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FAA-PMA

PARTS LIST <u>199-220 CONVERSION KIT</u> <u>BEECH – Model 1900C & 1900D</u>

PART NUMBER **DRAWING REVISION** DESCRIPTION QUANTITY 30-204A Rev. F dated 09-02-2003 Brake Assembly 4 40-273A Rev. D dated 10-04-2006 Wheel Assembly 4 103-24400 Bolt (MS21250-05040) 4 _____ 095-02800 Washer (MS20002C5) 8 -------094-16400 Nut (NAS1804-5N) 4 _____ 101-50337 O-Ring (MS28775-112) 4 _____ Rev. A dated 04-01-2003 4 101-20400 O-Ring 221-07100 _____ Pin, Cotter, Split (MS24665-428) 4 *199-213 Rev. E dated 12-10-1997 Brake De-ice Manifold Kit 2

Publication Package (P/N PP199-220)

IM199-220	Rev. B dated 03-28-1996	Installation Manual
50-152	Rev. D dated 05-02-2001	Installation Drawing
CM40-273A	Rev. K dated 07-17-2019	Component Maintenance Manual – Wheel
CM30-204A	Rev. E dated 07-25-2016	Component Maintenance Manual - Brake
SA1789GL	Amend date 01-08-2002	Supplemental Type Certificate

NOTES:

- 1. This kit will convert one aircraft to Cleveland Wheels and Brakes.
- 2. The 30-204A brake assembly is designed for use with MIL-H-5605 (Red Fluid).
- * Optional Two 199-212 or two 199-213 Kits are required if the Aircraft is equipped with the Brake De-ice system. These Kits must be purchased separately. The 199-220 manual specifies the kit applicability.

Rev. N 04-18-2006 (0369-54)

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) INSTALLATION	NEW INSTALLATION	N C1	(C_1)	4	2		40-27	'3A W	HEEL ASSEM	BLY		12.4
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				4	6		101-50	337 0)-RING	an a	MS28775-112	.00071
			B	\mathbf{D}	7		101-20	400 0)-RING	Septembria and a second se	MS28778-4	.00008
				4	8		221-07	'100 C	COTTER PIN		MS24665-428	.0152

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			REVISIONS				
CHANGE NOTICE	ZONE	LTR	DESCRIPTION OF CHANGE	CHG BY	CHK BY	DATE	APPROVED
0311/65	•	N/C	PRODUCTION RELEASE	PK	VR	94-05-19	P. KRONZ
0314/01	•	A	PRODUCTION CHANGE, SEE C/N	PK	VR	94-11-08	P. KRONZ
0316-47	•	В	PRODUCTION CHANGE, SEE DCN	JAC	BB	96-04-16	B.BARKER
0325-55	•	С	SEE C/N	GL	GR	97-08-06	PAUL KRONZ
0344-08	•	D	SEE C/N	DAB	\$.R.	05-02-2001	Bulkrong

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CLEVELAND WHEELS AND BRAKES

CONVERSION KIT

INSTALLATION MANUAL

KIT NUMBER 199-220

BEECH MODELS 1900C AND 1900D



Aircraft Wheel & Brake Division

Parker Hannifin Corporation 1160 Center Road Avon, Ohio 44011 U.S.A.



CLEVELAND WHEELS & BRAKES

INSTALLATION MANUAL

WITH

ILLUSTRATED PARTS LIST

FOR

CONVERSION KIT

199-220

FOR

BEECH MODEL 1900C AND 1900D AIRCRAFT

REVISION B DATED MARCH 28, 1996

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

March, 1996

Cleveland Wheels & Brakes Conversion Kit 199-220

LIST OF REVISIONS

REVISION	DATE	PAGE	DESCRIPTION	<u>APVD</u>
Initial Release	05/17/94		Installation Instructions Cleveland Wheels & Brakes Conversion Kit 199-220	BB (0311-65)
Rev. A	11/08/94	2	1-800-272-5464 -was- 1-800-272-5464 (Outside Ohio) Component Maintenance Manual	BB (0314-01)
			-was- Overhaul Manual	
		4	(analogous -was- analogous	
		8	grease per MIL-G-81322 (Aeroshell 22) -was- Mobil grease 77, Mobilux EP2 or equivalent	
		9	 37.9 lbswas- 35.7 lbs. <u>Aircraft Flight Manual and Equipment List Entries</u> 9.1 Update the "Weight and Balance" Section of the Aircraft Flight Manual as well as the Aircraft Equipment list for the change in both weight and moment created by the installation of this conversion kit. -was- 9. Flight Manual Inserts (Located in front 	
			cover pocket) 9.1 Attach label listed "Item installed in airplane" in flight manual as close as possible to the original section labeled	
			Main Wheel Assembly. Enter the correct arm and moment in blocks provided. Zero items out for the original main wheel and brake assemblies that have been removed.	
Rev. B	03/28/96	10	O-Ring Part Number: "101-20400" -was- "101-20800"	(0316-47)

Cleveland Wheels & Brakes Conversion Kit 199-220

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Cleveland Wheels & Brakes Conversion Kit 199-220

1. INTRODUCTION

1.1 This manual is published for the guidance of personnel responsible for the installation of Cleveland Conversion Kit 199-220.

1.2 <u>Brake De-ice</u>: Unless the aircraft has the optional brake de-icing equipment, the 199-220 kit contains all materials and instructions needed to replace existing equipment with Cleveland Wheels and Brakes. If the aircraft has the Beech brake de-icing equipment, then either two 199-212 or 199-213 Kits are required. These kits must be purchased separately.

The Cleveland 199-213 Kit contains all materials and instructions needed to replace one Beech P/N 114-81088-5 Brake De-ice Manifold with one Cleveland P/N 139-29900 Brake De-ice Manifold. Please refer to figure 1 of this manual for illustrations of Beech P/N 114-810088-5.

Kit 199-212 is designed to replace two Beech P/N 101-810072-1 Brake De-ice Manifold Support Assemblies which fasten to Beech P/N 101-810071-1 Brake De-ice Manifold. The 199-212 Kit is designed to retrofit one strut equipped with Beech P/N 101-810071-1. Please refer to figure 1 of this manual for illustrations of Beech P/N 101-810071-1 Brake De-ice Manifold.

2. TSO NOTICE

2.1 The wheel and brakes used in this conversion kit carry a "TSO" marking which identifies them as having been fully laboratory tested and qualified to meet the applicable Federal Aviation Agency (FAA) specifications and requirements.

2.2 After final certification, substitution of critical parts or changes of processes or materials are not permitted without requalification of the assemblies and resubmittal of the test data to the FAA for approval.

2.3 FAA regulations subject both Parker Hannifin, Aircraft Wheel and Brake Division and the user to constant surveillance to assure that uncompromising Quality Assurance materials and processing controls are maintained in order to provide replacement parts that are the same as the parts originally certified in the assembly.

Cleveland Wheels & Brakes Conversion Kit 199-220

3. APPLICABILITY

3.1 "KIT 199-220"

MAKE MODELS

Beech

1900C and 1900D

4. ORDER INFORMATION

4.1 To order spare parts, contact the nearest Parker Hannifin, Aircraft Wheel & Brake distributor in your area, or call Parker Hannifin, Aircraft Wheel & Brake Division, Customer Service for assistance at:

1-800-272-5464 or (216) 937-9211 Fax: (216) 937-5409

5. DESCRIPTION

5.1 The brake is a single fixed cylinder, 5 piston, hydraulically operated, and internal dual floating disc design. The brake is designed for use with MIL-H-5606 hydraulic fluid and to withstand 1,000 psi operation pressure with zero psi back pressure. It is composed of the parts listed in the 30-204A Brake Assembly Component Maintenance Manual.

5.2 The wheel is forged aluminum and conforms to all Tire and Rim Association Standards for a 22 x 6.75-10 divided type wheel. The wheel can be used in either a tubeless or tube-type application. It incorporates an O-ring seal. The inner wheel half flange will drive the dual free floating discs. Rubber lip seals on both wheel halves protect the bearings. It is composed of the parts listed in the 40-273A Wheel Assembly Component Maintenance Manual.

6. OPERATION

6.1 Braking action begins to occur when hydraulic pressure applied to the brake, via the pilots and copilots master cylinders, moves the pistons out of the cylinder housing. As this pressure overcomes the spring force in the retract assemblies, the pistons will contact the pressure plate assembly and force the discs and center stator into the torque plate generating torque. This braking action is then transmitted to the wheel by the drive tangs on the discs.

Cleveland Wheels & Brakes Conversion Kit 199-220

7. INSTALLATION

- 7.1 Jack aircraft per Beech Service Manual.
- 7.2 Deflate Main Wheels completely.
- 7.3 Remove hub cap and cotter pin.
- 7.4 Remove and retain castellated axle nut and tanged washer.
- 7.5 Remove existing main gear wheels. Discard spacer.

7.6 If the aircraft is equipped with the optional Beech Brake De-ice system, disconnect brake de-ice hose assembly using a 1 in. open end wrench. If the aircraft is equipped with the Beech P/N 101-810071-1 Brake De-icing Manifold, remove and retain the sixteen (16) Beech P/N 130909814 bolts and AN960-10L washers which fasten the brake de-icing manifold to the brake support bracket. Retain also the brake de-icing manifold P/N 101-810071-1. The sixteen (16) MS21042L3 nuts may be discarded.

7.7 Disconnect lower hydraulic line from swivel kit using a 9/16 in. open end wrench, and cap hydraulic line tightly. See view A-A of installation drawing 50-152.





BEECH P/N 114-810088-5



Cleveland Wheels & Brakes Conversion Kit 199-220

7.8 Remove and discard the two (2) brake tie bolts (analogous to Item #3 on 50-152 drawing).

7.9 Remove both brake assemblies from strut.

7.10 Disassemble swivel kit and remove O-ring seals. Clean all metal swivel kit parts.

7.11 Reassemble Beech Swivel Kit with O-rings, items #6 and #7 on the 50-152 installation drawing.



Figure 2

7.12 If the aircraft is not equipped with Beech Brake De-ice, mount the cylinders on opposite sides of the strut making sure that the cylinder bottoms on the strut and the torque ring engages the gear lug.

7.13 If the aircraft is equipped with Beech brake de-ice, refer to the brake de-ice installation manual before proceeding further

Cleveland Wheels & Brakes Conversion Kit 199-220



Figure 3

7.14 Install the swivel fitting (hydraulic "T" fitting) between the two brake assemblies.

- NOTE -

The brake is nonhanded. The plug may be moved to the opposite port if needed.

Cleveland Wheels & Brakes Conversion Kit 199-220

7.15 Draw the two cylinder assemblies together using the two bake tie bolts, two nuts, and four washers shown as items 3, 4 and 5 on the 50-152 installation drawing. Lubtork these bolts to 175-190 in-lbs.



Figure 4

Cleveland Wheels & Brakes Conversion Kit 199-220

7.16 Unplug the lower hydraulic line and re-attach this line to the swivel fitting.

7.17 If the aircraft has brake de-ice, wait until the aircraft is lowered off of the jacks before beginning to re-attach the brake de-ice hose assembly.

7.18 Check the master cylinder fluid reservoir and add fluid as required.

7.19 Bleed the brakes.



Figure 5

- CAUTION -

DO NOT ALLOW THE RESERVOIR TO BECOME EMPTY DURING BLEEDING.

7.20 The wheel assemblies are shipped from the factory as a complete assembly. The bearings are packed with grease and installed in the wheel halves.

- NOTE -

Extended storage of lubricated bearings may require relubrication.

7.21 Remove grease seals and bearing cones from the wheel assembly and place on a clean surface to avoid contamination.

7.22 To separate wheel halves remove nuts, countersunk washers, plain washers, and tie bolts which hold the wheel halves together for shipment.

7.23 Position outer wheel half on a flat surface with the register side facing up.

7.24 Place serviceable tire over outer wheel half and install tube in tire if applicable.

7.25 Next, lubricate O-ring seal with Dow Corning Molykote 55M grease or equivalent and position on register portion of inner wheel half.

Cleveland Wheels & Brakes Conversion Kit 199-220

- CAUTION -

Seal should not be twisted, but fully aligned in the groove.

7.26 Place inner wheel half in tire making sure to properly align inner and outer registers on wheel as well as valve stem on tube if applicable.

7.27 Coat both surfaces on the countersunk washers and under the bolt head of the 8 (eight) wheel tie bolts with MIL-T-5544 Anti-Seize compound, then slide the tie bolts through wheel assembly.

- CAUTION -

The countersunk side of countersunk washer must be toward the bolt head.

Coat both surfaces of the plain washers and the treaded portion of the bolt shank with MIL-T-5544 Compound. Install plain washers and nuts on the outer wheel half and torque to 300 in-lbs. When all nuts have been torqued, retorque a second time to make sure that the required torque value has been achieved. Sometimes O-ring compression will give a false initial reading. The wheel may now be inflated to proper pressure in a safety cage.

7.28 Inspect bearing cone for contamination and/or solidification at every periodic inspection. Repack wheel bearings with grease per MIL-G-81322 (Aeroshell 22) if required.

7.29 Check for burrs or rough threads on axle and axle nut. Install bearing cone and grease seal into the inner wheel half.

7.30 Mount the wheel and tire assembly on the axle. Make sure that the wheel drive keys engage the brake disc lugs. If the wheel fails to engage both discs, simultaneously lift up on the inboard disc and push the wheel towards the center of the strut.

