Component Maintenance Manual

Main Wheel Assembly
Aircraft Wheel and Brake, LLC
Part No. 40-480

Publication No.: CM40-480, Revision A

Manufacturer:

AIRCRAFT WHEEL & BRAKE BY KAMAN

Aircraft Wheel and Brake, LLC
1160 Center Road
Avon, Ohio 44011

Cleveland Wheels & Brakes

REVISION HIGHLIGHTS

TO: HOLDERS OF CM40-480 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR WHEEL ASSEMBLY PART NO. 40-480.

Revision NC, Dated 2017-12-20

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REVISION HIGHLIGHTS

TO: HOLDERS OF CM40-480 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR WHEEL ASSEMBLY PART NO. 40-480.

Revision A, Dated 2023-08-11

Section/Page No.	Description Of Change
As Follows	(CA-00000010)
All Sections/All Pages	Page Header (NOW) Aircraft Wheel and Brake, By Kaman logo (WAS) Parker logo
Title Page/T-1	(NOW) Aircraft Wheel and Brake proprietary rights statement and logo (WAS) Parker proprietary rights statement and logo
Record of Revisions/RR-1	Updated to reflect current revision
Service Bulletin List	(NOW) Aircraft Wheel and Brake, LLC (WAS) Parker Hannifin
List of Effective Pages/ LEP-1	Updated to reflect current revision
Introduction/ Pg INTRO-1	(NOW) Aircraft Wheel and Brake, LLC name and contact info (WAS) Parker Hannifin name and contact info
Pg INTRO-2	(NOW) Aircraft Wheel and Brake, LLC (WAS) Parker Hannifin
Description and Operation Pg 2	Table 1 Maintenance Schedule (Wheel half subassemblies and bolts) (NOW) Liquid penetrant inspection or user defined eddy current inspection and acceptance method. (WAS) Liquid penetrant inspection.
Testing and Fault Isolation Pg 1004	Section 2.D.(3)(b)1 (NOW) 1 Use Liquid Penetrant or user defined eddy current inspection or acceptance methods to inspect the wheel halves and check for cracks. (WAS) 1 Liquid Penetrant inspect the wheel halves and check for cracks.
Pg 1005	Table 1002 Troubleshooting (NOW) Use Liquid Penetrant or user defined eddy current inspection and acceptance methods to examine the wheel half for cracks. (WAS) Use Liquid Penetrant Inspect to examine the wheel half for cracks.

REVISION HIGHLIGHTS (continued)

Revision A, Dated 2023-08-11

Section/Page No.	Description Of Change
Disassembly/Pg 3001	(NOW) Aircraft Wheel and Brake, LLC (WAS) Parker Hannifin
Pg 3002	Section 4. Note (NOW) For a more thorough inspection of the wheel half, e.g. liquid penetrant inspection or user defined eddy current inspection and acceptance criteria. (WAS) For a more thorough inspection of the wheel half, e.g. liquid penetrant inspection.
Checks/Pg 5002	Section 3.A. (NOW) A. In accordance with the maintenance schedule (Table 1, DESCRIPTION AND OPERATION): use magnetic particle inspection (ASTM E1444) or user defined eddy current inspection and acceptance methods to examine the bolts for cracks in the radius under the bolt head and in the threaded area next to the bolt shank. (WAS) A. In accordance with the maintenance schedule (Table 1, DESCRIPTION AND OPERATION): use magnetic particle inspection (ASTM E1444) to examine the bolts for cracks in the radius under the bolt head and in the threaded area next to the bolt shank.
Pg 5006	Section 9.F. (NOW) F. In accordance with the maintenance schedule (Table 1, DESCRIPTION AND OPERATION), examine the wheel halves for cracks using liquid penetrant inspection (ASTM E1417, Type 1, Method A, Sensitivity Level 2; acceptance criteria per MIL-STD-1907, Grade B) or user defined eddy current inspection and acceptance method. (WAS) F. In accordance with the maintenance schedule (Table 1, DESCRIPTION AND OPERATION), examine the wheel halves for cracks using liquid penetrant inspection (ASTM E1417, Type 1, Method A, Sensitivity Level 2; acceptance criteria per MIL-STD-1907, Grade B).

REVISION HIGHLIGHTS (continued)

Revision A, Dated 2023-08-11

Section/Page No.	Description Of Change
Assembly/Pg 7001	(NOW) Aircraft Wheel and Brake, LLC (WAS) Parker Hannifin
Special Equipment and Consumables/Pg 9001	(NOW) Aircraft Wheel and Brake, LLC (WAS) Parker Hannifin
Illustrated parts list/ Pg 10001, 10003	(NOW) Aircraft Wheel and Brake, LLC (WAS) Parker Hannifin

RECORD OF REVISIONS

Check in the following record that all earlier changes have been incorporated.

Rev	Incorporated date	by (signature)	Rev	Incorporated date	by (signature)
NC	2017-12-20	PHC			
A	2023-08-11	JAS			

SERVICE BULLETIN LIST

Aircraft Wheel and Brake, LLC Service Bulletins are issued in order to provide general information on product line concerns. The bulletin listings contained herein identify subject matter directly related to the support and function of the assembly and components.

Number	Subject	Rev	Date incorporated at manual revision

LIST OF EFFECTIVE PAGES

SUBJECT	PAGE	DATE	SUBJECT	PAGE	DATE
Title Page	T-1	2023-08-11	Checks	5001	2023-08-11
				5002	2023-08-11
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				5004	2023-08-11
				5005	2023-08-11
Service Bulletin List	SB-1	2023-08-11		5006	2023-08-11
				5007	2023-08-11
				5008	Blank
List of Effective Pages	LEP-1	2023-08-11			
	LEP-2	2023-08-11	Repair	6001	2023-08-11
				6002	2023-08-11
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	3002	2023-08-11	Fits and	8001	2023-08-11
	3003	2023-08-11	Clearances	8002	Blank
	3004	Blank			
			Special	9001	2023-08-11
Cleaning	4001	2023-08-11	Equipment	9002	2023-08-11
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			Consumables	9004	2023-08-11
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C = Changed page

LIST OF EFFECTIVE PAGES

SUBJECT	PAGE	DATE
Illustrated	10001	2023-08-11
Parts List	10002	2023-08-11
	10003	2023-08-11
	10004	Blank
Storage	15001	2023-08-11
	15002	Blank

N = New page No.
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TABLE OF CONTENTS

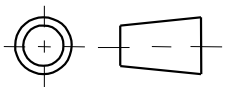
INTRODUCTION

1. General

SAFETY WARNING: ALL TORQUE AND SPECIFIC LIMITS OR VALUES CONTAINED HEREIN MUST BE STRICTLY OBSERVED. IGNORING OF TORQUE LIMITS AND OTHER SPECIFIC VALUES GIVEN BY THIS MANUAL CAN CAUSE PROPERTY DAMAGE, PERSONAL INJURY, OR DEATH.

This manual is published for the guidance of personnel responsible for the overhaul and/or general maintenance of the Aircraft Wheel and Brake, LLC Assembly covered in this publication.

THIRD ANGLE PROJECTION



Third angle projection is used in this manual. All weights and measurements are in U.S. English units.

The manual for the aircraft shall take precedence for the component's interface connections with the functional features as used in the aircraft. This manual may also describe functional features that may or may not be used when installed as a component of a system in the aircraft.

The manufacturer recommends that you ask for the latest revision of the manual before continuing with overhaul or maintenance operations. Ask the Technical Services Department of the Aircraft Wheel and Brake, LLC (AWB) for the latest revision.

Substitutions of critical parts or changes of processes or materials are not permitted without the written approval of the manufacturer.

Aircraft Wheel and Brake, LLC
1160 Center Road
Avon, Ohio 44011 U.S.A.
Attn: Technical Services/Hotline

E-mail: clevelandwbhelp@kaman.com
Fax: (440) 937-5409
Tel: 1-800-BRAKING (1-800-272-5464)
Websites: www.kaman.com
www.kaman.com/cleveland
www.clevelandwheelsandbrakes.com

INTRODUCTION

2. Manual use

This manual is divided into various section blocks such as Testing and Fault Isolation, Disassembly, Inspection / Check, Repair, etc. Refer to the Table of Contents for the location of the applicable section.

3. Warnings, cautions, and notes

These adjuncts to the text shall be used to highlight or emphasize important points when necessary. Refer to the descriptions of these statements that follow:

- A **"SAFETY WARNING"** flagged by this symbol  , calls attention to possible serious or life threatening situations if procedures are not followed.
- A **"WARNING"** calls attention to use of materials, processes, methods, procedures, or limits which must be followed precisely to avoid injury to persons.
- A **"CAUTION"** calls attention to methods and procedures, which must be followed to avoid damage to equipment.
- A **"NOTE"** calls attention to an essential operating or maintenance procedure, condition, or statement, which must be highlighted.

4. Replacement parts

SAFETY WARNING: AIRCRAFT WHEEL AND BRAKE, LLC (AWB) DOES NOT WARRANT OR ASSUME THE RISK OF THE USE OF REPLACEMENT PARTS NOT AUTHORIZED FOR USE BY AWB. OPERATORS WHO USE REPLACEMENT PARTS NOT AUTHORIZED BY AWB DO SO AT THEIR OWN RISK AND TAKE FULL RESPONSIBILITY FOR ALL PROPERTY DAMAGE, PERSONAL INJURY OR DEATH CAUSED BY SUCH REPLACEMENTS.

Use only the approved parts that are listed in the illustrated parts list of this manual.

DESCRIPTION AND OPERATION

1. Description

Refer to IPL Figure 1 for component identification.

SAFETY WARNING: THIS ASSEMBLY CONTAINS PARTS THAT HAVE A CADMIUM PLATING FINISH: (55), (60), (65), (115). REMOVING THE CADMIUM PLATING CAN CREATE EXPOSURE TO CADMIUM DUST AND CADMIUM COMPOUNDS. THIS CAN BE A POTENTIAL HEALTH HAZARD.

The wheel assembly conforms to the Tire and Rim Association, Inc., standards for use with a 6.50-10, 12 PR tubeless, bias ply tire. The main wheel assembly is the load bearing structural member that interfaces with the main landing gear and the main tire during ground operations.

Each wheel assembly is composed of the following base parts:

- two wheel half subassemblies: inboard (5) and outboard (20). The wheel halves are made from aluminum alloy forging and are surface treated and painted for corrosion protection.
- two sets of tapered roller bearings consisting of cups (25) and cones (40).
- one inflation valve (85) to inflate and deflate a tubeless tire.
- one rupture disc (105) to release tire pressure if tire is overpressurized.
- three fusible plugs (115) to release tire pressure if the wheel becomes overheated.
- high-strength bolts (55), single-countersunk washers (60), and self-locking nuts (65).

A preformed packing (70) provides an air seal at the juncture of the wheel halves.

Bearing cups (25) are press-fit into each bearing hub end of the outboard wheel half. Elastomer based seals (45) provide protection and lubricant retention for the bearings.

The inboard wheel half has drive lugs that engage the drive slots of the rotating brake discs. The drive lugs are lined with steel drive keys (75) each of which are held in place by screws (80). Stainless steel heat shields (95) are located between the drive keys.

2. Operation

The main wheel assembly provides partial support of the weight of the aircraft and a means of steering control. When mated with the brake assembly, the wheel assembly provides the braking operation by driving the rotating disc members of the brake assembly.

3. Handling procedures

Handle the wheel bearing cones with extreme care. Many bearing failures can be traced to dropping or mishandling the bearings during maintenance.

Handle and maintain the wheel components properly to protect all paint and surface finishes.

4. Leading particulars

Bearing lubricant		Mobil Aviation Grease SHC 100
Wheel half material		Aluminum alloy forging
Wheel half coatings	Surface treatment:	Refer to the REPAIR section
	Primer coating:	Refer to the REPAIR section
	Finish coating:	Refer to the REPAIR section

DESCRIPTION AND OPERATION

5. Maintenance schedule

The maintenance schedule is a guideline based on laboratory testing environments that simulate normal conditions. Field operating requirements can vary from aircraft to aircraft. These variations will directly affect the wear rate of the wheel assembly components. Operating conditions must be evaluated to determine a suitable schedule to maintain the equipment.

Table 1 Maintenance schedule

INTERVAL	ITEM	TASK (refer to the CHECKS section)
At every tire change	All components	Visual and detailed examination.
	Preformed packings: (70), (90), (110), (120)	Replace.
	Screws (80)	Check torque (Torq-Set® driver bit) 35 to 45 in-lb.
At the following tire changes: 3rd, 6th, 9th, 12th then every tire change after.	Wheel half subassemblies (5), (20)	➢ Visual and detailed examination. ➢ Liquid penetrant inspection or user defined eddy current inspection and acceptance method.
	Bolts (55)	➢ Visual examination. ➢ Magnetic particle inspection or user defined eddy current inspection and acceptance method.
Every tire change or every 12 months (whichever occurs first)	Bearing cones (40)	Clean and repack with clean grease. Refer to the ASSEMBLY section.
UNSCHEDULED INTERVAL	ITEM	TASK (refer to the CHECKS section)
Indication of overheating: One of the three fusible plugs releases the tire pneumatic pressure.	All components	Visual and detailed examination.
	Wheel half subassemblies (5), (20)	Hardness test.
	Fusible plugs (115)	Replace.
	Preformed packings (70), (90), (110), (120) Heat shield bumpers (100)	Replace.

TESTING AND FAULT ISOLATION

1. General

Refer to IPL Figure 1 for component identification.

This section contains test procedures that can be used as troubleshooting measures and means to test overhauled wheel assemblies. A test data sheet is included at the end of this section for reference.

A. Equipment and consumables

The term “Commercial Source” allows the repair facility to acquire the product from a supplier of choice.

NOTE: Unless specified differently, equivalent alternatives can be used for the items listed.

Table 1001 Equipment and consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Tire inflation safety equipment	Commercial source	Commercial
Dry nitrogen	Commercial source	Commercial
Standard tools (inch units)	Wrenches/sockets: • 12pt, external: for (55), (65) • Hex head, external: for (85), (105), (115) Torque wrench Tire pressure gage	Commercial
Soap solution	Mild dishwashing liquid	Commercial
Torq-Set® driver bit for (80)	NASM33781	Phillips Screw Company

TESTING AND FAULT ISOLATION

2. Testing

Examine all wheel assemblies that do not meet the test standards of this section. Refer to Table 1002 Troubleshooting for possible causes.

SAFETY WARNING: DO NOT PERFORM TESTING ON ANY WHEEL ASSEMBLY THAT SHOWS SIGNS OF DAMAGE.

SAFETY WARNING: ALWAYS FOLLOW PROPER TIRE INFLATION SAFETY PRACTICES. SERVICE THE TIRE WITH INFLATION SAFETY EQUIPMENT DESIGNED FOR THIS OPERATION.

SAFETY WARNING: WEAR THE APPROPRIATE PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

A. Tire inflation guidelines

- Use a clip-on chuck and an extension hose.
- Use a direct reading or dial type pressure gauge that is calibrated on a regular basis.
- When inflating a tire, regulate the supply line to a pressure no more than 50% higher than the tire service pressure.
- Use only dry nitrogen to inflate the tire.
- Inflate the tire to no more than the tire rated inflation pressure to seat the tire beads, then adjust inflation pressure to the airframe manufacturer's recommended inflation pressure.

B. Pretest examination of product

(1) Examine the wheel for corrosion, loose bearing cups, or visible damage.

(2) Check the rupture disc (105) for an indication of pressure release or damage.

(3) Check for evidence of melted fusible plugs (115).

(4) Examine all fasteners and threaded components for loose fit. Tighten loose fasteners. Refer to Table 8002, Assembly torque values.

(a) The self-locking feature of the nuts (65) is defective if the nut is loose and you cannot tighten the nut to the assembly torque value. If one nut is damaged, then replace all of the nuts.

(5) Check for loose, worn or damaged drive keys (75).

(6) Examine the tires for cuts, flat spots, or damage to the tread or sidewall.

NOTE: Refer to tire manufacturer's service and maintenance manual.

TESTING AND FAULT ISOLATION

C. 24 hour pressure retention test

CAUTION: COVER OR PLUG THE BEARING HUB OPENINGS OF THE OUTBOARD WHEEL HALF TO PREVENT CONTAMINATION OF THE BEARING BORE AREAS.

(1) Use the proper tire inflation safety equipment.

(2) Inflate the tire with dry nitrogen to the airframe manufacturer's recommended inflation pressure.

(a) Deflate the tire to equalize stretch.

(b) Re-inflate the tire to the airframe manufacturer's recommended inflation pressure.

(c) Allow 12 hours minimum for a new tire to stretch.

