AIRCRAFT WHEEL & BRAKE DIVISION
PARKER HANNIFIN CORPORATION
AVON, OHIO

PARTS LIST

199-256 NOSE WHEEL CONVERSION KIT

For

Raytheon Aircraft Models: 1900C and 1900D

| PART NUMBER | DRAWING REVISION | DESCRIPTION | QUANTITY |
|---|---|---|---|
| 40-450 | Rev. E dated 07-07-2011 | Nose Wheel Assembly | 1 |
| 221-07100 | ---------- | Pin, Cotter, Split (MS24665-428) | 1 |
| | | Publication Package (P/N PP199-25600) | |
| IM199-256 | Rev. A dated 11-17-2005 | Installation Manual | 1 |
| 50-159 | Rev. N/C dated 02-22-2005 | Installation Drawing | 1 |
| AMMS199-256 | ------- | Airplane Maintenance Manual Supplement | 1 |
| CM40-450 | Rev. C dated 02-03-2012 | Component Maintenance Manual | 1 |
| PRM78 | ------ | Product Reference Memo - Wheel Assemblies – Alternate Bearing Grease | 1 |
| SA02204CH | ------- | Supplemental Type Certificate | 1 |
| ------- | | Pilot Operating Manual Inserts | 1 |
| ------- | | Product Registration Card | 1 |

**Notes:**

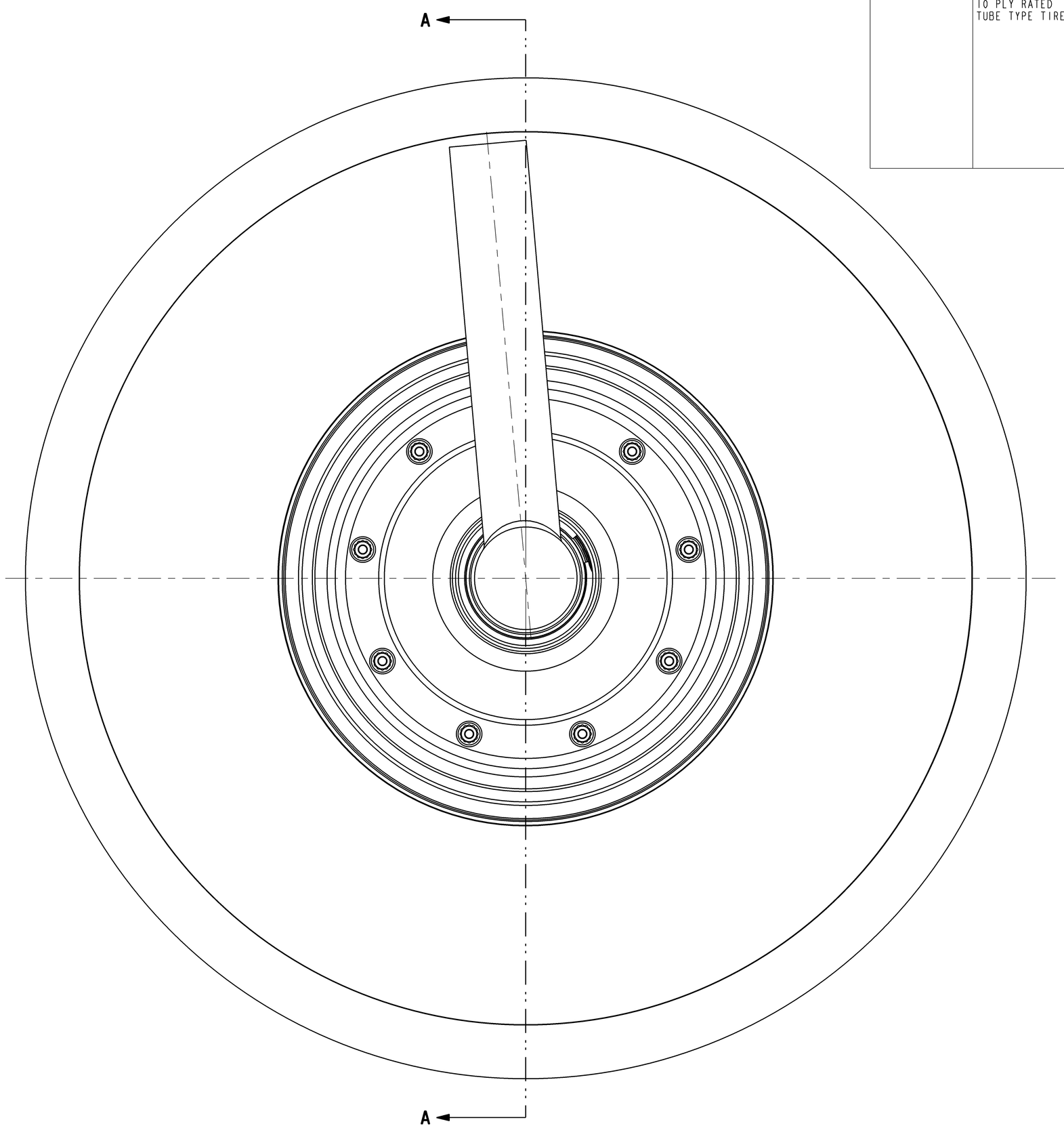
1. This kit converts one aircraft to Cleveland nose wheel.
2. This nose wheel assembly is designed for use with either a 19.5 X 6.75-8, 10 Ply Rated, Tube-type or tubeless tire.
3. For use with a tubeless tire order P/N 160-03500 air valve assembly separately.

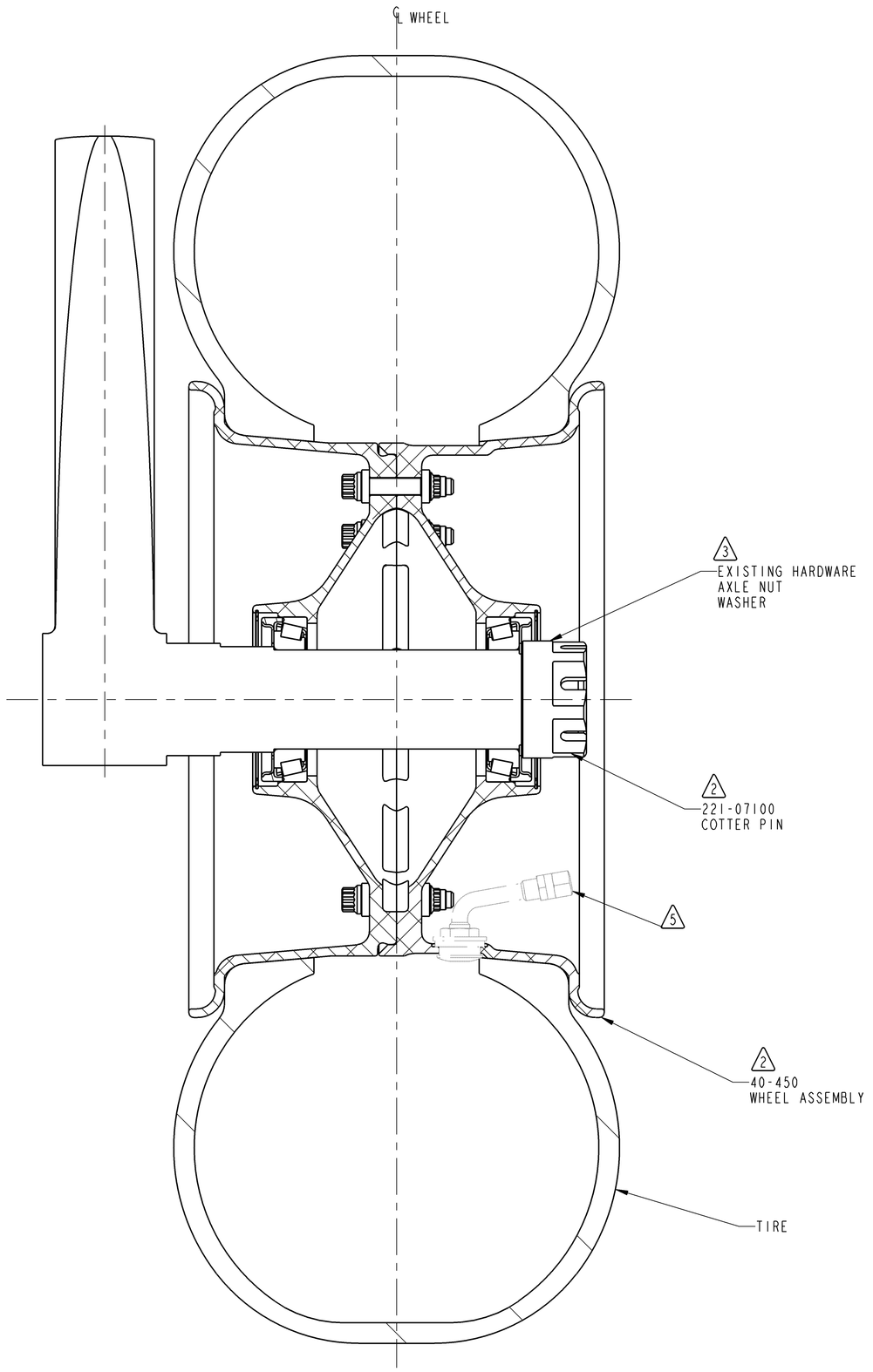
199-256
Rev. NC 02-22-2005 (DCN 0364-
Rev. A 04-26-2005 (DCN 0365-49)
Rev. B 11-17-2005 (DCN 0367-83)
Rev. C 06-30-2006 (DCN 0370-49)
Rev. D 12-21-2006 (DCN 0373-01)
Rev. E 11-26-2007 (DCN 0377-46)
Rev. F 11-11-2011 (DCN 0394-69)
Rev. G 08-24-2012 (ECO-0014166)

| REVISIONS | | | | | | |
|---|---|---|---|---|---|---|
| CHANGE NOTICE | REV | DESCRIPTION OF CHANGE | CHG BY | CHK BY | DATE | APPROVED |
| 0364-75 | N/C | INITIAL RELEASE | GL | GR | 02-22-2005 | P.KRONZ |

APPLICABILITY OF AIRCRAFT INSTALLATION
CLEVELAND KIT 199-256

| MODEL | TIRE SIZE | INFLATION PRESSURE |
|---|---|---|
| BEECH 1900C AND 1900D | 19.5 X 6.75-8 10 PLY RATED TUBELESS TIRE<br><br>OR<br><br>19.5 X 6.75-8, 10 PLY RATED TUBE TYPE TIRE | PER AIRCRAFT MANUAL |




SECTION A-A

NOTES:

1. READ THE INSTALLATION MANUAL BEFORE INSTALLING.
2. THESE PARTS ARE SUPPLIED IN THE 199-256 KIT.
3. THIS EXISTING HARDWARE MUST BE RETAINED AND USED FOR THIS INSTALLATION.
4. WEIGH THE OLD NOSEWHEEL. SUBTRACT THE OLD NOSEWHEEL WEIGHT FROM THE NEW NOSEWHEEL WEIGHT TO DETERMINE THE WEIGHT CHANGE CREATED BY THE 199-256 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.
5. THE WHEEL ASSEMBLY IS SUPPLIED FOR USE WITH A TUBE TYPE TIRE. TO CONVERT THE WHEEL ASSEMBLY FOR USE WITH A TUBELESS TIRE, INSTALL ONE P/N 160-03500 AIR VALVE ASSEMBLY. P/N 160-03500 MUST BE ORDERED SEPARATELY.

OLD INSTALLATION

NOSE
WHEEL
WEIGHT_____LBS.

NEW INSTALLATION

NOSE
WHEEL
WEIGHT 6.3 LBS.

| 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.

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 ✓ PER ANSI B46.1

THIRD ANGLE PROJECTION

RAW MATERIAL:

A CONTRACT ALTERED ITEM EXISTS FOR THIS PART NUMBER.

PARTS LIST

| QTY | ITEM NO. | CAGE CODE | PART NO. | DESCRIPTION | MATERIAL/SPECIFICATION | WGT (LB) |
|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| STRESS | DATE | PROGRAM/CONTRACT NO. P0454 | |
| MFG ENGRG J.ROTH | 02-21-2005 | DRAWN G.LOPRESTI | 01-04-2005 |
| QUAL ASSUR R.SMALHEER | 02-18-2005 | CHECKED G.RODRIGUEZ | 02-22-2005 |
| RELEASE DATE: | - | ENGINEER P.KRONZ | 02-22-2005 |
| | | DESIGN APPROVAL P.KRONZ | 02-22-2005 |
| | | PROJ APPROVAL C.NASO | 02-16-2005 |

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

DWG. TITLE
INSTALLATION DRAWING

| SIZE | CAGE CODE | DWG. NO. | REV. |
|---|---|---|---|
| E | 33269 | 50-159 | N/C |

SCALE: 1.000 UNIT WGT. - SHEET: 1 OF 1

DWG. NO. 50-159 REV. N/C SHEET 1 / 1

PD-E-GENL-PE-00

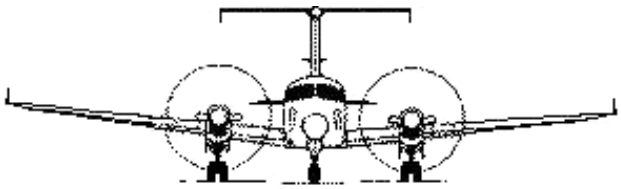
Technical Publication

# Conversion Kit Installation Manual With Illustrated Parts List

IM199-256

Nose Wheel Assembly
Part No. 40-450

Used On
Raytheon 1900C and 1900D
Initial Issue February 15, 2005



Cleveland Wheels & Brakes

**Parker Hannifin Corporation**
Aircraft Wheel & Brake
Avon, Ohio 44011 USA Cage Code 33269

# *STOP!*

***PLEASE COMPLETE AND RETURN THE ATTACHED REGISTRATION CARD. IT IS IMPORTANT THAT ALL INFORMATION IS LEGIBLY PRINTED. THIS DATA WILL ASSIST PARKER HANNIFIN, AIRCRAFT WHEEL & BRAKE TO NOTIFY END USERS OF SPECIFIC AIRWORTHINESS DOCUMENTS IF NECESSARY.***

# *- IMPORTANT -*

***MODEL YEAR AND SERIAL NUMBER EFFECTIVITY OF AN AIRCRAFT CAN AFFECT CONVERSION KIT INSTALLATION. AIRFRAME MANUFACTURER UPGRADES, SERVICE BULLETINS AND SIMILAR DOCUMENTATION CAN ALSO AFFECT HOW A KIT IS EQUIPPED.***

***BECAUSE OF THE MANY POSSIBLE AIRCRAFT CONFIGURATIONS, SOME KITS WILL NOT INCLUDE THE HARDWARE NEEDED TO COMPLETE THE KIT INSTALLATION. THESE ITEMS MUST BE OBTAINED SEPARATELY. MODIFICATIONS TO THE AIRFRAME CAN ALSO BE REQUIRED.***

***SEE SECTION 4.1 FOR ADDITIONAL INFORMATION SPECIFIC TO CONVERSION KIT NO. 199-256.***

For technical assistance, contact the

**TECHNICAL SERVICES HOTLINE:**

techhelp@parker.com

Fax: 440-937-5409

1-800-BRAKING (272-5464) Tel.: 440-937-1315

## LIST OF REVISIONS

| Revision | Date | Section/Page No. | Description Of Change | Apvd |
|---|---|---|---|---|
| NC (DCN 0364-75) | 02-15-2005 | All sections/All pages | Initial Release | PK |
| A (DCN 0367-83) | 11-17-2005 | Page 1, Section 4.0 | Added STC Number SA02204CH To Table 1 | BB |
| | | Page 10, Section 12.0 | Added STC Number SA02204CH And AMMS | |

## TABLE OF CONTENTS

## 1.0 INTRODUCTION

The information herein addresses the installation of a Cleveland Conversion Kit. It is published for the guidance of qualified maintenance personnel responsible for the installation of a Cleveland Conversion Kit, manufactured by Parker Hannifin Corporation, Aircraft Wheel and Brake.

