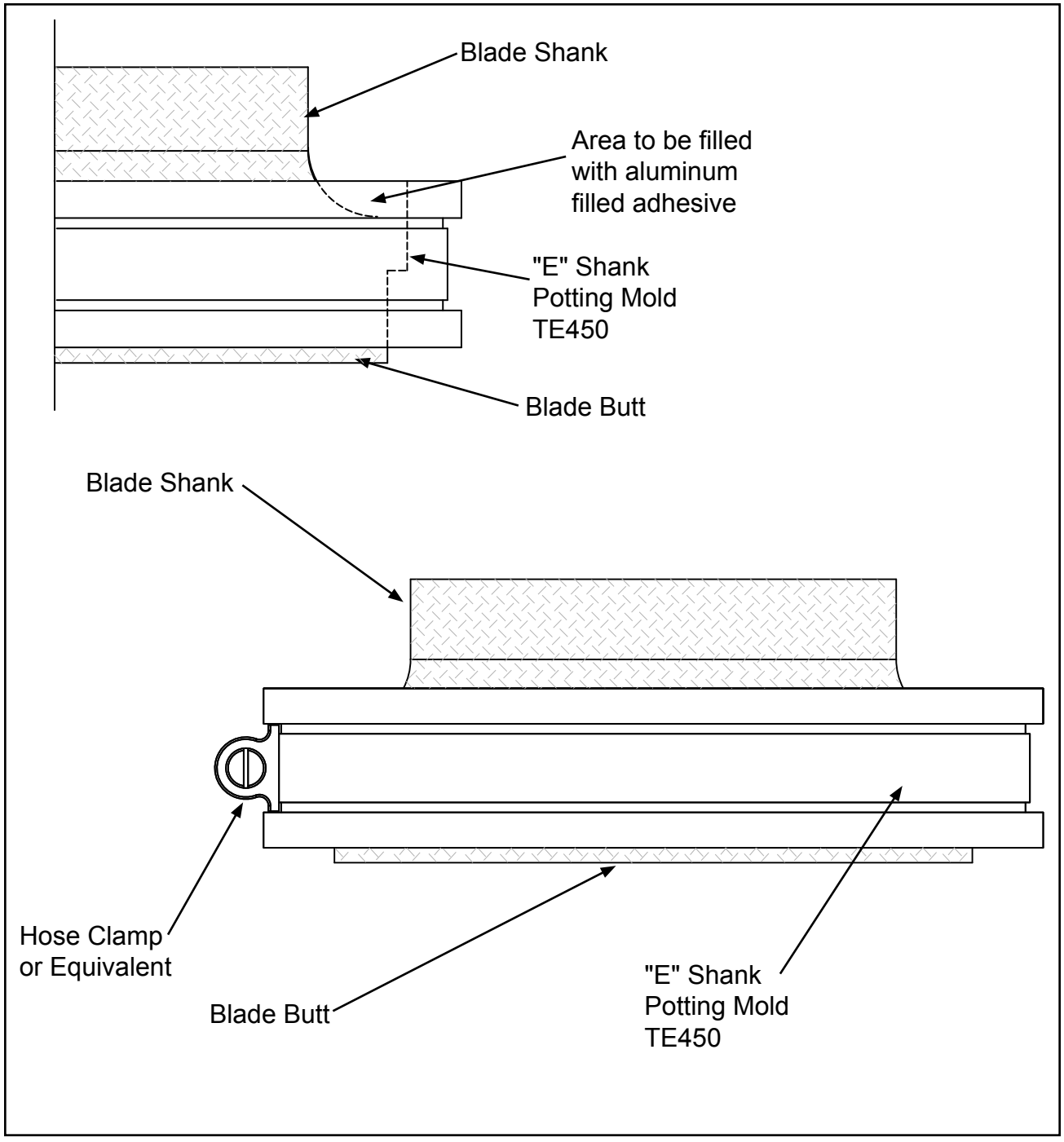

Installation of the "E" Shank Potting Mold TE450
Figure 4

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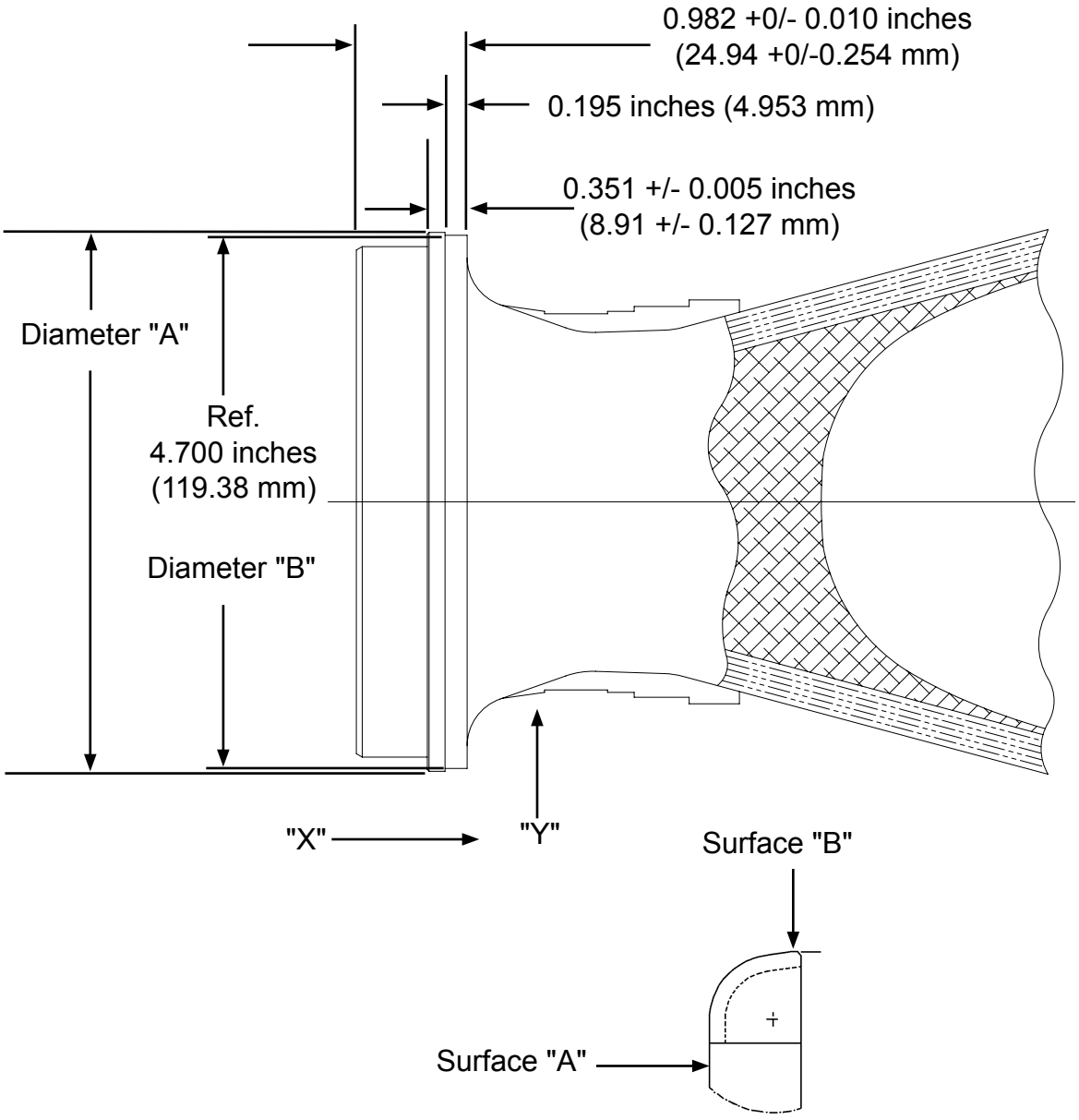


Dimensions After Machining of Blade Retention Radius
Figure 5

(3) Using an abrasive pad CM47 or equivalent, lightly rough up the retention radius surface.

(4) Apply mold release CM19 to the inside surface of the "E" shank potting mold TE450 and permit to dry.

(5) Install the "E" shank potting mold TE450 around the blade butt. Refer to Figure 4.

NOTE: The "E" shank potting mold TE450 is stepped to permit the mold to be secured around the blade shank in the correct position to achieve the required depth of aluminum filled adhesive.

(a) Wrap the mold TE450 around the blade shank with the larger diameter outboard on the blade shank.

(b) Put the smaller diameter inboard around the blade shank with the step snug against the blade shank. See Figure 4.

NOTE: The step in the "E" shank potting mold TE450 must seat firmly against the inboard edge of the lip on the blade shank.

(c) Hold the "E" shank potting mold TE450 to the blade shank with a hose clamp or equivalent.

