AIRCRAFT WHEEL & BRAKE DIVISION **FAA-PMA**

PARKER HANNIFIN CORPORATION

AVON, OHIO

PARTS LIST

199-220A CONVERSION KIT

Beech 1900D

PART NUMBER	DRAWING REVISION	DESCRIPTION	QUANTITY
30-204A	Rev. F dated 09-02-2003	Brake Assembly	4
40-273B	Rev. C 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
101-20400	Rev. A dated 04-01-2003	O-Ring	4
095-75200	Rev.A dated 09-07-2001	Washer	4
139-34900	Rev.B dated 02-01-2007	Lock Ring	4
102-33600	Rev.N/C dated 08-15-2001	Screw	8
095-13800	----------	Washer (AN960-8)	8
095-75400	Rev. A dated 01-11-2002	Washer	4
* 199-213	Rev.E dated 12-10-1997	Brake De-ice Manifold Kit	2
	Publication Package (P/N PP199-220A)		
IM199-220A	Rev.E dated 08-15-2002	Installation Manual	1
50-156	Rev. D dated 02-01-2007	Installation Drawing	1
CM40-273B	Rev. G dated 08-31-2006	Component Maintenance Manual	1
CM30-204A	Rev.D dated 03-17-2004	Component Maintenance Manual	1
SA1789GL	Amend date 01-08-2002	Supplemental Type Certificate	1

NOTES:

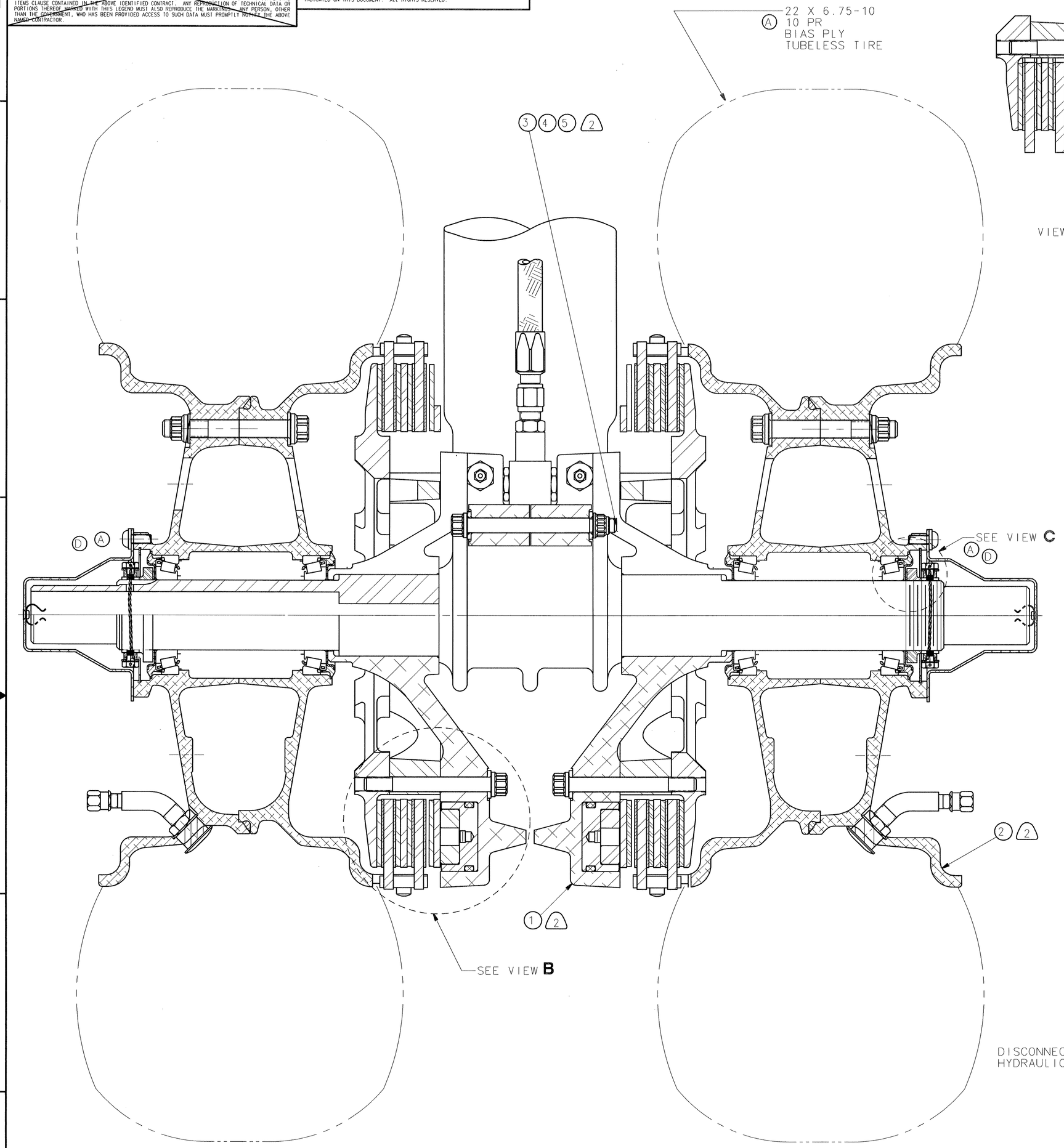
1. This kit will convert one aircraft to Cleveland Wheels and Brakes.
2. The 30-204A brake assembly is designed for use with MIL-H-5606 hydraulic fluid.
3. The 40-273B wheel assembly is designed for use with a 22 x 6.75-10 10PR tubeless bias ply tire.
4. This kit applicable only to Beech 1900D Aircraft equipped with Hydro-Aire Mark III Anti-skid system.

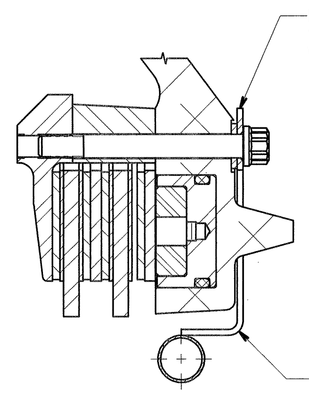
* Optional - Two 199-212 or two 199-213 Kits are required if the Aircraft is equipped with the Brake De-ice system. These Kits must be purchased separately. The IM199-220A Installation Manual specifies the kit applicability.

199-220A
Rev. NC 06-04-2001 (0344-84)
Rev's. A thru M history contained in Rev N
Rev. N 12-14-2006 (0372-87)
Rev. P 02-01-2007 (0373-36)

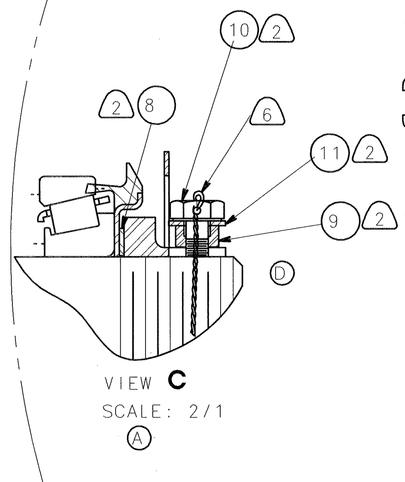
REVISIONS

CHANGE NOTICE	REV.	DESCRIPTION OF CHANGE	CHG BY	CHK BY	DATE	APPROVED
0344-84	N/C	INITIAL RELEASE	GL	DB	06-04-2001	PAUL KRONZ
0347-23	A	ENGINEERING RELEASE CHANGE, SEE C/N	GL	GR	08-31-2001	PAUL KRONZ
0348-75	B	SEE C/N	GL	DB	01-11-2002	PAUL KRONZ
0362-18	C	NOW: ITEM 10, MS9528-04 WAS MS9582-04	GR	GL	08-05-2004	PAUL KRONZ
0373-36	D	SEE C/N	DB	GL	02-01-2007	J. ZEISLER

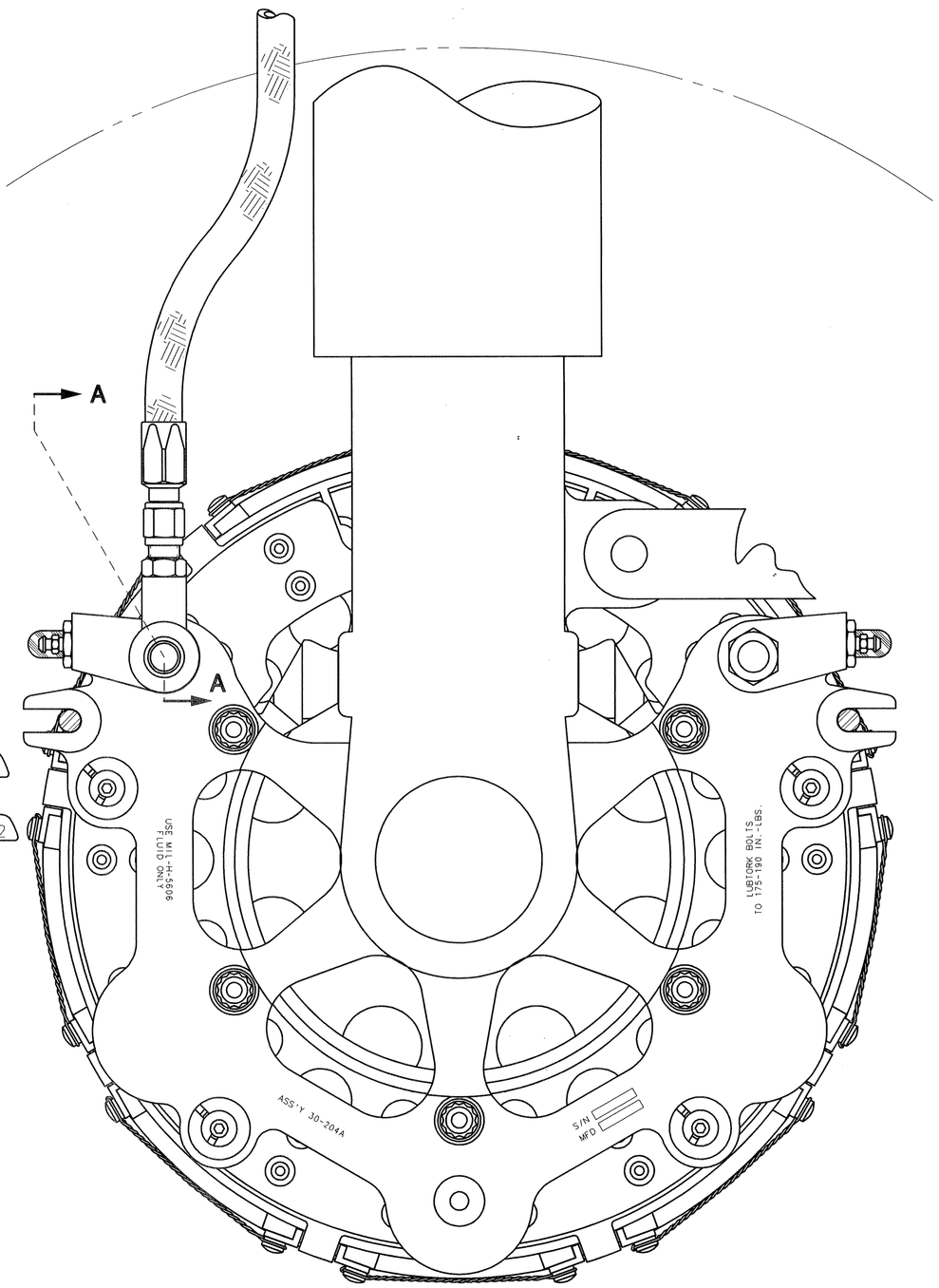


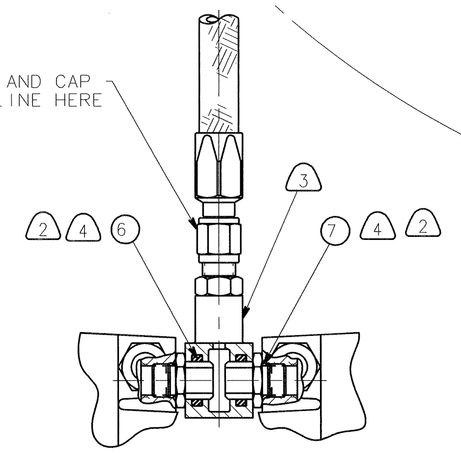


VIEW **B**



VIEW **C**
SCALE: 2/1
(A)





VIEW **A- A**

NOTES:

(B) (1) READ THE INSTALLATION MANUAL BEFORE INSTALLING

(2) THESE PARTS ARE SUPPLIED AS PART OF THE 199-220A KIT

(3) THIS EXISTING HARDWARE AND SWIVEL KIT MUST BE RETAINED AND REUSED FOR THIS INSTALLATION

(4) REPLACE THE PACKINGS FROM THE BEECH SWIVEL KIT WITH THE 199-220A KIT SUPPLIED PACKINGS (ITEMS 6 AND 7)

5. USE THIS KIT WITH MIL-H-5606 OR MIL-H-83282 HYDRAULIC FLUID ONLY

(A) (6) SAFETY WIRE PER NASM33540. IT IS PERMISSIBLE TO USE EITHER MS20995C20 OR MS20995C32 SAFETY WIRE.

(A) 7. WEIGH THE OLD WHEELS AND BRAKES. SUBTRACT THE OLD INSTALLATION WEIGHT FROM THE NEW INSTALLATION WEIGHT TO DETERMINE THE WEIGHT CHANGE CREATED BY THE 199-220A KIT INSTALLATION. MULTIPLY THE WEIGHT CHANGE BY THE APPLICABLE MOMENT ARM (FOR THE AIRCRAFT) AND REVISE THE WEIGHT AND BALANCE SHEET IN THE AIRCRAFT LOGBOOK

WEIGHT AND BALANCE DATA:

OLD INSTALLATION		NEW INSTALLATION	
BRAKE WEIGHT _____ LBS.		BRAKE WEIGHT	26.3 LBS.
WHEEL WEIGHT _____ LBS		WHEEL WEIGHT	12.7 LBS
TOTAL WEIGHT _____ LBS		TOTAL WEIGHT	39.0 LBS

BE SURE TO MULTIPLY THE WEIGHT DIFFERENCE PER ASSEMBLY BY THE NUMBER OF ASSEMBLIES PER AIRCRAFT

(B) (A) (C) (A) (A) (A)

QTY	ITEM NO.	CAGE CODE	PART NO.	DESCRIPTION	MATERIAL/SPECIFICATION	WGT.(LB)
4	12	.	095-75400	WASHER	.	.0048
8	11	.	095-13800	WASHER	AN960-8	.0008
8	10	.	102-33600	SCREW	MS9528-04	.005
4	9	.	139-34900	LOCK RING	.	.038
4	8	.	095-75200	WASHER	.	.009
4	7	.	101-20400	O-RING	MS28778-4	.00008
4	6	.	101-50337	O-RING	MS28775-112	.00071
4	5	.	094-16400	NUT	NAS 1804-5N	.0071
8	4	.	095-02800	WASHER	MS20002C5	.004
4	3	.	103-24400	BOLT	MS21250-05040	.0806
4	2	.	40-273B	WHEEL ASSEMBLY	.	12.7
4	1	.	30-204A	BRAKE ASSEMBLY	.	26.3

PARTS LIST

QTY	FINAL ASSY	QTY	NEXT ASSY
APPLICATION (NOT MAINTAINED)			

DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS APPLY AFTER HEAT TREATING, PLATING, AND BEFORE PAINTING.

DO NOT SCALE DRAWING
THIS PLOT IS COMPLETELY DEFINED BY THE COMPUTER DATASET, WHICH IS THE SOLE AUTHORITY FOR THE INFORMATION PROVIDED. DIMENSIONALLY STABLE COPIES MUST BE OBTAINED FROM THE DATASET. ALL REVISIONS TO THIS PLOT MUST BE BY DATASET REVISION ONLY - NO REVISIONS MAY BE MADE BY HAND.