## 1.1 PURPOSE

This manual provides the necessary procedures to accomplish the installation of an STC'd Cleveland Conversion Kit. For information regarding service limits, maintenance and component overhaul, a copy of the Cleveland Wheels and Brakes Component Maintenance Manual, CM40-450 is included in this kit. The manuals should be passed on to the owner or retained by the maintenance facility for future reference.

## 2.0 TSO NOTICE

The nose wheel used in this STC'd conversion kit carries a "TSO" marking which identifies it as having been fully laboratory tested and qualified to meet the applicable Federal Aviation Agency (FAA) specifications and requirements.

Modifications or use of unapproved parts will void the TSO qualification and warranty for the wheel assembly.

## 3.0 PRODUCT REGISTRATION

The product registration card is located at the front of this manual. The card is our way of tracking the conversion kits and your guarantee of receiving any future airworthiness information applicable to Conversion Kit No. 199-256. Please fill out the registration card completely and return promptly. Postage is prepaid.

## 4.0 KIT APPLICABILITY

**NOTE:** Service bulletins, service letters and similar documentation issued by the airframe manufacturer or other STC installations can affect the installation of Conversion Kit No. 199-256. Contact the airframe manufacturer for documentation applicable to your model aircraft and review the maintenance log for any other STC's installed for compatibility before installing Conversion Kit No. 199-256.

Table 1 Kit Applicability

| MAKE | STC | MODELS (SERIAL NUMBERS) |
|---|---|---|
| Raytheon Aircraft | SA02204CH | 1900C and 1900D |

## 4.1 KIT EQUIPMENT

Refer to section 12.0 for the kit parts list.

Review this installation manual, IM199-256 and the installation drawing, 50-159 completely before removal of existing original equipment and installation of 199-256 kit equipment.

a. The following hardware is not included in the 199-256 Conversion Kit:
   - Axle hardware: nut, washer and spacer.

b. The following hardware is included in the 199-256 Conversion Kit:
   - Axle hardware: cotter pin.

The 40-450 wheel assembly is not configured with an air valve assembly. If you are using a tubeless tire you must order Parker Hannifin P/N 160-03500 air valve assembly to configure this kit for use with a tubeless tire. Refer to component maintenance manual CM40-450 for more information.

## 5.0 SAFETY

Follow proper safety precautions when servicing aircraft braking systems.

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

## 6.0 ORDER INFORMATION

To order spare parts, contact the nearest Parker Hannifin, Aircraft Wheel and Brake distributor in your area, or contact Aircraft Wheel and Brake at the following address or numbers:

Parker Hannifin Corporation
Aircraft Wheel & Brake Division
1160 Center Road
Avon, Ohio 44011 U.S.A.
Attn: Technical Services/Hotline

Websites: www.parker.com/ag/wbd
www.clevelandwheelsandbrakes.com
E-mail: techhelp@parker.com
Fax: (440) 937-5409
Tel: 1-800-BRAKING (1-800-272-5464)
(440) 937-1315

## 7.0 EQUIPMENT DESCRIPTION

For a complete parts breakdown and fastener torque values of the wheel assembly, refer to CM40-450 Component Maintenance Manual.

The wheel halves are made from aluminum alloy forgings. The wheel conforms to all tire and rim association standards for a 6.50-8 divided type wheel, suitable for use with a 19.5 x 6.75-8 10 PR tubeless or tube type tire.

The 40-450 wheel assembly is not configured with an air valve assembly. If you are using a tubeless tire you must order Parker Hannifin P/N 160-03500 air valve assembly to configure this kit for use with a tubeless tire. Refer to component maintenance manual CM40-450 for more information.

## 8.0 GENERAL INFORMATION

The wheels are shipped from the factory as a complete assembly for use with a tube type tire. The bearing cones are packed with grease and installed in the wheel halves.

## 9.0 KIT INSTALLATION

Review this installation manual, IM199-256 and the installation drawing, 50-159 completely before removal of existing original equipment and installation of 199-256 kit equipment.

**SAFETY WARNING:** INSURE AIRCRAFT IS SECURE AND STABLE BEFORE BEGINNING ANY WORK. WORKING UNDER AN IMPROPERLY STABILIZED AIRCRAFT CAN CAUSE INJURY OR DEATH.

**SAFETY WARNING:** COMPLETELY DEFLATE THE TIRE BEFORE REMOVING THE VALVE CORE. VALVE CORES UNDER PRESSURE CAN BE EJECTED LIKE A BULLET AND CAUSE INJURY OR DEATH.

### 9.1 REMOVE THE ORIGINAL EQUIPMENT

**CAUTION:** ALWAYS CHECK THE CONDITION OF ORIGINAL EQUIPMENT HARDWARE THAT WILL BE RETAINED SUCH AS AXLE WASHERS, AXLE NUTS, ETC. REPLACE THESE ITEMS AS NEEDED.

a. Properly raise and support the aircraft by following the airframe manufacturer's instructions.

b. Remove the cap from the tire inflation valve and slowly deflate the tire.

c. Confirm that the tire is completely deflated.

d. When all the tire pressure has been released, remove the valve core from the inside of the valve stem.

**NOTE:** A new cotter pin is supplied as part of the 199-256 kit.

e. Remove and retain the axle nut and washer. Discard the old cotter pin.

f. Remove the original equipment nose wheel from the axle.

## 9.2 INSTALL THE CLEVELAND EQUIPMENT

Refer to installation drawing, 50-159, CM40-450 Component Maintenance Manual and section 12.0 Kit Parts List, for item number identification. Item numbers are in parenthesis.

### 9.2.1 Mount the Tire

a. To facilitate the installation of the wheel assembly onto the axle later, remove the retaining ring (60), bearing seal (55), and the bearing cone (50) from the outboard wheel half (45). Place the removed items on a clean surface to avoid contamination.

**NOTE:** You do not need to remove the retaining ring (60), bearing seal (55), and the bearing cone (50) from the inboard wheel half (30).

b. Remove all nine nuts (15), eighteen washers (10), and nine bolts, (5), then separate the wheel halves.

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

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

e. The preformed packing (20) groove in each wheel half should be examined for damage or other debris that would prevent the packing from properly seating. Remove any lubricant, grease or foreign material with a clean cloth moistened with a mild soap and water solution or with denatured alcohol.

#### 9.2.1.1 Tubeless Tire

a. Examine the inflation valve grommet (70) for damage such as cuts, tears, cracking. Replace if necessary. Install the grommet dry. Re-install the inflation valve assembly (65) in the outboard wheel half (45) and dry torque the valve nut to 20 to 45 lb-in (2,56 to 5,08 N-m)

b. Place the inboard wheel half subassembly (25) on a clean work surface with the register side facing up.

**NOTE:** The register is the area where the wheel halves contact each other.

c. Remove and examine the preformed packing (20) for damage. Replace if necessary.

(1) Apply a light coat of wheel bearing grease to the preformed packing before installation.

**CAUTION:** THE PREFORMED PACKING (20) MUST BE INSTALLED UNIFORMLY. IT SHOULD BE FREE OF KINKS AND TWISTS.

(2) Re-install the preformed packing in the wheel register groove of the inboard wheel half (30).

**CAUTION:** COMPOUNDS SUCH AS TALC INCREASE TIRE SLIPPAGE. REMOVING TALC WILL MINIMIZE TIRE SLIPPAGE ON THE WHEEL.

d. Make sure that the tire is clean inside. If it is not clean then wipe the bead seat base with a mild soap and water solution or with a suitable rubber cleaner.

**CAUTION:** WHEN YOU INSTALL A TIRE, DO NOT APPLY A LUBRICANT TO THE TIRE OR THE WHEEL BEAD SEAT. A LUBRICANT CAN CAUSE THE TIRE TO SLIP IN SERVICE AND DAMAGE THE WHEEL BEAD SURFACE.

e. Position the tire on the inboard wheel half (30) being careful not to move the preformed packing (20).

f. Place the outboard wheel half (45) inside the tire and align the bolt holes of both wheel halves.

g. Align the red balance dot on the tire with the inflation valve assembly.

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

(a) Align the tire serial number with the inflation valve assembly.

### 9.2.1.2 Tube Type Tire

**NOTE:** The preformed packing (20) does not need to be installed when using a tube type tire.

**CAUTION:** COMPOUNDS SUCH AS TALC INCREASE TIRE SLIPPAGE. REMOVING TALC FROM THE TIRE BEADS WILL MINIMIZE TIRE SLIPPAGE ON THE WHEEL.

a. Make sure that the tire is clean inside. If it is not clean then wipe the bead seat base with a mild soap and water solution or with a suitable rubber cleaner.

**CAUTION:** WHEN YOU INSTALL A TIRE, DO NOT APPLY A LUBRICANT TO THE TIRE OR THE WHEEL BEAD SEAT. A LUBRICANT CAN CAUSE THE TIRE TO SLIP IN SERVICE AND DAMAGE THE WHEEL BEAD SURFACE.

**CAUTION:** APPLY TIRE TALC TO THE TIRE TUBE ONLY. TIRE TALC ON THE TIRE BEADS CAN CAUSE THE TIRE TO SLIP IN SERVICE AND DAMAGE THE WHEEL BEAD SURFACE OR TUBE VALVE STEM.

b. Lubricate or dust the tire tube lightly with tire talc. This will prevent the tube from sticking to the inside of the tire or to the tire beads. It also helps the tube assume its normal shape inside the tire during inflation and lessens the chances of wrinkling or thinning from irregular stretching

c. Inflate the tube with dry nitrogen to slightly round, and insert the tube in the tire.

**NOTE:** The tube heavy spot is indicated by a painted yellow stripe about ½ inch wide by 2 inches long.

d. Align the stripe on the tube with the tire red balance dot.

   (1) If the tube has no balance mark.

      (a) Align the tube valve with the tire red balance dot.

e. Position the tire and tube on the outboard wheel half (45) inserting the valve stem through the valve hole in the wheel half tubewell.

f. Place the inboard wheel half (30) inside the tire and tube, so that the bolt holes in both wheel halves are aligned.

### 9.2.2 Attach the Wheel Half Subassemblies (25) and (40)

**CAUTION:** USE ONLY THE ANTI-SEIZE COMPOUND SPECIFIED. THE USE OF ANOTHER COMPOUND WILL RESULT IN IMPROPER FASTENER TENSION AND COULD LEAD TO FAILURE OF THE FASTENERS AND SUBSEQUENT FAILURE OF THE WHEEL.

**NOTE:** Lubricate hardware as needed just prior to installing.

a. Refer to Figure 1 and lubricate the hardware with anti-seize compound per AMS2518.

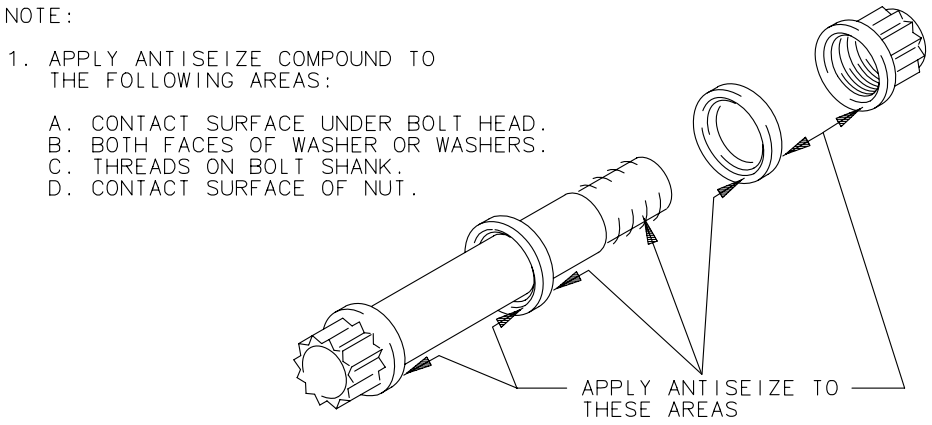



Figure 1 Apply Anti-Seize Compound

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

b. Install a minimum of three washers (10) and bolts (5) in the inboard wheel half (30) equally spaced, then:

   (1) Compress the wheel halves and install a washer (10) onto the threaded end of each bolt.

   (2) Then, install a nut (15) and tighten the nuts by hand.

c. Install the remaining bolts, washers and nuts such that all nine nuts and bolts and eighteen washers are installed.

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

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

d. Use the following steps and torque all of the nuts (15).

(1) Step one: (1/3 final torque): Torque to 35 to 40 lb-in (3,95 to 4,33 N-m) in a criss-cross pattern.

(2) Step two: (2/3 final torque): Torque to 70 to 77 lb-in (7,91 to 8,66 N-m) in a criss-cross pattern.

(3) Step three: (Final torque): Torque to 105 to 115 lb-in (11,9 to 13,00 N-m) in a criss-cross pattern.

### 9.2.3 Inflate the Tire

**SAFETY WARNING:** ALWAYS PLACE THE TIRE IN AN INFLATION CAGE BEFORE INFLATING. INFLATING THE TIRE CAN BE VERY DANGEROUS. THE TIRE CAN EXPLODE. FAILURE TO USE AN INFLATION CAGE CAN CAUSE SERIOUS INJURY OR DEATH. SERVICE THE TIRE WITH INFLATION EQUIPMENT DESIGNED FOR THIS OPERATION.

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

a. Inflate the tire to the tire manufacturer's specifications to seat the tire beads on the wheel. Then reduce the tire pressure to the recommended storage pressure and remove the wheel/tire assembly from the inflation cage.

### 9.2.4 Install the Wheel/Tire Assembly On the Aircraft

a. Examine the axle and nut for burrs or rough threads. The axle nut should rotate freely on the axle and not exhibit any drag or resistance. Apply a thin coat of the wheel bearing grease to the axle threads and all the bearing surfaces of the existing axle washer and axle nut and place to the side.

b. Mount the wheel/tire assembly on the axle.

c. Install the outboard bearing cone (50), bearing seal (55), and retaining ring (60) that was removed earlier (reference 9.2.1).

d. Install the existing axle washer and the axle nut.

### 9.2.5 Tighten the Axle Nut

a. Tighten the axle nut to 150 to 200 lb-in of torque while rotating the wheel to insure proper seating of the bearings. Back off the axle nut to zero torque (0 lb-in).

b. Tighten the axle nut until the outboard grease seal (55) does not rotate while rotating the wheel.