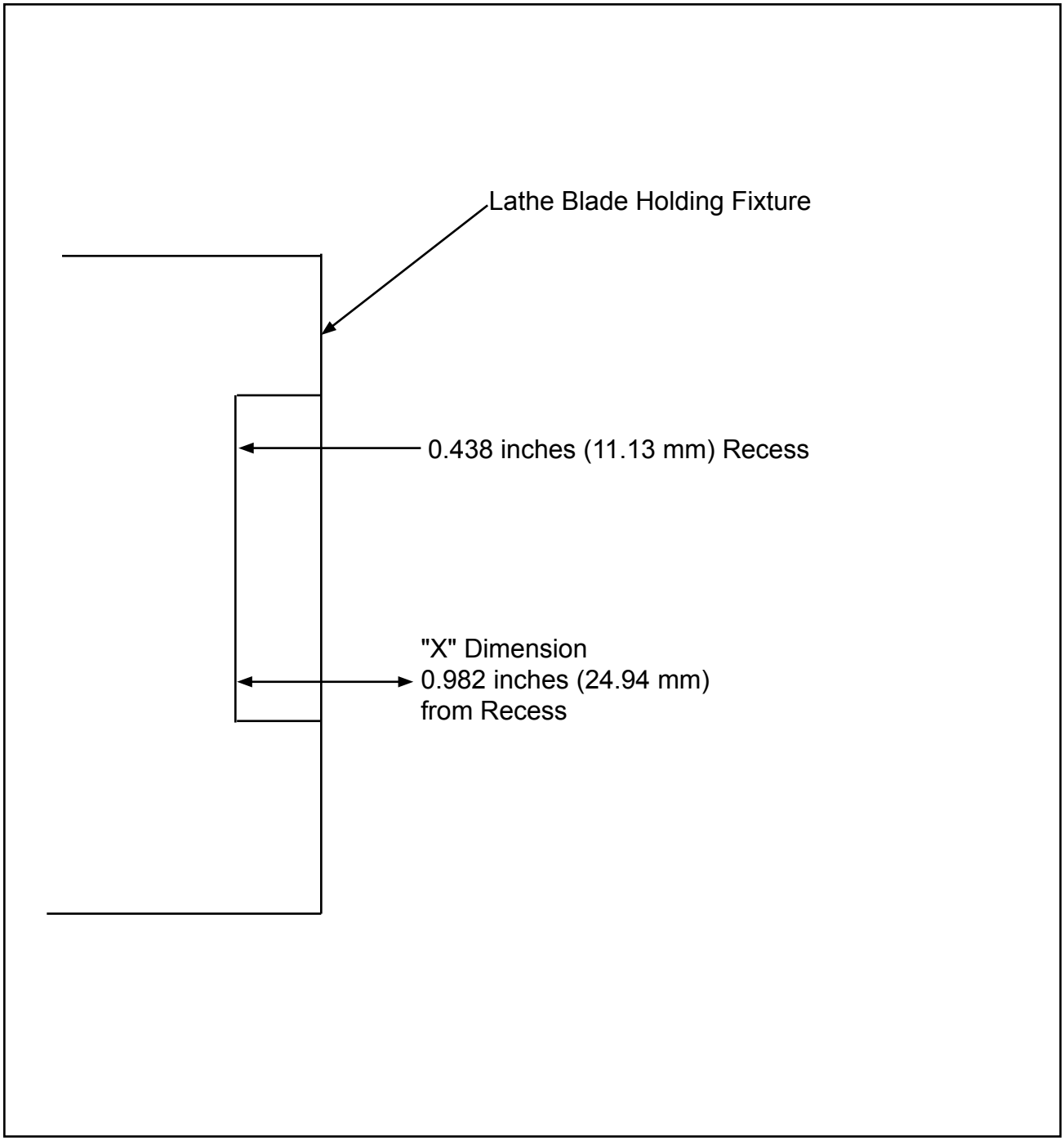
(6) Mix the aluminum filled adhesive CM94 and CM110 in accordance with the Consumable Materials Information section of this Service Bulletin.

NOTE: It is recommended to mask the blade shank area 1.250 inches (31.75 mm) from the blade butt above the mold to protect the area from spills. Remove the masking material before permitting the aluminum filled adhesive to cure.

(7) Pour the aluminum filled adhesive inside the "E" shank potting mold TE450 on to the blade retention radius until the aluminum filled adhesive is equal with the upper surface of the mold TE450.

(8) Using a tongue depressor or equivalent, smooth and level the aluminum filled adhesive.

(9) Remove the masking material and use a clean, lint free cloth soaked in solvent CM11 or CM106 to remove excess aluminum filled adhesive from the blade shank above the edge of the "E" shank potting mold TE450.