A CONTRACT ALTERED ITEM EXISTS FOR THIS PART NUMBER

GENERAL NOTES: UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES
2 PLACE (.XX): ±.03
3 PLACE (.XXX): ±.010
ANGULAR DIMS. ±0.5°
REMOVE ALL BURRS
BREAK CORNERS .010 MAX.
INTERNAL RADII .005-.010
GENERAL MACHINED SURFACES 125 PER ANSI B46.1
THIRD ANGLE PROJECTION

RAW MATERIAL:

STRESS	DATE
MFG ENGRG J.ROTH	06-01-2001
QUAL ASSUR H.SCHRECK	06-01-2001

PROGRAM/CONTRACT NO. P0158

		DATE
DRAWN	G.LOPRESTI	03-06-2001
CHECKED	D.BARNES	06-04-2001
ENGINEER	P.KRONZ	06-04-2001
DESIGN APPROVAL	J.STEFANO	05-31-2001
PROJ APPROVAL	D.RICHARDS	06-01-2001
RELEASE DATE:		

CLEVELAND WHEELS & BRAKES
Aircraft Wheel And Brake Division
Parker Hannifin Corporation
Avon, Ohio 44011
Parker Aerospace

DWG. TITLE
INSTALLATION
WHEEL AND BRAKE

SIZE E | CAGE CODE 33269 | DWG. NO. 50-156 | REV. D
SCALE: 1/1 | UNIT WGT.: | SHEET: 1 OF 1

SHEET 1 OF 1 REV D
DWG NO 50-156

PD-E-GENL-PC-00

CLEVELAND WHEELS AND BRAKES

CONVERSION KIT

INSTALLATION MANUAL

KIT NUMBER 199-220A

BEECH MODEL 1900D

Parker Aerospace

Aircraft Wheel & Brake Division

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

Aerospace

CLEVELAND WHEELS & BRAKES

INSTALLATION MANUAL

WITH

ILLUSTRATED PARTS LIST

FOR

CONVERSION KIT

199-220A

FOR

BEECH MODEL 1900D AIRCRAFT

REVISION E DATED AUGUST 15, 2002

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

INSTALLATION INSTRUCTIONS

Cleveland Wheels & Brakes Conversion Kit 199-220A

LIST OF REVISIONS

REVISION	DATE	PAGE	DESCRIPTION	APVD
Initial Release	05/15/2001	ALL	Installation Instructions Cleveland Wheels & Brakes Conversion Kit 199-220A	***BB*** (0344-84)
Revision A	08/31/2001	Pg. ii	Update Table of Contents to reflect rev.	***JFS*** (0347-23)
		2 (5.1)	(NOW) "The 30-204A brake assembly..." (WAS) "It…"	
		2 (5.2)	(NOW) "The 40-273B wheel assembly..." (WAS) "It…"	
		2 (6.1)	Revised para. to clarify operation	
		3 (7.3) & (7.4)	Revised para. to clarify use of hardware on aircraft equipped with anti-skid – remove cotter pin reference	
		3 (7.5)	Remove "Discard spacer." as the spacer is now discarded in previous step.	
		4 (7.10)	(ADD) –NOTE- for removing and retaining Beech inlet fittings	
		5 (7.14)	(NOW) " The plug and inlet fitting may…" (WAS) " The plug may…"	
		6 (7.15)	(ADD) "Using MIL-T-5544 anti-seize,…"	
		6 (7.15)	(ADD) –NOTE- to interface with countersunk side of washer	
		7 (7.19)	(ADD) reference to Raytheon Manual for bleeding of brakes	
			(ADD) –NOTE- referencing 30-204A bleeder fittings	
		8 (7.27)	(REMOVE) statement about O-ring compression	
		8 (7.28)	Revised statement to add "equivalent" for wheel bearing grease	
		8 (7.31)	Revised to address actual hardware used on aircraft equipped with anti-skid	
		9 (7.31)	Revised –NOTE- to specify max. torque value	
		11 (12.)	(ADD) Items: "095-75200 washer, 139-34900 lock ring, 102-33600 screw, 095-13800 washer"	
		11 (12.)	(REMOVE) Item: "221-07100 cotter pin"	

INSTALLATION INSTRUCTIONS

Cleveland Wheels & Brakes Conversion Kit 199-220A

LIST OF REVISIONS

REVISION	DATE	PAGE	DESCRIPTION	APVD
Revision B	01/11/2002	Pg. iii	Update Table of Contents page no. to reflect addition List of Revisions page	***BB***
		9 (7.31)	(NOW) "Back-off axle nut to zero in.-lbs. of torque, then torque axle nut until the grease seal does not rotate when rotating the wheel." (WAS) "Back-off axle nut to zero in-lbs of torque, then torque axle nut to 40 in-lbs while rotating wheel."	(0348-75)
		9 (7.31)	(NOW) Do not exceed 200 in.-lbs. of torque or 30° of rotation of the axle nut." (WAS) Do not exceed 160 in.-lbs. of torque or 30° of rotation of the axle nut."	
		9 (7.31)	(ADD) "**-NOTE-** IF MORE THAN 200 IN-LBS OF TORQUE ARE REQUIRED TO ALIGN A HOLE WITH THE NEXT AVAILABLE CASTELLATION THEN REMOVE THE AXLE NUT AND INSTALL ONE SPACER; TORQUE THE AXLE NUT UNTIL THE GREASE SEAL DOES NOT ROTATE WHEN ROTATING THE WHEEL. TIGHTEN THE AXLE NUT SO THAT THE NEXT AVAILABLE CASTELLATION IS ALIGNED WITH A HOLE IN THE AXLE THREADS. DO NOT EXCEED 200 IN-LBS OF TORQUE OR 30° OF ROTATION OF THE AXLE NUT."	
		9 (7.31)	(NOW) "-NOTE- Final axle nut torque must not exceed 200 in-lbs." (WAS) "-NOTE- Final axle nut torque must be 40 to 160 in-lbs."	
		11 (12.)	(ADD) 095-75400 Washer, Qty 4	
Revision C	01/25/2002	1 (1.1)	(ADD) "It is permissible to use Flight Manual Supplement P/N 129-590000-31, Revision No. 4 or latest revision, in conjunction with Parker Hannifin Aircraft Wheel and Brake Division Main Wheel and Brake Conversion Kit 199-220A (Ref. USA DOT FAA STC No. SA1789GL)."	***BB*** (0349-77)
Revision D	06/20/2002	9 (7.32)	(NOW) "Torque the hubcap attachment fasteners to 20-25 in.-lbs.)" (WAS) "Torque hubcap attachment fasteners 35 to 45 in.-lbs."	***BB*** ***(0351-12)***
Revision E	08/15/2002	9 (7.32)	(ADD) "Secure hubcap with washers and screws."	***BB*** ***(0352-62)***

INSTALLATION INSTRUCTIONS

Cleveland Wheels & Brakes Conversion Kit 199-220A

TABLE OF CONTENTS

INSTALLATION INSTRUCTIONS

Cleveland Wheels & Brakes Conversion Kit 199-220A

1. INTRODUCTION

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

It is permissible to use Flight Manual Supplement P/N 129-590000-31, Revision No. 4 or latest revision, in conjunction with Parker Hannifin Aircraft Wheel and Brake Division Main Wheel and Brake Conversion Kit 199-220A (Ref. USA DOT FAA STC No. SA1789GL).

1.2 Brake De-ice: Unless the aircraft has the optional brake de-icing equipment, the 199-220A 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.

3. APPLICABILITY

3.1 "KIT 199-220A"	MAKE	MODELS
	Beech	*1900D

*only models equipped with Hydro-Aire Mark III Anti-Skid system

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
(440) 937-9211
Fax: (440) 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. The 30-204A brake assembly 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. The wheel is also equipped with an anti-skid compatible hubcap. The 40-273B wheel assembly is composed of the parts listed in the 40-273B Wheel Assembly Component Maintenance Manual.

6. OPERATION

6.1 Braking action begins to occur when hydraulic pressure is applied to the brake. As the hydraulic pressure builds it will overcome the spring force in the retract assemblies and cause the piston insulators to force the pressure plate assembly, rotating discs, stationary discs and back plate assembly together. The normal force and friction between the rotating and stationary components is responsible for generating brake torque. The brake torque is transmitted to the wheel drive keys by the rotating discs tabs.

7. INSTALLATION

7.1 Jack aircraft per Beech Service Manual.

7.2 Deflate Main Wheels completely.

7.3 Remove the screws securing the hubcap to the wheel and remove hubcap. Cut the safety wire and remove the screws and washers that retain the lock ring. Remove the lock ring. Discard the safety wire, screws, washers, and lock ring..

7.4 Remove the wheel-retaining nut (Beech P/N 114-810062-1). Keep the retaining nut. Remove the key washer and any washers between the key washer and the bearing cone. Discard key washer and additional washers

7.5 Remove existing main gear wheels.

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 50-156.

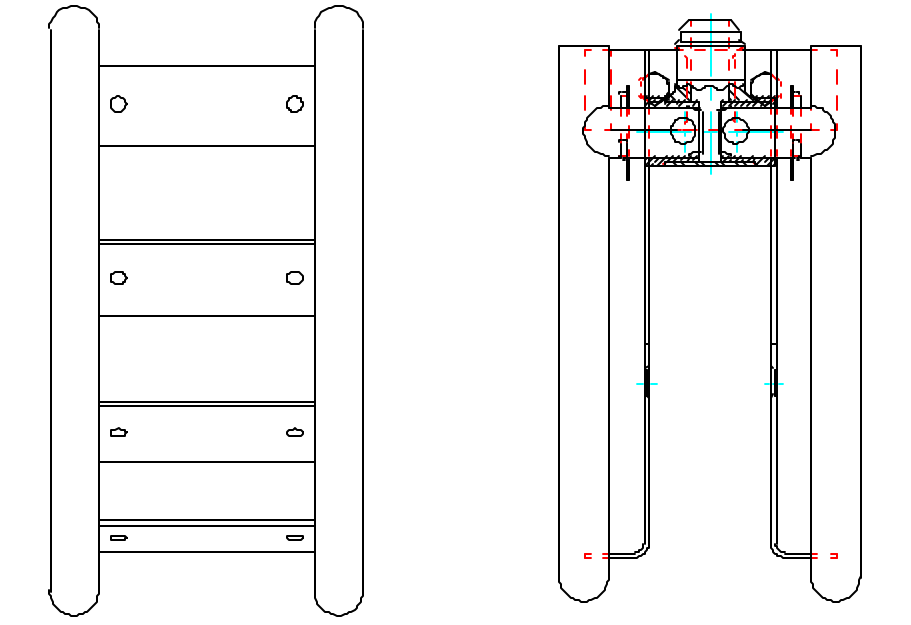


Figure 1

7.8 Remove and discard the two (2) brake tie bolts (analogous to Item #3 on 50-156 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.

- NOTE -
The brake inlet fittings (Beech P/N 9535088) must be removed from the old brake assemblies and installed into the new brake assemblies.

7.11 Reassemble Beech Swivel Kit with O-rings, items #6 and #7 on the 50-156 installation drawing.

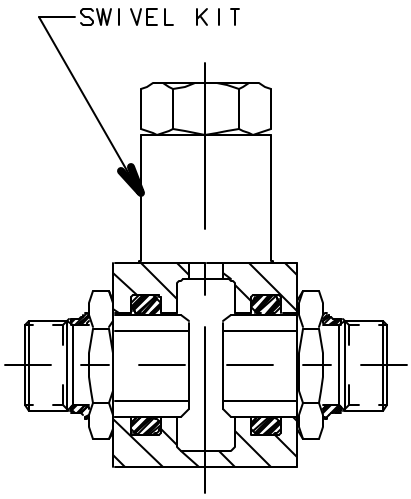


Figure 2

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.

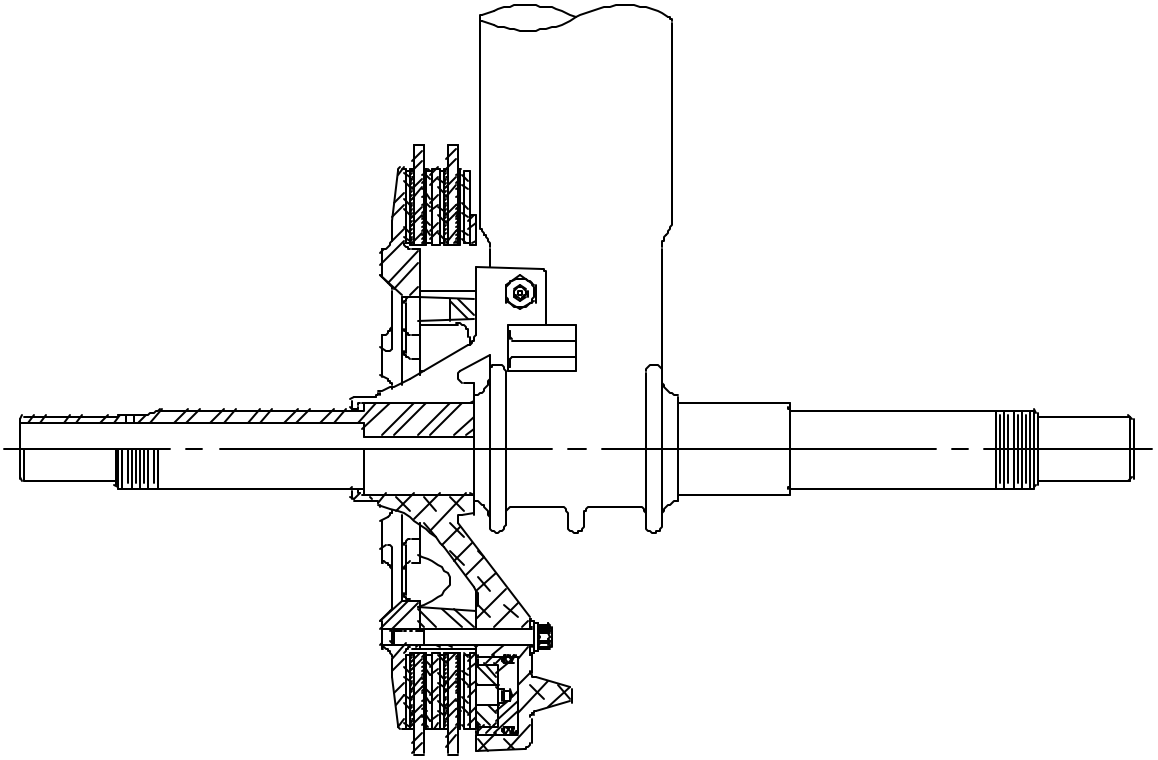


Figure 3

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

- NOTE -
The brake is nonhanded. The plug and inlet fitting may be moved to the opposite ports if needed.

7.15 Draw the two cylinder assemblies together using the two brake tie bolts, two nuts, and four washers shown as items 3, 4 and 5 on the 50-156 installation drawing. Using MIL-T-5544 anti-seize, lubtork these bolts to 175-190 in-lbs.

- NOTE -
The countersunk side of the washer (P/N 095-02800) must interface with the bolt head (P/N 103-24400).

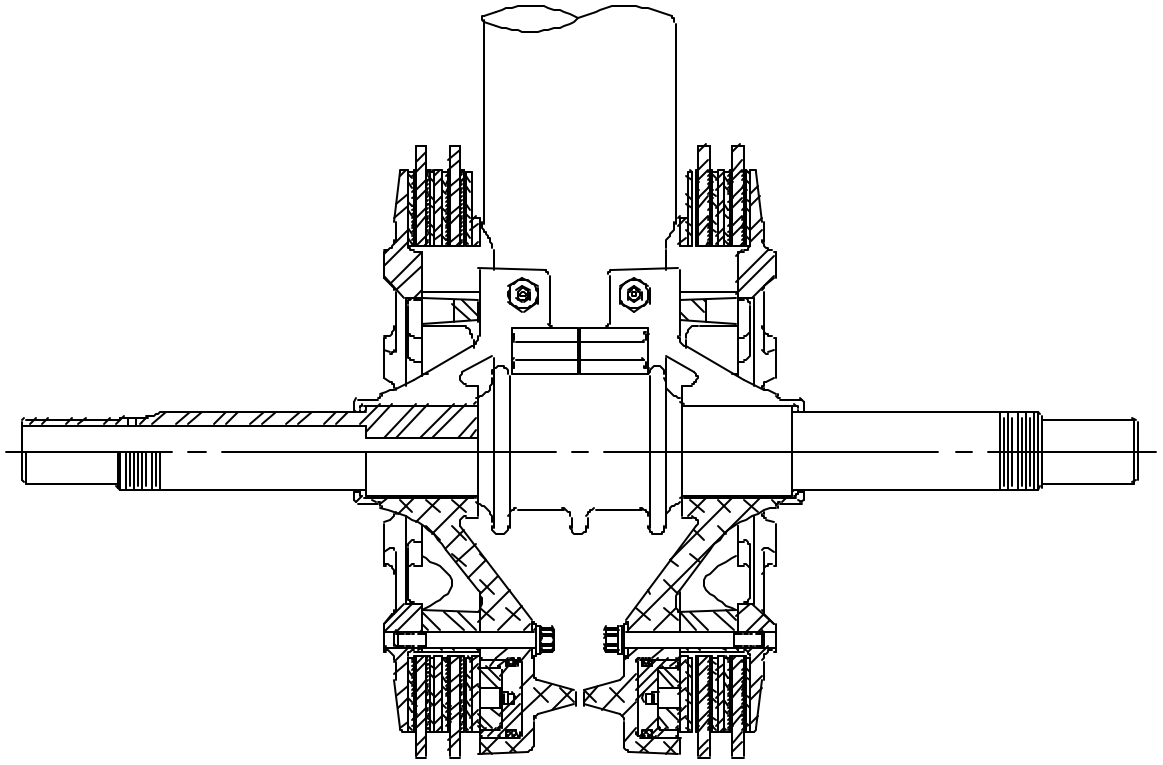


Figure 4

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 per Raytheon Aircraft Beech 1900D Airliner Maintenance Manual instructions (ref. 32-41-01).

