Aircraft Wheel & Brake
Parker Hannifin Corporation
1160 Center Road
Avon, Ohio 44011

FAA-PMA

PARTS LIST

199-141 CONVERSION KIT

BEECH 18 AIRCRAFT – MODELS EQUIPPED WITH

12 INCH WHEELS AND WISHBONE STRUTS

PART NUMBER	DRAWING REVISION	DESCRIPTION	QUANTITY
30-170	Rev. F dated 09-09-1987	Brake Assembly	2
040-21101	Rev. H dated 03-09-2007	Wheel Assembly	2
067-08200	Rev. B dated 09-16-1987	Inner Axle Spacer	2
067-08300	Rev. NC dated 10-22-1986	Outer Axle Spacer	2
094-10400	----------	Nut (MS21044-N5)	24
095-04500	----------	Washer (AN960-1216)	2
095-10700	----------	Washer (AN960-516L)	48
103-22100	----------	Bolt (AN5-10A)	24
104-06300	Rev. NC dated 08-13-1987	Fitting, Expander	2
111-07700	Rev. A dated 04-02-1991	Clamp Assembly	2
207-01000	Rev. F dated 03-28-2007	Upper Hose Assembly	2
207-01300	Rev. D dated 11-11-2011	Brake Inlet Hose Assembly	2

Publication Package (P/N PP199-141)

IM199-141	Rev. G dated 07-12-2000	Installation Manual
50-100	Rev. G dated 07-12-2000	Installation Drawing
CM30-170	Rev. A dated 06-15-2010	Component Maintenance Manual for 30-170
CM040-21101	Rev. C dated 06-15-2010	Component Maintenance Manual for 040-21101
SA1222GL	Issue date 08-13-1987	Supplemental Type Certificate
PRM14A	-------	Product Reference Memo "Conditioning Procedure for Metallic Brake Lining"
-------		Pilot Operating Manual Inserts
-------		Product Registration Card

NOTES:

1. This kit will convert one aircraft to Cleveland Wheels and Brakes.
2. The 30-170 brake assembly is designed for use with MIL-H-5606 hydraulic fluid.

199-141
Rev. NC 10-22-1986 (280-28)
Rev. B 09-16-1987 (285-55)
Rev. C 09-21-1989 (297-85)
Rev. D 09-24-1990 (301-53)
Rev. E 04-02-1991 (303-4)
Rev. F 01-14-1993 (307-43)
Rev. G 01-14-1997 (323-87)
Rev. H 07-12-2000 (341-64)
Rev. J 11-01-2004 (363-58)
Rev. K 07-14-2008 (380-77)
Rev. L 10-23-2009 (386-86)
Rev. M 02-21-2011 (392-54)
Rev. N 12-13-2011 (395-01)

DO NOT SCALE

VIEW A

(B)(G) USE EXISTING CLAMP, BULKHEAD FITTING AND HOSES FROM THIS LOCATION TO UPPER TUBE ASS'Y. REPLACE UPPER TUBE ASS'Y WITH UPPER HOSE. REF. INSTALL MANUAL, SECTION 8.2.

(A) 207-01300 INLET HOSE

10.00 CLAMP LOCATION (REF)

11.00-12 TIRE

AFT

30-170 BRAKE ASSY

(B) 103-16700 TIE BOLT — 4 EA.

(B) 103-16800 TIE BOLT — 8 EA.

NOTE: LUBTORK TIE BOLTS AT 80-85 IN-LBS, AND SAFETY WIRE. (B)(G)

095-14300 COUNTERSUNK WASHER — 12 EA.

CAUTION: COUNTERSUNK SIDE OF WASHER TO FACE TOWARDS BOLT HEAD

(A) 111-07700 CLAMP ASSY

095-04500 WASHER

104-06300 FITTING, EXPANDER

EXISTING SHUTTLE VALVE

EXISTING NUT

USE EXISTING HOSE

(G) DETAIL C

SHUTTLE VALVE MOUNT RELOCATION TO WHEEL WELL

(A)(G) 103-32800 BOLT — 9 EA.

(E)(D) 095-10600 WASHER — 9 EA. (UNDER NUT)

095-03100 WASHER — 9 EA.

(F) 094-15800 NUT — 9 EA.

154-03900 GREASE SEAL

155-08300 SNAP RING

USE EXISTING AXLE NUT

067-08300 OUTER SPACER

(C) 214-09200 BEARING CONE

101-50272 O-RING

INBOARD / OUTBOARD ORIENTATION DEPENDS ON AIRCRAFT STRUTS USED

VIEW B

(D) 040-21101 WHEEL ASSY

164-22400 BRAKE DISK

REPLACE WHEN WORN TO .385 THICK

075-17000 TORQUE PLATE

MOUNTING ORIENTATION PER VIEW A

103-22100 BOLT — 12 EA.
095-10700 WASHER — 24 EA
094-10400 NUT — 12 EA

067-08200 INNER SPACER

066-10000 LINING — 8 EA.

REPLACE WHEN WORN TO .100 THICK

NOTE:
069-02300 ANCHOR BOLT

APPLY DRY GRAPHITE OR SILICONE SPRAY TO BOLT PRIOR TO INSTALLATION TO TORQUE PLATE

068-04600 INSULATOR — 2 EA.

074-06000 BACK PLATE (A) — 4 EA.

APPLICABILITY OF AIRCRAFT INSTALLATION
CLEVELAND KIT P/N 199-141

MODEL	TIRE SIZE	PLY RATING	TYPE	PRESSURE
BEECH 18 MODEL EQUIPPED WITH 12" WHEELS	11.00-12	8 PLY	TUBELESS OR TUBE TYPE	PER MANUAL

50-100 G

CHANGE NOTICE	LET-TER	DESCRIPTION OF CHANGE	CHG. BY	DATE	CHK'D. BY
280-28	IN-T	INITIAL RELEASE	HA	6-22-86	BR
284-94	A	SEE CHANGE NOTICE	BR	8-13-87	BR
285-55	B	SEE CHANGE NOTICE	BR	9-14-87	BR
297-85	C	"214-09200" WAS "214-39250"	BR	9-21-89	GR
301/53	D	SEE C/N	DWR	9-29-90	BR
303/14	E	095-73200 WAS 095-14400	BR	4-2-91	BR
307/43	F	ITEM 46: "094-16700" WAS "094-91500"	BR	1-14-93	GR
0341-64	G	SEE C/N	BR	7-12-00	BR

WEIGHT AND BALANCE DATA

OLD REMOVED

BRAKE	LBS
WHEEL	LBS
TOTAL	LBS

NEW INSTALLED

BRAKE	16.0 LBS	(A)
WHEEL	40.0 LBS	(A)(D)
TOTAL	56.00 LBS	(A)(D)

NOTE: WEIGHTS ABOVE DO NOT INCLUDE TIRE. FLIGHT MANUAL LISTS ORIGINAL EQUIPMENT WEIGHT WITH TIRE INCLUDED. WEIGH TIRES SEPARATELY AND ADD TO INSTALLED WEIGHT FOR WEIGHT AND BALANCE CALCULATIONS.

COMPARISON WEIGHT

WEIGH EXISTING WHEELS & BRAKES, SUBTRACT FROM NEW WEIGHTS TO DERIVE WEIGHT INCREASE CREATED BY 199-141 KITS INSTALLATION. MULTIPLY WEIGHT INCREASE BY MOMENT (APPLICABLE AIRCRAFT) & REVISE WEIGHT & BALANCE INFORMATION IN LOG BOOK.

* FOR USE WITH MIL-H-5606 BRAKE FLUID

QTY	QTY	ITEM	PART NO.	DESCRIPTION	MATERIAL & SPEC.	HEAT TREAT & SPEC.	FINISH & SPEC.	WGT.

NEXT ASSEMBLY | QTY | FINAL ASSEMBLY | QTY | PATTERN, CASTING OR BLANK NO. | DRAWN BY

ZYGLO PER MIL-I-6866 STAMP M ON PART

MAGNAFLUX PER MIL-I-6868 STAMP M ON PART

√ MACHINED SURFACES PER MIL STD 10 UNLESS OTHERWISE NOTED

UNLESS NOTED ALL THREADS PER MIL-S-7742

WORK TO DIMENSIONS — DO NOT SCALE. TOLERANCE FOR XXX ± .010 TOLERANCE FOR XX ± .030 TOLERANCE FOR ANGULAR DIMS. ± 1/2° TOLERANCE FOR FRACTIONAL DIMS ± .030

BREAK SHARP EDGES .010 UNLESS NOTED. REMOVE ALL BURRS BEFORE PLATING. DRILL PER INSP. PROCEDURE NO. 114.

CHECKED BY

SCALE NONE

Cleveland Wheels & Brakes
Aircraft Wheel and Brake Division
Parker Hannifin Corporation
1160 Center Road
Avon, Ohio 44011

NAME INSTALLATION DRAWING KIT 199-141 BEECH 18

50-100

K&E CLEVELAND No. 10-9155

Aircraft Wheel & Brake
Parker Hannifin Corporation
1160 Center Road
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199-141

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Rev. D	09-24-1990 (DCN 301-53)
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Rev. F	01-14-1993 (DCN 307-43)
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Rev. H	07-12-2000 (DCN 0341-64)
Rev. J	11-01-2004 (DCN 0363-58)
Rev. K	07-14-2008 (DCN 0380-77)
Rev. L	10-23-2009 (DCN 0386-86)
Rev. M	02-21-2011 (DCN 0392-54)
Rev. N	12-13-2011 (DCN 0395-01)
Rev. P	12-13-2012 (ECO-001826[illegible])
Rev. R	09-22-2016 (ECO-0073894)

Component Maintenance Publication

Main Wheel Assembly
Parker Hannifin Part No. 040-21101

CM040-21101

Revision C
Completely revised

Publication No.: CM040-21101 Revision C

Manufacturer:

Parker Hannifin Corporation
Aircraft Wheel and Brake Division
1160 Center Road
Avon, Ohio 44011 U.S.A.

Cleveland
Wheels & Brakes

TO: HOLDERS OF CM040-21101 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 040-21101.

Attached to this transmittal letter is Revision C of CM040-21101 (dated June 15, 2010)

Revision C, Dated June 15, 2010

REVISION C CONTAINS ALL PAGES OF THE MANUAL. Pages that have been added or revised are outlined below together with the highlights of the revision.

Please retain all **REVISION HIGHLIGHTS** pages, inserting them into the manual for future reference.

REVISION HIGHLIGHTS

Section/Page No.	Description Of Change
All Sections/All Pages	DCN 0391-90 Updated to electronic format.

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)
A	11-01-1990	PHC			
B	06-16-2000	PHC			
C	06-15-2010	P. Hunyad			

SERVICE BULLETIN LIST

Parker Hannifin 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

LIST OF EFFECTIVE PAGES

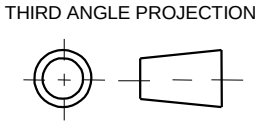
TABLE OF CONTENTS

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 maintenance of the Parker Hannifin Assembly covered in this publication.



Third angle projection is used in this manual. All weights and measurements are in U.S. English units with metric units in parentheses. English units are shown with a period for the decimal point. Millimeters are shown with a comma for the decimal point. Numbers that contain five or more digits to the left of the decimal point have a space between the “thousands” and “hundreds” digits to prevent confusion with the metric decimal point.

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 & Brake Division for the latest revision.

Parker Hannifin Corporation
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Fax: (440) 937-5409
Tel: 1-800-BRAKING (1-800-272-5464)

2. Data Rights

3. Export Statement

U.S. EXPORT CONTROLLED – Dissemination is restricted by the Export Administration Act of 1979 (50 U.S.C. App. 2401, et seq) and the Export Administration Regulations.

INTRODUCTION

4. TSO Notice

This assembly is certified for FAR Part 23 usage. It is identified with a "TSO-C26c" marking. This assembly has been tested and qualified to FAA (Federal Aviation Administration) requirements and specifications.

5. Manual Use

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

A. Warnings and 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 , alerts to possible serious or life threatening situations if the instructions in the operational or procedural task are not followed precisely.
- A **"WARNING"** alerts that possible hazards are associated with the materials/ processes/procedures/limits. These can cause injury in any form, if the instructions in the operational or procedural task are not followed precisely.
- A **"CAUTION"** identifies an instruction that must be followed precisely to avoid damage to the product.
- A **"NOTE"** provides additional helpful information.

6. Replacement Parts

SAFETY WARNING: PARKER HANNIFIN WHEEL & BRAKE DOES NOT WARRANT OR ASSUME THE RISK OF THE USE OF REPLACEMENT PARTS NOT AUTHORIZED FOR USE BY PARKER HANNIFIN WHEEL & BRAKE. OPERATORS WHO USE REPLACEMENT PARTS NOT AUTHORIZED BY PARKER HANNIFIN WHEEL & BRAKE 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 to identify the wheel assembly components.

SAFETY WARNING: THIS ASSEMBLY CONTAINS PARTS THAT HAVE A CADMIUM PLATED FINISH (5, 10, 15, 20, 90). REMOVING THE CADMIUM PLATING CAN CREATE EXPOSURE TO CADMIUM DUST AND CADMIUM COMPOUNDS. THIS CAN BE A POTENTIAL HEALTH HAZARD. USE APPROPRIATE SAFETY PRECAUTIONS.

The wheel assembly has a rim contour designed for an 11.00-12, 8 PR tubeless or tube type tire.

The wheel halves are magnesium alloy castings.

A preformed packing (25) installed on the inboard wheel half provides an air seal at the juncture of the wheel halves. An inflation valve (70) is installed in the outboard wheel half to inflate and deflate a tubeless tire.

The wheel assembly rotates on two tapered roller bearings consisting of the cups (45) and cones (75). The bearing cups are shrink fit into the hub of the wheel halves. An inboard molded seal (80) and an outboard molded seal hubcap provide retention of bearing grease and exclusion of contaminants.

2. Operation

The main wheel assembly is the primary interface between the main landing-gear strut and the tire during ground operation. The main wheels transfer stopping forces from the brake to the ground.

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 the paint and surface finishes.

4. Specifications

Wheel material/tire size		Magnesium alloy casting / 11.00-12 8 PR tubeless or tube type
Wheel nut torque		300 lb-in (33,9 N-m) with SAE-AMS-2518 (MIL-T-5544) anti-seize
Bearing lubricant		Mobil Aviation Grease SHC 100
Wheel half coatings	Primer coating:	Refer to the repair section
	Finish coating:	Refer to the repair section

DESCRIPTION AND OPERATION

5. Brake Disc Wear and Warpage Limits

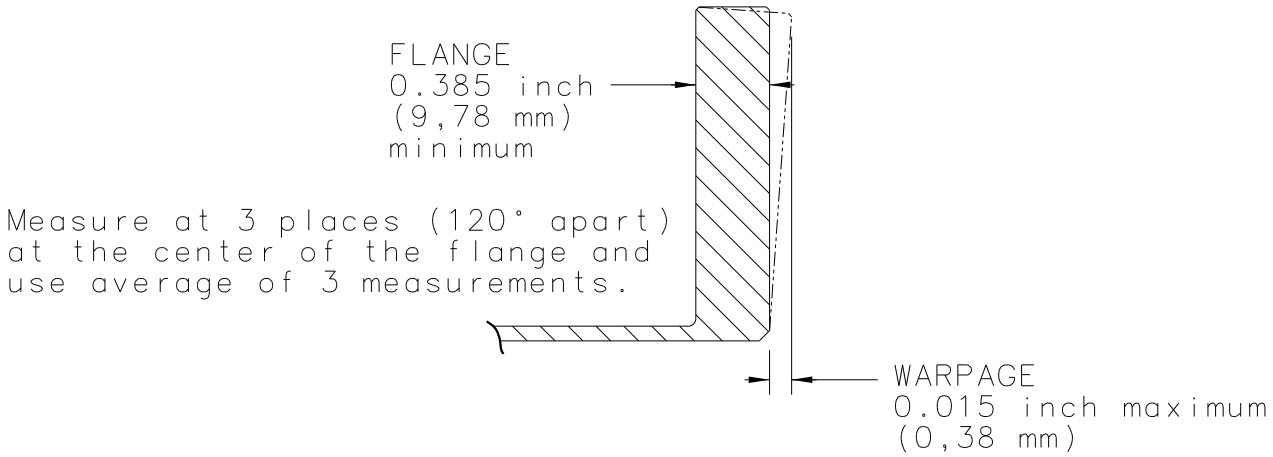


Figure 1 Disc Limits

6. Maintenance Schedule

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

NOTE: All task procedures in Table 1 refer to paragraphs in the CHECKS section.

Table 1 Maintenance Schedule

INTERVAL	ITEM	TASK
At every tire change	All parts	Visual and detailed examination.
	Bolts (5)	Visual and detailed examination including magnetic particle inspection.
	Preformed packing (25)	Replace
At the 5th, 8th, 10th, 12th 14th, and 16th tire changes	Wheel halves (35) and (55)	Visual and detailed examination including liquid penetrant inspection.
At the 17th tire change and every tire change after	Wheel halves (40) and (60)	Visual and detailed examination including Liquid Penetrant Inspection.
Every tire change – or – every 12 months (whichever occurs first)	Bearing cones (75)	Clean and repack with clean grease. Refer to the ASSEMBLY section.

TESTING AND FAULT ISOLATION

1. General

Refer to IPL Figure 1 to identify the wheel assembly components.

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

SAFETY WARNING: FULLY ASSEMBLE THE WHEEL BEFORE TESTING. SERIOUS INJURY OR DEATH CAN OCCUR FROM TESTING A WHEEL THAT IS NOT FULLY ASSEMBLED.

WARNING: PUT ON PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

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 1001 Testing Equipment and Consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Inflation cage	Not required	Commercial
Dry nitrogen	Not required	Commercial
Standard tools (inch units)	• 12pt external: items (5) and (15) • hex head external: item (70) • torque gauge • tire pressure gauge	Commercial
Soap solution	Mild dishwashing liquid	Commercial

TESTING AND FAULT ISOLATION

2. Test Procedures

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

NOTES:

- Follow instructions in the applicable sections for Disassembly, Checks, or Assembly procedures.
- All tubeless tires have been vented in the lower sidewall area. These vents prevent separation by relieving pressure buildup in the casing plies and under the sidewall rubber. These vent holes (marked by green dots) will not cause undue pressure loss. Covering them with water or a soap solution may show an intermittent bubbling, which is normal.

A. Tire Inflation Guidelines

SAFETY WARNING: PLACE THE WHEEL/TIRE ASSEMBLY IN A SAFETY CAGE DURING INFLATION TO PREVENT INJURY TO PERSONNEL FROM POSSIBLE EXPLOSION.

- Use a clip-on chuck, an extension hose and a safety cage for inflation.
- Use a direct reading or dial type pressure gauge that is calibrated on a regular basis.
- When inflating a wheel/tire assembly, 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.
- Do not inflate a tire above the rated service pressure to seat the beads.

B. Pretest Check

Perform the following inspections and checks to qualify the wheel assembly for testing.

(1) Visually examine the wheel for corrosion, cracks, loose bearing cups, or other visible damage.

(2) Examine all threaded components to make sure they have not become loose or have lost their self-locking feature (nuts). These include the bolts (5), nuts (15), and the nut on the inflation valve (70). Refer to Table 8002, Torque Values.

(a) If you cannot tighten a component, then examine for damage to the threads of the component or mating component. Also examine the self-locking feature of the nuts (15). Refer to the CHECKS section.

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

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

TESTING AND FAULT ISOLATION

NOTES:

- To limit disassembly and assembly procedures due to examination, troubleshooting or replacement of parts, the following parts do not need to be installed until the 24 hour pressure retention test is successfully performed: inboard bearing cone (75), grease seal (80), and snap ring (85).
- The outboard bearing cone (75), grease seal (80), hubcap (90) and snap ring (85) will be installed after the wheel/tire assembly is mounted on the aircraft.

C. 24 Hour Pressure Retention Test

CAUTION: COVER THE HUB OPENINGS OF THE WHEEL HALVES TO PREVENT CONTAMINATION OF THE BEARING BORE AREAS.

(1) Put the wheel/tire assembly in an inflation cage.

(2) Inflate the tire with dry nitrogen to the service inflation pressure.

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

(b) Measure the tire pressure. If necessary, re-inflate to the service inflation pressure again.

(3) The wheel/tire assembly must hold the service inflation pressure for 24 hours. A maximum five percent pressure drop is allowed.

(4) If pressure drop is less than five percent,

(a) The pressure retention test is successfully completed. Remove the wheel/tire assembly from the inflation cage and install the remaining components of the wheel. Refer to ASSEMBLY section, F. Final Assembly of the Wheel.

(5) If pressure drop is more than five percent,

(a) With the wheel/tire assembly is still in the inflation cage, inflate the tire with dry nitrogen to the service inflation pressure.

(b) Apply a soap and water solution to the following and examine for air leaks:

- juncture around the inflation valve (70) (for a tubeless tire)
- juncture tire tube valve stem (for a tube type tire)
- the tire bead area

(c) Examine for air leaks.

TESTING AND FAULT ISOLATION

(6) For a tube type tire, air leaks can occur at or around the tube valve stem area.

(a) Check the valve core for leakage and replace if necessary.

(b) Repeat the pressure retention test.

1 If the leakage continues, Refer to the DISASSEMBLY section and remove the tire from the wheel assembly.

2 Check the tube for leaks and replace the tube if necessary.

CAUTION: USE ONLY ENOUGH PRESSURE TO ROUND OUT THE TUBE. EXCESSIVE INFLATION STRAINS SPLICES AND MAY CAUSE FABRIC SEPARATION OF REINFORCED TUBES.

NOTE: Aircraft tubes are made of 100% natural rubber and will diffuse limited amounts of inflation gas.

3 Repeat the pressure retention test.

(7) For a tubeless tire, air leaks can occur around or through the inflation valve (70).

(a) Refer to Table 8002. Torque inflation valve, if loose, and inflate the tire with dry nitrogen to the service inflation pressure.

(b) Examine for air leaks.

1 If the leakage continues, deflate the tire and remove the inflation valve (70). Examine the valve including the rubber grommet for damage.

a If the rubber grommet is damaged, replace the inflation valve.

2 Examine the mating hole on the outboard wheel half (60) for damage that would prevent the rubber grommet 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 Reassemble the wheel/tire (if the tire was removed or the wheel disassembled).

4 Inflate the tire with dry nitrogen to the service inflation pressure and check for leaks. If no leaks are found, then do the 24 hour pressure retention test.

TESTING AND FAULT ISOLATION

(8) For a tubeless tire, air leaks can occur at the tire bead area.

(a) Deflate the tire completely and remove the wheel/tire assembly from the inflation cage.

(b) Remove the tire from the wheel assembly.

(c) Examine the tire bead and wheel bead seat 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 Reassemble the wheel/tire.

4 Inflate the tire with dry nitrogen to the service inflation pressure and check for leaks. If no leaks are found, then do the 24 hours pressure retention test.

CAUTION: REPAIR OF THE PREFORMED PACKING MATING SURFACES ON THE WHEEL HALVES IS NOT ALLOWED.

(9) For a tubeless tire, air leaks can occur at the preformed packing (25) area.

(a) Deflate the tire completely and remove the wheel/tire assembly from the inflation cage.

(b) Remove the tire from the wheel assembly.

(c) Examine the seal groove area of each wheel half for damage.

1 Disassemble the wheel.

2 Examine the preformed packing for cuts, tears, deformation or other damage that would prevent the preformed packing from properly sealing. Replace with a new packing if necessary.

3 Examine the wheel halves in the sealing groove area for damage that would prevent the preformed packing from properly sealing. If damage is found, replace the wheel half.

4 Reassemble the wheel/tire.

5 Inflate the tire with dry nitrogen to the service inflation pressure and check for leaks. If no leaks are found, then do the 24 hour pressure retention test.

TESTING AND FAULT ISOLATION

CAUTION: A CRACKED WHEEL HALF CANNOT BE REPAIRED.

(10) For a tubeless tire, air leaks can occur through the wheel.

(a) Deflate the tire completely and remove the wheel/tire assembly from the inflation cage.

(b) Remove the tire from the wheel assembly.

(c) Examine the wheel.

1 Disassemble the wheel.

2 Liquid penetrant inspect the wheel halves (40 and 60) and check for cracks. If cracks are found, replace the wheel half.

3 Reassemble the wheel/tire.

4 Inflate the tire with dry nitrogen to the service inflation pressure and check for leaks. If no leaks are found, then do the 24 hour pressure retention test.

TESTING AND FAULT ISOLATION

3. Troubleshooting

Table 1002 lists the possible problems you can find while operating the wheel assembly. The table cannot list all possible problems and is intended to assist with troubleshooting the wheel assembly.

Table 1002 Troubleshooting

PROBLEM	POSSIBLE CAUSE	CORRECTION
Loss of tire pressure.	For tube type tire: The tube valve stem is damaged or the tire tube is damaged	Replace the damaged part.
	For a tubeless tire: The preformed packing (25) is worn, damaged or twisted. Damage to the sealing surface of either wheel half (40, 60)	Replace the damaged part.
	For a tubeless tire: Damage to the inflation valve (70) or rubber grommet. Damage to the sealing surface on the outboard wheel half (60).	Replace the damaged part.
	Loss of the preload on wheel bolts (5).	Examine and replace the self-locking nuts (15) if the locking feature is defective.
	CAUTION: A CRACKED WHEEL HALF CANNOT BE REPAIRED.	
	A possible cracked wheel half (40 or 60).	Use Liquid Penetrant Inspect to examine the wheel half for cracks. Refer to the CHECKS section.
	NOTE: Liquid Penetrant Inspection will not detect subsurface defects.	
Excessive drag on the wheel when rotating.	Incorrect preload or torque on the axle nut.	Loosen and re-tighten the axle nut to the aircraft manufacturer's specifications.
	Damage to a bearing cone (75) or cup (45). **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. Replace any parts that are damaged or corroded. Pack new cones with clean bearing grease. Refer to the ASSEMBLY section.

TEST DATA SHEET

Date _____ **Wheel Serial No.** _____

Pretest Check **refer to paragraph 2.B.**

(1) Wheel condition **Pass** _____ **Fail** _____
(2) Wheel assembly hardware condition **Pass** _____ **Fail** _____
(3) Tire condition **Pass** _____ **Fail** _____

Comments: _____

_____

_____

_____

24 hour Pressure Retention Test **refer to paragraph 2.C.** **Pass** _____ **Fail** _____

Tire inflation pressure:_____ psig Required: service inflation pressure

Pressure after 24 hrs.:_____ psig Pressure Drop: five percent maximum

Pass ____ less than five percent pressure loss

Fail ____ more than five percent pressure loss

Leakage from tire tube valve stem or from tire tube: (tube type tire) Yes ____ No ____

Leakage around inflation valve (70): (tubeless tire) Yes ____ No ____

Leakage around bead seat: Yes ____ No ____

Leakage around wheel register: Yes ____ No ____

Leakage through the wheel: Yes ____ No ____

Comments: _____

_____

_____

_____

Tester: _____ **Date:** _____

DISASSEMBLY

1. General

Refer to IPL Figure 1 to identify the wheel assembly components.