(d) Measure the tire pressure. If necessary, re-inflate the tire to the airframe manufacturer's recommended inflation pressure.

(3) The wheel/tire assembly must hold the airframe manufacturer's recommended inflation pressure for 24 hours. A maximum 5% pressure drop is allowed.

(4) If pressure drop is 5% or less:

(a) The pressure retention test is successfully completed.

(b) Refer to F. Preparation for return to service.

(5) If pressure drop is greater than 5%:

(a) Inflate the tire with dry nitrogen to the airframe manufacturer's recommended inflation pressure.

(b) Apply a soap and water solution to the following:

- juncture around the inflation valve (85)
- juncture around the rupture disc (105)
- juncture around the fusible plugs (115)
- the tire bead area
- wheel half interface

(c) Examine for air leaks. Refer to D. Leakage diagnosis for additional procedures.

D. Leakage diagnosis

(1) Perform the following examinations to determine if an air leak exists at the inflation valve (85), rupture disc (105), or a fusible plug (115).

(a) Inflation valve, rupture disc, or fusible plug could be loose and not seated. Refer to Table 8002 and torque to specification. Inflate the tire with dry nitrogen to the airframe manufacturer's recommended inflation pressure.

1 If the leakage continues, deflate the tire completely and remove the leaking component. Examine the components for damage.

a Examine the component preformed packing (90), (110), (120) for cuts, tears, deformation or other damage that would prevent the preformed packing from properly sealing and replace as necessary.

(b) Inboard wheel half subassembly (5) could be damaged. Examine the mating surfaces for the inflation valve (85), rupture disc (105) and fusible plugs (115) for damage that would prevent the corresponding preformed packing (90), (110), or (120) from properly sealing.

1 Wheel half must be replaced if the mating surface is damaged.

TESTING AND FAULT ISOLATION

(c) After leakage diagnosis has been resolved and corrected, inflate the tire with dry nitrogen to the airframe manufacturer's recommended inflation pressure and perform the 24 hour pressure retention test.

(2) Perform the following examinations to determine if an air leak exists at the tire bead area or wheel interface. The wheel interface seal is provided by the preformed packing (70).

(a) Deflate the tire completely.

(b) Remove the tire from the wheel assembly.

(c) Examine the tire bead and wheel bead seats for damage. Examine the wheel interface surfaces and preformed packing (70) for damage.

1 Examine the tire bead for cuts or other damage that would prevent the tire from properly sealing. Replace tire, if damaged.

2 Examine the wheel bead seat on both wheel halves for damage that would prevent the tire from properly sealing.

a Repair the damaged area in accordance with the repair limits or replace the part if damage exceeds the repair limits.

3 Examine the wheel interface on both wheel halves for damage that would prevent the preformed packing (70) from properly sealing. Replace the part if damage is found.

4 Examine and replace the preformed packing (70) if damage is found.

(d) After leakage diagnosis has been resolved and corrected, then:

1 Reassemble the wheel/tire and inflate the tire with dry nitrogen to the airframe manufacturer's recommended inflation pressure.

2 Perform the 24 hour pressure retention test.

(3) An air leak can occur through the wheel if a wheel half is cracked. Perform the following examinations to determine if an air leak exists due to a cracked wheel half.

(a) Deflate the tire completely.

(b) Remove the tire from the wheel assembly and disassemble the wheel to the level necessary to examine the wheel halves.

1 Use Liquid Penetrant or user defined eddy current inspection or acceptance methods to inspect the wheel halves and check for cracks. If cracks are found in either wheel half, then replace both wheel half subassemblies.

(c) After leakage diagnosis has been resolved and corrected, reassemble the wheel/tire and perform the 24 hour pressure retention test.

E. Preformed packing (70)

It is possible for leakage to occur where the wheel halves mate. If the wheel is disassembled for other possible leakage examinations, check the following:

(1) Examine the preformed packing (70) for cuts, tears, deformation, or other damage that would prevent a positive seal.

(2) Examine the wheel halves in the register/sealing groove areas for damage that would prevent a positive seal.

F. Preparation for return to service

(1) Complete the final assembly of the wheel by installing any remaining components. Refer to the ASSEMBLY section.

TESTING AND FAULT ISOLATION

3. Troubleshooting

Table 1002 cannot list all possible problems and is intended to assist with troubleshooting.

Table 1002 Troubleshooting

PROBLEM	POSSIBLE CAUSE	CORRECTION
Loss of tire pressure at the: • inflation valve • rupture disc • fusible plug	Damage to the inflation valve (85) or preformed packing (90).	Replace the damaged part.
	Damage to the rupture disc (105) or preformed packing (110).	
	Damage to a fusible plug (115) or preformed packing (120).	
	Damage to the mating sealing surface on the inboard wheel half subassembly(5).	
Loss of tire pressure at the tire bead	Damage to the tire	Replace the damaged part.
	Damage to the bead seat area of the wheel half.	
Loss of tire pressure - other	Loss of the preload on wheel bolts (55).	Examine bolts for damage and the nuts (65) for damage to self-locking feature.
	A possible cracked wheel half.	Use Liquid Penetrant or user defined eddy current inspection and acceptance methods to examine the wheel half for cracks. Refer to the CHECKS section.
	Possible damage to preformed packing (70) or register/sealing groove areas of wheel halves.	Replace preformed packing. Examine wheel halves.
Excessive drag on the wheel when rotating.	Incorrect preload or torque on the axle nut.	Loosen and retighten the axle nut to the aircraft manufacturer's specifications.
	Damage to a bearing cone (40) or cup (25). **NOTE:** Damage could result from incorrect axle nut torque, misalignment of bearings; lack of or contamination of bearing grease.	Examine the bearing cones and cups. If a cup or cone is damaged or corroded, replace all cups and cones. Cups and cones should be replaced as a matched set. Pack new cones with clean bearing grease. Refer to the ASSEMBLY section.

TESTING AND FAULT ISOLATION

Test Date: _____ **Wheel P/N:** _____ **Wheel Serial No.:** _____

Pretest examination of product

(1) Wheel condition **Pass** _____ **Fail** _____

(2) Wheel assembly hardware condition **Pass** _____ **Fail** _____

(3) Tire condition **Pass** _____ **Fail** _____

Comments: _____

_____

_____

_____

24 hour pressure retention test **Pass** _____ **Fail** _____

Tire inflation pressure: _____ psig

Pressure after 24 hr: _____ psig Pressure Drop Allowed: 5% max.

Pass ____ 5% or less.

Fail ____ greater than 5%.

Leakage at inflation valve (85): Yes ____ No ____

Leakage at rupture disc (105): Yes ____ No ____

Leakage at a fusible plug (115): Yes ____ No ____

Leakage at bead seat: Yes ____ No ____

Leakage through wheel: Yes ____ No ____

Leakage due to damage at wheel register/sealing groove or preformed packing (70): Yes ____ No ____

Comments: _____

_____

_____

_____

Tester: _____ **Date:** _____

DISASSEMBLY

1. General

Refer to IPL Figure 1 for component identification.

A. Equipment and consumables

The term “Commercial Source” lets the repair facility get the product from a supplier of choice.

NOTE: Unless specified differently, equivalent alternatives can be used for the items listed.

Table 3001 Equipment and consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Preformed packing tool set	199-18	Aircraft Wheel and Brake, LLC
Standard tools (inch units)	Wrenches/sockets: • 12pt, external: for (55), (65) • Hex head, external: for (85), (105), (115) Flat blade screwdriver	Commercial
Portable tire bead breaker	Commercial source	Commercial
Soap solution	Mild dishwashing liquid	Commercial
Valve core tool	Commercial source	Commercial
Torq-Set® driver bit for (80)	NASM33781	Phillips Screw Company

2. Replace Components

A. In addition to replacement at the scheduled maintenance interval, replace the preformed packings (70), (90), (110), (120) if they are removed for any reason. Seals can take a set over time and should not be reused.

3. Remove the wheel assembly

SAFETY WARNING: WEAR THE APPROPRIATE PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

SAFETY WARNING: FOLLOW THE AIRFRAME MANUFACTURER’S INSTRUCTIONS AND SAFETY WARNINGS WHEN WORKING WITH AND AROUND THE AIRCRAFT.

A. Refer to the airframe manufacturer’s instructions to lift and support the aircraft.

B. Refer to the airframe manufacturer’s instructions to remove the wheel/tire unit from the aircraft.

DISASSEMBLY

4. Disassemble the wheel assembly

SAFETY WARNING: WEAR THE APPROPRIATE PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

SAFETY WARNING: FULLY DEFLATE THE TIRE BEFORE REMOVING THE VALVE CORE. THE AIR IN A TIRE PUTS PRESSURE ON THE VALVE CORE. THE VALVE CORE CAN EJECT WITH GREAT FORCE AND CAN CAUSE INJURY OR DEATH.

SAFETY WARNING: DO NOT DISASSEMBLE THE WHEEL UNTIL THE TIRE IS COMPLETELY DEFLATED. SERIOUS INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN RESULT.

NOTE: The bearing cups (25) are press-fit into both hub ends of the outboard wheel half subassembly (20) Removal is based on the following conditions or requirements:

- For replacement due to damage.
- For a more thorough inspection of the wheel half, e.g. liquid penetrant inspection or user defined eddy current inspection and acceptance criteria.

Refer to the REPAIR section for removal/installation instructions.

NOTE: Do not remove the threaded inserts (10) from the inboard wheel half or threaded inserts (30) from the outboard wheel half unless damaged or for loss of locking feature. Refer to the REPAIR section for replacement instructions.

A. Remove air from the tire by depressing the valve stem plunger in the inflation valve (85) until air can no longer be heard escaping from the tire.

B. When all the tire pressure is released, then carefully remove the valve core from the valve stem.

CAUTION: INFLATION VALVE REMOVAL IS REQUIRED TO ENSURE TIRE DEFLATION.

C. Unthread and remove the inflation valve (85). Remove and discard the preformed packing (90).

D. Unthread and remove the rupture disc (105). Remove and discard the preformed packing (110).

E. Unthread and remove the three fusible plugs (115). Remove and discard the preformed packing (120).

DISASSEMBLY

CAUTION: BE CAREFUL NOT TO DAMAGE THE RETAINING RING GROOVE OR WHEEL BORE DURING REMOVAL OF THE RETAINING RING (50).

F. Refer to Figure 3001. Use a flat blade screwdriver to remove the retaining rings (50) from the outboard wheel half. There is one retaining ring on each hub end of the wheel half. Then, remove the grease seals (45) and bearing cones (40).

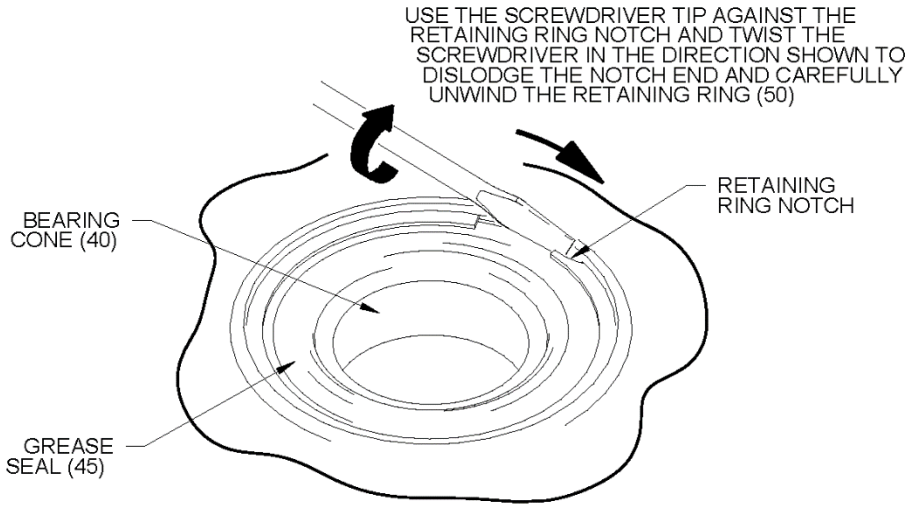


Figure 3001 Remove the retaining ring (50)

G. Apply a mild dish soap and water solution around the tire bead and wheel flange to help loosen the tire from the bead seat.

CAUTION: DO NOT USE TIRE IRONS OR SCREWDRIVERS TO PULL THE TIRE AWAY FROM THE WHEEL. SHARP METAL TOOLS WILL DAMAGE THE SURFACES OF THE WHEEL.

H. Use a tire bead breaker and separate the tire beads from both wheel flanges. Apply pressure evenly around the entire sidewall as close to the tire beads as possible.

CAUTION: DO NOT USE AN IMPACT WRENCH OR A POWER WRENCH TO REMOVE THE WHEEL NUTS AND BOLTS. THESE TOOLS CAN DAMAGE THE NUTS AND BOLTS.

I. Remove the nuts (65), bolts (55), and washers (60).

J. Separate the wheel halves and remove the tire.

K. Remove and discard the preformed packing (70).

L. If the drive keys (75) are very worn or damaged, remove the drive keys. Drive keys should also be removed for a more detailed inspection of the inboard wheel half. Screws (80) attach the drive keys.

M. If a heat shield (95) is damaged or a more detailed inspection of the inboard wheel half is required, then remove as follows:

(1) Remove the drive key screws (80) and drive keys (75).

(2) Carefully pry each end of the heat shield. Pry until the end tangs are away from the drive lugs.

CLEANING

1. General

Refer to IPL Figure 1 for component identification.

A. Equipment and consumables

The term “Commercial Source” lets the repair facility get the product from a supplier of choice.

NOTE: Unless specified differently, equivalent alternatives can be used for the items listed.

Table 4001 Equipment and consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Blast stripping equipment for plastic blast media	Plastic media: MIL-P-85891, Type II or V, Grade 20/30, 3.5 MOH max.	U.S. Technology Corp.
Air supply	30 psig maximum	Commercial
Clean cloths	Lint free	Commercial
Brushes	Nonmetallic soft and stiff bristle	Commercial
Stoddard solvent	Type 1 per MIL-PRF-680	Commercial
Cleaner/degreaser	Alkaline based	Commercial
Soap solution	Mild dishwashing liquid	Commercial
Mineral spirits	Commercial source	Commercial

SAFETY WARNING: WEAR THE APPROPRIATE PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

SAFETY WARNING: USE NO MORE THAN 30 PSIG AIR PRESSURE WHEN USING AIR TO DRY PARTS. EYE PROTECTION IS NECESSARY. EYE INJURY FROM DIRT PARTICLES OR SOLVENT SPRAY IS POSSIBLE WHEN COMPRESSED AIR IS USED.

2. Clean the hardware

The hardware is made from steel: (50), (55), (60), (65), (75), (80), (85), (95), (105), or brass (115).

SAFETY WARNING: FOLLOW THE MANUFACTURER’S INSTRUCTIONS AND REFER TO THE MATERIAL DATA SAFETY SHEET FOR SAFETY INSTRUCTIONS.

CAUTION: REMOVE THE HEAT SHIELD BUMPERS (100) BEFORE CLEANING THE HEAT SHIELD (95).

A. Use an alkaline based degreasing solution or Stoddard Solvent (per MIL-PRF-680) and a nonmetal soft bristle brush to remove any hardened dirt or grease deposits.

B. Rinse in clean water and dry thoroughly.

CLEANING

CAUTION: CLEAN THE BEARING CUPS (25) AND CONES (40) CAREFULLY IN A SEPARATE CONTAINER OF CLEAN SOLVENT TO AVOID CONTAMINATION.

CAUTION: DO NOT USE COMPRESSED AIR TO DRY BEARING CONES. SPINNING CAN RESULT IN DAMAGE TO THE BEARINGS. LET THEM AIR DRY.

C. Clean bearing cups (25) and cones (40) in a separate container of mineral spirits. Use a nonmetal soft bristle brush to remove all deposits of dirt, grease, and other contamination, then dry thoroughly.

NOTE: Repack bearing cones with clean grease in accordance with ASSEMBLY section.

3. Clean the grease seals (45) and heat shield bumpers (100)

The grease seals have a bonded nitrile material on a metal ring. Wipe the seals and heat shield bumpers with a clean soft cloth dampened in a mild soap and water solution, then dry thoroughly.

4. Clean the wheel halves

The wheel halves are made from aluminum alloy.

SAFETY WARNING: FOLLOW THE MANUFACTURER'S INSTRUCTIONS AND REFER TO THE MATERIAL DATA SAFETY SHEET FOR SAFETY INSTRUCTIONS.

A. Use an alkaline based degreasing solution and a nonmetal soft bristle brush to remove any hardened dirt or grease deposits.

