HARTZELL PROPELLER INC.

Alert Service Bulletin

TRANSMITTAL SHEET

HC-ASB-61-316

Propeller - Hub Inspection

June 26, 2009

This page transmits a revision to Alert Service Bulletin HC-ASB-61-316.

- Original Issue, dated Jun 05/09
- Revision 1, dated Jun 26/09

Propeller assemblies that have previously complied with the inspections required in a previous revision of this Alert Service Bulletin are affected by the overhaul inspection requirements and may be affected by the repetitive inspection requirements.

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

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

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

- This revision clarifies that all propeller hubs must be eddy current inspected at each propeller overhaul.
- This revision clarifies that the stamping of the letter "K" is on the cylinder side of the propeller hub.

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Propeller - Hub Inspection

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Propeller - Hub Inspection

1. Planning Information

   A. Effectivity

   (1) Any propeller hub installed in an HC-E4A-3( )/E10950( ) propeller assembly and installed on Raytheon Beechcraft 1900D aircraft is affected by the Overhaul Compliance section of this Alert Service Bulletin, paragraph 1.E.(2).

   (2) Any previously overhauled propeller hub installed in an HC-E4A-3( )/E10950( ) propeller assembly and installed on Raytheon Beechcraft 1900D aircraft is affected by the Initial Compliance section of this Alert Service Bulletin, paragraph 1.E.(1).

   (3) Any propeller hub installed in an HC-E4A-3( )/E10950( ) propeller assembly with a letter "**K**" stamped below the propeller serial number on the cylinder side of the hub and installed on Raytheon Beechcraft 1900D aircraft is affected by Repetitive Interval and the Overhaul Compliance sections of this Alert Service Bulletin, paragraphs 1.E.(2) and 1.E.(3).

   NOTE: A propeller installed on a Pilatus PC-12 aircraft is not affected by this Alert Service Bulletin.

   CAUTION: DO NOT USE OBSOLETE OR OUTDATED INFORMATION. PERFORM ALL INSPECTIONS OR WORK IN ACCORDANCE WITH THE MOST RECENT REVISION OF THIS ALERT SERVICE BULLETIN. INFORMATION CONTAINED IN THIS ALERT SERVICE BULLETIN MAY BE SIGNIFICANTLY 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 ALERT SERVICE BULLETIN.

   B. Concurrent Requirements

   (1) Hartzell Alert Service Bulletins HC-SB-61-276, HC-SB-61-283, and HC-SB-61-287 are also applicable.

C. Reason

WARNING: UNUSUAL OR ABNORMAL VIBRATION OR GREASE LEAKAGE, WHERE THE CONDITION INITIATED SUDDENLY, CAN BE AN INDICATION OF A FAILING PROPELLER HUB, BLADE, OR BLADE RETENTION COMPONENT. AN INFLIGHT FAILURE MAY RESULT IN DEATH, SERIOUS BODILY INJURY, AND/OR SUBSTANTIAL PROPERTY DAMAGE. UNUSUAL OR ABNORMAL VIBRATION OR GREASE LEAKAGE DEMANDS IMMEDIATE INSPECTION FOR POSSIBLE CRACKED HUB. (FOR FURTHER INFORMATION ON THIS SUBJECT SEE HARTZELL SERVICE LETTER HC-SL-61-165).

(1) Hartzell has discovered two propeller hubs with fractures on the mounting flange side of the hub.

(a) The fractures may have initiated near the dowel pin holes and extended to propeller mounting bolt holes.

(b) The fractures are located on the side of the dowel pin hole near a mounting bolt hole with an oversize threaded insert installed.

(2) The fractures were discovered when the propellers were removed from the aircraft for overhaul. At the time of removal, the fractures were visible during penetrant inspection on the mounting flange side of the hub and on the side of the mounting flange nearest the dowel pin holes.

(3) Hub damage of this type can lead to catastrophic hub failure and propeller blade separation.

(4) The cause of the fractures is being investigated.

WARNING: DO NOT OPERATE THE PROPELLER WITHIN THE PROPELLER RPM RESTRICTED RANGES. THE FRACTURES OR ACCELERATION OF THE FRACTURES MAY BE CAUSED BY OPERATION IN A RESTRICTED RANGE.

(5) A fracture may be initiated by operating the propellers in a restricted RPM region.

(6) Regulatory action is unknown.

D. Description

(1) This Alert Service Bulletin introduces an eddy current inspection of the propeller hub at each propeller hub overhaul for all HC-E4A-3( )/E10950( ) propellers.

NOTE: An eddy current inspection is required at overhaul on each HC-E4A-3( )/E10950( ) propeller hub with a B-1243 or B-1243-1 insert installed.

(2) This Alert Service Bulletin introduces the requirement to stamp the letter "**K**" on any propeller hub when a B-1243-1 oversize insert is installed in one or both of the mounting bolt holes identified in Figure 1 at a propeller overhaul.

(3) For all HC-E4A-3( )/E10950( ) propellers previously overhauled, this Alert Service Bulletin introduces a one-time visual inspection of the propeller hub mounting flange for a B-1243-1 insert installed in one or both of the mounting bolt holes identified in Figure 1.

