

HARTZELL PROPELLER INC.
SERVICE BULLETIN
TRANSMITTAL SHEET
HC-SB-61-374

Propeller - Blade Bearing Race Inspection Criteria

August 01, 2017

This page transmits a revision to Service Bulletin HC-SB-61-374.

- Original Issue, dated Apr 27/17
- Revision 1, dated Aug 01/17

Propeller assemblies that have previously complied with the inspections required in a previous revision of this Service Bulletin are affected.

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

Revision 1 is issued to change the following in the Service Bulletin:

- Revised the section, "Effectivity" to add steel hub propeller models.
- Revised the section, "Description" to add bearing race part numbers used in steel hub propeller models.
- Revised the section, "References"
- Revised the section, "Other Publications Affected"
- Revised the section, "Bearing Race Inspection Criteria"
- Revised Figure 1, "Race Inspection - For A-2202-(A,B), C-792-(A,B), C-7438-(A,B), and D-7745-(A,B)"
- Added Figure 2, "Race Inspection - For A-971-(A,B) and A-1851-(A,B,TA,TB)"
- Revised Table 1, "Race Inspection Criteria for All Except C-792-1(A,B)"
- Added Figure 3, "Race Inspection - For C-792-1(A,B)"
- Revised Table 2, "Race Inspection Criteria for C-792-1(A,B) Only"

This Service Bulletin is reissued in its entirety.

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1. Planning Information

A. Effectivity

- (1) All Hartzell Propeller Inc. aluminum hub compact propeller models ()HC-()()Y()-() are affected by this Service Bulletin.
- (2) All Hartzell Propeller Inc. aluminum hub lightweight turbine propeller models HC-(D,E)(3,4,5)()-() and HC-A6A-3() are affected by this Service Bulletin.
- (3) All Hartzell Propeller Inc. aluminum hub Raptor propeller models 3C1-()() and 5D3-N338() are affected by this Service Bulletin.
- (4) All Hartzell Propeller Inc. steel hub propeller models HA-(A2,B3)()()-(), ()HC-A(2,3)()()-(), and ()HC-B(3,4,5)()()-() are affected by this Service Bulletin.

WARNING: DO NOT USE OBSOLETE OR OUTDATED INFORMATION.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 SIGNIFICANTLY CHANGED FROM EARLIER REVISIONS. FAILURE TO COMPLY WITH THIS SERVICE BULLETIN OR THE USE OF OBSOLETE INFORMATION MAY CREATE AN UNSAFE CONDITION THAT 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) Additional service documents may apply to the components/propellers affected by this Service Bulletin. Compliance with additional service documents may be necessary in conjunction with the completion of the Accomplishment Instructions in this Service Bulletin. Refer to the Hartzell Propeller Inc. website at www.hartzellprop.com for a cross-reference of service documents.

C. Reason

- (1) Hartzell Propeller Inc. has revised the inspection criteria for the blade bearing races used on the affected propellers.

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D. Description

- (1) This Service Bulletin provides Instructions for Continued Airworthiness (ICA).
- (2) This Service Bulletin introduces revised inspection criteria for the following blade bearing races:
 - (a) A-971-(A,B)
 - (b) A-1851-(A,B,TA,TB)
 - (c) A-2202-(A,B)
 - (d) C-792-(A,B)
 - (e) C-792-1(A,B)
 - (f) C-7438-(A,B)
 - (g) D-7745-(A,B)

E. Compliance

- (1) At next propeller overhaul, inspect the blade bearing races on the affected propeller in accordance with the Accomplishment Instructions in this Service Bulletin

NOTE: Overhaul intervals are specified in Hartzell Propeller Inc. Service Letter HC-SL-61-61Y.

F. Approval

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

G. Manpower

- (1) No additional man-hours are required when inspection is performed at overhaul.

H. Weight and Balance

- (1) Not changed

I. Electrical Load Data

- (1) Not changed

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CAUTION: DO NOT USE OBSOLETE OR OUTDATED INFORMATION. PERFORM ALL INSPECTIONS OR WORK IN ACCORDANCE WITH THE MOST RECENT REVISION OF A DOCUMENT.