B. Rinse in clean water and dry thoroughly.

C. Remove the protective coatings (primer and topcoat).

CAUTION: IN ADDITION TO REMOVING THE COATING, THE PLASTIC MEDIA WILL ALSO REMOVE ANY NAMEPLATES (15), (35), (125) THAT ARE ATTACHED. A NAMEPLATE THAT IS DAMAGED OR REMOVED DURING THE PLASTIC MEDIA PROCESS WILL REQUIRE REPLACEMENT. REFER TO IPL FIGURE 1 FOR THE NAMEPLATE PART NUMBER.

NOTE: Removal of the protective coating is necessary when doing the liquid penetrant inspection.

NOTE: To achieve best results, always refer to the manufacturer's instructions for use and disposal of blast media.

(1) Part must be clean. This will remove dirt and other deposits that can contaminate the blast media.

(2) Blast the part per MIL-STD-1504 with plastic media.

CHECKS

1. General

Refer to IPL Figure 1 for component identification.

NOTE: All parts must be cleaned before examination. Refer to the CLEANING section.

NOTE: In addition to the general inspection, follow detailed inspection of applicable components.

A. Equipment and consumables

The term “Commercial Source” lets the repair facility get the product from a supplier of choice.

NOTE: Unless specified differently, equivalent alternatives can be used for the items listed.

Table 5001 Equipment and consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Inspection surface plate	Commercial source	Commercial
Magnifier	X10 Magnification	Commercial
Micrometers	Commercial source	Commercial
Vernier dial calipers	Commercial source.	Commercial
Magnetic particle inspection kit	ASTM E1444	Commercial
Liquid penetrant inspection kit	ASTM E1417 Type 1, method A, sensitivity level 2	Commercial
Air test fixture for (85), (105), (115)	Figure 9007	Fabrication
Hardness tester for (5), (20)	Commercial source	Commercial

CHECKS

SAFETY WARNING: THIS ASSEMBLY CONTAINS PARTS THAT HAVE A CADMIUM PLATING FINISH: (55), (60), (65), (115). REMOVING THE CADMIUM PLATING CAN CREATE EXPOSURE TO CADMIUM DUST AND CADMIUM COMPOUNDS. THIS CAN BE A POTENTIAL HEALTH HAZARD.

SAFETY WARNING: WEAR THE APPROPRIATE PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

CAUTION: REPAIR OR REWORK OF PLATED HARDWARE INCLUDING STRIPPING AND RE-PLATING IS NOT ALLOWED. DO NOT STRIP PLATING MATERIAL TO INSPECT A BOLT. REMOVAL OF PLATING MATERIAL WILL CAUSE THE BOLTS TO CORRODE.

2. General inspection

NOTE: Replace hardware that has damage to any protective coating, such as cad plate.

A. Examine visible surfaces of the following for corrosion, distortion, wear, burrs, pitting, nicks, cracks, chips, or other visible signs of damage: (5), (20), (25), (40), (45), (50), (55), (60), (65), (75), (80), (85), (95), (105), (115).

(1) Examine parts with sealing surfaces and grooves. Damage to the sealing surfaces could damage preformed packings during installation.

(2) Examine parts with threads for damage to threaded areas.

3. Examine the bolts (55) and nuts (65)

SAFETY WARNING: FOLLOW THE MANUFACTURER'S INSTRUCTIONS FOR USE AND REFER TO THE MATERIAL DATA SAFETY SHEET FOR SAFETY INSTRUCTIONS.

NOTE: If a bolt or nut needs to be replaced, then replace all of the bolts and nuts at the same time.

A. In accordance with the maintenance schedule (Table 1, DESCRIPTION AND OPERATION): use magnetic particle inspection (ASTM E1444) or user defined eddy current inspection and acceptance methods to examine the bolts for cracks in the radius under the bolt head and in the threaded area next to the bolt shank.

B. Examine the nuts for damage to the self-locking feature. If the nut can be turned onto the bolt by hand, past the nut's self-locking section or the nut cannot be tightened to the required torque value, then replace.

4. Examine the heat shield bumpers (100)

A. Examine and replace any bumper that shows signs of heat discoloration and/or cracking.

5. Examine the grease seals (45)

A. Examine the elastomer to metal bond. Replace the seal if there is a tear in the elastomer to metal bond or if the elastomer shows signs of damage.

CHECKS

6. Examine the drive keys (75) and screws (80)

A. Examine the drive keys for cracks, battering, or excessive corrosion. Refer to Figure 5001 and measure the width of the key. The width must not exceed the minimum dimension shown. Replace the drive key if conditions exceed the limit or the key is damaged or corroded.

B. If drive keys are replaced, examine the screws for corrosion, distortion or damage to the driving form and the screw threads.

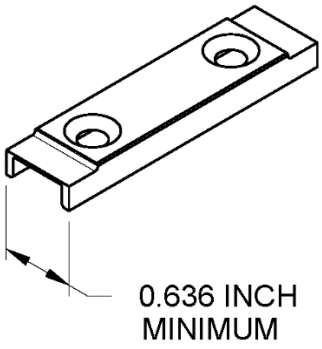


Figure 5001 Drive key inspection

7. Examine the bearing cups (25) and cones (40)

The bearing cups are press-fit into both hub ends of the outboard wheel half (20) Refer to the REPAIR section for removal/installation instructions.

NOTE: [1] Refer to the bearing manufacturer's brochure/manual for detailed information.

NOTE: Replace bearing cups and cones as a matched set. It is recommended that both inboard and outboard sets of cups and cones be replaced at the same time.

A. Examine the cups in the wheel half for loose fit, wear, corrosion, spalling, brinelling, nicks, scratches, water staining, pitting, and heat discoloration.

B. Examine the roller surfaces of the bearing cones for wear, corrosion, spalling, pitting and heat discoloration.

C. Examine the bearing cone cage for dents or distortion. Examine the roller pocket sides, corners, and ends for wear.

[1] How to Recognize and Prevent Tapered Roller Bearing Damage available from Timken Company, Canton, Ohio 44706 U.S.A.

CHECKS

8. Examine the inflation valve (85), rupture disc (105), and fusible plugs (115)

A. Visually examine for stripped or scored threads. Examine the sealing surfaces and preformed packing grooves for burrs, corrosion, or other damage that could damage the preformed packing (90), (110), or (120). If required, check for leaks using the fixture shown in Figure 5002 and the following procedure:

(1) Install component (with corresponding preformed packing) in the fixture. Tighten each component to torque listed below.

NOTE: The term dry torque refers to the torqueing of hardware without the application of anti-seize.

- Inflation valve (85): 40 to 50 in-lb dry torque
- Rupture disc (105): 50 to 60 in-lb dry torque
- Fusible plugs (115): 50 to 60 in-lb dry torque

(2) Connect an air hose to fixture inlet and pressurize to 75 to 95 psig.

(3) Apply a soapy water solution to the components and looks for bubbles for two minutes.

(4) Replace all components that leak or are damaged.

B. Examine the fusible plugs (115) for melting of the fusible material. Replace fusible plugs that show evidence of melting. This is indicated by the loss of the fusible alloy or by irregular openings in the fusible alloy at either end of the plug. If one plug shows evidence of melting, replace all the plugs.

NOTE: Refer to procedure for overheated wheels if the fusible plugs have blown or melted.

C. Examine and replace the rupture disc (105) for loss of the inlet body (disc material).

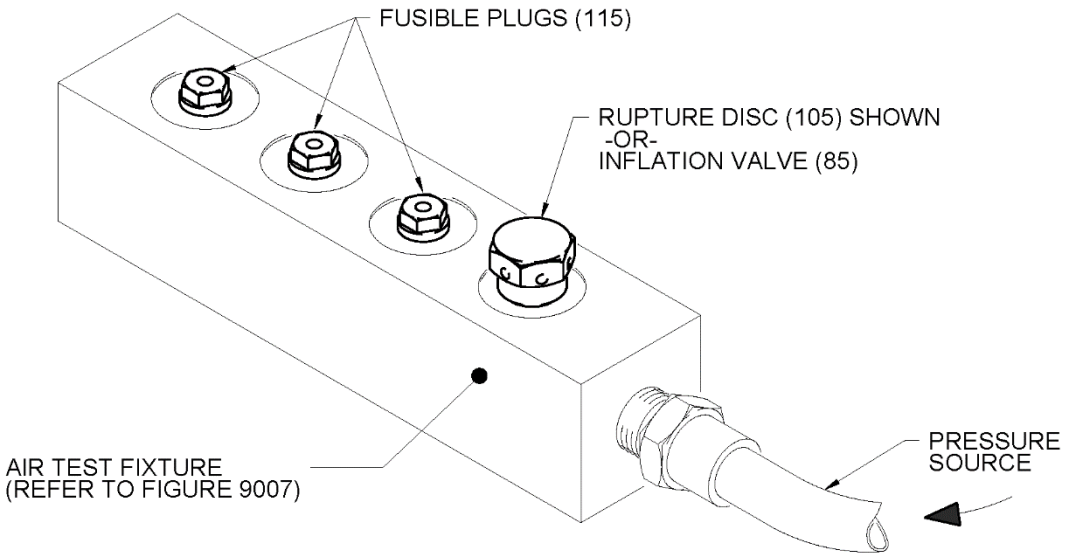


Figure 5002 Leakage test – inflation valve, rupture disc, fusible plugs

CHECKS

9. Examine the wheel halves

NOTE: Replace bearing cups and cones as a set. The outboard wheel half subassembly (20) includes installed bearing cups. If replacing the outboard wheel half subassembly (5), replace both bearing cones.

NOTE: Replace wheel half subassemblies as a set. If one wheel half subassembly requires replacement, then replace both wheel half subassemblies.

A. Examine the exterior surface for missing paint.

B. Examine the wheel halves for surface cracks, nicks, corrosion, or other damage.

NOTE: Look closely at the tire bead seat area for corrosion.

C. Examine the inboard and outboard wheel half register grooves. Examine for burrs, corrosion, or other raised edges that could damage the preformed packing (70) during installation or prevent an effective seal during operation.

D. Examine the inboard wheel half for the following:

(1) The three fusible plug (115) bosses for corrosion, burrs, or other raised edges that could damage the preformed packing (120) during installation or prevent an effective seal during operation.

(2) The rupture disc (105) boss for corrosion, burrs, or other raised edges that could damage the preformed packing (110) during installation or prevent an effective seal during operation.

(3) The inflation valve (85) boss for corrosion, burrs, or other raised edges that could damage the preformed packing (90) during installation or prevent an effective seal during operation.

(4) If drive keys screws (80) cannot be tightened, check the threaded inserts (10) for loss of self-locking feature or if inserts are backing out. Replace damaged inserts per the REPAIR section.

E. Examine the outboard wheel half for the following:

(1) The outboard wheel half has threaded inserts (30) in the the hub for attaching optional mating components. Replace damaged inserts per the REPAIR section.

- If component attachment fasteners cannot be tightened, check the threaded inserts for loss of self-locking feature.
- Check that inserts have not backed out.

CHECKS

SAFETY WARNING: FOLLOW THE MANUFACTURER'S INSTRUCTIONS AND REFER TO THE MATERIAL DATA SAFETY SHEET FOR SAFETY INSTRUCTIONS.

F. In accordance with the maintenance schedule (Table 1, DESCRIPTION AND OPERATION), examine the wheel halves for cracks using liquid penetrant inspection (ASTM E1417, Type 1, Method A, Sensitivity Level 2; acceptance criteria per MIL-STD-1907, Grade B) or user defined eddy current inspection and acceptance method.

(1) Refer to Figure 5003 and visually inspect wheel halves for surface cracks, nicks, corrosion or other damage. Examine these areas carefully to determine if the wheel is serviceable. If cracks are found in either wheel half, then replace both wheel half subassemblies.

NOTE: The protective coatings (primer and topcoat) must be removed from the part and the part must be clean before using liquid penetrant inspection methods. Refer to the CLEANING section for paint removal and cleaning instructions.

- Examine the tire bead seat area. The tire bead seat area is typically an area of stress concentration and possibly subjected to trauma from tire beads and tools used to remove tires.
- Examine the bolt bosses.
- Examine the fusible plugs, rupture disc and inflation valve areas on the inboard wheel half.
- Examine the areas between the weight reduction cutouts on the outboard wheel half.

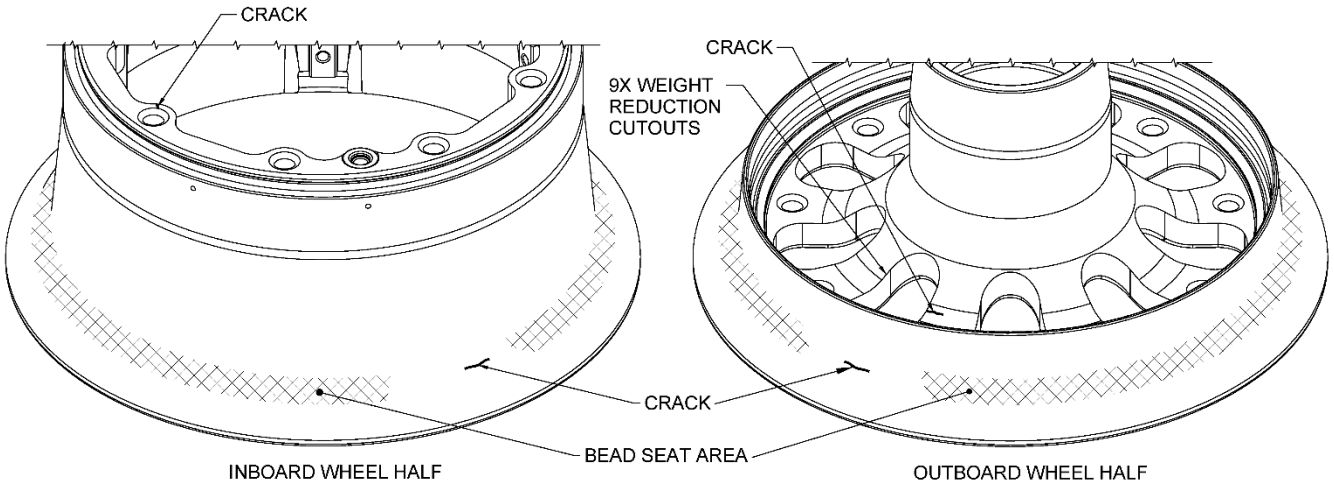


Figure 5003 Wheel half inspection

CHECKS

10. Procedure for overheated wheels

Indication of overheating: One of the three fusible plugs (115) releases the tire pneumatic pressure.

A Perform the following hardness check on the inboard wheel half and the outboard wheel half.

NOTE: To obtain an accurate reading, remove paint from the test areas (where the hardness ball will actually contact the surface). Use 400 grit or finer wet or dry aluminum oxide cloth. Refer to the REPAIR section for repaint instructions.

(1) Perform a hardness test in the area shown in Figure 5004. Obtain a minimum of three hardness readings, equally spaced. If any reading is below the limit specified in Table 5002 for either wheel half, then replace both wheel half subassemblies.

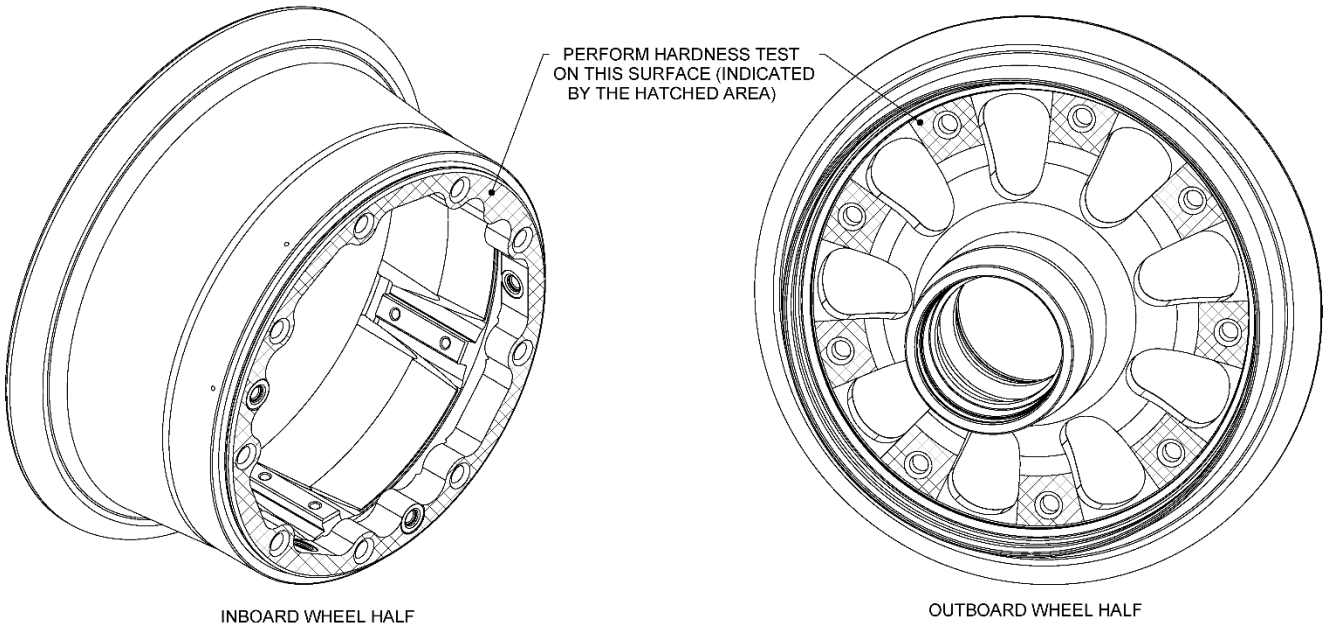


Figure 5004 Hardness test

Table 5002 Hardness test readings

ITEM	BRINELL TEST
BALL DIAMETER	10 mm
TEST LOAD	500 kg.
MINIMUM NUMBER OF READINGS (EQUALLY SPACED)	3
ACCEPTABLE MINIMUM AVERAGE HARDNESS	135 Bhn

REPAIR

1. General

Refer to IPL Figure 1 for component identification.