- NOTE -
Brake assembly 30-204A has two bleeder fittings. Bleed both fittings.

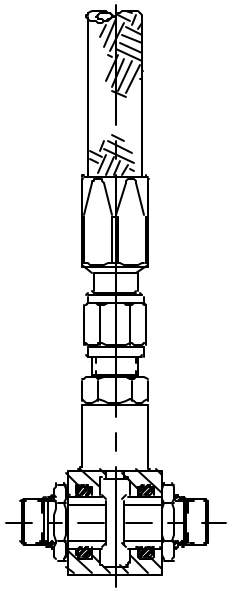


Figure 5

- 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.

- 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. 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. If required, repack wheel bearings with grease per MIL-G-81322 (Aeroshell 22) or equivalent.

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 Install bearing cone and grease seal into outer wheel half assembly. Install retaining ring in outboard wheel half subassembly (optional).

-NOTE-
Retaining ring installation is not required. The retaining ring is provided to prevent the grease seal and bearing cone from falling out of the wheel assembly when the wheel assembly is not installed on the axle.

Apply a thin coat of bearing grease to both sides of tang washer (Parker P/N 095-75200). Install tang washer (Parker P/N 095-75200) onto axle.

- CAUTION -

BE SURE TO USE ONLY THE PARKER P/N 095-75200 TANG WASHER, PARKER P/N 139-34900 LOCK RING, PARKER P/N 102-33600 SCREWS AND PARKER P/N 095-13800 WASHERS. THESE COMPONENTS ARE DESIGNED TO INSURE THAT THE AXLE NUT CASTELLATIONS WILL ALIGN WITH THE LOCKING HOLES IN THE AXLE AT THE PROPER TORQUE.

Apply a thin coat of bearing grease to the axle nut threads (Beech P/N 114-810062-1). Install axle nut. Tighten axle nut to 150 to 200 in.-lbs. of torque while rotating the wheel to insure proper seating of the bearings.

-NOTE-

Do not allow the wheel to rotate while backing off the axle nut.

Back the axle nut off to zero in.-lbs. of torque, then torque the axle nut until the grease seal does not rotate when rotating the wheel. Tighten the axle nut (Beech P/N 114-0810062-1) so that the next available castellation is aligned with a through hole in the axle threads. Do not exceed 200 in.-lbs. of torque or 30° of rotation of the axle nut.

-NOTE-

IF MORE THAN 200 IN-LBS OF TORQUE ARE REQUIRED TO ALIGN THE HOLE WITH THE NEXT AVAILABLE CASTELLATION THEN REMOVE THE AXLE NUT AND INSTALL ONE SPACER (PARKER P/N 095-75400); TORQUE THE AXLE NUT UNTIL THE GREASE SEAL DOES NOT ROTATE WHEN ROTATING THE WHEEL. TIGHTEN THE AXLE NUT (BEECH P/N 114-0810062-1) SO THAT THE NEXT AVAILABLE CASTELLATION IS ALIGNED WITH A HOLE IN THE AXLE THREADS. DO NOT EXCEED 200 IN-LBS OF TORQUE OR 30° OF ROTATION OF THE AXLE NUT.

Install lock ring (Parker P/N 139-34900), lock ring retaining screws (Parker P/N 102-33600), and washers (Parker P/N 095-13800). Torque lock ring retaining screws to 8 to 15 in.-lbs. Safety wire retaining screws per NASM33540. It is permissible to use either MS20995C20 OR MS20995C32 safety wire.

-NOTE-

Final axle nut torque must not exceed 200 in-lbs.

7.32 Refer to Figure 6 and fasten hubcap assembly to wheel assembly making sure that the hubcap drive coupling engages the wheel speed transducer. Lubricate the hubcap attachment fastener threads with MIL-T-5544 anti-seize compound. Secure hubcap with washers and screws. Torque the hubcap attachment fasteners to 20 - 25 in-lbs.

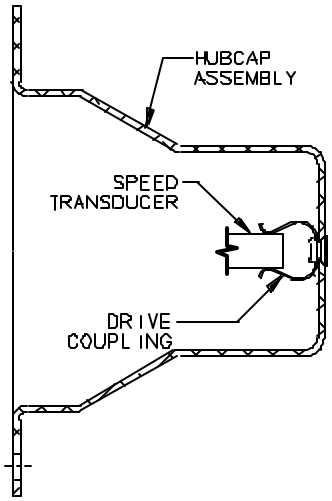


Figure 6

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

7.34 Repeat this procedure for both struts.

7.35 After lowering aircraft off of the jacks, re-attach both brake de-ice hose assemblies (if applicable).

8. WEIGHT AND BALANCE COMPUTATIONS

Weight: 39.0 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 applications 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 If the brakes are used exclusively for low speed (below 25 kts) applications, then periodic conditioning is recommended to optimize service life.

11. WARRANTY REGISTRATION

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

12. KIT PARTS LIST

AIRCRAFT WHEEL AND BRAKE DIVISION

PARKER HANNIFIN CORPORATION

AVON, OHIO

PARTS LIST

199-220A CONVERSION KIT

BEECH 1900D

	PART NO.	CODE NO.	DESCRIPTION	QUANTITY
	30-204A	030-20401	Brake Assembly	4
	40-273B	040-27302	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
	095-75200	095-75200	Washer	4
	139-34900	139-34900	Lock Ring	4
	102-33600	102-33600	Screw	8
	095-13800	095-13800	Washer, AN960-8	8
	095-75400	095-75400	Washer	4
*	199-212		Brake De-ice Manifold Support Kit	2
	or			
*	199-213		Brake De-ice Manifold Kit	2
	199-220A Manual		Installation Manual	1
	50-156		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.

CLEVELAND WHEELS AND BRAKES

COMPONENT MAINTENANCE MANUAL

WITH ILLUSTRATED PARTS LIST

BRAKE ASSEMBLY

PART NO. 30-204A

Parker Aerospace

Aircraft Wheel & Brake Division

Parker Hannifin Corporation
1160 Center Road
Avon, OH 44011

Aerospace

CLEVELAND WHEELS & BRAKES

CM30-204A

COMPONENT MAINTENANCE MANUAL

WITH

ILLUSTRATED PARTS LIST

FOR

BRAKE ASSEMBLY

PART NUMBER 30-204A

REVISION D DATED 17 MARCH 2004

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

March, 2004

Aerospace

CM30-204A COMPONENT MAINTENANCE MANUAL WITH IPL
BRAKE ASSEMBLY 30-204A

RECORD OF REVISIONS

REV NO.	ISSUE DATE	DATE INSERTED	BY	REV NO.	ISSUE DATE	DATE INSERTED	BY
A	9-15-94	9-15-94	PH				
B	3-28-96	3-28-96	PH				
C	9-19-03	9-19-03	PH				
D	3-17-04	3-17-04	PH				

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CM30-204A COMPONENT MAINTENANCE MANUAL WITH IPL
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LIST OF REVISIONS

INITIAL RELEASE DATED 4 APRIL 1994

REVISION	DATE	PAGE	DESCRIPTION OF CHANGE
Rev. A	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" - was - 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. ".525 - .570" -was- ".537 - .570"
		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."

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REVISION	DATE	PAGE	DESCRIPTION OF CHANGE
Rev. A (Cont'd)		503	G. "If not, repair" -was- "If not, grind flat"
		505	- ADDED - New page with Section 5, A and B
		506	- ADDED - New page with Figure 502
		507	- 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
		302	Section J. ".....that measure .405 inches or less in height." -was- " ....that measure .375 inches or less in height (.032 inches above piston when installed)."
		303	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"

CM30-204A COMPONENT MAINTENANCE MANUAL WITH IPL
BRAKE ASSEMBLY 30-204A

REVISION	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" ADD: "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 in.-lbs." -was- "....to 180-200 in.-lbs." Sections 2.D. & 2.E. "....to 65-70 in.-lbs." -was- "....to 160-180 in.-lbs."
		603	Section 2.L. "Torque snug to preclude leakage." -was- "Torque to 30-35 in.lbs."

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REVISION	DATE	PAGE	DESCRIPTION OF CHANGE
Rev. B (Cont'd)		604	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 0357-83)	9-19-03	SB List	Add Service Bulletin "SB7079" Rev. No. "NC"
		1002	Add Item 19A Call-out
		1003	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." "SUPSD The part in the part number column replaces and is not interchangeable with interchangeable with the item number shown in the notation."

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REVISION	DATE	PAGE	DESCRIPTION OF CHANGE

Rev. D 3-17-04 301
(DCN 0360-24)

(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 Fax. 847-657-5388 e-mail: info@magnaflux.com
	Zyglo ZL-2C, with emulsifier/remover ZE-4B	Zyglo ZP-4B, ZP-9F, ZP-5B, ZP-14A or SKD-S2	

(Was)

Fluorescent	Zyglo ZL-16	Zyglo ZP-13 (wet) optional	Magnaflux Corp. 7300 West Lawrence St. Chicago, IL 60656
	Penetrex ZL-2A with emulsifier ZE-4	Penetrex ZP-4 (dry) or ZP-13 optional	

303

(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

CM30-204A COMPONENT MAINTENANCE MANUAL WITH IPL
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SERVICE BULLETIN LIST

SERVICE BULLETIN NO.	REV. NO.	DATE INCORPORATED	SERVICE BULLETIN NO.	REV. NO.	DATE INCORPORATED
SB7079	NC				

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CM30-204A COMPONENT MAINTENANCE MANUAL WITH IPL
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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.

NOTE: 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.

CM30-204A COMPONENT MAINTENANCE MANUAL WITH IPL
BRAKE ASSEMBLY 30-204A

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 Sub-assembly, 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.

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: Columbia Paint Corporation 11-347Z Primer Topcoat: Columbia Paint Corporation 11-358A Gloss White Enamel

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.

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 Alcohol Specification TT-I-735	Commercially Available
Soft Bristle Brush	Commercially Available
Clean Wiping Cloth	Commercially Available

2. Cleaning Procedures

WARNING: 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.

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.

      CAUTION: 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.

      NOTE: REFER TO "REPAIR" FOR RETREATING AND REPAINTING CYLINDER.

CHECK

1. Check Materials

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR ITEMS LISTED BELOW:			
Type	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 Ph. 847-657-5300 Fax. 847-657-5388 e-mail: info@magnaflux.com
	Zyglo ZL-2C with emulsifier/remover ZE-4B	Zyglo ZP-4B, ZP-9F, ZP-5B, ZP-14A, or SKD-S2	
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

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. Detailed Check (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).

NOTE: 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.

I. 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.

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 ∅ .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 any of the bolts are cracked, replace all 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.

REPAIR

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
Columbia Paint Corporation 11-347Z Primer	Columbia Paint Corporation Huntington, W. VA.
Columbia Paint Corporation 11-358A Gloss White Enamel	Columbia Paint Corporation Huntington, W. VA.
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.

2. Replacing Wear Pads

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

   CAUTION: Do not enlarge the rivet holes in the base plate. If the rivet hole is enlarged to Æ .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.

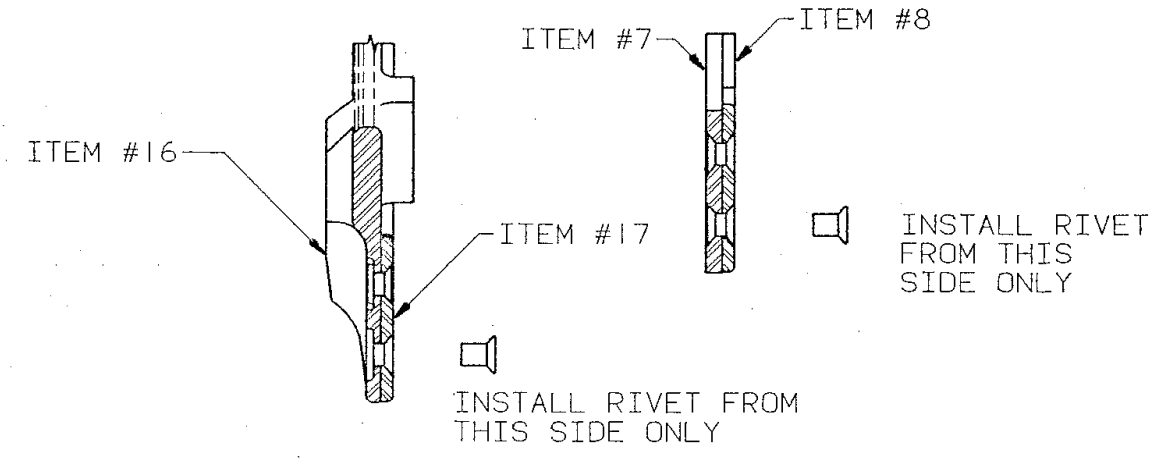

Figure 501

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.

CAUTION: 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.

3. Repair of Cylinder

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

   WARNING: 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. Repair of Base Plates

   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.

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.

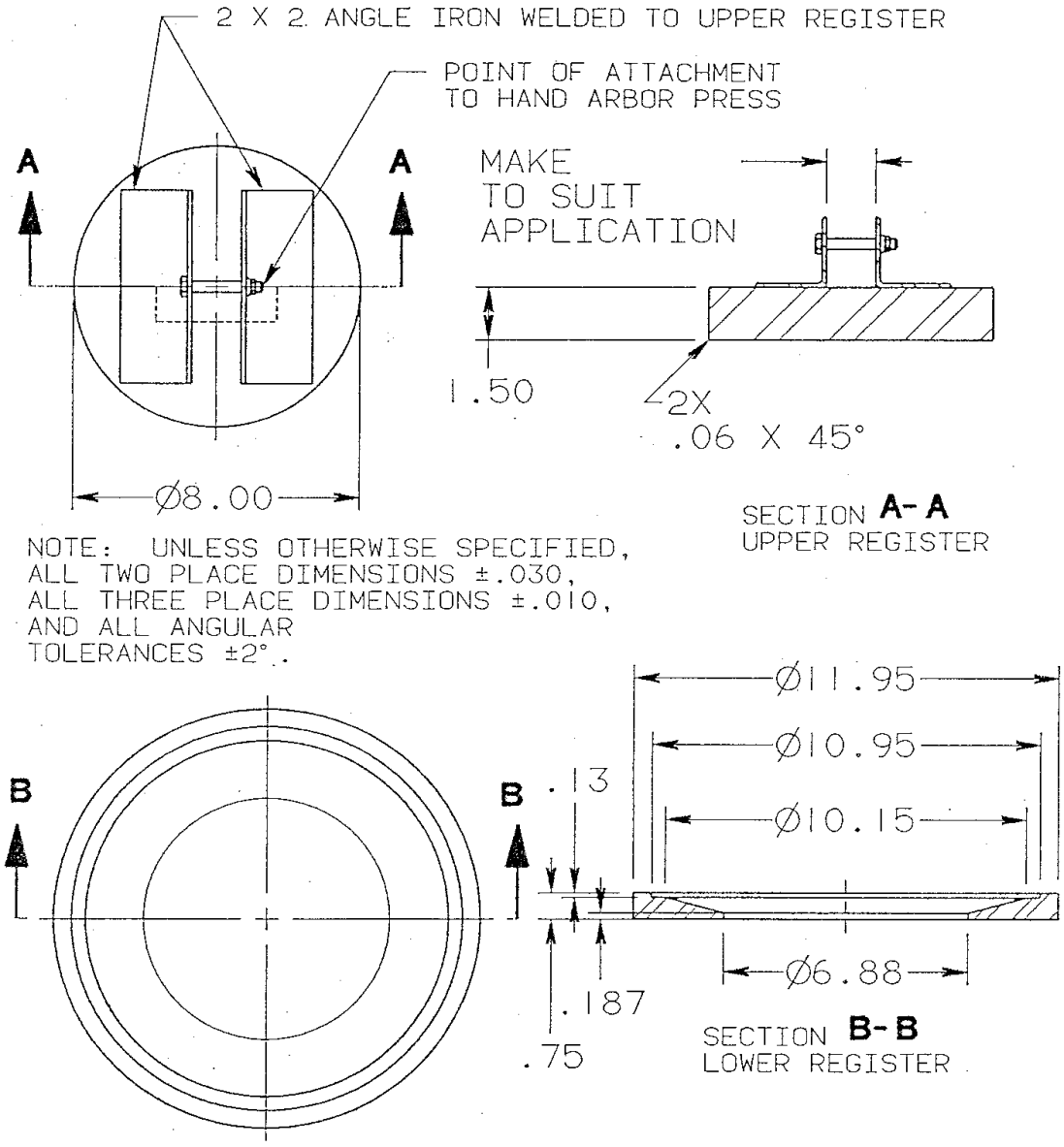
2 X 2 ANGLE IRON WELDED TO UPPER REGISTER
POINT OF ATTACHMENT TO HAND ARBOR PRESS
A
A
MAKE TO SUIT APPLICATION
1.50
2X .06 X 45°
Ø8.00
SECTION A-A UPPER REGISTER
NOTE: UNLESS OTHERWISE SPECIFIED, ALL TWO PLACE DIMENSIONS ±.030, ALL THREE PLACE DIMENSIONS ±.010, AND ALL ANGULAR TOLERANCES ±2°.
B
B
Ø11.95
Ø10.95
Ø10.15
.13
Ø6.88
.187
.75
SECTION B-B LOWER REGISTER

Figure 502

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.