WARNING: PUT ON PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

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 Disassembly Equipment and Consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Preformed packing tool set	P/N 199-18	Parker Hannifin Corp., Aircraft Wheel & Brake Division or Parker Hannifin distributor
Standard tools (inch units)	• 12pt external: items (5) and (15) • hex head external: item (70) • flat head screwdriver: item (125)	Commercial
Tire bead breaker	Not required	Commercial
Soap solution	Mild dishwashing liquid	Commercial
Valve core tool	Not required	Commercial

DISASSEMBLY

2. Remove the Wheel Assembly

SAFETY WARNING: MAKE SURE THE AIRCRAFT IS SECURE AND STABLE BEFORE BEGINNING ANY WORK. WORKING AROUND AN AIRCRAFT THAT IS NOT SECURE AND STABLE CAN CAUSE INJURY OR DEATH.

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.

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

B. Deflate the tire:

- If equipped with a tubeless tire, remove air from the tire by depressing the valve stem plunger in the inflation valve (70) until air can no longer be heard escaping from the tire.
- If equipped with a tube type tire, remove the cap from the tube valve stem deflate the tire by pushing the valve stem plunger until air can no longer be heard escaping from the tube.

C. When all the tire pressure is released, then:

- If equipped with a tubeless tire, remove the valve stem from the inflation valve (70).
- If equipped with a tube type tire, remove the valve stem from the tube valve.

D. Remove the inflation valve (70) from the outboard wheel half (60).

NOTE: The brake disc (30) is sandwiched between two components of the brake assembly: the pressure plate and the four back plates. It will be necessary to remove the brake assembly back plates before the wheel assembly can be removed from the axle.

DISASSEMBLY

E. Refer to Figure 3001. Remove the brake tie bolts which fasten the back plates to the brake housing. Refer to the brake assembly component maintenance manual CM30-170 for instructions.

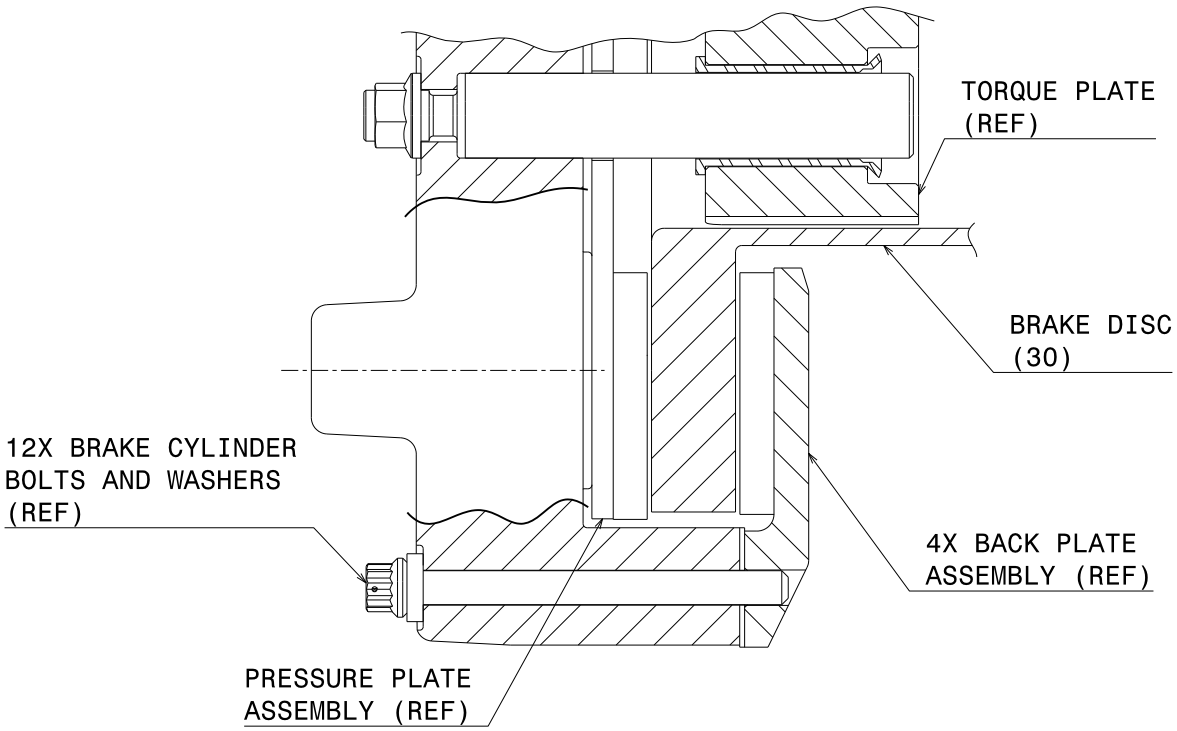


Figure 3001 Brake Bolt Removal

CAUTION: BE CAREFUL NOT TO DAMAGE THE SNAP RING GROOVE OR WHEEL BORE DURING REMOVAL OF THE SNAP RING (85).

F. After the brake back plates are removed, remove the snap ring (85) and hubcap (90) from the outboard wheel half (60).

NOTE: Refer to Figure 3002 for example of snap ring removal technique.

G. Remove the axle mounting hardware.

H. Remove the wheel assembly from the axle and put the wheel assembly on a clean, flat surface.

DISASSEMBLY

3. Disassembly Procedures

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 (45) are pressed into the hub of the wheel halves (40, 60). Do not remove them unless replacement is necessary. Replacement will be necessary if the bearing cups are damaged or if a more thorough inspection of the wheel is to be made. Refer to the REPAIR section for replacement instructions.

A. Make sure the tire is completely deflated. Refer to paragraph **2. Remove the Wheel Assembly**, procedures 2.A to 2.C.

B. Remove the grease seal (80), and bearing cone (75) from the outboard wheel half (60).

CAUTION: BE CAREFUL NOT TO DAMAGE THE SNAP RING GROOVE OR WHEEL BORE DURING REMOVAL OF THE SNAP RING (85).

C. Refer to Figure 3002. Use a flathead screwdriver to remove the snap ring (85) from the inboard wheel half (40). Remove the grease seal (80), and bearing cone (75).

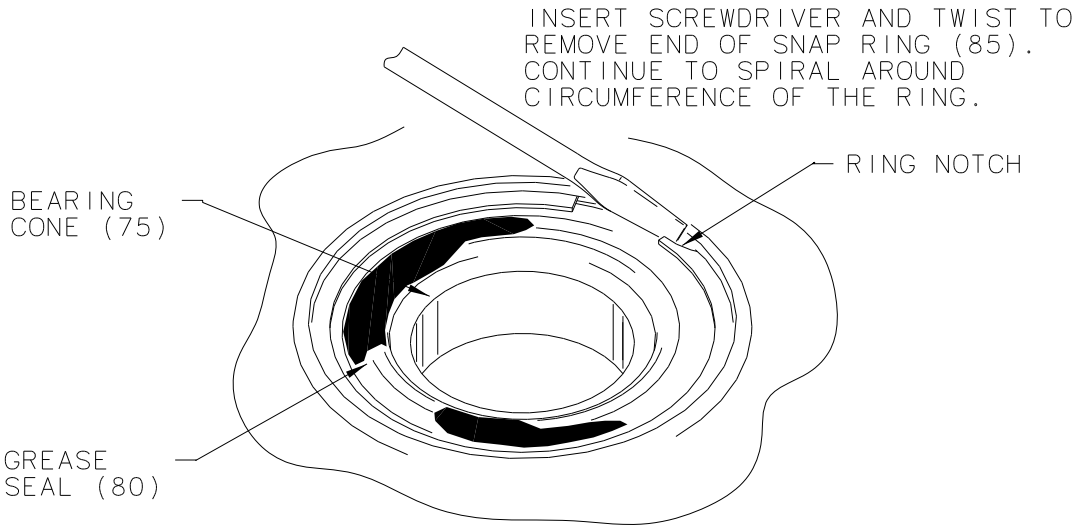


Figure 3002 Snap Ring Removal

DISASSEMBLY

D. 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 SEALING SURFACES OF THE WHEEL.

E. 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 BOLTS AND NUTS.

F. Remove the nuts (15), bolts (5) and washers (10, 20).

G. Remove the brake disc (30).

H. Separate the wheel halves, then remove the tire.

NOTE: It is recommended that the preformed packing (25) be replaced at each overall regardless of condition (tubeless tire only).

I. Remove the preformed packing (25) from the wheel register groove of the outboard wheel half (60).

CLEANING

1. General

Refer to IPL Figure 1 to identify the wheel assembly components.

WARNING: PUT ON PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

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 Cleaning Equipment and Consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Blast stripping equipment for plastic blast media and abrasive blast media	• Plastic media: MIL-P-85891, Type II or V, Grade 20/30, 3.5 MOH max. • Abrasive media: 80 Grit aluminum oxide	U.S. Technology Corp.
Cleaning cloths	Lint free	Commercial
Brushes	Non-metallic soft and stiff bristle	Commercial
Stoddard solvent	Type 1 per MIL-PRF-680	Commercial
Cleaner/degreaser	AMS1526	Commercial
Mineral spirits	Not required	Commercial
Air Supply	30 psig (2,1 bar) maximum	Commercial

CLEANING

2. Cleaning Procedures

SAFETY WARNING: MAKE SURE THAT THE AREA WHERE YOU WILL USE THE CLEANING SOLVENTS HAS GOOD AIRFLOW. DO NOT TOUCH OR GET FLUID ON YOUR BODY AND DO NOT BREATH VAPORS. KEEP CONTAINERS COVERED WHEN NOT IN USE.

SAFETY WARNING: USE NO MORE THAN 2,1 BAR (30 PSIG) AIR PRESSURE. EYE PROTECTION IS NECESSARY. EYE INJURY FROM DIRT PARTICLES OR SOLVENT SPRAY IS POSSIBLE WHEN COMPRESSED AIR IS USED.

A. Clean the Hardware and Steel Parts

(1) Clean the following parts with Stoddard Solvent (MIL-PRF-680): (5, 10, 15, 20, 30, and 85). Use a non-metal soft bristled brush to help remove the heavy dirt deposits:

CAUTION: USE A SEPARATE CONTAINER FOR THE MINERAL SPIRITS TO PREVENT CONTAMINATION.

(2) Carefully clean the bearing cones (75) in mineral spirits. Use a non-metallic soft bristled brush to help remove all deposits.

CAUTION: DO NOT SPIN BEARING CONES WHEN USING COMPRESSED AIR.

(3) Dry the parts quickly and thoroughly to remove all traces of moisture.

(4) Refer to the ASSEMBLY section and repack the bearing cones with clean bearing grease immediately after drying and then place them in a clean, closed container to prevent contamination.

B. Clean the Magnesium and Aluminum Parts

(1) Clean the following parts in a water based cleaner/degreaser (per AMS 1526): (40, 60 and 90). Use a non-metal soft bristle brush to remove any heavy dirt and grease deposits. Rinse parts thoroughly with water heated to 160° to 180°F (71° to 82°C) and dry the parts thoroughly to remove all traces of moisture.

CLEANING

C. Clean the Parts with Non-Metallic Components

(1) Wipe the following components with a clean soft cloth dampened in a mild soap and water solution, then dry thoroughly.

- The grease seals (80) which have a bonded nitrile material
- The inflation valve (70) which has a rubber grommet

D. Remove the Protective Coatings of the Magnesium Wheel Halves (35, 55) and Aluminum Fairing (100)

SAFETY WARNING: DUE TO THE TOXICITY AND VOLATILITY OF CHEMICAL STRIPPING SOLVENTS, THEY ARE A HEALTH CONCERN AND NOT A RECOMMENDED SOURCE OF PROTECTIVE COATING REMOVAL.

CAUTION: IN ADDITION TO REMOVING THE COATING, THE PLASTIC MEDIA WILL ALSO REMOVE ANY NAMEPLATES THAT ARE ATTACHED (45) AND THE NAMEPLATE WILL REQUIRE REPLACEMENT. REFER TO IPL FIGURE 1 FOR THE NAMEPLATE PART NUMBER.

NOTES:

- Removal of the protective coating (primer and topcoat) is necessary when doing the liquid penetrant inspection of the wheel halves.
- To achieve best results, always refer to the manufacturer's instructions for use and disposal of blast media.

(1) Clean the parts in accordance with paragraph 2.B.

(2) Blast the parts per MIL-STD-1504 with plastic media per MIL-P-85891, Type II or V, Grade 20/30, maximum media hardness of 3.5 MOH.

E. Protective Coating and Corrosion Removal for the Steel Brake Disc (30)

SAFETY WARNING: DUE TO THE TOXICITY AND VOLATILITY OF CHEMICAL STRIPPING SOLVENTS, THEY ARE A HEALTH CONCERN AND NOT A RECOMMENDED SOURCE OF PROTECTIVE COATING REMOVAL.

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

(1) Clean the parts in accordance with paragraph 2.A.

(2) Abrasive blast the disc per MIL-STD-1504 with 80 grit aluminum oxide media.

CHECKS

1. General

Refer to IPL Figure 1 to identify the wheel assembly components.

After a check is performed on a component, refer to the REPAIR section for applicable repairs.

Refer to Table 1 Maintenance Schedule for a timetable of scheduled maintenance tasks for the wheel assembly components. All parts must be cleaned before examination. Refer to the CLEANING section.

WARNING: PUT ON PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

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 Checks Equipment and Consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Inspection surface plate	Not required	Commercial
Magnifier	X10 magnification	Commercial
Vernier dial calipers	Not required	Commercial
Magnetic particle inspection equipment	ASTM E1444	Commercial
Liquid penetrant inspection equipment	ASTM E1417 or MIL-STD-6866, Type 1, Method A, Sensitivity Level 2	Commercial

B. Visual Examination

Examine all of the parts for cuts, tears, cracks, breaks, nicks, scratches, gouges, corrosion, wear, distortion, scoring, stripped or crossed threads and other damage. Replace a part that is cracked, has thread damage, is worn beyond limits, has exceeded allowable repair or is not a repairable or reworkable part.

CHECKS

SAFETY WARNING: THIS ASSEMBLY CONTAINS PARTS THAT HAVE A CADMIUM PLATING FINISH (5, 10, 15, 20, AND 90). REMOVING THE CADMIUM PLATING CAN CREATE EXPOSURE TO CADMIUM DUST AND CADMIUM COMPOUNDS. THIS CAN BE A HEALTH HAZARD. USE APPROPRIATE SAFETY PRECAUTIONS.

2. Detailed Examination

A. Examine the hardware listed below.

CAUTION: REPAIR OR REWORK OF HARDWARE IS NOT ALLOWED.

(1) Examine the bolts (5) for distortion, cracks, corrosion, or thread damage. Closely examine for cracks in the radius under the bolt head and in the threaded area next to the bolt shank. Use magnetic particle inspection (ASTM E1444).

NOTE: If one or more of the bolts are damaged, then replace all of the bolts.

(2) Examine the washers (10, 20) for corrosion, distortion or other signs of functional damage.

(3) Examine the nuts (15) 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, it should be replaced.

NOTE: If one or more of the nuts are damaged, then replace all of the nuts.

(4) Examine the snap rings (85) for distortion, cracks, nicks, burrs, pitting, corrosion, or other signs of functional damage.

(5) Examine the hubcap (90) for distortion, cracks, nicks, burrs, pitting, corrosion, or other signs of functional damage.

B. Examine the Bearing Cups (45) and Cones (75)

NOTE: The bearing cups (45) are pressed into the hub of the wheel halves (40, 60). They should not be removed unless replacement is necessary because of damage or loose fit or for a more thorough inspection of the wheel. Refer to the REPAIR section for cup removal.

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

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

CHECKS

(3) Examine the bearing cone cage for dents or distortion, and for wear of the roller pocket sides, corners and ends.

NOTE: [1] Refer to the bearing manufacturer's manual for more instruction.

C. Examine the Brake Disc (30)

Refer to Figure 1, DESCRIPTION AND OPERATION section and examine for mininum flange thickness and warpage. Replace the disc when the flange is worn to 0.385 inch (9,78 mm). Replace if warpage exceeds 0.015 inch (0,381 mm).

D. Examine the Grease Seal (80)

Examine for cuts, nicks, distortion, and other damage. Examine the rubber to metal bond. Replace the seal if there is a tear in the rubber to metal bond or if the rubber is cracked.

E. Examine the Inflation Valve (70)

Examine the threads and replace if there is thread damage. Examine the rubber grommet on the inflation valve. Replace the inflation valve if the rubber grommet has tears or is cracked.

F. Examine the Wheel Halves (40 and 60)

SAFETY WARNING: MAKE SURE THAT THE AREA WHERE YOU WILL USE THE LIQUID PENETRANT FLUID HAS GOOD AIRFLOW. DO NOT TOUCH OR GET FLUID ON YOUR BODY AND DO NOT BREATH VAPORS. KEEP CONTAINERS COVERED WHEN NOT IN USE. LIQUID PENETRANT FLUID CAN BE TOXIC AND EXPLOSIVE.

(1) Examine the exterior surface for missing paint caused by erosion or wear.

(2) Examine the wheel halves for surface cracks, nicks, corrosion, or other damage.

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

(3) Examine the inboard and outboard wheel half register grooves. Examine for burrs, corrosion, or other raised edges. Replace the wheel half if damage to the register areas can cause damage to the preformed (25) packing or prevent a good seal.

(4) Examine the sealing surface of the inflation valve. Examine for corrosion, burrs, or other raised edges that could damage the rubber grommet on the inflation valve and cause leakage.

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

CHECKS

(5) When it is necessary to examine the wheel half for cracks at the surface use Liquid Penetrant Inspection.

NOTE: The paint must be removed from the part when using liquid penetrant inspection methods. Refer to the CLEANING section for paint removal and cleaning instructions.

(6) Refer to Figure 5001. Examine the wheel half for cracks and structural damage. Examine these areas carefully to find out if the wheel is serviceable:

NOTE: These cracks may not be visible without the aid of penetrant inspection. Any cracks are cause for replacement.

- Tire bead seat area on the inboard and outboard wheel halves

  NOTE: The tire bead seat area can be damaged by tools that are used to remove the tires.

- The bolt bosses on the inboard and outboard wheel halves
- The inflation valve area on the outboard wheel half

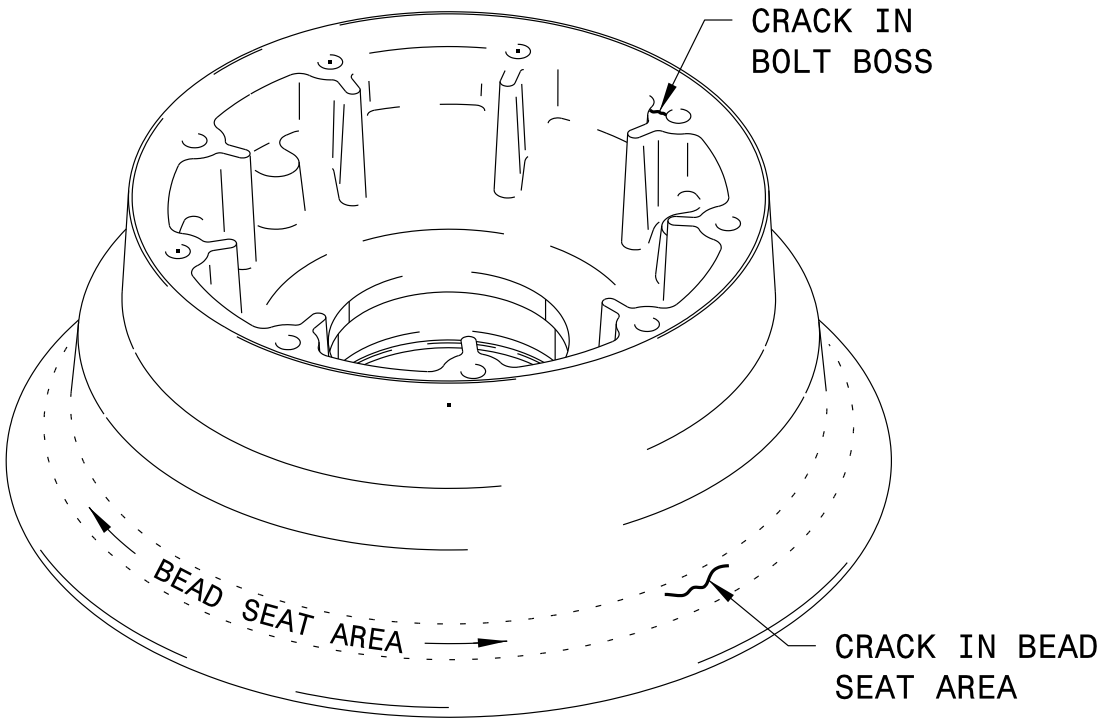


Figure 5001 Wheel Half Examination

REPAIR

1. General

Refer to IPL Figure 1 to identify the wheel assembly components.

WARNING: PUT ON PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

NOTE: Repairs are limited to the components listed in this section. All remaining components must be replaced.

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 Repair Equipment and Consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Aluminum oxide cloth	400 to 600 grade or finer, wet or dry	Commercial
Corrosion preventative treatment for items (40, 60)	MIL-C-5541, Class 1A (Alodine 1200 or equivalent)	Commercial
Sub-zero freezer or dry ice	-30°F to –60°F (-34°C to –51°C)	Commercial
Oven	250°F capacity (121°C)	Commercial
Bearing cup tools	SPECIAL EQUIPMENT AND TOOLS section	Fabrication
Arbor press	Not required	Commercial
Paint application equipment	Not required	Commercial
Primer and topcoat for items (40, 60)	Refer to Table 6002	Commercial
Primer and topcoat for item (30)	Refer to Table 6003	Commercial
Primer for bearing cup install	MIL-PRF-23377	Deft Chemical Coatings
		PPG Aerospace
Bearing grease	Mobil Aviation Grease SHC 100 (equiv. alternatives are not allowed)	Exxon-Mobil Oil Company, Aviation Lubricants

REPAIR

CAUTIONS:

- 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 MAGNESIUM COMPONENTS AND WILL CAUSE CORROSION.
- REPAIR OF THREADED SURFACES IS NOT PERMITTED
- THE FOLLOWING COMPONENTS ARE NOT REPAIRABLE:
  - GREASE SEALS (80) AND SNAP RINGS (85)
  - BEARING CUPS AND CONES (45, 75)
  - THE FOLLOWING HARDWARE: (5, 10, 15, 20, 70, 90)

    NOTE: It is good practice to replace hardware that has had the protective coating (plating) worn away or damaged.

2. Detailed Repairs

A. Repair the Wheel Halves (40 and 60)
The wheel halves are made from magnesium alloy castings.

Remove all corrosion and surface damage from the wheel halves. Use fine, wet or dry aluminum oxide cloth for polishing. Refer to the limits shown in this paragraph and Figure 6001. Unless otherwise specified, surface finish of repaired surfaces should not exceed a roughness of 150 rms.

(1) In area 1, polish out corrosion pits and scratches to 0.015 inch (0,38 mm) deep and 0.50 inch (12,70 mm) long. Surface finish not to exceed 20 microinches rms.

(2a) In area 2a, blend out and polish imperfections to 0.030 inch (0,76 mm) deep and 1 inch (25,4 mm) long. Reworked area is not to exceed 1.00 $inch^2$ (25,4 mm^2). Do not remove material if surface directly opposite was previously reworked. Surface finish not to exceed 32 microinches rms.

(2b) In area 2b, blend out and polish imperfections to 0.030 inch (0,76 mm) deep and 1 inch (25,4 mm) long. Reworked area is not to exceed 1.00 $inch^2$ (25,4 mm^2). Do not remove material if surface directly opposite was previously reworked.

(3) In area 3, blend out and polish imperfections to 0.030 inch (0,76 mm) deep and 1.00 $inch^2$ 25,4 mm^2).

(4) In area 4, polish out imperfections to 0.010 inch (0,25 mm) deep in register area, provided sealing qualities are maintained.

(5) In area 5, blend out and polish imperfections to 0.030 inch (0,76 mm) deep and 1.00 $inch^2$ (25,4 mm^2).

(6) In area 6, rework is limited to 0.040 inch (1,01 mm) deep and 0.50 $inch^2$ (12,7 mm^2) at a maximum of two places.

REPAIR

(7) In area 7, rework is limited to blending out scratches and corrosion, provided bearing cup retention is not affected.

(8) In area 8, rework is limited to 0.010 inch (0,25 mm) maximum depth on face of each bolt boss.

(9) In area 9, the maximum repair is 0.010 inch (0,25 mm) deep and 0.50 inch^2 (12,7 mm^2) on each interface boss.

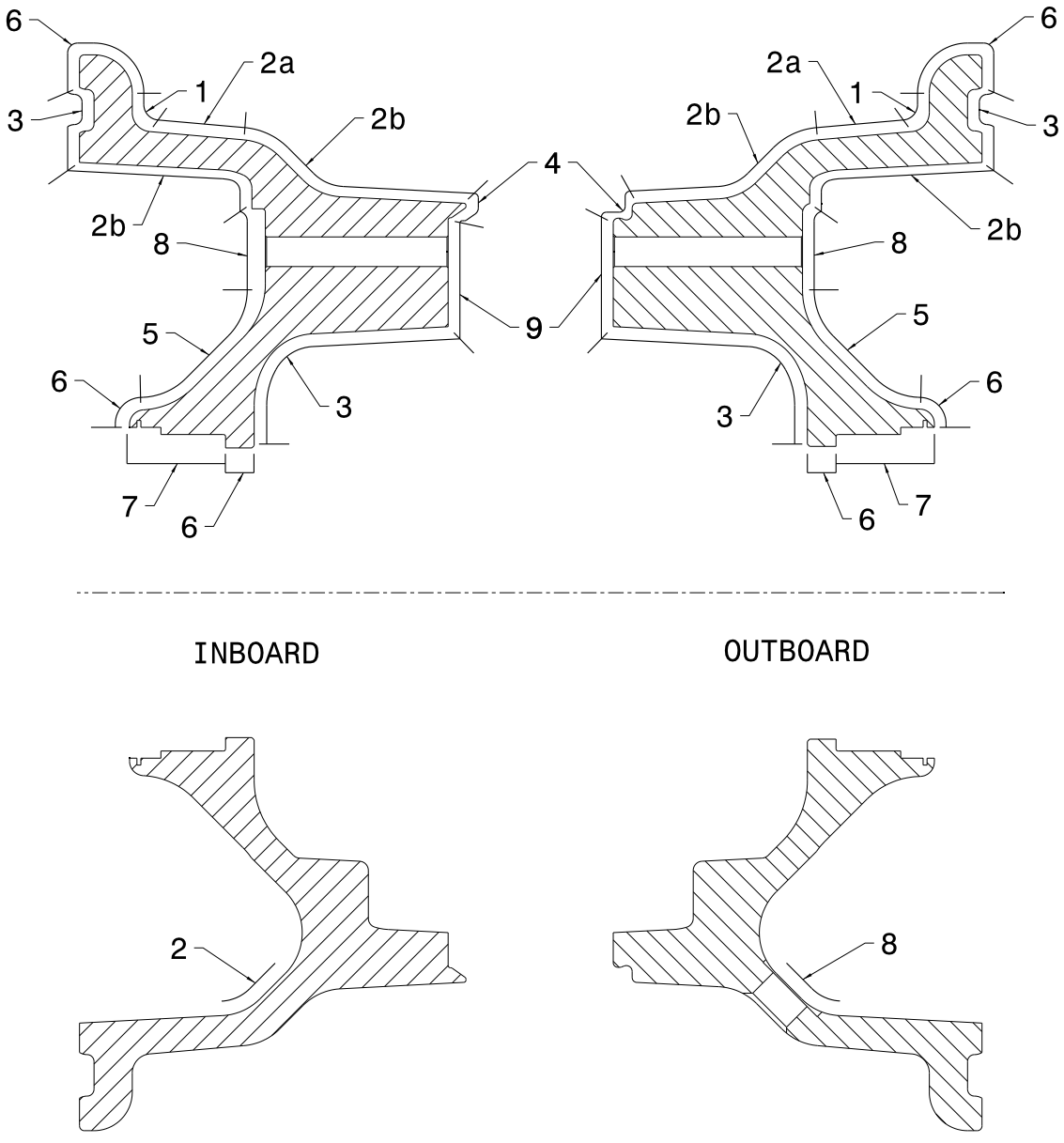


Figure 6001 Wheel Half Repair Limits

REPAIR

SAFETY WARNING: WEAR PROTECTIVE CLOTHING. SURFACE TREAMENT SOLUTIONS CAN BE TOXIC AND VOLATILE. FOLLOW THE MANUFACTURERS INSTRUCTIONS FOR MIXING, APPLYING AND FOR ALL SAFETY INSTRUCTIONS.