A. Equipment and consumables

The term “Commercial Source” lets the repair facility get the product from a supplier of choice.

NOTE: Unless specified differently, equivalent alternatives can be used for the items listed.

Table 6001 Equipment and consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Aluminum oxide cloth	400 to 600 grade or finer, wet or dry	Commercial
Surface treatment for (5), (20)	Alodine 1200 or equivalent MIL-C-5541, Class 1A	Commercial
Paint application equipment	Commercial source	Commercial
Protective coatings for (5), (20)	Refer to Table 6002	Deft Chemical Coatings
Threaded insert tools for (10), (30)	MIL-T-21209 1227-6 (extraction) 7552-3 (installation) 3695-3 (tang removal)	Emhart Fastening Teknologies
Tools for bearing cups (25)		
Inner and outer hub tools	Figures 9001, 9002, 9003, 9004, 9005, 9006	Fabrication
Heat source methods for wheel halves	Range capacity: up to 200°F: • Infrared lamp • Continuous run temperature chamber • Temperature control LOCALIZED thermal A/C Cover (TACCO) • Induction heating system	Commercial
Refrigeration source methods for cups (25)	Range capacity: -25°F to -65°F: • Subzero freezer • Dry ice	Commercial
Primer	MIL-PRF-23377, Type 1, Class C2	Commercial
Arbor press	Commercial source	Commercial
Feeler gauge	0.002 inch	Commercial

REPAIR

SAFETY WARNING: THIS ASSEMBLY CONTAINS PARTS THAT HAVE A CADMIUM PLATING FINISH: (55), (60), (65), (115). REMOVING THE CADMIUM PLATING CAN CREATE EXPOSURE TO CADMIUM DUST AND CADMIUM COMPOUNDS. THIS CAN BE A POTENTIAL HEALTH HAZARD.

CAUTION: DO NOT USE ABRASIVES CONTAINING IRON OR COPPER (STEEL WOOL, IRON OXIDE, BRASS OR STEEL WIRE). IRON OR COPPER PARTICLES WILL BECOME EMBEDDED IN THE ALUMINUM COMPONENTS AND WILL CAUSE CORROSION.

CAUTION: REPAIR IS LIMITED TO THE PARTS LISTED IN THIS SECTION. THE FOLLOWING ITEMS ARE NOT REPAIRABLE AND MUST BE REPLACED IF WORN OR DAMAGED:

- HARDWARE: (10), (25), (30), (40), (50), (55), (60), (65), (75), (80), (85), (105), (115), (95)
- COMPONENTS THAT CONTAIN ELASTOMERS: (45), (100)

CAUTION: THE FOLLOWING ITEMS ARE NOT PROCURABLE. ORDER THE NEXT HIGHER ASSEMBLY IF ITEM CANNOT BE REPAIRED:

- INBOARD WHEEL HALF. MUST ORDER ITEM (5).
- OUTBOARD WHEEL HALF. MUST ORDER ITEM (20).

2. Repair and paint the wheel halves

The wheel halves are made from an aluminum alloy. Repair is limited to the following.

SAFETY WARNING: WEAR THE APPROPRIATE PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

A. External surface damage repair.

(1) Blend out small nicks, burrs, scratches, and light corrosion.

B. Clean the wheel halves. Refer to the CLEANING section.

SAFETY WARNING: FOLLOW THE MANUFACTURER'S INSTRUCTIONS AND REFER TO THE MATERIAL DATA SAFETY SHEET FOR SAFETY INSTRUCTIONS.

C. Apply a surface treatment (Alodine 1200 or equivalent) to repaired areas.

REPAIR

D. Paint the wheel halves

SAFETY WARNING: FOLLOW THE MANUFACTURER'S INSTRUCTIONS AND REFER TO THE MATERIAL DATA SAFETY SHEET FOR SAFETY INSTRUCTIONS.

(1) For small area paint touchup.

(a) Prepare the area by sanding lightly with 400 to 600 grade or finer, wet or dry aluminum oxide cloth and feather out all edges of the adjacent area.

(b) Clean the area.

(c) Touch up the area with primer and topcoat.

(2) For complete primer and topcoat application:

NOTE: Performed if primer and topcoat was removed from entire part by plastic media blasting.

(a) Confirm that the part has been cleaned and surface treatment applied if repair work was performed.

(b) Mask the wheel halves. Refer to Figures 6001 and 6002.

(c) Apply the primer and the topcoat. Refer to Table 6002.

NOTE: Results can vary and depend on the environment and the equipment used. To achieve the best results, always refer to the manufacturer's instructions for mixing, application and use.

Table 6002 Wheel halves primer and topcoat specifications

MANUFACTURER	PRIMER	TOPCOAT
Deft Chemical Coatings Irvine, CA	P/N 44-GN-36, Components A and B MIL-PRF-85582C, Type 1, Class C2	P/N 03-W-127A, Components A and B MIL-PRF-85285D, Type 1 Color 17925 (Untinted White)
	Primer Thickness [1]: 0.0006-0.0009 inch Drying Time (air dry) [2]: Touch, mask, topcoat: 1 hour minimum Stack: 4 to 6 hours Hard cure: 14 days minimum	Topcoat Thickness [1]: 0.0017-0.0023 inch Drying Time (air dry) [2]: Recoat: 15 minutes minimum Stack: 4 to 8 hours Hard cure: 7 days minimum

[1] The total dry film thickness of the primer and topcoat to be 0.0023 to 0.0032 inch. This excludes the anodic coating thickness.

[2] Refer to the manufacturer's data sheet for the forced dry (heat accelerated cure) schedule.

REPAIR

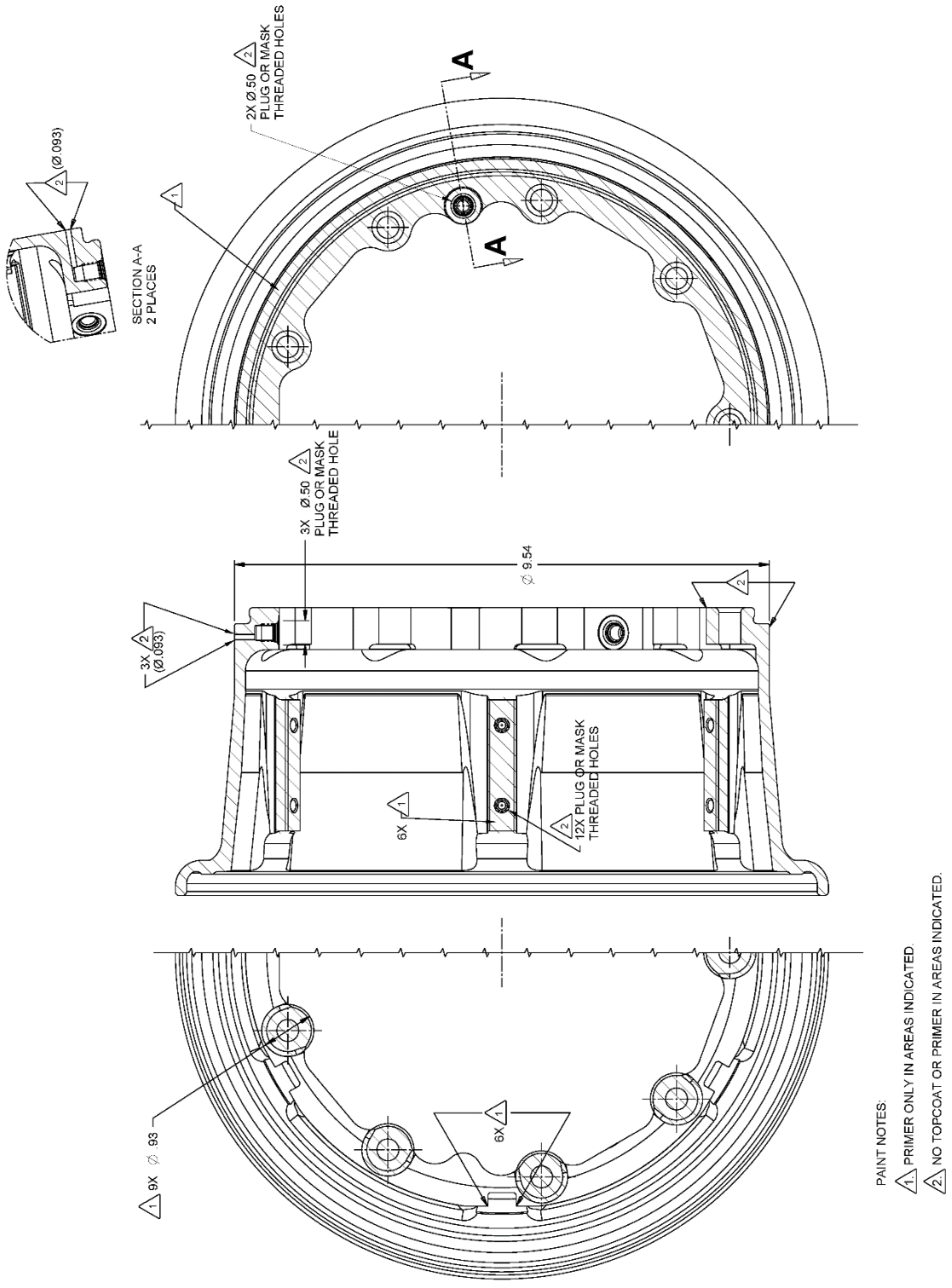


Figure 6001 Mask the inboard wheel half

REPAIR

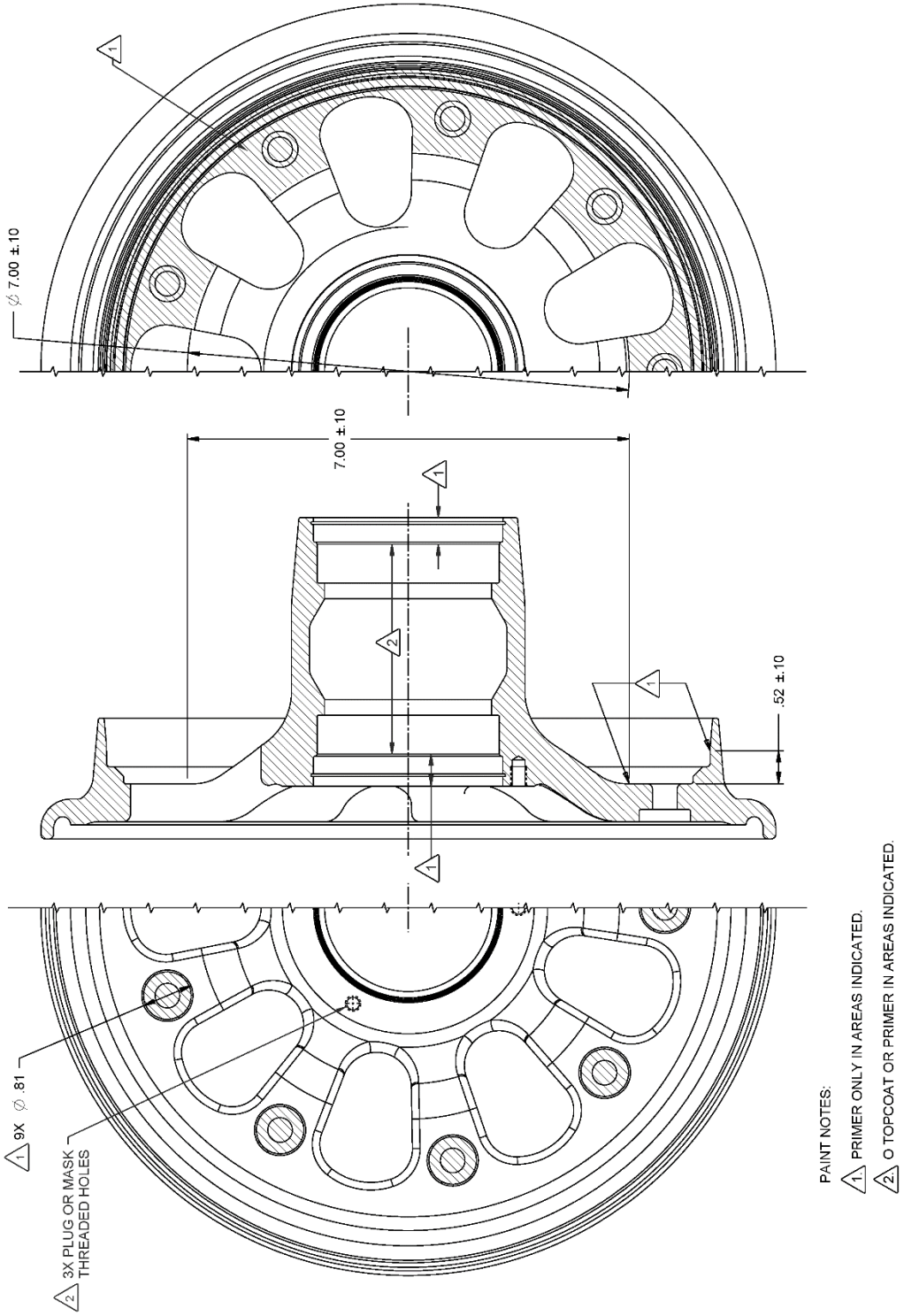


Figure 6002 Mask the outboard wheel half

REPAIR

3. Replace the bearing cups (25)

SAFETY WARNING: WEAR THE APPROPRIATE PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

CAUTION: BEARING CUPS AND CONES MUST BE REPLACED AS A SET. WHEN REPLACING BEARING CUPS, ALSO REPLACE THE BEARING CONES. REPLACE BOTH SETS OF CUPS AND CONES AT THE SAME TIME.

CAUTION: REMOVE THE INFLATION VALVE (85), RUPTURE DISC (105), AND FUSIBLE PLUGS (115) BEFORE HEATING THE INBOARD WHEEL HALF.

CAUTION: WORK SWIFTLY. THERMAL EXPANSION AND CONTRACTION OF PARTS WILL AFFECT THE INSTALLATION PROCESS.

CAUTION: DURING BEARING CUP REMOVAL AND INSTALLATION, SUPPORT THE WHEEL HALF ON THE HUB, NOT ON THE FLANGE. SUPPORTING THE WHEEL HALF ON THE FLANGE CAN DAMAGE THE FLANGE.

CAUTION: AVOID RAISING BURRS IN THE WHEEL HALF BORE WHEN REMOVING AND INSTALLING THE BEARING CUP.

NOTE: [2] Refer to the bearing manufacturer's manual for damage allowances.

A. Removal

The bearing cups (25) are press-fit into both hub ends of the outboard wheel half. Instructions are included to remove a bearing cup from each hub end. It does not matter which bearing cup is removed first. Read the instructions completely before doing any work.

CAUTION: DO NOT HEAT THE WHEEL HALF ABOVE 200°F.

NOTE: As an option, the removal of the bearing cups can be made easier when the wheel half is heated to 175°F. See Table 6001 for a list of methods.

[2] How to Recognize and Prevent Tapered Roller Bearing Damage available from Timken Company, Canton, Ohio 44706 U.S.A.

REPAIR

(1) Refer to Figure 6003. The following procedure will remove a bearing cup from the outer hub end.

(a) If wheel half was heated, remove from the heat source.

(b) Thread the pilot guide pin into the support base. Tighten snug.