J. References

- (1) Hartzell Propeller Inc. Compact and Lightweight Compact Non-Feathering (-1) and Aerobatic (-4) Propeller Overhaul and Maintenance Manual 113B (61-10-13)
- (2) Hartzell Propeller Inc. Constant Speed and Feathering Two and Three-Blade Propeller Inspection, Repair, and Overhaul Instruction Manual 114B
- (3) Hartzell Propeller Inc. -3 and -5 Steel "A" Hub Propeller Maintenance Manual 114C (61-10-14)
- (4) Hartzell Propeller Inc. Compact Constant Speed and Feathering Propeller Overhaul and Maintenance Manual 117D (61-10-17)
- (5) Hartzell Propeller Inc. Steel Hub Turbine Propeller Maintenance Manual 118F (61-10-18)
- (6) Hartzell Propeller Inc. Five-Blade Steel Hub Turbine Engine Propeller Overhaul and Maintenance Manual 132A (61-10-32)
- (7) Hartzell Propeller Inc. Four Blade Lightweight Turbine Propeller Overhaul Manual 141 (61-10-41)
- (8) Hartzell Propeller Inc. Four Blade Lightweight Turbine Propeller Overhaul Manual 142 (61-10-42)
- (9) Hartzell Propeller Inc. Four Blade Lightweight Turbine Propeller Maintenance Manual 143A (61-10-43)
- (10) Hartzell Propeller Inc. Instruction Manual for Series HC-A6A-3() Six-Blade Lightweight Turbine Propeller Manual 144 (61-10-44)
- (11) Hartzell Propeller Inc. Three Blade Lightweight Turbine Propeller Maintenance Manual 155 (61-10-55)
- (12) Hartzell Propeller Inc. Instruction Manual for Series HC-E4P-5()/E11990K Manual 156A (61-10-56)
- (13) Hartzell Propeller Inc. Five Blade Lightweight Turbine Propeller Overhaul Manual 157 (61-10-57)
- (14) Hartzell Propeller Inc. Five Blade Lightweight Turbine Propeller Overhaul Manual 158A (61-10-58)
- (15) Hartzell Propeller Inc. Steel Hub Reciprocating Propeller Overhaul and Maintenance Manual 177 (61-10-77)

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- (16) Hartzell Propeller Inc. Three Blade Raptor Series Reciprocating Propeller Overhaul Manual 490 (61-10-90)
- (17) Hartzell Propeller Inc. Raptor Series Turbine Propeller Overhaul Manual 496 (61-10-96)

K. Other Publications Affected

- (1) Hartzell Propeller Inc. Compact and Lightweight Compact Non-Feathering (-1) and Aerobatic (-4) Propeller Overhaul and Maintenance Manual 113B (61-10-13)
- (2) Hartzell Propeller Inc. Constant Speed and Feathering Two and Three-Blade Propeller Inspection, Repair, and Overhaul Instruction Manual 114B
- (3) Hartzell Propeller Inc. -3 and -5 Steel "A" Hub Propeller Maintenance Manual 114C (61-10-14)
- (4) Hartzell Propeller Inc. Compact Constant Speed and Feathering Propeller Overhaul and Maintenance Manual 117D (61-10-17)
- (5) Hartzell Propeller Inc. Steel Hub Turbine Propeller Maintenance Manual 118F (61-10-18)
- (6) Hartzell Propeller Inc. Five-Blade Steel Hub Turbine Engine Propeller Overhaul and Maintenance Manual 132A (61-10-32)
- (7) Hartzell Propeller Inc. Four Blade Lightweight Turbine Propeller Overhaul Manual 141 (61-10-41)
- (8) Hartzell Propeller Inc. Four Blade Lightweight Turbine Propeller Overhaul Manual 142 (61-10-42)
- (9) Hartzell Propeller Inc. Three Blade Lightweight Turbine Propeller Maintenance Manual 155 (61-10-55)
- (10) Hartzell Propeller Inc. Instruction Manual for Series HC-E4P-5()/E11990K Manual 156A (61-10-56)
- (11) Hartzell Propeller Inc. Five Blade Lightweight Turbine Propeller Overhaul Manual 157 (61-10-57)
- (12) Hartzell Propeller Inc. Five Blade Lightweight Turbine Propeller Overhaul Manual 158A (61-10-58)
- (13) Hartzell Propeller Inc. Steel Hub Reciprocating Propeller Overhaul and Maintenance Manual 177 (61-10-77)
- (14) Hartzell Propeller Inc. Raptor Series Turbine Propeller Overhaul Manual 496 (61-10-96)