NOTE: A B-1243-1 oversize insert will not be installed in a new propeller hub. A new propeller hub will have standard size inserts installed. An oversize insert may have been installed during the first overhaul or a subsequent overhaul of a propeller hub.

(a) This Alert Service Bulletin introduces an eddy current inspection of the propeller hub mounting flange if the B-1243-1 oversize insert is installed in one or both of the mounting bolt holes identified in Figure 1.

(b) This Alert Service Bulletin introduces the requirement to stamp the letter "**K**" on any propeller hub with a B-1243-1 oversize insert in one or both of the mounting bolt holes identified in Figure 1.

E. Compliance

(1) Initial compliance for all HC-E4A-3( )/E10950( ) propellers:

NOTE: An oversize B-1243-1 insert will not be installed in a new propeller hub. A new propeller hub will have standard size inserts installed. An oversize insert may have been installed during the first overhaul or a subsequent overhaul of a propeller hub.

(a) If the propeller hub time since overhaul (TSO) is unknown:

1 Perform the visual inspection in accordance with the Accomplishment Instructions in this Alert Service Bulletin within 100 hours of the effective date of this Alert Service Bulletin.

2 If required, perform hub stamping and eddy current inspection.

(b) If the propeller hub time since overhaul (TSO) is less than 2,000 hours on the effective date of this Alert Service Bulletin:

1 Perform the visual inspection in accordance with the Accomplishment Instructions in this Alert Service Bulletin before accumulating 2,250 hours TSO.

2 If required, perform hub stamping and eddy current inspection.

(c) If the propeller hub time since overhaul (TSO) is equal to or greater than 2,000 hours, but less than 3,000 hours on the effective date of this Alert Service Bulletin:

1 Perform the visual inspection in accordance with the Accomplishment Instructions in this Alert Service Bulletin within 250 hours of the effective date of this Alert Service Bulletin.

2 If required, perform hub stamping and eddy current inspection.

(d) If the propeller hub time since overhaul (TSO) is equal to or greater than 3,000 hours on the effective date of this Alert Service Bulletin:

1 Perform the visual inspection in accordance with the Accomplishment Instructions in this Alert Service Bulletin within 200 hours of the effective date of this Alert Service Bulletin or at propeller overhaul, whichever occurs first.

2 If required, perform hub stamping and eddy current inspection.

(2) **Overhaul Compliance** for any propeller hub installed in an HC-E4A-3( )/E10950( ) propeller assembly **- Refer to Figure 1 for the inspection area:**

NOTE: An eddy current inspection is required at overhaul on each HC-E4A-3( )/E10950( ) propeller hub with a B-1243 or B1243-1 insert installed.

(a) Perform the eddy current inspection in accordance with the Accomplishment Instructions in this Alert Service Bulletin at each propeller overhaul.

(3) **Repetitive Interval** for any propeller hub installed in an HC-E4A-3( )/E10950( ) propeller assembly and with a B-1243-1 oversize insert installed in one or both of the mounting holes specified in Figure 1 or a letter "**K**" stamped below the propeller serial number on the cylinder side of the hub **- Refer to Figure 1 for the inspection area:**

(a) Perform the eddy current inspection in accordance with the Accomplishment Instructions in this Alert Service Bulletin every 1,000 hours.

F. Approval

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

G. Manpower

(1)	Removal and installation	3.0 man hours
(2)	Eddy Current Inspection	0.5 man hour
(3)	Dynamic Balance	3.0 man hours

H. Weight and Balance

(1) No change

I. Electrical Load Data

(1) No change

J. References

(1) Hartzell Propeller Owner's Manual 147 (61-00-47)