(c) Position the wheel half on the support base.

(d) Insert the push plate into the wheel hub, over the pilot guide pin and on the back face of the bearing cup.

(e) Position the push bar over the pilot guide pin and on top of the push plate.

(f) Use an arbor press to apply even pressure to the push bar until the bearing cup drops out of the hub.

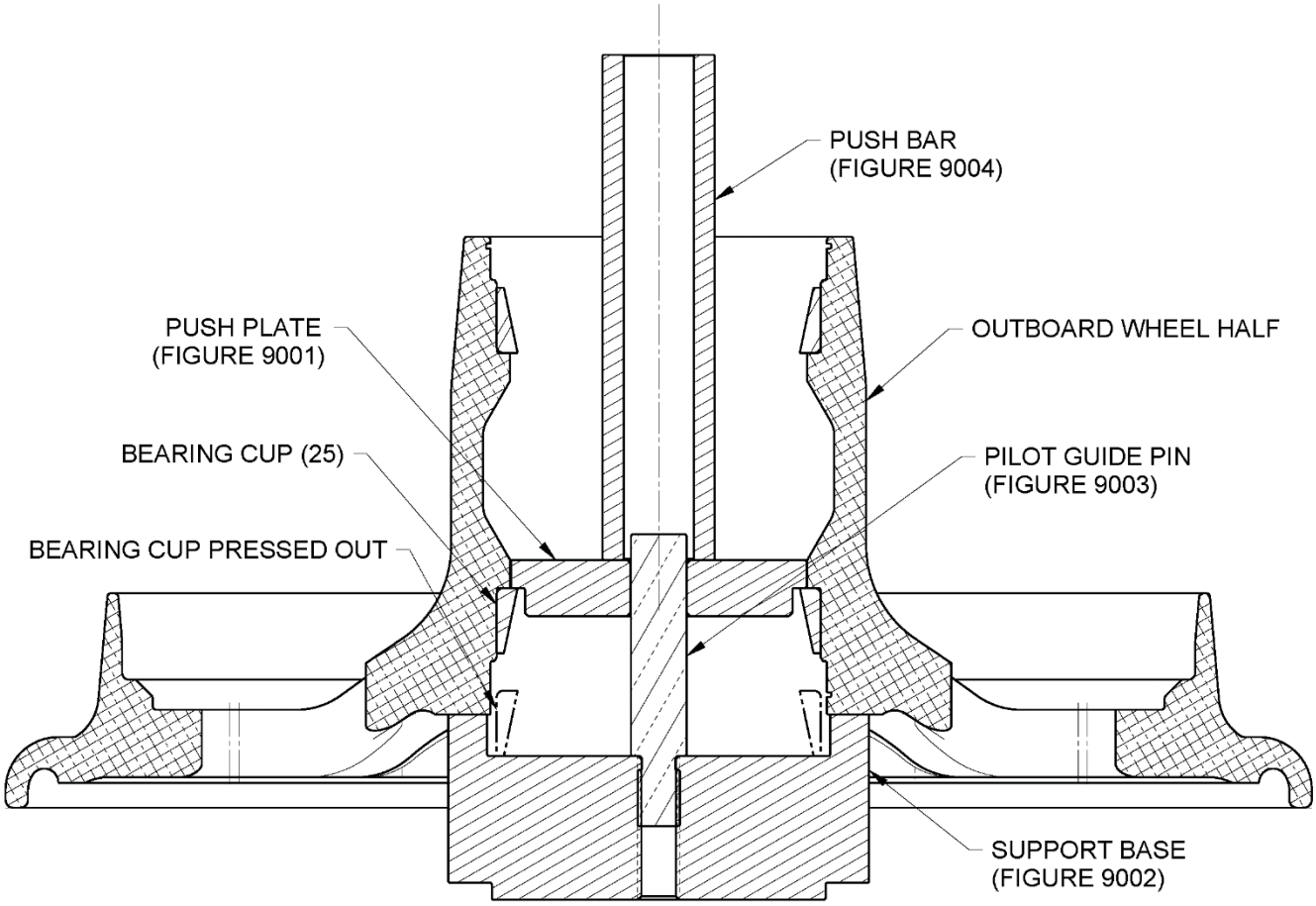


Figure 6003 Remove the bearing cup-outer hub end

REPAIR

(2) Refer to Figure 6004. The following procedure will remove a bearing cup from the inner hub end.

(a) If wheel half was heated, remove from the heat source.

(b) Thread the pilot guide pin into the support base. Tighten snug.

(c) Position the wheel half on the support base.

(d) Insert the push plate into the wheel hub, over the pilot guide pin and on the back face of the bearing cup.

(e) Position the push bar over the pilot guide pin and on top of the push plate.

(f) Use an arbor press to apply even pressure to the push bar until the bearing cup drops out of the hub.

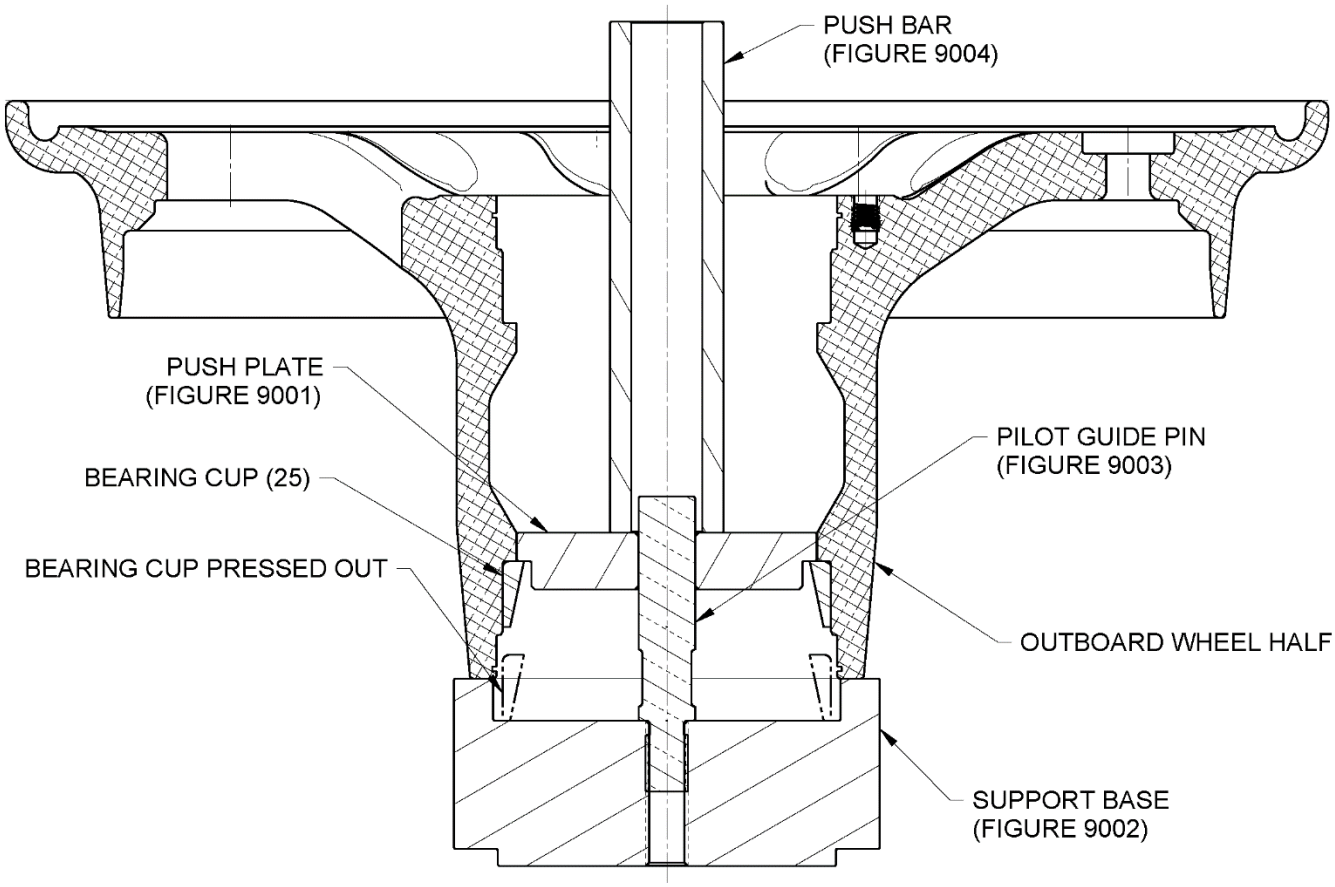


Figure 6004 Remove the bearing cup-inner hub end

REPAIR

B. Installation

The bearing cups (25) are press-fit into both the inner and outer hub ends of the outboard wheel half. Instructions are included to install a bearing cup into each hub end. It does not matter which bearing cup is installed first. Read the instructions completely before doing any work.

CAUTION: THE FOLLOWING PROCEDURE SHOULD BE ACCOMPLISHED QUICKLY WITH SPECIAL ATTENTION GIVEN TO ALIGNMENT OF PARTS. THIS PROCEDURE SHOULD NOT BE DELAYED AS THE PRIMER WILL BEGIN TO CURE IN THE BORE AND LOSE IT'S LUBRICITY.

CAUTION: DO NOT LET THE PRIMER COATING DRY BEFORE INSTALLING THE BEARING CUP.

CAUTION: AVOID COCKING THE CUP DURING INSTALLATION.

CAUTION: DO NOT CHILL THE BEARING CUP BELOW -65°F

NOTE: The installation of a bearing cup is made easier when the bearing cup is chilled to between -25° to -65°F, 4 hours chill time is recommended. See Table 6001 for a list of refrigeration methods.

(1) Refer to Figure 6005. The following procedure will install a bearing cup into the inner hub end.

(a) Make sure that the bearing bore and the bearing cup are clean and free of burrs.

(b) Remove the bearing cup from the refrigeration source and wipe off any condensation.

(c) Brush a light wet coat of the MIL-PRF-23377, Type 1, Class C2 primer into the bearing bore. This will help prevent corrosion.

(d) Position the wheel half on the support base and align the bearing cup over the bore.

(e) Position the push plate on the front face of the bearing cup.

(f) Insert the push bar into the push plate hole.

(g) Use an arbor press to apply even pressure to the cup press. Make sure that the back face of the bearing cup is flush against the surface (shoulder) of the bearing bore.

(h) Check for proper seating of the cup against the housing shoulder. Try to insert a 0.002 inch feeler gauge between the back surface of the bearing cup and the bore shoulder.

1 The feeler gauge must not be able to be inserted at any location between the back surface of the cup and the bearing bore shoulder.

(i) Remove excess primer with a clean shop towel so that a fillet of not more than 0.08 inch wide extends beyond the cup.

(j) Apply a light coat of bearing grease to the I.D. of the bearing cups to prevent corrosion.

REPAIR

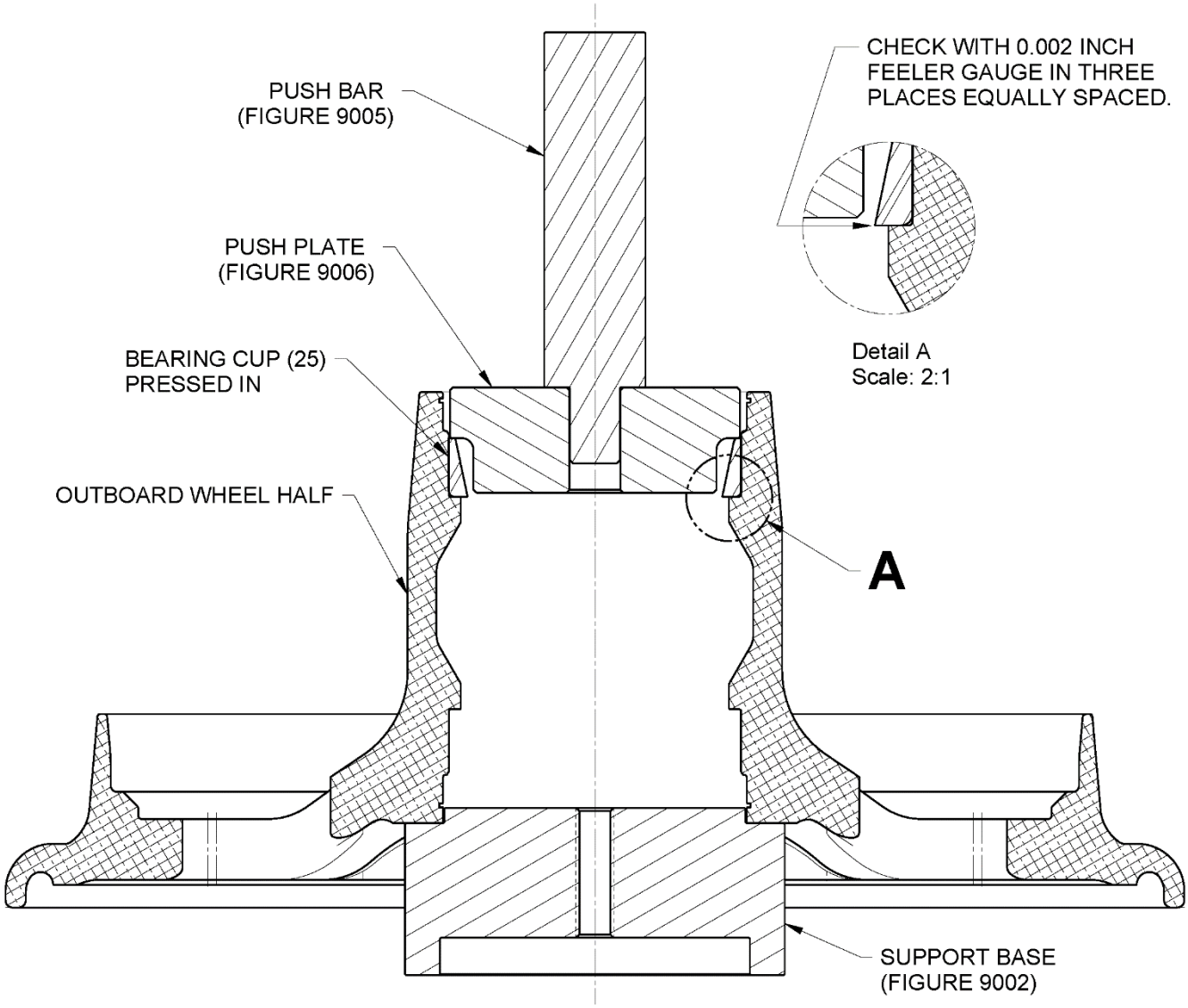


Figure 6005 Install the bearing cup-inner hub end

(2) Refer to Figure 6006. The following instructions will install a bearing cup into the outer hub end.

(a) Make sure that the bearing bore and the bearing cup are clean and free of burrs.

(b) Remove the bearing cup from the refrigeration source and wipe off any condensation.

(c) Brush a light wet coat of the MIL-PRF-23377, Type 1, Class C2 primer into the bearing bore. This will help prevent corrosion.

(d) Position the wheel half on the support base and align the bearing cup over the bore.

(e) Position the push plate on the front face of the bearing cup.

REPAIR

(f) Insert the push bar into the push plate hole.

(g) Use an arbor press to apply even pressure to the cup press. Make sure that the back face of the bearing cup is flush against the surface (shoulder) of the bearing bore.

(h) Check for proper seating of the cup against the housing shoulder. Try to insert a 0.002 inch feeler gauge between the back surface of the bearing cup and the bore shoulder.

1 The feeler gauge must not be able to be inserted at any location between the back surface of the cup and the bearing bore shoulder.

(i) Remove excess primer with a clean shop towel so that a fillet of not more than 0.08 inch wide extends beyond the cup.

(j) Apply a light coat of bearing grease to the I.D. of the bearing cups to prevent corrosion.