**CAUTION:** DO NOT EXCEED 200 LB-IN (22,6 N-M) OR 30° OF AXLE NUT ROTATION ON FINAL TORQUE.

c. Continue to tighten the axle nut until the first castellation is aligned with the cotter pin hole in the axle threads.

**NOTE:** The axle nut torque must be a minimum of 40 lb-in (4,5 N-m).

d. Install a new cotter pin.

**SAFETY WARNING:** INFLATE THE TIRE TO THE SERVICE OPERATING PRESSURE ONLY AFTER THE AXLE NUT IS SECURE.

e. Inflate the tire to the service operating pressure.

## 10.0 WEIGHT AND BALANCE COMPUTATIONS

Refer to the aircraft equipment list located in the Pilot's Operating Handbook for the weight of the existing nose wheel. Subtract from the new weights to derive weight change created by the kit installation. Multiply the weight increase by the applicable aircraft moment and revise the weight and balance information in the log book.

### 10.1 WEIGHT AND BALANCE DATA

New installed (per gear leg)

Nose wheel assembly.....6.3 lbs. (2,86 Kg.)

**NOTE:** This weight does not include the tire or tube.

Complete form 337 and make appropriate log book entries.

## 11.0 PILOT OPERATING MANUAL INSERTS

Inserts are located in front with conversion kit documentation.

Attach the label in the Pilot Operating Manual as close as possible to the original section labeled Nose Wheel Assembly. Enter the correct arm and moment in the blocks provided. Zero the items out for the original nose wheel that was removed.

Inserts are reprinted below for reference:

| | | | |
|---|---|---|---|
| X | One 6.50-8 Type III Wheel Assembly<br>Cleveland P/N 40-450 | 6.3 lb | 29.3 inch |

## 12.0 KIT PARTS LIST

| (1) ITEM NUMBER | PART NUMBER | DESCRIPTION | QUANTITY |
|---|---|---|---|
| (2) 1 | 40-450 | Nose Wheel Assembly | 1 |
| 2 | 221-07100 | Cotter Pin (MS24665-428) | 1 |
| | IM199-256 | Installation Manual for | 1 |
| | 50-159 | Installation Drawing | 1 |
| | AMMS199-256 | Airplane Maintenance Manual Suplement | 1 |
| | CM40-450 | Component Maintenance Manual | 1 |
| | SA02204CH | Supplemental Type Certificate | 1 |
| | PRM78 | Wheel Assemblies-Alternate Bearing Grease | 1 |
| | - - - - - | Pilot Operating Manual Inserts | 1 |
| | - - - - - | Product Registration Card | 1 |

(1) Refer to 50-159 Installation Drawing.

(2) For a complete parts breakdown, refer to Component Maintenance Manual CM40-450.

# FAA APPROVED

# AIRPLANE MAINTENANCE MANUAL SUPPLEMENT

FOR

RAYTHEON AIRCRAFT COMPANY (BEECH)
AIRCRAFT MODELS
1900C AND 1900D

THOSE AIRCRAFT MODIFIED IN
ACCORDANCE WITH

STC SA02204CH

This supplement, which includes the Component Maintenance Manual for Parker Hannifin Corporation, Aircraft Wheel & Brake Division, Nose Wheel Model 40-450, must be attached to the Airplane Maintenance Manuals when the aircraft is modified per the above listed STC.

In addition an aircraft logbook entry referring to this document must be made to insure that maintenance personnel have available a record of this inspection requirement.

The information in this document supplements or supersedes the basic airplane maintenance manual only where covered in the items contained herein. For limitations and procedures not contained in this supplement, consult the basic Airplane Maintenance Manuals.

Aircraft: Model Number _____

Registration Number _____

Serial Number _____

FAA Approved For: Mary Ellen Schutt
Chicago Aircraft Certification Office
Federal Aviation Administration
Des Plaines, IL

Date: November 29, 2005

Technical Publication

# Component Maintenance Manual With Illustrated Parts List

## CM40-450
## Nose Wheel Assembly

## Parker Hannifin
## Part No. 40-450

Used On
Beech 1900C and 1900D

Initial Issue
December 01, 2004



Cleveland Wheels & Brakes

**Parker Hannifin Corporation**
Aircraft Wheel & Brake
Avon, Ohio 44011 Cage Code 33269

TO: HOLDERS OF CM40-450 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR NOSE WHEEL ASSEMBLY PART NO. 40-450.

Attached to this transmittal letter is Revision NC of CM40-450 (dated December 01, 2004)

**Revision NC, Dated December 01, 2004**

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 0364-02) |

TO: HOLDERS OF CM40-450 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR NOSE WHEEL ASSEMBLY PART NO. 40-450.

Attached to this transmittal letter is Revision A pages of CM40-450 (dated November 03, 2005)

**Revision A, Dated November 03, 2005**

REVISION A CONTAINS RR-1, LEP-1, T/C-1, AL-1, DESCRIPTION & OPERATION PAGES 1 & 2, 1002, 5002, AND 7007 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 |
|---|---|
| RR-1 | Add Distribution of Manual Revisions Section, and add "Instructions" Section heading. (DCN 0367-65) |
| LEP-1 | Update applicable effective dates, and add new pages, AL-1 & AL-2 |
| T/C-1 | Add new pages, AL-1 |
| AL-1 | Add new Airworthiness Limitations Section |
| Description & Operation, pp 1&2 | Move "4. Specifications" to page 1, and revise Table 1, Maintenance Schedule, on page 2. |
| 1002 | Sections 2. B. (2) & 2, B. (5) (a): Delete "with dry nitrogen". |
| 5002 | Section 2. A. (1): Add "or liquid penetrant inspection . . . ." Section 2. A. (3): Add "Examine the nuts (15) for cracks. Use magnetic particle inspection . . . . . " |
| 7007 | Section 2. G. (2): " adjust to 60 – 65 psig MAX. (or to a lower operating pressure if specified by aircraft manual). was " . . adjust to operating pressure specified by aircraft manual. Use dry nitrogen to inflate". |

TO: HOLDERS OF CM40-450 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR NOSE WHEEL ASSEMBLY PART NO. 40-450.

Attached to this transmittal letter is Revision B pages of CM40-450 (dated June 30, 2006)

**Revision B, Dated June 30, 2006 (DCN 0370-49)**

REVISION B CONTAINS RR-1, LEP-1, DESCRIPTION & OPERATION PAGES 1, 6001, 7001AND 9001 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 |
|---|---|
| RR-1 | ADDED 2 alternate greases to tables 6001, 7001 and 9001.and update required pages. |
| LEP-1 | Update applicable effective dates on pages revised |
| Description & Operation pp 1 | Wheel Bearing Lubricant SEE TABLES 7001, 6001 AND 9001 (WAS)<br>Wheel Bearing Lubricant MIL-PRF-81322, GRADE 2 OR DOD-G-24508A |
| 6001 | ADDED “Mobil Aviation Grease SHC 100 or Mobilux EP2 (at Ambient Temps. Above -20ºF) Mobil Oil Corp. Shoreham Building Washington, DC 2005<br>www. Exxonmobil. Com” to table 6001 |
| 7001 | ADDED “ www.shell-lubricants.com” and “Mobil Aviation Grease SHC 100 or Mobilux EP2 (at Ambient Temps. Above -20ºF) Mobil Oil Corp. Shoreham Building Washington, DC 20005” and “www. Exxonmobil. Com” to table 6001 |
| 9001 | ADDED “ www.shell-lubricants.com” and “Mobil Aviation Grease SHC 100 or Mobilux EP2 (at Ambient Temps. Above -20ºF) Mobil Oil Corp. Shoreham Building Washington, DC 20005” and “www. Exxonmobil. Com” to table 6001 |

TO: HOLDERS OF CM40-450 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR NOSE WHEEL ASSEMBLY PART NO. 40-450.

Attached to this transmittal letter is Revision C of CM40-450 (dated February 03, 2012)

**Revision C, Dated February 03, 2012**

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 | DCN 0395-46 |
| Title page/T-1 | (ADD) Export compliance |
| Record of Revisions/RR-1 | Update to reflect latest revision. |
| List of Effective Pages/LEP-1 | Update applicable pages to reflect latest revision. |
| Introduction/INTRO-1 | (ADD) Export compliance statement<br>(UPDATE) Data rights statement. |
| 7001 | Table 7001,Dow Corning 55 Lube<br>(DELETE) 'or a lube per MIL-G-4343…or Commercial Source' |
| 7003 | Paragraph 2.C.(2) (a)<br>(NOW) Apply a light coat of Dow Corning 55 O-ring lube to the preformed packing before installation.<br>(WAS) Apply a light coat of wheel bearing grease to the preformed packing before installation. |
| 10005 | Detailed parts list<br>(REVISE) Item 20, 101-50262, Preformed Packing, Qty NP SUPSD BY ITEM 20A<br>(ADD) Item 20A, 101-26600, Preformed Packing, Qty 1 SUPSDS ITEM 20 |

# RECORD OF REVISIONS

## Distribution of Manual Revisions

Upon Installation of Nose Wheel Conversion Kit 199-256 on Raytheon (Beech) Aircraft Models 1900C or 1900D, the owner/operator is required to register the aircraft per Kit Registration Card sent to Parker Hannifin Corporation, Aircraft Wheel & Brake Division. All Registered Owner/Operators will receive Hard Copies of all subsequent Revisions to this manual.

## Instructions

Retain this record in front of manual. On receipt of revision, insert revised pages in the manual, and enter revision letter, date inserted and initial.

| REV. | DATE ISSUED | DATE INSERTED | BY | REV. | DATE ISSUED | DATE INSERTED | BY |
|---|---|---|---|---|---|---|---|
| NC | 12-01-2004 | 12-01-2004 | PHC | | | | |
| A | 11-03-2005 | 11-03-2005 | PHC | | | | |
| B | 06-30-2006 | 06-30-2006 | PHC | | | | |
| C | 02-03-2012 | 02-03-2012 | PHC | | | | |
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## SERVICE BULLETIN LIST

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

| SERVICE BULLETIN NUMBER | SUBJECT | REV. | DATE INCORPORATED |
|---|---|---|---|
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## LIST OF EFFECTIVE PAGES

## TABLE OF CONTENTS

# AIRWORTHINESS LIMITATIONS

RAYTHEON (BEECH) AIRCRAFT MODELS 1900C AND 1900D,
EQUIPPED WITH
PARKER HANNIFIN CORPORATION
AIRCRAFT WHEEL & BRAKE DIVISION
NOSE WHEEL CONVERSION KIT 199-256
PER

STC SA02204CH

The Airworthiness Limitations section is FAA Approved and specifies maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA Approved.

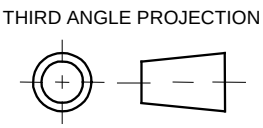
***There are no airworthiness limitations associated with this STC.***

# INTRODUCTION

## 1. General

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

This manual is published for the guidance of personnel responsible for the overhaul and/or maintenance of the Parker Hannifin Assembly covered in this publication.




Third angle projection utilized. All weights and measurements are in U.S. English units followed by S.I. metric units in parentheses.. English units (default in inches) are shown with a period for the decimal point and Metric units (default in millimeters) are shown with a comma for the decimal point. Large numbers with five or more digits to the left of the decimal point have a space (instead of a comma) between the “thousands” and “hundreds” digits to prevent confusion with metric decimal points.

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

The manufacturer recommends that you ask for the latest revision of the manual before continuing with overhaul or maintenance operations. Ask the Technical Services Department of the Aircraft Wheel & Brake Division for the latest revision.

Parker Hannifin Corporation
Aircraft Wheel & Brake Division
1160 Center Road
Avon, Ohio 44011 U.S.A.
Attn: Technical Services/Hotline

Websites: www.parker.com/ag/wbd
www.clevelandwheelsandbrakes.com
E-mail: techhelp@parker.com
Fax: (440) 937-5409
Tel: 1-800-BRAKING (1-800-272-5464)
(440) 937-1315

## 2. Data Rights and Export Statement

## INTRODUCTION

### 3. TSO Notice

This assembly is certified for FAR Part 23 usage. It is identified with a "TSO-C26d" marking. This assembly has been tested and qualified to FAA (Federal Aviation Administration) requirements and specifications.

### 4. Manual Use

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

A. Warnings and Cautions and Notes

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

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

### 5. Replacement Parts

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

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

## DESCRIPTION AND OPERATION

### 1. Description

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

The wheel assembly has a rim contour designed for a 19.5 X 6.75-8, 10PR tubeless or tube type tire.

**CAUTION:** FOR TUBELESS USE, PARKER HANNIFIN P/N 160-03500 MUST BE USED (ORDER SEPARATELY).

The divided type wheel facilitates tire installation and removal. The two wheel halves are fastened together with high strength bolts (5), double countersunk washers (10), and self-locking nuts (15). The wheel halves are machined from forged aluminum alloy.

A preformed packing (20) 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.

The wheel assembly rotates on two tapered roller bearings consisting of the cups (35) and cones (60). The bearing cups are shrink fit into the hub of the wheel halves. Molded rubber bearing seals (65) with stainless steel reinforcement rings provide retention of bearing grease and exclusion of contaminants.

### 2. Operation

The nose wheel assembly provides the primary interface between the nose gear landing strut and tire during landing and taxiing and provides a means of steering control.

### 3. Handling Procedures

Strictly observe the deflation and inflation procedures, and the torque and lubtork values specified in this manual. Do not overtighten any bolt, nut, or fitting. Handle the wheel bearing cones with extreme care. Many bearing failures can be traced to dropping or mishandling the bearings during maintenance. Handle and maintain the wheel halves properly to protect the paint and surface finishes.

Careful handling of wheel components will assure a long service life and trouble-free operation.