7.31 Apply a thin coat of bearing grease on axle nut and threads. Install the bearing cone and grease seal in the outer wheel half. Install tang washer and axle nut on axle. Tighten axle nut to 150 to 200 in-lbs. of torque while rotating the wheel to insure proper seating of the bearings. Back off the axle nut to zero torque, then retorque the nut to 40 in-lbs. while rotating the wheel. tighten the castellated nut (MS21025-24) so that the next available castellation is aligned with the thru hole in the axle threads. Install a cotter pin, item #8 on the 50-152 drawing.

-NOTE-

Axle nut torque must be 40 in-lbs minimum.

7.32 Repeat the procedure to install the second wheel and tire on the opposite side of the strut.

7.33 Repeat this procedure for both struts. After lowering aircraft off of the jacks, reattach both brake de-ice hose assemblies.

Cleveland Wheels & Brakes Conversion Kit 199-220

8. WEIGHT AND BALANCE COMPUTATIONS

Weight: 37.9 lbs. per wheel and brake assembly. The weight does not include a tire.

Complete Form 337 and make appropriate log book entries.

9. AIRCRAFT FLIGHT MANUAL AND EQUIPMENT LIST ENTRIES

9.1 Update the "Weight and Balance" Section of the Aircraft Flight Manual as well as the Aircraft Equipment List for the change in both weight and moment created by the installation of this conversion kit.

10. METALLIC BRAKE LINING CONDITIONING PROCEDURE

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

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

10.3 Conditioning may be accomplished as follows:

10.3.1 Perform two (2) full stop braking application from 30 to 35 knots, allowing the brake disc to cool between each stop.

10.3.2 This conditioning procedure will wear off high spots and generate sufficient heat to glaze the lining. Once the lining is glazed, the brake system will provide many hours of maintenance free service.

10.3.3 Avoid light use, such as taxiing, which will cause the glaze to be worn rapidly.

11. WARRANTY REGISTRATION

11.1 Completely fill out enclosed warranty card and return promptly. Postage is prepaid.

Cleveland Wheels & Brakes Conversion Kit 199-220

12. KIT PARTS LIST

AIRCRAFT WHEEL AND BRAKE DIVISION

PARKER HANNIFIN CORPORATION

AVON, OHIO

PARTS LIST

199-220 CONVERSION KIT

BEECH 1900D

PART NO.	CODE NO.	DESCRIPTION	<u>QUANTITY</u>
30-204A	030-20401	Brake Assembly	4
40-273A	040-27301	Wheel Assembly	4
MS21250-05040	103-24400	Bolt MS21250-05040	4
095-02800	095-02800	Washer MS20002C5	8
NAS1804-5N	094-16400	Nut	4
MS28775-112	101-50337	O-Ring	4
MS28778-4	101-20400	O-Ring	4
221-07100	221-07100	Pin, Cotter, (Split) MS24665-428	4
199-212		Brake De-ice Manifold Support Kit	2
199-213		Brake De-ice Manifold Kit	2
199-220 Manual		Installation Manual	1
50-152		Drawing	1

THIS KIT WILL CONVERT ONE AIRCRAFT TO CLEVELAND WHEELS & BRAKES

NOTE: For use with MIL-H-5606 (Red Fluid)

*

* Optional - Two 199-212 or two 199-213 Kits are required if aircraft is equipped with Beech Brake De-ice system. These Kits must be purchased separately.



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Aerospace

Aircraft Wheel & Brake Division

Parker Hannifin Corporation 1160 Center Road Avon, OH 44011



CLEVELAND WHEELS & BRAKES

CM30-204A

COMPONENT MAINTENANCE MANUAL

WITH

ILLUSTRATED PARTS LIST

FOR

BRAKE ASSEMBLY

PART NUMBER 30-204A

REVISION E DATED 25 JULY 2016

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

July, 2016



REV NO.	ISSUE DATE	DATE INSERTED	BY	REV NO.	ISSUE DATE	DATE INSERTED	BY
А	9-15-94	9-15-94	PH				
В	3-28-96	3-28-96	PH				
С	9-19-03	9-19-03	PH				
D	3-17-04	3-17-04	PH				
E	7-25-2016	7-25-2016	PH				

RECORD OF REVISIONS

Record of Revisions Page 1/1



LIST OF REVISIONS

INITIAL RELEASE DATED 4 APRIL 1994

<u>REVISION</u>	_DATE_	<u>PAGE</u>	DESCRIPTION OF CHANGE
Rev. A 9-15-94	9-15-94	Table of Contents(p.2)	5. Repair of Base Plates 505 -Added- 6. Repair of Adjuster Assembly 507 -Added-
	Description & Operation(p.2	"26.1 lbs." -was- "23.8 lbs.")	
	102	 K. "The two Bleeder Seats (Item #22) and Bleeder Screws (Item #23) must also be removed from the cylinder along with the Bleeder Plug(Item #25). When these items are" 	
			 K. "The two Bleeder Seats (Item #22) and Bleeder Screws (Item #23) can also be removed from the cylinder (if necessary).along with the Bleeder Plug (Item #25). If these items are"
		303	A. ".525570" -was- ".537570"
		502	 D. "The Pressure Plate (Item #7) or Center Stator (Item #11) may be straightened by either Cold Straightening or Draw Flattening. Draw Flattening is the preferred method. Refer to the Repair of Base Plates for details." was -
			D. "The Pressure Plate may be ground within the flatness requiremetns provided that the thickness of the Pressure Plate (Item #7) exceeds .125 in. after grinding. Similarly, the Center Stator (Item #11) and Back Plate (Item #16) may be ground flat provided the finished thicknesses exceed .130 in. and .115 in. respectively. (All thickness measurements must be taken at the bolt circle diameter of the outer rivet holes."



<u>REVISION</u>	DATE	<u>PAGE</u>	DESCRIPTION OF CHANGE
Rev. A		503	G. "If not, repair" -was- "If not, grind flat"
(202)		505 506 507	- ADDED - New page with Section 5, A and B - ADDED - New page with Figure 502 - ADDED - New page with Section 6, A thru F, and Figure 503
		1003	139-30200 Subass'y Brake De-ice Manifold -ADDED- or 139-30300 Subass'y Brake De-ice Manifold
		all pages	"CM 30-204A COMPONENT MAINTENANCE " -WAS- "OVERHAUL"
Rev. B	3-28-96	Description & Operation Page 2	 "Primer: Columbia Paint Corporation 11-347Z Primer" -was- "Primer: Sherwin Williams P60G2 Primer" "Topcoat: Columbia Paint Corporation 11-358A Gloss White Enamel" -was- "Topcoat: Sherwin Williams F63W13 White Polyurethane Section J. "that measure .405 inches or less in height." -was- "that measure .375 inches or less
		303	in height (.032 inches above piston when installed)." Sections S., T., and U. "repair or replace"
			-was- "replace"
		501	"Columbia Paint Corporation 11-347Z Primer" "Columbia Paint Corporation Huntington W. VA. -was- "Epoxy Polyamide Primer Specification Mil-P-23377" "Commercially Available"



<u>REVISION</u>	DATE	PAGE	DESCRIPTION OF CHANGE
Rev. B (Cont'd)		501	 "Columbia Paint Corporation 11-358A Gloss White Enamel" "Columbia Paint Corporation Huntington W. VA. -was- "White Polyurethane Topcoat Specification MIL-C-83286" "Sherwin Williams Commercial Products Division 761 Beta Drive Mayfield Village, Ohio 44143"
			"Galvilite Galvanizing Compound (MIL-P-26915A)" "ZRC Products Quincy, Mass." "XXX Thinner" "ZRC Products Quincy, Mass."
		504	 "CAUTION: DO NOT TOPCOAT OR" -was- "CAUTION: DO NOT PAINT OR" 3.D. "The outside of the housing should be primed (.0002 to .0005 dry film thickness) and topcoated (.0008 to .0014 inch dry film thickness including primer)."
		-was- "The outside of the housing should be primed with epoxy polyamide primer per MIL-P-23377, and painted with one coat of White Polyurethane topcoat per MIL-C-83288."	
		505	ADD Section 5.C., Painting base plates
		601	Section 2.C. "to 65-70 inlbs." -was- "to 180-200 inlbs."
			Sections 2.D. & 2.E. "to 65-70 inlbs." -was- "to 160-180 inlbs."
		603	Section 2.L. "Torque snug to preclude leakage." -was- "Torque to 30-35 in.lbs."



REVISION	DATE	DATE PAGE DESCRIPTION OF CHANGE						
Rev. B 604 (Cont'd)			Section 2.Z. "Pressurize to 360 psi ± 50 psi to set retracts and check for leaks. It is permissible to perform this test off-aircraft on an individual brake assembly." -was- "Pressurize to approximately 360 psi to set retracts and					
			check for leaks."					
Rev. C (DCN 0357-	9-19-03 83)	SB List	Add Service Bulletin "SB7079" Rev. No. "NC"					
		1002 1003	 Add Item 19A Call-out Item 19: Add Notation "SUPSD BY Item 19A, (refer to Parker Hannifin Service Bulletin SB7079)" Add Item 19A: "P/N 065-15401, Torque Ring, SUPSDS Item 19, Qty 1" Add Item 38: "P/N 139-29900, Assembly, Brake De-ice Manifold, Item 19, Qty 1" Remove Line item for: "P/N 139-30200, Subassy, Brake De-ice Manifold, Qty 1." Remove Line item for: "P/N 139-30300, Subassy, Brake De-ice Manifold, Qty 1." Add Flagnotes: "1: Optional Equipment. Refer to Parker Hannifin Conversion Kit, P/N 199-212." "2: Optional Equipment. Refer to Parker Hannifin Conversion Kit, P/N 199-213." Add definitions for abbreviations used: "- Item is not illustrated." "SUPSD BY The part in the part number column is replaced by and is not interchangeable with interchangeable with the item number shown in the notation." 					



REVISION _	DATE	PAGE DESCRIPTION OF CHANGE				CHANGE
Rev. D 3 (DCN 0360-24	3-17-04 4)	301	(Now)			
(,			Fluorescent	Zyglo ZL-60D	Zyglo ZP-4B, ZP-9F, ZP-5B, or SKD-S2	Magnaflux Corp. 3624 West Lake Ave. Glenview, IL 60025 www.magnaflux.com Ph. 847-657-5300
				Zyglo ZL-2C, with emulsifier/rem over ZE-4B	Zyglo ZP-4B, ZP-9F, ZP-5B, ZP-14A or SKD-S2	Fax. 847-657-5388 e-mail: info@magnaflux.com
			(Was)			
			Fluorescent	Zyglo ZL-16	Zyglo ZP-13 (wet) optional	Magnaflux Corp. 7300 West Lawrence St.
				Penetrex ZL- 2A with emulsifier ZE- 4	Penetrex ZP-4 (dry) or ZP-13 optional	Chicago, IL 60656
		000				

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(Add (ref. paragraph N))

Check the five torque ring stationary disc engagement lugs for battering. If the drive lug width is less than .650 inches, replace the Torque Ring (Item #19).

Record of Revisions Updated to reflect Rev. D



<u>REVISION</u>	DATE	<u>PAGE</u>	DESCRIPTION OF CHANGE
Rev. E 0 (ECO-0070789	07-25-2016 39)	Title Pg	Add Proprietary and Export stamps Update rev level and date.
		Record of Revisions	Update to reflection latest revision.
		Description & Operation Pg. 2	 Primer: Sherwin-Williams Co. P60G2 or PSE2130-WHITE -was- Primer: Columbia Paint Corporation 11347Z Primer Topcoat: Sherwin-Williams Co. F63W13 (white polyurethane) -was- Topcoat: Columbia Paint Corporation 11-358A Gloss White Enamel
		Repair Pg. 501	Primer: P/N P60G2 or PSE2130-WHITE Sherwin-Williams Co. Cleveland, OH -was- Columbia Paint Corporation, 11-347Z Primer Columbia Paint Corporation Huntington, W. VA.
			Topcoat: P/N F63W13 (white polyurethane) Sherwin-Williams Co. Cleveland, OH -was- Columbia Paint Corporation, 11-358A Gloss White Enamel Columbia Paint Corporation Huntington, W. VA.



SERVICE BULLETIN LIST

SERVICE	REV. NO.		SERVICE	REV. NO.	
BULLETIN NO.		INCORPORATED	BULLETIN NO.		INCORPORATED
SB/0/9	NC				

Service Bulletin List Page1/1 Rev. C September 19, 2003



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INTRODUCTION

This manual is published for the guidance of personnel responsible for the overhaul and/or maintenance of the Parker Hannifin 30-204A Brake Assembly covered in this publication. The procedures outlined in this manual may be altered if better and/or more economical methods can be employed by the individual facilities. However, alternative procedures must not reduce the efficiency of operation of the assembly.

<u>NOTE</u>: All torque values and specified limits or values set by Parker Hannifin Engineering and contained herein must be strictly observed and not deviated from.