Setting "X" Dimension
Figure 6

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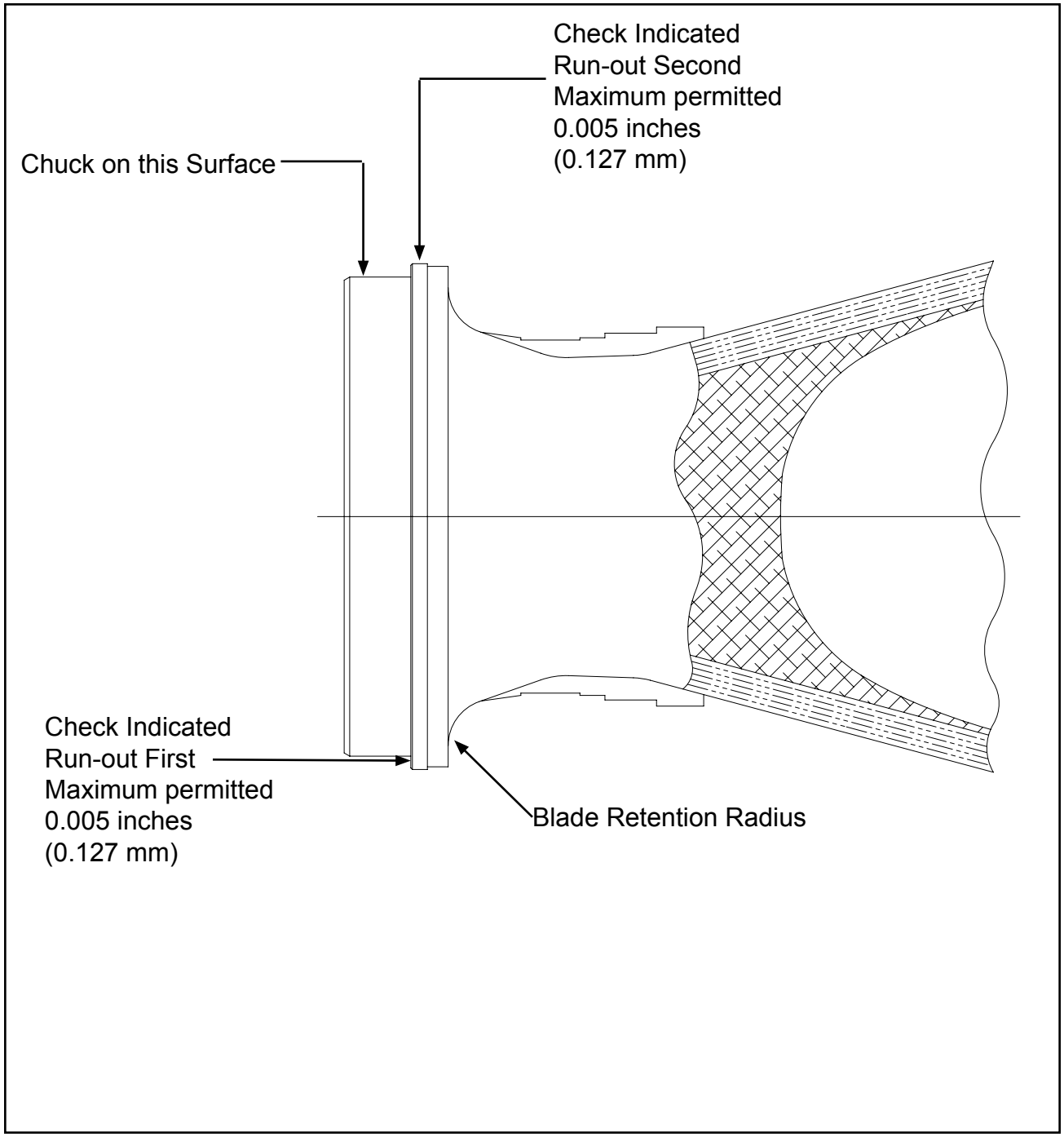

Areas for Checking Blade Shank Run-out
Figure 7

(10) If necessary add additional aluminum filled adhesive to bring the level equal to the upper surface of the mold.

NOTE: Filling the area between the blade retention radius and the outboard edge of the "E" shank potting mold TE450 supplies sufficient material for cutting the new radius.

(11) Permit the aluminum filled adhesive to cure in accordance with manufacturer's instructions.

(a) Heat accelerated cure at 130 - 145 degrees F (45 - 72.2 degrees C) for a minimum of 2 hours is permitted. If accelerated cure is used, permit the aluminum filled adhesive to cool to room temperature before machining.

(12) Remove the "E" shank potting mold TE450 from the blade butt.

(13) Machine the blade retention bearing radius.

(a) Machine the blade retention radius to the dimensions shown in Figure 5.

1 Use "E" shank form tool TE449. See Figure 5.

a The "E" shank form tool TE449 must be installed perpendicular to the blade centerline.

2 Start at 50 to 75 RPM - adjust as needed for best results

3 Use Manual feed

4 Make a rough pass and a finish pass.

NOTE: The following procedure is recommended for machine set-up. The equipment and the procedure used by a particular facility may vary in detail from the procedure described below. Regardless of the procedure used, the blade retention radius must meet the dimensional requirements specified in Figure 5 after rework.