### 4. Specifications

Wheel Material/Tire Size .. Aluminum Alloy Forging / 19.5 X 6.75-8, 10PR tubeless or tube type
For tubeless use, Parker Hannifin P/N 160-03500 must be used (order separately).
Wheel Nut Torque ..... 105 to 115 lb-in (11,9 to 13,0 N-m) with SAE AMS2518 anti-seize
Bearing Lubricant ..... see tables 6001, 7001 and 9001
Wheel Half Coatings .... Surface Pretreatment: ..... MIL-A-8625, Type II, Class 1
Primer: ..... Columbia Paint Corp, P/N 11-347Z
Topcoat: ..... Columbia Paint Corp P/N 11-358A Gloss White Enamel

## DESCRIPTION AND OPERATION

### 5. Maintenance Schedule

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

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

Table 1 Maintenance Schedule

| SCHEDULED MAINTENANCE | ITEM | TASK |
|---|---|---|
| At every tire change | All components | General inspection per Checks para. 1.B |
| | Inflation Valve (65)<br>(if used with tubeless tire) | a. Inspect per para. 2.E<br>b. Check torque (ref. Table 8002) 20-45 in-lb (2.56-5.08 N-m) |
| | O-Rings (20)<br>(if used with tubeless tire) | Replace |
| | Bearing Cups and Cones (35 and 50) | Inspection per Checks para. 2.B |
| | Bearing Seals (55) | Inspection per Checks para. 2.C |
| At the following tire changes:<br>5th , 10th , 15th , 18th , 21st , 24th | Wheel Halves (30 and 45) | a. Visual inspection per Checks para. 2.D.<br>b. Penetrant or eddy current inspect per para. 2.D. |
| | Bolts (5), Washers (10), Nuts (15), and Retaining Rings (60) | a. Visual inspection per para. 2.A.(1)<br>b. Magnetic particle inspect or liquid penetrant inspect per Checks para. 2.A |
| | All Components | Detailed inspection per para. 2. |
| At the 25th tire change and every tire change thereafter | Wheel Halves (30 and 45) | a. Visual inspection per Checks para. 2.D.<br>b. Penetrant or eddy current inspect per para. 2.D. |
| | Bolts (5), Washers (10), Nuts (15), and Retaining Rings (60) | a. Visual inspection per para. 2.A.(1)<br>b. Magnetic particle inspect or liquid penetrant inspect per Checks para. 2.A |
| | All Components | Detailed inspection per para. 2. |
| | Grommet (70) | Replace |
| Every tire change – or – 12 months whichever comes first | Bearing Cones (65) | Re-pack per Assembly para. 1.B |

## TESTING AND FAULT ISOLATION

### 1. General

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

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

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

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

A. Equipment and Consumables

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

**NOTE:** Unless specified differently, you can use equivalent alternatives for the items listed.

Table 1001 Equipment and Consumables

| NOMENCLATURE/ PART NO. | SPECIFICATION / SOURCE OF SUPPLY |
|---|---|
| Inflation Cage | Commercial Source |
| Dry nitrogen | Commercial Source |
| Tire Pressure Gage | Commercial Source |
| Socket Set/ Wrench Set | Standard 12 Pt. (Dbl. Hex) and Std. Hex Head, (inch units), Commercial Source |
| Torque Gage | Commercial Source |
| Soap Solution | Mild Dishwashing Liquid, Commercial Source |
| Brushes | Non-Metallic Soft Bristle, Commercial Source |

### 2. Test The Wheel Assembly

**SAFETY WARNING:** ALWAYS PLACE THE TIRE IN AN INFLATION CAGE BEFORE YOU INFLATE THE TIRE. INFLATING THE TIRE CAN BE VERY DANGEROUS. THE TIRE CAN EXPLODE. FAILURE TO USE AN INFLATION CAGE CAN CAUSE SERIOUS INJURY OR DEATH.

## TESTING AND FAULT ISOLATION

A. Pretest Check
Do these examinations and check procedures to approve the wheel assembly for testing.

(1) Do a visual check of the wheel for corrosion, cracks, loose bearing cups, or other visible damage.

(2) Examine all threaded components to make sure they have not become loose. These include the bolts (5) and the nuts (15). If a loose component is found, tighten it. Refer to Table 8001, Torque Values.

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

(3) If so equipped, examine the nut on the inflation valve assembly (65) for looseness. If loose, then tighten it. Refer to Table 8001, Torque Values.

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

**NOTE:** Refer to the tire manufacturer's service and maintenance manuals for tire service procedures.

B. 24 Hour Pressure Test

**CAUTION:** COVER THE HUB OPENINGS OF THE WHEEL HALVES TO PREVENT CONTAMINATION OF THE BEARINGS.

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

(2) Inflate the tire to 60 psig (4,14 bar).

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

(b) Measure the tire pressure. If necessary, re-inflate to 60 psig (4,14 bar) again.

(3) The wheel and tire assembly must hold the service inflation pressure for 24 hours. A maximum five percent pressure drop [3 psig (0,21 bar)] is allowed.

(4) Pressure drop is less than five percent.

(a) The test is completed. Remove the wheel and tire assembly from the inflation cage.

(5) Pressure drop is more than five percent.

(a) Put the wheel and tire assembly in an inflation cage. Inflate the tire to 60 psig (4,14 bar).

(b) For a tube type tire, apply a soap and water solution to:

– the tire tube valve stem area.

Examine for air leaks.

## TESTING AND FAULT ISOLATION

(c) For a tubeless tire, apply a soap and water solution to:

– the inflation valve assembly (65)

– the tire bead area

– the area where the wheel halves contact each other (known as the wheel register area)

Examine for air leaks.

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

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

(b) Do the pressure test again.

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

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

3 Do the pressure test again.

(7) For a tubeless tire, air leaks occur around the inflation valve assembly (65).

(a) The inflation valve assembly nut can be loose. Refer to Table 8002, Torque Values and tighten it.

(b) Do the pressure test again.

1 If the part continues to leak, remove the part and examine the mating surfaces on the outboard wheel half (45). Examine the grommet and replace if necessary.

2 Install the parts. Do the pressure test again.

(8) For a tubeless tire, air leaks occur around the tire bead

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

(b) Refer to the DISASSEMBLY section and remove the tire from the wheel assembly.

(c) Examine the tire bead and wheel bead seat for damage. Use the instructions that follow.

1 Examine the tire bead. If the tire is cut or damaged, install a new tire. Refer to the ASSEMBLY section.

2 Disassemble the wheel. Refer to the DISASSEMBLY section.

3 Examine the wheel bead seat. Refer to the CHECKS section.

4 If the wheel bead seat is damaged, repair the wheel. Refer to the REPAIR section.

## TESTING AND FAULT ISOLATION

5 Assemble the wheel. Refer to the ASSEMBLY section.

6 Install the tire. Refer to the ASSEMBLY section.

7 Do the 24 hour pressure test again.

(9) For a tubeless tire, air leaks occur through the wheel

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

(b) Refer to the DISASSEMBLY section and remove the tire from the wheel assembly.

(c) Examine the wheel. Use the instructions that follow.

1 Disassemble the wheel. Refer to the DISASSEMBLY section.

2 Liquid penetrant inspect the wheel halves (30 and 45) for cracks. Refer to the CHECKS section. If cracks are found, replace the wheel half.

3 Assemble the wheel. Refer to the ASSEMBLY section.

4 Install the tire. Refer to the ASSEMBLY section.

5 Do the 24 hour pressure test again.

(10) For a tubeless tire, air leaks occur where the wheel halves contact each other (known as the wheel register area)

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

(b) Refer to the DISASSEMBLY section and remove the tire from the wheel assembly.

(c) Examine the register area of each wheel half for damage. Examine the seal groove area of each wheel half for damage. Examine the preformed packing (20) for damage. Use the instructions that follow.

1 Examine the preformed packing. If the preformed packing is cut, torn, deformed or has other damage, install a new preformed packing. Refer to the ASSEMBLY section.

2 Disassemble the wheel. Refer to the DISASSEMBLY section.

3 Examine the wheel halves. Refer to the CHECKS section.

4 If the wheel register is damaged, repair the wheel. Refer to the REPAIR section.

5 If the sealing groove area is damaged, replace the wheel half.

6 Assemble the wheel. Refer to the ASSEMBLY section.

7 Do the 24 hour pressure test again.

## TESTING AND FAULT ISOLATION

### 3. Troubleshooting

Table 1003 Troubleshooting is a list of the possible problems you can find while operating the wheel assembly. The table includes possible causes and the corrective action. Table 1003 cannot list all the possible problems. It is a reference to help you find the cause of the problem.

Table 1002 Troubleshooting

| PROBLEM | POSSIBLE CAUSE | CORRECTION |
|---|---|---|
| Loss of tire pressure. | The packing (20) on the wheel register is worn, damaged or twisted on the mating groove. | Replace the packing and align on mating groove taking care not to twist packing. |
| | The rubber grommet on the inflation valve (70) is damaged. | Replace the grommet. |
| | Inflation valve (65) is damaged. | Replace the inflation valve. |
| | Damage to sealing surface on the outer wheel half where the inflation valve rubber grommet seals | Replace the wheel half. |
| | Loss of the preload on wheel bolts (5). | Examine and replace the self-locking nuts (15) if the locking feature is defective. |
| | The wheel half (30 or 45) is cracked.<br>**NOTE:**<br>Use Liquid Penetrant Inspection to examine the wheel half for cracks at or near the surface. Refer to paragraphs 2.D. (4) in the CHECKS section. Liquid Penetrant Inspection will not detect cracks below the wheel surface. This method only scans the near surface. | Examine the wheel half for cracks. Refer to the CHECKS section.<br>**NOTE:**<br>A cracked wheel half cannot be repaired. |
| Excessive drag on the wheel when rotating. | Incorrect preload or torque on the axle nut. | Loosen and re-tighten the axle nut to the aircraft manufacturer's specifications. |

## TESTING AND FAULT ISOLATION

Table 1002 Troubleshooting (continued)

| PROBLEM | POSSIBLE CAUSE | CORRECTION |
|---|---|---|
| Excessive drag on the wheel when rotating. | Damage to the bearing cones (50) or bearing cups (35). | Examine the bearing cones and cups. Replace any parts that are damaged or corroded. Pack the new cones with bearing grease. Refer to the ASSEMBLY section. |
| Cracked or damaged wheel half (30 or 45).<br>**NOTE:**<br>Use Liquid Penetrant Inspection to examine the wheel half for cracks at or near the surface. Refer to paragraphs 2.D. (4) in the CHECKS section. Liquid Penetrant Inspection will not detect cracks below the wheel surface. This method only scans the near surface. | Hitting rocks or other hard objects during landing or takeoff. | Visually examine the wheel half for cracks and other damage. Refer to the CHECKS section. Find out if the part can be repaired. Refer to the REPAIR section.<br>**NOTE:**<br>A cracked wheel half cannot be repaired. |
| | Use of sharp objects to break the tire bead. | |
| | Hard landing or landing with a flat tire. | |
| | Wheel fatigue. | Replace the wheel or wheel half. |
| Damaged bearing cones (50) or bearing cups (35). | Bearings are not in alignment. | Replace the damaged part. |
| | Incorrect axle nut torque. | Replace the damaged part. Tighten the axle nut to the airframe manufacturer's specifications. |
| | Unwanted material in the bearing grease. | Replace the damaged part. Examine the bearing seals (55) for damage. Replace any seals that are damaged. Be sure the bearing grease is clean. |
| | Low or no bearing grease in the bearings. | Replace the damaged part. |

## TEST DATA SHEET

**Date** _____ **Wheel Serial No.** _____

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

(1) Wheel condition **Accept** _____ **Reject** _____
(2) Wheel assembly hardware condition **Accept** _____ **Reject** _____
(3) Tire condition **Accept** _____ **Reject** _____

Comments: _____

_____

_____

_____

**24 hour Pressure Test** **refer to paragraph 2.B.** **Accept** _____ **Reject** _____

Tire inflation pressure:_____ psig Required: 60 psig (4,14 bar)

Pressure after 24 hrs.:_____ psig Pressure Drop: five percent maximum [3 psig (0,21 bar)]

Pass ____ less than five percent pressure loss

Fail ____ more than five percent pressure loss

Leakage from tire tube valve stem or from tire tube: Yes ____ No ____

Leakage around inflation air valve (65): (if so equipped) Yes ____ No ____

Leakage around bead seat: Yes ____ No ____

Leakage through wheel: Yes ____ No ____

Leakage around wheel register: Yes ____ No ____

Comments: _____

_____

_____

_____

**Tester:** _____ **Date:** _____

## DISASSEMBLY

**1. General**

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

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

**NOTE:** The wheel assembly should only be disassembled as far as necessary to repair or replace defective parts.

A. Equipment and Consumables

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

**NOTE:** Unless specified differently, you can use equivalent alternatives for the items listed.

Table 3001 Equipment and Consumables

| NOMENCLATURE/ PART NO. | SPECIFICATION / SOURCE OF SUPPLY |
|---|---|
| Preformed Packing Extraction Tool Set 199-18 | Parker Hannifin Corp., Aircraft Wheel & Brake |
| Tire Bead Breaker | Commercial Source |
| Socket Set / Wrench Set | Standard 12 Pt. (Dbl. Hex) and Std. Hex Head, (inch units), Commercial Source |
| Screw Driver | Standard-Flat Head, Commercial Source |
| Soap Solution | Mild Dishwashing Liquid, Commercial Source |
| Valve Core Tool | Commercial Source |

## DISASSEMBLY

**2. Remove the Wheel Assembly**

**SAFETY WARNING:** MAKE SURE AIRCRAFT IS SECURE AND STABLE BEFORE BEGINNING ANY WORK. WORKING UNDER AN IMPROPERLY STABILIZED AIRCRAFT COULD CAUSE INJURY OR DEATH.

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

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

B. Deflate the tire:

- If equipped with a tube type tire, remove the cap from the tube valve stem deflate the tire by pushing the valve stem plunger until air can no longer be heard escaping from the tube.
- If equipped with a tubeless tire, remove the cap from the inflation valve assembly (65) and deflate the tire by pushing the valve stem plunger until air can no longer be heard escaping from the tire.

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

- If equipped with a tube type tire, remove the valve stem from the tube valve.
- If equipped with a tubeless tire, remove the valve stem from the inflation valve assembly (65).

D. If so equipped, remove the remainder of the inflation valve assembly (65) from the outboard wheel half (45).

E. Support the wheel and tire assembly and remove the axle mounting hardware.

F. Move the wheel and tire assembly back and forth to unseat the outboard bearing.

G. Remove the wheel and tire assembly from the axle and put on a clean flat surface.

## DISASSEMBLY

### 3. Disassemble the Wheel Assembly

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

**NOTE:** The bearing cups (35) are pressed into the hub of the wheel halves (30, 45). Do not remove them unless replacement is necessary. Replacement will be necessary if the bearing cups are damaged or if a more thorough inspection of the wheel is to be made.

A. Make sure the tire is completely deflated.

B. Refer to Figure 3001. Use a flathead screwdriver to remove the retaining rings (60) from the wheel halves.

C. Remove the bearing seals (55) and bearing cones (50) from the wheel halves.

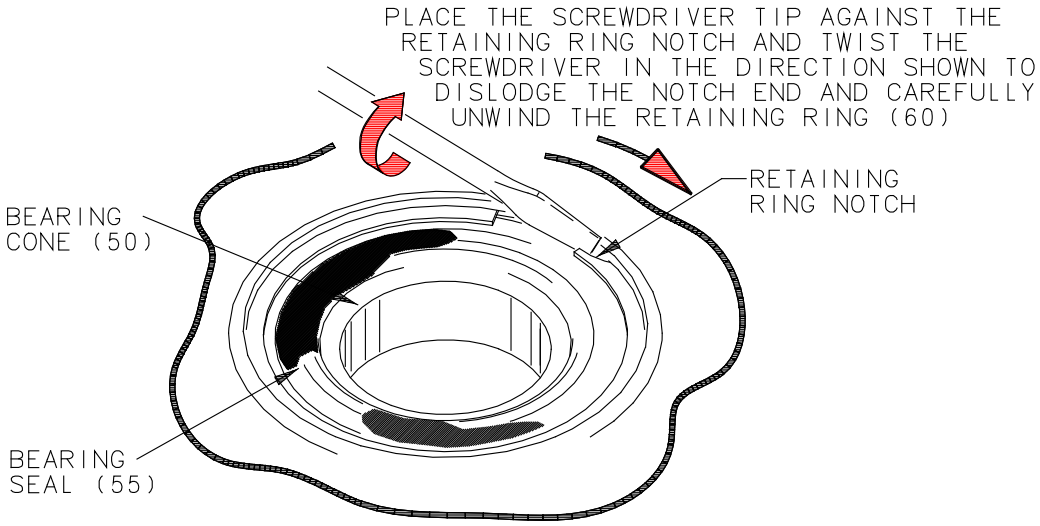



Figure 3001 Retaining Ring Removal

## DISASSEMBLY

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

**CAUTION**: DO NOT USE TIRE IRONS OR SCREWDRIVERS TO PULL THE TIRE AWAY FROM THE WHEEL. SHARP METAL TOOLS CAN DAMAGE THE SEALING SURFACE OF THE WHEEL.