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

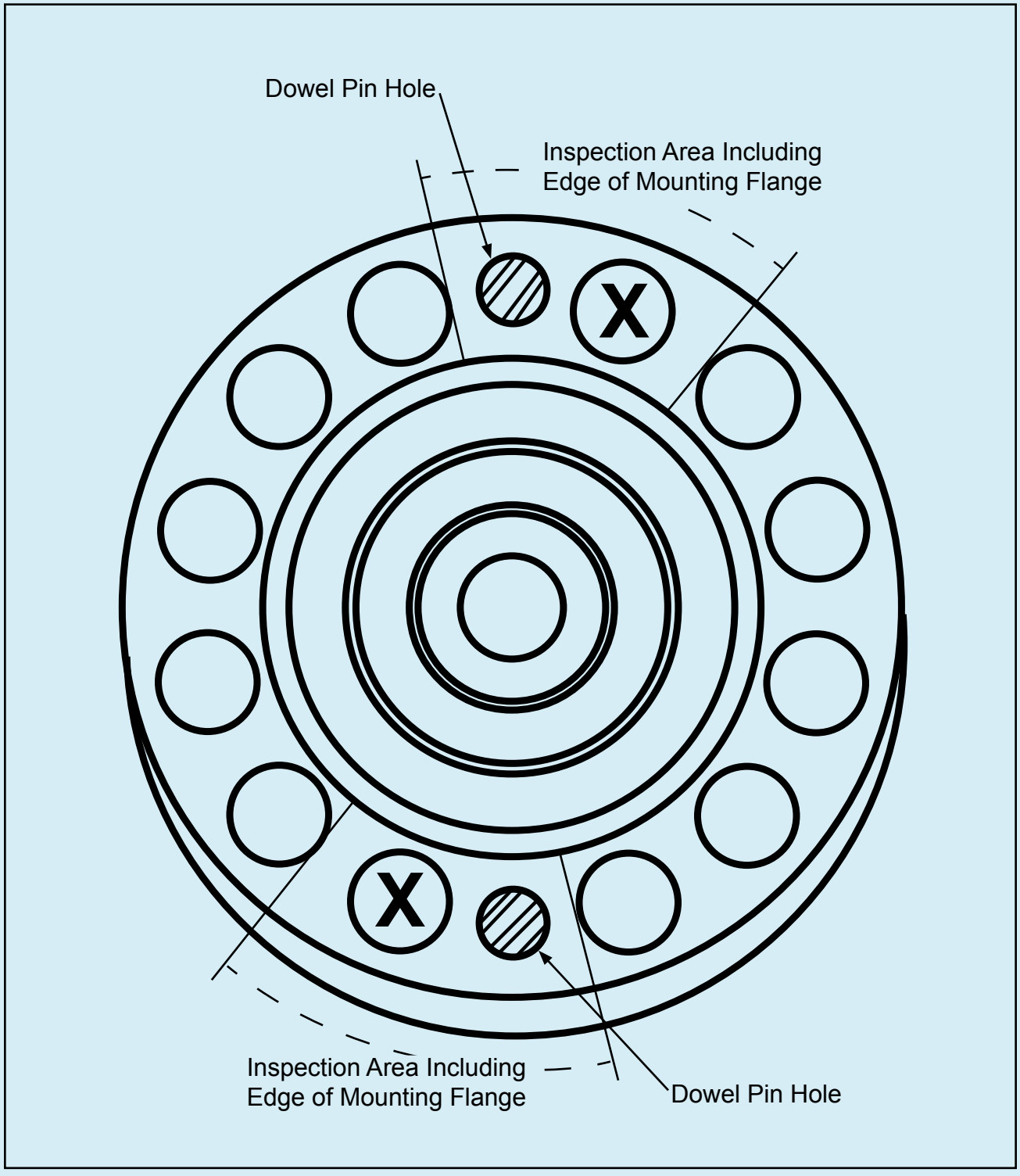
(3) Hartzell Standard Practices Manual 202A (61-01-02)

(4) Aircraft Maintenance Manual (AMM)

Alert Service Bulletin

HC-ASB-61-316

Propeller - Hub Inspection



Eddy Current Mounting Flange Inspection Area
Figure 1

K. Other Publications Affected

(1) None

2. Material Information

A. Consumables

(1)	Cotton swab	Customer procured
(2)	Aerosol Solvent/Cleaner	Quick Dry Stoddard Solvent Methyl-Propyl-Ketone (MPK) Methyl-Ethyl-Ketone (MEK) Contax HP, 90393
(3)	Anti-seize compound	MIL-PRF-83483( ) (Hartzell Part No. A-3338-[ ])
(4)	Safety Wire	0.032 inch (0.81 mm) Stainless Steel Aircraft Safety wire
(5)	C-3317-239-2	O-ring, Propeller-to-Engine Seal

B. Tooling

(1)	Safety wire pliers	Customer procured
(2)	Torque wrench	Customer procured

(3) Torque wrench adapter Hartzell P/N AST-2877

(4) Shielded, 200 - 500 kHz, bolt hole probe of sufficient diameter to ensure continued contact with the wall of the dowel pin hole

(5) Shielded, 200 - 500 kHz, pencil probe, 0.125 inch diameter

NOTE: 45 degree and 90 degree angle probes are acceptable options for inspecting the flange surfaces only.

(6) An eddy current instrument (with instruction manual) capable of operating within a frequency range of 50 kHz to 500 kHz.

(7) An aluminum block with an EDM notch greater than 0.250 inch (6.35 mm) thick with a 0.020 inch (0.51 mm) deep reference notch that is maximum width of 0.005 inch (0.12 mm) wide.

3. Accomplishment Instructions

A. Initial Visual Inspection for an Oversize Threaded Inserts:

WARNING: MAKE SURE THE SLING IS RATED UP TO 800 LBS (363 KG) TO SUPPORT THE WEIGHT OF THE PROPELLER ASSEMBLY DURING REMOVAL AND INSTALLATION.

(1) Using a suitable crane hoist and sling, carefully remove the propeller assembly from the aircraft in accordance with the Hartzell Propeller Owner's Manual 147 (61-00-47) or the Aircraft Maintenance Manual (AMM).

(2) Move the hoist away from the aircraft.

(3) Using an aerosol solvent with a nozzle sufficient to reach the bottom of the dowel pin holes, flush the dowel pin hole until the solvent runs clear.

(4) Using a clean cotton swab, clean the dowel pin holes to remove remaining oil, grease, or other contaminants.

(5) Using a clean cloth and solvent, clean the propeller mounting flange and the edge of the propeller mounting flange.

(6) Visually inspect the propeller mounting flange for fractures.

(a) If a fracture is visible, contact Hartzell Product Support.