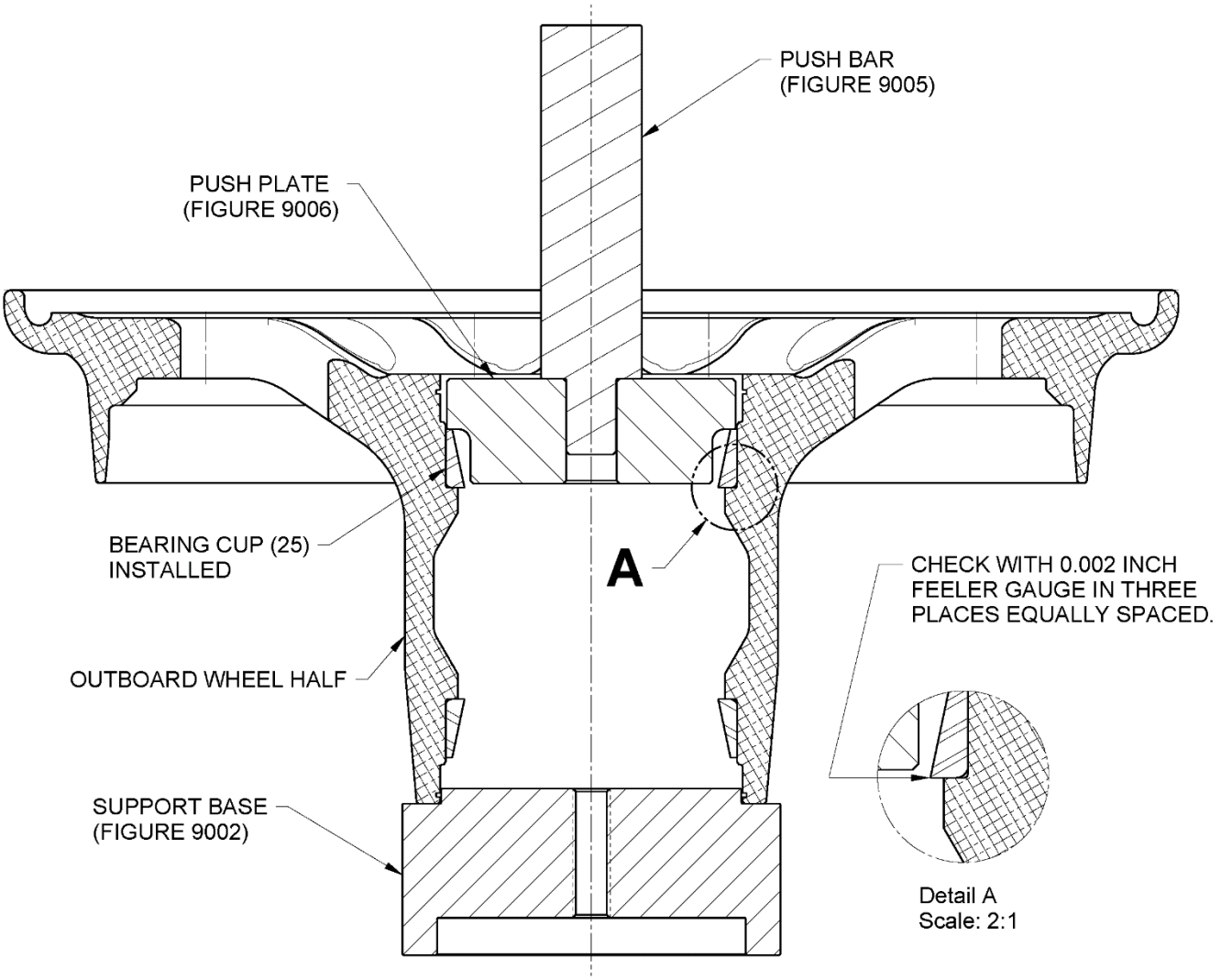


Figure 6006 Install the bearing cup-outer hub end

REPAIR

4. Replace wheel half inserts (10) and (30)

SAFETY WARNING: WEAR THE APPROPRIATE PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

A. Removal

Refer to Figure 6007 and use the following procedure.

(1) Remove damaged inserts by applying the extracting tool to the insert, striking the head of the tool a light blow and turning it counterclockwise, maintaining steady downward pressure.

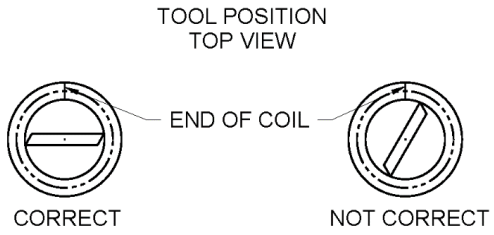


Figure 6007 Use the extracting tool

B. Installation

Refer to Figure 6008.

(1) Use the installation tool and install the inserts into the applicable wheel half so that the top coil is a minimum of 0.093 inch below the wheel surface. Break off the tang.

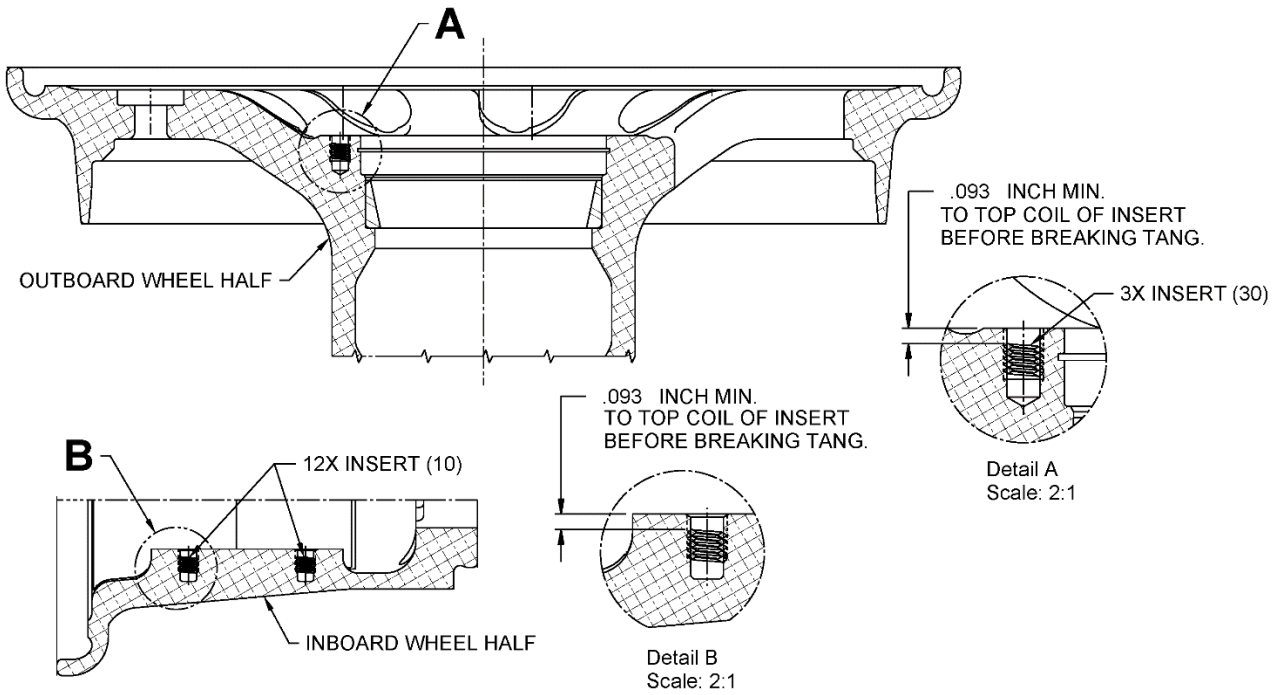


Figure 6008 Install the threaded insert

ASSEMBLY

1. General

Refer to IPL Figure 1 for component identification.

NOTE: The term dry torque refers to the torqueing of hardware without the application of anti-seize compound.

A. Equipment and consumables

The term “Commercial Source” lets the repair facility get the product from a supplier of choice.

NOTE: Unless specified differently, equivalent alternatives can be used for the items listed.

Table 7001 Equipment and consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Bearing grease	Mobil Aviation Grease SHC 100 (equivalent alternatives are not allowed)	ExxonMobil Oil Corporation
Preformed packing tool set	199-18	Aircraft Wheel and Brake, LLC
Standard tools (inch units)	Wrenches/sockets: • 12pt, external: for (55), (65) • Hex head, external: for (85), (105), (115) Torque wrench Tire pressure gage	Commercial
Torq-Set® driver bit for (80)	NASM33781	Phillips Screw Company
Anti-seize compound for (55), (60), (65)	MIL-PRF-83483 (equivalent alternatives are not allowed)	FEL-PRO Chemical Products
Tire inflation safety equipment	Commercial source	Commercial
Dry nitrogen	Commercial source	Commercial
Soap solution	Mild dishwashing liquid	Commercial
Clean cloths	Lint free	Commercial
Lubricant for (70), (90), (110), (120)	Dow Corning 55 Lube	Dow Corning Corporation

ASSEMBLY

B. Bearing cone grease packing procedure

The correct application of grease to the tapered roller bearing will reduce friction, dissipate heat and maintain a rust and corrosion proof coating on the operating surfaces of the roller bearings.

SAFETY WARNING: WEAR THE APPROPRIATE PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

NOTE: Packing the bearings with grease is best performed with the use of a mechanical lubricating fixture such as a bearing greaser.

(1) Make sure the bearing cones are clean. Refer to the CLEANING section.

(2) Push the grease up between the rollers, cone and cage. Make sure that all empty spaces inside the cone are filled (see Figure 7001). Make sure that a thick coat of grease is applied to the roller surfaces on the outside of the cone.

NOTE: Shaded area shows the recommended quantity of grease.

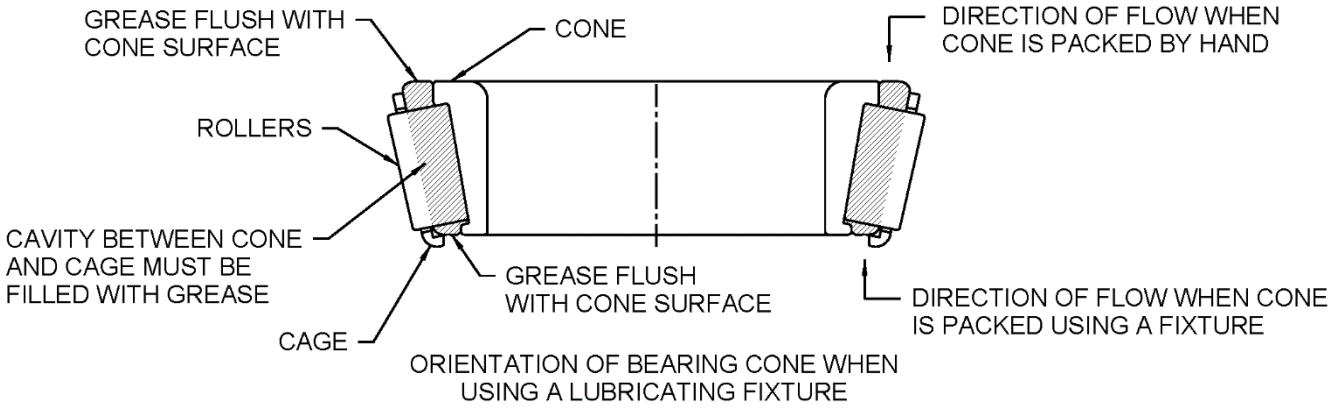


Figure 7001 Pack the bearing cones (40)

C. Wheel pre-assembly verification

(1) Verify that the bearing cups (25) have been installed in the outboard wheel half.

ASSEMBLY

(2) Refer to Figure 7002. Verify that the heat shield (95) and heat shield bumpers (100) are properly installed on the inboard wheel half.

(a) Position each heat shield between the drive key lugs with the heat shield tabs positioned on each end of a drive key lug.

NOTE: The drive keys (75) will keep the heat shields in place.

(3) Refer to Figure 7002. Verify that the drive keys (75) are properly installed on the inboard wheel half.

(a) Screws (80) fasten the drive keys to the inboard wheel half. Screw torque value is 35 to 45 in-lb dry torque.

NOTE: Requires Torq-Set® driver bit.

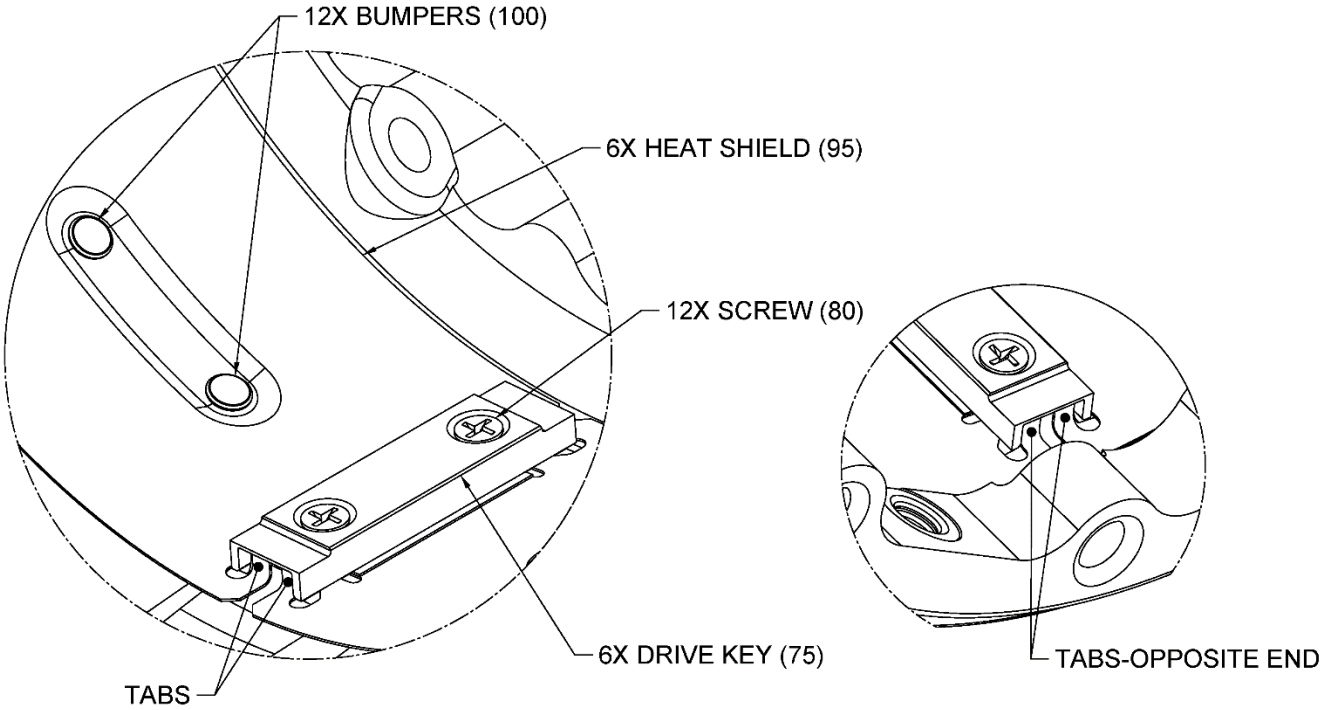


Figure 7002 Install the heat shields (95) and drive keys (75)

ASSEMBLY

2. Wheel and tire pre-assembly preparation

SAFETY WARNING: WEAR THE APPROPRIATE PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

A. Examine the bead seat area of the wheel halves. If necessary, remove dirt with a clean cloth moistened with a mild soap and water solution or with denatured alcohol.

B. The mating surfaces of the wheel halves should not have nicks, burrs, small dents, or other damage. Damaged mating surfaces can prevent the wheel halves from mating.

C. The preformed packing groove in each wheel half should be examined for damage or other debris that would prevent the packing (70) from properly seating. Remove any lubricant, grease or foreign material with a clean cloth moistened with a mild soap and water solution or with denatured alcohol.

D. Verify that the tire is clean inside. If it is not cean, then wipe the bead base with a clean cloth dampened with a mild dishwashing soap and water solution or a suitable rubber cleaner.

E. Install the inflation valve (85), rupture disc (105), and fusible plugs (115) in the inboard wheel half as follows.

NOTE: The inflation valve (85) and rupture disc assembly (105) ports are identical and interchangeable.

NOTE: The term dry torque refers to the torqueing of hardware without the application of anti-seize.

(1) Examine the preformed packings (90), (110), (120) for damage such as cuts, tears, cracking. Replace if necessary.

(2) Apply a light coat of Dow Corning 55 O-ring lube to the preformed packings (90), (110), (120).

(3) Install the preformed packing (90) on the inflation valve (85). Install the inflation valve and tighten to 40 to 50 in-lb dry torque.

(4) Install the preformed packing (110) on the rupture disc (105). Install the rupture disc and tighten to 50 to 60 in-lb dry torque.

(5) Install a preformed packing (120) on each of the three fusible plugs (115). Install the fusible plugs and tighten to 50 to 60 in-lb dry torque.

3. Mount the tire

SAFETY WARNING: WEAR THE APPROPRIATE PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

A. Position the inboard wheel half subassembly (5) with the register side facing up.

B. Examine the preformed packing (70) for damage such as cuts, tears, cracking. Replace if necessary.

CAUTION: THE PREFORMED PACKING (70) MUST BE INSTALLED UNIFORMLY. IT SHOULD BE FREE OF KINKS AND TWISTS.