(b) Using a lathe with soft jaws that have been bored to a depth of 0.438 inches (11.13 mm) to accept the 4.500 inches (114.3 mm) diameter, move the "E" shank cutting tool so that surface "A" is 0.982 inches (24.94 mm) towards the tip from the recess of the lathe blade holding fixture. Set the lathe measurement device to zero. See Figure 6.

NOTE: The "X" axis refers to cutting tool travel parallel to the blade centerline.

The "Y" axis refers to cutting tool travel perpendicular to the blade centerline.

CAUTION 1: THE BLADE MAY BE DAMAGED IF SOFT JAWS ARE NOT USED TO HOLD THE BLADE WHILE ON THE LATHE.

CAUTION 2: USE A PLATEN TYPE TAIL STOCK WITH A RUBBER CONTACTING SURFACE TO STABILIZE THE TIP OF THE BLADE.

(c) Put the blade in a lathe. Hold the blade in soft jaws that have been bored to a depth of 0.438 inches (11.13 mm) to accept the 4.500 inches (114.3 mm) diameter.

(d) Apply light pressure with the tail stock to support the blade.

(e) Rotate the spindle by hand and check the run-out of the blade shank at the surfaces shown in Figure 7.

1 First indicate and adjust the back face of the blade butt shoulder. See Figure 7.

2 Second indicate and adjust the outside diameter of the blade butt shoulder. See Figure 7.

3 If run-out does not meet limits specified, correct as necessary.

NOTE: The tip support should be backed off and reapplied when adjustments are made to correct the run-out of the shank, to keep the blade running true to center.

CAUTION: MAKE SURE THAT THE BLADE IS SECURELY CHUCKED BEFORE TURNING ON THE LATHE. USE THE MINIMUM RPM NECESSARY TO ACHIEVE A SMOOTH SURFACE AFTER MACHINING.

(f) With the blade secured in the lathe with the run-out within limits, move the "E" shank cutting tool to the delrin seal groove.

1 For a blade without the Delrin® seal installed:

a Touch off the tip, surface "B" of the "E" shank cutting tool TE449, on the highest spot in the Delrin® seal groove. Set the lathe measurement device to zero.

b Move the cutting tool away from the seal groove 0.030 inches (0.762 mm). Reset the lathe measurement device to zero.

2 For a blade with the Delrin® seal installed, measure the diameter of the Delrin® seal in accordance with the Blade Shank Wear Strip Inspection in Hartzell Composite Blade Maintenance Manual 135F (61-13-35).

a If the measurement does not meet the minimum diameter requirement, replace the Delrin® seal in accordance with Hartzell Composite Blade Maintenance Manual 135F (61-13-35).

b If the measurement does meet the minimum diameter requirement, place a 0.001 inch (0.025 mm) feeler gauge between the tip surface "B" of the "E" shank cutting tool and the Delrin® seal. Set the lathe measurement device to zero.

3 Move the "E" shank cutting tool TE449 toward the blade tip until the lathe measurement device "X" dimension indicates 0.025 inches (0.635 mm), cut the aluminum filled adhesive by moving the "E" shank cutting tool TE449 toward the blade shank until the lathe measurement device "Y" dimension indicates 0.025 (0.635 mm).

4 Measure the blade shoulder height.

a Adjust the "X" dimension accordingly to achieve desired dimension and recut the aluminum filled adhesive in the same manner as above to remove material to meet the dimensions specified in Figure 5 and plunge the cross slide to "Y" equals zero.

(g) The blade retention radius contains Kevlar material. During the machining process, this material may be cut. If the material is cut, it may create fuzz that may interfere with the optical comparator inspection and the bearing installation process. If fuzz is present, perform the following repair:

1 Repair the surface of the composite material with adhesive CM71 and talc CM72.

WARNING: BE SURE TO WEAR VINYL OR LATEX PROTECTIVE GLOVES FOR THIS PROCEDURE.

CAUTION: USE CAUTION WHEN APPLYING ADHESIVE CM71 AND TALC CM72. THE COMBINATION MAY BECOME VERY HOT.

a Apply a small amount of adhesive CM71 to area.

b Quickly wipe off excess and immediately apply small amount of talc CM72.

c Allow to dry.

d Sand area smooth using an air vibratory sander with 140 grit or finer sandpaper.

e Repeat steps 3.D.(11).(g) as needed to achieve a smooth, even retention radius.

CAUTION: MACHINING OF DIAMETER "A" IS NOT PERMITTED.

(h) Using a square cutting tool, cut the outside Diameter "B" of the aluminum filled adhesive. Diameter "B" must be less than diameter "A" shown in Figure 5 and greater than 4.700 inches (119.38 mm).