(b) If a fracture is not visible, continue with the visual inspection for an oversize threaded inserts.

(7) Visually inspect the threaded inserts in each mounting bolt hole. An oversize threaded insert is approximately 0.875 inch (22.23 mm) in OD diameter and is visually larger in diameter than the standard threaded insert.

(a) If an oversize threaded insert is installed in one or both of the mounting bolt holes identified with an "X" in Figure 1:

1 Proceed to Paragraph 3.B., Eddy Current Inspection.

(b) If an oversize threaded insert is installed, but is not installed in one or both of the mounting bolt holes identified with an "X" in Figure 1:

1 Proceed to Paragraph 3.H., Propeller Return to Service.

(c) If an oversized threaded insert is not installed in any mounting hole:

1 Proceed to Paragraph 3.H., Propeller Return to Service.

B. Eddy Current Inspection

NOTE: When performed at propeller hub overhaul, it is preferred that the eddy current inspection be performed before propeller hub rework, but the eddy current inspection may be performed after propeller hub rework.

(1) If required, use a suitable crane hoist and sling and carefully remove the propeller assembly from the aircraft in accordance with Hartzell Propeller Owner's Manual 147 (61-00-47) or the Aircraft Maintenance Manual (AMM).

(2) Move the hoist away from the aircraft.

(3) Using an aerosol solvent with a nozzle sufficient to reach the bottom of the dowel pin holes, flush the dowel pin hole until the solvent runs clear.

(4) Using a clean cotton swab, clean the dowel pin holes to remove remaining oil, grease, or other contaminants that may interfere with the efficiency of the eddy current inspection.

(5) Using a clean cloth and solvent, clean the propeller mounting flange and the edge of the mounting flange adjacent to the dowel pin holes identified with the letter "X" in Figure 1.

(6) Personnel performing eddy current inspections must be qualified and certified based on the requirements of the American Society for Nondestructive Testing, Inc. Recommended Practice No. SNT-TC-1A, National Aerospace Standard NAS 410 (replaces MIL-STD-410E), Air Transport Association ATA 105, or equivalent international standard such as ISO 9712.

C. Eddy Current Equipment Initial Set Up

CAUTION: PERFORM ALL CHECKS AND ADJUSTMENTS IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S GUIDELINES.

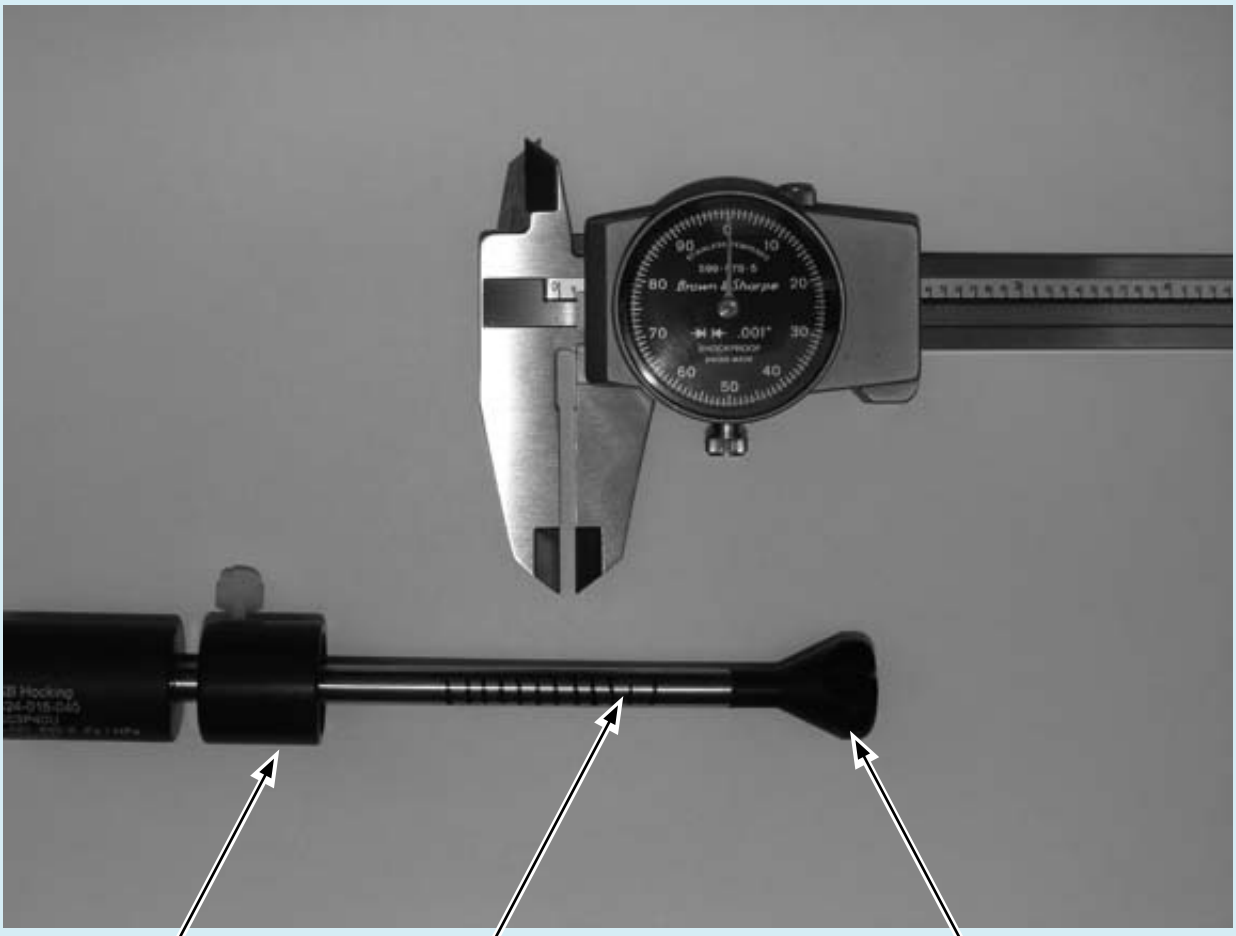
(1) Set up the instrument on the same type power supply that will be used for the evaluation.