(1) Apply a light coat of Dow Corning 55 O-ring lube to the preformed packing (70) and install the preformed packing carefully in the wheel register groove of the inboard wheel half without stretching or twisting.

C. Position the tire on the inboard wheel half being careful not to disturb the preformed packing (70).

D. Position the outboard wheel half subassembly (20) inside the tire and align the bolt holes of both wheel halves.

E. Align the red balance dot on the tire with the inflation valve (85).

(1) If there is no balance dot on the tire, then align the tire serial number with the inflation valve.

ASSEMBLY

4. Attach the wheel halves

SAFETY WARNING: WEAR THE APPROPRIATE PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

A. Prior to installing, lubricate the wheel half fasteners (55), (60), (65), with anti-seize compound, per MIL-PRF-83483.

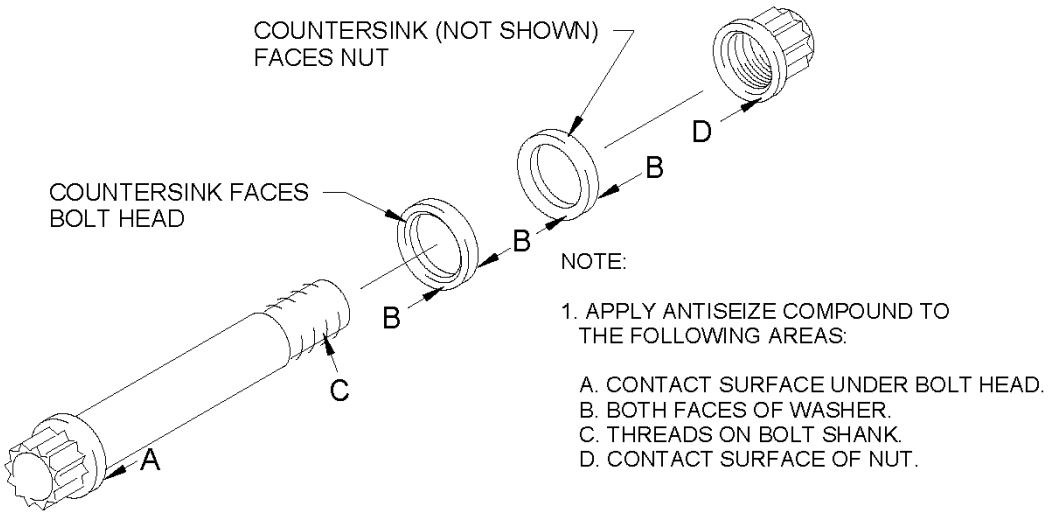


Figure 7003 Apply anti-seize compound

CAUTION: WASHER (60) IS INSTALLED WITH THE COUNTERSINK FACING THE BOLT HEAD AND NUT.

B. Slide a countersunk washer (60) onto each bolt (55). Make sure the countersink side of the washer is facing the bolt head.

C. Install at least three bolts (55) [with washer (60)] into the inboard wheel half side. Compress the wheel halves together and install one washer (60) and nut (65) onto each bolt. Make sure the countersink side of the washer is facing the nut.

NOTE: The nuts (65) must be located on the outboard wheel half side.

D. Install the remaining bolts (55), washers (60) and nuts (65). Run the nuts down by hand as far as possible.

CAUTION: DO NOT USE POWER TOOLS FOR THE INSTALLATION OF WHEEL FASTENERS. POWER TOOLS CAN CAUSE OVER TIGHTENING.

CAUTION: THE FASTENERS MUST BE TIGHTENED BY APPLYING THE TORQUE TO THE NUT (65) WHILE SECURING THE BOLT HEAD.

CAUTION: DO NOT DAMAGE THE PREFORMED PACKING (70) DURING THE TORQUING PROCEDURE.

E. Wheel nuts should first be snugged in a criss-cross pattern to seat the flange. Apply the final torque evenly in a criss-cross pattern using calibrated tools until all nuts are properly torqued. Final torque is 335 to 345 in-lb.

5. Test the wheel/tire assembly

A. Refer to the TESTING AND FAULT ISOLATION section.

ASSEMBLY

6. Final assembly of the wheel

After successfully completing the 24-hour pressure retention test, complete the remaining assembly procedures as follows.

SAFETY WARNING: WEAR THE APPROPRIATE PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

SAFETY WARNING: ALWAYS FOLLOW PROPER TIRE INFLATION SAFETY PRACTICES. SERVICE THE TIRE WITH INFLATION SAFETY EQUIPMENT DESIGNED FOR THIS OPERATION.

A. Apply a light coat of wheel bearing grease to the following:

NOTE: Make sure the bearing cones (40) have been packed with fresh, clean grease.

- Exposed surfaces of the bearing cups (25).
- The elastomer of the grease seals (45).

B. Install the following into each hub of the outboard wheel half in the order listed:

- Bearing cone (40).
- Grease seal (45). Observe '**This Side Out'** instruction on seal.
- Retaining ring (50). Install the end of the retaining ring into the groove in the inner hub of the wheel half and wind or spiral the ring into the groove.

7. Return to service

SAFETY WARNING: FOLLOW THE AIRFRAME MANUFACTURER'S INSTRUCTIONS AND SAFETY WARNINGS WHEN WORKING WITH AND AROUND THE AIRCRAFT.

SAFETY WARNING: ALWAYS FOLLOW PROPER TIRE INFLATION SAFETY PRACTICES. SERVICE THE TIRE WITH INFLATION SAFETY EQUIPMENT DESIGNED FOR THIS OPERATION.

A. Inflate the tire to the airframe manufacturer's recommended inflation pressure.

(1) Install the inflation valve cap. The cap is the positive means of resisting pressure leakage and should always be used to prevent rapid deflation should a problem occur with the valve core.

SAFETY WARNING: MAKE SURE THE DRIVE KEYS ON THE INBOARD WHEEL HALF ENGAGE IN THE SLOTS ON THE BRAKE ASSEMBLY ROTOR DISCS. DAMAGE TO THE WHEEL, TO THE LANDING GEAR/AIRCRAFT; AND PERSONAL INJURY COULD RESULT IF THE DRIVE KEYS DO NOT ENGAGE THE SLOTS WHEN EQUIPMENT IS IN OPERATION.

B. Slide the wheel/tire unit onto the axle and align with the brake assembly.

(1) Make sure the drive keys on the inboard wheel half engage in the slots on the brake assembly rotor discs.

(2) Make sure the bearing cones are seated.

C. Install the axle hardware in accordance with the airframe manufacturer's manual.

FITS AND CLEARANCES

1. General

Refer to IPL Figure 1 for component identification.

A. Assembly wear limits

Table 8001 In-service wear limits

PART NAME (IPL item number)	FIGURE	WORN AREA DESCRIPTION	WORN DIMENSION
Drive key (75)	5001	Width	0.636 inch minimum

B. Assembly torque values

NOTE: The term dry torque refers to the torqueing of hardware without the application of anti-seize.

Table 8002 Assembly torque values

PART NAME (IPL item number)	TORQUE LIMITS
Nut (65)	335 to 345 in-lb Apply anti-seize compound to items (55), (60), (65). Refer to ASSEMBLY.
Screw (80)	35 to 45 in-lb dry torque. Requires Torq-Set® driver bit.
Inflation valve (85)	40 to 50 in-lb dry torque.
Rupture disc (105)	50 to 60 in-lb dry torque.
Fusible plugs (115)	50 to 60 in-lb dry torque.

SPECIAL EQUIPMENT AND CONSUMABLES

1. General

This section contains source of supply information for all applicable sections of this manual.

A. Source of supply

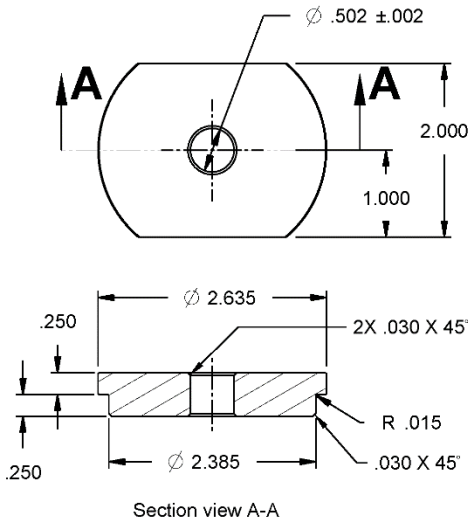
NOTE: Unless specified differently, equivalent alternatives can be used for the items listed.

NOTE: Fabricated tools are for reference only. They are meant to provide design guidance and can be adjusted to meet the needs of the Repair Facility.

Table 9001 List of manufacturers

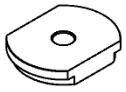
NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Preformed packing tool set	199-18	Aircraft Wheel and Brake, LLC Avon, OH 44011 U.S.A. www.kaman.com/cleveland
Blast stripping equipment for plastic blast media	Plastic media: MIL-P-85891, Type II or V, Grade 20/30, 3.5 Mohs max.	U.S. Technology Corporation www.ustechnology.com
Tools for bearing cups (25) Inner and outer hub tools	Figure 9001, 9002, 9003, 9004, 9005, 9006	Fabrication
Air test fixture for (85), (105), (115)	Figure 9007	Fabrication
Bearing lubricant	Mobil Aviation Grease SHC 100 (equiv. alternatives are not allowed)	Exxon-Mobil Oil Corporation Fairfax, VA 22037 U.S.A.
Anti-seize compound for (55), (60), (65)	MIL-PRF-83483	FEL-PRO Chemical Products Skokie, IL 60076 U.S.A.
Threaded insert tools for (10), (30)	MIL-T-21209 1227-6 (extraction) 7552-3 (installation) 3695-3 (tang removal)	Emhart Fastening Teknologies Shelton, CT 06484 U.S.A.
Protective coatings for (5), (20)	Refer to Table 6002	Deft Chemical Coatings Irvine, CA 92714 U.S.A.
Lubricant for (70), (90), (110), (120)	Dow Corning 55 Lube	Dow Corning Corporation Midland, MI, 48640 U.S.A.
Torq-Set® driver bit for (80)	NASM33781	Phillips Screw Company phillips-screw.com

SPECIAL EQUIPMENT AND CONSUMABLES



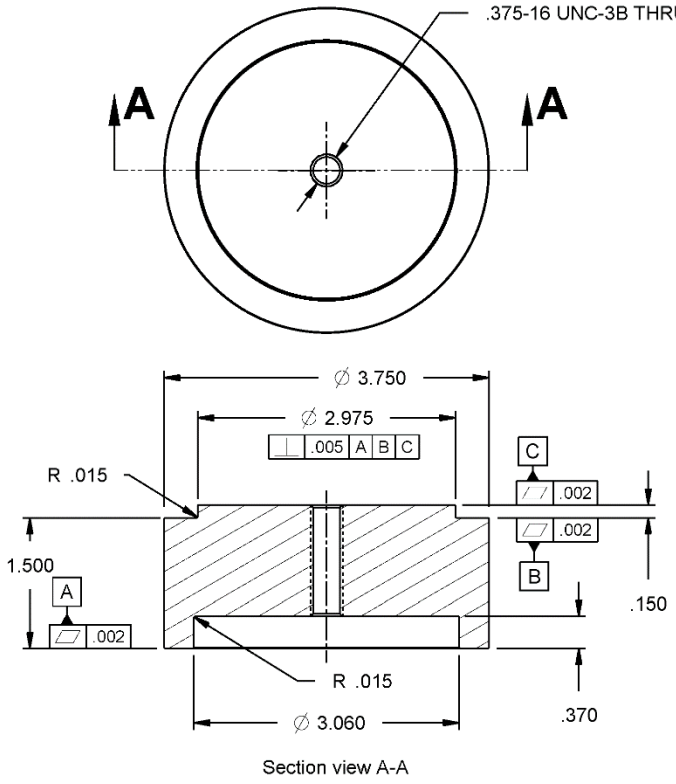
NOTES:

1. MATERIAL: 4130 STEEL OR EQUIVALENT.
2. TOLERANCES UNLESS OTHERWISE SPECIFIED:
   .XXX ± 0.010
   ANGULAR: ± 0.5°
3. BREAK CORNERS 0.010 MAX.
4. DIMENSIONS IN INCH UNITS.



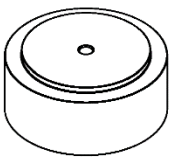
Isometric view
Scale: 1:2

Figure 9001 Push plate
(Bearing cup removal)



NOTES:

1. MATERIAL: 4130 STEEL OR EQUIVALENT.
2. TOLERANCES UNLESS OTHERWISE SPECIFIED:
   .XXX ± 0.010
   ANGULAR: ± 0.5°
3. BREAK CORNERS 0.010 MAX.
4. DIMENSIONS IN INCH UNITS.



Isometric view
Scale: 1:2

(Figure 9002 Support base
(Bearing cup removal/installation)

Figures 9001 and 9002 Bearing cup tools

SPECIAL EQUIPMENT AND CONSUMABLES

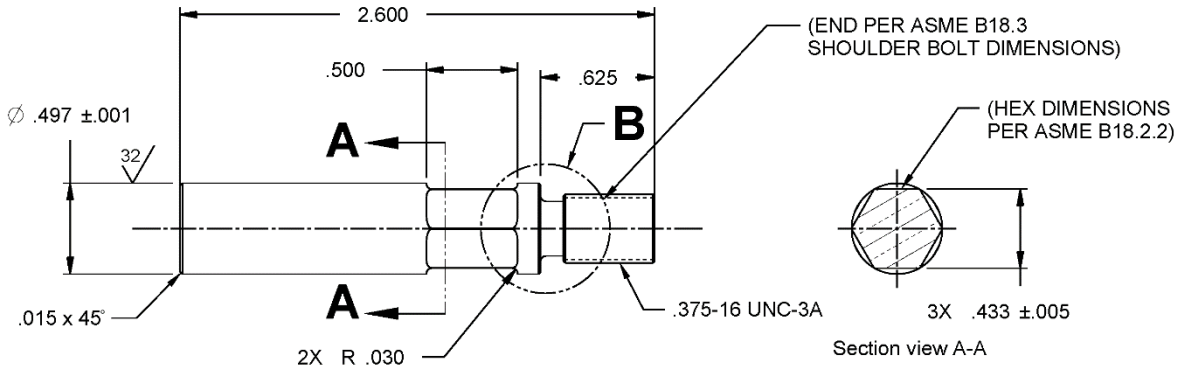


Figure 9003 Pilot guide pin
(Bearing cup removal)
Scale: 2:1

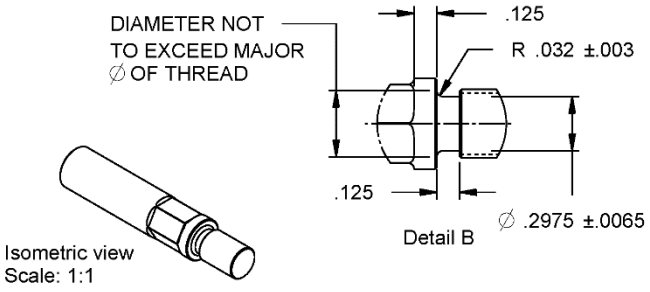
NOTES:

1. MATERIAL: 4130 STEEL OR EQUIVALENT.

2. TOLERANCES UNLESS OTHERWISE SPECIFIED:
   .XXX ± 0.010
   ANGULAR: ± 0.5°

3. BREAK CORNERS 0.010 MAX.

4. DIMENSIONS IN INCH UNITS.



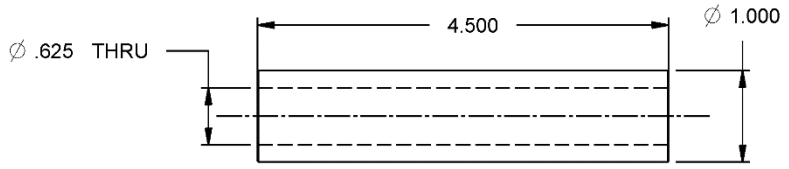


Figure 9004 Push bar
(Bearing cup removal)

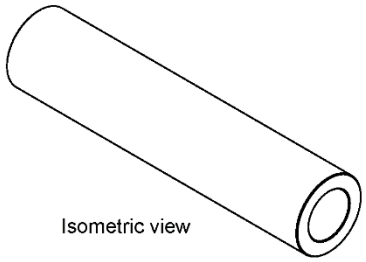
NOTES:

1. MATERIAL: 4130 STEEL OR EQUIVALENT.

2. TOLERANCES UNLESS OTHERWISE SPECIFIED:
   .XXX ± 0.010
   ANGULAR: ± 0.5°

3. BREAK CORNERS 0.010 MAX.

4. DIMENSIONS IN INCH UNITS.



Figures 9003 and 9004 Bearing cup tools

SPECIAL EQUIPMENT AND CONSUMABLES

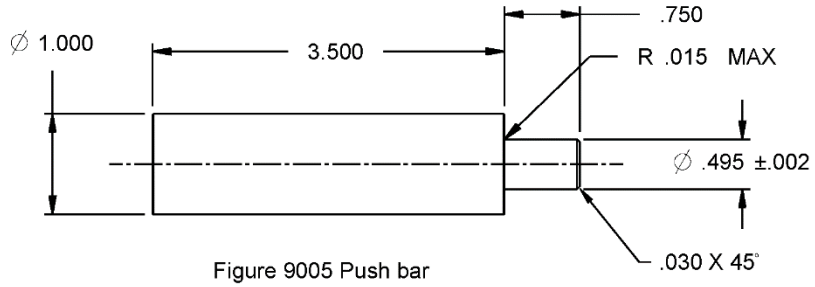
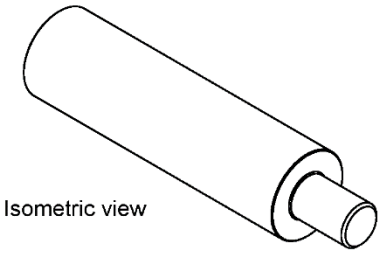


Figure 9005 Push bar
(Bearing cup installation)

NOTES:

1. MATERIAL: 4130 STEEL OR EQUIVALENT.
2. TOLERANCES UNLESS OTHERWISE SPECIFIED:
   .XXX ± 0.010
   ANGULAR: ± 0.5°
3. BREAK CORNERS 0.010 MAX.
4. DIMENSIONS IN INCH UNITS.