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2. Material Information

A. None

3. Accomplishment Instructions

A. Bearing Race Inspection Criteria

- (1) Disassembly, inspection, and assembly of the propeller and propeller hub must be performed by a certified propeller repair station with the appropriate rating.
- (2) Remove the bearing races in accordance with the applicable Hartzell Propeller Inc. overhaul/maintenance manual.
- (3) Inspect each bearing race in accordance with the applicable Table in this Service Bulletin.
 - (a) Inspect the bearing races A-971-(A,B), A-1851-(A,B,TA,TB), A-2202-(A,B), C-792-(A,B), C-7438-(A,B), and D-7745-(A,B) in accordance with Table 1.
 - (b) Inspect the bearing race C-792-1(A,B) in accordance with Table 2.
- (4) Complete the propeller overhaul in accordance with the applicable Hartzell Propeller Inc. overhaul/maintenance manual.

B. Recommended Service Facilities

- (1) Hartzell Propeller Inc. has a worldwide network of Recommended Service Facilities for overhaul and repair of our products.
- (2) Each service facility must meet standard FAA requirements and additional Hartzell Propeller requirements before being recommended by Hartzell Propeller Inc. Each service facility is audited by Hartzell Propeller Inc. to verify the continuation of the standards.
- (3) Hartzell Propeller Inc. recommends that you use one of these service facilities when having your propeller overhauled or repaired.
- (4) For a current list of Hartzell Propeller Inc. Recommended Service Facilities, contact Hartzell Propeller Inc. Product Support or refer to the Hartzell Propeller Inc. website at www.hartzellprop.com.