(10) Clean and surface treat the repaired areas

(a) Clean the wheel halves. Refer to the CLEANING section.

(b) Surface treat the repaired areas with corrosion preventative (Iridite 15 or equivalent). Refer to MIL-M-3171, Type VI. Allow to dry completely.

B. Apply Protective Coating to the Wheel Halves (40 and 60)

SAFETY WARNING: WEAR PROTECTIVE CLOTHING. COATING MATERIALS CAN BE TOXIC AND VOLATILE. FOLLOW THE MANUFACTURERS INSTRUCTIONS FOR ALL SAFETY INSTRUCTIONS.

(1) Ensure that the part is clean.

(2) Mask the wheel halves per Figures 6002 and 6003.

REPAIR

(3) Apply the primer and topcoat per Table 6002.

NOTE: To achieve best results, always refer to the manufacturer's instructions for mixing, application and use; for forced dry (heat accelerated cure) schedule and for disposal of primer and topcoat media.

Table 6002 Wheel Half Primer and Topcoat Product Specifications

PRIMER	TOPCOAT	DRY FILM THICKNESS AND DRYING TIME (AIR)
Deft Chemical Coatings Irvine, CA	Columbia Paint Corp. Huntington, WV	
P/N 44-GN-36 Components A and B MIL-PRF-85582D, Type 1, Class C2	P/N 17-250A (524 silver) (water reducible) No mixing required.	Primer: 0.0006-0.0009 inch 1 hour min. (to touch, mask, or topcoat) 4 to 6 hours (to stack) 14 days min. (hard cure)
		Topcoat (including primer): 0.0008-0.0014 inch 15 minutes (to touch) 30 minutes (to handle) 48 hours (dry hard)

Alternate Wheel Half Primer and Topcoat Product Specifications		
PRIMER	TOPCOAT	DRY FILM THICKNESS AND DRYING TIME (AIR)
Sherwin Williams Co., Cleveland, OH		
2 parts washcoat (P/N P60G2) 3 parts catalyst reducer (P/N R7K44)	P/N F63BXS58-4337 (silver) 6 parts base 1 part catalyst (P/N V66V27)	Primer: 0.0002-0.0004 inch 3-10 minutes (to touch) 10-15 minutes (tack free) 10-60 minutes (to topcoat)
		Topcoat (including primer): 0.0008-0.0014 inhc 20 minutes (to touch) 60 minutes (to handle) 24 hours (dry hard)

REPAIR

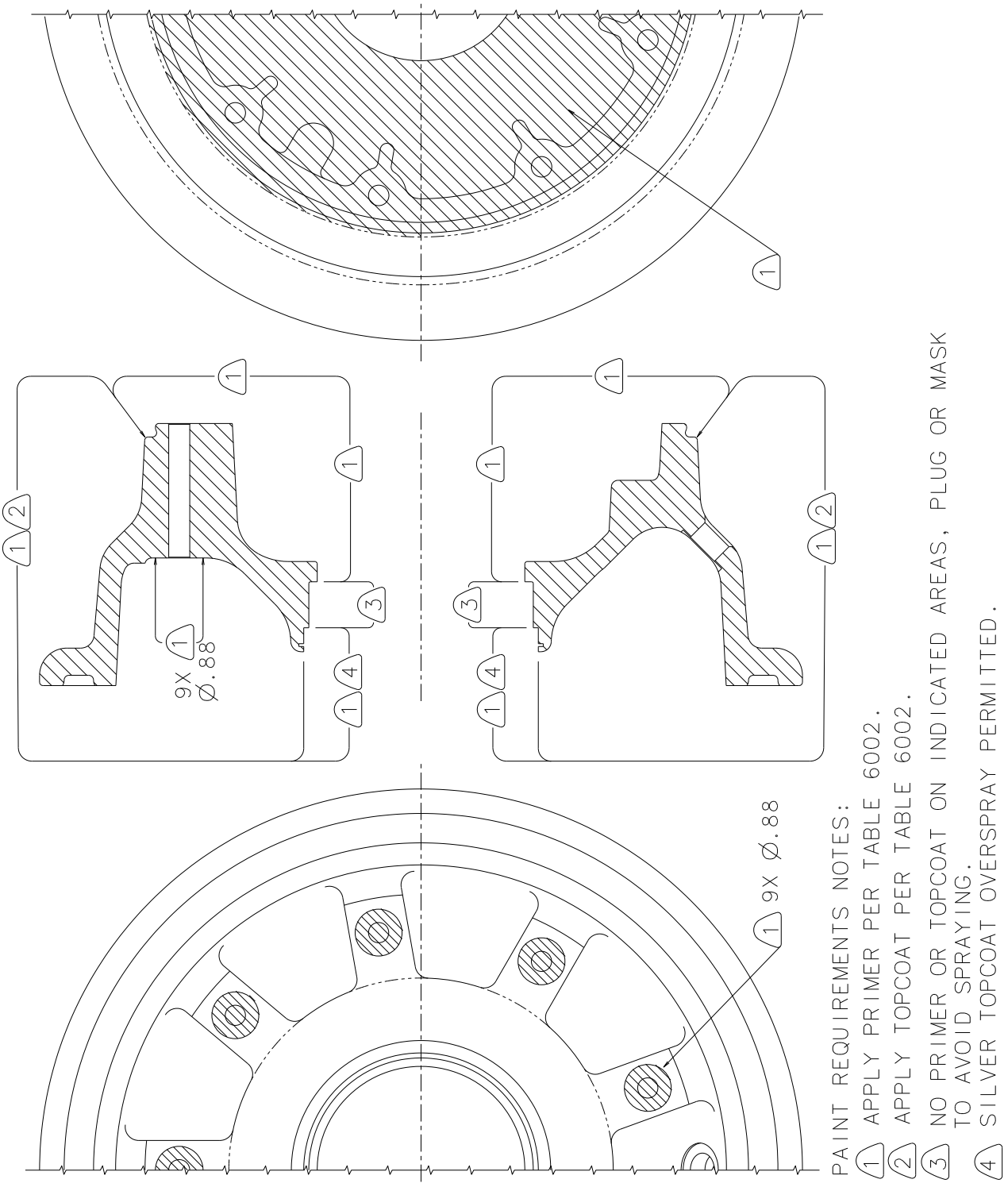


Figure 6002 Mask the Outboard Wheel Half (60)

REPAIR

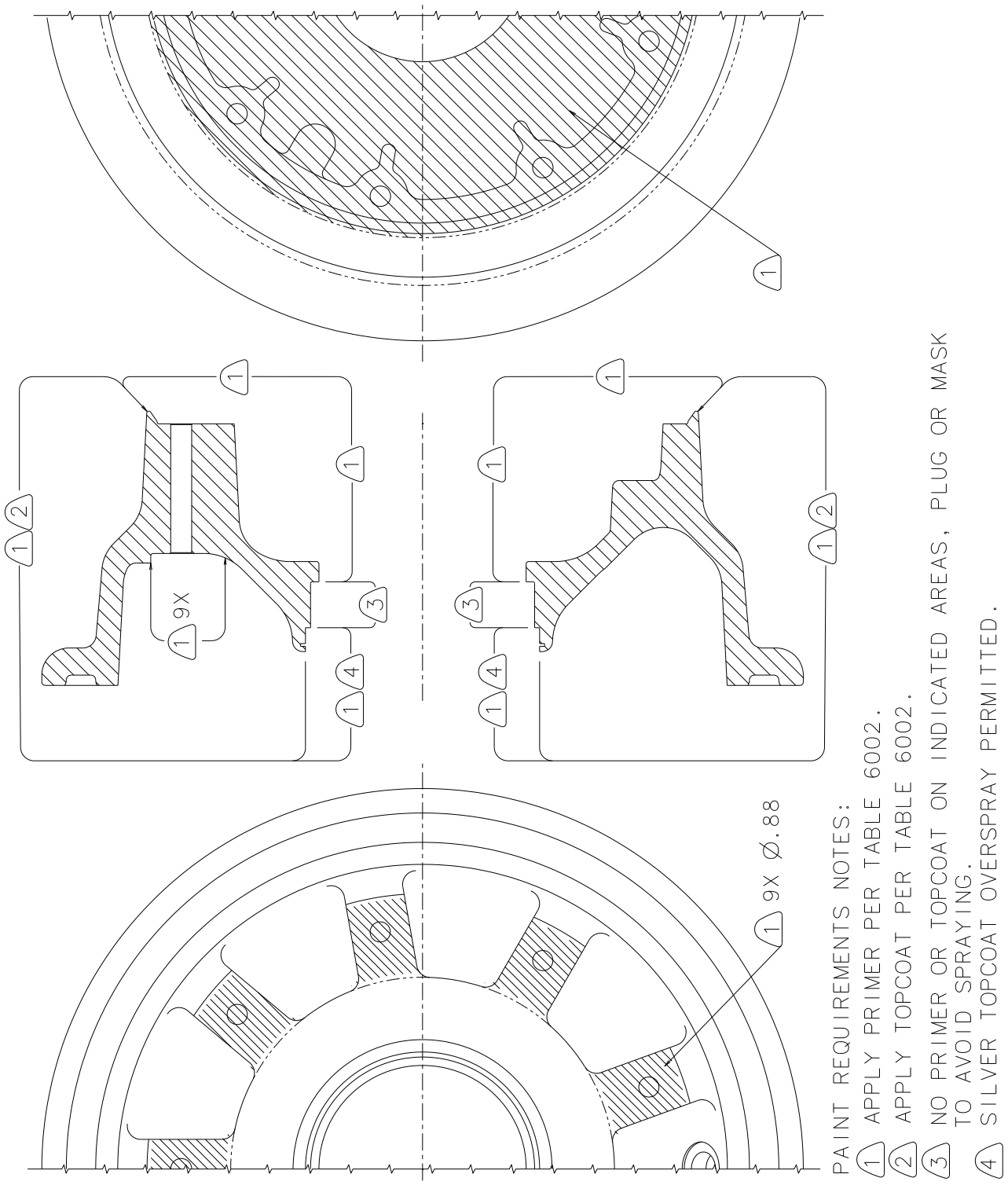


Figure 6003 Mask the Inboard Wheel Half (40)

REPAIR

C. Replace the Bearing Cups (45)

The bearing cups are pressed into the hub of the wheel halves (40, 60). Do not remove them unless replacement is necessary. Replacement will be necessary if the bearing cups are damaged or if a more thorough inspection of the wheel is to be made.

WARNING: PUT ON PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK. DRY ICE AND HOT PARTS CAN BE THE CAUSE OF INJURY.

CAUTIONS:

- WORK SWIFTLY. THERMAL EXPANSION AND CONTRACTION OF PARTS WILL AFFECT THE INSTALLATION PROCESS.
- DO NOT HEAT WHEEL HALF ABOVE 200° F (93.3° C).
- 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.

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

(1) Removal

Refer to Figure 6004 and remove the bearing cups using the following procedure.

NOTE: Oven heating is the preferred method for heating the wheel half. If oven heating is not possible, use a container of clean, boiling water.

(a) Heat one of the wheel halves (40 or 60) to 175 to 200° F (79 to 93.3° C). Do not heat the wheel half for more than 30 minutes.

(b) Remove the cup from the bore by tapping it out evenly with a fiber or phenolic punch, or fabricate a bearing cup removal tool. Use the tool by hand or adapt to an arbor press.

(c) Repeat for the remaining wheel half.

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

REPAIR

(2) Installation
Refer to Figure 6004 and install the bearing cups using the following procedure.

NOTE: The installation of the bearing cup is made easier when the temperature of the bearing cup is reduced.

(a) Make sure that the bearing bores and the bearing cups are clean and free of burrs.

(b) Before installing, use a sub zero freezer or dry ice and chill the bearing cups to between -30° to -60°F (-34° to -51°C).

(c) Remove the bearing cup from the freezer or the dry ice.

(d) Dry the bearing cups to remove condensation.

NOTE: Do not let the primer coating dry before installing the bearing cup.

(e) Apply a coat of MIL-PRF-23377 primer to the bearing bore surface where the bearing cup will be installed. This will help prevent corrosion.

(f) Fabricate a bearing cup installation tool and hand press the bearing cup into the bore. Apply even pressure and make sure that the back face of the bearing cup is flush against the surface (shoulder) of the bearing bore.

(g) See Figure 6004. 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 bearing 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.

(h) Wipe off excess primer and let the wheel half cool to room temperature.

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

(j) Repeat steps for the remaining wheel half.

REPAIR

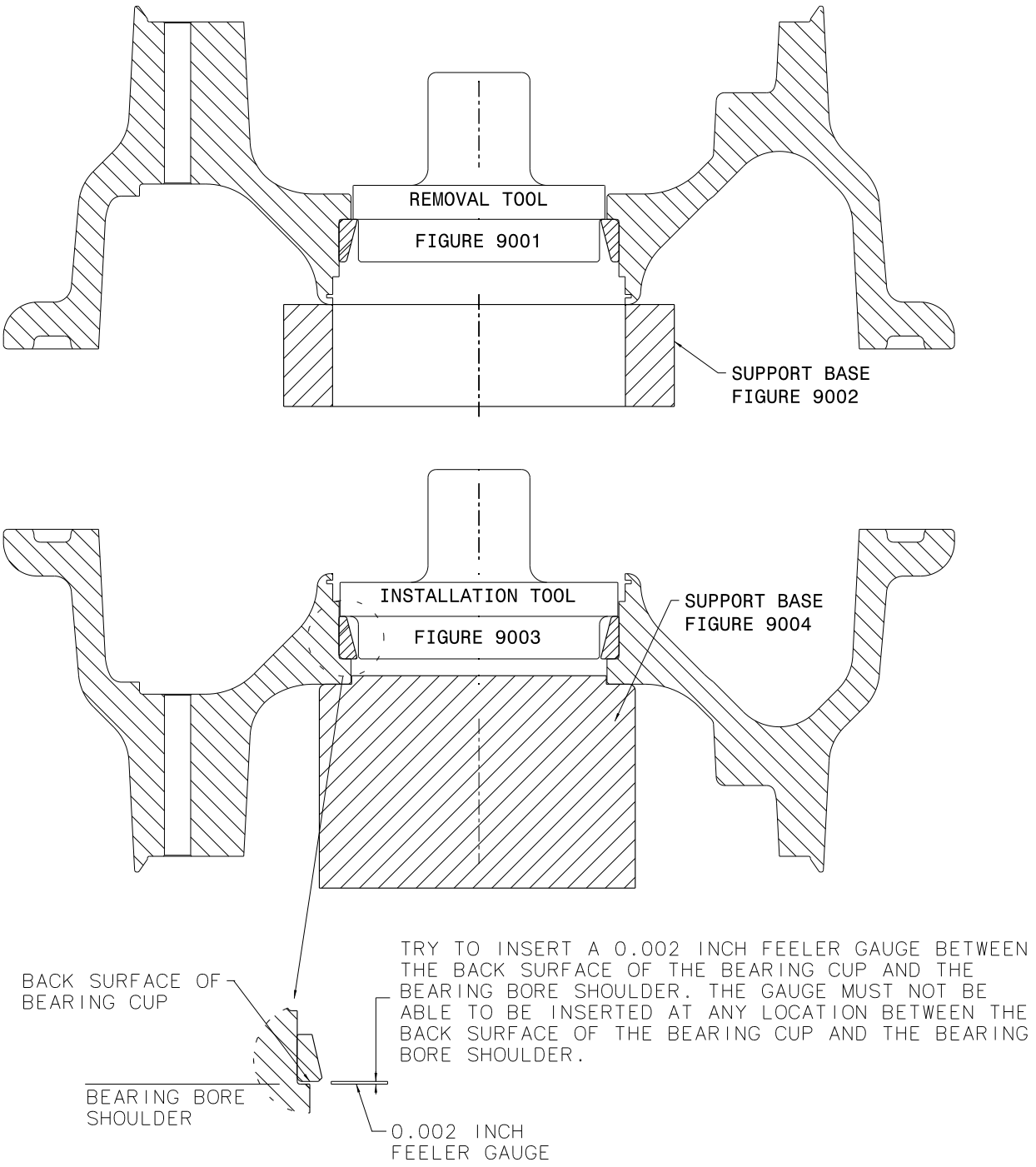


Figure 6004 Bearing Cup Replacement

REPAIR

D. Apply Protective Coating to the Brake Disc (30)
The brake disc is made from alloy steel.

SAFETY WARNING: WEAR PROTECTIVE CLOTHING. COATING MATERIALS CAN BE TOXIC AND VOLATILE. FOLLOW THE MANUFACTURERS INSTRUCTIONS FOR ALL SAFETY INSTRUCTIONS.

(1) Sandblast or use a wire wheel to remove corrosion and pitting.

(2) Clean the brake disc. Refer to the CLEANING section.

(3) Mask the brake disc per Figure 6005.

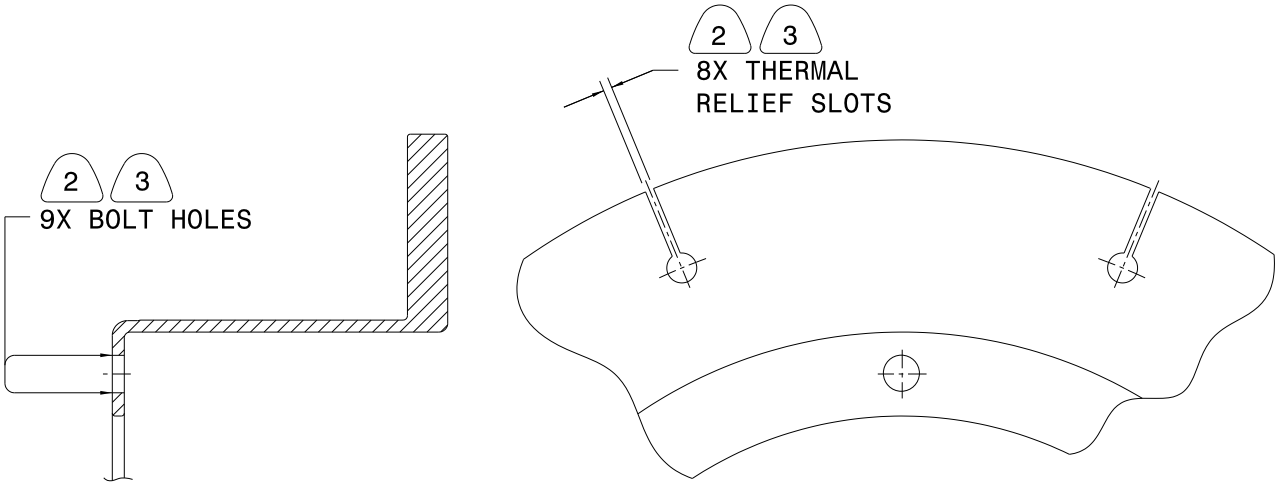
(4) Apply the primer and topcoat per Table 6003. Apply to the entire part.

NOTE: To achieve best results, always refer to the manufacturer's instructions for mixing, application and use; for forced dry (heat accelerated cure) schedule and for disposal of primer and topcoat media.

Table 6003 Disc Primer and Topcoat Product Specifications

PRIMER	TOPCOAT	DRY FILM THICKNESS AND DRY TIME (AIR)
Columbia Paint Corp., Huntington, WV		
P/N 18-017A (water reducible) No mixing required.	P/N 17-250A (524 Aluminum) (water reducible) No mixing required.	P/N 18-017A Primer: 0.0002-0.0005 inch 15 minutes min. (to touch or topcoat) 60 minutes (to handle) 4-24 hours (dry hard)
P/N 12-231A (alternate) (water reducible) No mixing required.		P/N 12-231A Primer: 0.0002-0.0005 in. 15 minutes min. (to touch or topcoat) 30 minutes (to handle) 2-4 hours (dry hard)
		Topcoat (including primer): 0.0008-0.0014 inch 15 minutes (to touch) 30 minutes (to handle) 48 hours (dry hard)
Alternate: Sherwin Williams Co., Cleveland, OH		
2 parts washcoat (P/N P60G2) 3 parts catalyst reducer (P/N R7K44)	P/N F63BXS58-4337 (silver) 6 parts base 1 part catalyst (P/N V66V27)	Primer: 0.0002-0.0004 in. 3-10 minutes (to touch) 10-15 minutes (tack free) 10-60 minutes (to topcoat)
		Topcoat (including primer): 0.0008-0.0014 inch 20 minutes (to touch) 60 minutes (to handle) Overnight (dry hard)

REPAIR



NOTES:

1. APPLY PRIMER AND TOPCOAT TO ALL SURFACES EXCEPT AS NOTED. USE THE PRODUCTS LISTED IN TABLE 6003.

2. APPLY PRIMER ONLY (NO TOPCOAT) TO THESE SURFACES.

3. TOPCOAT OVERSPRAY PERMITTED.

Figure 6005 Mask the Brake Disc (30)

ASSEMBLY

1. General

Refer to IPL Figure 1 to identify the wheel assembly components.

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

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 Assembly Equipment and Consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Bearing grease	Mobil Aviation Grease SHC 100 (equiv. alternatives are not allowed)	Exxon-Mobil Oil Company, Aviation Lubricants
O-Ring lubricant	Dow Corning 55 lube (equiv. alternatives are not allowed)	Dow Corning Corporation
Anti-seize compound	SAE-AMS-2518 (MIL-T-5544) (equiv. alternatives are not allowed)	Armite Laboratories or Royal Lubricants Company
Clean cloths	Lint free	Commercial
Soap solution	Mild dishwashing liquid	Commercial
Preformed packing tool set	P/N 199-18	Parker Hannifin Corp., Aircraft Wheel & Brake Division or Parker Hannifin distributor
Standard tools (inch units)	• 12pt external: items (5) and (15) • hex head external: item (70) • torque gauge • tire pressure gauge	Commercial
Inflation cage	Not required	Commercial
Dry nitrogen	Not required	Commercial

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.

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

(1) If necessary, clean the bearing cones. 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.

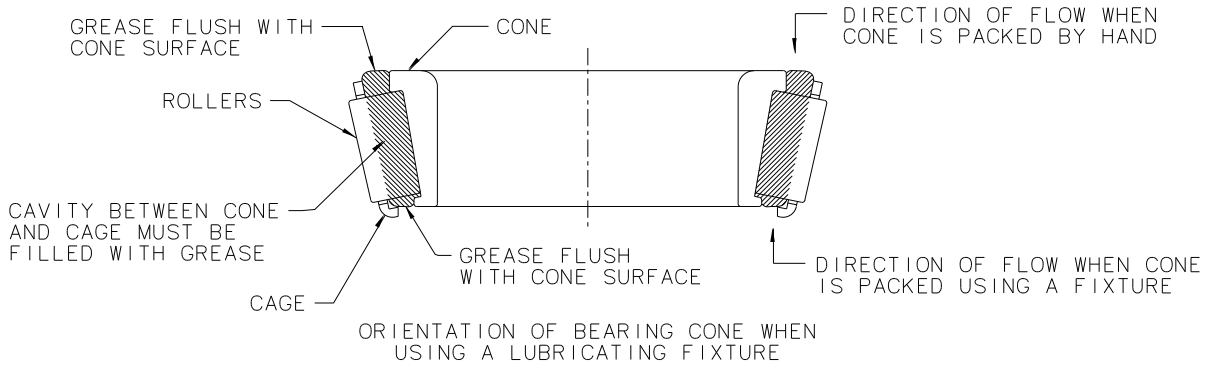


Figure 7001 Pack the Bearing Cones

ASSEMBLY

2. Assembly Procedures

A. Wheel and Tire Pre-Assembly Preparation

(1) Examine the bead seat area of the wheel halves. If necessary, remove all lubricant, grease or foreign material with a clean cloth moistened with a mild soap and water solution or with denatured alcohol.

(2) 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 or sealing.

B. Tire Mounting (Tubeless Tires)

(1) The preformed packing groove in each wheel half should be examined for damage or other debris that would prevent the packing 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.

(2) Install the inflation valve (70) in the outboard wheel half (60). Tighten the valve nut to 60 to 80 lb-in (6,8 to 9,0 N-m), dry torque.

(3) Position the outboard wheel half (60) with the register side facing up.

(4) Examine the wheel register preformed packing (25) for damage. Replace if necessary.

(a) Apply a light coat of Dow Corning 55 O-ring lube to the preformed packing.

CAUTION: THE PREFORMED PACKING (25) MUST BE INSTALLED UNIFORMLY. IT SHOULD BE FREE OF KINKS AND TWISTS.

(b) Install the preformed packing in the wheel register groove of the outboard wheel half (60).

(5) Use the correct tire specified for the wheel assembly. Make sure that the tire is clean inside. If it is not cean, then wipe the bead base with a clean cloth moistened with a mild dishwashing soap and water solution or a suitable rubber cleaner.

(6) Position the tire over the outboard wheel half being careful not to disturb the preformed packing (25).

(7) Position the inboard wheel half (40) inside the tire and align the bolt holes of both wheel halves.

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

(a) If there is no balance dot on the tire.

1 Align the tire serial number with the inflation valve.

(9) Continue to paragraph D. Attach the Wheel Half Haves (40) and (60)

ASSEMBLY

C. Tire Mounting (Tube Type Tires)

(1) Use the correct tire and tube specified for the wheel assembly. Make sure that the tire is clean inside. If it is not cean, then wipe the bead base with a clean cloth moistened with a mild dishwashing soap and water solution or a suitable rubber cleaner.