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

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

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

G. Separate the wheel halves. Then, remove the tire.

H. Remove the preformed packing (20) from the wheel register groove of the inboard wheel half (35).

## CLEANING

### 1. General

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

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

A. Equipment and Consumables

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

**NOTE:** Unless specified differently, you can use equivalent alternatives for the items listed.

Table 4001 Equipment and Consumables

| NOMENCLATURE/ PART NO. | SPECIFICATION / SOURCE OF SUPPLY |
|---|---|
| Plastic Media Stripping Equipment | Commercial Source |
| Plastic Media | MIL-P-85891, Type II or V, Grade 20/30, 3.5 MOH max U.S. Technology Corp. |
| Air Supply | 30 psig maximum (2,1 bar), Commercial Source |
| Clean Cloths | Lint Free, Commercial Source |
| Brushes | Non-Metallic Soft and Stiff Bristle, Commercial Source |
| Solvent, Stoddard, Type 1 | MIL-PRF-680, Commercial Source |
| Cleaner/Degreaser | AMS1526, Commercial Source |
| Mineral Spirits | Commercial Source |
| Soap Solution | Mild Dishwashing Liquid, Commercial Source |

## CLEANING

**2. Cleaning Procedures**

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

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

**WARNING: NEVER SPIN A BEARING WITH COMPRESSED AIR. THE COMPRESSED AIR FORCE CAN EJECT THE ROLLERS WITH GREAT FORCE AND CAUSE A SERIOUS INJURY.**

A. Clean the Metal Components

(1) Clean metal parts that follow in Stoddard Solvent (MIL-PRF-680): (5, 10, 15, 60, 65). Use a non-metal soft bristled brush to help remove the heavy dirt deposits

**CAUTION:** CAREFULLY CLEAN BEARING CONES (50) IN A SEPARATE CONTAINER OF CLEAN SOLVENT TO PREVENT CONTAMINATION.

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

**NOTE:** Bearing cones can be packed with grease just before installation. Refer to the ASSEMBLY section. If bearing cones are packed after cleaning and drying, then place them in a clean, closed container to prevent contamination.

(3) Dry the parts using compressed air and lint-free cloths.

B. Clean the Non-Metallic Components

(1) Wipe the following rubber-based components with a clean soft cloth dampened in a mild soap and water solution or with the wheel bearing grease and a clean cloth. This will loosen the dirt:

-
– The nitrile seal material of the bearing seals (55)
– The nitrile preformed packing (20)
– The rubber-based grommet (70) of the inflation valve assembly (65)

## CLEANING

C. Clean the Aluminum Components

(1) Clean the parts that follow in Stoddard Solvent (MIL-PRF-680): (30, 45). Use a non-metal soft bristle brush to remove the heavy dirt deposits.

(2) To remove chemical residue, clean parts in a water based cleaner/degreaser (per AMS 1526).

(3) Rinse the parts with a mild soap and water solution.

(4) Rinse the parts in clean water.

(5) Dry the parts using compressed air and lint free cloths.

D. Protective Coating Removal for the Wheel Halves (30, 45)

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

**NOTES:** Removal of the protective coating (primer and topcoat) is necessary when doing the liquid penetrant inspection of the wheel halves.

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

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

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

## CHECKS

### 1. General

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

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

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

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

A. Equipment and Consumables

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

**NOTE:** Unless specified differently, you can use equivalent alternatives for the items listed.

Table 5001 Equipment and Consumables

| NOMENCLATURE/ PART NO. | SPECIFICATION / SOURCE OF SUPPLY |
|---|---|
| Magnetic Particle Inspection Equipment | ASTM E1444, Commercial Source |
| Liquid Penetrant Inspection Equipment | ASTM E1417 or MIL-STD-6866, Type 1, Method A, Sensitivity Level 2, Commercial Source |
| Eddy Current Inspection | ASNT-460 or MIL-HDBK-728/2, Commercial Source |
| Magnifier | X10 Magnification, Commercial Source |
| Vernier Dial Calipers | Commercial Source |

B. Visual Examination

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

## CHECKS

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

**2. Detailed Wheel Examination**

A. Examine the hardware: bolts (5), washers (10), nuts (15), retaining rings (60)

**CAUTION:** REWORK OF BOLTS IS NOT ALLOWED.

(1) Examine the bolts (5) for distortion, cracks, corrosion, or thread damage. Closely examine for cracks in the radius under the bolt head and in the threaded area next to the bolt shank. Use magnetic particle inspection (ASTM E1444) or liquid penetrant inspection (ASTM E1417 or MIL-STD-6866).

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

(2) Examine the washers (10) for corrosion, distortion or damage. Replace a part that is distorted or damaged.

(3) Examine the nuts (15) for cracks. Use magnetic particle inspection (ASTM E1444) or liquid penetrant inspection (ASTM E1417 or MIL-STD-6866). Examine the nuts (15) for damage to the self-locking feature. The self-locking feature can be a deformation of the nut (elliptical), segmented beam lock, or a non-metallic insert that provides the self-locking effect. The self-locking feature is defective if:

– The self-locking feature does not tighten when you turn the nut onto the mating thread of the bolt (5).

– The nut is loose and you cannot tighten the nut to the necessary torque value.

**NOTE:** If one or more of the nuts is cracked or damaged, then replace all of the nuts.

(4) Examine the retaining rings (60) for distortion, cracks, nicks, burrs, pitting, corrosion, or other signs of damage. Replace a part that is damaged.

B. Examine the Bearing Cups and Cones (35 and 50)

**NOTE:** The bearing cups (35) are pressed into the hub of the wheel halves (30, 45). They should not be removed unless replacement is necessary because of damage or loose fit or for a more thorough inspection of the wheel. Refer to the REPAIR section for cup removal.

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

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

## CHECKS

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

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

C. Examine the Bearing Seals (55)

Examine the bearing seals for cuts, nicks, distortion, and other damage. Examine the rubber to metal bond. Replace a seal that has a tear in the rubber to metal bond. If the rubber is cracked replace the seal.

D. Examine the Wheel Halves (30 and 45)

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

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

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

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

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

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

(5) When it is necessary to examine the wheel half for cracks at or near the surface use Liquid Penetrant Inspection (ASTM E1417 or MIL-STD-6866, Type 1, Method A, Sensitivity Level 2).

**NOTE:** The paint must be removed from the part. The part must be clean before doing a liquid penetrant inspection procedure. Refer to the CLEANING section for paint removal and cleaning instructions.

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

## CHECKS

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

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

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

– The bolt bosses on the inboard and outboard wheel halves

– The tube air valve stem or if equipped, the inflation air valve area on the outboard wheel half

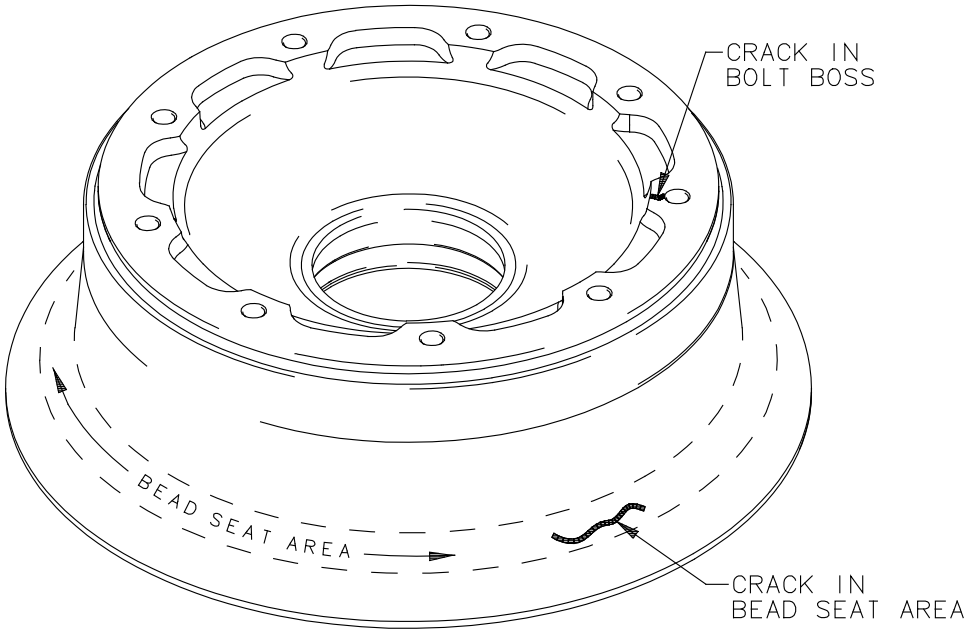



Figure 5001 Wheel Half Inspection

## CHECKS

(7) Eddy Current Inspection Requirements

(a) Examine the bead seat area shown in Figure 5002.

(b) Calibrate the eddy current equipment to detect a 0.060 inch (1.52mm) long by 0.030 inch (0.76mm) deep elox notch. An elox notch is produced by electrical discharge machining.

(c) Remove all dirt and grease from the wheel half subassemblies. If the wheel has no scratches, chips, nicks, and cracks, the paint does not need to be removed.

(d) Eddy current probe must fit the beadseat area defined in Figure 5002.

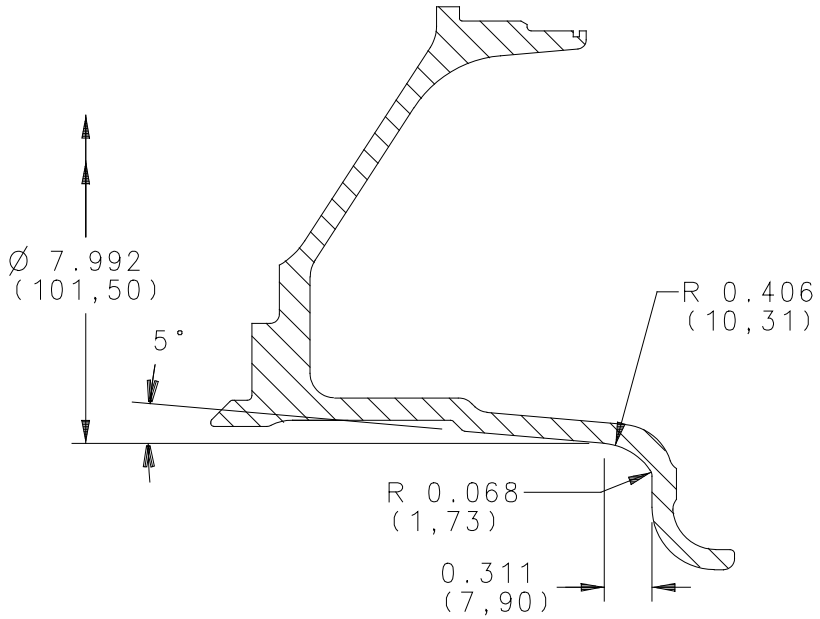



Figure 5002 Eddy Current Probe Criteria

E. Examine the Inflation Valve Assembly (65)

(1) Examine threads and replace if there is thread damage.

(2) Examine and replace the rubber grommet if it has cuts, tears, cracking, and other damage.

## REPAIR

### 1. General

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

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

**NOTE:** Repairs are limited to the replacement of parts and to the repairs specified in this section.

A. Equipment and Consumables

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

**NOTE:** Unless specified differently, you can use equivalent alternatives for the items listed.

Table 6001 Equipment and Consumables

| NOMENCLATURE/ PART NO. | SPECIFICATION / SOURCE OF SUPPLY |
|---|---|
| Aluminum Oxide Cloth | 400 to 600 Grade or Finer, Wet or Dry, Commercial Source |
| Alodine 1200 or Equiv. | MIL-C-5541, Class 1A, Commercial Source |
| Sub-Zero Freezer or Liquid Nitrogen or Dry Ice | -34.4°C to -51.1°C (-30°F to -60°F), Commercial Source |
| Oven | 121°C (250°F) capacity, Commercial Source |
| Bearing Cup Tools | SPECIAL EQUIPMENT AND TOOLS section |
| Hand Files | Assorted, Commercial Source |
| Arbor Press | Commercial Source |
| Paint Application Equipment | Commercial Source |
| Primer and Topcoat | Refer to Table 6002 |
| Bearing Grease | MIL-PRF-81322 Grade 2 or DOD-G-24508A |
| Aeroshell Grease 22 or | Shell Oil Company, Lubricant Division |
| Mobil Aviation Grease SHC 100 or Mobilux EP2 (at Ambient Temps. Above -20ºF) | Mobil Oil Corp. Shoreham Building Washington, DC 2005 |
| | www. Exxonmobil. com |

B. General Repairs

**CAUTION:** DO NOT TRY TO REPAIR A SEALING SURFACE FOR A PREFORMED PACKING.

1 Replace all parts that have cracks or distortions. Replace all parts with damage that you cannot repair. Replace all parts that are damaged or worn more than the specified limits.

2 Use 400 to 600 grade or finer, wet or dry aluminum oxide cloth to remove small burrs, nicks, and scratches.

## REPAIR

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

**2. Detailed Repairs**

A. Repair the Wheel Halves (30 and 45)
The wheel halves are made from an aluminum alloy.

Remove all corrosion and surface damage from the wheel halves. Refer to the limits shown in this paragraph and Figure 6001. Replace a wheel half that has corrosion or damage that is more than the limits shown.

**CAUTION:** THE REPAIR LIMITS GIVEN ARE BASED ON THE ORIGINAL MATERIAL THICKNESS.

**NOTE:** Corrosion begins where the protective coating is damaged. Remove corrosion from wheel halves before doing part repair. Remove corrosion on threads with a soft wire brush.

(1) Remove all sharp corners and raised edges which can result in stress concentrations. Blend out small nicks, gouges, scratches and light corrosion. Use hand tools to remove the damaged material. Remove the material with a very slow change in contour from the repaired surface to the adjacent surface.

(2) In area 1, polish out corrosion pits, scratches, and tool marks to 0.010 inch (0,25 mm) maximum depth and 0.50 inch (12,70 mm) long.

(3) In area 2, blend out and polish imperfections to 0.020 inch (0,51 mm) maximum depth and 1.00 inch (25,40 mm) long. Reworked area not to exceed 1.00 square inch (25,40 square mm). Do not remove metal if surface directly opposite was previously reworked.

(4) In area 3, blend out and polish imperfections to 0.030 inch (0,76 mm) maximum depth. Reworked area not to exceed 1.00 square inch (25,40 square mm).