(i) Perform height inspection and optical comparator inspection in accordance with sections 3.B. and 3.C. of this Service Bulletin.

(j) Apply conductive coating Mix #13 CM164 in accordance with the Paint and Finish chapter of Hartzell Standard Practices Manual 202A (61-01-02).

1 Conductive coating may be applied as part of the blade finish procedures when accomplished in conjunction with an overhaul.

2 If accomplished outside of an overhaul, conductive coating must be applied to the blade retention radius and the blade counterweight clamp area.

(k) Perform an electrical resistance inspection between the erosion shield and aluminum filled adhesive in accordance with Hartzell Composite Blade Maintenance Manual 135F (61-13-35).

1 If the measured resistance is too high, reapply the conductive coating to the blade in accordance with Hartzell Composite Blade Maintenance Manual 135F (61-13-35). Removal of the blade seal ring may be required.

E. Blade Thrust Bearing installation

CAUTION 1: THE PROCEDURE BELOW DIFFERS SIGNIFICANTLY FROM THE PROCEDURE CURRENTLY PUBLISHED IN HARTZELL COMPOSITE BLADE MAINTENANCE MANUAL 135F (61-13-35). THIS PROCEDURE APPLIES ONLY TO THE E10950 BLADE.

CAUTION 2: APPLY MOLD RELEASE CM19 TO THE BLADE SIDE RACE, BEFORE APPLYING THE RACE TO THE BLADE RETENTION RADIUS. THIS IS TO PREVENT THE ALUMINUM FILLED ADHESIVE FROM ADHERING TO THE BLADE SIDE RACE.

(1) Apply a light coating of mold release CM19 to the blade side race.

(2) Permit the mold release CM19 to dry at room temperature.

(3) Using solvent CM11 or CM106, clean the aluminum filled adhesive on the blade retention radius.

(4) Mix the aluminum filled adhesive CM94 and CM110 in accordance with the Consumable Materials section of this Service Bulletin.

CAUTION: MAKE SURE THAT THE BLADE THRUST BEARING RACE HALVES HAVE THE SAME SERIAL NUMBER. UNMATCHED BEARING HALVES WILL CAUSE IMPROPER FIT AND PREMATURE BLADE THRUST BEARING FRACTURE.

(5) Visually inspect both halves of the blade thrust bearing race to make sure that the serial numbers are the same.

CAUTION: MAKE SURE THE BLADE RETENTION RADIUS IS CLEAN AND HAS NO GREASE ON IT.

(6) Liberally, apply the aluminum filled adhesive to the inboard surface of the blade retention radius and to the large OD of the composite material where the material contacts the metal section of the shank. Apply enough aluminum filled adhesive to fill the voids created between the contour differences of the mating surfaces and the gap formed between the large OD of the shank and the bearing retaining ring.

(7) Install a new D-7745 blade thrust bearing race on the blade retention radius with the parting line 90 degrees from the leading and trailing edges of the blade shank.

(8) Blade Retaining Ring Installation

CAUTION: THE BEARING PRESS MUST DELIVER 6000 TO 6500 LBS (2721 TO 2848 KG) OF FORCE TO THE BLADE RETAINING RING.

(a) Put the blade retaining ring over the base of the blade. Using the blade bearing press TE93, or equivalent, force the blade retaining ring over the outside diameter of the blade thrust bearing race.

(b) Apply uniform pressure for a minimum of five (5) seconds.

(c) Release the pressure and rotate the blade in the press 45 degrees and re-apply the pressure for a minimum of five (5) seconds.

(d) Repeat the “release, rotate, re-apply pressure” sequence a minimum of nine (9) times. All rotations must be in the same direction to make sure that the blade completes a minimum of one (1) revolution in the press.

(e) Apply and maintain the pressure for a minimum of one (1) minute.

(f) Visually inspect the blade thrust bearing race and blade retaining ring position to each other. If the position of the blade thrust bearing race to the blade retaining ring is not consistent around the shank, repeat the pressure application procedure.

(g) Using a clean cloth dampened with solvent CM11 or CM106 remove excess aluminum filled adhesive.

(h) Put the blade in a vertical position with the blade butt down on a smooth, flat surface such as a propeller inspection table or surface plate.

CAUTION: MEASUREMENTS MUST REPRESENT THE LOCATION OF THE BALL TRACK AND NOT THE FLAT SURFACE OF THE BLADE THRUST BEARING RACE OUTSIDE OF THE TRACK.

(i) Using a measuring instrument with a reading resolution of 0.0005 inches (0.013 mm) or better, measure within 0.25 inches (6.4 mm) of both sides of the parting line of the blade thrust bearing to identify any vertical offset. The maximum permitted offset at each parting line is 0.002 inches (0.05 mm).