NOTE: A new tube should be used when installing a new tire.

(2) After the inside of the tire has been cleaned, lubricate lightly with tire talc.

(3) Inflate the tube with dry nitrogen to slightly round, and insert in the tire. The tube heavy spot is indicated by a painted yellow stripe about ½ inch wide by 2 inches long. Align the stripe on the tube with the tire red balance dot. If the tube has no balance mark, align the tube valve with the tire red balance dot.

(4) Position the tire on the outboard wheel half, inserting the valve stem through the valve hole in the wheel.

(5) Position the inboard wheel half inside the tire, aligning as necessary to clear the valve stem and align the bolt holes of both wheel halves.

(6) Continue to paragraph D. Attach the Wheel Half Haves (40) and (60)

D. Attach the Wheel Half Halves (40) and (60)

NOTE: Lubricate hardware as needed just prior to installing.

(1) Refer to Figure 7002 and lubricate the hardware with the anti-seize compound listed in Table 7001.

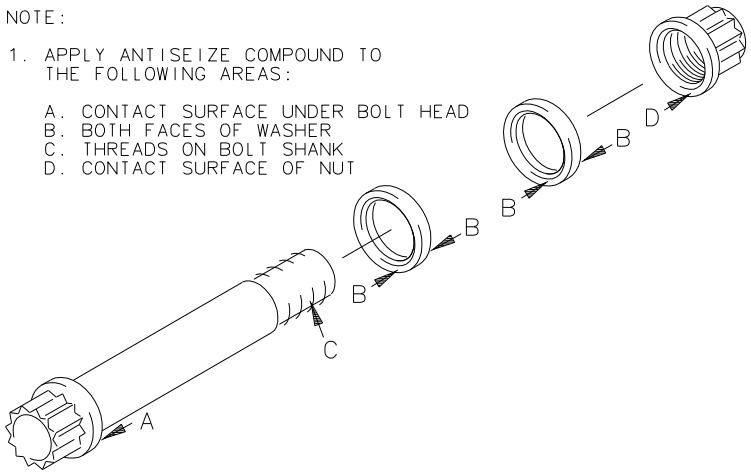


Figure 7002 Apply Anti-Seize Compound

ASSEMBLY

(2) Install a washer (10) onto each bolt (5).

NOTE: The nuts (15) must be located on the outboard wheel half side.

(3) Install the brake disc (30) in the inboard wheel half (40) aligning the bolt holes, then install the following equally spaced: a minimum of three bolts (5) [with washers (10)].

(a) Compress the wheel halves and install a washer (20) and nut (15) on each bolt. Tighten the nuts by hand as far as possible.

(4) Repeat steps for the remaining bolts, washers and nuts.

CAUTION: DO NOT USE IMPACT OR POWER WRENCHES TO TORQUE THE WHEEL NUTS AND BOLTS. THE USE OF IMPACT OR POWER WRENCHES CAN CAUSE OVER TIGHTENING.

NOTE: The fasteners must be tightened by applying the torque to the nut while holding the bolt head.

(5) The nuts should first be snugged in a criss-cross pattern to seat the flange.

(6) The final torque value for the nuts is 300 lb-in (33,9 N-m).

E. Testing

(1) To limit disassembly and assembly procedures due to examination troubleshooting or replacement of parts, the following parts do not need to be installed until the 24 hour pressure retention test is successfully performed:

- inboard bearing cone (75)
- Inboard grease seal (80)
- Inboard snap ring (85)

NOTE: The outboard bearing cone (75), grease seal (80), hubcap (90) and snap ring (85) will be installed after the wheel/tire assembly is mounted on the aircraft.

(2) Test the wheel/tire assembly. Refer to the TESTING AND FAULT ISOLATION section.

ASSEMBLY

F. Final Assembly of the Wheel

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

(1) Place the wheel/tire on a clean surface.

NOTE: Make sure the bearing cones (75) have been packed with clean grease.

(2) Before installing the inboard bearing cone, apply a light coat of wheel bearing grease to the following:

- Exposed surfaces of the inboard bearing cup (45).
- The molded rubber of the grease seal (80).

(3) Install a bearing cone (75) in the inboard wheel half (40) and then install the following in the hub of the inboard wheel half:

- A grease seal (80).
- A snap ring (85). Install the end of the snap ring into the groove in the hub of the inboard wheel half and wind or spiral the ring into the groove.

G. Install the Wheel/Tire Assembly on the Aircraft

(1) Before installing the outboard bearing cone, apply a light coat of wheel bearing grease to the following:

- Exposed surfaces of the outboard bearing cup (45).
- The molded rubber of the grease seal (80).

(2) Install a bearing cone (75) over the axle and into the outboard wheel half.

(3) Install the axle hardware and tighten in accordance with the airframe manufacturer's manual. Make sure the inboard bearing is seated.

(4) Complete the wheel assembly by installing the following in the hub of the outboard wheel half:

- A grease seal (80).
- The hubcap (90).
- A snap ring (85). Install the end of the snap ring into the groove in the hub of the inboard wheel half and wind or spiral the ring into the groove.

(5) Complete the installation by re-attaching the brake assembly back plates to the brake housing with the brake tie bolts. Refer to Figure 3001 and refer to the brake assembly component maintenance manual for specific part identification.

FITS AND CLEARANCES

1. General

Refer to IPL Figure 1 to identify the wheel assembly components.

A. Assembly Wear Limits

Table 8001 In-Service Wear Limits

PART NAME (IPL item number)	FIGURE	WORN AREA DESCRIPTION	WORN DIMENSION
Brake disc (30)	1	Flange thickness	0.385 inch (9,78 mm) minimum
		Warping	0.015 inch (0,38 mm) maximum

B. Assembly Torque Values

Table 8002 Assembly Torque Values

PART NAME (IPL item number)	TORQUE LIMITS
Nuts (15)	300 lb-in (33,9 N-m) final torque. apply anti-seize compound [1]
Inflation valve (70)	60 to 80 lb-in (6,8 to 9,0 N-m), dry torque

[1] **NOTE:** Refer to ASSEMBLY section for applying anti-seize compound to wheel attaching hardware: bolts (5), washers (10, 20), and nuts (15).

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.

Table 9001 List of Manufacturers

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Preformed packing tool set	P/N 199-18	Parker Hannifin Corp. Aircraft Wheel & Brake Div. Avon, OH 44011 USA www.parker.com or Parker Hannifin distributor
Plastic media	MIL-P-85891, Type II or V, Grade 20/30, 3.5 MOH max	U.S. Technology Corporation www.ustechnology.com
Primer and topcoat for items (40, 60)	Primer: P/N 44-GN-36 MIL-PRF-85582D, Type 1, Class C2	Deft Chemical Coatings www.deftfinishes.com
	Topcoat: P/N 17-250A	Columbia Paint Corp. 641 Jackson Ave. Huntington, WV 25728 USA
	Alternate primer: P/N P60G2 Alternate topcoat: P/N F63BXS58-4337	Sherwin Williams Co. www.sherwin-williams.com
Primer and topcoat for item (30)	Primer: P/N 18-017A or 12-231A Topcoat: P/N 17-250A	Columbia Paint Corp. 641 Jackson Ave. Huntington, WV 25728 USA
	Alternate primer P/N P60G2 Alternate topcoat: P/N F63BXS58-4337	Sherwin Williams Co. www.sherwin-williams.com
Primer for item (45) install	MIL-PRF-23377	Deft Chemical Coatings www.deftfinishes.com
		PPG Aerospace www.ppg.com
Bearing grease	Mobil Aviation Grease SHC 100 (equiv. alternatives are not allowed)	Exxon-Mobil Oil Company Aviation Lubricants www.mobil.com
O-Ring lubricant	Dow Corning 55 lube (equiv. alternatives are not allowed)	Dow Corning Corporation www.dowcorning.com
Anti-seize compound	SAE-AMS-2518 (MIL-T-5544) (equiv. alternatives are not allowed)	Armite Laboratories www.armitelabs.com
		Royal Lubricants Company www.anderol.com

SPECIAL EQUIPMENT AND CONSUMABLES

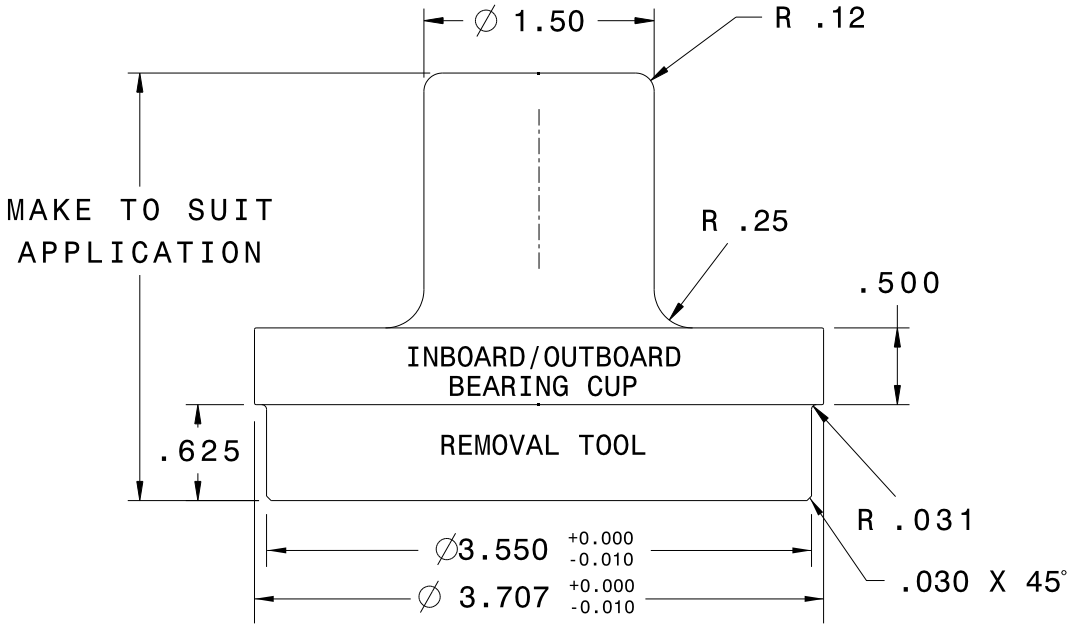


FIGURE 9001

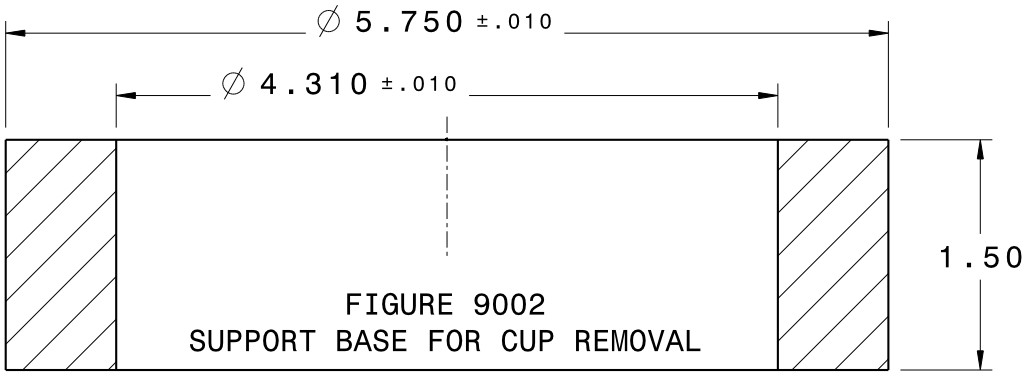


FIGURE 9002
SUPPORT BASE FOR CUP REMOVAL

Notes for Figures 9001 and 9002:

1. Material: 4130 steel or equivalent
   Heat treat to 40-45 Rc
2. Tolerances unless otherwise specified:
   .XXX ± 0.005inch
3. Break unspecified sharp edges
   0.005-0.015 inch

SPECIAL EQUIPMENT AND CONSUMABLES

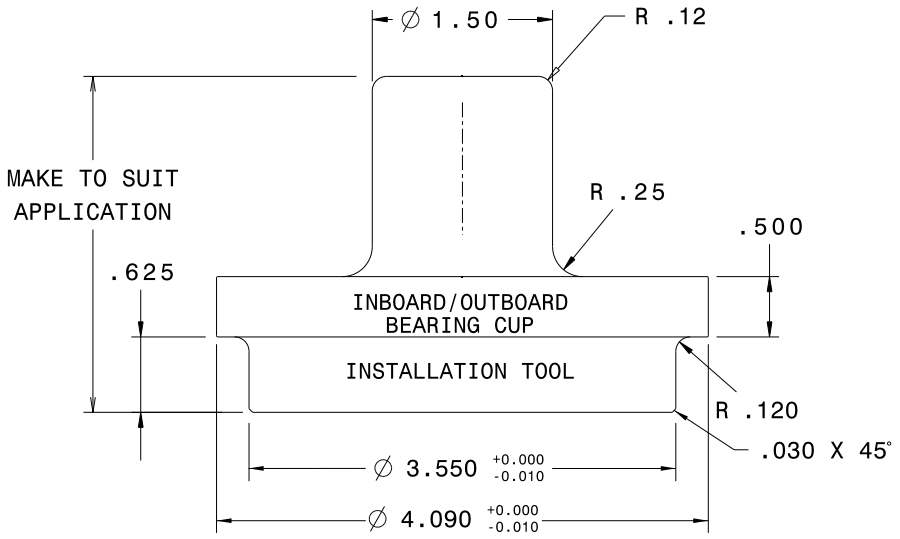


FIGURE 9003

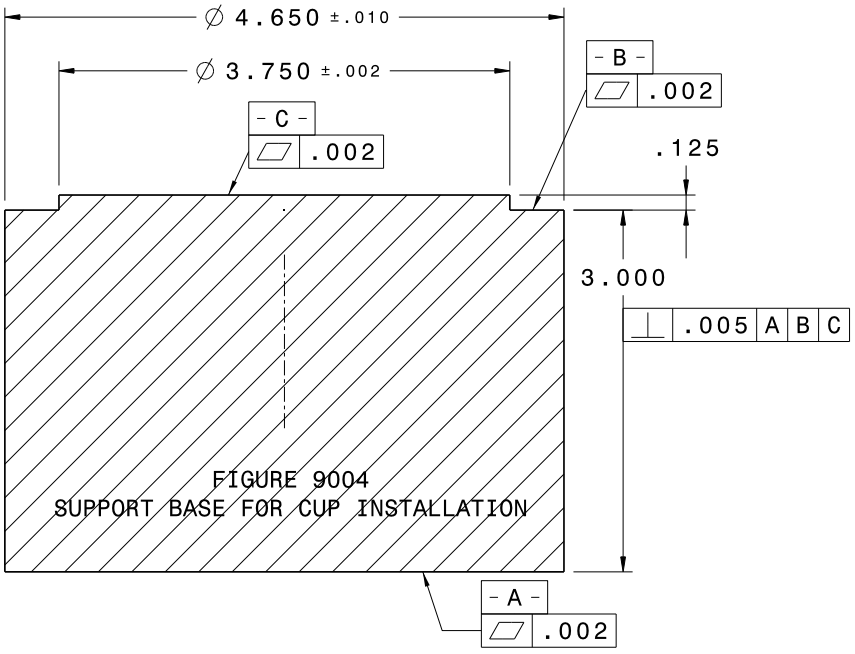


FIGURE 9004
SUPPORT BASE FOR CUP INSTALLATION

Notes for Figures 9003 and 9004:

1. Material: 4130 steel or equivalent
   Heat treat to 40-45 Rc
2. Tolerances unless otherwise specified:
   .XXX ± 0.005inch
3. Break unspecified sharp edges
   0.005-0.015 inch

ILLUSTRATED PARTS LIST

1. General

The illustrated parts list describes and illustrates the detail parts of the brake assembly.

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) Figure/Item column: The figure and item numbers refer to the applicable Illustrated Parts List (IPL) Figure. The first number shows the figure number of the illustration.

(2) Part Number column: This column shows the Parker Hannifin Aircraft Wheel and Brake part number for the individual item.

(3) Airline Stock Number column: This column gives the Airline Stock Number when applicable.

(4) Nomenclature column: This column identifies the parts being listed by noun name followed by modifiers when applicable. The indenting system used in the parts list shows the relationship of the parts to their subassemblies and to the assembly:

1 2 3 4
Assembly
Attaching Parts for Assembly
  Detailed Parts for Assembly
    Subassembly
    Attaching Parts for Subassembly
      Detailed Parts for Subassembly

(5) Effectivity column: An effectivity code shows the difference in parts within different configurations. The effectivity code is used for more than one configuration of the basic part number. Effectivity codes only apply to the figure in which they are used.

(6) Units Per Assembly column: This column shows the total number required for each assembly or for each subassembly as applicable. These abbreviations may appear in the Units Per Assembly column:

AR..... As Required (for bulk items)
NP..... Item is Nonprocurable (listed for reference only)
RF .....Reference (item listed for reference only)

ILLUSTRATED PARTS LIST

B. Part Numbering System

Parker Hannifin Aircraft Wheel & Brake has given a part number to all the purchased and government standard off-the-shelf parts. They are defined and used as follows:

When a purchased part is listed, the Parker Hannifin AWB part number will be used in the part number column. If required by contract or if the original manufacturer of a purchased part has FAA manufacturing approval then; the original manufacturer's part number along with the manufacturer's federal supply code will be shown in parentheses following the part nomenclature. The letter "V" will precede the federal supply code.

Unless specified differently by contract, the assigned Parker Hannifin AWB part number will be used in the part number column to identify 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 in the part number column is replaced by and is not interchangeable with the item number shown in the notation.
Supersedes	SUPSDS	The part in the part number column replaces and is not interchangeable with the item number shown in the notation.
Replaced by	REPLD BY	The part in the part number column is replaced by and interchangeable with the item number shown in the notation.
Replaces	REPLS	The part in the part number column replaces and is interchangeable with the item number shown in the notation.
Vendor	V	Federal Supply Code for vendors.

ILLUSTRATED PARTS LIST

D. Items Not Illustrated

Items not illustrated are shown by a dash (-) in front of the item number in the Figure/Item number column.

E. 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

Alpha variant item numbers are not shown on the exploded view when the appearance and location of the alpha variant item is the same as the basic item.

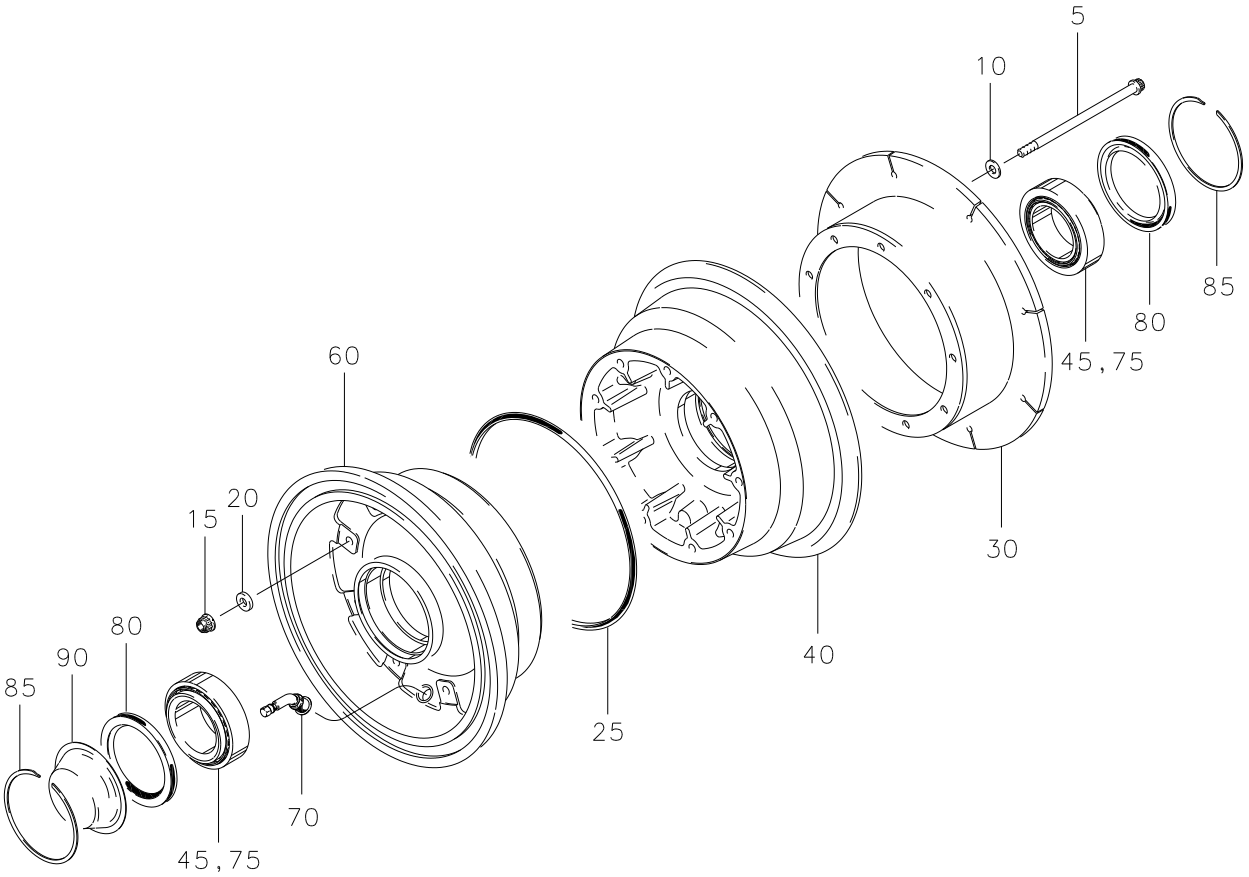
2. Optional Vendor Index

Not applicable.

3. Federal Supply Code for Manufacturers

Not applicable.

ILLUSTRATED PARTS LIST



IPL Figure 1 Main Wheel Assembly Exploded View

ILLUSTRATED PARTS LIST

4. Detailed Parts List – Main Wheel Assembly

FIG. ITEM	PART NUMBER	AIRLINE STOCK NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	EFF CODE	UNITS PER ASSY.
1 -1	040-21101		MAIN WHEEL ASSEMBLY		RF
5	103-32800		. BOLT (MS21250-06080)		9
10	095-03100		. WASHER (MS20002C6) under bolt head		9
15	094-15800		. NUT (NAS1804-6N)		9
20	095-10600		. WASHER (AN960-616) under nut		9
25	101-50272		. PREFORMED PACKING (MS28775-272)		1
30	164-22400		. BRAKE DISC		1
35	161-13301		. SUBASSEMBLY, WHEEL HALF, INBOARD		1
40	151-12901		. . WHEEL HALF, INBOARD		NP
45	214-39412		. . CUP, BEARING		1
– 50	166-19700 [1]		. . NAMEPLATE		1
55	162-12401		. SUBASSEMBLY, WHEEL HALF, OUTBOARD		1
60	152-12901		. . WHEEL HALF, OUTBOARD		NP
45	214-39412		. . CUP, BEARING		1
– 50	166-19700		. . NAMEPLATE		1
– 65	166-20000		. . NAMEPLATE, WARNING		1
70	160-01100		. . VALVE, INFLATION		1
75	214-09200		. CONE, BEARING		2
80	154-03900		. SEAL, GREASE		2
85	155-08300		. RING, SNAP		2
90	158-01700		. HUBCAP		1

[1] Used only when inboard wheel half subassembly is shipped as a spare component.

STORAGE

1. Procedures

Refer to IPL Figure 1 to identify the wheel assembly components.

Wheel assemblies which will not be immediately installed on the aircraft must be properly stored. The storage instructions are for wheels stored without the tires mounted. Acceptable storage conditions are listed below.

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

A. Lubricate the bearing cups (45) and cones (75) with the wheel bearing grease and plug or cover bearing hub areas during storage to prevent contamination.

B. The length of time that a wheel assembly can be stored is governed by the storage life of its elastomer-based components. The storage life may be shortened by exposure to sunlight, extreme temperatures, humidity, ozone, contamination of fluids, severe operating conditions, etc.

C. Store all parts in moisture-barrier material in a clean, dry environment in a temperature range from 50° to 70°F (10° to 21°C). Exposure to extreme temperatures can affect service life.

Component Maintenance Publication

Main Brake Assembly
Parker Hannifin Part No. 30-170

CM30-170

Revision B

Publication No.: CM30-170 Revision B

Manufacturer:

Parker

Parker Hannifin Corporation
Aircraft Wheel and Brake Division
1160 Center Road
Avon, Ohio 44011 U.S.A.

Cleveland
Wheels & Brakes

TO: HOLDERS OF CM30-170 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN BRAKE ASSEMBLY PART NO. 30-170.

Attached to this transmittal letter is Revision A of CM30-170 (dated June 15, 2010)

Revision A, Dated June 15, 2010

REVISION A CONTAINS ALL PAGES OF THE MANUAL. Pages that have been added or revised are outlined below together with the highlights of the revision.

Please retain all **REVISION HIGHLIGHTS** pages, inserting them into the manual for future reference.

REVISION HIGHLIGHTS

Section/Page No.	Description Of Change
All Sections/All Pages	DCN 0391-90 Updated to electronic format

TO: HOLDERS OF CM30-170 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN BRAKE ASSEMBLY PART NO. 30-170.

Attached to this transmittal letter is Revision B of CM30-170 (dated September 22, 2016)

Revision B, Dated September 22, 2016

REVISION B CONTAINS ALL PAGES OF THE MANUAL. Pages that have been added or revised are outlined below together with the highlights of the revision.

Please retain all **REVISION HIGHLIGHTS** pages, inserting them into the manual for future reference.

REVISION HIGHLIGHTS

Section/Page No.	Description Of Change
As follows	ECO-0072883
Title Page/T-1	Update to reflect latest revision. Update proprietary and export statements.
Record of Revisions/RR-1	Update to reflect latest revision.
List of Effective Pages/LEP-1	Update applicable pages to reflect latest revision.
Introduction/INTRO-1	(DELETE) Data rights and Export statement. These statements now located on first (title) page which is referenced to by the disclosure statement in every page footer.
Illustrated Parts List/ 10005	Detailed Parts List (NOW) item 85, 074-06000 Back Plate Assembly (WAS) item 85, 074-04700 Back Plate Assembly

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)
A	06-15-2010	P. Hunyad			
B	09-22-2016	P. Hunyad			

SERVICE BULLETIN LIST

Parker Hannifin 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

LIST OF EFFECTIVE PAGES

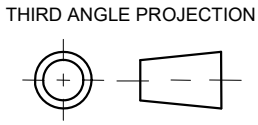
TABLE OF CONTENTS

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 maintenance of the Parker Hannifin Assembly covered in this publication.



Third angle projection is used in this manual. All weights and measurements are in U.S. English units with metric units in parentheses. English units are shown with a period for the decimal point. Millimeters are shown with a comma for the decimal point. Numbers that contain five or more digits to the left of the decimal point have a space between the “thousands” and “hundreds” digits to prevent confusion with the metric decimal point.