(2) Adjust the instrument to compensate for a 0.003 inch to 0.005 inch (0.07 to 0.12 mm) lift-off.

(3) Calibration

(a) Refer to Paragraph 2.B.(7) for the calibration standard to be used.

(b) Balance the probe on a calibration standard area known to be free of any discontinuities.



Bolt Hole Probe with Inspection Increments Marked
Figure 2

(c) Scan the 0.020 inch (0.51 mm) EDM notch perdendicular to the notch length.

(d) Minimum responses allowable are:

1 Set the equipment to achieve the maximum deflection response from the 0.020 inch (0.51 mm) notch.

2 Scan the surface of the inspection area and adjust the equipment to minimize the surface noise.

3 The amplitude of the signal received from the 0.020 inch (0.51 mm) EDM notch must be a minimum of 3 times greater than the maximum amplitude observed from the surface (noise) of the inspection area.

D. Using the Bolt Hole Probe

CAUTION 1: DO NOT CHANGE THE INSTRUMENT SETTINGS DURING THE INSPECTION EXCEPT FOR "BALANCE".

CAUTION 2: DURING THE INSPECTION, MAINTAIN THE SAME SCANNING SPEED USED TO ACHIEVE THE REFERENCE NOTCH REQUIREMENTS.

CAUTION 3: DISREGARD SIGNALS THAT ARE DETECTED WHEN STARTING OR STOPPING A SCAN. ONLY SIGNALS THAT CAN BE REPEATED AT THE SAME SPEED USED TO ACHIEVE CALIBRATION ARE CAUSE FOR EVALUATION.

(1) Calibrate the bolt hole probe in accordance with the Paragraph 3.C., Eddy Current Equipment Initial Set Up.

(2) The inspection increment of the dowel pin hole is 0.100 inch (2.54 mm). Marking the inspection increments on the probe is an optional method to make sure of complete coverage during the inspection. Refer to Figure 2.

(a) Put the probe in the dowel pin hole and the bottom the probe in the dowel pin hole.

(b) Move the probe collar flush with the surface of the hub.

(c) Make a mark on the probe at the outboard edge of the collar.

(d) Remove the probe from the dowel pin hole.

(e) Move the collar to the outboard end of the probe.

(f) Make marks on the probe in increments of 0.100 inch (2.54 mm). Refer to Figure 2.

(3) Inspecting The Dowel Pin Hole With The Bolt Hole Probe

(a) Put the probe in the dowel pin hole and bottom the probe in the dowel pin hole.

(b) Move the probe collar flush with the surface of the hub.

(c) Perform two circumferential scans at the bottom of the dowel pin hole.

(d) Remove the probe.

(e) Move the collar to the next increment marked on the probe.

(f) Put the probe in the dowel pin hole until the collar is flush with the surface of the hub.

(g) Perform two circumferential scans of the dowel pin hole at this increment.

(h) Repeat steps (3)(d) through (3)(g) until the complete dowel pin hole has been scanned.

(i) Repeat the inspection in each dowel pin hole.

(j) Verify the calibration in accordance with Paragraph 3.G., Verification of the Instrument's Calibration.

(k) If any hub is identified as having an indication greater than or equal to the reference notch, contact Hartzell Product Support before further flight.

E. Inspection Of Dowel Pin Hole With Pencil Probe

(1) Calibrate the pencil probe in accordance with the Paragraph 3.C., Eddy Current Equipment Initial Set Up.

(2) The geometry of the dowel pin hole does not permit complete inspection of the hole surfaces with the bolt hole probe. Refer to Figure 3 and Figure 4.

(3) Inspect the areas identified in Figure 4 using the pencil probe.