While Parker Hannifin Corporation represents that the information contained in this manual was current at the time of publication, it is recommended that the user inquire as to the latest revision level in existence before proceeding with overhaul or maintenance operations. This can be accomplished by contacting the Product Support Department of the Aircraft Wheel & Brake Division at the following address or numbers:

Parker Hannifin Corporation Aircraft Wheel & Brake Division Attn: Product Support Dept. 1160 Center Road Avon, Ohio 44011

Phone: (216) 937-6211 1-800-272-5464

Fax: (216) 937-5409

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TSO NOTICE

This assembly carries a "TSO C26c" marking for FAR Part 23 usage, which identifies it as having been fully tested in the laboratory and qualified to applicable FAA (Federal Aviation Administration) requirements and specifications. After final certification, substitutions of critical parts or changes of processes or materials are not permitted without requalification of the assembly and resubmittal of the test data to the FAA for approval.

FAA regulations subject both Parker Hannifin, Aircraft Wheel & Brake Division and the user to constant surveillance to assure that uncompromising quality assurance material and processing controls are maintained in order to provide replacement parts that are the same as the parts originally certified in the assembly.

DATA RIGHTS

The unit charge for this manual covers reproduction and handling costs only and does not constitute purchase of the data or design contained herein, nor does it convey to the purchaser any rights, patent or otherwise, to reproduce or manufacture from said data.

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DESCRIPTION AND OPERATION

1. Description and Operation

- A. The Parker Hannifin 30-204A Brake Assembly is a piston actuated, hydraulically operated dual rotor unit that is designed to be compatible with MIL-H-5606 and MIL-H-83282 hydraulic fluids. The brake assembly is a nonhanded unit and can be used on the opposite side of the strut by simply switching the fittings on top of the housing to the opposite port. The 30-204A Brake Assembly is designed to be used with the 40-273A Wheel Assembly.
- B. Each Brake Assembly is composed of the following: One Cylinder Subassembly, one Pressure Plate Sub-assembly utilizing replaceable steel wear pads, two Rotating Discs with sintered friction material on the core, one Cast Steel Torque Tube, one Backplate Subassembly with replaceable steel wear pads, five high strength Bolts and Washers, one Center Stator Assembly with replaceable steel wear pads, and four pressure plate retraction mechanisms.
- C. Each of the five pistons contains an O-Ring groove to prevent leakage of hydraulic fluid past the pistons.
- D. An Insulator slides into the pocket of each piston in order to shield the brake fluid from the heat generated during braking.
- E. This manual specifies minimum wear dimensions that must be checked when the brake is off of the aircraft for periodic servicing intervals.
- F. The 30-204A Brake Assembly is designed in such a way that there is a built in running clearance on the wear components that prevents excessive drag from occurring.
- G. The brake also utilizes four pressure plate retraction mechanisms to minimize brake drag and maximize lining life.

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H. Braking action begins to occur when hydraulic pressure is applied to the brake, via the pilot's or copilot's master cylinders. As the hydraulic pressure reaches the brake it forces the pistons in the cylinder housing outward against the pressure plate which contacts the inboard disc, center stator, outboard disc and backplate. The frictional force of the wear components generates torque in the brake which is transmitted into the wheel/tire and slows the aircraft.

2. Leading Particulars

Hydraulic fluid	MIL-H-5606 or MIL-H-83282
Normal Operating Pressure	275-325 psi.
Running Clearance in Brake	.015 in. nominal
Weight of Brake Assembly	26.1 Lbs.
Cylinder Housing Material	C355 T6 Cast Aluminum
O-Ring Compound	Parker N304-75 (Nitrile)
Cylinder Coatings	Anodize: MIL-A-8625, Type I, Class 1 Primer: Sherwin-Williams Co. P60G2 or PSE2130-WHITE Topcoat: Sherwin-Williams Co. F63W13 (white polyurethane)

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DISASSEMBLY

1. General

Disassemble the brake assembly in accordance with the following instructions (Ref. IPL Fig. 1).

2. Disassembly Procedures

- A. After the main wheel and tire have been removed, disconnect hydraulic lines and cap open lines and ports.
- B. Disconnect Beech Swivel Kit (99-80003-27) and remove the bolts, nuts, and washers which fasten the two brake assemblies together.
- C. Unfasten the deicing tubes from the mounting bracket (if the plane has this optional equipment).
- D. Slide the assembly off of the axle and place it on a clean flat surface.
- E. Remove the five Bolts and Washers (Item #20 and #21) which fasten the assembly.
- F. Remove the Back Plate Assembly (Item #15), the Torque Ring (Item #19), the two Rotors (Item #10), and Center Stator (Item #11).
- G. Unscrew the four Internal Wrenching Adjuster Assemblies (Item #26).
- H. Remove the Pressure Plate Assembly (Item #6) with the four Retraction Base Assemblies (Item #34) still in the pressure plate pockets.



- I. The four retraction base assemblies can then be removed from the pressure plate assembly.
- J. Remove the five Piston Insulators (Item #5), O-rings (Item #4), and Pistons (Item #3) by threading an AN4 (or any other Ø .250-28 UNF-3B bolt) into the pistons and pulling them from the cylinder.
- K. The two Bleeder Seats (Item #22) and Bleeder Screws (Item #23) must be removed from the cylinder along with the Bleeder Plug (Item #25). When these items are removed, the three O-Rings (Item #24) must be replaced upon reassembly.
- L. The remainder of the four Adjuster Assemblies (Item #26 less Item #34 which is in the pressure plate assembly) can be removed from the cylinder (if necessary) by removing the four Snap Rings (Item #32).
- M. Drain hydraulic fluid from housing.

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CLEANING

1. Cleaning Materials

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR ITEMS LISTED BELOW.					
Dry Cleaning Solution	Commercially Available				
Specification P-D-680					
Stoddard Solvent					
Isopropyl Alcohol	Commercially Available				
Specification TT-I-735					
Soft Bristle Brush	Commercially Available				
Clean Wiping Cloth	Commercially Available				

2. <u>Cleaning Procedures</u>

<u>WARNING</u>: CLEANING SOLUTIONS SHOULD BE USED IN A WELL VENTILATED AREA. AVOID PROLONGED INHALATION OF FUMES.

- A. Clean all metal parts, except Discs (Item #10), by immersing in dry cleaning solution conforming to specification P-D-680. Use a soft bristle brush to remove hardened grease, dust, and dirt.
- B. Clean rotating Discs (Item #10) with compressed air and a stiff bristle or wire brush.
- C. Dry all metal parts thoroughly after cleaning, using filtered and dried compressed air.
- D. Clean Piston Insulators (Item #5) in isopropyl alcohol and dry with a clean, soft cloth.
- E. All O-Rings must be replaced at each overhaul.

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3. Paint Removal Procedures

- A. Remove paint from the cylinder using chemical paint removal solvents or plastic media stripping in accordance with the following instructions.
 - WARNING: DUE TO THE TOXICITY OF CHEMICAL PAINT REMOVAL SOLVENTS, IT IS HIGHLY RECOMMENDED THAT PAINT REMOVAL BY THIS METHOD BE ACCOMPLISHED BY A COMMERCIAL FACILITY WITH THE PROPER EQUIPMENT AND CHEMICAL DISPOSAL CAPABILITIES.
 - <u>CAUTION:</u> REFER TO THE APPLICABLE MANUFACTURERS INSTRUCTIONS WHEN UTILIZING CHEMICAL PAINT REMOVAL SOLVENTS OR PLASTIC MEDIA STRIPPING EQUIPMENT.
- B. Completely disassemble the brake prior to paint removal.

<u>NOTE</u>: REFER TO "REPAIR" FOR RETREATING AND REPAINTING CYLINDER.



<u>CHECK</u>

1. Check Materials

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR ITEMS LISTED BELOW:					
Туре	Penetrant	Developer	Supplier		
Fluorescent	Zyglo ZL-60D	Zyglo ZP-4B. ZP-9F, ZP-5B, or SKD-S2	Magnaflux Corp. 3624 West Lake Ave.		
	Zyglo ZL-2C with emulsifier/remover ZE-4B	Zyglo ZP-4B, ZP-9F, ZP-5B, ZP-14A, or SKD-S2	Glenview, IL 60025 <u>www.magnaflux.com</u> Ph. 847-657-5300 Fax. 847-657-5388		
Red Dye	Spot Check	Spot Check	e-mail: info@magnaflux.com		
	Dy-Chek	Dy-Chek	Turco Products Division of Purex Corp. P.O. Box 6200 Carson, CA 90749		
	Met-L-Chek	Met-L-Chek	Met-L-Chek Company 1639 Euclid Street Santa Monica, CA 90404		

2. General (Ref. IPL Fig. 1)

- A. Check all components of the brake assembly for cracks, nicks, corrosion, and other damage. Replace any cracked, severely corroded, or badly damaged parts.
- B. Perform the specific checks listed below and refer to REPAIR for the appropriate repair procedures.
- 3. <u>Detailed Check</u> (Requires stripping topcoat and primer)
 - A. Check the Brake Cylinder and Torque Ring (Items #2 and 19) for cracks and structural damage.

NOTE:

Parker recommends that the Brake Cylinder and Torque Ring (Items #2 and #19) be penetrant inspected at every brake overhaul (due to lining being worn below minimum limits).

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<u>NOTE</u>: CHECK BRAKE BY ZYGLO OR OTHER DYE-PENETRANT METHODS. REPLACE ALL CRACKED CYLINDERS AND TORQUE RINGS.

- B. Check the Backplate Assembly (Item #15), Center Stator (Item #11), and Pressure Plate Assembly (Item #6) for loose, cracked, or worn wear pads; replace all wear pads if three or more wear pads are worn below .080 in. in thickness. Replace all loose or cracked wear pads.
- C. Check discs for cracks. Replace any cracked Discs (Item #10).
- D. Check disc thickness. Replace any disc whose thickness is .205 in. or less, or if there is less than .010 in. of mix at any unchipped point on the entire face of the Disc (Item #10).
- E. Check Disc (Item #10) drive tangs for wear and battering. Replace discs if one or more tangs are bent, battered, severely corroded or cracked.
- F. Check Center Stator (Item #12) for cracks and corrosion. Replace any cracked or severely corroded center stators.
- G. Check corners of the center stator key slots (the slots which engage the torque tube) for both cracks and wear. If the width of any key slot is .802 inches or greater, replace the center stator; if any of the key slots contain cracks, replace the center stator.
- H. Check Pressure Plate (Item #7) for cracks (especially in the key slot area) and wear. If the width of any key slot is .802 inches or greater, replace the pressure plate; if any of the key slots contain cracks, replace the pressure plate.
- Check all Pistons (Item #3) for nicks, scratches, burrs, and wear. Measure the outside diameter of the piston at three places. Replace all pistons whose outside diameter measures 1.485 inches or less at any location. Replace all pistons with a nick or scratch .003 inch deep or more. Pistons with defects of a depth less than .003 inch can be repaired per the section of this manual entitled REPAIR.
- J. Check the Piston Insulators (Item #5) for deterioration. Replace all piston insulators that show signs of deterioration or that measure .405 inches or less in height.
- K. Install new insulators per REPAIR.

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- L. Check the condition of the threads in the inlet and bleeder ports of the Cylinder (Item #2). Replace all housings that have badly damaged threads in any port.
- M. Check the five piston bores for nicks, scratches, and wear. Any nicks or scratches deeper than .003 inch necessitates replacement of the Cylinder (Item #2). Measure the inside diameter of each piston bore in three places; if any measurement exceeds 1.496 inches, then replace the cylinder. Blend any nicks or scratches less than .003 inches deep per REPAIR.
- N. Check the torque ring strut engagement area for battering. If the width between flats exceeds 3.370 inches, replace the Torque Ring (Item #19). Check the five torque ring stationary disc engagement lugs for battering. If the drive lug width is less than .650 inches, replace the Torque Ring (Item #19).
- O. Check the torque ring bolt holes for elongation; replace the Torque Ring (Item #19) if any of the bolt holes becomes elongated into an ellipse with a major diameter exceeding Ø .350 inches.
- P. Check the Bolts (Item #20) for thread damage. Replace thread damaged bolts.
- Q. Check the bolts for cracks using magnetic particle inspection methods or penetrant inspection methods. If <u>any</u> of the bolts are cracked, replace <u>all</u> of the bolts.
- R. Visually inspect the Retraction Assembly Parts (Items #26 through #36) for wear and damage. Replace Studs (Item #27) if threads are damaged or if the surface on the shaft contains elevated nicks. Replace the Snap Ring (Item #32) if it becomes bent or twisted during removal. Check Springs (Item 333) for load at installed height of .525-.570; the pre-load should be 21 - 23 pounds.
- S. Inspect the Pressure Plate Assembly (Item #6) for flatness. If the flatness exceeds .020 in. repair or replace the assembly.
- T. Inspect the Center Stator Assembly (Item #11) for flatness on both sides. If the flatness exceeds .015 in., repair or replace the assembly.
- U. Inspect the rubbed surface of the backplate assembly for flatness. If the flatness exceeds .020 in., repair or replace the assembly.