NOTE: To measure the position of the ball track, put a ball bearing in the ball track and measure to the top of the ball bearing.

a If a measurement of more than 0.002 inches (0.05 mm) occurs and the aluminum filled adhesive has not cured, repeat the press procedure and reinspect.

b If a measurement is more than 0.002 inches (0.05 mm) and the aluminum filled adhesive has cured, remove the blade thrust bearing in accordance with Paragraph 3.G. of this Service Bulletin.

NOTE: If the aluminum filled adhesive has cured, removal of the blade thrust bearing will require re-machining of the blade retention radius to achieve a smooth radius.

F. Removal and Reinstallation of Blade Counterweight Clamp

(1) Removal of the blade counterweight clamp outside overhaul.

(a) Remove and retain the de-ice lead wire attaching hardware.

(b) Removal of E-7016 blade counterweight clamps:

1 Remove and retain counterweight clamp assembly bolts and washers.

2 Remove and discard the attaching nut.

(c) Removal of D-5117-1 blade counterweight clamps:

1 Remove and retain counterweight clamp assembly bolts and washers.

2 Remove and discard the cotter pins.

CAUTION: DISCARD THE COUNTERWEIGHT CLAMP ASSEMBLY BOLTS IF THEY ARE DAMAGED OR CORRODED, OR WHEN THE PROPELLER IS REMOVED FOR OVERHAUL.

(d) Gently tap the clamp halves from the blade.

1 The de-ice boot filler may keep the clamp from being removed. The filler may be carefully cut with a utility knife if necessary. If so, care must be taken not to damage the blade, or de-ice boot leads, in the process.

(2) Complete the blade retention radius inspection and rework as required in accordance with Paragraph 3.B and 3.C.

(3) Reinstallation of the blade counterweight clamp outside overhaul.

CAUTION: DO NOT SAND COMPLETELY THROUGH AND REMOVE THE BLACK P-STATIC PAINT FROM THE BLADE.

(a) Carefully hand sand the excess potting compound from the leading and trailing edges of the blade around the area of the clamp parting lines.

(b) Lightly scuff the potting compound on face and camber sides of the blades with emery cloth to roughen up the existing potting compound.

(c) Perform an electrical resistance inspection between the erosion shield and blade butt in accordance with Hartzell Composite Blade Maintenance Manual 135F (61-13-35).

1 If the measured resistance is too high, the blade must have its conductive coating reapplied to the blade retention radius and blade counterweight clamp area in accordance with Hartzell Composite Blade Maintenance Manual 135F (61-13-35).

(d) Perform an electrical resistance inspection of the de-ice boot in accordance with Hartzell Composite Blade Maintenance Manual 135F (61-13-35).

1 If the measured resistance is too high, the de-ice boot must be replaced in accordance with Hartzell Composite Blade Maintenance Manual 135F (65-13-35).

(e) Using solvent CM11 or CM106, clean the blade shank and wipe the existing aluminum filled adhesive.

(f) Apply mold release CM19 to the inside surface and inboard and outboard edges of the clamp halves and permit the mold release CM19 to dry.

(g) Mix the aluminum filled adhesive CM94 and CM110 in accordance with the Material Information section of this Service Bulletin.

(h) Apply an even layer of aluminum filled adhesive to the inside surfaces of the clamp halves.

(i) Put the counterweight clamp on the blade shank with parting line of clamp halves aligned with previous clamp alignment marks.

CAUTION 1: DO NOT USE ELECTRIC OR PNEUMATIC TOOLING WHEN INSTALLING THE BOLTS. USE OF ELECTRIC OR PNEUMATIC TOOLING MAY CAUSE THREAD DAMAGE.

CAUTION 2: CORRECT ALIGNMENT OF THE CLAMP IS VERY IMPORTANT. INCORRECT ALIGNMENT CAN CAUSE CROSS THREADING. IF BOLT BINDS DURING INSTALLATION, IT MAY INDICATE MISALIGNMENT.

(j) Install blade counterweight clamp in accordance with the counterweight clamp installation instructions in Hartzell Composite Blade Maintenance Manual 135F (61-13-35).

(4) Reinstall de-ice boot leads, balance weights and weight slugs.

(5) Repeat steps (a) through (j), as needed, to replace the remaining counterweight clamps.

(6) Permit the aluminum filled adhesive to cure at room temperature for a minimum of 24 hours before the propeller is operated. Heat accelerated cure is not permitted.

(7) Mix a sufficient amount of sealant CM161, in accordance with the manufacturer's instructions, to fill the counterweight clamp parting lines.

(8) Using a brush, apply a thin bead of sealant CM161 to the counterweight clamp parting lines.

(a) A small bead of sealant CM161 may be applied to the inboard clamp/blade interface to prevent moisture/grease/contaminants from migrating under the clamp.