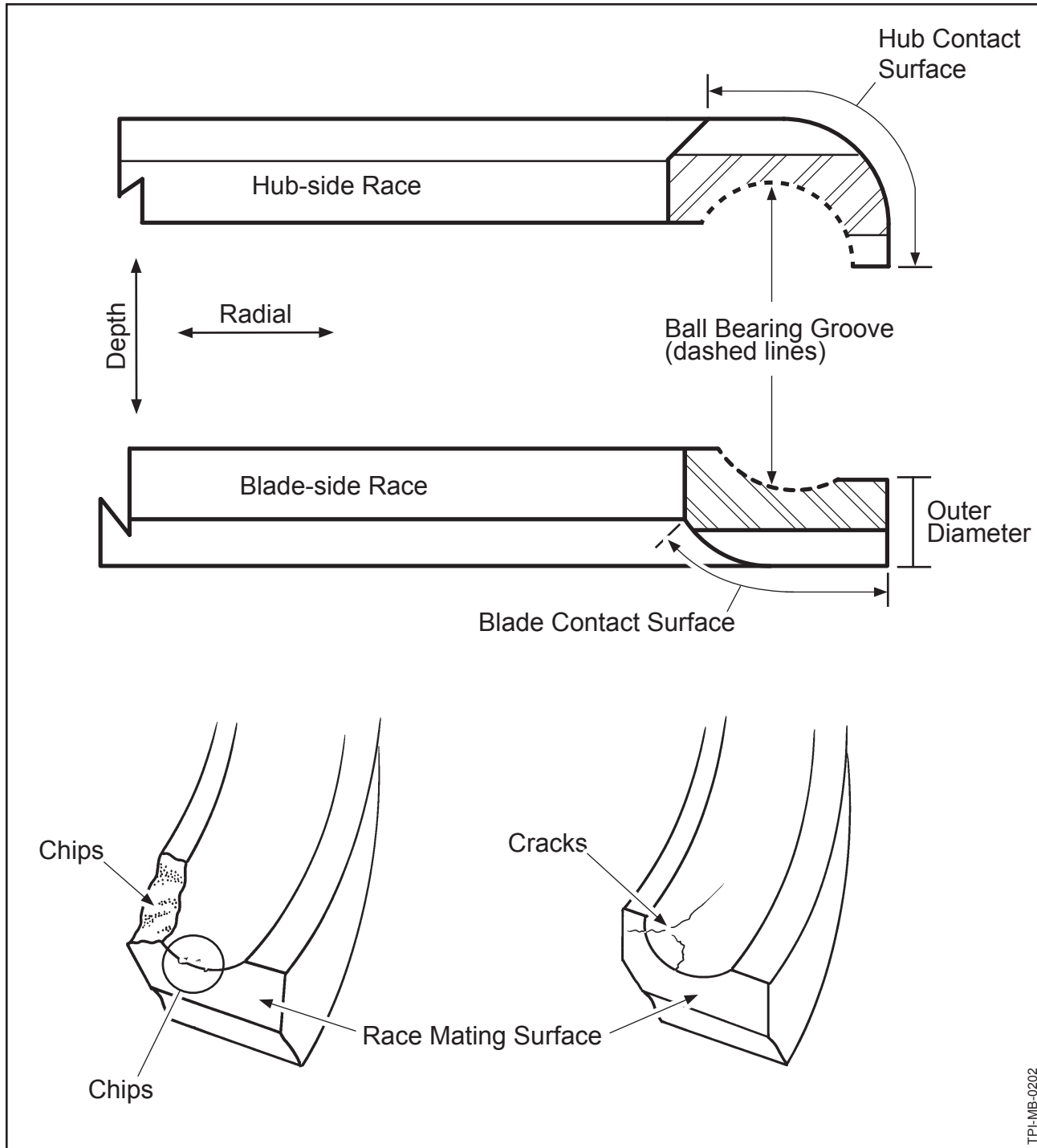
C. Contact Information

Hartzell Propeller Inc.
Attn.: Hartzell Propeller Inc. Product Support
One Propeller Place
Piqua, Ohio 45356-2634 USA
Phone: (001) 937.778.4379
Fax: (001) 937.778.4215
E-mail: techsupport@hartzellprop.com