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<u>REPAIR</u>

1. General Repair Procedures:

Repair of the brake is limited to the replacement of worn or damaged parts and to the specific repairs listed in this section. The following is a list of the required repair equipment and materials and its source. (NOTE: Equivalent substitutes may be used for the items listed below):

Equipment/Materials	Source
Primer: P/N P60G2 or P/N PSE2130-WHITE	Sherwin-Williams Co. Cleveland, OH
Topcoat: P/N F63W13 (white polyurethane)	Sherwin-Williams Co. Cleveland, OH
Dry-Cleaning Solvent Specification P-D-680 (Stoddard Solvent)	Commercially Available
Aluminum, Oxide Cloth 400 Grit Wet-or-Dry	Commercially Available
Grease Dow Molykote 55M Grease	Dow Corning Corp. Box 1767 Midland, MI. 48640
Sulfuric-acid Anodize Specification MIL-A-8625 Type II, Class 1	Commercially Available
Chemical Conversion Coating Specification MIL-C-5541, Class 1A (Alodine)	Commercially Available
Galvilite Galvanizing Compound (MIL-P-26915A)	ZRC Products Quincy, Mass.
XXX Thinner	ZRC Products Quincy, Mass.

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2. Replacing Wear Pads

A. Using a 3/16 (\oslash .187) in. drill bit, drill out the shop head of the rivets and punch the rivets from the assembly.

<u>CAUTION</u>: Do not enlarge the rivet holes in the base plate. If the rivet hole is enlarged to \emptyset .205 in. or larger, the base plate must be replaced.

- B. Check the base plates for cracks using Zyglo or magnaflux methods. Replace cracked base plates.
- C. Check the base plates for flatness. If the flatness of any base plate exceeds .020 in., repair or replace that Base Plate (Item #7, Item #12 and Item #16). Failure to do so could result in a dragging brake.
- D. The Pressure Plate (Item #7) or Center Stator (Item #11), may be straightened by either Cold Straightening or Draw Flattening. Draw Flattening is the preferred method. Refer to Repair of Base Plates for details.
- E. Install the proper Rivet [i.e. a 105-06700 (Items #9 and #18) are used in the Pressure Plate (Item #6) and Back Plate (Item #15) Assemblies while a 105-06800 (Item #14) is used in the Center Stator Assembly (Item #11)] as shown in Figure 501.

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Figure 501

- F. Form the shop head of the rivet using a compression rivetor.
- **NOTE:** Check the seating of the wear pads by attempting to insert a .0015 inch feeler gage must between the pad and the base plate. The gage must not pass the centerline of the wear pads between the rivets, nor should the corners of the wear pads be dished up after riveting. Loose pads, or pads whose corners dish by more than .010 TIR must be replaced.
- **<u>CAUTION</u>**: The Wear-padded subassemblies (Items #6, #11, and #15) are designed to maintain the rivet heads flush with or recessed below the wear pad surface. If the rivet head protrudes above the wear pad surface, it must be ground flush with the wear pad. Failure to do so could result in brake failure.
- **NOTE**: No more than two cracks are permitted in the shop head of the rivet, and no cracks are permitted to extend into the rivet shank. If the rivet has more than two cracks or has at least one crack which extends into the rivet shank, replace the rivet.
- G. Check to insure that the newly padded subassemblies (Items #6, #11, and #15) are flat within .020 inch. If not, repair.

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3. <u>Repair of Cylinder</u>

A. Polish scratches not exceeding .003 inch deep in piston cavities with fine (400 grit) aluminumoxide paper.

<u>WARNING</u>: DO NOT USE ABRASIVES CONTAINING IRON SUCH AS STEEL WOOL, IRON OXIDE, OR STEEL WIRE; IRON PARTICLES WHICH BECOME EMBEDDED IN THE ALUMINUM CYLINDER WILL ACCELERATE CORROSION.

- B. Blend out burrs, nicks, and scratches less than .030 inch deep on the outside of the housing with 280 grit aluminum oxide paper.
- C. Treat reworked areas with sulfuric-acid anodize per MIL-A-8625 Type II, Class 1, or "Alodine" per MIL-C-5541 Class 1A.

CAUTION: DO NOT TOPCOAT OR PRIME PISTON BORES.

- D. The outside of the housing should be primed (.0002 to .0005 inch dry film thickness) and topcoated (.0008 to .0014 inch dry film thickness including the primer).
- 4. Repair of Pistons
 - A. Polish scratches, nicks, and burrs of up to .003 inches deep. Replace all pistons that are damaged deeper than .003 inches.
 - B. Treat reworked areas with sulfuric-acid anodize per MIL-8625 Type II, Class 1, or "Alodine" per MIL-C-5541, Class 1A.

CAUTION: DO NOT PAINT PISTONS.

- 5. <u>Repair of Base Plates</u>
 - A. Cold Straightening
 - (1) Pressure Plate Assemblies (Item #7) or Stator Assemblies (Item #11) which do not meet the flatness requirements of this manual may be straightened in accordance with the following instructions:
 - (a) Remove wear pads from base plate.

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- 5. Repair of Base Plates (Cont'd)
 - (b) Fabricate upper and lower register plates (Ref. Fig. 501).
 - (c) Mount upper and lower register plates in an arbor press.
 - (d) Place dished plate or disk in lower register plate with domed side up.
 - (e) Apply sufficient pressure with arbor press to straighten plate or disk. Base plates must be flat within .010 inch.
 - B. Draw Flattening
 - (1) Pressure Plate Assemblies (Item #7) or Stator Assemblies (Item #11) which do not meet the flatness requirements of this manual may be straightened in accordance with the following instructions:
 - (a) Remove wear pads from base plate.
 - (b) Stack base plates back-to-back between two-inch thick boiler plates with long bolts through center of stack and boiler plates.
 - (c) Place in an oven and heat slowly to a temperature range of 1100° F (593° C) to 1150° F (621° C) and hold that temperature range for one hour.
 - (d) Remove from oven and retighten bolts.
 - (e) Place in an oven and heat slowly to a temperature range of 1100° F (593° C) to 1150° F (621° C) and hold that temperature range for three hours.
 - (f) Remove from oven and air cool at room temperature; then remove bolts and separate parts.
 - C. Painting
 - (1) The Pressure Plate (Item #7), Center Stator (Item #12), and Back Plate (Item #16) may be stripped and repainted. Paint with Galvilite Galvanizing Compound. The dry film thickness shall be .0015 to .0030 inch.

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Figure 502

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- 6. Repair of Adjuster Assembly
 - A. During the Overhaul Procedure, the four adjuster assemblies (Item #26) must be repaired before returning the brake to service.
 - B. Discard any severely corroded parts.

<u>WARNING</u>: DO NOT ATTEMPT TO REMOVE CORROSION FROM THE SPACER (ITEM #30) OR THE FRICTION SLEEVE (ITEM #29) BY SANDING. THESE PARTS HAVE BEEN CADMIUM PLATED, AND INHALATION OF CADMIUM DUST CAN BE HAZARDOUS TO YOUR HEALTH.

- C. If the friction sleeve (Item #28) can be moved on the stud (Item #27) by a force of thirty pounds or less, replace the friction sleeve.
- D. If the friction sleeve (Item #28) is not flush with the sleeve retainer (Item #29), use a vice or an arbor press to install the friction sleeve flush into the sleeve retainer.
- E. Use a vice or an arbor press to reset the spacer (Item #30), friction sleeve (Item #28), and sleeve retainer (Item #29) onto the stud (Item #27) as shown in figure 502.
- F. The adjuster assembly (Item #26) may now be returned to service.



Figure 503

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ASSEMBLY

1. Assembly Materials

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR ITEMS LISTED BELOW.			
Hydraulic Fluid Specification MIL-H-5606 or MIL-H-83282	Commercially Available		
Antiseize Thread Compound Specification MIL-T-5544	W.J. Ruscoe & Company 479 Kenmore Boulevard Akron, Ohio 44301		

2. Assembly Procedures

It is <u>strongly</u> recommended that all O-Ring packings (removed during disassembly) be replaced with new O-Ring packings during assembly.

- A. Lubricate a new O-Ring (Item #24) with a thin film of MIL-H-5606 or MIL-H-83282 hydraulic fluid and place it on the Plug (Item #25).
- B. Lubricate two new O-Rings (Item #24) with a thin film of hydraulic fluid (MIL-H-5606 or MIL-H-83282) and place one on each of the two bleeder seats (Item #22).
- C. Thread the two bleeder seats (with new packings) into their respective ports and torque to 65-70 in.-lbs.
- D. Similarly thread the plug from Step A into its respective port (to make either a right or left hand brake). Torque to 65-70 in.-lbs.
- E. Next, place a new O-Ring with a thin layer of hydraulic film onto the hydraulic fitting (Beech supplied part), and thread the hydraulic fitting into the appropriate port torquing to 65-70 in.lbs.
- F. Next, lubricate a new O-Ring (Item #4) and place the O-Ring into the appropriate groove in the piston for each of the five Pistons (Item #3). Lubricate the piston bore with hydraulic fluid also.

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- G. Install each of the five pistons (as shown in Figure 1) into the Cylinder (Item #2), and each of the five piston Insulators (Item #5) into the Pistons (Item #3). Push and rotate the pistons (do not cock) until they seat in the bottom of the bore.
- H. Install each of the five Retraction Springs (Item #33) into the appropriate cylinder cavities.
- I. Place one Washer (Item #31) over each Spring (Item #33), place one Snap Ring (Item #32) over each washer, compress the spring, and position the snap ring into the snap ring groove in the Cylinder (Item #2). See Figure 601.





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- J. Next, slide the four Retraction Base Assemblies (Item #34) into the corresponding pockets in the Pressure Plate Assembly (Item #6).
- K. Slide each of the four Adjuster Studs (Item #27) through the retraction housing and thread the stud into the Retraction Base Assembly (Item #34) as shown in Figure 601. Torque to 40-50 in.-lbs.
- **<u>NOTE</u>**: Be sure to position the pressure plate assembly carved out section at the top of the cylinder as shown in Figure 1.
- L. Thread one of the two Bleeder Screws (Item #23) into each of the two Bleeder Seats (Item #22). Torque snug to preclude leakage.
- M. Coat each of the five Washers (Item #21) with antiseize compound (per MIL-T-5544) and slide one washer onto each of the five Bolts (Item #20); make sure that the countersunk side of the washer faces the bolt head.
- * N. Slide one of the five Bolts/Washers (Item #20 and Item #21) through each of the five bolt holes in the Cylinder (Item #2).
 - O. Slide the Torque Ring (Item #19), positioned as shown in Figure 1, onto the five Bolts (Item #20) and up against the Cylinder (Item #2).
 - P. Slide a Disc (Item #10) over the Torque Ring (Item #19) and up against the Pressure Plate Assembly (Item #6).
- * If the aircraft is equipped with the optional brake de-icing equipment, the Bolts (Item #20) pass through the Mounting Bracket (Item #37), then the Washers (Item #21), then through the Cylinder (Item #2). See Figure 1.

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- Q. Slide the Center Stator Assembly (Item #11) onto the Torque Ring (Item #19) and up against the Disc (Item #10).
- R. Slide the remaining Disc (Item #10) over the Torque Ring (Item #19) and up against the center stator.
- S. Position the Back Plate Assembly (Item #15) against the Torque Ring (Item #19), align the bolt holes and torque the five Tie Bolts (Item #20) to 175-190 in.-lbs., in a crisscross pattern. Torque again to 175-190 in.-lbs.
- T. Check to verify that the pressure plate assembly is fully retracted up against the Piston Insulators (Item #5). If it is not, check for obstructions. If no obstructions can be found, it may be necessary to replace the Retraction Springs (Item #33).
- U. Verify that the two bleeder fittings, the plug, and the hydraulic fitting have been installed.
- V. Install the brake assembly on the axle.
- W. Install another brake assembly on the opposite side of the axle, and fasten together per Parker P/N 199-220 Conversion Kit Installation Instructions.
- X. Reconnect hydraulic pressure source.
- Y. Bleed brakes per Aircraft Manual.
- Z. Pressurize to 360 psi ± 50 psi to set retracts and check for leaks. It is permissible to perform this test off-aircraft on an individual brake assembly.

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Trouble	Cause	Correction		
Hydraulic fluid leaking from brake assembly	Defective hydraulic Connection	Tighten connection or replace fitting.		
	Defective O-Ring packing	Replace O-Ring packing.		
	Piston or cylinder worn or damaged	Replace piston and/or housing.		
Brake not engaging correctly	Air in brake	Bleed brake.		
	Obstruction in hydraulic line or fluid passage	Remove obstruction.		
	Pistons sticking	Replace piston O-Ring packings and wiper rings.		
	Pistons damaged	Replace pistons.		
	Cylinder damaged	Replacing housing.		
	Torque tube damaged	Replace torque tube.		
	Pressure plate, rotating disk, not moving freely on torque tube.	Repair or replace defective plate or disk.		
Brake not releasing correctly.	Obstruction in hydraulic line or fluid passage	Remove obstruction.		
	Pistons sticking	Replace piston O-Ring packings and wiper rings.		
	Defective Retraction Mechanisms	Replace Retracts.		

TROUBLE SHOOTING

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TROUBLE SHOOTING

Trouble	Cause	Correction	
Brake not releasing correctly (Cont'd.)	Pistons damaged	Replace Pistons.	
	Cylinder damaged	Replacing housing.	
	Torque ring damaged	Replace torque ring.	
	Pressure plate, rotating disk, or stationary disk not moving freely on torque ring.	Repair or replace defective plate or disk.	
	Rotating or stationary disk excessively dished	Replace disk or Pressure Plate Sub-Assy.	
Loss or ineffective Braking	Friction material worn from Brake Disc	Replace Brake Disc and Wear Pads if worn.	
	Excessive glaze on surface of Friction Material resulting in decreased friction coefficient	Perform several hard braking. applications to brake or reduce glaze on friction surface.	
	Worn seals in Master Cylinders	Repair Master Cylinder.	
	Stone or foreign object jammed in brake stack	Remove foreign object.	