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 & Brake Division for the latest revision.

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2. Data Rights

(Deleted)

3. Export Statement

(Deleted)

INTRODUCTION

4. TSO Notice

This assembly is certified for FAR Part 23 usage. It is identified with a "TSO-C26c" marking. This assembly has been tested and qualified to FAA (Federal Aviation Administration) requirements and specifications.

5. Manual Use

This manual is divided into various section blocks such as Disassembly, Check, Repair, etc. Each section has its own range of page numbers. Refer to the Table of Contents for the location of the applicable section.

A. Warnings and 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  , alerts to possible serious or life threatening situations if the instructions in the operational or procedural task are not followed precisely.
- A **"WARNING"** alerts that possible hazards are associated with the materials/ processes/procedures/limits. These can cause injury in any form, if the instructions in the operational or procedural task are not followed precisely.
- A **"CAUTION"** identifies an instruction that must be followed precisely to avoid damage to the product.
- A **"NOTE"** provides additional helpful information.

6. Replacement Parts

SAFETY WARNING:  PARKER HANNIFIN WHEEL & BRAKE DOES NOT WARRANT OR ASSUME THE RISK OF THE USE OF REPLACEMENT PARTS NOT AUTHORIZED FOR USE BY PARKER HANNIFIN WHEEL & BRAKE. OPERATORS WHO USE REPLACEMENT PARTS NOT AUTHORIZED BY PARKER HANNIFIN WHEEL & BRAKE 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 to identify the brake assembly components.

SAFETY WARNING: THIS ASSEMBLY CONTAINS PARTS THAT HAVE A CADMIUM PLATED FINISH (5, 10, 15, 65, 75, 90, 100, 105, 110, 120, 125). REMOVING THE CADMIUM PLATING CAN CREATE EXPOSURE TO CADMIUM DUST AND CADMIUM COMPOUNDS. THIS CAN BE A POTENTIAL HEALTH HAZARD. USE APPROPRIATE SAFETY PRECAUTIONS.

The brake assembly is a hydraulically operated, piston actuated, external disc unit designed for use with MIL-H-5606 hydraulic fluid.

The cylinder (25) and torque plate (150) are aluminum alloy castings.

The bleeder and inlet ports are identical to allow a left or right hand mounting configuration.

Each piston assembly uses a friction spring (50) to maintain ideal piston positioning that limits piston travel for fluid displacement concerns.

The cylinder piston bores contain a preformed packing (35) to prevent leakage of hydraulic fluid and a piston boot (30) to prevent contaminates from entering the system. A piston insulator (55) in each piston (45) and two insulator shims (95) minimize the conduction of heat into the brake fluid.

High strength attaching hardware fasten the back plate assemblies to the cylinder housing.

2. Operation

Brake action occurs when hydraulic pressure is applied to the brake via the pilot's or copilot's master cylinders. As hydraulic pressure reaches the caliper, the pistons move outward in the caliper forcing the pressure plate against the surface of the brake disc. This causes the caliper to align itself so that the pressure plate linings and backplate linings provide uniform contact against both rubbed surfaces of the brake disc. Kinetic energy is transformed into thermal energy as braking action takes place.

3. Handling Procedures

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

DESCRIPTION AND OPERATION

4. Specifications

Brake cylinder material .....Aluminum alloy casting
Brake bolt torque ..... 80 to 85 lb-in (9,0 to 9,6 N-m), dry torque

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

Hydraulic fluid MIL-H-5606
Seals.....Compatible with the listed hydraulic fluid
Brake cylinder coatings ..... Primer coating: ..... Refer to the repair section
Finish coating: ..... Refer to the repair section

5. Brake Lining Wear Check

Maximum wear limits for the brake linings are shown below.

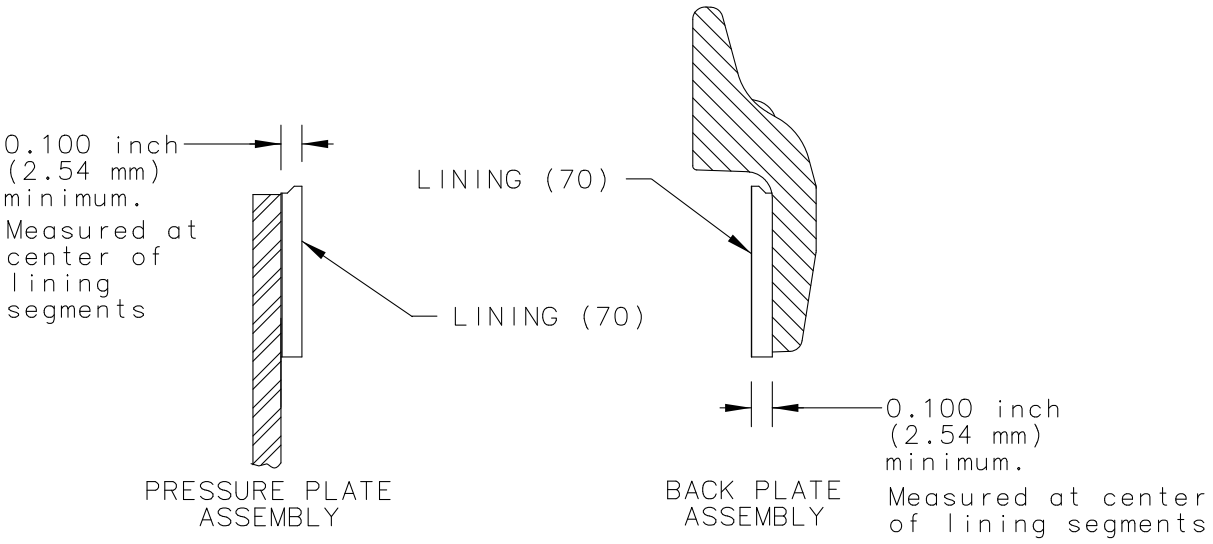

Figure 1 Minimum Lining Thickness

DESCRIPTION AND OPERATION

6. Maintenance Schedule

The maintenance schedule is intended to be a guideline based on laboratory testing environments that simulate normal braking conditions. Field operating requirements can vary from aircraft to aircraft. These variations will directly affect the wear rate of the brake assembly components. You must evaluate your own operating conditions to determine a suitable schedule to support and maintain the equipment.

NOTE: All task procedures in Table 1 refer to paragraphs in the CHECKS section.

Table 1 Maintenance Schedule

INTERVAL	ITEM	TASK
Every time the linings (70) have reached the in-service wear limits as specified in Figure 1.	All parts	Visual and detailed examination.
	Bolts (5), (10)	Visual and detailed examination including magnetic particle inspection.
	Piston boots (30), preformed packings (35, 115, 140) bleeder cap (130), and insulator shim (95)	Replace
At the 3rd (third) set of lining replacement and every other set of lining replacement thereafter.	Brake cylinder (25)	Visual and detailed examination including liquid penetrant inspection.
	Torque plate (150)	Visual and detailed examination including liquid penetrant inspection.

INTERVAL	ITEM	TASK
After a high-energy braking event	Linings	Visual and detailed examination.
	Insulator shim (95)	Visual and detailed examination.
	Piston insulators (55)	Visual and detailed examination.

TESTING AND FAULT ISOLATION

1. General

Refer to IPL Figure 1 to identify the brake assembly components.

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

SAFETY WARNING: FULLY ASSEMBLE BRAKE BEFORE TESTING. SERIOUS INJURY OR DEATH CAN OCCUR FROM TESTING A BRAKE THAT IS NOT FULLY ASSEMBLED.

WARNING: PUT ON PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

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 1001 Testing Equipment and Consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Fluid, hydraulic	MIL-H-5606 (equiv. alternatives are not allowed)	Commercial
Powered hydraulic test stand and applicable hoses and gauges	• Capable of applying 600 psi (41,4 bar) hydraulic pressure to the brake • Pressure gauge accuracy: ± 2%	Commercial
Disc test segment	SPECIAL EQUIPMENT AND TOOLS section	Fabrication
Standard tools (inch units)	• 12pt external: items (5) and (10) • hex head external: items (110), (120), and (135) • torque gauge	Commercial

TESTING AND FAULT ISOLATION

2. Test Procedures

Examine all brake assemblies that do not meet the test standards of this section. Disassembly will be necessary for further inspection of individual components to find the reason for failure. Replacement or repair of components may be necessary.

A. Pretest Check

Do these inspections and check procedures to approve the brake assembly for testing. Do not do a test on a brake assembly that shows signs of damage.

(1) Examine the cylinder (25) surfaces for dents, cracks, or other visible damage.

(2) Examine all threaded components to make sure they have not become loose or have lost their self-locking feature (nuts). These include the bolts (5, 10), nuts (110), fitting (135), and bleeder components (120). Refer to Table 8002, Torque Values.

(a) If you cannot tighten a component, then examine for damage to the threads of the component or mating component. Also examine the self-locking feature of the nuts (110). Refer to the CHECKS section.

B. Bleed and Pressure Test the Brake Assembly

SAFETY WARNING: FULLY ASSEMBLE BRAKE BEFORE TESTING. A MANUFACTURED DISC SEGMENT OF THE PROPER THICKNESS MUST BE PLACED BETWEEN THE PRESSURE PLATE LINING AND THE BACK PLATE LINING TO REPLICATE THE WHEEL DISC AND PREVENT DAMAGE TO THE BRAKE ASSEMBLY AND PREVENT SERIOUS INJURY TO TESTING PERSONNEL.

(1) Connect the brake assembly on the test stand.

CAUTION: THE TEST DISC SEGMENT MUST BE INSERTED BETWEEN THE LININGS PRIOR THE THE APPLICATION OF HYDRAULIC PRESSURE.

(2) Insert the test disc segment between the linings prior to the application of hydraulic pressure. Refer to Figure 9001 for fabricating the test disc segment.

(3) Connect the hydraulic supply line to the brake inlet fitting (135).

TESTING AND FAULT ISOLATION

(4) Bleed the brake.

(a) No fluid flow from the bleeder screw is cause for examination. Refer to Table 1002, Troubleshooting.

CAUTION: DO NOT EXCEED 12 LB-IN (1,35 N-M) WHEN TIGHTENING THE BLEEDER SCREW (80). TORQUE IN EXCESS OF 12 LB-IN (1,35 N-M) WILL DAMAGE THE BLEEDER SEAT (75).

(5) Tighten the bleeder screw (125) snug to prevent leakage.

C. Piston Actuation and Flow Through Check

(1) Pressurize the brake to 600 ± 25 psig. (41,4 ± 1,7 bar)

(2) Actuate the pistons a minimum of three times. Pistons should not bind. If pistons bind, further examination is required.

(3) Shut off pressure to the brake.

(4) Slowly loosen bleeder screw while observing the bleeder fitting. No fluid flow is cause for further examination.

CAUTION: DO NOT EXCEED 12 LB-IN (1,35 N-M) WHEN TIGHTENING THE BLEEDER SCREW (80). TORQUE IN EXCESS OF 12 LB-IN (1,35 N-M) WILL DAMAGE THE BLEEDER SEAT (75).

(5) Tighten the bleeder screw (80) snug to prevent leakage.

TESTING AND FAULT ISOLATION

D. Pressure Test

(1) Pressurize the brake to 600 ± 25 psig. (41,4 ± 1,7 bar)

(2) Maintain 600 ± 25 psig. (41,4 ± 1,7 bar) for a minimum of two minutes. Check the areas around the piston, and ports. Leakage in any area of the brake assembly is cause for further examination.

(3) Shut off pressure to the brake.

(4) Compress the pistons back into the brake cylinder bores. Check for freedom of movement of the disc test segment. Failure of the disc segment to move freely is cause for further examination.

CAUTION: DO NOT EXCEED 12 LB-IN (1,35 N-M) WHEN TIGHTENING THE BLEEDER SCREW (80). TORQUE IN EXCESS OF 12 LB-IN (1,35 N-M) WILL DAMAGE THE BLEEDER SEAT (75).

(5) Tighten the bleeder screw (80) snug to prevent leakage.

E. Disconnect the Brake

(1) Upon successful completion of all testing, disconnect the hydraulic supply line from the brake assembly.

(3) Install protective cap (130) on the bleeder screw (125).

(4) Wipe off the brake with a clean shop towel.

TESTING AND FAULT ISOLATION

3. Troubleshooting

Table 1002 lists the possible problems you can find while operating the brake assembly. The table cannot list all possible problems and is intended to assist with troubleshooting the brake assembly.

Table 1002 Troubleshooting

PROBLEM	COMMON CAUSE	CORRECTION
Hydraulic fluid leaking from the brake assembly	Loose hydraulic connection or defective hydraulic component	Tighten the connection or replace fitting or bleeder component.
	Damaged or defective preformed packing (35, 115)	Replace preformed packing
	Pistons (45) worn or damaged	Replace pistons
	Cylinder (25) damaged or bores worn	Replace cylinder
No fluid flow from fittings	Obstruction in hydraulic line, fitting or brake port	Clear obstruction – flush system if necessary
Brake not engaging or releasing correctly	Air in the brake system	Bleed the brake
	Obstruction in hydraulic line or fluid passage	Remove obstruction – flush system if necessary
	Pistons (45) sticking or binding	Replace preformed packing (25) and examine the pistons
	Pistons (45) worn or damaged	Replace pistons
	Cylinder (25) damaged or bores worn	Replace cylinder
	Anchor bolts (100) not sliding freely in the torque plate bushings (155)	Examine the anchor bolts for contamination and clean, then apply a lubricant (refer to the ASSEMBLY section).
	Anchor bolts (100) bent or damaged.	Replace anchor bolts.
	Pressure plate (65) not sliding freely on anchor bolts (100)	Examine the pressure plate for distortion, warpage beyond limits, or damage.
	Torque plate (150) is damaged or the bushings (155) are worn	Replace the torque plate assembly (145)
Maximum pedal effort does not decelerate aircraft properly or does not actuate brake	Linings (70) and/or brake disc on the wheel assembly are worn beyond limits	Replace linings and/or disc
	Air in the brake system	Bleed the brake
	Brakes have overheated	Allow the brakes to cool and examine

TEST DATA SHEET

Date _____ **Brake Serial No.** _____

Pretest Check and Bleed Brake **refer to paragraphs 2.A and 2.B.**

(1) Brake cylinder condition **Pass** _____ **Fail** _____
(2) Brake assembly hardware condition **Pass** _____ **Fail** _____
(3) Brake bleed **Pass** _____ **Fail** _____

Comments: _____

_____

_____

Piston Actuation and Flow Through Check **refer to paragraph 2.C.** **Pass** _____ **Fail** _____

Pressure applied _____ bar/psig Required: 600 psig ± 20 psig (41,4 bar ± 1,4 bar)

Leakage: **Yes** _____ **No** _____

Piston actuation _____ times Required: three times minimum

Binding: **Yes** _____ **No** _____

Shut off pressure to the brake

Bleeder screw fluid flow: **Yes** _____**No** _____

Comments: _____

_____

_____

Pressure Test **refer to paragraph 2.D.** **Pass** _____ **Fail** _____

Pressure applied _____ bar/psig Required: 600 psig ± 20 psig (41,4 bar ± 1,4 bar)

Duration _____ minutes Required: two minutes minimum

Leakage: **Yes** _____ **No** _____

Shut off pressure to the brake and compress pistons

Disc movement: **Yes** _____ **No** _____

Comments: _____

_____

_____

Tester: _____ **Date:** _____

DISASSEMBLY

1. General

Refer to IPL Figure 1 to identify the brake assembly components.

It is not necessary to remove the wheel to replace the linings or remove the cylinder assembly (20), but it is necessary to remove the wheel to remove and inspect the torque plate assembly (145).

WARNING: PUT ON PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

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 Disassembly Equipment and Consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Preformed packing tool set	P/N 199-18	Parker Hannifin Corp., Aircraft Wheel & Brake Division or Parker Hannifin distributor
Standard tools (inch units)	• 12pt external: items (5) and (10) • hex head external: items (110), (120), and (135) • torque gauge	Commercial

2. Remove the Brake Assembly

SAFETY WARNING: MAKE SURE THE AIRCRAFT IS SECURE AND STABLE BEFORE BEGINNING ANY WORK. WORKING AROUND AN AIRCRAFT THAT IS NOT SECURE AND STABLE CAN CAUSE INJURY OR DEATH.

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

B. Disconnect and cap the hydraulic inlet line that is attached to the brake inlet fitting (135). Cap the brake inlet fitting.

C. Remove safety wire from the bolts (5, 10).

DISASSEMBLY

NOTES:

- The wheel assembly brake disc is sandwiched between the back plate linings and the pressure plate linings. The back plate assemblies (85) must first be removed to disengage the brake from the torque plate assembly (145).
- The wheel assembly must first be removed to allow removal of the torque plate assembly (145). Refer to the wheel assembly component maintenance manual CM040-21101 for instructions on wheel removal.

D. Refer to Figure 3001. To keep each back plate assembly (85) from falling, hold each back plate assembly while loosening and removing the bolts (5, 10) and washers (15). Remove each back plate assembly (85) and the two insulator shims (95).

NOTE: It is recommended that the insulator shims be replaced at each overall regardless of condition.

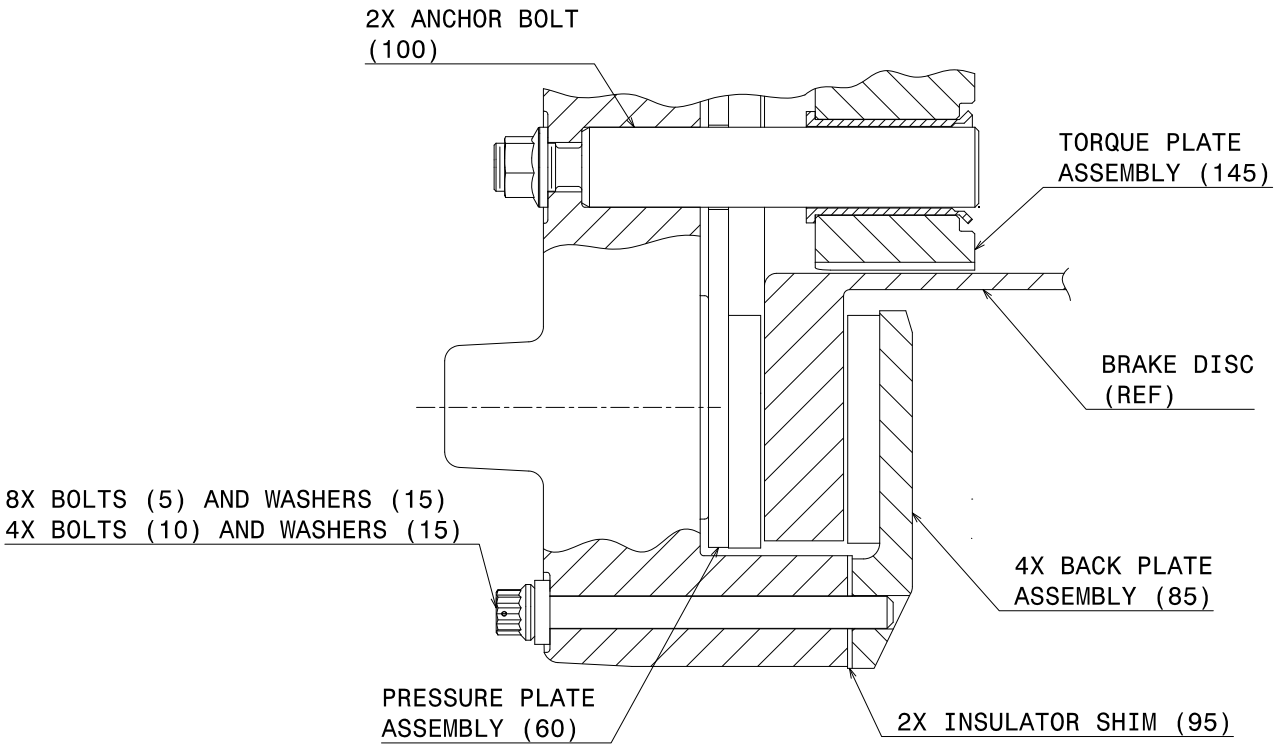

Figure 3001 Brake Bolt Removal

DISASSEMBLY

E. Slide the brake from the torque plate assembly (145).

F. Slide the wheel off of the axle. Refer to the wheel maintenance manual for wheel removal instructions.

G. Remove the axle flange mounting hardware that attaches the torque plate assembly (145) to the axle flange and remove the torque plate assembly.

3. Disassembly Procedures

SAFETY WARNING: FOLLOW ALL SAFETY PRECAUTIONS AND WEAR PROTECTIVE CLOTHING AND SAFETY GLASSES WHEN WORKING WITH THE BRAKE ASSEMBLY AND HYDRAULIC FLUIDS. FAILURE TO COMPLY CAN RESULT IN PERSONAL INJURY.

CAUTION: BE CAREFUL TO KEEP BRAKE FLUID FROM SPLASHING ONTO THE BRAKE LININGS (70). BRAKE FLUID THAT HAS SOAKED INTO THE FRICTION MATERIAL CAN AFFECT THE BRAKING PROCESS.

A. Slide the cylinder assembly (20) out of the torque plate (150).

B. Cylinder Assembly (20)

NOTE: The anchor bolts (100) are pressed into the brake cylinder (25) and secured with a washer (105) and nut (110). Do not remove the anchor bolts unless replacement is necessary due to damage or if a more thorough inspection of the brake cylinder is required. Refer to the REPAIR section for replacement instructions.

(1) Slide the pressure plate assembly (60) off of the anchor bolts (100).

(2) Remove the bleeder cap (130), then remove the bleeder screw (125) from the bleeder seat (120).

(3) Remove the bleeder seat (75).

(4) Remove the inlet fitting (135).

DISASSEMBLY

(5) Remove the fitting and bleeder seat preformed packings (115, 140).

NOTE: It is recommended that new preformed packings be replaced at each overall regardless of condition.

(6) Drain the hydraulic fluid from the cylinder (25).

C. Piston Assemblies (40)

NOTES:

- Do not remove the friction spring (50) from the piston unless it needs to be replaced because of distortion or damage.
- The piston insulator (55) is press fit into the piston (45). Do not remove the insulator from the piston unless it is worn or damaged. Refer to the REPAIR section for removal instructions.

(1) Remove the four piston assemblies (40) by threading a 0.250-28 bolt into the threaded hole of the piston. Hold the down the cylinder and pull the piston out.

(2) Remove the piston boot (30) and preformed packing (35) from each piston bore.

NOTE: It is recommended that new piston boots and preformed packings be replaced at each overall regardless of condition.

D. Remove the nuts (110) and washers (105) from the anchor bolts (100).

E. Torque Plate Assembly (145)

NOTE: The bushings (155) are press fit into the cast torque plate and are not replaceable. The torque plate assembly must be replaced as a unit.

(1) There are no disassembly procedures for the torque plate assembly.

CLEANING

1. General

Refer to IPL Figure 1 to identify the brake assembly components.

WARNING: PUT ON PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

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 Cleaning Equipment and Consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Blast stripping equipment for plastic blast media and abrasive blast media	• Plastic media: MIL-P-85891, Type II or V, Grade 20/30, 3.5 MOH max. • Abrasive media: 80 Grit aluminum oxide	U.S. Technology Corp.
Cleaning cloths	Lint free	Commercial
Brushes	Non-metallic soft and stiff bristle	Commercial
Stoddard solvent	Type 1 per MIL-PRF-680	Commercial
Cleaner/degreaser	AMS1526	Commercial
Soap solution	Mild dishwashing liquid	Commercial
Air Supply	30 psig (2,1 bar) maximum	Commercial

2. Cleaning Procedures

SAFETY WARNING: MAKE SURE THAT THE AREA WHERE YOU WILL USE THE CLEANING SOLVENTS HAS GOOD AIRFLOW. DO NOT TOUCH OR GET FLUID ON YOUR BODY AND DO NOT BREATH VAPORS. KEEP CONTAINERS COVERED WHEN NOT IN USE.

SAFETY WARNING: USE NO MORE THAN 30 PSIG (2,1 BAR) AIR PRESSURE. EYE PROTECTION IS NECESSARY. EYE INJURY FROM DIRT PARTICLES OR SOLVENT SPRAY IS POSSIBLE WHEN COMPRESSED AIR IS USED.

A. Clean the Hardware and Steel Parts

(1) Clean the following parts in Stoddard Solvent (MIL-PRF-680): (5, 10, 15, 65, 90, 105, 110, 120, 125, 135). Use a non-metal soft bristle brush to remove the heavy dirt deposits. Dry the parts quickly and thoroughly to remove all traces of moisture.

CLEANING

B. Clean the Aluminum Parts

NOTES:

- Do not remove the friction spring (50) from the piston (45) unless it needs to be replaced because of distortion or damage.
- The piston insulator (55) is press fit into the piston (45). Do not remove the insulator from the piston unless it is worn or damaged.
- The anchor bolt (100) is press fit into the cylinder (25). Do not remove the anchor bolt from the cylinder unless it needs to be replaced because of distortion or damage.

(1) Clean the following parts in Stoddard Solvent (MIL-PRF-680): (40). Use a non-metal soft bristle brush to remove any heavy dirt and grease deposits. Dry the parts thoroughly to remove all traces of moisture.

(2) Clean the following parts in a water based cleaner/degreaser (per AMS 1526): (25, 145). Use a non-metal soft bristle brush to remove any heavy dirt and grease deposits. Rinse and parts thoroughly with water heated to 160° to 180°F (71° to 82°C) and dry the parts thoroughly to remove all traces of moisture.

C. Clean the Non-Metal Parts

(1) The insulator shim (95) can be wiped clean with a cloth dampened with a mild soap and water solution. Wipe dry with a clean cloth.

D. Remove the Protective Coatings for the Aluminum Cylinder (25) and Torque Plate (150)

SAFETY WARNING: DUE TO THE TOXICITY AND VOLATILITY OF CHEMICAL STRIPPING SOLVENTS, THEY ARE A HEALTH CONCERN AND NOT A RECOMMENDED SOURCE OF PROTECTIVE COATING REMOVAL.

CAUTION: IN ADDITION TO REMOVING THE COATING, THE PLASTIC MEDIA WILL ALSO REMOVE ANY NAMEPLATES THAT ARE ATTACHED (160) AND THE NAMEPLATE WILL REQUIRE REPLACEMENT. REFER TO IPL FIGURE 1 FOR THE NAMEPLATE PART NUMBER.

NOTES:

- Removal of the protective coatings (primer and topcoat) is necessary when doing the liquid penetrant inspection of the brake cylinder, and torque plate.
- To achieve best results, always refer to the manufacturer's instructions for use and disposal of blast media.
- The press fit components: anchor bolts (100) and bushings (155) will not be damaged by the plastic media.

(1) Clean the parts in accordance with paragraph 2.B.

(2) Blast the parts per MIL-STD-1504 with plastic media per MIL-P-85891, Type II or V, Grade 20/30, maximum media hardness of 3.5 MOH.

CHECKS

1. General

Refer to IPL Figure 1 to identify the brake assembly components.