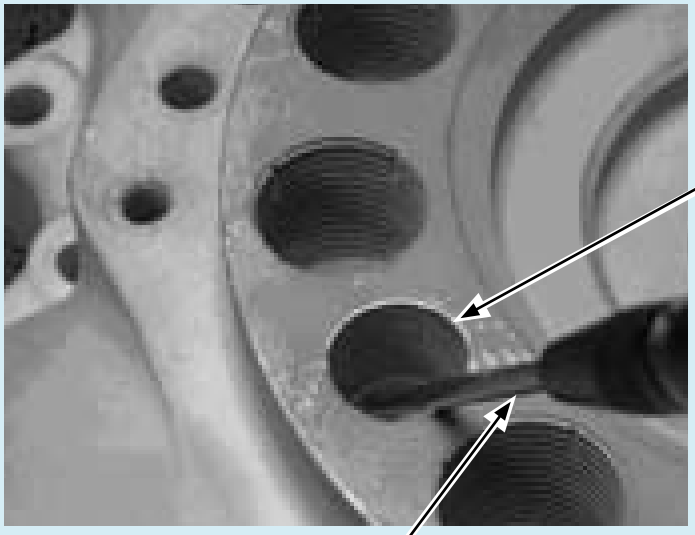
(a) While holding the probe steady and perpendicular to the bottom of the dowel pin hole, scan the entire area highlighted in Figure 4.

1 To make sure of complete coverage of the inspection area, each scan must overlap the previous scan.

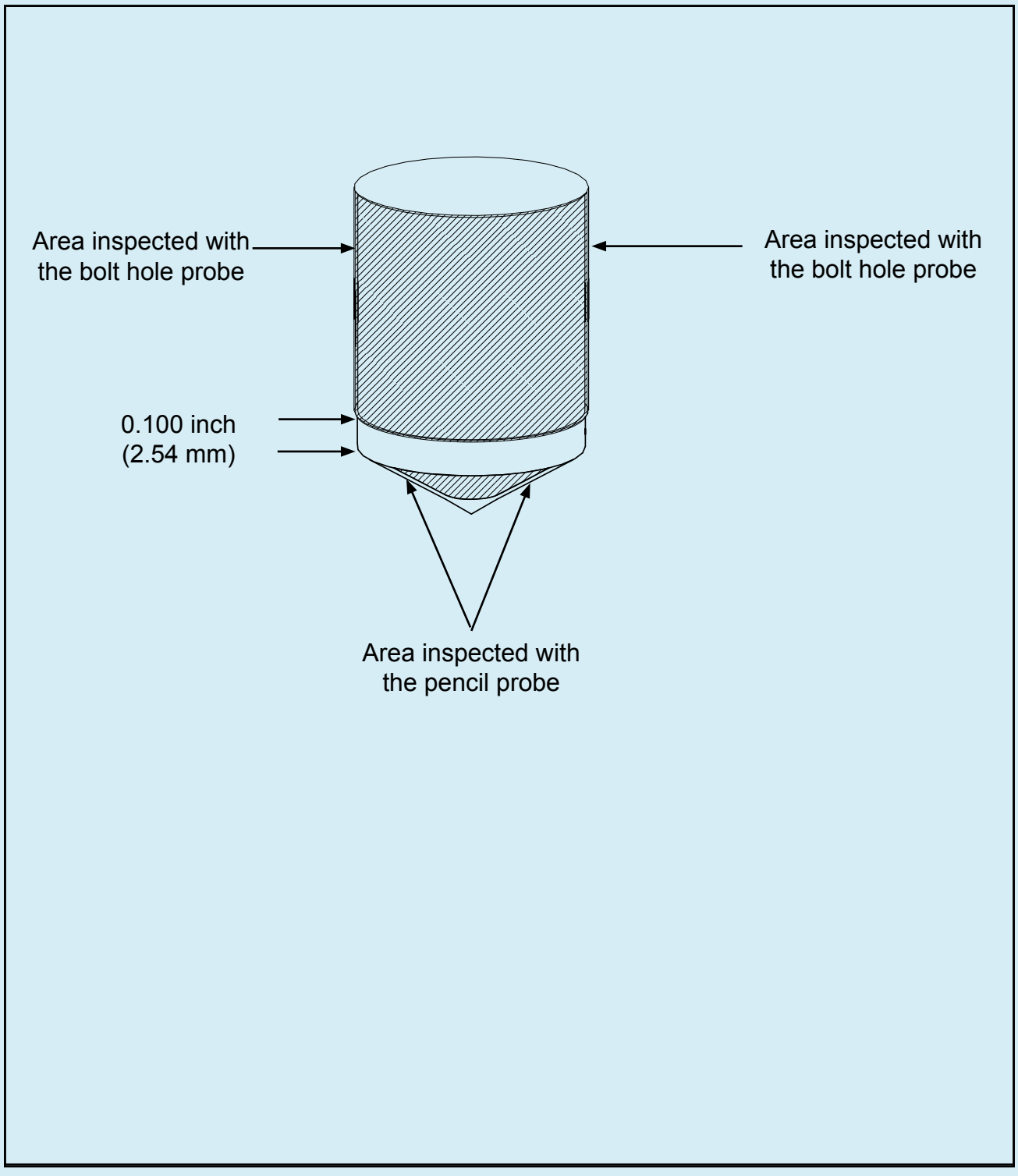
2 Maintain a scanning rate that is equivalent to the rate used for calibration.

(4) Repeat the inspection in each dowel pin hole.

(5) Verify the calibration in accordance with Paragraph 3.G., Verification of the Instrument's Calibration.