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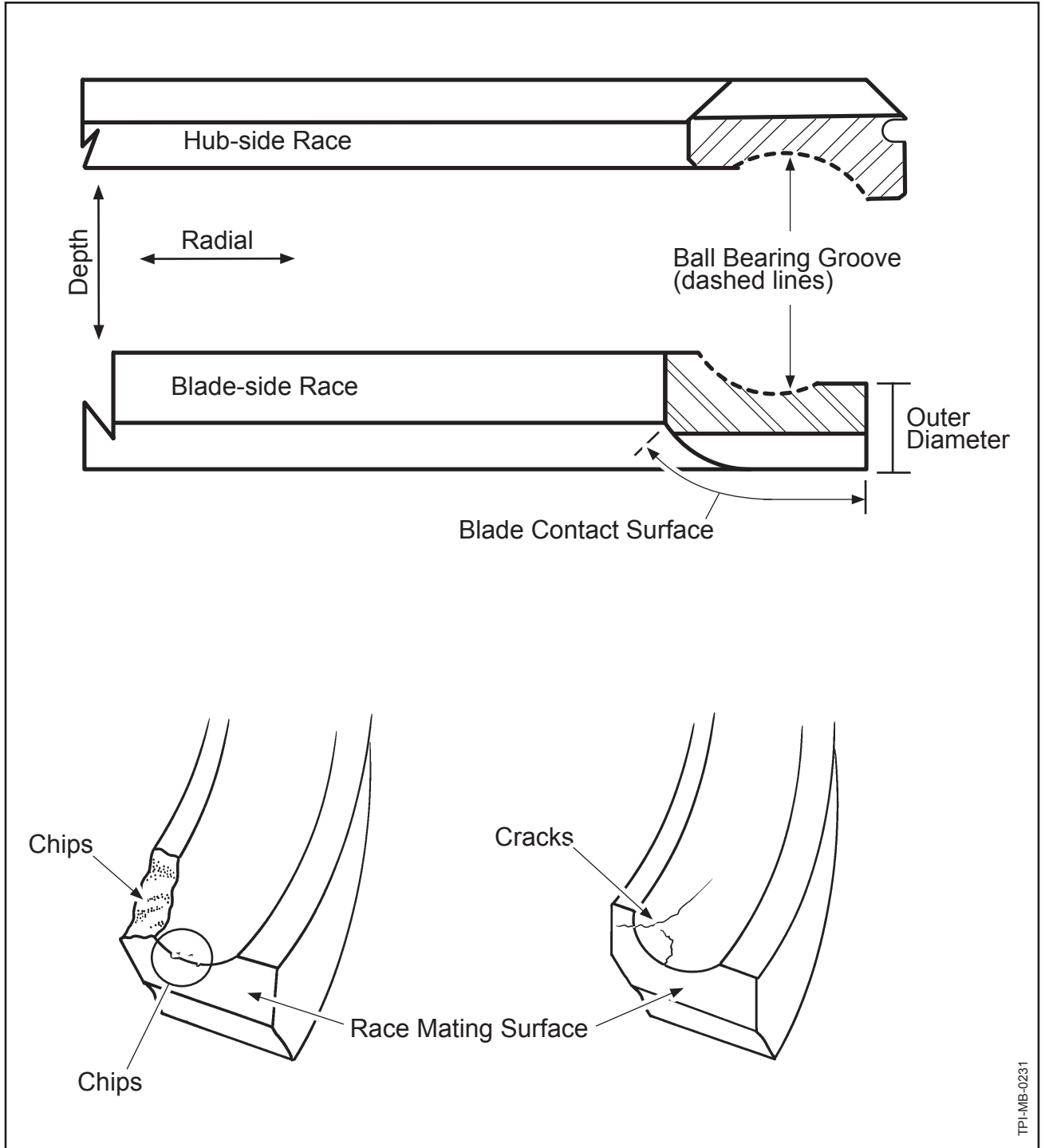


Race Inspection - For A-2202-(A,B), C-792-(A,B), C-7438-(A,B), and D-7745-(A,B)

Figure 1

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Propeller - Blade Bearing Race Inspection Criteria



Race Inspection - For A-971-(A,B) and A-1851-(A,B,TA,TB)

Figure 2

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Propeller - Blade Bearing Race Inspection Criteria

Inspect	Serviceable Limits	Corrective Action
<p>A. <u>RACE, FOR ALL EXCEPT C-792-1(A,B)</u> For A-2202-(A,B), C-792-(A,B), C-7438-(A,B), and D-7745-(A,B) refer to Figure 1. For A-971-(A,B) and A-1851-(A,B,TA,TB) refer to Figure 2.</p>		
(1) Visually examine the ball bearing groove in each race for corrosion.	Corrosion is not permitted. If there is corrosion, remove it in accordance with the corrective action repair limits.	Remove corrosion using glass bead cleaning. For glass bead cleaning refer to the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). If the corrosion cannot be removed, replace the race.
(2) Visually examine the ball bearing groove in each race for pitting, wear, fretting, and damage.	The maximum permitted depth of pitting is 0.003 inch (0.076 mm) in the ball bearing groove.	If the pitting is greater than the serviceable limits, replace the race.
	The maximum permitted diameter of a pit is 0.032 inch (0.81 mm).	
	The maximum permitted total area of pitting in the ball bearing groove on a complete race is 0.12 square inch (77.4 square mm) (two races for each bearing set). Pitting must not interfere with bearing ball movement or support.	
	If the ball bearing groove has wear, measure the wear. The maximum permitted depth of wear is 0.005 inch (0.12 mm).	If the wear is greater than the permitted serviceable limits, replace the race.
	Fretting damage is not permitted.	If there is fretting damage, replace the race.
	For damage other than pitting or fretting, the maximum permitted depth of damage is 0.003 inch (0.076 mm) and must not interfere with bearing ball movement or support.	If damage is greater than the permitted serviceable limits, replace the race.