After a check is performed on a component, refer to the REPAIR section for applicable repairs.

Refer to Table 1 Maintenance Schedule for a timetable of scheduled maintenance tasks for the brake assembly components. All parts must be cleaned before examination. Refer to the CLEANING section.

WARNING: PUT ON PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

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 Checks Equipment and Consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Inspection surface plate	Not required	Commercial
Magnifier	X10 magnification	Commercial
Vernier dial calipers	Not required	Commercial
Micrometers	Not required	Commercial
Magnetic particle inspection equipment	ASTM E1444	Commercial
Liquid penetrant inspection equipment	ASTM E1417 or MIL-STD-6866, Type 1, Method A, Sensitivity Level 2	Commercial

B. Visual Examination

Examine all of the parts for cuts, tears, cracks, breaks, nicks, scratches, gouges, corrosion, wear, distortion, scoring, stripped or crossed threads and other damage. Replace a part that is cracked, has thread damage, is worn beyond limits, has exceeded allowable repair or is not a repairable or reworkable part.

CHECKS

SAFETY WARNING: THIS ASSEMBLY CONTAINS PARTS THAT HAVE A CADMIUM PLATED FINISH (5, 10, 15, 65, 75, 90, 100, 105, 110, 120, 125). REMOVING THE CADMIUM PLATING CAN CREATE EXPOSURE TO CADMIUM DUST AND CADMIUM COMPOUNDS. THIS CAN BE A POTENTIAL HEALTH HAZARD. USE APPROPRIATE SAFETY PRECAUTIONS.

2. Detailed Examination

A. Examine the hardware listed below.

CAUTION: REPAIR OR REWORK OF HARDWARE IS NOT ALLOWED.

(1) Examine the bolts (5, 10) for distortion, cracks, corrosion, or thread damage. Closely examine for cracks in the radius under the bolt head and in the threaded area next to the bolt shank. Use magnetic particle inspection (ASTM E1444).

NOTE: If one or more of the bolts are damaged, then replace all of the bolts.

(2) Examine the anchor bolts (100) for distortion, cracks, corrosion, or thread damage. Refer to the ASSEMBLY section for instruction on applying proper lubricant to the anchor bolt.

(3) Examine the washers (15, 105) for corrosion, distortion or damage. Replace a part that is distorted or damaged.

(4) Examine the nuts (110) for damage. If the nut can be turned onto the bolt by hand, past the nut's self-locking section, the nut should be replaced.

(5) Examine the fitting (135) and bleeder hardware: bleeder seat (120) and bleeder screw (125) for corrosion, damage to the threads and sealing surfaces or other damage. Replace a part that is corroded or damaged.

CHECKS

B. Examine the Brake Cylinder (25)

SAFETY WARNING: MAKE SURE THAT THE AREA WHERE YOU WILL USE THE LIQUID PENETRANT FLUID HAS GOOD AIRFLOW. DO NOT TOUCH OR GET FLUID ON YOUR BODY AND DO NOT BREATH VAPORS. KEEP CONTAINERS COVERED WHEN NOT IN USE. LIQUID PENETRANT FLUID CAN BE TOXIC AND EXPLOSIVE.

(1) Examine the exterior surface of the cylinder for missing paint caused by erosion or wear.

(2) Visually examine the cylinder for surface cracks, nicks, corrosion, or other damage.

(3) Visually examine the cylinder for cracks to the areas around the anchor bolt holes, the piston bores and the ports.

(4) Examine for dimpled areas around the back plate to cylinder bolt holes. Refer to Figure 5001. Maximum allowable depression is 0.005 inch (0,127 mm).

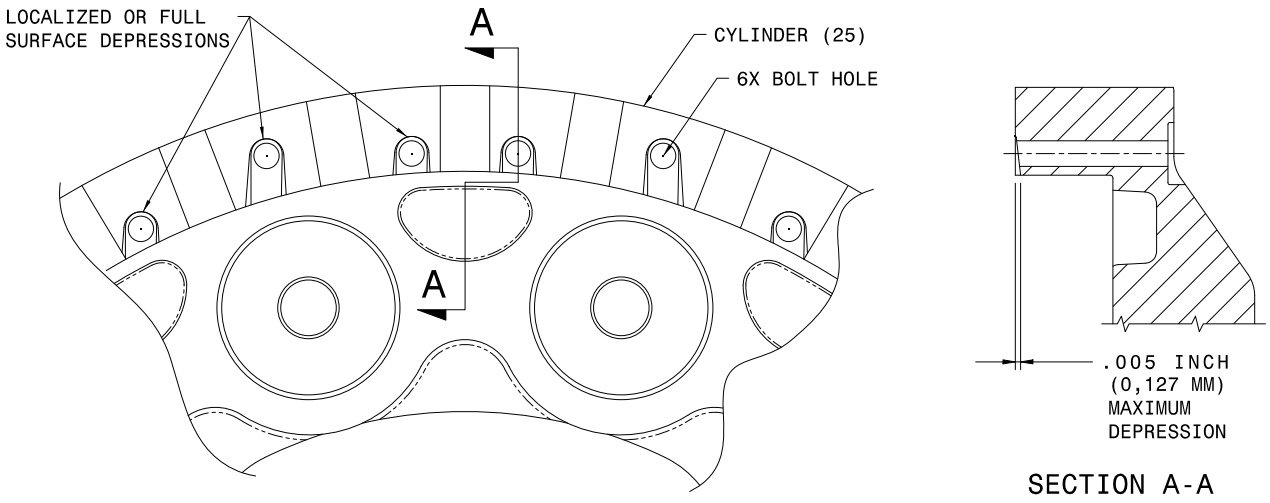

Figure 5001 Cylinder to Back Plate Surface Inspection

(5) Examine the port threads for corrosion or damage to the sealing surfaces or threads.

(6) Use a 10 power magnifier and examine the cylinder piston bores and pay special attention to the packing groove. Examine for corrosion, scratches, nicks and burrs which can prevent the pistons from properly retracting, resulting in brake drag.

CHECKS

(7) Examine the piston bores for wear. Measure the bore diameter at three places. Replace the cylinder if the bore diameter measures more than ∅ 1.753 inch (44,52 mm) maximum at any point.

(8) Examine for loose, corroded or bent anchor bolts. To replace an anchor bolt, refer to the REPAIR section for replacement instructions.

(9) When it is necessary to examine the brake cylinder for cracks at or near the surface use Liquid Penetrant Inspection.

NOTE: The protective coating (topcoat and primer) must be removed from the part and the part must be clean before doing a liquid penetrant inspection procedure.

(a) Remove the protective coatings (topcoat and primer) and clean the part. Refer to the CLEANING section for paint removal and cleaning instructions.

(b) Examine for cracks paying particular attention to the lug area around the anchor bolt holes, the piston bores and the ports.

C. Examine the Piston Assembly (40)
Components (50) and (55) are not repairable.

NOTES:

- Do not remove the friction spring (50) from the piston unless it needs to be replaced because of distortion or damage.
- The piston insulator (55) is press fit into the piston (45). Do not remove the insulator from the piston unless it is worn or damaged. Refer to the REPAIR section for removal instructions.

(1) Examine the pistons (45) for corrosion, minor scratches, nicks, burrs, and other signs of damage that can lead to fluid leakage past the preformed packing (35).

(2) Examine the piston O.D. for wear by measuring the O.D. at three places around the circumference. Replace all pistons with an O.D. measuring less than ∅ 1.748 inch minimum (44,39 mm) at any point.

(3) Examine the friction spring (50) for burrs or distortion which can prevent the pistons from properly retracting, resulting in brake drag.

(4) Examine the insulators (55) and replace those that show evidence of delamination, are cracked or have severe heat damage (charred). Constant heat and pressure will compress the insulators over time. Replace the insulator when it is flush with the head of the piston. Refer to the REPAIR section for removal instructions.

CHECKS

D. Examine the Insulator Shims (95)
The insulator shims a not repairable.

(1) Replce shims that are delaminating, cracked, or that show evidence of severe heat damage resulting from a high energy braking event.

E. Examine the Pressure Plate Assembly (60)

(1) Examine the linings (70) for looseness. Refer to para. 2.G. for detailed examination of the linings.

(a) If any rivets (80) are loose, damaged, or are missing, then replace per the REPAIR section.

(b) It is not necessary to remove the pins (75) on the pressure plate (65) unless the outside diameter of the pin is worn and does not allow for secure engagement of the linings (70). Refer to the REPAIR section for replacement of the pins (75).

(2) When it is required to replace the linings (70), check the pressure plate (65) for the following.

(a) Visually examine for cracks, nicks, corrosion, or other damage. Replace if cracks are found.

(b) Visually examine for cracks at the rivet holes and surrounding areas. Replace if cracks are found.

(c) Examine the two anchor bolt holes for elongation or cracks. Badly elongated holes will prevent the pressure plate from moving or sliding freely on the anchor bolts and requires the replacement of the pressure plate.

(d) Visually examine the pins (75) for looseness, distorted or mushroomed heads or other visible damage. Refer to the REPAIR section for replacement of the pins (75).

NOTE: It is recommended that all pins be replaced if one is found to be damaged or worn.

(e) If the pins (75) are removed, then check the pin holes for elongation. Replace the pressure plate if the pin holes are elongated.

(f) Examine for distortion. Replace any pressure plate that is dished or out-of-flatness more than 0.020 inch (0,508 mm).

CHECKS

F. Examine the Back Plate Assembly (85)

(1) Examine the linings (70) for looseness. Refer to para. 2.G. for detailed examination of the linings.

(a) If any rivets (80) are loose, damaged, or are missing, then replace per the REPAIR section.

(b) It is not necessary to remove the pins (75) on the back plate (90) unless the outside diameter of the pin is worn and does not allow for secure engagement of the linings (70). Refer to the REPAIR section for replacement of the pins (75)

(2) When it is required to replace the back plate assembly linings (70), check the back plate (90) for the following.

(a) Visually examine for cracks, nicks, corrosion, or other damage. Replace if cracks are found.

(b) Visually examine for cracks at the rivet holes and surrounding areas. Replace if cracks are found.

(c) Examine the three threaded holes for thread damage. Replace if thread damage is found.

(d) Visually examine the pins (75) for looseness, distorted or mushroomed heads or other visible damage. Refer to the REPAIR section for replacement of the pins (75).

NOTE: It is recommended that all pins be replaced if one is found to be damaged or worn.

(e) If the pins (75) are removed, then check the pin holes for elongation. Replace the back plate if the pin holes are elongated.

G. Examine the Linings (70)
The linings are not repairable.

(1) Examine the linings for looseness. Examine for edge chipping and surface deterioration. Replace damaged or worn pads per the REPAIR section.

NOTE: The wear limits for the linings on the pressure plate and back plate assemblies are the same. See paragraph 5. Brake Lining Wear Check in the DESCRIPTION AND OPERATION section

CHECKS

H. Examine the Torque Plate Assembly (145)

NOTES: Stainless steel bushings (155) are press fit into the cast aluminum torque plate and swaged on the backside for retention. The bushings are not replaceable and a bushing that is damaged beyond the repair limits (refer to the REPAIR section) will require the replacement of the torque plate assembly.

(1) Examine the bushings (155) for the following:

(a) Bushings must be flat against the torque plate surface. Examine for corrosion, cracks, looseness or other visible damage. Also examine for elongation of the inside diameter which can prevent the brake from sliding freely resulting in excessive brake drag.

(b) Examine the for internal stepping which could indicate severe cocking of the cylinder anchor bolts in the torque plate.

(2) Examine the torque plate (150) for the following:

(a) Examine the exterior surface for missing paint caused by erosion, wear, or inspection techniques.

(b) Visually examine for surface cracks, nicks, corrosion, or other damage.

(c) Visually examine for cracks to the areas around the anchor bolt holes and the mounting bolt holes.

(d) Examine the mounting bolt hole areas for elongation. Badly elongated holes requires the replacement of the torque plate assembly.

(3) When it is necessary to examine the torque plate for cracks at the surface use Liquid Penetrant Inspection.

NOTE: The paint must be removed from the part when using liquid penetrant inspection methods. Refer to the CLEANING section for paint removal and cleaning instructions.

(a) Examine for cracks paying close attention to the areas around the bushings and the mounting bolt holes.

REPAIR

1. General

Refer to IPL Figure 1 to identify the brake assembly components.

WARNING: PUT ON PROTECTIVE CLOTHING AND EYEWEAR BEFORE DOING THE WORK.

NOTE: Repairs are limited to the components listed in this section. All remaining components must be replaced.

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 Repair Equipment and Consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Brake lining rivet tool kit	P/N 199-579	Parker Hannifin Corp., Aircraft Wheel & Brake Division or Parker Hannifin distributor
Twist drill bits	For steel	Commercial
Pin punch set	Inch or metric	Commercial
Screwdriver	Standard flat head	Commercial
Aluminum oxide cloth	400 to 600 grade or finer, wet or dry	Commercial
Corrosion preventative treatment for items (25, 150)	MIL-C-5541, Class 1A (Alodine 1200 or equivalent)	Commercial
Bench vise	Not required	Commercial
Arbor press	Not required	Commercial
Paint application equipment	Not required	Commercial
Primer and topcoat for items (25, 150)	Refer to Table 6002 (item 25) Refer to Table 6003 (item 150)	Commercial
Blast stripping equipment for abrasive blast media	• Abrasive media: 80 Grit aluminum oxide	U.S. Technology Corp.
ZRC galvilite cold galvanizing compound for items (65, 90)	P/N 11011-10014 MIL-PRF-26915, Type I, Class A	ZRC Products Company

REPAIR

SAFETY WARNING: THIS ASSEMBLY CONTAINS PARTS THAT HAVE A CADMIUM PLATED FINISH (5, 10, 15, 65, 75, 90, 100, 105, 110, 120, 125). REMOVING THE CADMIUM PLATING CAN CREATE EXPOSURE TO CADMIUM DUST AND CADMIUM COMPOUNDS. THIS CAN BE A POTENTIAL HEALTH HAZARD. USE APPROPRIATE SAFETY PRECAUTIONS.

CAUTIONS:

- 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.
- REPAIR OF THREADED SURFACES IS NOT PERMITTED
- THE FOLLOWING COMPONENTS ARE NOT REPAIRABLE AND MUST BE REPLACED IF WORN OR DAMAGED:
  - LINING (70) AND LINING HARDWARE: (75, 80)
  - PISTON ASSEMBLY COMPONENTS: (50, 55)
  - INSULATOR SHIM (95)
  - THE FOLLOWING HARDWARE: (5, 10, 15, 105, 110, 120, 125, 135)

    NOTE: It is good practice to replace hardware that has had the protective coating (plating) worn away or damaged.

2. Detailed Repairs

A. Repair the Pistons (45)
The piston is made from an aluminum alloy and anodized.

NOTE: The piston insulator (55) is press fit into the piston (45).

(1) Piston repair is limited to polishing out small nicks, scratches and light corrosion. Surface finish of repaired surfaces should not exceed a roughness of 45 rms. Replace the pistons if the outside diameter measures less than ∅ 1.748 minimum (44,39 mm).

(a) Clean, then surface treat the repaired areas with corrosion preventative (Alodine 1200 or equivalent). Refer to MIL-C-5541, Class 1A.

CAUTION: DO NOT DAMAGE THE PISTON WHEN REMOVING THE INSULATOR.

(2) Insulators (55) have a Ø .375 hole in the center to facilitate removal. Worn insulators (55) can be replaced by using a small screwdriver to work through the center ∅ .375 diameter hole and lift to pry off insulator. Then, press in a new insulator.

REPAIR

B. Repair the Brake Cylinder (25)
The cylinder is made from cast aluminum alloy.

(1) Surface damage repair

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

(2) Piston bore repair

(a) Light scratches and nicks can be polished out. Repair of piston bore cavity must not exceed ∅ 1.753 inch maximum (44,52 mm). Surface finish of repaired surfaces should not exceed a roughness of 64 rms. If blend or polishing repair exceeds limits and prohibits the brake cylinder from retaining pressure during testing, then the cylinder must be replaced.

SAFETY WARNING: WEAR PROTECTIVE CLOTHING. SURFACE TREAMENT SOLUTIONS CAN BE TOXIC AND VOLATILE. FOLLOW THE MANUFACTURERS INSTRUCTIONS FOR MIXING, APPLYING AND FOR ALL SAFETY INSTRUCTIONS.

(3) Clean, then surface treat the repaired areas of the cylinder with corrosion preventative (Alodine 1200 or equivalent). Refer to MIL-C-5541, Class 1A.

C. Repair the Anchor Bolt (100)
The anchor bolt is made from alloy steel and cad plated.

(1) Surface damage repair

(a) Repair is limited to blending out light corrosion as long as the protective cadmium plating is not removed by the repair procedure. If repair removes the protective plating, then the anchor bolt must be replaced. Refer to paragraph D. Replace the Anchor Bolt (100).

REPAIR

D. Replace the Anchor Bolt (100)
The anchor bolt is made from alloy steel and cad plated. Replace damaged or severely corroded anchor bolts as follows.

CAUTION: THE CYLINDER MUST BE SQUARE WITH THE ARBOR PRESS SO THAT THE ANCHOR BOLT DOES NOT COCK.

(1) Refer to Figure 6001. The anchor bolts can be removed by using a support fixture and arbor press with a press anvil. Place the anchor bolts into the support fixture so that the anchor bolt is piloted while being removed.

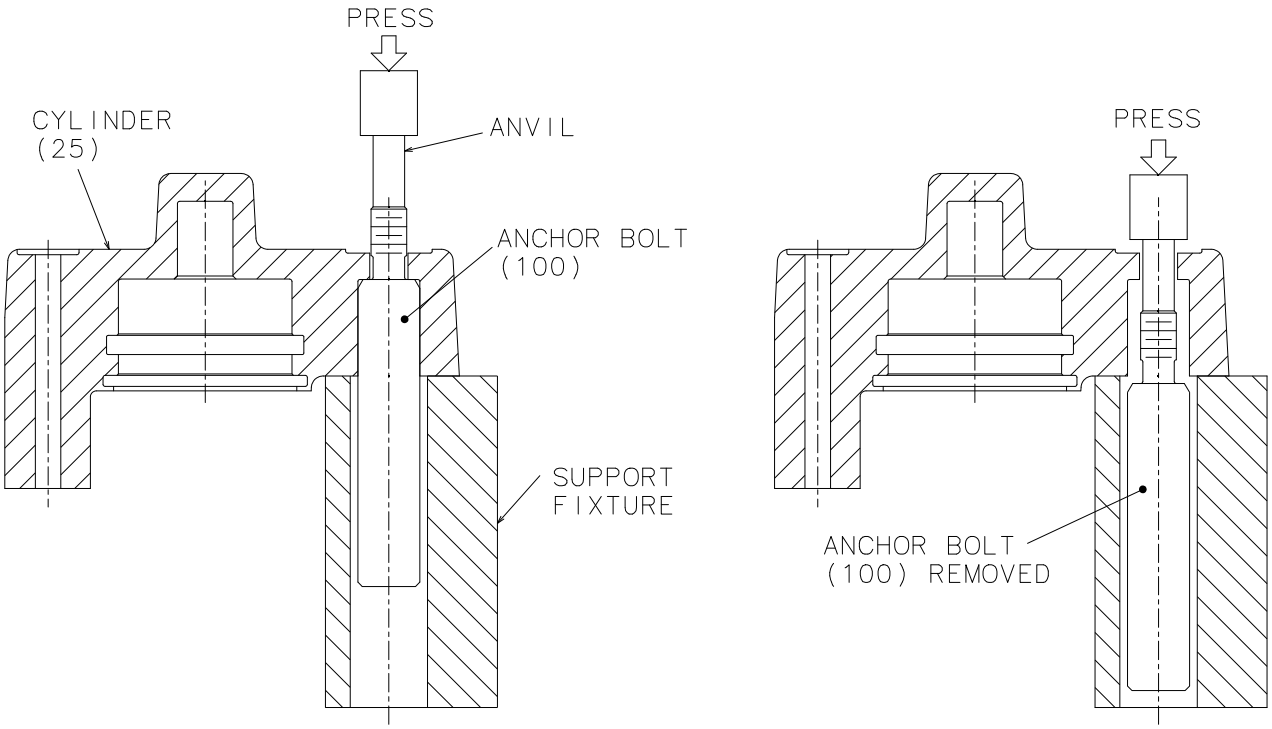

Figure 6001 Remove the Anchor Bolt

REPAIR

CAUTION: THE CYLINDER MUST BE SQUARE WITH THE ARBOR PRESS AND THE ANCHOR BOLT PERPENDICULAR TO THE CYLINDER SO THAT THE ANCHOR BOLT DOES NOT COCK.

(2) Refer to Figure 6002. The anchor bolts can be installed by using a support fixture and arbor press with a press bushing. Place the anchor bolts into the holding fixture so that the anchor bolt is supported and piloted while being installed.

(3) Position the cylinder (20) anchor bolt hole over the anchor bolt.

(4) Press the cylinder down over the anchor bolt. Ensure that the anchor bolt is seated in the cylinder.

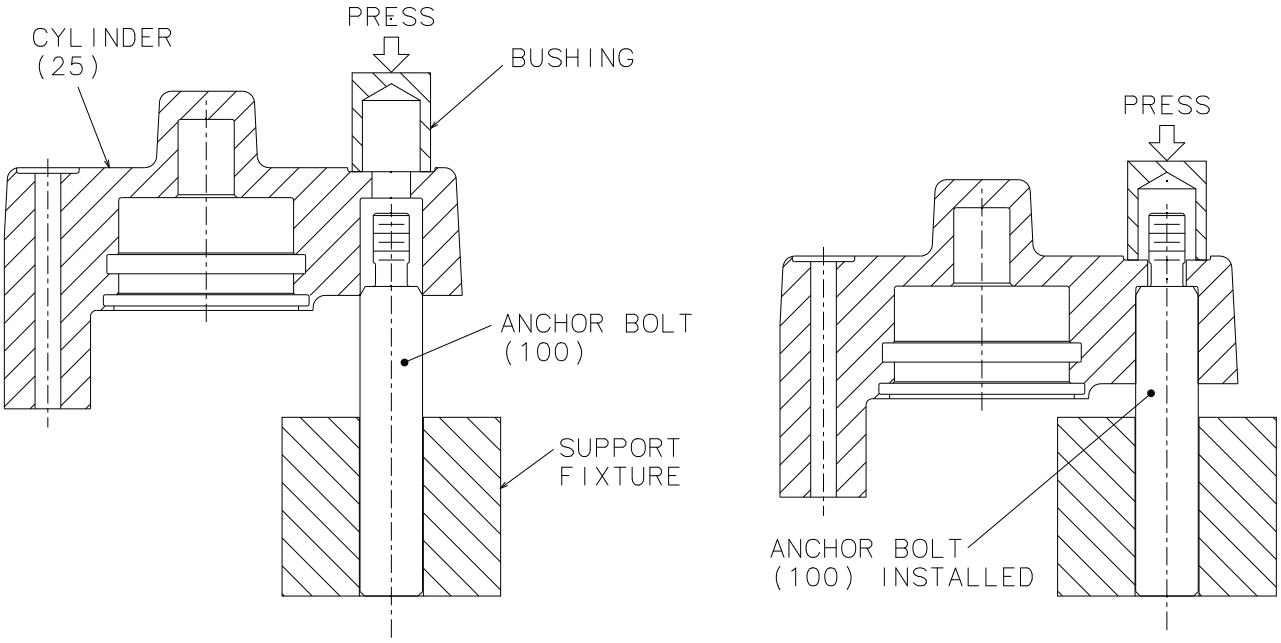

Figure 6002 Install the Anchor Bolt

(5) After installation, the anchor bolts must be perpendicular to the cylinder and parallel to one another for proper operation.

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REPAIR

E. Apply Protective Coating to the Brake Cylinder (25)

SAFETY WARNING: WEAR PROTECTIVE CLOTHING. COATING MATERIALS CAN BE TOXIC AND VOLATILE. FOLLOW THE MANUFACTURERS INSTRUCTIONS FOR ALL SAFETY INSTRUCTIONS.

(1) Ensure that the part is clean.

(2) Mask the cylinder per Figure 6003.

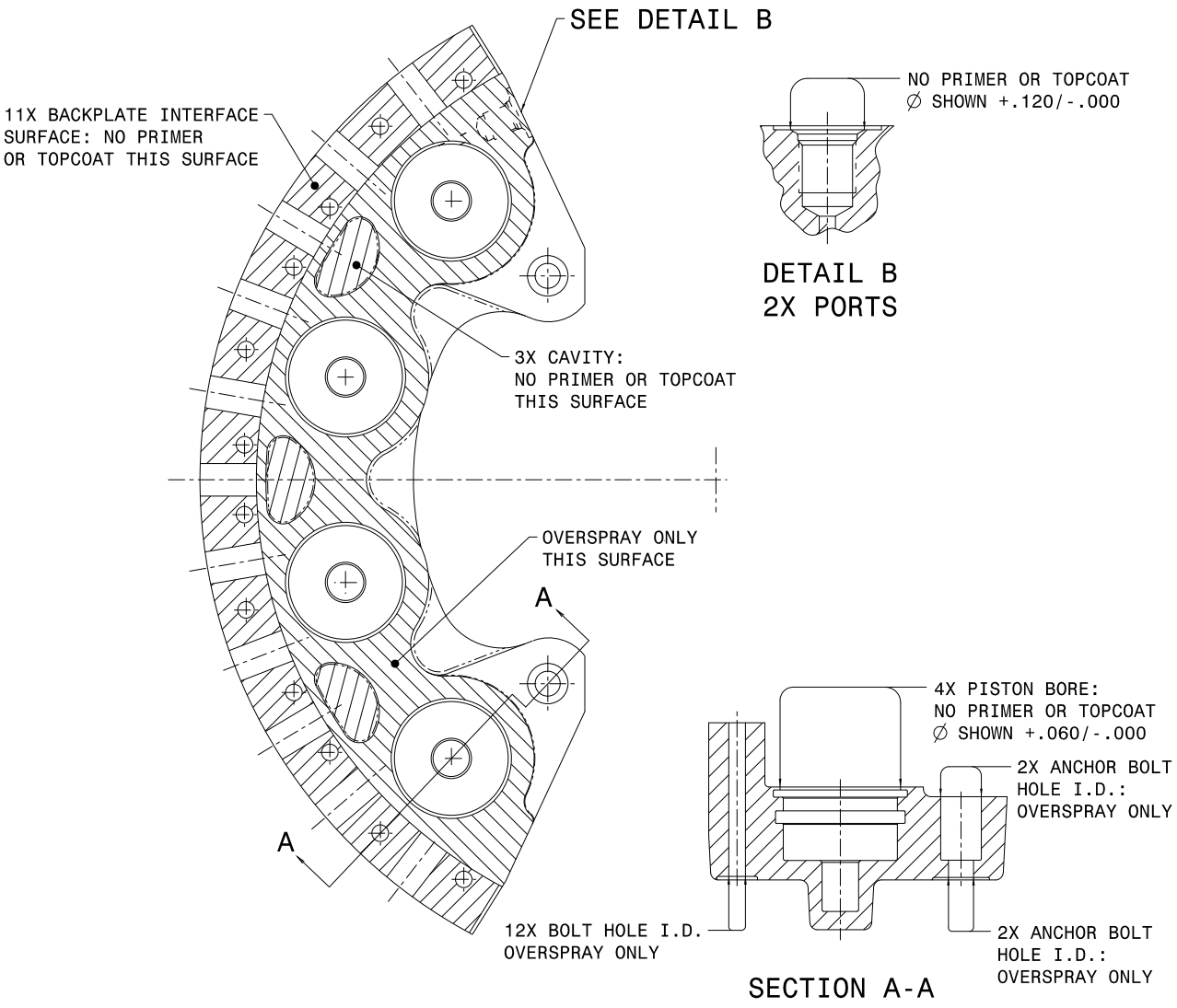
(3) Apply the primer and topcoat per Table 6002.