(5) In area 4, repair not to exceed is 0.010 inch (0,254 mm) maximum depth. Reworked area not to exceed 0.50 square inch (12,70 square mm).

(6) In area 5, air valve sealing surface, repair not to exceed is 0.005 inch (0,127 mm) maximum depth. Through hole not to exceed ∅ 0.632 inch (16,05 mm) maximum.

(7) Clean and surface treat the repaired areas

(a) Clean the wheel halves. Refer to paragraph 2.C., CLEANING section.

(b) Apply a corrosion preventative (Alodine 1200 or equivalent) to the repaired areas. Refer to MIL-C-5541, Class 1A.

## REPAIR

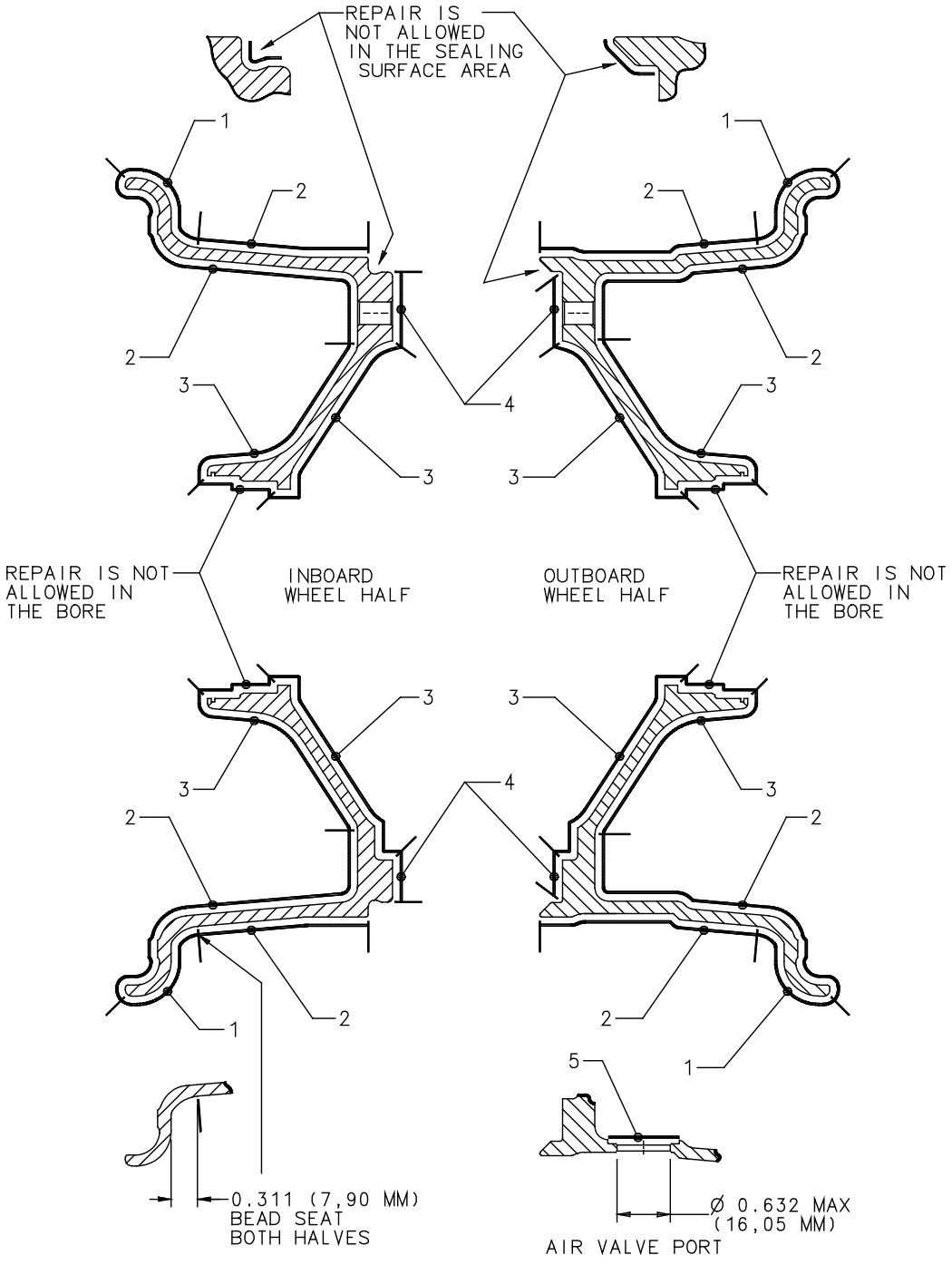



Figure 6001 Wheel Half Repairable Limits

## REPAIR

B. Repaint the Wheel Halves (30 and 45)

**SAFETY WARNING:** PAINT MATERIALS CAN BE TOXIC AND VOLATILE. USE ONLY IN WELL VENTILATED AREAS. AVOID PHYSICAL CONTACT WITH PAINTS AND DO NOT INHALE VAPORS. KEEP PAINT CONTAINERS COVERED WHEN NOT IN USE. OBSERVE FIRE PRECAUTIONS.

**CAUTION:** THE DRY FILM THICKNESS OF THE PRIMER ON THE WHEEL HALF TO WHEEL HALF INTERFACE AND THE WHEEL HALF TO WASHER (10) INTERFACE MUST NOT EXCEED THE MAXIMUM SPECIFIED IN TABLE 6001. EXCESS COATING THICKNESS ON THESE SURFACES WILL REDUCE THE FATIGUE LIFE OF THE WHEEL ASSEMBLY BOLTS (5).

**NOTE:** Aircraft Wheel & Brake uses Columbia Paint Corp. coatings in the production of the wheel assembly. Alternative products can be used by the repair facility.

(1) For small areas requiring a paint touchup.

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

(2) Clean the surfaces to be painted.

**CAUTION:** DO NOT GET PAINT ON THE BEARING CUPS. PAINT ON THE BEARING CUPS CAN CAUSE BEARING FAILURE.

(3) Mask wheel halves per Figure 6002 and apply primer and topcoat per Table 6002.

**NOTE:** Always refer to the manufacturer's instructions for mixing and pot life.

Table 6002 Primer and Topcoat Product Characteristics

| MANUFACTURER | PRIMER | TOPCOAT | DRY FILM THICKNESS AND AIR DRY TIMES [1] |
|---|---|---|---|
| Columbia Paint Corp.<br>Huntington, WV | P/N 11-347Z<br>(water reducible)<br>No mixing required. | P/N 11-358A, Gloss White Enamel<br>(water reducible)<br>No mixing required.<br><br>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: 0.0002-0.0005 in.<br>(0,0051-0,0127 mm)<br>1 hour (to touch, mask or topcoat)<br>4 to 24 hours (dry hard)<br><br>Topcoat (includes primer):<br>0.0008-0.0014 in.<br>(0,0203-0,0356 mm)<br>3 hours (to touch)<br>48 hours (dry hard) |

[1] Refer to the manufacturer's data sheet for forced dry (oven heating) schedule.

**REPAIR**

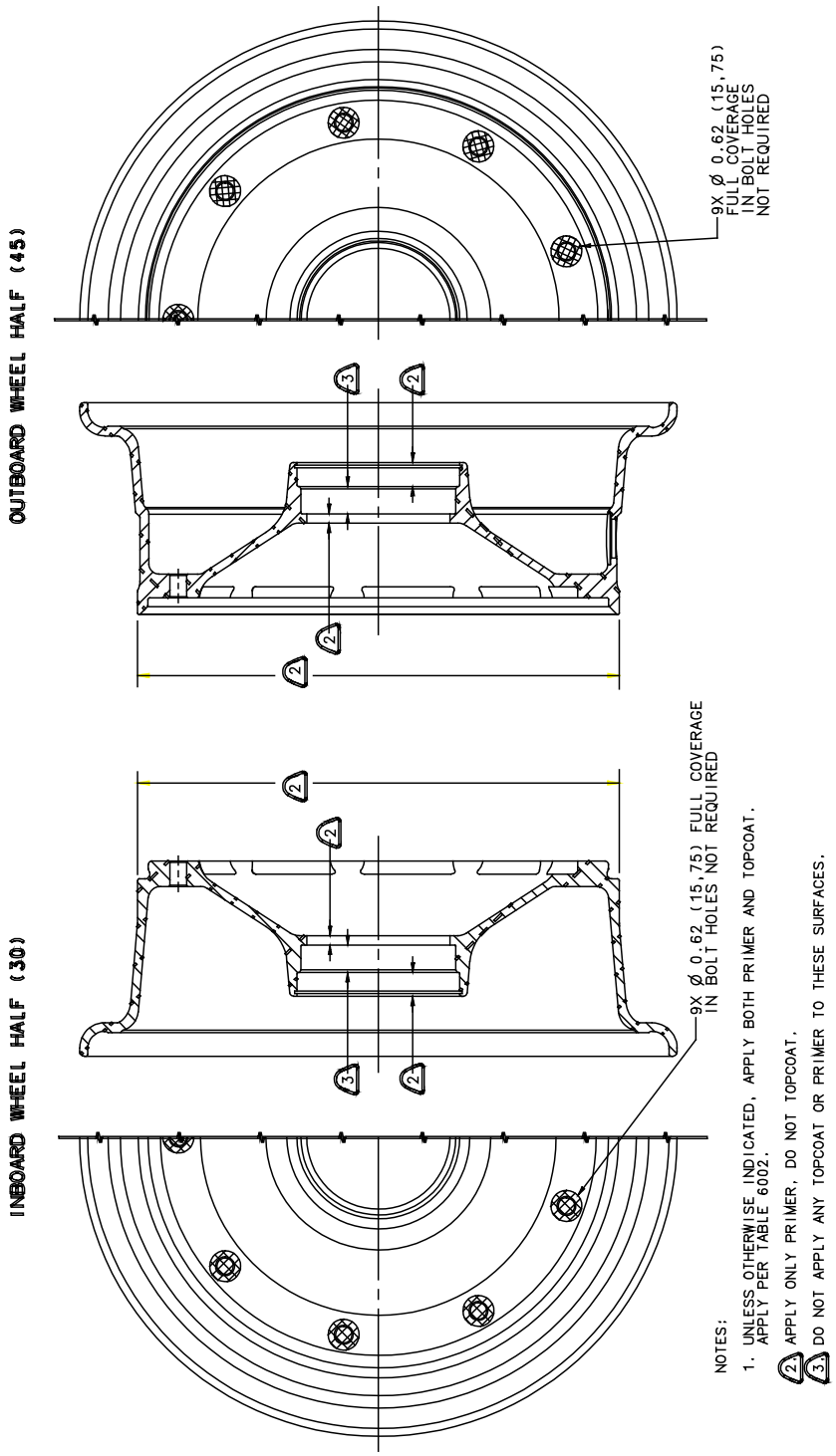



Figure 6002 Wheel Half Masking Instructions

## REPAIR

D. Replacement of the Bearing Cups (35)

The bearing cups are pressed into the hub of the wheel halves (30, 45). Do not remove them unless replacement is necessary. Replacement will be necessary if the bearing cups are damaged or if a more thorough inspection of the wheel is to be made.

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

**CAUTION:** BEARING CUPS AND CONES MUST BE REPLACED AS A SET.

IF SO EQUIPPED, REMOVE THE INFLATION VALVE ASSEMBLY (110) BEFORE HEATING THE OUTBOARD WHEEL HALF.

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

DO NOT HEAT WHEEL HALF ABOVE 200° F (93.3° C).

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

(1) Removal
Refer to Figure 6003 and remove the bearing cups using the following procedure.

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

(a) Heat one of the wheel halves (30 or 45) to 175 to 200° F (79 to 93.3° C). Do not heat the wheel half for more than 30 minutes.

(b) Remove the wheel half from the heat source and place it on a support block.

(c) Place the inboard/outboard bearing cup removal tool (Figure 9002) on the back face of the bearing cup (40).

(d) Use an arbor press to apply even pressure to the cup removal tool. The bearing cup will then drop out.

(e) Repeat steps (a) thru (d) for the remaining wheel half.

**REPAIR**

(2) Installation
Refer to Figure 6003 and install the bearing cups using the following procedure.

**NOTE:** The installation of the bearing cup is made easier when the bearing cup is frozen.

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

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

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

(d) Dry the bearing cups to remove the condensation.

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

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

(f) Place the wheel half on a support block. Align the bearing cup over the bore. Place the inboard/outboard bearing cup installation tool (Figure 9002) on the front face of the cup.

(g) Press the bearing cup into the bearing bore by applying even pressure to the cup installation tool. Make sure that the back face of the bearing cup is flush against the surface (shoulder) of the bearing bore. See Figure 6004.

(h) See Figure 6002. Use a 0,051 mm (0.002 inch) feeler gage and measure for clearance between the back surface of the cup and the front surface (shoulder) of the bearing bore.

(1) A 0.002 inch maximum (0,051 mm) clearance is allowed, only if the feeler gage cannot be inserted more than one-half the width of the bearing bore shoulder at any location around the back surface of the cup.

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

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

(k) Repeat steps (a) thru (j) for the remaining wheel half.