Race Inspection Criteria for All Except C-792-1(A,B)

Table 1, page 1 of 3

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Propeller - Blade Bearing Race Inspection Criteria

Inspect	Serviceable Limits	Corrective Action
<p>A. <u>RACE, FOR ALL EXCEPT C-792-1(A,B), CONTINUED</u> For A-2202-(A,B), C-792-(A,B), C-7438-(A,B), and D-7745-(A,B) refer to Figure 1. For A-971-(A,B) and A-1851-(A,B,TA,TB) refer to Figure 2.</p>		
<p>(3) Except for the ball bearing groove, visually examine all other surfaces of each race for corrosion.</p>	<p>Corrosion is not permitted. If there is corrosion, remove it in accordance with the corrective action repair limits.</p>	<p>Remove corrosion using glass bead cleaning. For glass bead cleaning refer to the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). If the corrosion cannot be removed, replace the race.</p>
<p>(4) Except for the ball bearing groove, visually examine all other surfaces of each race for pitting, wear, fretting, and damage.</p>	<p>The maximum permitted depth of pitting is 0.005 inch (0.12 mm).</p> <p>The maximum permitted diameter of a pit is 0.062 inch (1.57 mm).</p> <p>The maximum permitted total area of pitting on all surfaces except the ball bearing groove of a complete race is 0.25 square inch (161.2 square mm) (two races for each bearing set).</p>	<p>If the pitting is greater than the permitted serviceable limits, replace the race.</p>
	<p>Fretting damage is permitted on the outer diameter of the races that interface with the bearing retaining ring. Fretting must not loosen the tight fit with the bearing retaining ring.</p>	<p>Clean the fretted area thoroughly using an abrasive pad CM47 or equivalent to decrease fretting damage to a minimum. If the fit of the bearing retaining ring to the race is not tight, replace the race.</p>
	<p>Wear is not permitted.</p>	<p>If there is wear, replace the race.</p>