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WEAR LIMITS

1. General

A brake wear check can be accomplished by parking the brake and checking the indicator pins (Item #26 111-10300 Adjuster Assemblies on page 1003); if the pin is flush or recessed below the friction sleeve, then the brake should be disassembled and further inspection of the individual wear components should be performed per Sections 3.3 and 8.2.



Figure 801

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- **NOTE**: When a wear component of the 30-204A BRAKE ASSEMBLY fails to meet the min. dimensions noted in this section, the Brake Assembly should be rebuilt by replacing that wear component.
- 2. Wear Pads

The wear limits for the wear pads used on the Pressure Plate Assembly (Item #6), Center Stator Assembly (Item #11), and Backplate Assembly (Item #15) are identical. The minimum dimensions for wear are shown in Figures 802 and 803.



MEASURE ON CENTERLINE BETWEEN RIVETS







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Figure 804

3. Discs

Figure 804 shows the minimum amounts of friction material that are allowed before Discs (Item #10) have to be replaced.

NOTES:

- 1. Cracks at slots (as shown above) are acceptable if in the lining material only. Cracks extending from the thermal relief slot to the I.D. of the Disc in the steel material necessitates replacement.
- 2. Pitting is acceptable if area of pitting does not exceed .250 in. max. diameter.
- 3. Crumbling of lining material is acceptable in I.D., O.D. and slot areas (as shown above), if loss from edges does not exceed .125 inch.

Page 804 April 4, 1994



ILLUSTRATED PARTS LIST

1. Introduction

- A. The Illustrated Parts List (IPL) section lists and illustrates the procurable parts of the Parker Hannifin assembly covered in this publication.
- B. The Figure item column provides the cross reference between the parts list and IPL Figure 1.
- C. The Part Number column gives the part number of the item, which is stamped on the part when practical. This number should be used when ordering parts.
- D. The description column gives the basic name of each part, together with any specifications required to identify the part listed. The descriptions are indented under the column heading to show the relationship of the parts to their subassemblies and to the assembly.
- E. The Units Per Assembly column gives the number of parts required for each assembly or subassembly.

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FIGURE 1

EXPLODED VIEW WITH

ILLUSTRATED PARTS LIST

Page 1002 Rev. C September 19, 2003



KEY TO FIGURE 1

<u>ITEM</u>	PART NUMBER	DESCRIPTION	<u>QTY</u>
1	30-204A	Brake Assembly	1
2	061-14000	Cylinder	1
3	062-08900	Piston	5
4	101-02300	O-Ring MS28775-218	5
5	088-01500	Insulator	5
6	073-07101	Pressure Plate Assembly	1
7	063-05501	Pressure Plate	1
8	109-00201	Wear Pad	16
9	105-06700	Rivet	32
10	159-05900	Disc	2
11	242-01200	Stator Assembly	1
12	232-01201	Stator	1
13	109-00201	Wear Pad	36
14	105-06800	Rivet	36
15	074-07000	Backplate Assembly	1
16	064-04303	Backplate	1
17	109-00201	Wear Pad	18
18	105-06700	Rivet	36
19	065-15400	Torque Ring, SUPSD BY Item 19A	1
		(refer to Parker Hannifin Service Bulletin SB 7079)	
19A	065-15401	Torque Ring, SUPSDS Item 19	1
20	103-25100	Bolt MS21250-05034	5
21	095-02800	Washer MS20002C5	5
22	081-00200	Bleeder Seat	2
23	079-00300	Bleeder Screw	2
24	101-00700	O-Ring MS28775-012	3
25	104-05000	Plug AN814-4	1
26	111-10300	Adjuster Assembly	4
27	139-21500	Stud	4
28	139-12000	Friction Sleeve	4
29	139-11900	Sleeve Retainer	4
30	067-13200	Spacer	4
31	095-13600	Washer MS20002-5	4
32	155-07800	Snap Ring	4
33	082-10400	Spring	4
34	111-08301	Retract Base Assembly	4
35	230-03300	Insert	4
36	139-22101	Retract Base	4
<u>1</u> 37	139-19101	Assembly, Bracket Manifold	1
_	² 139-29900	Assembly, Brake De-ice Manifold	1

¹ Optional Equipment. Refer to Parker Hannifin Conversion Kit, P/N 199-212.

² Optional Equipment. Refer to Parker Hannifin Conversion Kit, P/N 199-213.

- Item is not illustrated

SUPSD BY The part in the part number column is replaced by and is not interchangeable with the item number shown in the notation.

SUPSDS The part in the part number column replaces and is not interchangeable with the item number shown in the notation.

Page 1003 Rev. C September 19, 2003



CLEVELAND WHEELS & BRAKES

CM40-273A

COMPONENT MAINTENANCE MANUAL

WITH

ILLUSTRATED PARTS LIST

FOR

WHEEL ASSEMBLY

PART NUMBER 40-273A

REVISION K

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

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Initial Release November 15, 1993 Rev. K July 17, 2019 Delivered from Parker Vault - VERIFY REVISION BEFORE USE



CM40-273A COMPONENT MAINTENANCE MANUAL WITH IPL WHEEL ASSEMBLY 40-273A

REV NO.	ISSUE DATE	DATE INSERTED	BY	REV NO.	ISSUE DATE	DATE INSERTED	BY
А	8-15-94	8-15-94	PH				
В	3-28-96	3-28-96	PH				
С	4-29-97	4-29-97	PH				
D	2-24-98	2-24-98	PH				
Е	6-24-99	6-24-99	PH				
F	3-17-04	3-17-04	PH				
G	6-01-05	6-01-05	PHC				
Н	2-28-06	2-28-06	PHC				
J	10-5-07	10-5-07	PHC				
К	07-17-2019	07-17-2019	PHC				

RECORD OF REVISIONS

Record of Revisions Page 1/1 July 17, 2019


LIST OF REVISIONS

INITIAL RELEASE DATED 15 NOVEMBER 1993

<u>REVISION</u>	DATE	PAGE	DESCRIPTION OF CHANGE	
Rev. A	8-15-94	603	"199-184 0r 199-220 manual" -was- "199-184 manual"	
		1003	"205-00600" -was- "205-00700" "NAS1804-6N" -was- "NAS1804-6S"	
Rev. B BB (0316-47)	3-28-96	Description & Operation Page 2	 "Primer: Columbia Paint Corporation 11-347Z Primer" -was- "Primer - Epoxy Polyamide per MIL-P-23377" "Topcoat: Columbia Paint Corporation 11-358A Gloss White Enamal" -was- "Topcoat - White Polyurethane per MIL-C-83286" 	
		402	Section E. ADD "Insure that all drive keys meet the minimum thickness measurement as shown below."	
			Section E. ADD: Figure and Note:	
		403	Section G. "Magnetic particle inspect or penetrant inspect" -was- "Magnetic particle inspect"	
			Section G. ADD "See Page 401 for recommended penetrant and developer."	
		501	"Columbia Paint Corporation 11-347Z Primer" "Columbia Paint Corporation Huntington W. VA." -was- "Epoxy Polyamide Primer Specification Mil-P-23377" "Commercially Available"	



<u>REVISION</u>	DATE	PAGE	DESCRIPTION OF CHANGE
Rev. B (Cont'd)		501	"Columbia Paint Corporation 11-358A Gloss White Enamal" "Columbia Paint Corporation Huntington W. VA." -was- "White Polyurethane Topcoat Specification
			MIL-C-83286" "Sherwin Williams Commercial Products Division 761 Beta Drive Mayfield Village, Ohio 44143"
		504	Section 4. C. "Apply primer to reworked areas. The dry film thickness shall be .0002 to .0005 inch." -was-
			"Apply one coat of polyamide primer, specification MIL-P-23377 to reworked areas."
			Section 4. D. "Apply topcoat to reworked areas. The dry film thickness shall be .0008 to .0014 inch, including primer."
			"Apply one coat of White Polyurethane Topcoat, specification MIL-C-83286."
		505	Figure 502, Sheet 1 of 2, DELETE from Note 1: "(White polyurethane topcoat per MIL-C-83286 and epoxy polyamide primer per MIL-P-23377)"
		506	Figure 502, Sheet 2 of 2, DELETE from Note 1: "(White polyurethane topcoat per MIL-C-83286 and epoxy polyamide primer per MIL-P-23377)"
		507	Section G. "primer" -was- "MIL-P-23377 primer"
		601	Section 1. "Aeroshell Grease 22 (MIL-G-81322 Grade A)" "Shell Oil Company Houston, TX." -was-
			"Grease Specification MIL-G-81322" "Commercially Available"
			"Dow Corning 55 O-ring Lubricant Compound" -was- "Silicone Grease Dow Molykote 55M"
			Section 2.C. "O-ring lubricant" -was- "Dow Molykote 55M"
		602	Section 2.G. "Dow 55 O-ring lubricant" -was- "Dow Molykote 55M or equivalent"



<u>REVISION</u>	<u>DATE</u>	<u>PAGE</u>	DESCRIPTION OF CHANGE
Rev. C BB (0324-34)	4-29-97	Description & Operation Page 1	"Section 1.D. "inner" was "outer"
		Description & Operation Page 2	Section 3. "Approximate Wheel Weight: 12.4 lbs." was "Wheel Weight: 11.9 Pounds." Section 3., "Wheel Bolt Nut Torque: 290-300 in.lbs. lubtork (use MIL-T-5544 anti-seize compound) " was "Wheel Bolt Nut Torque: 300 Pound-Inches Lubtork."
		601	Section 2.C. "Apply o-ring lubricant to grommet of inflation valve (15). Install inflation valve (15) in outer wheel half (8). Torque inflation valve (15) to 75 - 100 inlbs. " was "Install inflation valve (15) in outer wheel half (8) Apply O-ring lubricant to grommet prior
			(a). Apply O-Ing lubicant to growniet phot to installation of inflation valve. " Section 2.E. "Using 30 - 35 inlbs. of torque, fasten each drive key (4) to the inner wheel half (3) using one screw (5). Safety wire with MS20995C32 lockwire; use MS33540 for general practices for safety wiring. "
			was "Fasten each drive key (4) to the inner wheel half (3) using one screw (5) and lockwire as shown in IPL Figure 1. "
		602	Section 2.G. "Lubricate o-ring (16) with Dow 55 O-ring lubricant and install in wheel register groove of inner wheel half (3). "
			was "Lubricate o-ring (16) with Dow 55 O-ring lubicant and install in wheel register groove of outer wheel half (8). "
		603	Section 2.L. "Lubtork nuts to 290-300 inlbs. " was 2.K. "Lubtork nuts to 300 inch-pounds. " Note: Remaining Section 2 items have been renumbered to reflect change above.
Rev. D	2-24-98	Table of Contents, Page 2	Add Section 6 to REPAIR as follows:"6. Repair of Inboard Wheel Half Drive Key509Attachment Screw Tapped Holes"

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REVISION	DATE	PAGE	DESCRIPTION OF CHANGE	
Rev. D (Cont'd)		201	Section 2.A "A. Jack aircraft per aircraft maintenance manual until tire is clear of ground. It is <u>strongly</u> recommended that the tire be <u>deflated</u> at this time.	
			WARNING: FAILURE TO DEFLATE TIRE BEFORE REMOVING AXLE NUT CAN RESULT IN <u>SERIOUS</u> INJURY OR <u>DEATH</u> ." was	
			"A. Jack aircraft per aircraft maintenance manual until tire is clear of ground and <u>fully deflate tire</u> ."	
		202	" <u>NOTE</u> : THE INFLATION VALVE MUST BE REMOVED IF PAINT IS TO BE STRIPPED FROM THE WHEEL HALVES BY PLASTIC MEDIA STRIPPING; THE BEARING CUPS MAY REMAIN IN THE WHEEL HALVES PROVIDED THAT THEY ARE NOT DAMAGED BY THE STRIPPING PROCESS. BOTH THE INFLATION VALVE AND THE BEARING CUPS MUST BE REMOVED IF PAINT IS TO BE STRIPPED FROM THE WHEEL HALVES BY CHEMICAL PAINT REMOVAL SOLVENTS." Was " <u>NOTE</u> : THE INFLATION VALVE AND THE BEARING CUPS MUST BE REMOVED IF PAINT IS TO BE STRIPPED FROM THE WHEEL HALVES."	
		301	Section 2.C "Repack bearing cones with clean bearing grease, specification MIL-G-81322 or equivalent, immediately after visually inspecting per check." Was "Repack bearing cones with clean bearing grease, specification MIL-G-81322, immediately after visually inspecting per check."	
		509	add New Page 509, which contains Section 6, paragraphs A., B, C, D, E, and F, along with Figure 504. Section 6 describes repair of inboard wheel half drive key attachment screw tapped holes.	
		601	Section 2.C "Torque inflation valve (15) to 35 – 45 inlb." was "Torque inflation valve (15) to 75 – 100 inlb."	