(9) Wipe off excess sealant from the clamp with solvent CM11.

(a) Make sure no voids are present in the sealant bead. If voids are present, reapply as necessary.

G. Inspection and Rework Instructions at Next Overhaul or Recurring Bearing Replacement

(1) Disassemble the propeller in accordance with Hartzell Four Blade Lightweight Turbine Propeller Maintenance Manual 143A (61-10-43).

(2) Remove the blade counterweight clamp if not previously removed in accordance with Hartzell Composite Blade Maintenance Manual 135F (61-13-35).

(3) Remove blade thrust bearing in accordance with Hartzell Composite Blade Maintenance Manual 135F (61-13-35).

(4) Machine the blade retention radius to remove aluminum filled adhesive used for previous blade thrust bearing potting as required in accordance with Paragraph 3.D. of this Service Bulletin.

NOTE: At each subsequent blade thrust bearing removal, the blade retention radius will require re-machining of the blade retention radius to remove aluminum filled adhesive used for previous blade thrust bearing potting and to achieve a smooth radius.

(5) Perform blade retention radius inspection in accordance with Paragraph 3.A. of this Service Bulletin.

(6) If required, install new D-7745 blade thrust bearings in accordance with Paragraph 3.E. of the Accomplishment Instructions of this Service Bulletin. Blade thrust bearing replacement is required as specified in the Compliance section of this Service Bulletin.

(7) Install the blade counterweight clamp in accordance with Paragraph 3.F. of this Service Bulletin or Hartzell Four Blade Lightweight Turbine Propeller Maintenance Manual 143A (61-10-43).

(8) Assemble the propeller in accordance with Hartzell Four Blade Lightweight Turbine Propeller Maintenance Manual 143A (61-10-43).

(9) Make a logbook entry indicating compliance with this Service Bulletin and when next inspection/bearing replacement is due.

H. Recommended Service Facilities

A. Hartzell Propeller has a worldwide network of Recommended Service Facilities that are approved by Hartzell Propeller for overhaul and repair of our products.

B. Each facility must meet the standard FAA requirements and the additional Hartzell Propeller requirements before being approved by Hartzell Propeller. Each facility is audited by Hartzell Propeller to verify the continuation of the standards.

C. Hartzell Propeller recommends that you use one of these facilities when having your propeller overhauled or repaired.

D. For a current list of Hartzell Propeller Recommended Service Facilities, contact Hartzell Product Support or refer to the Hartzell Propeller website at www.hartzellprop.com; select Product Support then Worldwide Network.

I. Hartzell Propeller Inc. Contact Information:

Hartzell Propeller Inc.
Attn: Product Support
One Propeller Place
Piqua, Ohio 45356-2634 USA
Phone: (001) 937.778.4379
Fax: (001) 937.778.4391
E-mail: techsupport@hartzellprop.com

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HARTZELL PROPELLER INC.

1900D Blade Bearing Evaluation

HC-SB-61-287

REPORT FORM

This Report Form must be completed and submitted to Hartzell Propeller only when a cracked thrust bearing race is found. Fax: (001) 937.778.4391 or Email: techsupport@hartzellprop.com
It is important to complete **ALL** information on this form.

Date:		Propeller Serial Number:			
Owner/Operator:					
Propeller Repair Station:		Repair Station Reference Only:			
Company:		Contact:			
State/Country:		E-mail:			
Phone:		Fax:			
		Blade No. 1	Blade No. 2	Blade No. 3	Blade No. 4
Blade Serial Number:					
TSN: (If all are same, list once)					
TSO: (If all are same, list once) *__REQUIRED__*					
Is this **INITIAL** compliance or **RE-INSPECTION**?					
Complete the **CONDITION OF THRUST BEARING RACE** information for each blade even if blades are sent to Hartzell Service Center for overhaul / repair					
Condition of Thrust Bearing Race: **For any cracks or fractures indicated, where was damage noted?**	Cracked:				
	Cracked and Separated:				
	Multiple Fractures:				
	(For bearing race condition select only one above; select only one below if any cracks or fractures present)				
	Blade Side Race:				
	Hub Side Race:				
	Both Races:				
Condition of aluminum filled adhesive / potting**:**	No Cracking / Chipping:				
	Cracking / Chipping <30%:				
	Cracking / Chipping >30%:				
	Completely Degraded:				
Initial Incoming Shoulder Height (lowest measurement)					
Incoming Optical Comparator Inspection:	Outside A:				
	Between “A” and “C”:				
	Between “C” and “D”:				
	Inside “D”:				
Shoulder Height After Re-Work (lowest measurement) Mark **N/A** if re-work NOT NEEDED					
Notes:					

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