Race Inspection Criteria for All Except C-792-1(A,B)
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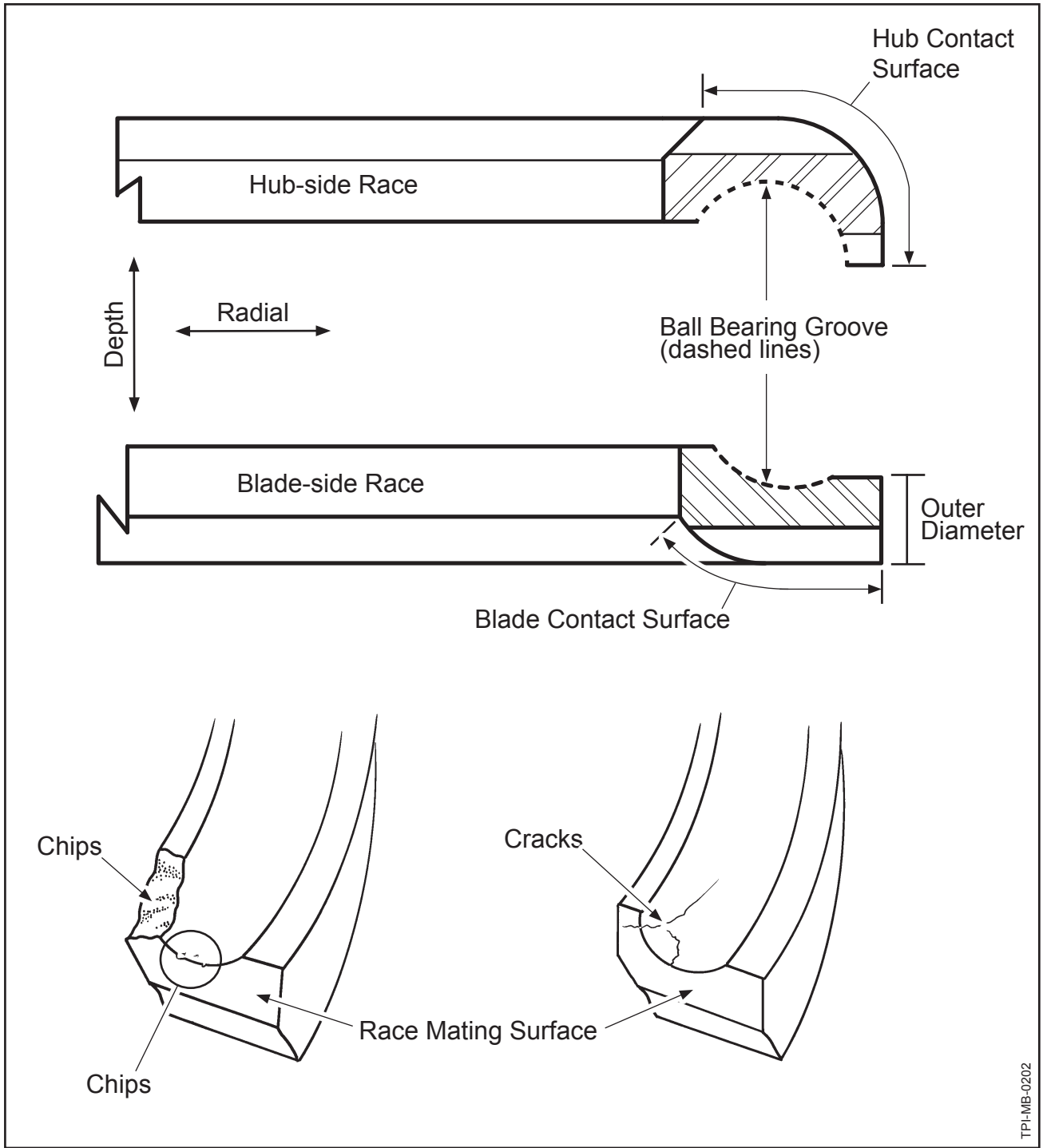
Propeller - Blade Bearing Race Inspection Criteria

Inspect	Serviceable Limits	Corrective Action
<p>A. <u>RACE, FOR ALL EXCEPT C-792-1(A,B),CONTINUED</u> For A-2202-(A,B), C-792-(A,B), C-7438-(A,B), and D-7745-(A,B) refer to Figure 1. For A-971-(A,B) and A-1851-(A,B,TA,TB) refer to Figure 2.</p>		
<p>(4) Except for the ball bearing groove, visually examine all other surfaces of each race for pitting, wear, fretting, and damage. -Continued</p>	<p>For damage other than pitting or fretting, the maximum permitted depth of damage is 0.005 inch (0.12 mm) and must not interfere with the mating surfaces.</p>	<p>If the damage is greater than the permitted serviceable limits, replace the race.</p>
<p>(5) Visually examine the race for chips or cracks that are adjacent to the mating surfaces of the race.</p>	<p>Chips or cracks that are adjacent to the mating surfaces of the race are not permitted.</p>	<p>If there are chips or cracks adjacent to the mating surfaces of the race, replace the race.</p>
<p>(6) Magnetic particle inspect each race in accordance with the Magnetic Particle Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02).</p>	<p>A relevant indication is not permitted.</p>	<p>If there is a relevant indication, replace the race.</p>

Race Inspection Criteria for All Except C-792-1(A,B)
Table 1, page 3 of 3

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Race Inspection - For C-792-1(A,B)
Figure 3