WARNING: 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.

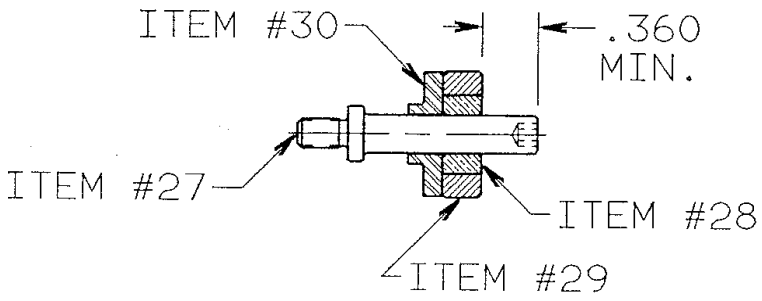

Figure 503

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 strongly 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.

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.

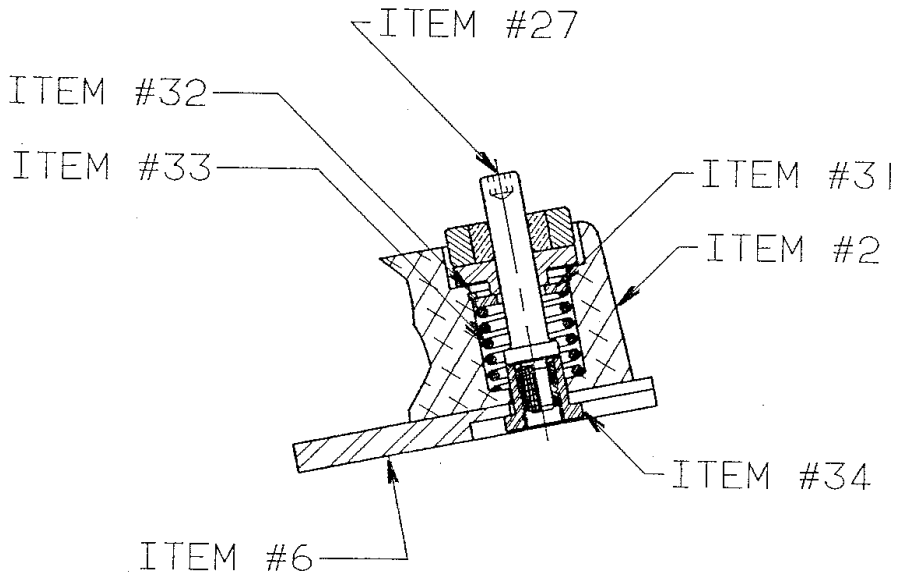

Figure 601

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.

NOTE: 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.

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.

TROUBLE SHOOTING

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

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.

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.

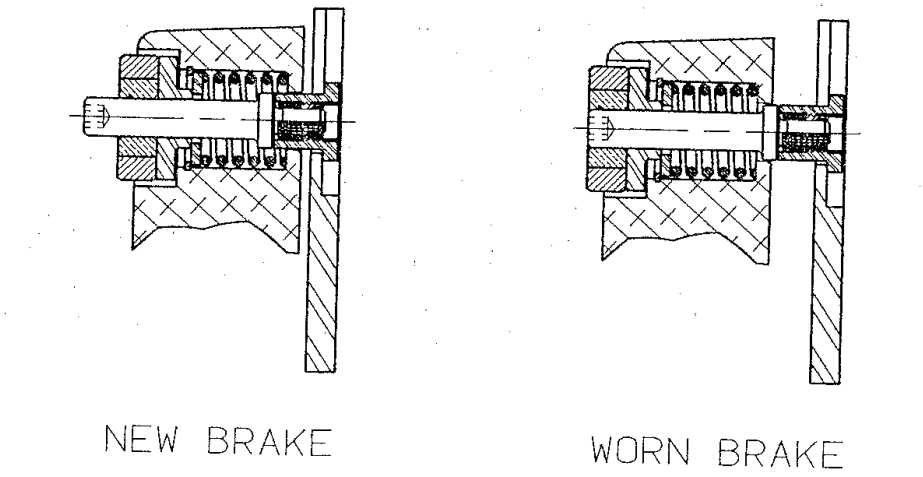

Figure 801

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.

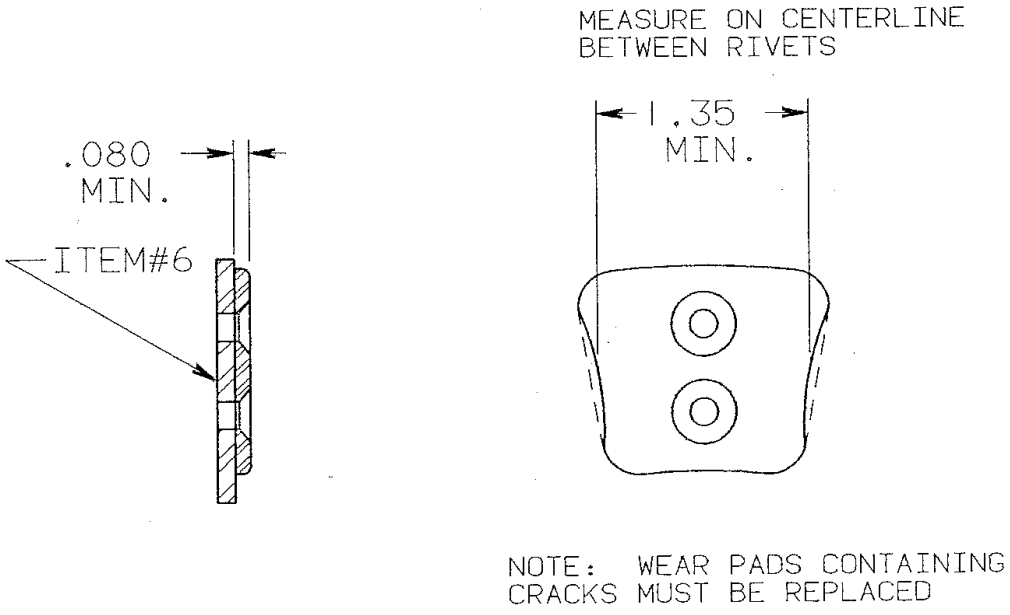

Figure 802

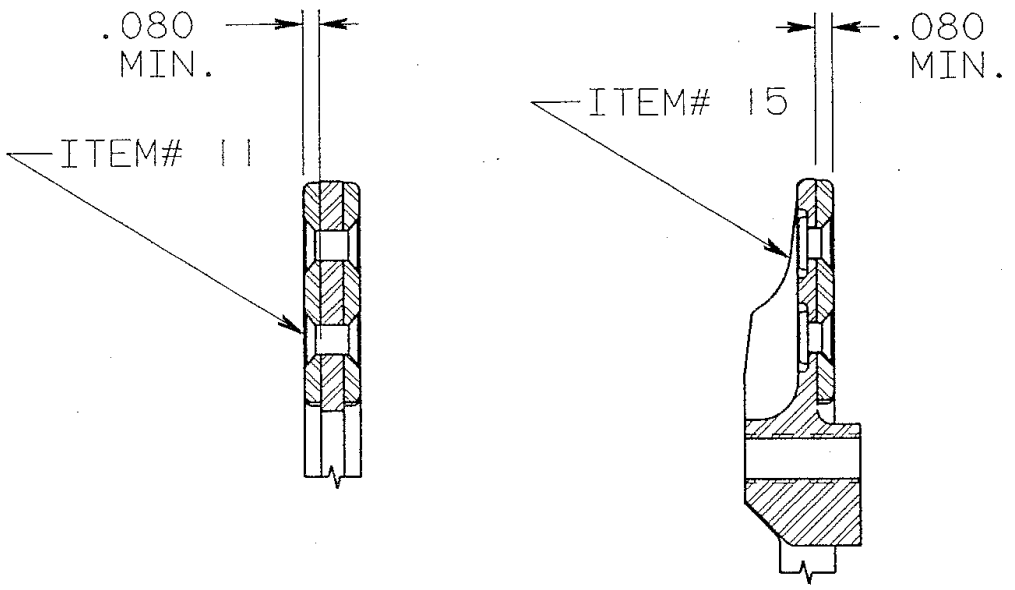

Figure 803

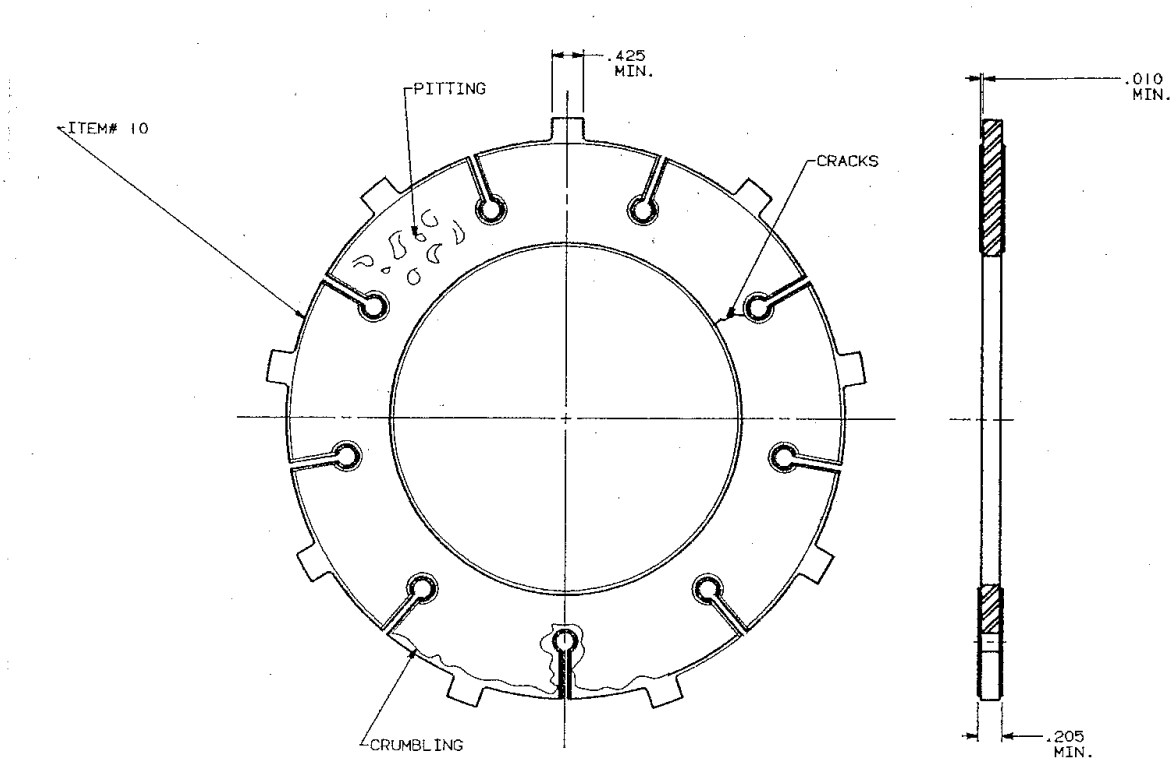

Figure 804

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.

CM30-204A COMPONENT MAINTENANCE MANUAL WITH IPL
BRAKE ASSEMBLY 30-204A

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.

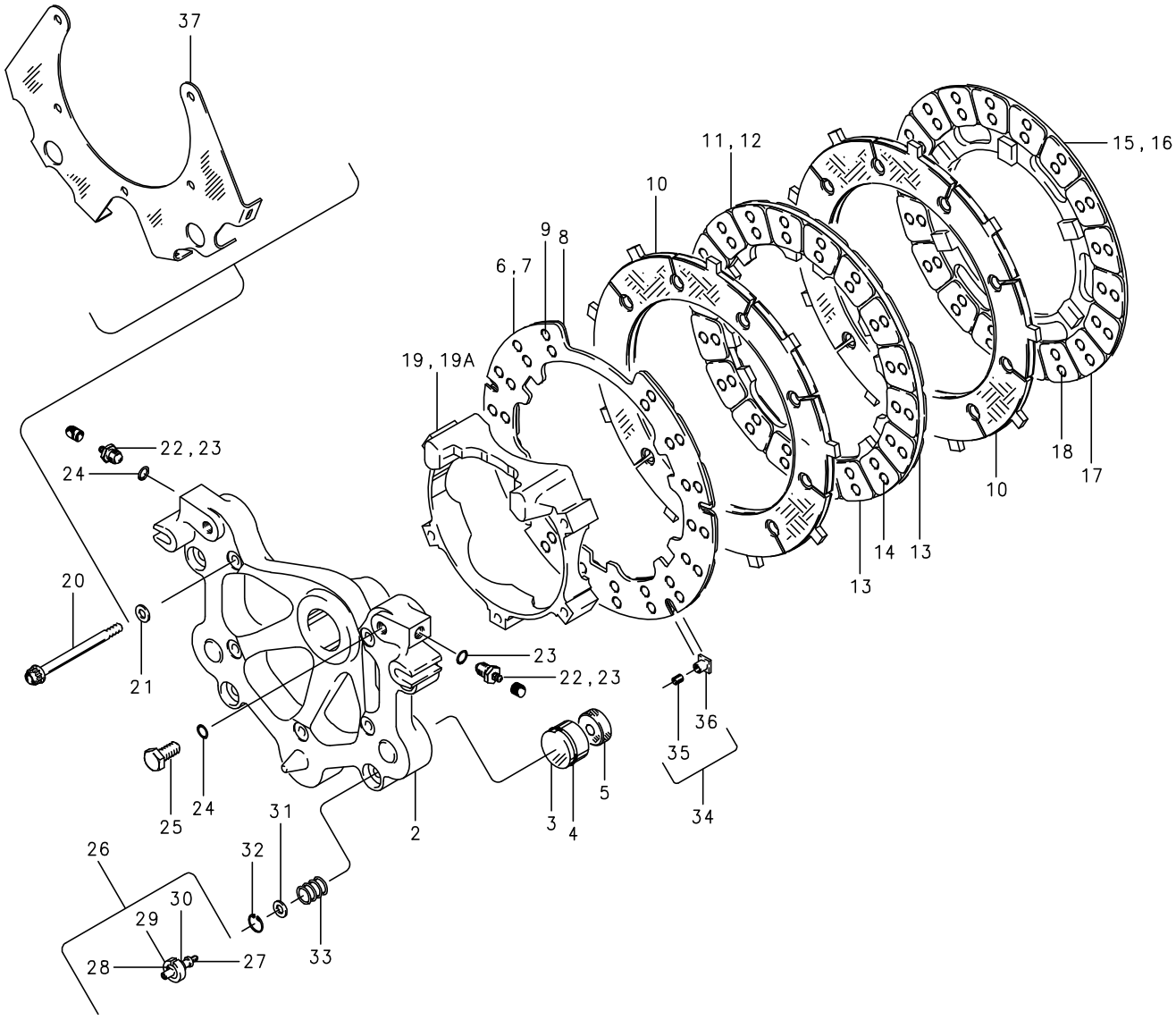

FIGURE 1

EXPLODED VIEW WITH

ILLUSTRATED PARTS LIST

CM30-204A COMPONENT MAINTENANCE MANUAL WITH IPL
BRAKE ASSEMBLY 30-204A

KEY TO FIGURE 1

ITEM	PART NUMBER	DESCRIPTION	QTY
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 (refer to Parker Hannifin Service Bulletin SB 7079)	1
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
[1] 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.