NOTE: To achieve best results, always refer to the manufacturer's instructions for mixing, application and use; for forced dry (oven heating) schedule and also for disposal of primer and topcoat media.

Table 6002 Cylinder Primer and Topcoat Product Characteristics

PRIMER	TOPCOAT	DRY FILM THICKNESS AND DRY TIME (AIR)
Columbia Paint Corp., Huntington, WV		
P/N 18-017A (water reducible) No mixing required.	P/N 17-250A (524 Aluminum) (water reducible) No mixing required.	Primer: 0.0002-0.0005 in. 15 minutes min. (to touch or topcoat) 60 minutes (to handle) 4-24 hours (dry hard)
		Topcoat (including primer): 0.0008-0.0014 in. 15 minutes (to touch) 30 minutes (to handle) 48 hours (dry hard)
Alternate: Sherwin Williams Co., Cleveland, OH		
2 parts washcoat (P/N P60G2) 3 parts catalyst reducer (P/N R7K44)	P/N F63BXS58-4337 (silver) 6 parts base 1 part catalyst (P/N V66V27)	Primer: 0.0002-0.0004 in. 3-10 minutes (to touch) 10-15 minutes (tack free) 10-60 minutes (to topcoat)
		Topcoat (including primer): 0.0008-0.0014 in. 20 minutes (to touch) 60 minutes (to handle) Overnight (dry hard)

REPAIR



NOTE:
1. MASK CYLINDER AS INDICATED AND APPLY PRIMER AND TOPCOAT PER TABLE 6002.

Figure 6003 Mask the Cylinder

REPAIR

F. Repair the Torque Plate Assembly (145)
The torque plate is made from cast aluminum alloy.

(1) Bushing repair
The bushings are made from stainless steel and are not replaceable. Repair is limited to the following.

(a) Light scratches, nicks, and corrosion on the bushings (155) inside diameter can be polished out. I.D. of the bushing must not exceed ∅ 0.640 inch (16,25 mm) maximum.

(2) Torque plate (150) surface damage repair

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

SAFETY WARNING: WEAR PROTECTIVE CLOTHING. SURFACE TREAMENT SOLUTIONS CAN BE TOXIC AND VOLATILE. FOLLOW THE MANUFACTURERS INSTRUCTIONS FOR MIXING, APPLYING AND FOR ALL SAFETY INSTRUCTIONS.

(3) Clean, then surface treat the repaired areas of the torque plate with corrosion preventative (Alodine 1200 or equivalent). Refer to MIL-C-5541, Class 1A.

REPAIR

G. Apply Protective Coating to the Torque Plate (150)

SAFETY WARNING: WEAR PROTECTIVE CLOTHING. COATING MATERIALS CAN BE TOXIC AND VOLATILE. FOLLOW THE MANUFACTURERS INSTRUCTIONS FOR ALL SAFETY INSTRUCTIONS.

(1) Ensure that the part is clean.

(2) Mask the torque plate per Figure 6004.

NOTE: The bushings (155) are not removable and must be masked to prevent paint overspray.

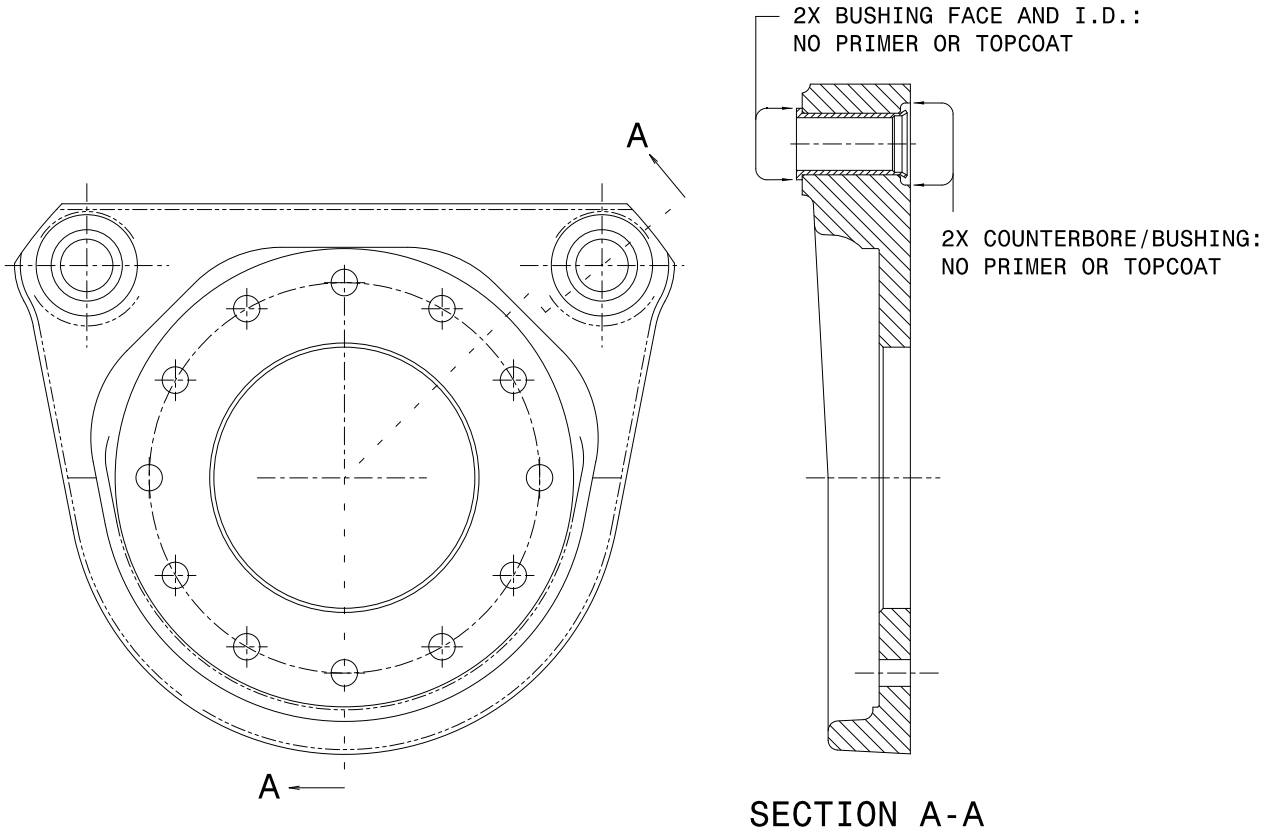
(3) Apply the primer and topcoat per Table 6003.

NOTE: To achieve best results, always refer to the manufacturer's instructions for mixing, application and use; for forced dry (oven heating) schedule and also for disposal of primer and topcoat media.

Table 6003 Torque Plate Primer and Topcoat Product Characteristics

PRIMER	TOPCOAT	DRY FILM THICKNESS AND DRY TIME (AIR)
Columbia Paint Corp., Huntington, WV		
P/N 18-017A (water reducible) No mixing required.	P/N 17-250A (524 Aluminum) (water reducible) No mixing required.	Primer: 0.0002-0.0005 in. 15 minutes min. (to touch or topcoat) 60 minutes (to handle) 4-24 hours (dry hard)
		Topcoat (including primer): 0.0008-0.0014 in. 15 minutes (to touch) 30 minutes (to handle) 48 hours (dry hard)
Alternate: Sherwin Williams Co., Cleveland, OH		
2 parts washcoat (P/N P60G2) 3 parts catalyst reducer (P/N R7K44)	P/N F63BXS58-4337 (silver) 6 parts base 1 part catalyst (P/N V66V27)	Primer: 0.0002-0.0004 in. 3-10 minutes (to touch) 10-15 minutes (tack free) 10-60 minutes (to topcoat)
		Topcoat (including primer): 0.0008-0.0014 in. 20 minutes (to touch) 60 minutes (to handle) Overnight (dry hard)

REPAIR



NOTE:
1. MASK TORQUE PLATE AS INDICATED AND APPLY PRIMER AND TOPCOAT PER TABLE 6002.

Figure 6004 Mask the Torque Plate

REPAIR

H. Replace the Linings (70)
Each metallic lining pad used on the brake assembly is a hard composition with a steel backing. Each pad is attached by three cad plated steel pins (75) and a brass plated steel rivet (80). The pins (75) are attached to the pressure plate and back plates. The lining is first seated onto the pins which press fit into the steel backing of the lining. The center retention rivet completes the attachment. The pins (75) are not visible on the lining surface unless the lining is worn beyond its wear limit.

WARNING: USE PROTECTIVE GOGGLES OR GLASSES WHEN REMOVING RIVETS TO AVOID INJURY TO EYES. AVOID GRABBING SHARP EDGES OF RIVETS WITH HANDS.

CAUTION: DO NOT ENLARGE THE RIVET HOLES IN THE PRESSURE PLATE OR BACK PLATE. IF THE RIVET HOLE EXCEEDS ∅ 0.159 INCH (4,0 MM) THE PRESSURE PLATE OR BACK PLATE MUST BE REPLACED.

(1) Lining Removal

(a) Refer to Figure 6005. Use a twist drill bit and carefully drill into the clinched end of the rivet (80). Remove only enough material to allow a press punch or pin punch to force the rivet out of the hole without deforming or enlarging the hole. Discard the rivet.

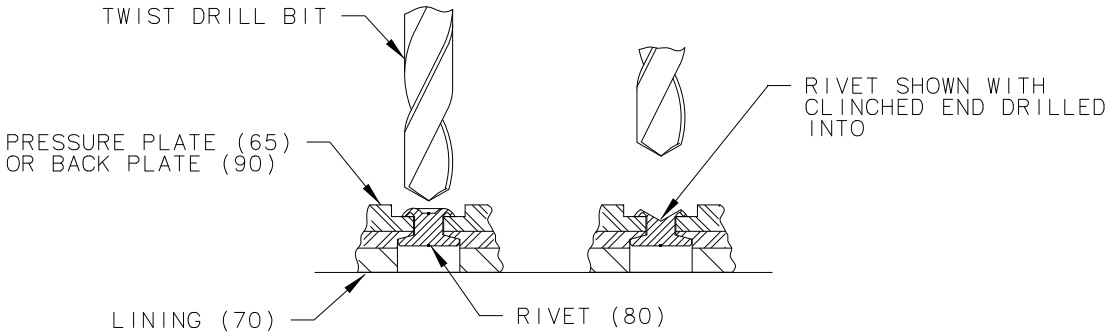


Figure 6005 Remove the Rivets

(b) Next, pry the lining pads off of the pins (75) with a thin, flat blade screwdriver. Position the screwdriver between the pressure plate or back plate and the lining's steel backing. Pry evenly around the lining pad.

(c) Repeat steps (a) and (b) for remaining linings.

(d) The pressure plate (65) should now be examined for continued service per the CHECKS section. Refer to paragraph 2.I. of this section for replacement of the pins (75).

1 After the pressure plate is determined to be serviceable, clean the pressure plate and install new linings (70).

REPAIR

(e) The back plate (90) should now be examined for continued service per the CHECKS section. Refer to paragraph 2.I. of this section for replacement of the pins (75).

1 After the back plate is determined to be serviceable, clean the back plate and install new linings (70).

(2) Lining Installation

(a) Install each lining segment onto the pins (75). Check to make sure the metal backing is tight against the pressure plate or back plate surface. A fibre mallet may be used to lightly tap the lining onto the pins to seat it.

(b) Refer to Figure 6006. Next, install the center retention rivets (80) through the linings on the pressure plate (65) and back plates (90) using the Cleveland Brake Lining Rivet Tool Kit P/N 199-579 (or equivalent).

(c) Splits resulting from the clinching operation are permitted as follows.

- The split shall not occur inside the crest of the clenched surface.
- No more than two (2) splits shall occur in a 90° area.
- A total of no more than three (3) splits shall be allowed.

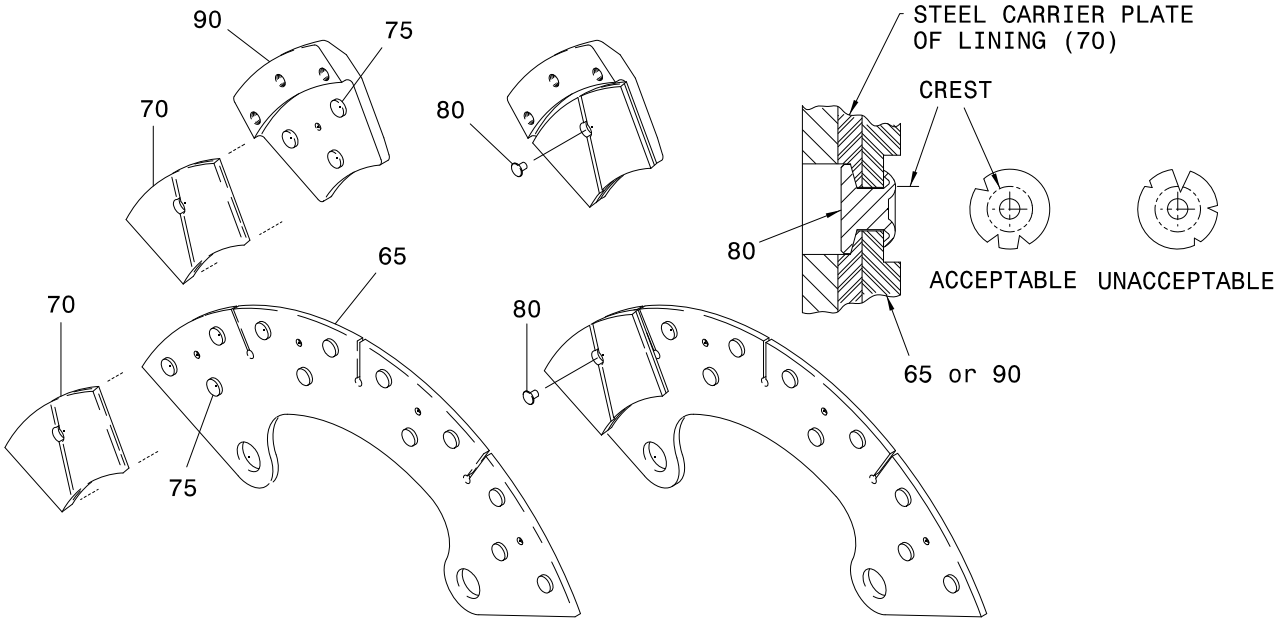


Figure 6006 Lining and Rivet Installation

REPAIR

I. Repair the Pressure Plate (65) and Back Plates (90)
The pressure plate and back plates are made from alloy steel and are cad plated. Order of repair is as follows:

- Remove the pins (75)
- Remove corrosion from the pressure plate and back plates
- Apply protective coating to the pressure plate and back plates
- Install new pins (75)

(1) Remove the Pins (75)
The pins are made from alloy steel and are cad plated.

WARNING: USE PROTECTIVE GOGGLES OR GLASSES WHEN REMOVING PINS TO AVOID INJURY TO EYES. AVOID GRABBING SHARP EDGES OF PINS WITH HANDS.

CAUTION: DO NOT ENLARGE THE PIN HOLES IN THE PRESSURE PLATE OR BACK PLATE. IF ANY PIN HOLE EXCEEDS ∅ 0.200 INCH (5,08 MM) THE PRESSURE PLATE OR BACK PLATE MUST BE REPLACED.

(a) Refer to Figure 6007. Use a twist drill bit and carefully drill into the clinched end of the pin. Remove only enough material to allow a press punch or pin punch to force the pin out of the hole without deforming or enlarging the hole. Discard the pin.

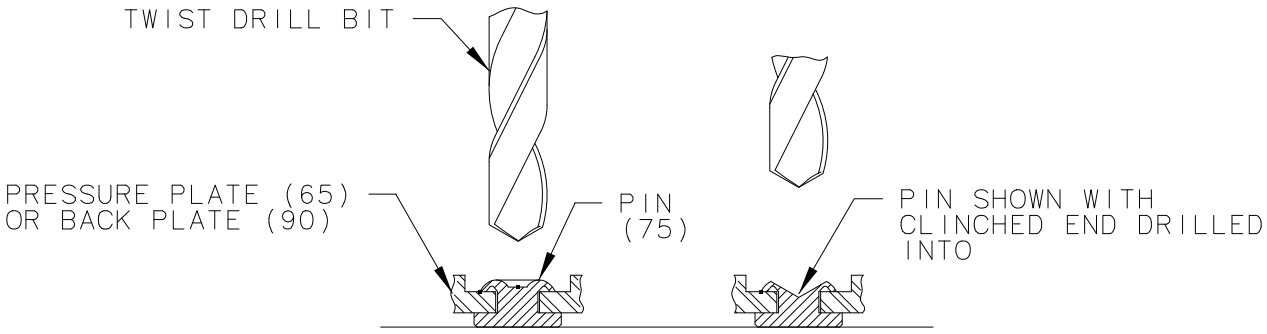


Figure 6007 Remove the Pins

REPAIR

(2) Stripping and re-cadmium plating steel parts is generally cost prohibitive in small lots. Therefore, steel parts that have been cadmium plated may be protected with an application of zinc rich cold galvanizing compound.

SAFETY WARNING: EXPOSURE TO CADMIUM DUST IN UNVENTILATED GRINDING ACTIVITIES AND WORKING WITH CADMIUM AND IT'S COMPOUNDS CAN BE A POTENTIAL HEALTH HAZARD.

(a) Small nicks and light corrosion may be hand finished using 400 to 600 grade or finer aluminum oxide cloth.

(b) Any area from which the protective coating is removed should be thoroughly cleaned and treated as follows.

SAFETY WARNING: WEAR PROTECTIVE CLOTHING. COATING MATERIALS CAN BE TOXIC AND VOLATILE. FOLLOW THE MANUFACTURERS INSTRUCTIONS FOR ALL SAFETY INSTRUCTIONS.

1 Apply one coat of cold galvanizing compound to the entire part (pressure plate or back plates).

NOTE: To achieve best results, always refer to the manufacturer's instructions for mixing, application and use; for dry time schedule and also for disposal of product.

REPAIR

(3) Install the Pins (75)

(a) Refer to Figure 6008. Install the pins on the pressure plate (65) and back plates (90) using the Cleveland Brake Lining Rivet Tool Kit P/N 199-579 (or equivalent).

(b) Splits resulting from the clinching operation are permitted as follows.

- The split shall not occur inside the crest of the clenched surface.
- No more than two (2) splits shall occur in a 90° area.
- A total of no more than three (3) splits shall be allowed.

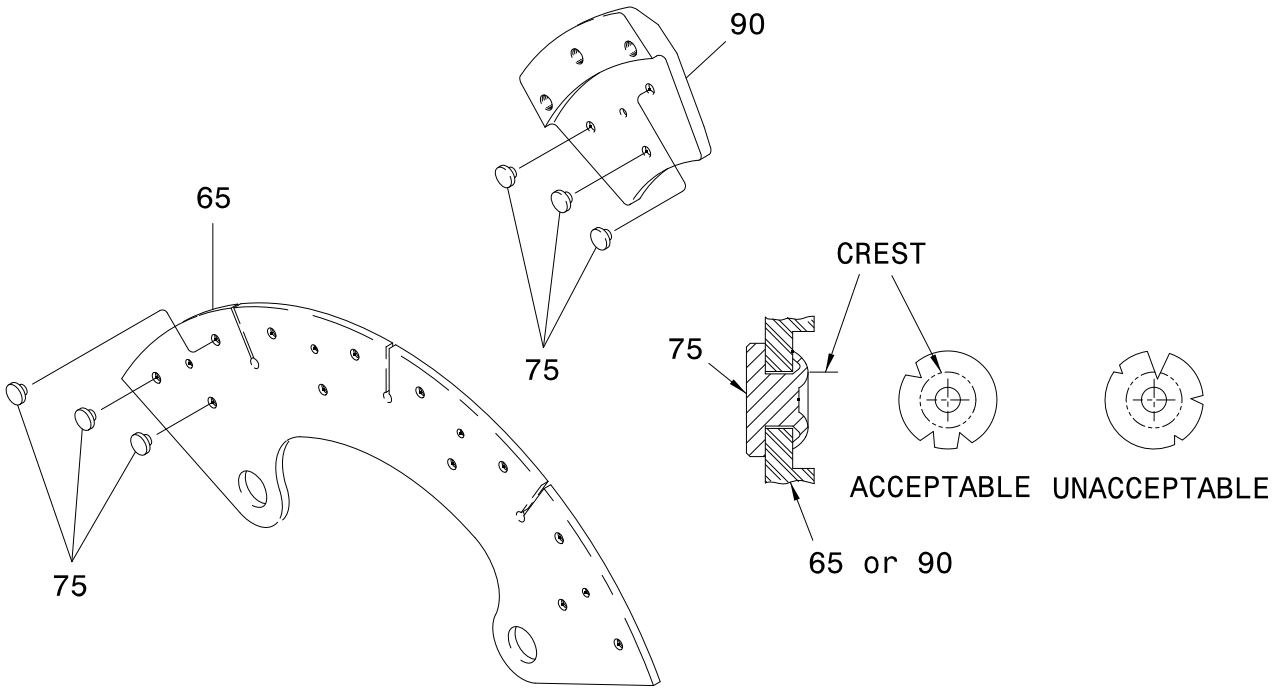


Figure 6008 Pin Installation

ASSEMBLY

1. General

Refer to IPL Figure 1 to identify the brake assembly components.

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

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 Assembly Equipment and Consumables

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Fluid, hydraulic	MIL-H-5606 (equiv. alternatives are not allowed)	Commercial
Preformed packing tool set	P/N 199-18	Parker Hannifin Corp., Aircraft Wheel & Brake Division or Parker Hannifin distributor
Dry film lubricant for item (100)	One of the following for non-amphibious environment: • Silicone spray • Dri-Slide® Multi Purpose Lubricant • LPS Force 842® Dry Moly Lubricant	Commercial
Standard tools (inch units)	• 12pt external: items (5) and (10) • hex head external: items (110), (120), and (135) • torque gauge	Commercial

B. Reference Documents

Parker Hannifin, Aircraft Wheel & Brake Division product reference memo

- PRM14A ..... Metallic Brake Lining Conditioning Procedure.

ASSEMBLY

2. Assembly Procedures

A. Assemble the Brake

(1) Install a washer (105) onto the threaded end of the anchor bolt. Install a nut (110) and tighten to 80 to 90 lb-in (9,0 to 10,2 N-m), dry torque.

NOTE: The inlet and bleeder ports are identical to allow for left and right hand installation. Install the bleeder as required.

(2) Lubricate the preformed packing (115) with Dow Corning Molykote 55M silicone grease and install the packing on the bleeder seat (120). Install the bleeder seat into the cylinder port. Tighten the bleeder seat to 65 to 70 lb-in (7,3 to 7,9 N-m), dry torque.

CAUTION: DO NOT EXCEED 12 LB-IN (1,35 N-M) WHEN TIGHTENING THE BLEEDER SCREW (125). TORQUE IN EXCESS OF 12 LB-IN (1,35 N-M) WILL DAMAGE THE BLEEDER SEAT (120).

(3) Install the bleeder screw (125) into the bleeder seat (120). Tighten the bleeder screw snug to prevent leakage.

(4) Lubricate the preformed packing (140) with Dow Corning Molykote 55M silicone grease and install the packing on the fitting (135). Install the fitting into the inlet port of the cylinder. Tighten the fitting to 50 to 70 lb-in (5,6 to 7,9 N-m), dry torque.

(5) Refer to Figure 7001. Lubricate the preformed packings (25) with MIL-H-5606 hydraulic fluid and install in each of the cylinder (20) piston bore grooves.

(6) Refer to Figure 7001. Install the pistons (45) as follows:

(a) Install the I.D. of the piston boots into the piston O.D. groove.

(b) Lubricate the following with a small amount of hydraulic fluid:

- Cylinder piston bore.
- Piston O.D.

(7) Refer to Figure 7001. Insert the pistons (45) as follows.

(a) Place each piston into a piston bore and rotate to seat the drag ring and to insure that the piston and seal (35) are in proper alignment.

(b) Tap the piston with a wooden, plastic, or rubber mallet while alternately rotating.

1 If considerable effort is required, remove the piston and inspect both the bore and the pilot bore for damage.

2 If the bore is damaged, check the corresponding area of the piston for damage. Repair if necessary and repeat the procedure.

ASSEMBLY

(8) Refer to Figure 7001. Once the pistons are seated, install the piston boots (30) into the appropriate groove in the cylinder.

(9) Refer to Figure 7001. The insulators are an interference fit. Press the piston insulators (55) into each piston (45).

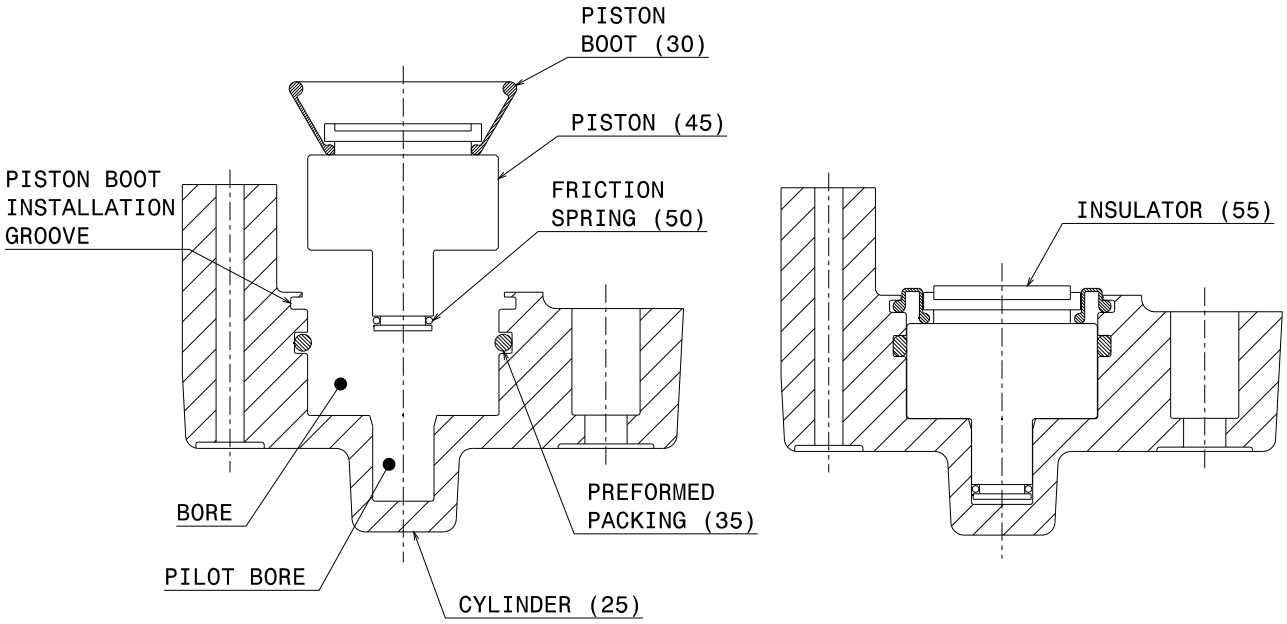


Figure 7001 Install the Preformed Packings, Boots, Pistons, and Insulators

(10) Install the pressure plate assembly (60) as follows.