Inspection of Dowel Pin Hole with Pencil Probe
Figure 3



Dowel Pin Hole Inspection Areas
Figure 4

(6) If any hub is identified as having an indication greater than or equal to the reference notch, contact Hartzell Product Support before further flight.

F. Inspection of Propeller Mounting Flange.

(1) Calibrate the pencil probe in accordance with the Paragraph 3.C., Eddy Current Equipment Initial Set Up.

(2) Using a pencil probe, position the probe on the propeller mounting flange surface in the inspection area as defined in Figure 1.

(3) While holding the probe steady and perpendicular to the propeller mounting flange surface, inspect the areas identified in Figure 1.

(a) To make sure of complete coverage of the inspection area, each scan must overlap the previous scan.

(b) Maintain a scanning rate that is equivalent to that used for calibration.

(4) Scan the probe slowly on the mounting flange surface around the mounting bolt hole identified with the letter "X" in Figure 1.

(5) Scan the probe slowly on the edge of the propeller mounting flange near each dowel pin hole as shown in Figure 1.

(6) Verify the calibration in accordance with Paragraph 3.G., Verification of the Instrument's Calibration.

(7) If any hub is identified as having an indication greater than or equal to the reference notch, contact Hartzell Product Support before further flight.

G. Verification of the Instrument's Calibration

CAUTION 1: PERFORM THE VERIFICATION OF THE INSTRUMENT'S CALIBRATION AFTER THE INSPECTION OF EACH PROPELLER.

CAUTION 2: WITH THE EXCEPTION OF "BALANCE", DO NOT CHANGE THE EDDY CURRENT INSTRUMENT SETTINGS DURING CALIBRATION VERIFICATION.

(1) Repeat the calibration procedure. There must be no change in equipment performance from the initial calibration.

(2) Verify the minimum signal amplitude from the 0.20 inch (0.51 mm) the EDM reference notch is equal to or greater than the amplitude established at the previous calibration.

CAUTION: ANY PROPELLER INSPECTED SINCE THE LAST VERIFIED CALIBRATION MUST BE INSPECTED AGAIN IF CALIBRATION CANNOT BE VERIFIED.

(3) If calibration cannot be verified, the eddy current inspection must be performed again.

(4) If calibration is verified and an indication was not found, proceed to Propeller Return to Service.

H. Propeller Return to Service

(1) If an oversize threaded insert was not installed in a mounting bolt hole identified with the letter "X" in Figure 1:

(a) Complete the report form on page 19 and return the report form to Hartzell Product Support.

1 Using the letter "O", indicate on the report form all mounting holes with an oversize insert installed.

2 Using the letter "S", indicate on the report form all mounting holes with a standard insert installed.

3 Return the report form to Hartzell even if oversized inserts are not installed and/or a fracture indication is not found.

(b) Make an entry in the propeller logbook indicating compliance with the Initial Visual Inspection for an Oversize Threaded Inserts section of this Alert Service Bulletin.

(c) At each propeller overhaul, perform eddy current inspection in accordance with the Eddy Current Inspection section of this Alert Service Bulletin.

(2) If an oversize threaded insert is installed in a mounting bolt hole identified with the letter "X" in Figure 1:

(a) Complete the report form on page 19 and send the report form to the Hartzell Product Support Department:

1 Using the letter "O", indicate on the report form all mounting holes with an oversize insert installed.

2 Using the letter "S", indicate on the report form all mounting holes with an standard insert installed.

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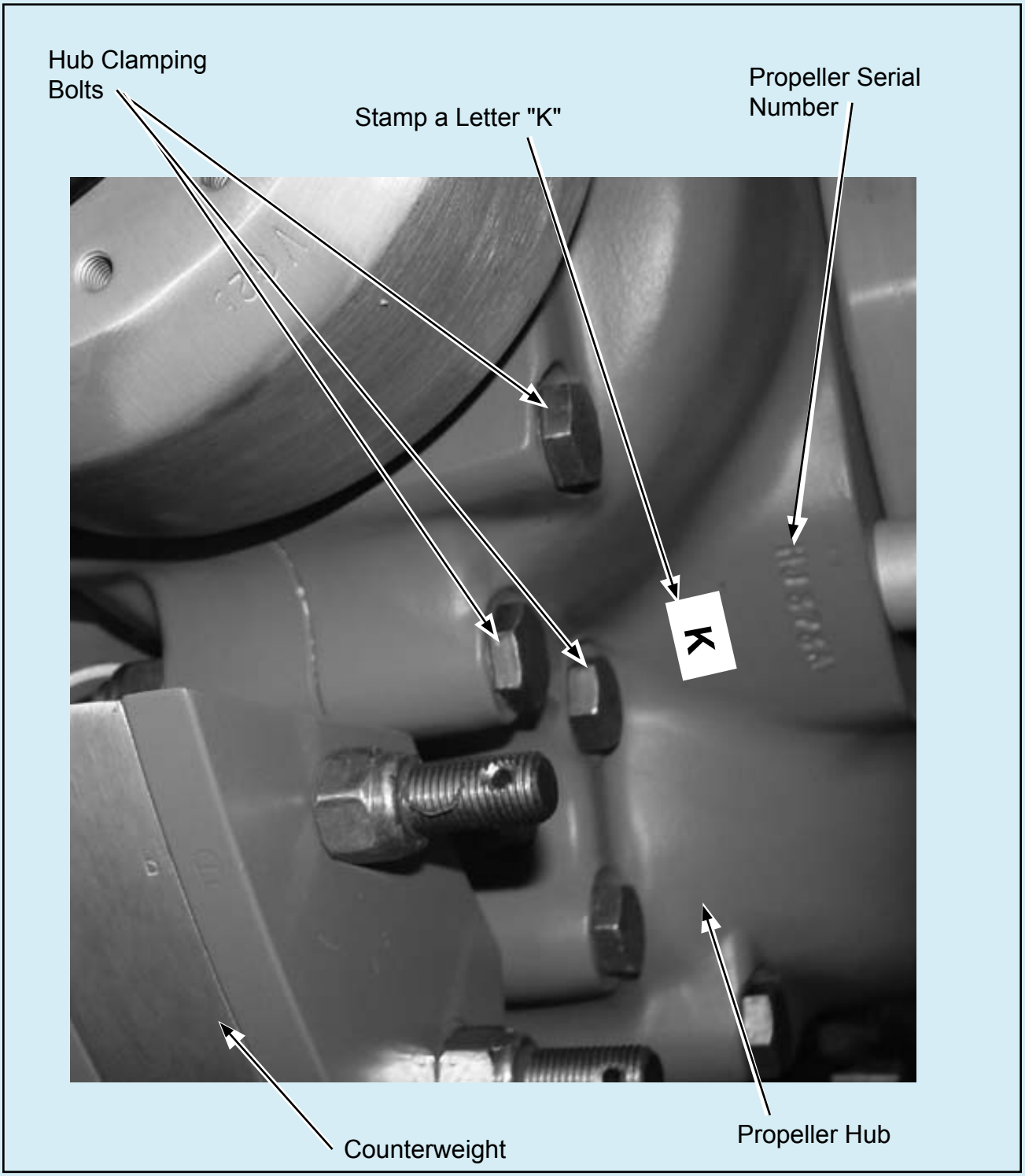
Propeller - Hub Inspection



Location for Stamping a Letter "K"
Figure 5

(b) Stamp a letter "**K**" if a B-1243-1 insert is installed in any hole identified with an "X" in Figure 1.

1 Use a metal impression stamp (0.125 inch [3.175 mm]), round bottom characters, to stamp the letter "**K**" below the propeller serial number on the cylinder side of the hub. Refer to Figure 5.

NOTE: The propeller serial number is stamped between blade position #1 and blade position #4.

2 If a letter "**K**" is stamped below the propeller serial number on the cylinder side of the hub, the Repetitive Interval inspection requirements will apply.

(c) Make an entry in the propeller logbook

1 Indicate compliance with the Initial Visual Inspection for an Oversize Threaded Insert section of this Alert Service Bulletin.

2 Indicate compliance with the Eddy Current Inspection section of this Alert Service Bulletin.

3 Indicate that a repetitive Eddy Current Inspection in accordance with this Alert Service Bulletin is required.

I. Visually inspect the propeller mounting hardware for damage or corrosion and replace any damaged or corroded mounting hardware.

J. Install the propeller assembly on the aircraft in accordance with Hartzell Propeller Owner's Manual 147 (61-00-47) or the Aircraft Maintenance Manual (AMM).

K. Dynamic balance the propeller in accordance with the Static and Dynamic Balance chapter of Hartzell Standard Practices Manual 202A (61-01-02) or the Aircraft Maintenance Manual (AMM).

L. Contact Information

Hartzell Propeller Inc.
Attn.: Hartzell 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

Alert Service Bulletin

HC-ASB-61-316 Report Form

Inspection Date: _____

Propeller Serial Number: _____ TSN: _____

TSO: _____

Aircraft Model: _____ Aircraft Serial Number: _____

Owner/Operator: _____

Contact Person: _____

Telephone Number: _____

Inspection Facility: _____

Contact Person: _____

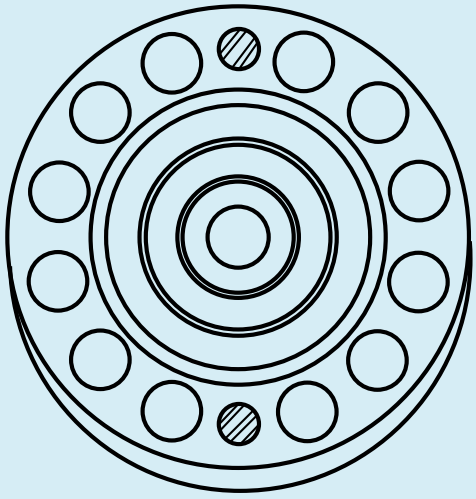
Telephone Number: _____

Inspection Results:

Relevant indication found	Number of holes with standard threaded insert	Number of holes with oversize threaded insert
Yes ☐ No ☐	_____	_____

Send this form to:

Hartzell Propeller Inc.
Attn.: Hartzell 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



Use the letter "O" to indicate each location of the oversize insert.
Use the letter "S" to indicate each location of the standard size insert.
Indicate the location of each relevant indication.

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