CLEVELAND WHEELS AND BRAKES

COMPONENT MAINTENANCE MANUAL

WITH ILLUSTRATED PARTS LIST

WHEEL ASSEMBLY

PART NO. 40-273B

Parker Aerospace

Aircraft Wheel & Brake Division

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

Aerospace

CLEVELAND WHEELS & BRAKES

CM40-273B

COMPONENT MAINTENANCE MANUAL

WITH

ILLUSTRATED PARTS LIST

FOR

WHEEL ASSEMBLY

PART NUMBER 40-273B

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

Initial Release May 15, 2001
Rev. G August 31, 2006

Aerospace

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

TO: HOLDERS OF CM40-273B COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-273B.

Attached to this transmittal letter is Revision NC of CM40-273B (dated May 15, 2001)

Revision NC, Dated May 15, 2001

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

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

REVISION HIGHLIGHTS

Section/Page No.	Description Of Change
All Sections/All Pages	Initial Release (DCN 0344-84)

Aerospace

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

TO: HOLDERS OF CM40-273B COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-273B.

Attached to this transmittal letter is Revision A of CM40-273B (dated August 28, 2001)

Revision A, Dated August 28, 2001

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

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

REVISION HIGHLIGHTS

Section/Page No.	Description Of Change
As Follows:	Rev A (DCN 0347-40):
Record of Rev./RR-1	Update page to reflect Rev. A
Disassembly/Pg. 201	Para. 2.B. (add) "….and washers (26)."
Pg. 201	Para. 2.C. (add) "If installed, …."
Pg. 201	Para. 2.D. (add) "Cut safety wire and loosen lock ring retaining screws, and washers. Remove lock ring from axle." (now) "Remove axle nut..." (was) "Remove and retain axle nut…"
Check/Pg. 402	Para. 3.E. (now) "…Figure 401." (was) "…Figure 40."
Pg. 403	Para. 3.J. (now) "Replaced drive coupling if…" (was) "Replaced drive coupling is…"
Repair/Pg. 501	Repair Material Table (add) "www.dowcorning.com"
Pg. 504	Para. 2. (add) "**NOTE:** EQUIVALENT PRIMERS AND TOPCOATS MAY BE USED IN LIEU OF THE PRODUCTS SPECIFIED HEREIN, PROVIDED THAT THE PRIMERS AND TOPCOATS ARE COMPATIBLE AND PROVIDED THAT THE THICKNESS SPECIFICATIONS AND MASKING INSTRUCTIONS CONTAINED HEREIN ARE OBEYED."
Pg. 507	Para. 5. (now) "**WARNING: DURING CUP INSTALLATION OR REMOVAL…"** (was) "**WARNING**: **DURING CUP REMOVAL…"**
Pg. 507	Para. 5. (add) "**CAUTION: USE PROTECTIVE GLOVES WHEN HANDLING HEATED OR CHILLED PARTS.**"

Aerospace

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

Section/Page No.	**Description Of Change**
Repair/Pg. 507	Para. 5. (add) "**NOTE:** WORK SWIFTLY SINCE THERMAL EXPANSION OF THE CUP AND CONTRACTION OF THE WHEEL WILL INCREASE THE DIFFICULTY OF INSTALLATION."
Pg. 507	Para. 5. A. (now) "…to 200° ± 15° F (93.3° ± 8.3° C) for 30 to 60 minutes." (was) "…not exceeding 212° F for 15 minutes."
Pg. 507	Para. 5. B. (add) "Remove wheel half from heat source and place wheel half on a support block…"
Pg. 507	Para. 5. B. (now) "Remove cup from bore by tapping the cup out…" (was) "Remove cup from bore by tapping it out…"
Pg. 507	Para. 5. B. (now) "…(See Figure 503) and use by hand…" (was) "…(See Figure 503) and utilize by hand…"
Pg. 507	Para. 5. D. (now) "…chill the new bearing cup to between -30° to -60° F (-34° to -51° C) for a minimum of 30 minutes." (was) "…chill the new bearing cup with dry ice for a minimum of 15 minutes."
Pg. 507	Para. 5. E. (now) "…to 200° ± 15° F (93.3° ± 8.3° C) for 30 to 60 minutes." (was) "…not exceeding 212° F for 15 minutes."
Pg. 507	Para. 5. F. (now) "Remove…the bearing cup from refrigeration." (was) "…remove the bearing cup from the dry ice."
Pg. 507	Para. 5. G. (now) "Brush a wet coat of primer..." (was) "Brush a wet coat (generous but not dripping) of primer.."
Pg. 507	(add) Para. 5. J. "Try inserting a 0.002 in. (051mm) feeler gage between the cup and the base of the bearing bore in three equally spaced locations. If the gage can be inserted, the cup is not seated, and this procedure must be repeated."
Pg. 509	Para. 6. A. (now) "…may be repaired per 40-273B wheel assembly." (was) "…may be repaired per 40-273A wheel assembly."
Assembly/Pg. 601	Para. 2.E. (now) "…use NASM33540..." (was) "…use MS33540…"
Pg. 601	Para. 2.H. (now) "…10 Ply…" (was) "…8 Ply or 10 Ply…"
Pg. 602	Para. 2.S. (now) "Install…ring (21) in …subassembly (7) (optional)." (was) "Install…ring (21) in …subassembly (7)."
Pg. 602	Following Para. 2.S. (add) "**NOTE:** RETAINING RING (21) INSTALLATION IS **NOT REQUIRED**. THE RETAINING RING IS PROVIDED TO PREVENT THE GREASE SEAL AND BEARING CONE FROM FALLING OUT OF THE WHEEL ASSEMBLY WHEN THE WHEEL ASSEMBLY IS NOT INSTALLED ON THE AXLE."

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Section/Page No.	Description Of Change
Assembly/Pg. 603	Before Para. 2.T. (add) "**CAUTION: BE SURE TO USE ONLY THE PARKER P/N 095-75200 WASHER. THE PARKER P/N 095-75200 IS DESIGNED TO INSURE THAT THE AXLE NUT CASTELLATIONS WILL ALIGN WITH THE LOCKING HOLES IN THE AXLE AT THE PROPER TORQUE.**"
Pg. 603	(add) Para. 2.T. "Apply a thin coat of bearing grease to both sides of tang washer (Parker P/N 095-75200) and install tang washer on axle."
Pg. 603	(add) Para. 2.U. "Apply a thin coat of bearing grease on axle nut (Beech P/N 114-810062-1) threads. Tighten axle nut to 150 to 200 in.-lbs. of torque while rotating the wheel to insure proper seating of the bearings."
	Note: verbage previously identified as para. 2.U. is now identified as para. 2.W.
Pg. 603	Before Para. 2.V (add). "**NOTE:** DO NOT ALLOW THE WHEEL TO ROTATE WHILE BACKING OFF THE AXLE NUT."
Pg. 603	(add) Para. 2.V. "Back-off axle nut to zero in.-lbs. of torque, then torque axle nut to 40 in.-lbs. while rotating wheel. Tighten axle nut so that the next available castellation is aligned with a through hole in the axle threads. Do not exceed 160 in.-lbs. of torque or 30° of rotation of the axle nut. Install lock ring (Parker P/N 139-34900), lock ring retaining screws (Parker P/N 102-33600), and washers (Parker P/N 095-13800). Torque ring retaining screws to 8 to 15 in.-lbs. Safety wire axle nut retaining screws per NASM33540. It is permissible to use either MS20995C20 or MS20995C32 safety wire."
Pg. 603	(now) Para. 2.W. "Lubricate screw threads with antiseize…" (was) previously identified as para. 2.U.

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TO: HOLDERS OF CM40-273B COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-273B.

Attached to this transmittal letter is Revision B of CM40-273B (dated November. 30, 2001)

Revision B, Dated Nov. 30, 2001

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

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

REVISION HIGHLIGHTS

Section/Page No.	Description Of Change
As Follows:	Rev B (DCN 0348-71):
Record of Rev./RR-1	Update page to reflect Rev. B
Assembly/Pg. 602	Following Para. 2.O. (ADD) "**NOTE:** RE-PACK THE WHEEL BEARINGS WITH GREASE AT EVERY TIRE CHANGE OR 200 HOURS, WHICHEVER COMES FIRST**.**"
Assembly/Pg. 603	Para. 2.V.: (NOW) "Back-off axle nut to zero in.-lbs. of torque, then torque axle nut until the grease seal does not rotate when rotating the wheel." (WAS) "Back-off axle nut to zero in-lbs of torque, then torque axle nut to 40 in-lbs while rotating wheel." (NOW) Do not exceed 200 in.-lbs. of torque or 30° of rotation of the axle nut." (WAS) Do not exceed 160 in.-lbs. of torque or 30° of rotation of the axle nut."
Assembly/Pg. 603	Following Para. 2.V. (ADD) "**NOTE:** IF MORE THAN 200 IN-LBS OF TORQUE ARE REQUIRED TO ALIGN THE HOLE WITH THE NEXT AVAILABLE CASTELLATION THEN REMOVE THE AXLE NUT AND INSTALL ONE SPACER (PARKER P/N 095-75400); TORQUE THE AXLE NUT UNTIL THE GREASE SEAL DOES NOT ROTATE WHEN ROTATING THE WHEEL. TIGHTEN THE AXLE NUT SO THAT THE NEXT AVAILABLE CASTELLATION IS ALIGNED WITH A HOLE IN THE AXLE THREADS. DO NOT EXCEED 200 IN-LBS OF TORQUE OR 30° OF ROTATION OF THE AXLE NUT."

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TO: HOLDERS OF CM40-273B COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-273B.

Attached to this transmittal letter is Revision C of CM40-273B (dated June 20, 2002)

Revision C, Dated June 20, 2002

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

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

REVISION HIGHLIGHTS

Section/Page No.	Description Of Change
As Follows:	Rev C (DCN 0351-11):
Record of Rev./RR-1	Update page to reflect Rev. C
Assembly/Pg. 603	(NOW) W. Lubricate screw threads with antiseize compound specification MIL-T-5544. Install hubcap assembly (22) on outboard wheel half subassembly (7) and secure with washers (26) and screws (27). Torque screws to 20-25 in.-lbs. (WAS) W. Lubricate screw threads with antiseize compound specification MIL-T-5544. Install hubcap assembly (22) on outboard wheel half subassembly (7) and secure with washers (26) and screws (27). Torque screws 30 to 40 in.-lbs.

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TO: HOLDERS OF CM40-273B COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-273B.

Attached to this transmittal letter is Revision D of CM40-273B (dated December 18, 2003)

Revision D, Dated December 18, 2003

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

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

REVISION HIGHLIGHTS

Section/Page No.	Description Of Change
As Follows:	Rev D (DCN 0359-07):
Record of Rev./RR-1	Update page to reflect Rev. D
Description and Operation/2	(Now) Bearing Lubricant: MIL-G-81322, Grade A, Mobil Aviation Grease SHC 100 or equivalent. (Was) Bearing Lubricant: MIL-G-81322, Grade A or equivalent.
Cleaning/301	(Now) C. Dry bearing cones thoroughly, using filtered and dried compressed air. Immediately after visually inspecting per CHECK, repack bearing cones with clean bearing grease, specification MIL-G-81322 Grade A, Mobil Aviation Grease SHC 100, or equivalent. (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.
Assembly/601	(Now)

Mobil Aviation Grease SHC 100	ExxonMobil Corp. Beaumont, TX 77704 www.exxonmobil.com
Aeroshell Grease 22	Shell Oil Company, Lubricant Div. One Shell Plaza Houston, TX 77002 www.shell.com

(Was)

Aeroshell Grease 22	Shell Oil Company, Lubricant Div. One Shell Plaza Houston, TX 77002 www.shell.com

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Section/Page No.	Description Of Change
Assembly/602	Now) O. Pack bearing cones (13) with clean bearing grease, specification MIL-G-81322 Grade A, Mobil Aviation Grease SHC 100, or equivalent. (Was) O. Pack bearing cones (13) with clean bearing grease, specification MIL-G-81322 or equivalent. (Add) **CAUTION:** AVIATION BEARING GREASES SHOULD NOT BE INTERMIXED WITH EACH OTHER. PRECAUTIONS SHOULD BE TAKEN TO INSURE THAT THE BEARING GREASES ARE BEING USED IN ACCORDANCE WITH THE MANUFACTURER'S GUIDELINES. TECHNICAL DATA AND MSDS SHEETS ARE AVAILABLE ON THE MANUFACTURER'S WEBSITES. (Now) **NOTE:** IF USING MOBIL AVIATION GREASE SHC 100, REPACK THE WHEEL BEARINGS WITH GREASE AT EVERY TIRE CHANGE OR 350 HOURS, WHICHEVER COMES FIRST. IF USING MIL-G-81322 GREASE OR EQUIVALENT, REPACK THE WHEEL BEARINGS WITH GREASE AT EVERY TIRE CHANGE OR 200 HOURS, WHICHEVER COMES FIRST. (Was) **NOTE:** RE-PACK THE WHEEL BEARINGS WITH GREASE AT EVERY TIRE CHANGE OR 200 HOURS, WHICHEVER COMES FIRST.

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TO: HOLDERS OF CM40-273B COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-273B.

Attached to this transmittal letter is Revision E of CM40-273B (dated March 17, 2004)

Revision E, Dated March 17, 2004

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

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

REVISION HIGHLIGHTS

Section/Page No.	Description Of Change
As Follows:	Rev E (DCN 0360-24):
Title Page	(Now) Revision E Dated March 17, 2004 (Was) Initial Issue May 15, 2001 (Added) Rev. E March 17, 2004
Record of Revisions	(Added)

E	3-17-04	3-17-04	PH

401

(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 Fax. 847-657-5388 e-mail: INFO@magnaflux.com
	Zyglo ZL-2C, with emulsifier/remover ZE-4B	Zyglo ZP-4B, ZP-9F, ZP-5B, ZP-14A or SKD-S2	

(Was)

Fluorescent	Zyglo ZL-60D	Zyglo ZP-4B (wet) optional	Magnaflux Corp. 7300 West Lawrence St. Chicago, IL 60656 www.magnaflux.com

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Section/Page No.	Description Of Change
603	(When page 602 Dec. 18, 2003 was created, data was moved to page 603. The data transfer was not documented. Therefore, Rev. E hereby documents the transfer of the following data from page 602 (dated Nov. 30, 2001) to page 603 (dated March 17, 2004).) R. Install outboard bearing cone and outboard grease seal in the wheel assembly. S. Install retaining ring (21) in outboard wheel half subassembly (7) (optional). **NOTE:** RETAINING RING (21) INSTALLATION IS NOT REQUIRED. THE RETAINING RING IS PROVIDED TO PREVENT THE GREASE SEAL AND BEARING CONE FROM FALLING OUT OF THE WHEEL ASSEMBLY WHEN THE WHEEL ASSEMBLY IS NOT INSTALLED ON THE AXLE.

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TO: HOLDERS OF CM40-273B COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-273B.

Attached to this transmittal letter is Revision F of CM40-273B (dated June 01, 2005)

Revision F, Dated June 01, 2005

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

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

REVISION HIGHLIGHTS

Section/Page No.	Description Of Change
As Follows:	Rev F (DCN 0365-89):
Title Page	(Now) Revision F Dated June 01, 2005
Record of Revisions	Update page to reflect Revision F
Description and Operation / pg. 2	(Add) "…or AMS2518"
Assembly / pg. 601	Assembly Material Table: (Add) "…or AMS2518" to antiseize callout
pg. 602	Paragraph J: (Add) "…or AMS2518" to antiseize reference
pg. 603	Paragraph W: (Add) "…or AMS2518" to antiseize reference
Illustrated Parts List / pg. 1003	Parts List for 102-07700 screw: (Now) MS35266-59 (Was) AN501A10-4

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TO: HOLDERS OF CM40-273B COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-273B.