<u>REVISION</u>	DATE	PAGE	DESCRIPTION OF CHANGE	
Rev. D (Cont'd)		603	Section 2.0 "Pack bearing cones (13) with clean grease specification MIL- G-81322 or equivalent" was "Pack bearing cones (13) with clean grease specification MIL- G-81322."	
Rev. E	6-24-99	201	<u>CAUTION</u> : THE USE OF POWER OR IMPACT WRENCHES IS NOT A RECOMMENDED PRACTICE. IF USING POWER OR IMPACT WRENCHES, OBSERVE TORQUING SPECIFICATIONS. IN THE EVENT A BOLT/NUT COMBINATION IS OVER TORQUED, THE BOLT/NUT COMBINATION SHALL BE DISCARDED.	
			(Was) <u>CAUTION</u> : DO NOT USE POWER OR IMPACT WRENCHES TO REMOVE WHEEL NUTS AND BOLTS.	
		502	(Add)K. In area 10, Blend out and polish imperfections to .050 inch deep and one square inch in area.	
		503		





(DCN0360-24)

/N

(Now)			
Fluorescent	Zyglo ZL-60D	Zyglo ZP-4B, ZP-9F, ZP-5B, or SKD-S2	Magnaflux Corp. 3624 West Lake Ave. Glenview, IL 60025 www.magnaflux.com Ph. 847-657-5300
	Zyglo ZL-2C, with emulsifier/remover ZE-4B	Zyglo ZP-4B, ZP-9F, ZP-5B, ZP-14A or SKD-S2	Fax. 847-657-5388 e-mail: <u>INFO@magnaflux.com</u>
(Was)			
Fluorescent	Zyglo ZL-16 Penetrex ZL-2A	Zyglo ZP-13 (wet) optional Penetrex	Magnaflux Corp. 7300 West Lawrence St Chicago, IL 60656
	With emulsifier ZE-4	ZP-4 (dry) or ZP-13 optional	



REVISION	DATE	PAGE	DESCRIPTION OF CHANGE			
Rev. G DCN 0365-89	6/01/05	2	Add "or AMS2518"			
		601	Assembly Material Table: Add "or AMS2518" to antiseize callout			
		602	Paragraph J.: Add "…or AMS2518" to antiseize reference			
		1002	Re-insert Figure 1 and adjusted graphics for clarity			
		1003	102-07700 screw: MS35266-59 –was- AN501A10-4			
Rev. H	02-28-06	Title Page	(Now) Rev. H Dated February 28, 2006 (Was) Rev. G Dated 01 June 2005 (Now) Rev. H Dated February 28, 2006 (Was) Rev. G June 01, 2005			
		Record of Revisions	(Added) H 2-28-06 2-28-06 PHC (Now) February 28, 2006 (Was) June 01, 2005			
		Intoduction Page 1	Parker Hannifin Corporation Aircraft Wheel & Brake Division 1160 Center Road Avon, Ohio 44011 U.S.A. Attn: Technical Services/Hotline Websites: www.parker.com/ag/wbd www.clevelandwheelsandbrakes E-mail: techhelp@parker.com Fax: (440) 937-5409 Tel: 1-800-BRAKING (1-800-272-5464) (440) 937-1315			
			(WAS)			
			Parker Hannifin Corporation Aircraft Wheel & Brake Division Attn: Product Support Dept. 1160 Center Road Avon, Ohio 44011 Phone: (216) 937-6211 1-800-272-5464 Fax: (216) 937-6416			



Description	(Now) Bearing Lubricant:	See Assembly Materials
& Operation	table Page 601	
Page 2	(Was) Bearing Lubricant:	MIL-G-81322.

301 (Now)

C. Dry bearing cones thoroughly, using filtered and dried compressed air. Repack bearing cones with clean bearing grease, see <u>Assembly Material</u> table Page 601, immediately after visually inspecting per CHECK.

(Was)

C. Dry bearing cones thoroughly, using filtered and dried compressed air. Repack bearing cones with clean bearing grease, specification MIL-G-81322 or equivalent, immediately after visually inspecting per CHECK.

601 (Now)		
Aeroshell Grease 22 (MIL-G-81322 Grade A)	Shell Oil Company One Shell Plaza Houston, TX. www.shell-lubricants.com	
Mobilux EP2 Bearing Grease (at Ambient Temperatures above -20° F)	Mobil Oil Corp. Shoreham Building, Washington DC. 20005	
Mobil Aviation Grease SHC 100	www.exxonmobil.com	

(Was)	
Aeroshell Grease 22	Shell Oil Company
(MIL-G-81322 Grade A)	Houston, TX.

- 602 "C. Apply O-ring lubricant"..., "D. If removed, install the"..., and "E. Using 30-35 in.-lbs. of torque"...moved from 601.
- 603 O. . Pack bearing cones (13) with clean bearing grease, See <u>Assembly Materials</u> table Page 601.

(WAS)

O. Pack bearing cones (13) with clean bearing grease, specification MIL-G-81322 or equivalent.



Rev. J	10-5-07	Title Page	 (Now) Rev. J Dated October 5, (Was) Rev. H Dated February (Now) Rev. J Dated October 5, (Was) Rev. H Dated February 	, 2007 28, 2006 , 2007 28, 2006
		Record of Revisions	(Added) J 10-05-07 (Now) October 5, 2007	10-05-07 PHC (Was) February 28, 2006

401 (Add)

NOMENCLATURE	SPECIFICATION	SOURCE OF SUPPLY
Eddy Current Inspection Equipment	ASNT-460 or MIL-HDBK-728/2	Commercial Source

402

(Now) NOTE:

Select one of the two recommended wheel half nondestructive inspection schedules.

(Schedule 1)

Inspect the wheel halves using liquid penetrant methods as follows:

• First inspection after 5th tire change or 2000 cycles, whichever comes first; one cycle is defined as one take-off and one landing. Additional inspections should be performed at every second tire change or 1000 cycles, whichever comes first.

<u>NOTE</u>: CHECK WHEEL BY ZYGLO OR OTHER DYE-PENETRANT METHODS. REPLACE ALL CRACKED WHEELS.

(Schedule 2)

Inspect the wheel halves using eddy current and penetrant methods as follows:

At every tire change, eddy current inspect the wheel half bead seat area, and at every fourth tire change, liquid penetrant inspect the entire wheel half.



(Was) NOTE:

Penetrant inspection of wheel halves is recommended at the following intervals:

* First inspection after 5th tire change or 2000 cycles, whichever comes first; one cycle is defined as one take-off and one landing. Additional inspections should be performed at every second tire change or 1000 cycles, whichever comes first.

<u>NOTE</u>: CHECK WHEEL BY ZYGLO OR OTHER DYE-PENETRANT METHODS. REPLACE ALL CRACKED WHEELS.

402 (Moved to 403) <u>NOTE</u>: INSURE THAT ALL KEYS ARE WITHIN .005 IN. THICKNESS OF EACH OTHER. E.G. IF THE THICKEST KEY (MEASUREMENT AS SHOWN ABOVE) IS .105 IN., THEN THE THINNEST MUST BE .100 IN.

> WARNING: DO NOT ATTEMPT TO SAND CORROSION FROM THE DRIVE KEYS; THE DRIVE KEYS HAVE BEEN CADMIUM PLATED, AND CADMIUM DUST IS VERY TOXIC.

403 (Moved from 402) <u>NOTE</u>: INSURE THAT ALL KEYS ARE WITHIN .005 IN. THICKNESS OF EACH OTHER. E.G. IF THE THICKEST KEY (MEASUREMENT AS SHOWN ABOVE) IS .105 IN., THEN THE THINNEST MUST BE .100 IN.

> WARNING: DO NOT ATTEMPT TO SAND CORROSION FROM THE DRIVE KEYS; THE DRIVE KEYS HAVE BEEN CADMIUM PLATED, AND CADMIUM DUST IS VERY TOXIC.



404 (Add)

- (4) Eddy Current Inspection Requirements
- (a) Examine the beadseat area shown in Figure 401.
- (b) Calibrate the eddy current equipment to detect a 0.060 inch (1.52mm) long by 0.030 inch (0.76mm) deep elox notch. An elox notch is produced by electrical discharge machining.
- (c) Remove all dirt and grease from the wheel half assemblies. If the wheel has no scratches, chips, nicks, and cracks, the paint does not need to be removed.
- (d) Eddy current probe must fit the beadseat area defined in Figure 401.



Typical for both wheel halves

Eddy Current Probe Criteria Figure 401



REVISION	DATE	PAGE	DESCRIPTION OF CHANGE
Rev. K ECO-0106275	07-17-2019		(Delete) cover page. Not required.
	-	2	Description & Operation, para. 3: (Now) Primer: Sherwin Williams Company P/N P60G2 Primer Topcoat: Sherwin Williams Company P/N F63W13 Gloss White Enamel
			(Was) Primer: Columbia Paint Corporation P/N 11-347Z Primer Topcoat: Columbia Paint Corporation P/N 11-358A Gloss White Enamel
		2	Introduction (Delete) Data Rights. Now on title page.
		501	Repair, Repair Materials: (Now) Sherwin Williams primer and paint data (Was) Columbia primer and paint data
		1003	Illustrated Parts List, Para 2. Parts List (Now) qty 8 for items 9, 10, 11, & 12 (Was) qty 9

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SERVICE BULLETIN LIST

SERVICE BULLETIN NO.	REV. NO.	DATE INCORPORATED	SERVICE BULLETIN NO.	REV. NO.	DATE INCORPORATED

Service Bulletin List Page1/1 November 15, 1993

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DESCRIPTION AND OPERATION

1. Description and Operation

- A. The Main wheel assembly is a 6.50-10, Type III wheel designed for use with a 22 x 6.75-10, 8 ply or 10 ply tube type or tubeless tire.
- B. The divided type main wheel facilitates tire installation and removal.
- C. The two wheel halves are fastened together with high strength bolts, washers and self-locking nuts. The wheel halves are machined from aluminum alloy forgings.
- D. An O-ring is installed on the inner wheel half to provide an air seal at the juncture of the wheel halves. An inflation valve assembly is installed in the outer wheel half to inflate and deflate a tubeless tire. This valve must be removed to utilize a tube type tire.
- E. The wheel assembly rotates on two tapered roller bearings. The bearings are protected by a molded type lip seal in each hub. The bearing cups are shrink-fitted into the hubs of each wheel half.
- F. The inner wheel half flange is slotted in nine (9) places to engage the brake discs and transmit torque to the brake.
- G. The inner wheel half flange slots are lined with steel drive keys (which are held in place by a single screw and lockwire) to prevent the aluminum wheel flange from being battered by the steel brake discs.

2. Handling Procedures

A. Strictly observe the deflation and inflation procedures, and the torque and lubtork values specified in this manual. Do not overtighten any bolt, nut, or fitting.



- B. Handle the wheel bearing cones with extreme care. Many bearing failures can be traced to dropping or mishandling the bearings during maintenance.
- C. Handle and maintain the wheel halves properly to protect the paint and surface finishes.
- 3. Leading Particulars

Wheel Size and Type: 6.50-10, Type III Tubeless or Tubetype

Material: Aluminum Alloy Forging.

Approximate Wheel Weight: 12.4 Lbs.

Wheel Bolt Nut Torque: 290-300 in.-lbs. Lubtork. (Use either MIL-T-5544 or AMS2518 antiseize compound)

Bearing Lubricant: . See <u>Assembly Materials</u> table Page 601.

Paint Requirements: (Recommended)

- Primer: Sherwin Williams Company P/N P60G2 Primer
- Topcoat: Sherwin Williams Company P/N F63W13 Gloss White Enamel



INTRODUCTION

This manual is published for the guidance of personnel responsible for the overhaul and/or maintenance of the Parker Hannifin 40-273A Wheel Assembly covered in this publication. The procedures outlined in this manual may be altered if better and/or more economical methods can be employed by the individual facilities. However, alternative procedures must not reduce the efficiency of operation of the assembly.

<u>NOTE</u>: All torque values and specified limits or values set by Parker Hannifin Engineering and contained herein must be strictly observed and not deviated from.

While Parker Hannifin Corporation represents that the information contained in this manual was current at the time of publication, it is recommended that the user inquire as to the latest revision level in existence before proceeding with overhaul or maintenance operations. This can be accomplished by contacting the Product Support Department of the Aircraft Wheel & Brake Division at the following address or numbers:

Parker Hannifin Corporation Aircraft Wheel & Brake Division 1160 Center Road Avon, Ohio 44011 U.S.A. Attn: Technical Services/Hotline Websites: www.parker.com/ag/wbd www.clevelandwheelsandbrakes.com E-mail: techhelp@parker.com Fax: (440) 937-5409 Tel: 1-800-BRAKING (1-800-272-5464) (440) 937-1315



TSO NOTICE

This assembly carries a "TSO C26c" marking for FAR Part 23 usage, which identifies it as having been fully tested in the laboratory and qualified to applicable FAA (Federal Aviation Administration) requirements and specifications. After final certification, substitutions of critical parts or changes of processes or materials are not permitted without requalification of the assembly and resubmittal of the test data to the FAA for approval.

FAA regulations subject both Parker Hannifin, Aircraft Wheel & Brake Division and the user to constant surveillance to assure that uncompromising quality assurance material and processing controls are maintained in order to provide replacement parts that are the same as the parts originally certified in the assembly.