(a) The lining side must facing away from the pistons.

(b) Align the anchor bolt holes with the anchor bolts and slide the pressure plate/lining onto the cylinder.

NOTE: The pressure plate/lining must slide freely over the anchor bolts for proper operation.

ASSEMBLY

B. Mount the Brake onto the Aircraft

(1) Mount the torque plate assembly (145) onto the axle mounting flange with the existing mounting hardware. Tighten to specifications in the aircraft manual.

CAUTION: DO NOT USE GREASE OR OIL TO LUBRICATE THE INSIDE OF THE TORQUE PLATE BUSHINGS (155) OR ANCHOR BOLTS (100). THIS WILL ATTRACT CONTAMINANTS.

(2) Apply a light coat of dry film lubricant, such as silicone spray, Dri-Slide ® Multi-Purpose lubricant (molybdenum disulfide) or LPS Force 842® Dry Moly lubricant to the I.D. of the torque plate bushings (155) and the O.D. of the anchor bolts.

NOTE: Reapply dry film lubricant periodically as required to maintain friction free operation.

(3) Mount the wheel assembly. Refer to the wheel assembly component maintenance manual CM040-21101 for instructions on mounting the wheel assembly.

(4) Install the brake cylinder (25) into the torque plate assembly (145) by aligning the anchor bolts (100) with the torque plate bushings (155) and sliding the brake cylinder onto the torque plate.

NOTE: The anchor bolts must slide freely in the torque plate bushings (155) for proper operation.

CAUTION: THE COUNTERSUNK SIDE OF THE WASHER MUST FACE THE BOLT HEAD OR BOLT FAILURE MAY RESULT.

(5) Place a countersunk washer (15) on each of the brake tie bolts (5, 10), and insert these bolts into the respective brake housing holes.

(6) Install two insulator shims (95) onto the bolts and position against the cylinder.

CAUTION: MAKE SURE THAT THE BRAKE DISC IS SANDWICHED BETWEEN THE BACK PLATES AND THE PRESSURE PLATE. SEE FIGURE 3001, DISASSEMBLY SECTION.

(7) Install the four back plate assemblies (85) between the brake disc and the wheel flange and align with the bolts (5, 10). Thread the bolts into the back plates and tighten the bolts to 80 to 85 lb-in (9,0 to 9,6 mm), dry torque.

(8) Safety wire the bolts (5, 10).

(9) Reconnect the aircraft system hydraulic lines. Bleed and pressure test the brake. Check the pedal for proper feel and travel.

(10) Perform conditioning procedure for new lining segments. Refer to Parker Hannifin product reference memo, PRM14A for conditioning procedure.

FITS AND CLEARANCES

1. General

Refer to IPL Figure 1 to identify the brake assembly components.

A. Assembly Wear Limits

Table 8001 In-Service Wear Limits

PART NAME (IPL item number)	FIGURE	WORN AREA DESCRIPTION	WORN DIMENSION
Pressure plate assembly (65): Lining (70) Lining (70)	1	 Thickness Out-of-flat	 0.100 inch (2,54 mm) minimum 0.020 inch (0,51 mm) maximum
Back plate assembly (85): Lining (70) Lining (70)	1	 Thickness Out-of-flat	 0.100 inch (2,54 mm) minimum 0.020 inch (0,51 mm) maximum
Cylinder (25) Piston bore	N/A	Inside Dia.	∅ 1.753 inch (44,52 mm) maximum
Piston (30)	N/A	Outside Dia.	∅ 1.746 inch (44,35 mm) minimum
Bushing (155)	N/A	Inside Dia.	∅ 0.640 inch (16,25 mm) maximum

B. Assembly Torque Values

Table 8002 Assembly Torque Values

PART NAME (IPL item number)	TORQUE LIMITS
Bolts (5, 10)	80 to 85 lb-in (9,0 to 9,6 N-m), dry torque. Safety wire after installing brake assembly on aircraft.
Bleeder seat (120)	65 to 70 lb-in (7,3 to 7,9 N-m), dry torque
Bleeder screw (125)	Close the screw, then tighten snug to prevent leakage. **CAUTION:** DO NOT EXCEED 12 LB-IN (1,35 N-M) WHEN TIGHTENING THE BLEEDER SCREW (80). TORQUE GREATER THAN 12 LB-IN (1,35 N-M) WILL DAMAGE THE BLEEDER SEAT (75).
Fitting assembly (135)	50 to 70 lb-in (5,6 to 7,9 N-m), dry torque
Nuts (110)	80 to 90 lb-in (9,0 to 10,2 N-m), 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, you can use equivalent alternatives for items listed.

Table 9001 List of Manufacturers

NOMENCLATURE	SPECIFICATION / PART NO.	SOURCE
Preformed packing tool set	P/N 199-18	Parker Hannifin Corp. Aircraft Wheel & Brake Div. Avon, OH 44011 USA www.parker.com or Parker Hannifin distributor
Plastic media for items (25, 150)	MIL-P-85891, Type II or V, Grade 20/30, 3.5 MOH max	U.S. Technology Corporation www.ustechnology.com
Abrasive media for items (65, 90)	80 Grit aluminum oxide	
Primer and topcoat for items (25, 150)	Primer: P/N 18-017A or 12-231A Topcoat: P/N 17-250A	Columbia Paint Corp. Huntington, WV 25728 USA
	Alternate primer and topcoat Primer: P/N P60G2 Topcoat: P/N F63BXS58-4337	Sherwin Williams Co. www.sherwin-williams.com
O-Ring lubricant	Dow Corning 55 lube (equiv. alternatives are not allowed)	Dow Corning Corporation www.dowcorning.com
ZRC galvilite cold galvanizing compound for items (65, 90)	P/N 11011-10014 MIL-PRF-26915, Type I, Class A	ZRC Products Company www.zrcworldwide.com

SPECIAL EQUIPMENT AND CONSUMABLES

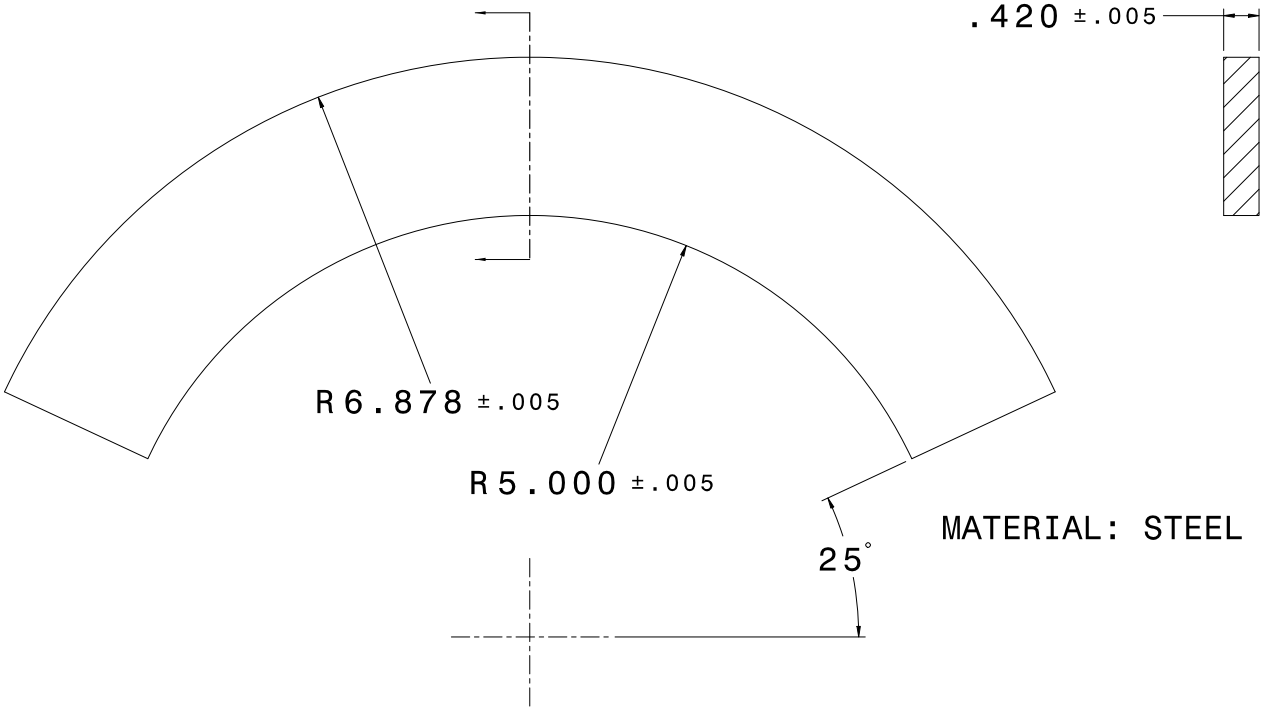


Figure 9001 Test Disc Segment

ILLUSTRATED PARTS LIST

1. General

The illustrated parts list describes and illustrates the detail parts of the brake assembly.

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) Figure/Item column: The figure and item numbers refer to the applicable Illustrated Parts List (IPL) Figure. The first number shows the figure number of the illustration.

(2) Part Number column: This column shows the Parker Hannifin Aircraft Wheel and Brake part number for the individual item.

(3) Airline Stock Number column: This column gives the Airline Stock Number when applicable.

(4) Nomenclature column: This column identifies the parts being listed by noun name followed by modifiers when applicable. The indenting system used in the parts list shows the relationship of the parts to their subassemblies and to the assembly:

1 2 3 4
Assembly
Attaching Parts for Assembly
Detailed Parts for Assembly
Subassembly
Attaching Parts for Subassembly
Detailed Parts for Subassembly

(5) Effectivity column: An effectivity code shows the difference in parts within different configurations. The effectivity code is used for more than one configuration of the basic part number. Effectivity codes only apply to the figure in which they are used.

(6) Units Per Assembly column: This column shows the total number required for each assembly or for each subassembly as applicable. These abbreviations may appear in the Units Per Assembly column:

AR..... As Required (for bulk items)
NP..... Item is Nonprocurable (listed for reference only)
RF ..... Reference (item listed for reference only)

ILLUSTRATED PARTS LIST

B. Part Numbering System

Parker Hannifin Aircraft Wheel & Brake has given a part number to all the purchased and government standard off-the-shelf parts. They are defined and used as follows:

When a purchased part is listed, the Parker Hannifin AWB part number will be used in the part number column. If required by contract or if the original manufacturer of a purchased part has FAA manufacturing approval then; the original manufacturer's part number along with the manufacturer's federal supply code will be shown in parentheses following the part nomenclature. The letter "V" will precede the federal supply code.

Unless specified differently by contract, the assigned Parker Hannifin AWB part number will be used in the part number column to identify 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 in the part number column is replaced by and is not interchangeable with the item number shown in the notation.
Supersedes	SUPSDS	The part in the part number column replaces and is not interchangeable with the item number shown in the notation.
Replaced by	REPLD BY	The part in the part number column is replaced by and interchangeable with the item number shown in the notation.
Replaces	REPLS	The part in the part number column replaces and is interchangeable with the item number shown in the notation.
Vendor	V	Federal Supply Code for vendors.

ILLUSTRATED PARTS LIST

D. Items Not Illustrated

Items not illustrated are shown by a dash (-) in front of the item number in the Figure/Item number column.

E. 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

Alpha variant item numbers are not shown on the exploded view when the appearance and location of the alpha variant item is the same as the basic item.

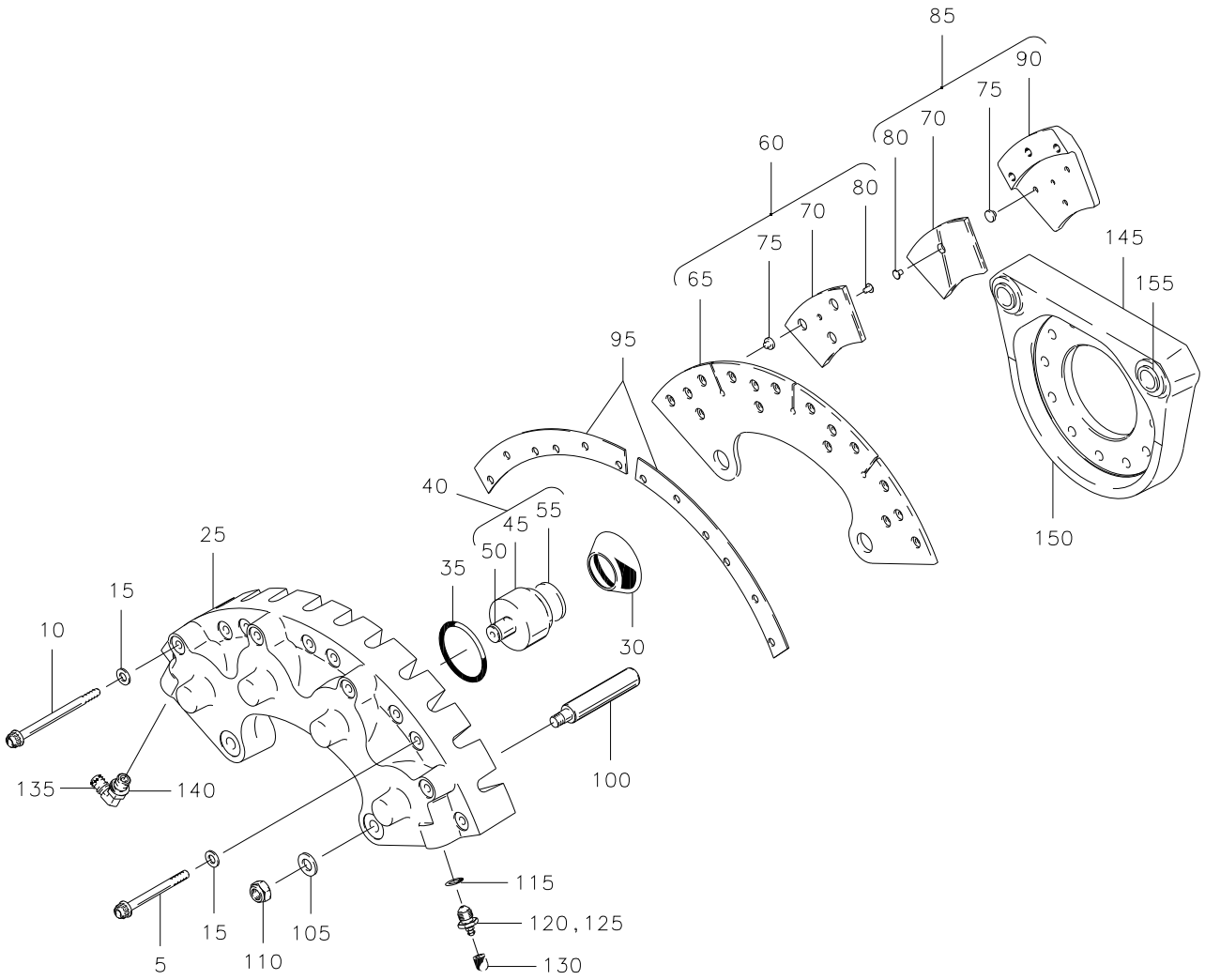
2. Optional Vendor Index

Not applicable.

3. Federal Supply Code for Manufacturers

Not applicable.

ILLUSTRATED PARTS LIST



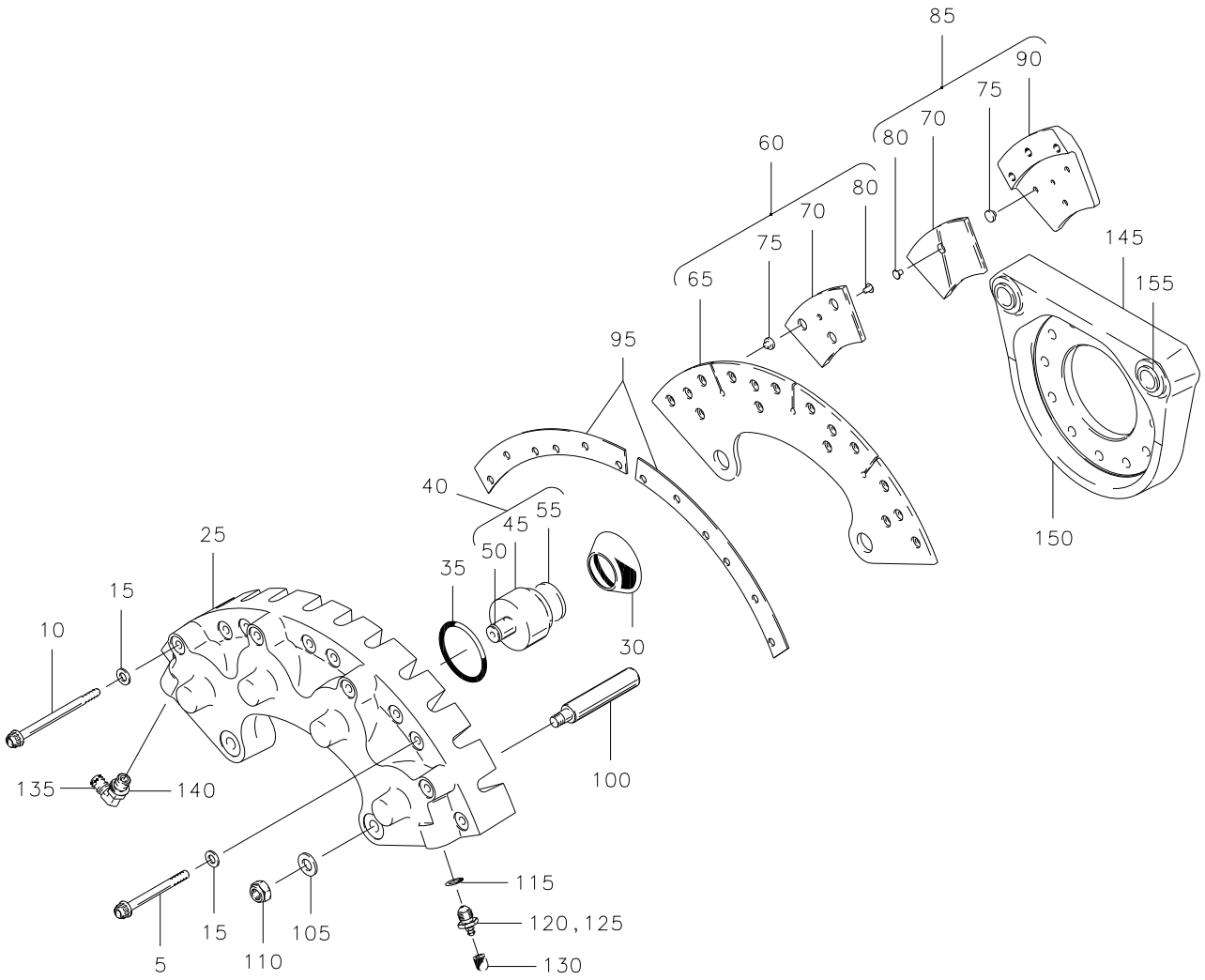
IPL Figure 1 Main Brake Assembly Exploded View

ILLUSTRATED PARTS LIST

4. Detailed Parts List – Main Brake Assembly (Sheet 1 of 2)

FIG. ITEM	PART NUMBER	AIRLINE STOCK NUMBER	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY.
1 - 1	30-170		BRAKE ASSEMBLY, MAIN		RF
5	103-16800		. BOLT (MS21250H04024)		8
10	103-16700		. BOLT (MS21250H04036)		4
15	095-14300		. WASHER (MS20002C4)		12
– 20	091-17300		. CYLINDER ASSEMBLY		1
25	061-12300		. . CYLINDER		1
30	139-20000		. . BOOT, PISTON		4
35	101-05200		. . PREFORMED PACKING (MS28775-224)		4
40	092-06900		. . PISTON ASSEMBLY		4
45	062-06800		. . . PISTON		1
50	082-02000		. . . FRICTION SPRING		1
55	088-01400		. . . INSULATOR		1
60	073-07400		. . PRESSURE PLATE ASSEMBLY		1
65	063-05800		. . . PRESSURE PLATE		1
70	066-10000		. . . LINING		4
75	177-01600		. . . PIN		12
80	105-00200		. . . RIVET		4
85	074-06000		. . BACK PLATE ASSEMBLY		4
90	064-03200		. . . BACK PLATE		1
70	066-10000		. . . LINING		1
75	177-01600		. . . PIN		3
80	105-00200		. . . RIVET		1

ILLUSTRATED PARTS LIST



IPL Figure 1 Main Brake Assembly Exploded View

ILLUSTRATED PARTS LIST

4. Detailed Parts List – Main Brake Assembly (Sheet 2 of 2)

FIG. ITEM	PART NUMBER	AIRLINE STOCK NUMBER	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY.
95	068-04600		. . SHIM, INSULATOR		2
100	069-02300		. . ANCHOR BOLT		2
105	095-10600		. . WASHER (AN960-616)		2
110	094-10100		. . NUT (MS21042-6)		2
115	101-00700		. . PACKING, PREFORMED (MS28775-012)		1
120	081-00200		. . SEAT, BLEEDER		1
125	079-00300		. . SCREW, BLEEDER		1
130	183-00100		. . CAP, BLEEDER		1
135	104-03100		. . FITTING ASSEMBLY		1
140	101-39800		. . . PACKING, PREFORMED (M83461/2-904)		1
145	075-17000		. TORQUE PLATE ASSEMBLY		1
150	065-15900		. . TORQUE PLATE		1 (NP)
155	145-08700		. . BUSHING		2 (NP)
–160	166-08600		. NAMEPLATE		1

STORAGE

1. Procedures

Refer to IPL Figure 1 to identify the brake assembly components.

Brake assemblies which will not be immediately installed on the aircraft must be properly stored. Acceptable storage conditions are listed below.

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

A. Cap all fittings.

B. The length of time that a brake assembly can be stored is governed by the storage life of its elastomer-based components. The storage life may be shortened by exposure to sunlight, extreme temperatures, humidity, ozone, contamination of fluids, severe operating conditions, etc.

C. Store all parts in moisture-barrier material in a clean, dry environment in a temperature range from 50° to 70°F (10° to 21°C). Exposure to extreme temperatures can affect service life.

Cleveland
Wheels & Brakes

Parker Hannifin Corporation
Aircraft Wheel & Brake
1160 Center Road
Avon, Ohio 44011 USA
1-800-BRAKING (272-5464)
216-937-1272 ● FAX 216-937-5409

PRODUCT REFERENCE MEMO

METALLIC BRAKE LINING CONDITIONING PROCEDURE

The brake lining material used in this brake assembly is an iron based metallic composition. This material must be properly conditioned (glazed) in order to provide optimum service life.

Dynamometer tests have shown that at low braking energies, unglazed linings experience greater wear and the brake discs can become severely scored.

Conditioning may be accomplished as follows:

1. Perform two (2) consecutive full stop braking applications from 30 to 35 kts. Do not allow the brake discs to cool substantially between stops.

2. On aircraft with tail wheels, exercise caution during stopping to prevent tail lifting. Due to the efficiency of these brakes, extremely hard braking could result in lifting the tail from the ground.

This conditioning procedure will wear off high spots and generate sufficient heat to glaze the linings. Once the linings are glazed, the braking system will provide many hours of maintenance free service.

Visual inspection of the brake disc will indicate the lining condition. A smooth surface, without grooves, indicates the linings are properly glazed. If the disc is rough (grooved), the linings must be reglazed. The conditioning procedure should be performed whenever the rough disc condition is evident.

Light use, such as in taxiing, will cause the glaze to be worn rapidly.

Use caution in performing this procedure, as higher speeds with successive stops could cause the brakes to overheat resulting in warped discs and/or pressure plates.

Parker Hannifin Corporation
Aerospace/Aircraft Wheel & Brake
1160 Center Road
Avon, OH 44011

Date: _ _/_ _/20_ _

Subject: Letter of Authorization for Installation of STC'd Conversion Kits

To whom it may concern:

Parker Hannifin Corporation, Aircraft Wheel & Brake Division, hereby states that the following item(s):

KIT NUMBER: 199-_____

FAA APPROVAL: 1) STC # _____

NO OTHER APPROVALS NECESSARY

AUTHORIZATION TO INSTALL: With the sale of this STC KIT, OWNER of the Supplemental Type Certificate agrees to permit the buyer or buyer's agent or agency to use the certificate to alter the product under the terms and conditions of this STC.

A/C MAKE: _____

A/C MODEL_____

TAIL # _____

Regards,

Technical Support Team
Technical Hotline (800) 272-5464
Clevelandwbhelp@parker.com
Web-site: www.clevelandwheelandbrake.com
Manufacturer of Cleveland Wheels & Brakes

United States of America

Department of Transportation — Federal Aviation Administration

Supplemental Type Certificate

Number SA1222GL

This certificate, issued to Aircraft Wheel & Brake Division
Parker Hannifin Corporation
1160 Center Road
Avon, Ohio 44011

certifies that the change in the type design for the following product with the limitations and conditions thereof as specified hereon meets the airworthiness requirements of Part 03 *of the* Civil Air *Regulations* See Aircraft Specification No. A-765 for complete certification basis.

Original Product — Type Certificate Number A-765

Make Beech Aircraft

Model D18S, D18C, E18S, C-45G, TC-45G, C-45H.TC-45H, TC-45J, RC-45J, E18S-9700, G-18S, H18, JRB-6, 3N, 3NM, 3TM

Description of Type Design Change

Replace existing Main Wheels & Brakes with Cleveland 40-211/30-170 in accordance with Parker Hannifin Corporation Aircraft Wheel & Brake Division Conversion Kit 199-141, Rev. A, dated August 13, 1987.

Limitations and Conditions

This STC applies to those models listed above equipped with 12 inch wheels and wishbone struts.
The compatibility of this modification, with previously approved modifications, must be determined by the installer.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application February 2, 1987 *Date reissued*

Date of issuance August 13, 1987 *Date amended*

By direction of the Administrator

W. F. Horn *(Signature)*
Manager, Chicago Aircraft Certification Office
ACE-115C, Central Region
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47

FAA Form 8110-2 (10-68)