Attached to this transmittal letter is Revision G of CM40-273B (dated August 31, 2006)

Revision G, Dated August 31, 2006

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

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

REVISION HIGHLIGHTS

Section/Page No.	Description Of Change
As Follows:	Rev G (DCN 0371-03)
Title Page	(Now) Revision G Dated August 31, 2006
Record of Revisions	Update page to reflect Revision G
Assembly / pg. 602	Paragraph 2.O. NOTE: (NOW) "…REPACK THE WHEEL BEARINGS WITH GREASE AT EVERY TIRE CHANGE OR 400 HOURS,…" (WAS) "…REPACK THE WHEEL BEARINGS WITH GREASE AT EVERY TIRE CHANGE OR 350 HOURS,…"

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RECORD OF REVISIONS

REV NO.	ISSUE DATE	DATE INSERTE	BY	REV NO.	ISSUE DATE	DATE INSERTED	BY
NC	5-15-01	5-15-01	PHC				
A	8-28-01	8-28-01	PHC				
B	11-30-01	11-30-01	PHC				
C	06-20-02	06-20-02	PHC				
D	12-18-03	12-18-03	PHC				
E	3-17-04	3-17-04	PHC				
F	6-01-05	6-01-05	PHC				
G	08-31-06	08-31-06	PHC				

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SERVICE BULLETIN LIST

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

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CM40-273B COMPONENT MAINTENANCE MANUAL WITH IPL
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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 40-273B 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.

NOTE: 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) 937-6416

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.

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DATA RIGHTS

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

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.

   H. The wheel assembly is equipped with an anti-skid compatible hubcap

2. Handling Procedures

   A. Strictly observe the deflation and inflation procedures, as well as 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 : 12.7 Lbs.

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

Bearing Lubricant: MIL-G-81322, Grade A, Mobil Aviation Grease SHC 100, or equivalent

Paint Requirements: (Recommended)

Primer:	Columbia Paint Corporation P/N 11-347Z	Alternate:	Sherwin Williams Company P/N P60G2
Topcoat:	Columbia Paint Corporation 11-358A Gloss White Enamel	Alternate:	Sherwin Williams Company P/N F63W13

TESTING

1. General

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

2. Testing Procedures

   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.

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DISASSEMBLY

1. General

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

WARNING: 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 **deflated** at this time.

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

B. Remove hubcap assembly (22) by removing the three installation screws (27) and washers (26).

C. If installed, remove retaining ring (21).

D. Cut safety wire and loosen lock ring retaining screws and washers. Remove lock ring from axle. Remove axle nut, tang washer, grease seal (14), and outer bearing cone (13).

E. Remove wheel assembly from axle and place on a clean flat surface.

F. Remove remaining grease seal (14) and inner bearing cone (13).

G. Break tire beads away from both wheel flanges by applying pressure in even increments around entire sidewall as close to tire beads as possible.

CAUTION: 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.

H. 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 inner wheel half (3).

I. Remove lockwire (18), screws (5), and drive keys (4) from inner wheel half (3).

NOTE: 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 (15) 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
Cleaner/Degreaser per AMS 1526	Commercially Available
Isopropyl Alcohol	Commercially Available
Soft Bristle Brush	Commercially Available
Clean Wiping Cloth	Commercially Available

2. Cleaning Procedures

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

CAUTION: THE WHEEL HALVES MAY HAVE A WATER REDUCIBLE FINISH (COLUMBIA PAINT CORP.) AND THE USE OF SOLVENTS SUCH AS MINERAL SPIRITS WILL REMOVE THE FINISH AND ARE NOT RECOMMENDED.

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.

CAUTION: 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. Immediately after visually inspecting per CHECK, repack bearing cones with clean bearing grease, specification MIL-G-81322 Grade A, Mobil Aviation Grease SHC 100, or equivalent.

CAUTION: DO NOT SPIN BEARING CONES WITH COMPRESSED AIR.

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

E. Inner and outer wheel half subassemblies (2) and (7) can be degreased with a water based cleaner/degreaser that meets or exceeds AMS1526. Use a non-metallic soft bristled brush to remove stubborn deposits.

F. Rinse parts thoroughly with a mild soap and water solution at ambient temperature.

G. Final rinse parts thoroughly with water heated to a temperature of 160° to 180°F (71° to 82°C).

H. Dry parts thoroughly after cleaning, using low pressure compressed air, 30 psig maximum (2.07 bar). Wipe dried parts with lint free cleaning cloths.

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.

CAUTION: 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.

CHECK

1. Check Materials

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR ITEMS LISTED BELOW:			
Type	**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 Ph. 847-657-5300 Fax. 847-657-5388 e-mail: INFO@magnaflux.com
	Zyglo ZL-2C, with emulsifier/remover ZE-4B	Zyglo ZP-4B, ZP-9F, ZP-5B, ZP-14A or SKD-S2	
Red Dye	Spot Check SKL-WP	Spot Check ZP-5B	
	Met-L-Chek	Met-L-Chek	Met-L-Chek Company 1639 Euclid Street Santa Monica, CA 90404 www.met-l-chek.com

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 (Requires stripping topcoat and primer)

   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:
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.

NOTE: CHECK WHEEL BY ZYGLO OR OTHER PENETRANT METHODS. REPLACE ALL CRACKED WHEEL HALVES.

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 in Figure 401.

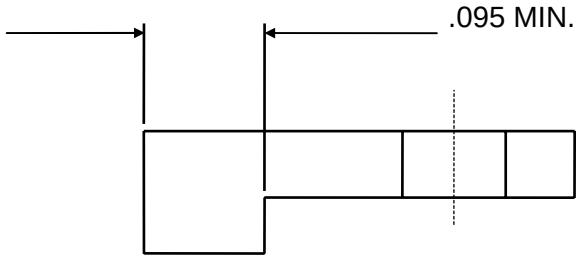


Figure 401

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 any of the bolts have cracks, replace all 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.

J. Inspect the drive coupling (24) of the hubcap assembly (22) for looseness. If necessary, replace rivets (25) per REPAIR. Replace drive coupling if bent, cracked or showing other obvious signs of damage. Check reset dimension of drive coupling as shown in Figure 402. Replace drive coupling if reset dimension cannot be maintained.

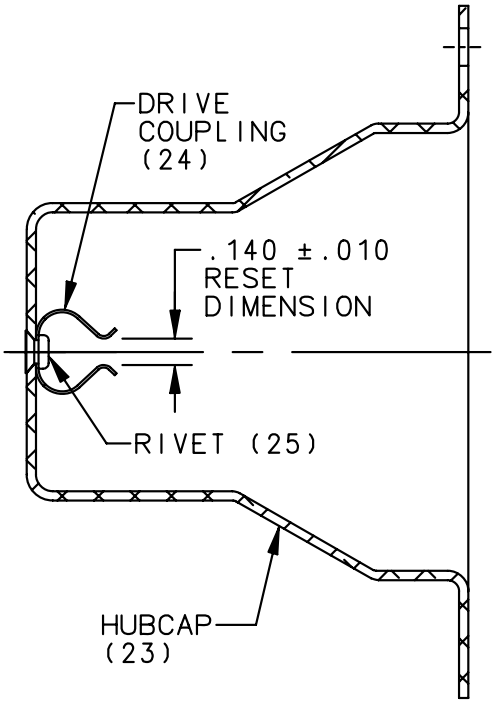


Figure 402

REPAIR

1. Repair Materials

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR ITEMS LISTED BELOW.	
Cleaner/Degreaser per AMS 1526	Commercially Available
Aluminum Oxide Cloth 400 Grit Wet-Or-Dry	Commercially Available
Sulfuric-acid Anodize per MIL-A-8625 Type II, Class 1 or Specification MIL-C-5541, Class 1A	Commercially Available
Columbia Paint Corporation 11-347Z Primer	Columbia Paint Corporation Huntington, W. VA.
Alternate for primer: Sherwin Williams Company P60G2	Sherwin Williams Company Cleveland, Ohio
Columbia Paint Corporation 11-358A Gloss White Enamel	Columbia Paint Corporation Huntington, W. VA.
Alternate for topcoat: Sherwin Williams Company F63W13	Sherwin Williams Company Cleveland, Ohio
Dow Corning 55 O-ring Lubricant	Dow Corning Corp. Midland, Michigan 48640 www.dowcorning.com
Drill Bit, ∅ 0.125 in.	Commercially Available
Drift Punch, ∅ 0.125 in.	Commercially Available
Heli-Coil Extracting Tool, 1227-6	MIL-T-21309, Emhart Fastening Teknologies Fastening Systems Division www.emhart.com
Heli-Coil Installation Tool, 7552-3	
Heli-Coil Tang Removal Tool, 3695-3	

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. Repair of Wheel Halves (3 and 8, Ref. Figure 501)

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, aluminum oxide 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.

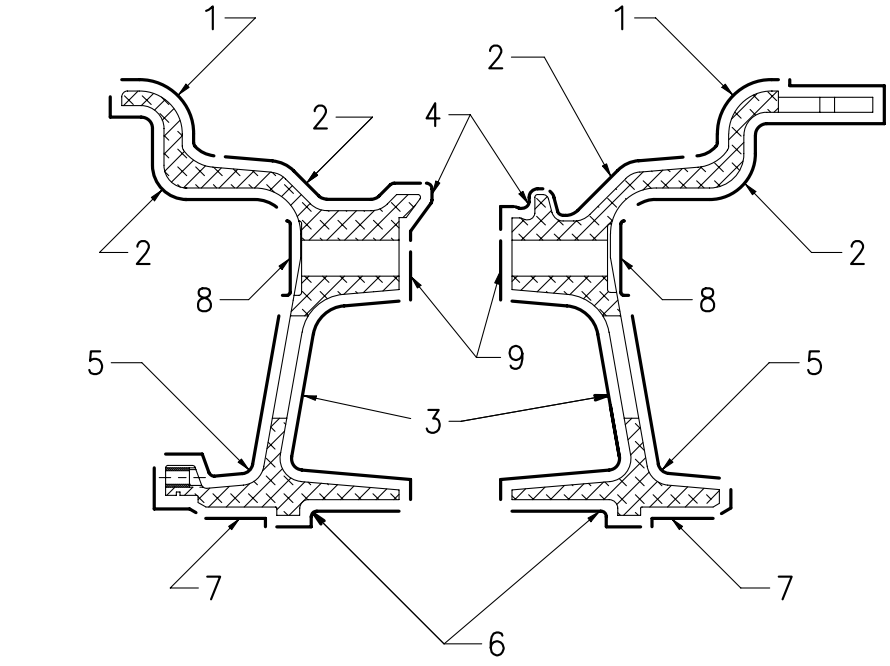
G. In area 6, rework is limited to .040 inch deep and .5 square inch in area at a maximum of two places.

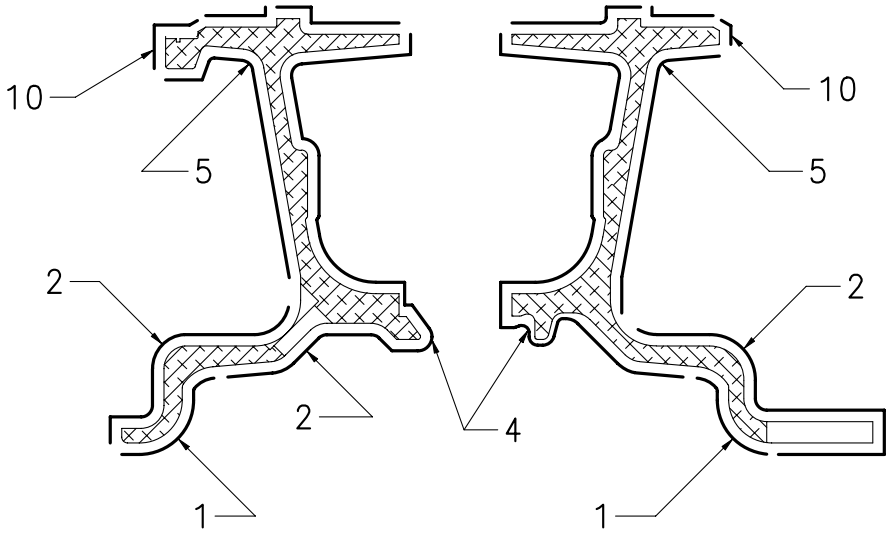
H. In area 7, rework is limited to blending out scratches and corrosion, provided bearing cup retention is not affected.

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.





OUTER WHEEL HALF INNER WHEEL HALF

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

WHEEL REPAIR LIMITS
FIGURE 501

4. Repainting

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

NOTE: EQUIVALENT PRIMERS AND TOPCOATS MAY BE USED IN LIEU OF THE PRODUCTS SPECIFIED HEREIN, PROVIDED THAT THE PRIMERS AND TOPCOATS ARE COMPATIBLE AND PROVIDED THAT THE THICKNESS SPECIFICATIONS AND MASKING INSTRUCTIONS CONTAINED HEREIN ARE OBEYED.

A. Clean part per CLEANING section and 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.

B. Mask wheel halves per Figure 502 sheets 1 and 2 and apply primer per Table 501.

C. Mask wheel halves per Figure 502 sheets 1 and 2 and apply topcoat per Table 501.

Table 501
Primer and Topcoat Product Characteristics

MFR	PRIMER	TOPCOAT	DRY FILM THICKNESS AND DRYING TIMES (AIR)
Columbia Paint Corp. Huntington, WV	P/N 11-347Z (water reducible) No mixing required.	P/N 11-358A (water reducible) No mixing required. It is desirable to apply topcoat without thinning, however, topcoat material may be thinned up to 10% by volume with either water (use distilled) or a mixture of 4 parts water to 1 part butyl cellosolve..	Primer: .0002-.0005 in. 15 minutes min. (to touch or topcoat) 15-60 minutes (to handle)
			Topcoat (including primer): .0008-.0014 in. 15 minutes (to touch) 30 minutes (to handle) 48 hours (dry hard)
			Note: Refer to Mfr. Data Sheet for forced dry schedule
Alternate: Sherwin Williams Co. Cleveland, OH	2 parts washcoat (P/N P60G2) 3 parts catalyst reducer (P/N R7K44)	6 parts base (P/N F63W13) 1 part catalyst (P/N V66V27) Thin using up to 20% polane reducer (P/N R7K84).	Primer: .0002-.0004 in. 3-10 minutes (to touch) 10-60 minutes (to topcoat)
			Topcoat (including primer): .0008-.0014 in. 20 minutes (to touch) 60 minutes (to handle) 24 hours (dry hard)
			Note: Refer to Mfr. Data Sheet for forced dry schedule