DATA RIGHTS

(Deleted)



<u>TESTING</u>

1. General

Test the wheel assembly in accordance with the following procedure. (Ref. IPL Fig. 1)

2. <u>Testing Procedures</u>

- A. Clean bearing cones (13) in dry cleaning solution, specification P-D-680, and visually check roller contacting surfaces for nicks, scratches, rust, corrosion, spalling, flat spots, pitting, heat discoloration and wear. Check bearing cage for dents or distortion and for wear of sides, corners and at ends of roller pockets. Replace bearing cones having any defects.
- B. Wipe bearing cups (6) free of grease and visually check cup face for scratches, pitting, brinelling, spalling, heat discoloration, rust, corrosion and wear. Remove defective cups and install new cups per REPAIR.
- C. Visually check grease seals (14) for cuts and wear on rubber sealing lip and bent or distorted reinforcing washer. Replace damaged grease seals.
- D. Cover hub openings of wheel halves to prevent contamination of bearing lubricant.
- E. Place wheel/tire assembly in an inflation cage and inflate to recommended operating pressure.



- F. Coat juncture around inflation valve (15) and tire beads with soap solution. Check carefully for air leaks in the form of soap bubbles. If air leaks occur around valve, check torque on leaking part. If air leaks occur around tire bead seat, completely deflate tire and remove assembly from inflation cage. Remove tire from wheel and examine wheel bead seat and tire for damage. If wheel bead seat is scratched, nicked or pitted, repair in accordance with REPAIR.
- G. Place wheel/tire assembly in an inflation cage and inflate to recommended operating pressure, after the initial 24 hours (growth stabilization) reinflate to recommended operating pressure. Check pressure after an additional 24 hours. If the reduction in pressure exceeds five percent of inflation pressure, replace wheel O-Ring (16) and retest wheel/tire assembly in accordance with step F.



DISASSEMBLY

1. General

Disassemble the main wheel assembly in accordance with the following instructions (Ref. IPL Fig. 1).

<u>WARNING</u>: DO NOT ATTEMPT TO DISASSEMBLE WHEEL UNTIL TIRE HAS BEEN COMPLETELY DEFLATED; OTHERWISE, SERIOUS INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT CAN RESULT.

- 2. Disassembly Procedures
 - A. Jack aircraft per aircraft maintenance manual until tire is clear of ground. It is strongly recommended that the tire be <u>deflated</u> at this time.

WARNING: FAILURE TO DEFLATE TIRE BEFORE REMOVING AXLE NUT CAN RESULT IN <u>SERIOUS INJURY</u> OR <u>DEATH</u>

- B. Remove and retain axle nut, tang washer, grease seal, and outer bearing cone.
- C. Remove wheel assembly from axle and place on a clean flat surface.
- D. Remove remaining grease seal (14) and inner bearing cone (13).
- E. Break tire beads away from both wheel flanges by applying pressure in even increments around entire sidewall as close to tire beads as possible.

<u>CAUTION</u>: THE USE OF POWER OR IMPACT WRENCHES IS NOT A RECOMMENDED PRACTICE. IF USING POWER OR IMPACT WRENCHES, OBSERVE TORQUING SPECIFICATIONS. IN THE EVENT A BOLT/NUT COMBINATION IS OVER TORQUED, THE BOLT/NUT COMBINATION SHALL BE DISCARDED.

- F. Remove nuts (12), washers (11), bolts (9) and countersunk washers (10).
- G. Separate the wheel halves and remove tire.
- H. Remove O-Ring (16) from wheel register groove of outer wheel half (8).



I. Remove lockwire, screws, and drive keys from inner wheel half.

<u>NOTE</u>: IT IS RECOMMENDED THAT A NEW O-RING BE INSTALLED AT EACH OVERHAUL.

- J. Bearing cups (6) should not be removed from the wheel halves unless replacement is required. Refer to REPAIR for removal and installation procedures.
 - NOTE: THE INFLATION VALVE MUST BE REMOVED IF PAINT IS TO BE STRIPPED FROM THE WHEEL HALVES BY PLASTIC MEDIA STRIPPING; THE BEARING CUPS MAY REMAIN IN THE WHEEL HALVES PROVIDED THAT THEY ARE NOT DAMAGED BY THE STRIPPING PROCESS. BOTH THE INFLATION VALVE AND THE BEARING CUPS MUST BE REMOVED IF PAINT IS TO BE STRIPPED FROM THE WHEEL HALVES BY CHEMICAL PAINT REMOVAL SOLVENTS.



CLEANING

1. Cleaning Materials

NOTE:	EQUIVALENT SUBSTITUTES MAY BE USED FOR ITEMS LISTED BELOW.		
Dry Cleaning Solution Specification P-D-680 Stoddard Solvent		Commercially Available	
Isopropyl Alc	ohol	Commercially Available	
Soft Bristle Brush		Commercially Available	
Clean Wiping Cloth		Commercially Available	

2. <u>Cleaning Procedures</u>

<u>WARNING</u>: CLEANING SOLUTIONS SHOULD BE USED IN A WELL VENTILATED AREA. AVOID PROLONGED INHALATION OF FUMES.

A. Clean all metal parts by immersing in dry cleaning solution conforming to specification P-D-680. Use a soft bristle brush to remove hardened grease, dust, and dirt.

<u>CAUTION</u>: CLEAN BEARING CONES (13) CAREFULLY IN A SEPARATE CONTAINER OF CLEAN SOLVENT TO AVOID CONTAMINATION.

- B. Dry all metal parts thoroughly after cleaning, using filtered and dried compressed air.
- C. Dry bearing cones thoroughly, using filtered and dried compressed air. Repack bearing cones with clean bearing grease, see <u>Assembly Material</u> table Page 601, immediately after visually inspecting per CHECK.

CAUTION: DO NOT SPIN BEARING CONES WITH COMPRESSED AIR.

D. Clean rubber parts in isopropyl alcohol and dry with a clean, soft cloth.



3. Paint Removal Procedures

A. Remove paint from the wheel halves using chemical paint removal solvents or plastic media stripping in accordance with the following instructions.

WARNING: DUE TO THE TOXICITY OF CHEMICAL PAINT REMOVAL SOLVENTS, IT IS HIGHLY RECOMMENDED THAT PAINT REMOVAL BY THIS METHOD BE ACCOMPLISHED BY A COMMERCIAL FACILITY WITH THE PROPER EQUIPMENT AND CHEMICAL DISPOSAL CAPABILITIES.

<u>CAUTION</u>: REFER TO THE APPLICABLE MANUFACTURERS INSTRUCTIONS WHEN UTILIZING CHEMICAL PAINT REMOVAL SOLVENTS OR PLASTIC MEDIA STRIPPING EQUIPMENT.

- B. Completely disassemble the wheel prior to paint removal. Remove inflation valve (15).
- NOTE: REFER TO "REPAIR" FOR RETREATING AND REPAINTING WHEEL.



<u>CHECK</u>

1. Check Materials

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR ITEMS LISTED BELOW:				
Туре	Penetrant	Developer	Supplier	
Fluorescent	Zyglo ZL-60D	Zyglo ZP-4B, ZP-9F, ZP-5B, or SKD-S2	Magnaflux Corp. 3624 West Lake Ave. Glenview, IL 60025 www.magnaflux.com	
	Zyglo ZL-2C, with emulsifier/remover ZE-4B	Zyglo ZP-4B, ZP-9F, ZP-5B, ZP-14A or SKD-S2	Ph. 847-657-5300 Fax. 847-657-5388 e-mail: <u>INFO@magnaflux.com</u>	
Red Dye	Spot Check	Spot Check		
	Dy-Chek	Dy-Chek	Turco Products Division of Purex Corp. P.O. Box 6200 Carson, CA 90749	
	Met-L-Chek	Met-L-Chek	Met-L-Chek Company 1639 Euclid Street Santa Monica, CA 90404	

NOMENCLATURE	SPECIFICATION	SOURCE OF SUPPLY
Eddy Current Inspection Equipment	ASNT-460 or MIL-HDBK-728/2	Commercial Source

2. General (Ref. IPL Fig. 1)

A. Check all components of the main wheel assembly for cracks, nicks, corrosion, and other damage. Replace any cracked, severely corroded, or badly damaged parts.



B. Perform the specific checks listed below and refer to REPAIR for the appropriate repair procedures.

3. Detailed Check

A. Check wheel halves (3 and 8) for cracks and structural damage. Take particular note of bead seat and valve areas. Check the underside of the wheel tubewell area paying particular attention to the critical area from the tire bead seat radius to the end of the toe of the tire.

NOTE:

Select one of the two recommended wheel half nondestructive inspection schedules.

(Schedule 1)

Inspect the wheel halves using liquid penetrant methods as follows:

* First inspection after 5th tire change or 2000 cycles, whichever comes first; one cycle is defined as one take-off and one landing. Additional inspections should be performed at every second tire change or 1000 cycles, whichever comes first.

NOTE: CHECK WHEEL BY ZYGLO OR OTHER DYE-PENETRANT METHODS. REPLACE ALL CRACKED WHEELS.

(Schedule 2)

Inspect the wheel halves using eddy current and penetrant methods as follows: At every tire change, eddy current inspect the wheel half bead seat area, and at every fourth tire change, liquid penetrant inspect the entire wheel half.

- B. Check carefully for corrosion on the surfaces that contact the tire beads. Remove corrosion and repair surface damage to the limits defined in REPAIR.
- C. Check bearing cups (6) in the wheel halves for looseness, wear, corrosion, spalling, brinelling, scratches, pitting, and heat discoloration. Replace defective bearing cups in accordance with REPAIR.
- D. Check roller surfaces of bearing cones (13) for wear, corrosion, spalling, scratches, pitting, and heat discoloration. Check bearing cage for nicks, dents, distortion, and wear in the roller pockets. Replace bearing cones having any of the above defects.
- E. Check the drive keys (4) for cracks, battering, or excessive corrosion. Replace cracked, battered or corroded parts. Insure that all drive keys meet the minimum thickness measurement as shown below.





- NOTE: INSURE THAT ALL KEYS ARE WITHIN .005 IN. THICKNESS OF EACH OTHER. E.G. IF THE THICKEST KEY (MEASUREMENT AS SHOWN ABOVE) IS .105 IN., THEN THE THINNEST MUST BE .100 IN.
- WARNING: DO NOT ATTEMPT TO SAND CORROSION FROM THE DRIVE KEYS; THE DRIVE KEYS HAVE BEEN CADMIUM PLATED, AND CADMIUM DUST IS VERY TOXIC.
- F. Check self-locking nuts (12) for worn, stripped or crossed threads. Replace if any of the above damage exists. Check the nuts self-locking feature. Replace the nut when it can be run down with the fingers after the locking feature engages the bolt.
- G. Magnetic particle inspect or penetrant inspect the wheel tie bolts (9) for cracks, particularly in the areas near the bolt head radius and the threads. If <u>any</u> of the bolts have cracks, replace <u>all</u> of the bolts. See Page 401 for recommended penetrant and developer.
- H. New O-Rings should be installed at each overhaul. Remove burrs or other damage on the adjoining wheel components that could cause O-Ring damage.
- I. Examine grease seals (14) for cuts, nicks, distortion, and other damage. Check the integrity of the rubber-to-metal interface. Replace seals that have any of these defects.



- (4) Eddy Current Inspection Requirements
 - (a) Examine the beadseat area shown in Figure 401.
 - (b) Calibrate the eddy current equipment to detect a 0.060 inch (1.52mm) long by 0.030 inch (0.76mm) deep elox notch. An elox notch is produced by electrical discharge machining.
 - (c) Remove all dirt and grease from the wheel half assemblies. If the wheel has no scratches, chips, nicks, and cracks, the paint does not need to be removed.
 - (d) Eddy current probe must fit the beadseat area defined in Figure 401.



Typical for both wheel halves

Eddy Current Probe Criteria Figure 401



<u>REPAIR</u>

1. Repair Materials

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR ITEMS LISTED BELOW.		
Dry Cleaning Solution Specification P-D-680 Stoddard Solvent	Commercially Available	
Aluminum Oxide Cloth 400 Grit Wet-Or-Dry	Commercially Available	
Sulfuric-acid Anodize Specification MIL-A-8625 Type II, Class 1 or Specification MIL-C-5541 Class 1A	Commercially Available	
Sherwin Williams Company P60G2 Primer	Sherwin Williams Company Cleveland, Ohio	
Sherwin Williams Company F63W13 Gloss White Enamel	Sherwin Williams Company Cleveland, Ohio	
Grease Dow Molykote 55M Grease	Dow Corning Corp. Box 1767 Midland, Michigan 48640	

2. General (Ref. IPL Fig. 1)

- A. Repairs to the main wheel are limited to the replacement of parts and to the repairs specified in this section. No attempt should be made to repair cracked, severely corroded or badly damaged parts.
- CAUTION: REMOVAL OF CORROSION AND SURFACE DAMAGE WILL PREVENT STRESS CONCENTRATIONS AND PREMATURE WHEEL FAILURE. ANY EXCESSIVE REMOVAL OF MATERIAL WILL SHORTEN THE ROLL LIFE OF THE WHEEL; THEREFORE IT IS RECOMMENDED THAT MATERIAL REMOVED BY BLENDING BE LIMITED TO THE MINIMUM REQUIRED FOR REMOVING CORROSION OR SURFACE DAMAGE.