**REPAIR**

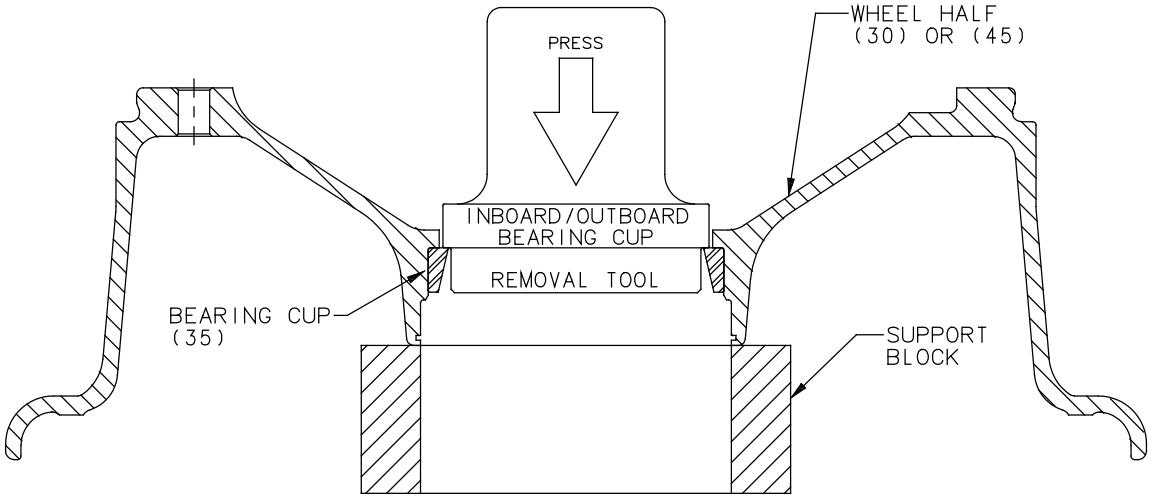



Figure 6003 Bearing Cup Removal

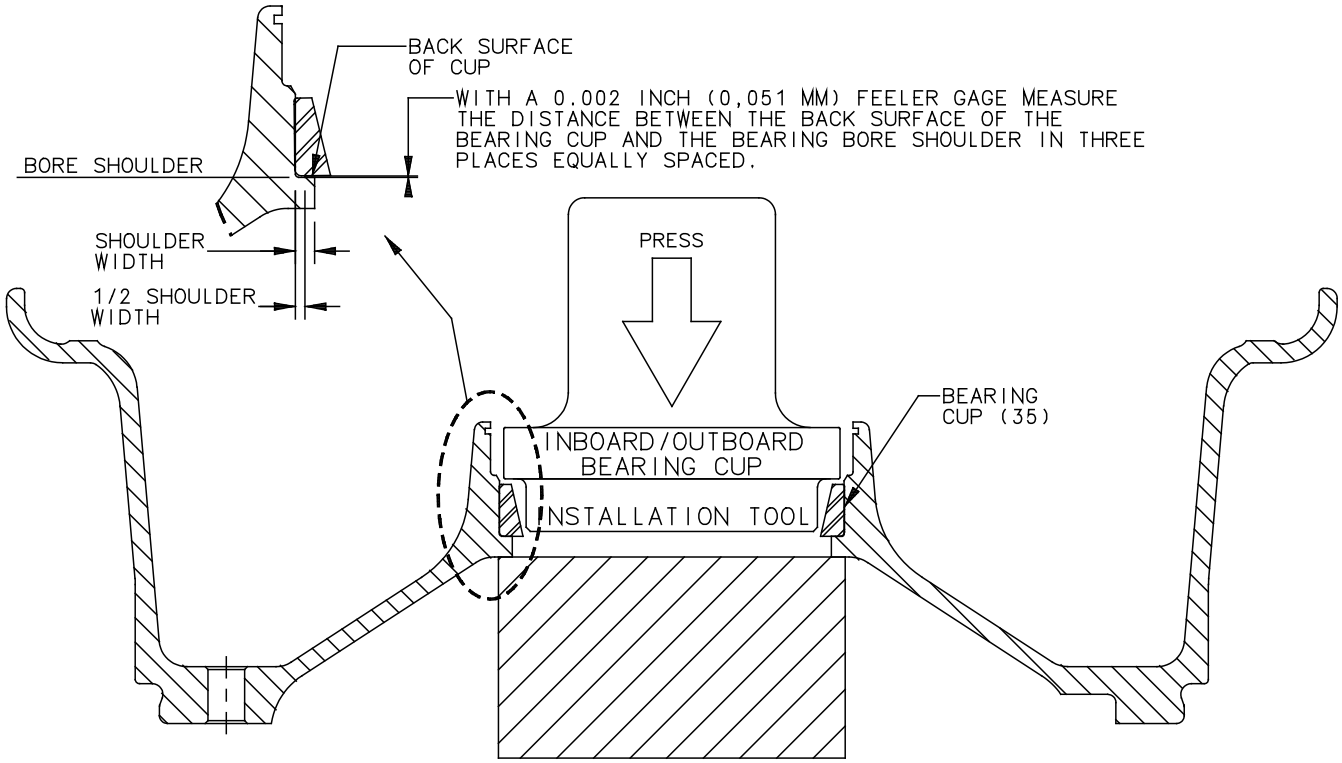



Figure 6004 Bearing Cup Installation

## ASSEMBLY

### 1. General

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

A. Equipment and Consumables

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

**NOTE:** Unless specified differently, you can use equivalent alternatives for the items listed.

Table 7001 Equipment and Consumables

| NOMENCLATURE/ PART NO. | SPECIFICATION / SOURCE OF SUPPLY |
|---|---|
| Aeroshell Grease 22 Bearing Grease | MIL-PRF-81322 Grade 2 or DOD-G-24508A<br>Shell Oil Company, Lubricant Division<br>www.shell-lubricants.com |
| Mobilux EP 2 (at Ambient Temp. above -20º F)<br>or Mobil Aviation Grease SHC 100 Bearing Grease | Mobil Oil Corp. Shoreham Building<br>Washington DC 20005<br>www.exxonmobil.com |
| Dow Corning 55 Lube | Dow Corning Corporation |
| Anti-Seize Compound | AMS2518<br>Armite Laboratories or Royco Lubricant (P/N Royco 44) |
| Clean Cloths | Lint Free, Commercial Source |
| Soap Solution | Mild Dishwashing Liquid, Commercial Source |
| Preformed Packing Extraction Tool Set, 199-18 | Parker Hannifin Corp., Aircraft Wheel & Brake |
| Socket Set/ Wrench Set | Standard 12 Pt. (Dbl. Hex) and Std. Hex Head (inch units),<br>Commercial Source |
| Inflation Cage | Commercial Source |
| Torque Gage | Commercial Source |
| Tire Pressure Gage | Commercial Source |

## ASSEMBLY

B. Bearing Cone Grease Packing Procedure

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

**CAUTION:** IF USING AN EQUIVALENT SUBSTITUTE FOR THE GREASE SPECIFIED IN TABLE 7001, DO NOT MIX BEARING GREASES. GREASE INCOMPATIBILITY COULD RESULT IN CONTAMINATION AND LOSS OF GREASE PERFORMANCE.

**NOTE:** Pack the bearing cones just before installation to prevent contamination or pack the bearing cones immediately after cleaning and drying and then place them in a clean, closed container.

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

(1) If necessary, clean the bearing cones. Refer to the CLEANING section.

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

**NOTE:** Shaded area shows the recommended quantity of grease.

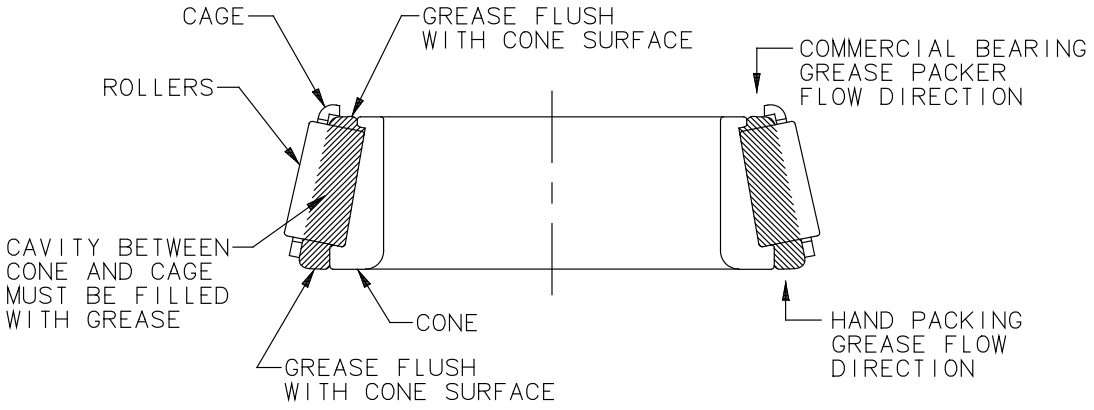



Figure 7001 Packing Bearing Cones

## ASSEMBLY

**2. Assembly Procedures**

A. Install the Bearing Cups (50)

If new bearing cups are necessary, install them now. Refer to the REPAIR section. If it is not necessary to replace them, continue to step 2.B.

B. Wheel and Tire Pre-Assembly Preparation

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

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

(3) The preformed packing (20) groove in each wheel half should be examined for damage or other debris that would prevent the packing from properly seating. Remove any lubricant, grease or foreign material with a clean cloth moistened with a mild soap and water solution or with denatured alcohol.

(4) If so equipped, examine the inflation valve grommet (70) for damage such as cuts, tears, cracking. Replace if necessary. Install the grommet dry.

(b) Install the inflation valve assembly (70) in the outboard wheel half (45). Torque the inflation valve assembly nut to the values shown in Table 8002.

C. Tire Mounting

(1) Place the inboard wheel half subassembly (30) on a clean work surface with the register side facing up.

(2) Examine the wheel register preformed packing (20) for damage. Replace if necessary.

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

**CAUTION:** THE PREFORMED PACKING (20) MUST BE INSTALLED UNIFORMLY. IT SHOULD BE FREE OF KINKS AND TWISTS.

(b) Install the preformed packing in the wheel register groove of the inboard wheel half (35).

## ASSEMBLY

**CAUTION:** COMPOUNDS SUCH AS TALC INCREASE TIRE SLIPPAGE. REMOVING TALC WILL MINIMIZE TIRE SLIPPAGE ON THE WHEEL.

(3) Make sure that the tire is clean inside. If it is not clean, then wipe the bead base with a mild soap and water solution or with a suitable rubber cleaner.

**CAUTION:** WHEN YOU INSTALL A TIRE, DO NOT APPLY A LUBRICANT TO THE TIRE OR THE WHEEL BEAD SEAT. A LUBRICANT CAN CAUSE THE TIRE TO SLIP IN SERVICE AND DAMAGE THE WHEEL BEAD SURFACE.

(4) Place a serviceable 19.5 X 6.75-8, 10 PR tire (and tube if so equipped) over the outboard wheel half (45) being careful not to move the preformed packing (20).

**NOTE:** If so equipped, lubricate or dust the tire tube lightly with tire talc. This will prevent the tube from sticking to the inside of the tire or to the tire beads. It also helps the tube assume its normal shape inside the tire during inflation and lessens the chances of wrinkling or thinning from irregular stretching.

(5) Position the inboard wheel half (30) inside the tire (and tube if so equipped) and align the bolt holes of both wheel halves.

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

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

D. Attach the Wheel Half Subassemblies (25) and (40)

**CAUTION:** USE ONLY THE ANTI-SEIZE COMPOUND LISTED IN TABLE 7001. THE USE OF ANOTHER COMPOUND WILL RESULT IN IMPROPER FASTENER TENSION AND COULD LEAD TO FAILURE OF THE FASTENERS AND SUBSEQUENT FAILURE OF THE WHEEL.

**NOTE:** Lubricate hardware as needed just prior to installing.

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

## ASSEMBLY

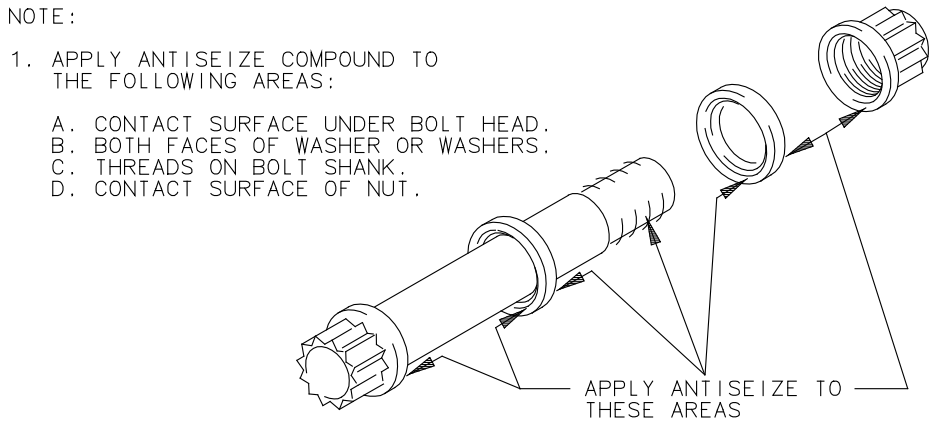



Figure 7002 Apply Anti-Seize Compound

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

(2) Install a minimum of three washers (10) and bolts (5) in the inboard wheel half (30) equally spaced, then:

(a) Compress the wheel halves and install a washer (10) onto the threaded end of each bolt.

(b) Then, install a nut (15) and tighten the nuts by hand.

(3) Install the remaining bolts, washers and nuts.

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

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

(4) Use the following steps and torque all of the nuts (15).

(a) Step one: (1/3 final torque): Torque to 35 to 40 lb-in (3,95 to 4,33 N-m) in a criss-cross pattern.

(b) Step two: (2/3 final torque): Torque to 70 to 77 lb-in (7,91 to 8,66 N-m) in a criss-cross pattern.

(c) Step three: (Final torque): Torque to 105 to 115 lb-in (11,9 to 13,00 N-m) in a criss-cross pattern.

## ASSEMBLY

E. Tire Inflation

**SAFETY WARNING:** ALWAYS PLACE THE TIRE IN AN INFLATION CAGE BEFORE INFLATING. INFLATING THE TIRE CAN BE VERY DANGEROUS. THE TIRE CAN EXPLODE. FAILURE TO USE AN INFLATION CAGE CAN CAUSE SERIOUS INJURY OR DEATH. SERVICE THE TIRE WITH INFLATION EQUIPMENT DESIGNED FOR THIS OPERATION.

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

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

(1) Inflate the tire to the tire manufacturer's specifications to seat the tire beads on the wheel. Then reduce the tire pressure to the recommended storage pressure and remove the wheel/tire assembly from the inflation cage.

F. Final Assemble the Wheel

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

(2) If not already done, pack the bearing cone (50) with wheel bearing grease as specified in Table 7001, or equivalent, and put aside. Refer to paragraph 1.B. for the grease packing procedure.

(4) Before installing the bearing cone, apply a light coat of wheel bearing grease to the exposed surfaces of the bearing cups (35) and the outside profile of the bearing seals (55).

(5) Install a bearing cone (50) in the inboard wheel half (30) and then install the following in the hub of the inboard wheel half:

**NOTE:** Observe **"this side out"** in molded characters on the outside surface of the seal.

– A bearing seal ring (55).

– A retaining ring (60). See Figure 7003. Install the end of the retaining ring into the groove in the hub of the inboard wheel half (30) and wind or spiral the ring into the groove.

(6) Repeat steps (2) through (5) to install the remaining bearing cone (50), bearing seal (55) and retaining ring (60) in the hub of the outboard wheel half (55).

## ASSEMBLY

(7) Put a cover on the inboard and outboard hub openings of the wheel halves to prevent the bearings from being contaminated with dirt and moisture. Keep the covers on until the wheel assembly is installed on the aircraft.

(8) Test the wheel assembly. Refer to the TESTING AND FAULT ISOLATION section.

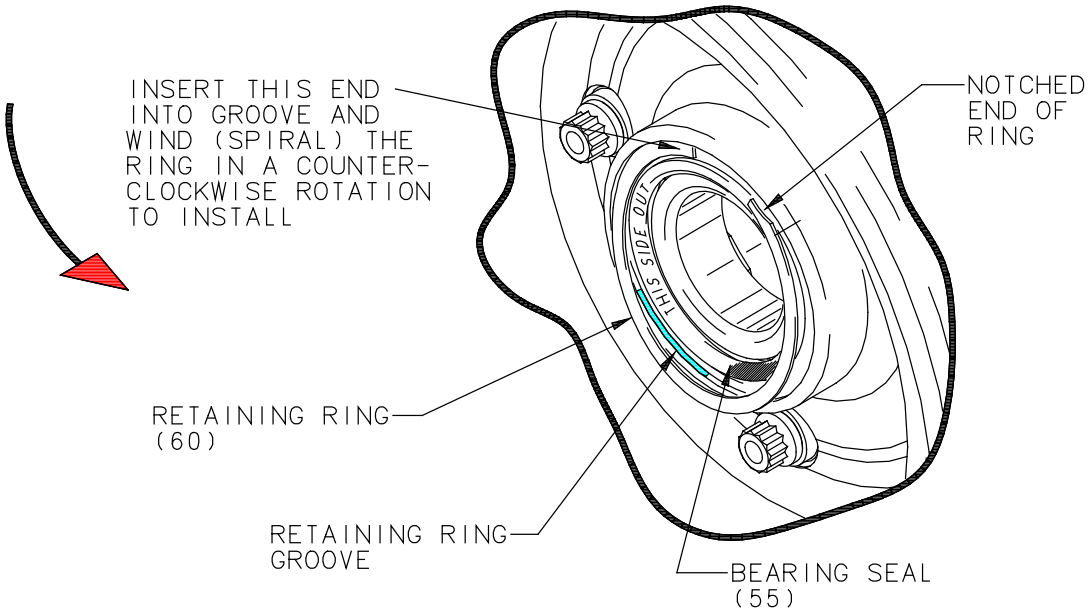



Figure 7003 Retaining Ring Installation

G. Install the Wheel and Tire Assembly On the Aircraft

(1) Install wheel / tire and (if applicable) tube on the axle in accordance with the aircraft manual.