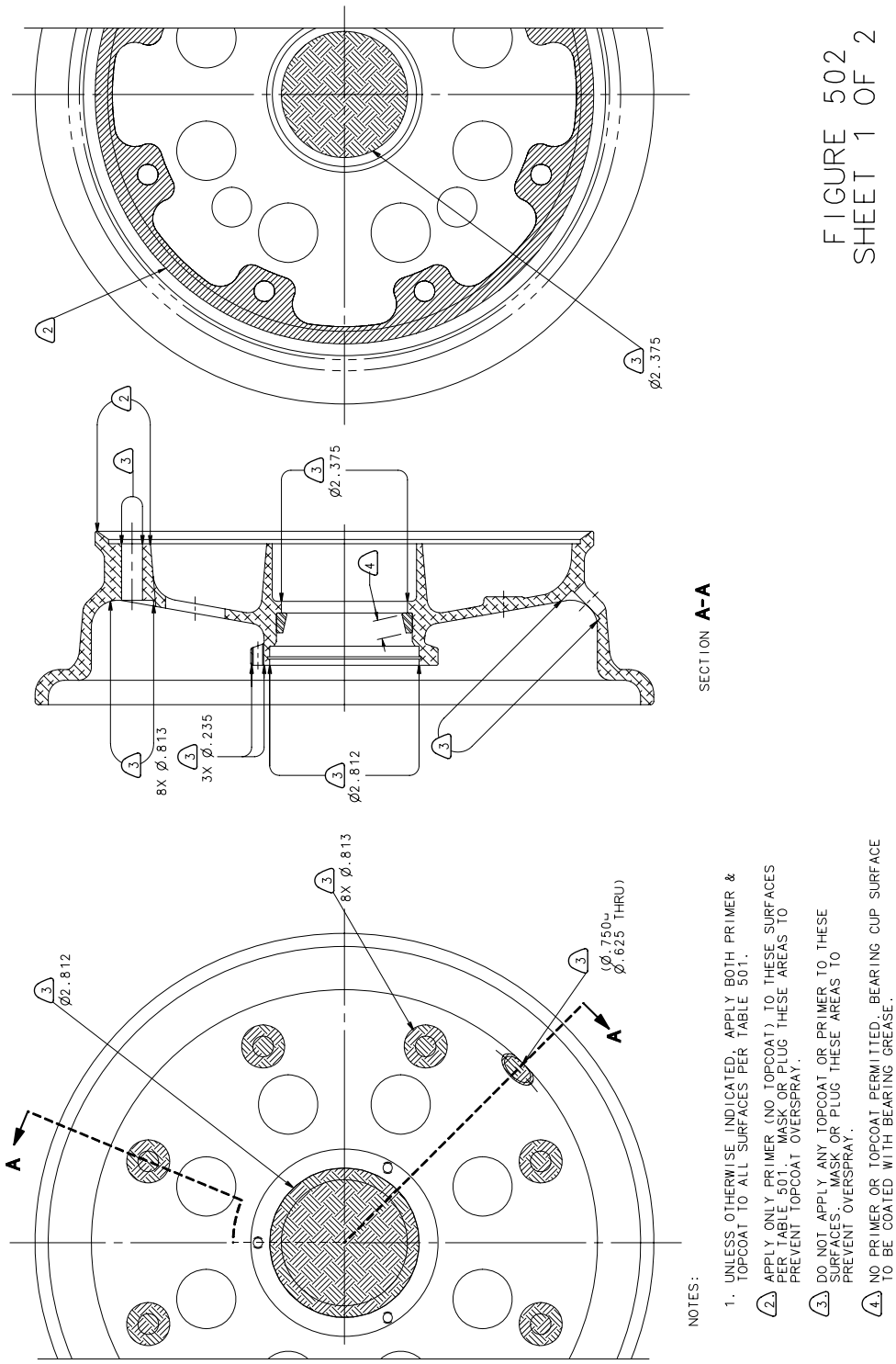
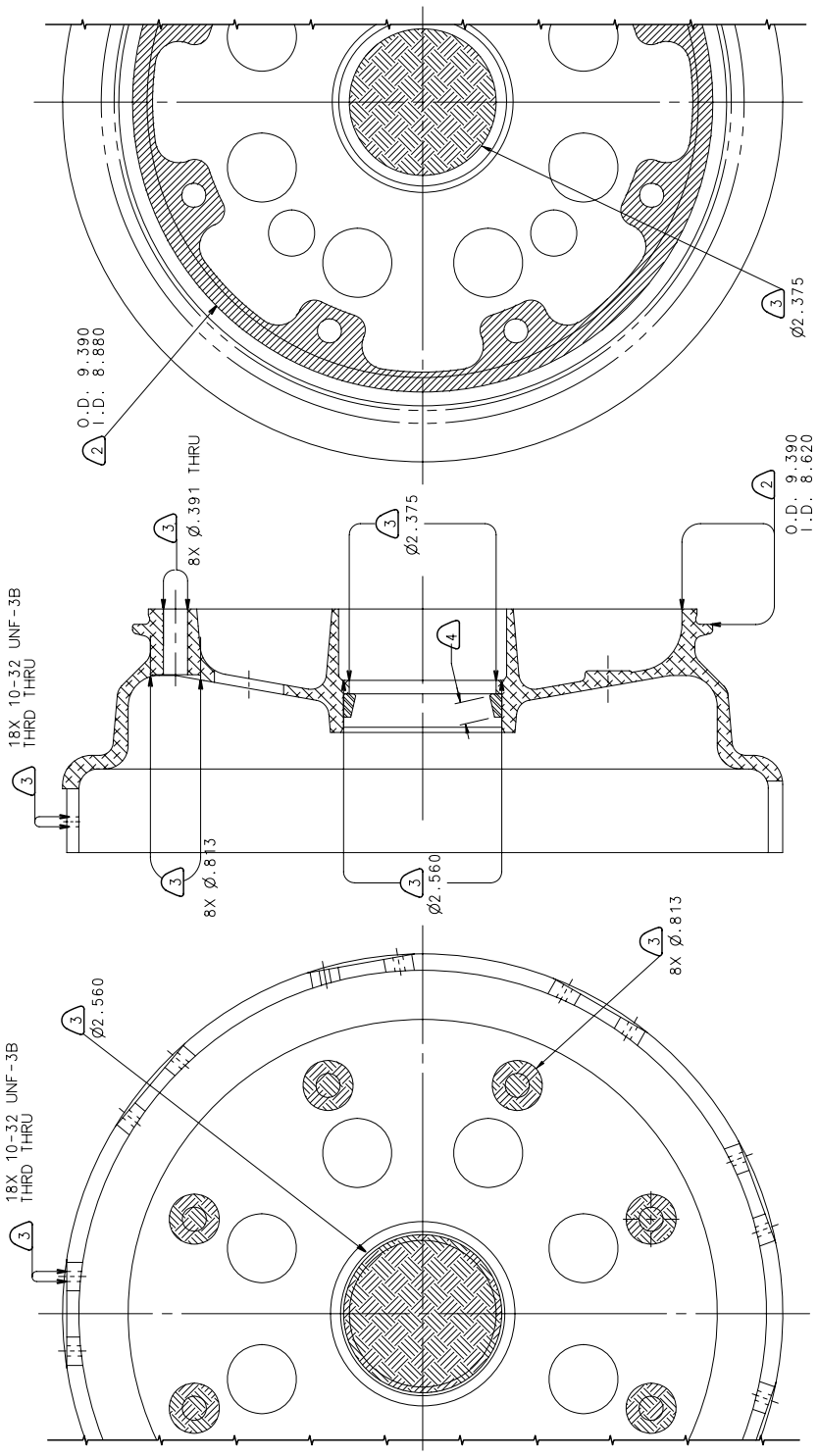


FIGURE 502
SHEET 1 OF 2

NOTES:

1. UNLESS OTHERWISE INDICATED, APPLY BOTH PRIMER & TOPCOAT TO ALL SURFACES PER TABLE 501.
2. APPLY ONLY PRIMER (NO TOPCOAT) TO THESE SURFACES PER TABLE 501. MASK OR PLUG THESE AREAS TO PREVENT TOPCOAT OVERSPRAY.
3. DO NOT APPLY ANY TOPCOAT OR PRIMER TO THESE SURFACES. MASK OR PLUG THESE AREAS TO PREVENT OVERSPRAY.
4. NO PRIMER OR TOPCOAT PERMITTED. BEARING CUP SURFACE TO BE COATED WITH BEARING GREASE.



NOTES:

1. UNLESS OTHERWISE INDICATED, APPLY BOTH PRIMER & TOPCOAT TO ALL SURFACES PER TABLE 501.
2. APPLY ONLY PRIMER (NO TOPCOAT) TO THESE SURFACES PER TABLE 501. MASK OR PLUG THESE AREAS TO PREVENT TOPCOAT OVERSPRAY.
3. DO NOT APPLY ANY TOPCOAT OR PRIMER TO THESE SURFACES. MASK OR PLUG THESE AREAS TO PREVENT OVERSPRAY.
4. NO PRIMER OR TOPCOAT PERMITTED. BEARING CUP SURFACE TO BE COATED WITH BEARING GREASE.

FIGURE 502
SHEET 2 OF 2

5. Replacing Defective Bearing Cups (13)

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

CAUTION: USE PROTECTIVE GLOVES WHEN HANDLING HEATED OR CHILLED PARTS.

NOTE: WORK SWIFTLY SINCE THERMAL EXPANSION OF THE CUP AND CONTRACTION OF THE WHEEL WILL INCREASE THE DIFFICULTY OF INSTALLATION.

A. Heat wheel half in an oven to 200° ± 15° F (93.3° ± 8.3° C) for 30 to 60 minutes.

B. Remove wheel half from heat source and place wheel half on a support block. Remove cup from bore by tapping the cup out evenly with a fiber or phenolic punch, or fabricate bearing cup removal tool (See Figure 503) and use by hand or adapt to arbor press. Exercise extreme care to avoid raising burrs in the hub bore.

C. Make sure that bearing bore and shoulder are clean and free of burrs.

D. Prior to installation, chill the new bearing cup to between -30° to -60° F (-34°to -51° C) for a minimum of 30 minutes.

E. Heat wheel half in an oven to 200° ± 15° F (93.3° ± 8.3° C) for 30 to 60 minutes.

F. Remove the wheel half from the heat source and the bearing cup from refrigeration. Dry the cup thoroughly.

G. Brush a wet coat of primer into the bearing bore.

H. 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.

J. Try inserting a 0.002 in. (0.051mm) feeler gage between the cup and the base of the bearing bore in three equally spaced locations. If the gage can be inserted, the cup is not seated, and this procedure must be repeated.

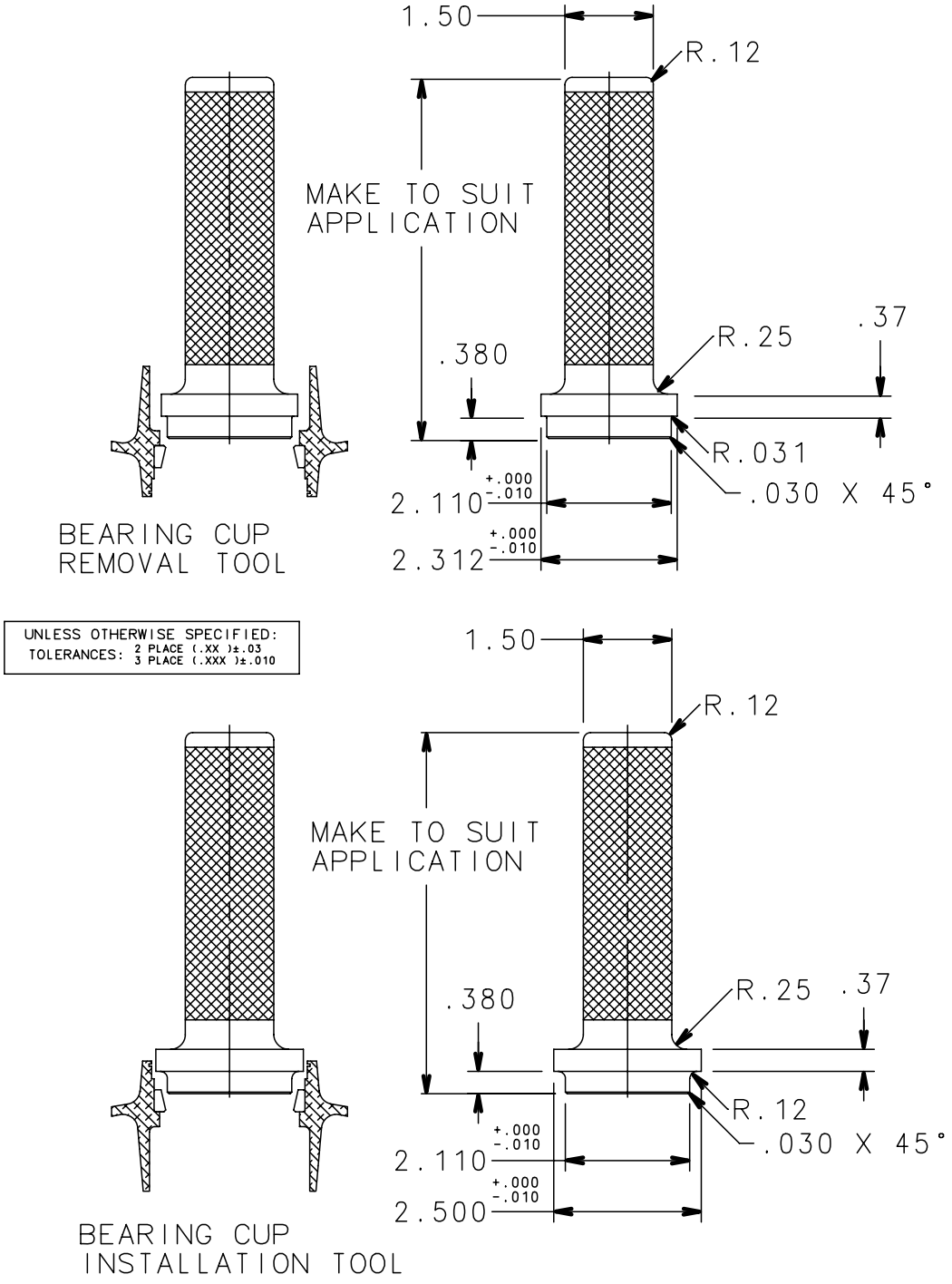

1.50
R.12
MAKE TO SUIT
APPLICATION
.380
R.25
.37
R.031
.030 X 45°
+.000
2.110 -.010
+.000
2.312 -.010
BEARING CUP
REMOVAL TOOL
UNLESS OTHERWISE SPECIFIED:
TOLERANCES: 2 PLACE (.XX)±.03
3 PLACE (.XXX)±.010
1.50
R.12
MAKE TO SUIT
APPLICATION
.380
R.25
.37
R.12
.030 X 45°
+.000
2.110 -.010
+.000
2.500 -.010
BEARING CUP
INSTALLATION TOOL

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 40-273B wheel assembly.

B. Drill stripped No. 10-32 tapped hole to ∅.210$^{+.005/-.002}$ in. (drill size no. 7)

C. Measure minimum edge to hole distance. Inner wheel halves with an edge to hole distance below the minimum specified in Figure 504 must be scrapped.

D. Tap ∅.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.

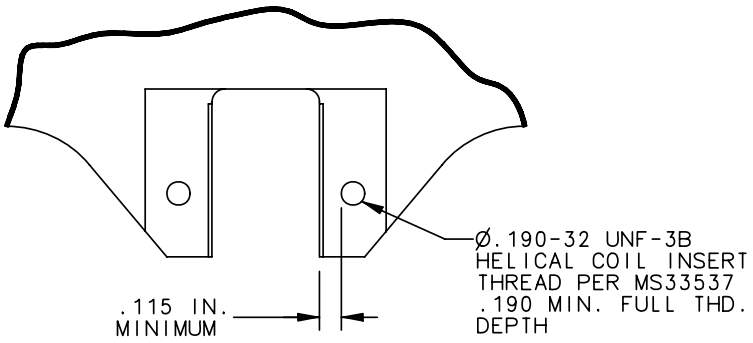


FIGURE 504

7. Replacing Hubcap Drive Coupling

A. Remove hubcap assembly (22) from wheel assembly.

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

CAUTION: DO NOT ENLARGE THE RIVET HOLES IN THE HUBCAP (23) OR DRIVE COUPLING (24). IF THE RIVET HOLE EXCEEDS ∅ 0.134 IN., THE HUBCAP AND/OR DRIVE COUPLING MUST BE REPLACED.

(1) Refer to Figure 505 and use a ∅ 0.125 in. drill bit to drill out the shop head of the rivets (25) and punch the rivets from the respective assembly. Discard rivets.
(2) Inspect drive coupling (24) per CHECK section and replace if necessary.

(3) Remove any burrs around rivet hole areas on the hubcap (23).

(4) Assemble drive coupling to hubcap with new rivets as follows:

(a) Refer to Figure 505. Locate the drive coupling (24) over the rivet holes on the hubcap (23) and insert with rivets (25).