3. <u>Repair of Wheel Halves (3 and 8, Ref. Figure 501)</u>

A. Remove all corrosion and surface damage from wheel halves according to limits specified in the following paragraphs and defined in Figure 501. Use fine, wet-or-dry, <u>aluminum oxide</u> cloth for polishing. Unless otherwise specified, surface finish of repaired surfaces should not exceed a roughness of 150 rms.

WARNING: DO NOT USE ABRASIVES CONTAINING IRON SUCH AS STEEL WOOL, IRON OXIDE, OR STEEL WIRE; IRON PARTICLES WHICH BECOME EMBEDDED IN THE ALUMINUM WHEEL HALVES WILL ACCELERATE CORROSION.

- B. In area 1, polish out corrosion pits, scratches, and tool marks to .015 inch deep and .5 inch long. Surface finish in bead seat radius should be 20 microinches rms.
- C. In area 2, blend out and polish imperfections to .030 inch deep and 1 inch long. Reworked area is not to exceed 1 square inch. Do not remove metal if surface directly opposite was previously reworked.
- D. In area 3, blend out and polish imperfections to .030 inch deep and one square inch area.
- E. In area 4, polish out imperfections to .010 inch maximum depth in register area, provided sealing qualities are maintained.
- F. In area 5, blend out and polish imperfections to .030 inch deep and one square inch in area.
- G. In area 6, rework is limited to .040 inch deep and .5 square inch in area at a maximum of two places.
- H. In area 7, rework is limited to blending out scratches and corrosion, provided bearing cup retention is not affected.
- I. In area 8, rework is limited to .010 inch maximum depth on face of each bolt boss.
- J. In area 9, the maximum repair is .010 inch deep and one-half square inch on each interface boss.
- K. In area 10, blend out and polish imperfections to .050 inch deep and one square inch in area.







QUIER_WHEEL_HALE INNER_WHEEL_HALE NOTE: NUMBERS REFER TO REWORKED AREAS DISCUSSED IN REPAIR OF WHEEL HALF.

> WHEEL REPAIR LIMITS FIGURE 501

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- 4. Repainting
 - A. Rinse reworked areas with dry-cleaning solution, specification P-D-680 and dry thoroughly with filtered compressed air.

<u>WARNING</u>: CLEANING SOLUTIONS SHOULD BE USED IN A WELL VENTILATED AREA. AVOID PROLONGED INHALATION OF FUMES.

- B. Treat reworked areas with surfuric-acid anodize per MIL-A-8625 Type II, Class 1, or "Alodine" per MIL-C-5541 Class 1A. MIL-A-8625 Type II, Class 1 is preferred.
- C. Apply primer to reworked areas. The dry film thickness shall be .0002 to .0005 inch.

<u>CAUTION:</u> DO NOT GET PAINT ON ROLLER CONTACTING SURFACES OF BEARING CUPS. PAINT ON THESE SURFACES WILL CONTRIBUTE TO BEARING FAILURE (SEE FIGURE 502).

- D. Apply topcoat to reworked areas. The dry film thickness shall be .0008 to .0014 inch, including primer.
- 5. <u>Replacing Defective Bearing Cups (13)</u>
 - A. Heat wheel half in an oven not exceeding 175^o F. for 30 minutes.
 - B. Remove cup from bore by tapping it out evenly with a fiber or phenolic punch, or fabricate bearing cup removal tool (See Figure 503) and utilize by hand or adapt to arbor press. Exercise extreme care to avoid raising burrs in the hub bore.





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Aerospace

CM40-273A COMPONENT MAINTENANCE MANUAL WITH IPL WHEEL ASSEMBLY 40-273A



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WARNING: DURING BEARING CUP REMOVAL, ALWAYS SUPPORT THE WHEEL HALF ON THE HUB, NOT ON THE FLANGE. FAILURE TO DO SO COULD DAMAGE THE FLANGE.

- C. Make sure that bearing bore and shoulder are clean and free of burrs.
- D. Prior to installation, chill the new bearing cup with dry ice.
- E. Heat wheel half in oven not exceeding 175^o F. for 30 minutes.
- F. Remove the wheel half from the heat source and remove the bearing cup from the dry ice. Dry the cup thoroughly.
- G. Brush a wet coat (generous but not dripping) of primer into the bearing bore.
- H. Hand press the bearing cup into the coated housing making sure the backing surface of the cup mates to the shoulder of the bearing bore. Avoid cocking the cup during installation. (Installation tool for cup is pictured in Figure 503)
- I. Remove excess primer compound with a clean shop towel so that a fillet of not more than .08 wide extends beyond the cup.





FIGURE 503



- 6. Repair of Inboard Wheel Half Drive Key Attachment Screw Tapped Holes
 - A. No more than two 10-32 tapped holes may be repaired per 40-273A wheel assembly.
 - B. Drill stripped No. 10-32 tapped hole to \emptyset .210^{+.005/-.002} in. (drill size no. 7)
 - C. Measure minimum edge to hole distance as shown in figure 1. Inner wheel halves with an edge to hole distance below the minimum specified in Figure 504 must be scrapped.
 - D. Tap Ø.201 hole with Heli-Coil Corp. (Ph. 203-924-4737) Tap P/N 3FPB to obtain .190-32 UNF-3B helical coil insert thread per MS33537.
 - E. Surface treat repaired areas with conversion coating per MIL-C-5541, Class 1A.
 - F. Install Heli-Coil Corp. insert P/N 1191-3CNY190 per Heli-Coil. Corp. installation instructions.



Ø.190-32 UNF-3B HELICAL COIL INSERT THREAD PER MS33537 .190 MIN. FULL THD. DEPTH

FIGURE 504

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ASSEMBLY

1. Assembly Materials

NOTE:	EQUIVALENT SUBSTITUTES MAY BELOW.	BE USED FOR ITEMS LISTED	
Aeroshell Grease 22 (MIL-G-81322 Grade A)		Shell Oil Company One Shell Plaza Houston, TX. www.shell-lubricants.com	
Mobilux EP2 Bearing Grease (at Ambient Temperatures above -20°F) Mobil Aviation Grease SHC 100		Mobil Oil Corp. Shoreham Building, Washington DC. 20005 www.exxonmobil.com	
Antiseize Compound (Lubtork) Specification MIL-T-5544 or AMS2518		W.J. Ruscoe & Company 483 Kenmore Boulevard Akron, Ohio 44301	
Isopropyl Alcohol		Commercially Available	
Dow Corning 55 O-ring Lubricant Compound		Dow Corning Corp. Box 1767 Midland, Michigan 48640	

<u>CAUTION:</u> AVIATION BEARING GREASES SHOULD NOT BE INTERMIXED WITH EACH OTHER. PRECAUTIONS SHOULD BE TAKEN TO ENSURE THAT THE WHEEL BEARING GREASES ARE BEING USED IN ACCORDANCE WITH THE MANUFACTURER'S GUIDELINES. FOR TECHNICAL DATA AND MSDS SHEETS, VISIT THE APPROPRIATE MANUFACTURER'S WEB SITE.

2. Assembly Procedures (Ref. IPL Fig. 1)

- A. Assemble wheel on a clean flat surface.
- B. New O-Rings should be installed at each reassembly.



- C. Apply O-ring lubricant to grommet of inflation valve (15). Install inflation valve (15) in outer wheel half (8). Torque inflation valve (15) to 35-45 in-lbs.
- D. If removed, install the bearing cups (6) per Section 5 "Replacing Defective Bearing Cups".
- E. Using 30-35 in.-lbs. of torque, fasten each drive key (4) to the inner wheel half (3) using one screw (5). Safety wire with MS20995C32 lockwire; use MS33540 for general practices for safety wiring.
- F. Place outer wheel half subassembly (7) on work surface with flange down. Clean wheel flange, bead seat, register and packing groove with a cloth dampened with isopropyl alcohol.
- G. Lubricate O-Ring (16) with Dow 55 O-ring lubricant and install in wheel register groove of inner wheel half (3).

<u>CAUTION:</u> THE O-RING CAN NOT BE TWISTED.

- H. Place serviceable 22 x 6.75-10, 8 Ply or 10 Ply tubeless or tubetype tire and tube (if used) over outer wheel half subassembly (7).
- I. Position the inner wheel half subassembly (2) in the tire so that the bolt holes in both wheel halves are aligned.
- J. Lubricate bolt and nut threads and bearing surfaces of bolt (9) heads, washers (10 and 11) and nuts (12) with either antiseize compound, specification MIL-T-5544 or AMS2518. Slide a countersunk washer (10) onto each bolt. The countersunk side of the washer must face the bolt heads.
- K. Insert a bolt (9) [with washer (10)] into the inner wheel half subassembly (2). Compress the wheel halves together and install a flat washer (11) and nut (12) onto each of the eight bolts (9), thus fastening the wheel halves together.

<u>NOTE</u>: THE NUTS SHOULD BE ON THE OUTER WHEEL HALF SUBASSEMBLY (7), AND A STRIPE OF PAINT SHOULD BE PAINTED ON THE NUT AND BOLT (AFTER FINAL TORQUING) SUCH THAT ANY ROTATION OF THE NUT RELATIVE TO THE BOLT WILL BE INDICATED BY A BROKEN STRIPE.



L. Lubtork nuts to 290-300 in.-lbs.

<u>NOTE:</u> TORQUE NUTS IN A CRISS-CROSS PATTERN TO OBTAIN A MORE EVEN TORQUE VALUE.

- M. When all the nuts have been torqued, torque them a second time to insure that the required value has been achieved.
- N. Place the wheel/tire assembly in an inflation cage for initial inflation. Inflate tire just enough to seat the beads. Reduce tire pressure to recommended storage pressure (40 psi) and remove wheel/tire assembly from inflation cage.

<u>WARNING</u>: DO NOT INFLATE TIRE TO FULL OPERATING PRESSURE UNTIL THE WHEEL ASSEMBLY HAS BEEN MOUNTED ON AIRCRAFT.

- O. Pack bearing cones (13) with clean bearing grease, See <u>Assembly Materials</u> table Page 601.
- P. Install inboard bearing cone and inboard grease seal in the wheel assembly.
- Q. Install wheel assembly on axle. Be sure to engage both brake disks between wheel drive keys (4).
- R. Install outboard bearing cone and outboard grease seal in the wheel assembly.
- S. Install tang washer on axle. Install castellated nut on axle per the instructions in the 199-184 or 199-220 manual.

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STORAGE INSTRUCTIONS

1. Wheels Stored with Tires Installed

- A. The length of time that a wheel assembly can be stored is governed by the storage life of its rubber components.
- B. The wheel/tire assembly should be stored in a clean, cool, dry storeroom out of direct sunlight. The desirable storeroom temperature range is 32^o 75^o F. If this temperature range cannot be maintained, temperatures as high as 100^o F. or even 125^o F. can be tolerated for short periods.
- C. The recommended storage pressure for tires is 40 psi.

2. Wheels Stored Without Tires Installed

- A. Store without the O-Ring (16) installed between the two halves.
- 3. Plug Or Cover Bearing Hub Area During Storage To Prevent Contamination.

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ILLUSTRATED PARTS LIST

1. Introduction

- A. The Illustrated Parts List (IPL) section lists and illustrates the procurable parts of the Parker Hannifin assembly covered in this publication.
- B. The Figure item column provides the cross reference between the parts list and IPL Figure 1.
- C. The Part Number column gives the part number of the item, which is stamped on the part when practical. This number should be used when ordering parts.
- D. The description column gives the basic name of each part, together with any specifications required to identify the part listed. The descriptions are indented under the column heading to show the relationship of the parts to their subassemblies and to the assembly.
- E. The Units Per Assembly column gives the number of parts required for each assembly or subassembly.





ILLUSTRATED PARTS LIST (IPL) FOR 40-273A WHEEL ASSEMBLY FIGURE 1



2. PARTS LIST

40-273A WHEEL ASSEMBLY (BEECH 1900 MAIN WHEEL)

VENDOR OR			_	
MIL. DESIGNATION	PART NUMBER	DESCRIPTION	<u>QUANTITY</u>	<u>ITEM</u>
40-273A	40-273A	Wheel Assembly	1	1
	161-17301	Inner Wheel Half Sub-Assy	<i>.</i> 1	2
	*	Wheel Half-Inner	1	3
	205-00600	Key Drive	18	4
MS35266-59	102-07700	Screw	18	5
13836	214-00100	Cup Bearing (Timken)	1	6
	162-17301	Outer Wheel Half, Sub-Ass	sy. 1	7
	*	Wheel Half-Outer	1	8
13836	214-00100	Cup Bearing (Timken)	1	6
MS21250-06034	103-31200	Bolt	8	9
MS20002C6	095-03100	Washer (C'sunk)	8	10
AN960-616	095-10600	Washer (Plain)	8	11
NAS1804-6N	094-15800	Nut (SPS)	8	12
13889	214-00200	Cone-Bearing (Timken)	2	13
	154-05100	Grease Seal	2	14
TR716-03	160-01200	Air Valve Assy. (TR752-03)) 1	15
MS28775-267	101-25800	O-Ring	໌ 1	16
	*	Nameplate	1	17
	*	Lockwire	A/R	18
	*	Nameplate	1	19

* Item not procurable as individual part.



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 <u>Clevelandwbhelp@parker.com</u> Web-site: <u>www.clevelandwheelandbrake.com</u> Manufacturer of Cleveland Wheels & Brakes