TPI-MB-0202

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Inspect	Serviceable Limits	Corrective Action
B. <u>RACE, C-792-1(A,B) ONLY</u> Refer to Figure 3		
(1) Visually examine the ball bearing groove in each race for corrosion.	Corrosion is not permitted. If there is corrosion, remove it in accordance with the corrective action repair limits.	Remove corrosion using glass bead cleaning. For glass bead cleaning refer to the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). If the corrosion cannot be removed, replace the race.
(2) Visually examine the ball bearing groove in each race for pitting, wear, fretting, and damage.	<p>The maximum permitted depth of pitting is 0.003 inch (0.076 mm) in the ball bearing groove.</p> <p>The maximum permitted diameter of a pit is 0.032 inch (0.81 mm).</p> <p>The maximum permitted total area of pitting in the ball bearing groove on a complete race is 0.12 square inch (77.4 square mm) (two races for each bearing set). Pitting must not interfere with bearing ball movement or support.</p> <p>If the ball bearing groove has wear, measure the wear. The maximum permitted depth of wear is 0.005 inch (0.12 mm).</p> <p>Fretting damage is not permitted.</p> <p>For damage other than pitting, the maximum permitted depth of damage is 0.003 inch (0.076 mm) and must not interfere with bearing ball movement or support.</p>	<p>If the pitting is greater than the serviceable limits, replace the race.</p> <p>If the wear is greater than the permitted serviceable limits, replace the race.</p> <p>If there is fretting damage, replace the race.</p> <p>If damage is greater than the permitted serviceable limits, replace the race.</p>

Race Inspection Criteria for C-792-1(A,B) Only
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Inspect	Serviceable Limits	Corrective Action
<p>B. <u>RACE, C-792-1(A,B) ONLY, CONTINUED</u> Refer to Figure 3</p>		
(3) Visually examine the hard chrome plating in the ball bearing groove of each race for flaking.	The maximum permitted total area of flaking in the ball bearing groove on a complete race (blade side or hub side) is 5%.	If the flaking is greater than the serviceable limits, replace the race.
(4) Except for the ball bearing groove, visually examine all other surfaces of each race for corrosion.	Corrosion is not permitted. If there is corrosion, remove it in accordance with the corrective action repair limits.	Remove corrosion using glass bead cleaning. For glass bead cleaning refer to the Cleaning chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). If the corrosion cannot be removed, replace the race.
(5) Except for the ball bearing groove, visually examine all other surfaces of each race for pitting, wear, fretting, and damage.	The maximum permitted depth of pitting is 0.005 inch (0.12 mm).	If the pitting is greater than the permitted serviceable limits, replace the race.
	The maximum permitted diameter of a pit is 0.062 inch (1.57 mm).	
	The maximum permitted total area of pitting on all surfaces except the ball bearing groove of a complete race is 0.25 square inch (161.2 square mm) (two races for each bearing set).	
	Fretting damage is permitted on the outer diameter of the races that interface with the bearing retaining ring. Fretting must not loosen the tight fit with the bearing retaining ring.	
	Wear is not permitted.	If there is wear, replace the race.

Race Inspection Criteria for C-792-1(A,B) Only
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Inspect	Serviceable Limits	Corrective Action
B. <u>RACE, C-792-1(A,B) ONLY, CONTINUED</u> Refer to Figure 3		
(5) Except for the ball bearing groove, visually examine all other surfaces of each race for pitting, wear, fretting, and damage. - Continued	For damage other than pitting or fretting, the maximum permitted depth of damage is 0.005 inch (0.12 mm) and must not interfere with the mating surfaces.	If the damage is greater than the permitted serviceable limits, replace the race.
(6) Except for the ball bearing groove, visually examine the hard chrome plating on all other surfaces of each race for flaking.	The maximum permitted total area of flaking for all other surfaces except the ball bearing groove on a complete race (blade side or hub side) is 5%.	If the flaking is greater than the serviceable limits, replace the race.
(7) Visually examine the race for chips or cracks that are adjacent to the mating surfaces of the race.	Chips or cracks that are adjacent to the mating surfaces of the race are not permitted.	If there are chips or cracks adjacent to the mating surfaces of the race, replace the race.
(8) Magnetic particle inspect each race in accordance with the Magnetic Particle Inspection chapter of Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02). <u>NOTE:</u> It is not necessary to strip the hard chrome plating from the race before magnetic particle inspection.	A relevant indication is not permitted.	If there is a relevant indication, replace the race.

Race Inspection Criteria for C-792-1(A,B) Only
Table 2, page 3 of 3