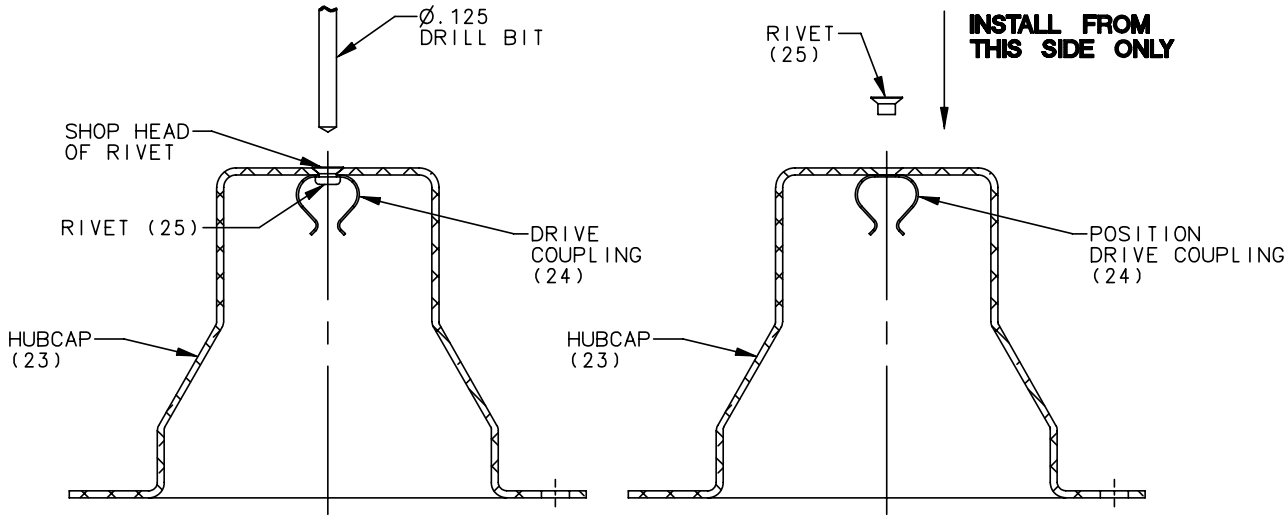
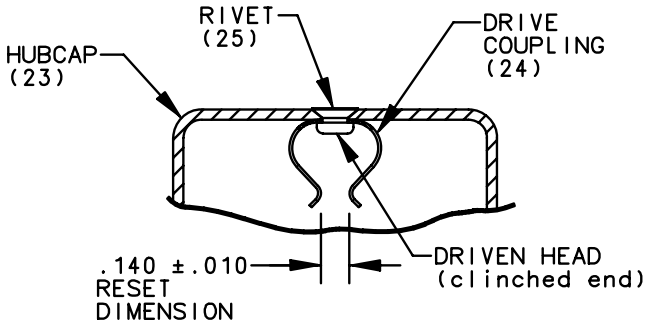


FIGURE 505

(b) Use a compression or squeeze riveter and clinch the rivets to install.

(c) Refer to Figure 506 and verify clinching operation.

1 Solid flat (or countersunk) head rivets shall fill the countersunk hole provided.



2 Check reset dimension of drive coupling as shown in Figure 506.

FIGURE 506

8. Insert Repair

Do not replace inserts (20) unless damaged. Replace damaged inserts in accordance with the following procedure.

SAFETY WARNING: USE PROTECTIVE GOGGLES OR GLASSES WHEN STRIKING ANY TOOL.

(1) Refer to Figure 507 and remove damaged inserts by applying the HeliCoil extracting tool to the insert (position tool with relation to end of coil as shown), striking the head of the tool a light blow and turning it counterclockwise, maintaining steady downward pressure

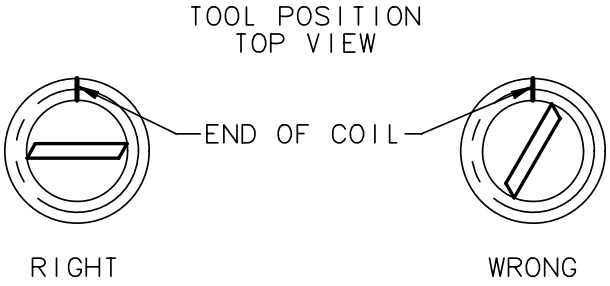


FIGURE 507

(2) Use the hand inserting tools and install inserts into outer wheel half (8) as shown by Figure 508. Break off tang.

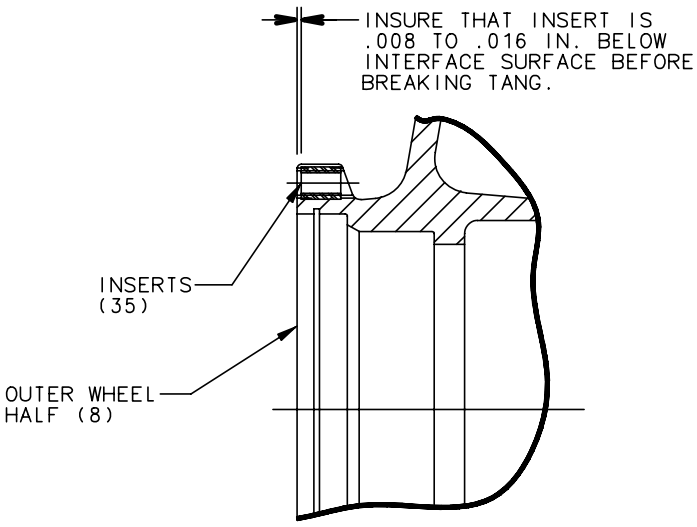


FIGURE 508

ASSEMBLY

1. Assembly Materials

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR ITEMS LISTED BELOW.	
Mobil Aviation Grease SHC 100	ExxonMobil Corp. Beaumont, TX 77704 www.exxonmobil.com
Aeroshell Grease 22 (MIL-G-81322 Grade A)	Shell Oil Company, Lubricant Div. One Shell Plaza Houston, TX 77002 www.shell.com
Antiseize Compound (Lubtork) Specification MIL-T-5544 or AMS2518	W.J. Ruscoe & Company 485-T Kenmore Boulevard Akron, Ohio 44301
	Newman Tool Inc. 151 New Park Avenue Hartford, CT 06106 www.newmantools.com
Isopropyl Alcohol	Commercially Available
Dow Corning 55 O-ring Lubricant Compound	Dow Corning Corp. Box 1767 Midland, Michigan 48640 www.dowcorning.com

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 NASM33540 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 or equivalent and install in wheel register groove of inner wheel half (3).

   CAUTION: THE O-RING CAN NOT BE TWISTED.

   H. Place serviceable 22 x 6.75-10, 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.

NOTE: 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.

NOTE: 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.

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

CAUTION: AVIATION BEARING GREASES SHOULD NOT BE INTERMIXED WITH EACH OTHER. PRECAUTIONS SHOULD BE TAKEN TO INSURE THAT THE BEARING GREASES ARE BEING USED IN ACCORDANCE WITH THE MANUFACTURER'S GUIDELINES. TECHNICAL DATA AND MSDS SHEETS ARE AVAILABLE ON THE MANUFACTURER'S WEBSITES.

O. Pack bearing cones (13) with clean bearing grease, specification MIL-G-81322 Grade A, Mobil Aviation Grease SHC 100, or equivalent.

NOTE: IF USING MOBIL AVIATION GREASE SHC 100, REPACK THE WHEEL BEARINGS WITH GREASE AT EVERY TIRE CHANGE OR 400 HOURS, WHICHEVER COMES FIRST. IF USING MIL-G-81322 GREASE OR EQUIVALENT, RE-PACK THE WHEEL BEARINGS WITH GREASE AT EVERY TIRE CHANGE OR 200 HOURS, WHICHEVER COMES FIRST.

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 retaining ring (21) in outboard wheel half subassembly (7) (optional).

NOTE: RETAINING RING (21) INSTALLATION IS **NOT REQUIRED**. THE RETAINING RING IS PROVIDED TO PREVENT THE GREASE SEAL AND BEARING CONE FROM FALLING OUT OF THE WHEEL ASSEMBLY WHEN THE WHEEL ASSEMBLY IS NOT INSTALLED ON THE AXLE.

CAUTION: BE SURE TO USE ONLY THE PARKER P/N 095-75200 WASHER. THE PARKER P/N 095-75200 IS DESIGNED TO INSURE THAT THE AXLE NUT CASTELLATIONS WILL ALIGN WITH THE LOCKING HOLES IN THE AXLE AT THE PROPER TORQUE.

T. Apply a thin coat of bearing grease to both sides of tang washer (Parker P/N 095-75200) and install tang washer on axle

U. Apply a thin coat of bearing grease on axle nut (Beech P/N 114-810062-1) threads. Tighten axle nut to 150 to 200 in.-lbs. of torque while rotating the wheel to insure proper seating of the bearings.

NOTE: DO NOT ALLOW THE WHEEL TO ROTATE WHILE BACKING OFF THE AXLE NUT.

V. Back-off axle nut to zero in.-lbs. of torque, then torque axle nut until the grease seal does not rotate when rotating the wheel. Tighten axle nut so that the next available castellation is aligned with a through hole in the axle threads. Do not exceed 200 in.-lbs. of torque or 30° of rotation of the axle nut.

NOTE: IF MORE THAN 200 IN-LBS OF TORQUE ARE REQUIRED TO ALIGN THE HOLE WITH THE NEXT AVAILABLE CASTELLATION THEN REMOVE THE AXLE NUT AND INSTALL ONE SPACER (PARKER P/N 095-75400); TORQUE THE AXLE NUT UNTIL THE GREASE SEAL DOES NOT ROTATE WHEN ROTATING THE WHEEL. TIGHTEN THE AXLE NUT SO THAT THE NEXT AVAILABLE CASTELLATION IS ALIGNED WITH A HOLE IN THE AXLE THREADS. DO NOT EXCEED 200 IN-LBS OF TORQUE OR 30° OF ROTATION OF THE AXLE NUT.

Install lock ring (Parker P/N 139-34900), lock ring retaining screws (Parker P/N 102-33600), and washers (Parker P/N 095-13800). Torque ring retaining screws to 8 to 15 in.-lbs. Safety wire axle nut retaining screws per NASM33540. It is permissible to use either MS20995C20 or MS20995C32 safety wire.

W. Lubricate screw threads with antiseize compound, specification MIL-T-5544 or AMS2518. Install hubcap assembly (22) on outboard wheel half subassembly (7) and secure with washers (26) and screws (27). Torque screws to 20 to 25 in-lbs.

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WHEEL ASSEMBLY 40-273B

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 5 to 15 psig.

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.

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

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.

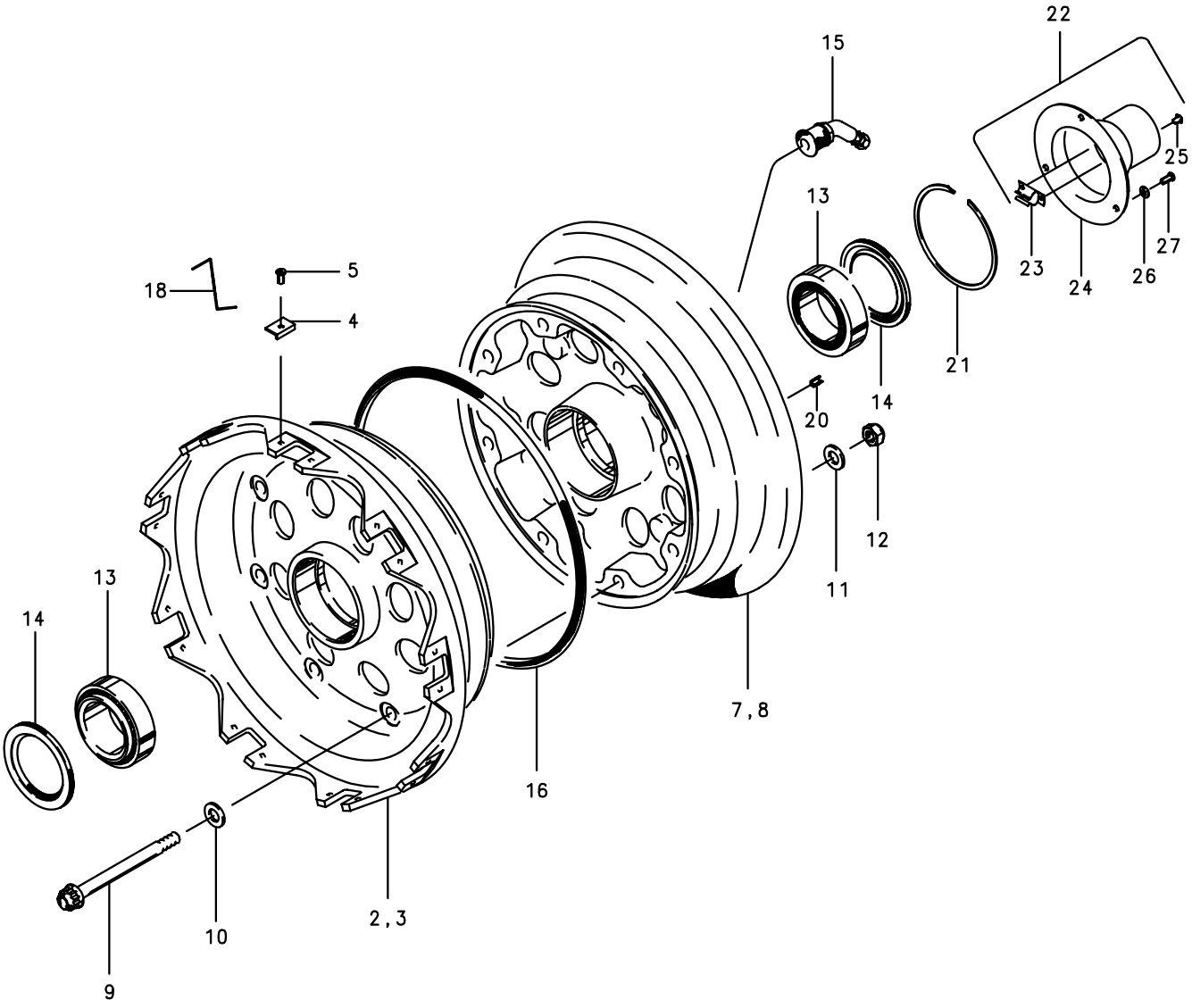
   B. The Figure item column provides the cross reference between the parts list and IPL Figure 1.

   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.

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



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

2. PARTS LIST

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

VENDOR OR MIL. DESIGNATION	PART NUMBER	DESCRIPTION	QUANTITY	ITEM
40-273B	40-273B	Wheel Assembly	1	1
	161-17301	Inner Wheel Half Sub-Assy.	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
	162-17302	Outer Wheel Half Sub-Assy.	1	7
	*	Wheel Half-Outer	1	8
13836	214-00100	Cup Bearing (Timken)	1	6
MS21209F1-15P	230-05400	Insert, Helicoil	3	**20
MS21250-06034	103-31200	Bolt	8	9
MS20002C6	095-03100	Washer (C'sunk)	8	10
AN960-616	095-10600	Washer (Plain)	8	11
NAS1804-6S	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 Assembly	1	15
TR RG21	*	Rubber Grommet	1	–
MS28775-267	101-25800	O-Ring	1	16
	*	Nameplate	3	–17
	*	Lockwire	A/R	18
	*	Nameplate, Warning	1	–19
UR-281SP	155-13600	Ring, Retaining	1	21
	158-02500	Hubcap Assembly	1	22
	157-03200	Hubcap	1	23
140-04721	139-34400	Drive Coupling (Hydro-Aire)	1	24
MS20426DD4-3	105-12000	Rivet, Solid	2	25
AN960-10	095-10300	Washer	3	26
MS35207-263	102-33500	Screw	3	27

* Item not procurable as individual part.
]– Item Not Illustrated
**** Do Not Remove Unless Damaged.

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

Date: _ _/_ _/20_ _

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

To whom it may concern:

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

KIT NUMBER: 199-_____

FAA APPROVAL: 1) STC # _____

NO OTHER APPROVALS NECESSARY

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

A/C MAKE: _____

A/C MODEL_____

TAIL # _____

Regards,

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

United States of America
Department of Transportation -- Federal Aviation Administration

Supplemental Type Certificate

Number SA1789GL

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

certifies that the change in the type design for the following product with the limitations and conditions thereof as specified hereon meets the airworthiness requirements of Part 23 of the Federal Aviation *Regulations.* (See Type Certificate Data Sheet A24CE for complete certification basis)

Original Product—Type Certificate Number A24CE

Make: Raytheon Aircraft Company (Beech)
Model: 1900C, 1900D

Description of Type Design Change:

Installation of Cleveland Main Wheels and Brakes in accordance with Parker Hannifin's Conversion Kit Parts List 199-184, Revision E, dated May 28, 1993, or Conversion Kit Parts List 199-220, Revision NC, dated May 17, 1994, or Conversion Kit Parts List 199-220A, Revision B, dated September 7, 2001, or later FAA approved revisions.

Limitations and Conditions:

1. Compatibility of this design change with previously approved modifications must be determined by the installer. (See Continuation Sheet 3)

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

Date of application: September 24, 1991

Date of issuance August 28, 1992

Date reissued:

Date amended July 28, 1993, July 25, 1994, January 8, 2002

By direction of the Administrator

Mary Ellen A. Schutt
(*Signature*)
Mary Ellen A. Schutt
Manager, Airframe and Administrative Branch
Chicago Aircraft Certification Office

(*Title*)

United States of America

Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number SA1789GL

Date amended: January 8, 2002

Limitations and Conditions (Continued from Page 1 of 3)

2. Installation of Parker Hannifin Conversion Kit Parts List 199-220A is limited to Raytheon (Beech) Model 1900D aircraft equipped with Hydro-Aire Mark III Anti-skid system.

3. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

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