Isometric view

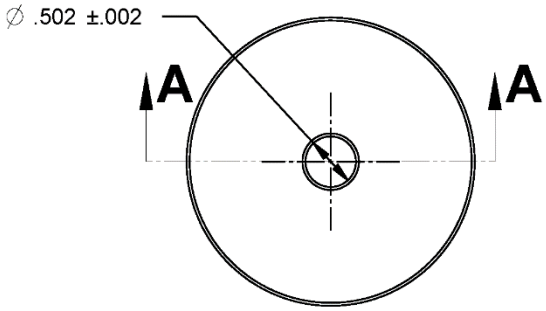
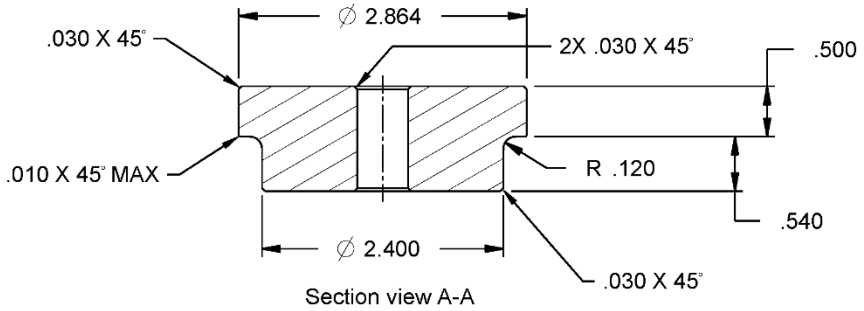


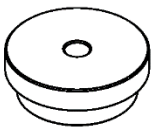
Figure 9006 Push plate
(Bearing cup installation)

NOTES:

1. MATERIAL: 4130 STEEL OR EQUIVALENT.
2. TOLERANCES UNLESS OTHERWISE SPECIFIED:
   .XXX ± 0.010
   ANGULAR: ± 0.5°
3. BREAK CORNERS 0.010 MAX.
4. DIMENSIONS IN INCH UNITS.



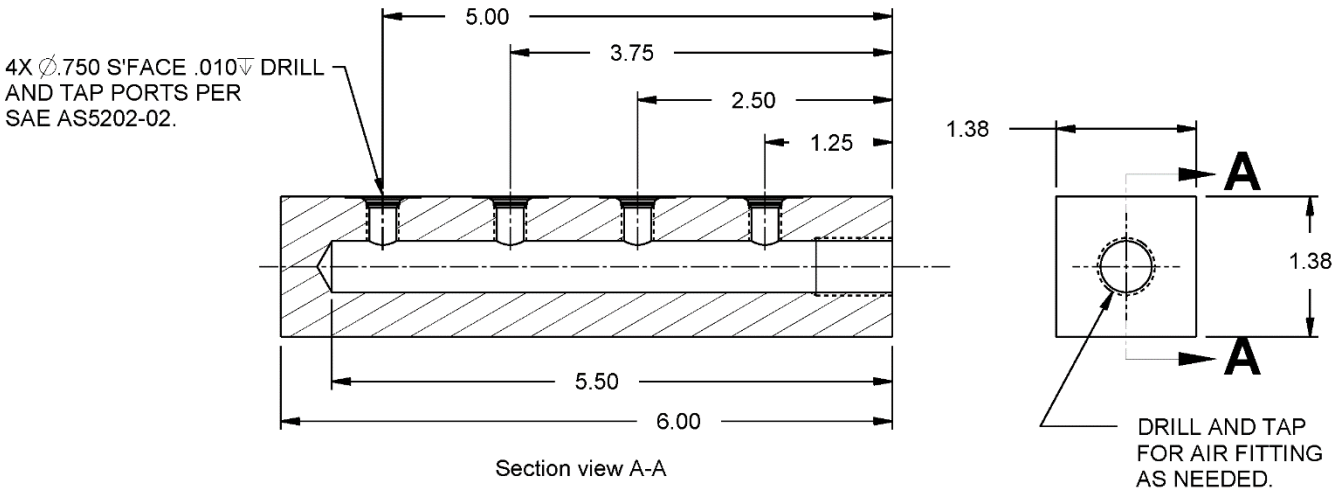
Section view A-A



Isometric view
Scale: 1:2

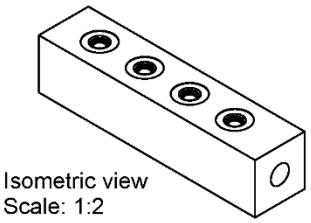
Figures 9005 and 9006 Bearing cup tools

SPECIAL EQUIPMENT AND CONSUMABLES



NOTES:

1. DIMENSIONS GIVEN ARE FOR A 4 PORT FIXTURE AND CAN BE ADJUSTED AS NEEDED.
2. MATERIAL: 4130 STEEL OR EQUIVALENT.
3. TOLERANCES UNLESS OTHERWISE SPECIFIED:
   .XXX ± 0.010
   .XX ±.03
4. BREAK CORNERS 0.010 MAX.
5. DIMENSIONS IN INCH UNITS.



Figures 9007 Air test fixture

ILLUSTRATED PARTS LIST

1. General

All parts are listed, except parts which lose their identities by being permanently fastened to other parts of assemblies and cannot be disassembled.

A. Explanation of columns

(1) Fig: Refers to the applicable illustrated parts figure. A hyphen "-" is used to indicate that the item is not illustrated.

(2) Item: Refers to the applicable item in the illustrated parts list figure.

(3) Units per assembly: Number of units required for the next higher assembly.

AR..... As Required (for bulk items) REF..... Reference
NP..... Item is Not Procurable

(4) CAGE: Commercial and Government Entity code of part supplier.

(5) Part No.: Part number of the item.

(6) Description: This column identifies the parts being listed by noun name followed by modifiers when applicable. An indenture system using dots are used to show the relationship of the parts to the assembly.

Assembly
- Subassembly or Item
- • Item

(7) Usable on code: This code is used to identify more than one configuration of the basic part number. Effectivity codes only apply to the figure in which they are used.

B. Part numbering system

Unless specified differently by contract, the assigned Aircraft Wheel and Brake, LLC part number will be used in the part number column for all purchased and government standard off-the-shelf parts (such as MS, AN, NAS, etc.).

C. Parts replacement data

The interchangeability relationship between parts is identified in the Nomenclature column of the parts list. A list of the terms used to show interchangeability and their definition is as follows:

Term	Abbreviation	Definition
Optional	OPT	This part is optional to and interchangeable with other parts in the same item number variant group or other item number if designated.
Superseded by	SUPSD BY	The part is replaced by and is not interchangeable with the item listed.
Supersedes	SUPSDS	The part replaces and is not interchangeable with the item listed.
Replaced by	REPLD BY	The part is replaced by and interchangeable with the item listed.
Replaces	REPLS	The part replaces and is interchangeable with the item listed.

D. Alpha variant item numbers

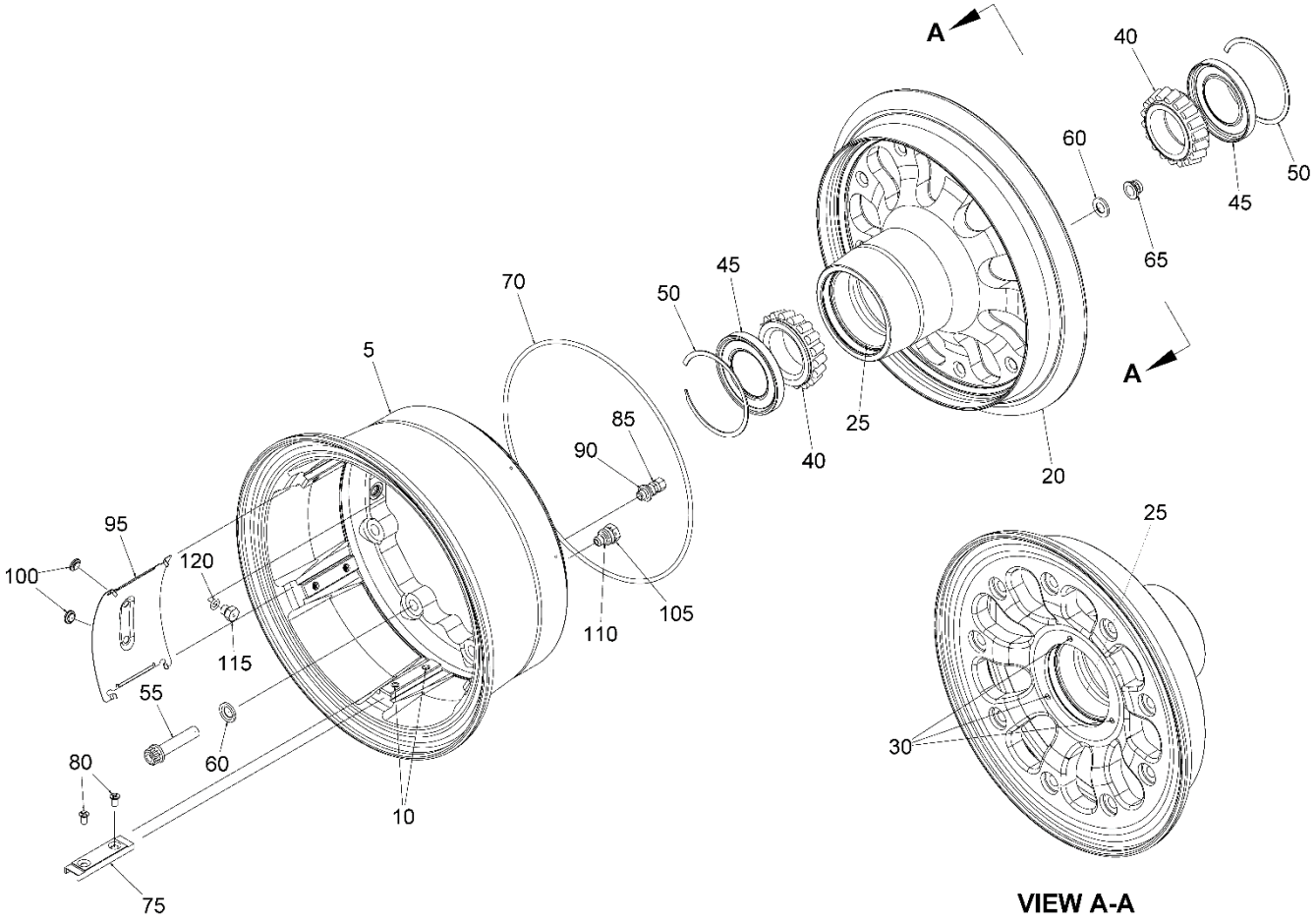
Alpha variants A through Z (except I and O) are assigned to existing numbers when necessary to show:

(1) Added items

(2) Modification or configuration differences

(3) Optional parts

ILLUSTRATED PARTS LIST



IPL Figure 1 Main wheel assembly, exploded view

ILLUSTRATED PARTS LIST

2. Detailed parts list

Fig	Item	Units per assembly	CAGE	Part no.	Description	Usable on code
1	1	REF	33269	40-480	Wheel assembly, main	
	5	1		161-24701	• Subassembly, wheel half, inboard	
	10	12		230-04700	• • Insert (MS21209F1-10L) or Heli-Coil® P/N 3591-3CNW190	
–	15	1		166-19700 [1]	• • Nameplate (when item 5 is ordered as spares)	
	20	1		162-24701	• Subassembly, wheel half, outboard	
	25	2		214-02900	• • Cup, bearing	
	30	3		230-04700	• • Insert (MS21209F1-10L) or Heli-Coil® P/N 3591-3CNW190	
–	35	1		166-19700 [1]	• • Nameplate (when item 20 is ordered as spares)	
	40	2		214-02800	• Cone, bearing	
	45	2		154-14000	• Seal, grease	
	50	2		155-04400	• Ring, retaining	
	55	9		103-26400	• Bolt, external wrenching (MS21250-06018)	
	60	18		095-03100	• Washer, countersunk (MS20002C6)	
	65	9		094-15800	• Nut (NAS1804-6N)	
	70	1		101-50268	• Packing, preformed (MS28775-268)	
	75	6		205-07200	• Key, drive	
	80	12		102-33300	• Screw (NAS1102E3-6)	
	85	1		160-03100	• Valve, inflation (MS27436C2) (Tire & Rim P/N TR 768-03)	
	90	1		- - - - - - - - -	• • Packing, preformed (MS9068-010 or AS3582-010) (Tire & Rim P/N TR RG-30)	
	95	6		157-06200	• Shield, heat	
	100	12		110-15300	• Bumper, heat shield	
	105	1		106-03400	• Disc, rupture	
	110	1		101-00500	• Packing, preformed (MS28775-010)	
	115	3		106-03300	• Plug, fusible	
	120	3		101-00500	• Packing, preformed (MS28775-010)	
–	125	1		166-19700 [1]	• Nameplate	

[1] Item 125, 166-19700, is used at the top assembly level to identify the 40-480 and at the wheel half subassembly level (item 15 or 35) to identify the 161-24701 and 162-24701 respectively when those items are ordered as spares.

STORAGE

1. General

Refer to IPL Figure 1 for component identification.

Wheel storage procedures differ depending on whether the wheels are stored with or without tires installed.

CAUTION: WHEELS STORED IN CARDBOARD BOXES, WHICH HAVE BECOME WET OR HAVE BEEN EXPOSED TO HIGH HUMIDITY, CAN BECOME CORRODED.

NOTE: Lubricate the bearing cups (25) and cones (40) with the wheel bearing grease and plug or cover bearing hub area during storage to prevent contamination.

2. Procedures

A. Wheels stored with tires installed

(1) The length of time that a wheel assembly can be stored is governed by the storage life of its rubber components. Basically, rubber components are considered to have a usable life of up to 10 years from the date of cure. The usable life may be shortened by exposure to sunlight, extreme temperatures, low humidity; and contamination by fluids; severe operating conditions, etc.

(2) The wheel assembly should be stored in a clean, dry storeroom. The desirable storeroom temperature range is from 50°F to 77°F. If this temperature range cannot be maintained, temperatures as high as 125°F and as low as -20°F can be tolerated for shorter periods. Total time above 100°F shall not exceed three months. The recommended storage pressure for tires is 10 psig.

(3) Plug or cover bearing hub area to prevent contamination of grease or bearing damage during storage of wheel.

B. Wheels stored without tires installed

(1) Short term storage of tubeless wheel assemblies may be stored with the wheel preformed packing installed between the two halves.

(2) Storage of components containing rubber longer than two years should be assembled without the preformed packing. Preformed packings to be placed in an ultraviolet protective package.

(3) The storage life of wheel assemblies (stored without rubber components installed) depends upon the storage conditions. Under ideal conditions, the storage life is indefinite. However, humid conditions will eventually lead to corrosion. Dust, dirt, or water will contaminate the wheel bearing grease etc.

(4) Plug or cover bearing hub area to prevent contamination of grease or bearing damage during storage of wheel.