(2) Check the tire inflation pressure and adjust to 60 – 65 psig MAX. (or to a lower operating pressure if specified by aircraft manual).

(3) Perform any additional installation functions to complete the aircraft readiness in accordance with the aircraft manual.

## FITS AND CLEARANCES

**1. General**

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

A. Assembly Wear Limits

There are no in-service wear limits for the components of the nose wheel assembly.

B. Assembly Torque Values

Table 8002 Assembly Torque Values

| PART NAME | TORQUE LIMITS |
|---|---|
| Nut (15) | 105 to 115 lb-in (11,9 to 13,0 N-m) final torque apply anti-seize compound [1] |
| Nut of the Inflation Valve Assembly (65) (if so equipped) | Dry torque to 20 to 45 lb-in (2,56 to 5,08 N-m) |

[1] **NOTE:** Refer to ASSEMBLY section for applying anti-seize compound.

## SUPPORT EQUIPMENT AND CONSUMABLES

### 1. General

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

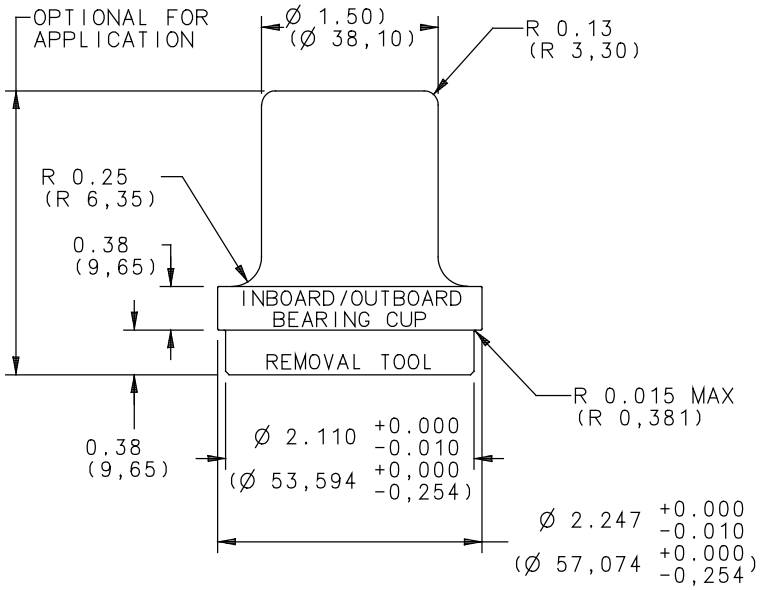
A. Source of Supply

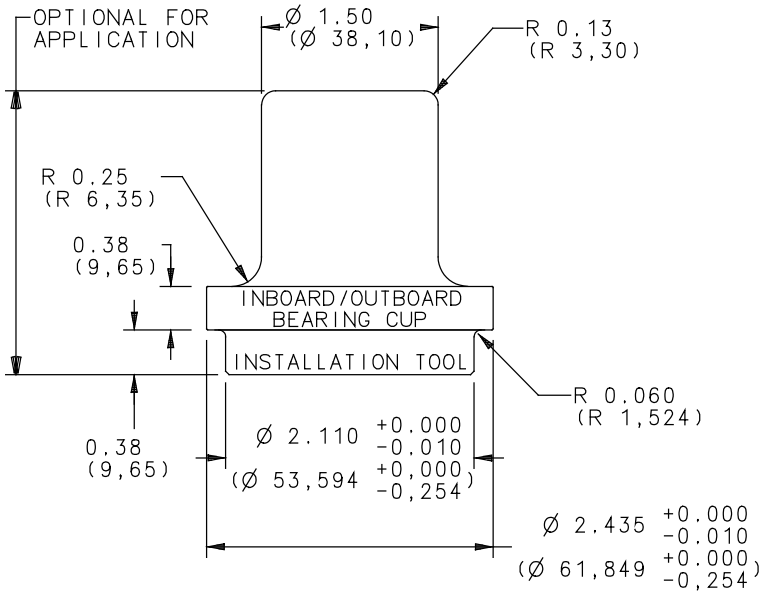
**NOTE:** Unless specified differently, you can use equivalent alternatives for the items listed.

Table 9001 List of Manufacturers

| PRODUCT NOMENCLATURE | SPECIFICATION OR REQUIREMENT | SOURCE OF SUPPLY | DISASSEMBLY | CLEANING | CHECKS | REPAIR | ASSEMBLY |
|---|---|---|---|---|---|---|---|
| Preformed Packing Extraction Tool Set 199-18 | N/A | Parker Hannifin Corp. Aircraft Wheel & Brake Avon, OH U.S.A. | X | | | | X |
| Plastic Media for stripping paint | MIL-P-85891, Type II or V, Grade 20/30, 3.5 MOH max | U.S. Technology Corp. Canton, OH U.S.A. | | X | | | |
| Bearing Cup Tools | Figure 9001 | N/A | | | | X | |
| Primer P/N 11-347Z | N/A | Columbia Paint Corporation Huntington, WV U.S.A. | | | | X | |
| Topcoat P/N 11-358A | N/A | | | | | X | |
| Aeroshell Grease 22, Bearing Grease | MIL-PRF-81322 Grade 2 or DOD-G-24508A | Shell Oil Company Lubricant Division Metairie, LA U.S.A<br>www.shell-lubricants.com | | | | | X |
| Mobilux EP 2 Bearing Grease (at Ambient Temps. Above -20ºF) OR Mobil Aviation Grease SHC100 | | Mobil Oil Corp. Shoreham Building, Washington, DC 20005<br>www.exxonmobil.com | | | | | X |
| Anti-Seize Compound | AMS2518 | Armite Laboratories Costa Mesa, CA U.S.A.<br>Royco Lubricant (P/N Royco 44) East Hanover, NJ U.S.A. | | | | | X |

## SUPPORT EQUIPMENT AND CONSUMABLES




1. Material: 4130 steel or equivalent

2. Break unspecified sharp edges 0.005-0.010 inch (0,13-0,25)

3. Tolerances unless otherwise specified:
   .XXX ± 0.010 inch (± 0,254)
   .XX ± 0.03 inch (± 0,76)
   Angular: ± ½°
   Fractional: ± 0.03 inch (± 0,76)

Figure 9001 Bearing Cup Tools

## ILLUSTRATED PARTS LIST

### 1. General

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

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

A. Explanation of Columns

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

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

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

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

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

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

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

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

## ILLUSTRATED PARTS LIST

B. Part Numbering System

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

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

Unless specified differently by contract, the assigned Parker Hannifin AWB part number will be used in the part number column to identify government standard off-the-shelf parts (such as MS, AN, NAS, etc.).

C. Parts Replacement Data

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

| Term | Abbreviation | Definition |
|---|---|---|
| Optional | OPT | This part is optional to and interchangeable with other parts in the same item number variant group or other item number if designated. |
| Superseded by | SUPSD BY | The part in the part number column is replaced by and is not interchangeable with the item number shown in the notation. |
| Supersedes | SUPSDS | The part in the part number column replaces and is not interchangeable with the item number shown in the notation. |
| Replaced by | REPLD BY | The part in the part number column is replaced by and interchangeable with the item number shown in the notation. |
| Replaces | REPLS | The part in the part number column replaces and is interchangeable with the item number shown in the notation. |
| Vendor | V | Federal Supply Code for vendors. |


Proprietary Information – See Page INTRO-1

## ILLUSTRATED PARTS LIST

D. Items Not Illustrated

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

E. Alpha Variant Item Numbers

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

(1) Added items
(2) Modification or configuration differences
(3) Optional parts

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

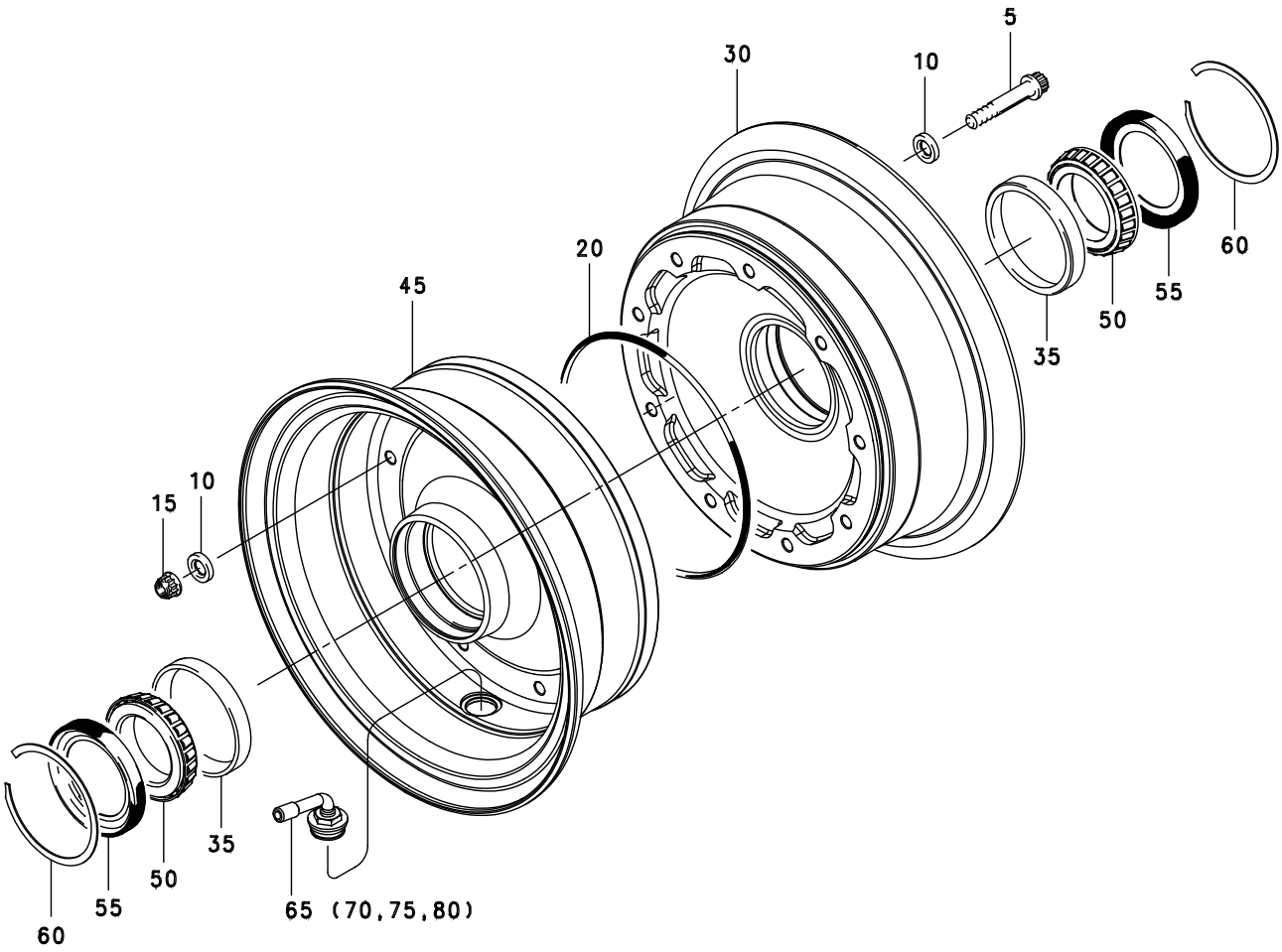
**2. Optional Vendor Index**

Not applicable.

**3. Federal Supply Code for Manufacturers**

Not applicable.

## ILLUSTRATED PARTS LIST




Nose Wheel Assembly
IPL Figure 1

## ILLUSTRATED PARTS LIST

### 4. Detailed Parts List - Nose Wheel Assembly

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NUMBER | NOMENCLATURE 1 2 3 4 5 6 7 | EFF CODE | UNITS PER ASSY. |
|---|---|---|---|---|---|
| 1 - 1 | 40-450 | | NOSE WHEEL ASSEMBLY | | RF |
| | | | ATTACHING PARTS | | |
| 5 | 103-19300 | | BOLT (MS21250-04014) | | 9 |
| 10 | 095-14600 | | WASHER, DBL C'SUNK (MS14155-4) | | 18 |
| 15 | 094-17700 | | NUT, SELF-LOCKING (NAS1804-4N) | | 9 |
| | | | * * * | | |
| 20 | 101-50262 | | . PACKING, PREFORMED SUPSD BY ITEM 20A | | NP |
| 20A | 101-26600 | | . PACKING, PREFORMED (MS28775-261) SUPSDS ITEM 20 | | 1 |
| – 25 | 161-22500 | | . SUBASSEMBLY, WHEEL HALF, INBOARD | | 1 |
| 30 | 151-21900 | | . . WHEEL HALF, INBOARD | | NP |
| 35 | 214-06300 | | . . CUP, BEARING | | 1 |
| – 40 | 162-22500 | | . SUBASSEMBLY, WHEEL HALF, OUTBOARD | | 1 |
| 45 | 152-21900 | | . . WHEEL HALF, OUTBOARD | | NP |
| 35 | 214-06300 | | . . CUP, BEARING | | 1 |
| 50 | 214-00200 | | . CONE, BEARING | | 2 |
| 55 | 154-09600 | | . SEAL, BEARING | | 2 |
| 60 | 155-14100 | | . RING, RETAINING | | 2 |
| 65 | 160-03500 (1) | | . ASSY, INFLATION VALVE (Tire and Rim P/N 747-07) | | 1 |
| 70 | 217-01300 (2) | | . . GROMMET (Tire and Rim P/N RG40) | | 1 |
| 75 | - - - - - - - - | | . . STEM, VALVE (Tire & Rim P/N 747-06) | | NP |
| 80 | MS20813-1 | | . . CAP, VALVE (Tire & Rim P/N VC5) | | NP |

(1) Must be ordered separately. For use with tubeless tire.

(2) Can be ordered separately

## STORAGE

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

### 1. Procedures

The storage instructions are for wheels stored without the tires mounted.

A Rubber Based Components

The shelf life of rubber-based components is listed below. The serviceable life can be decreased by exposure to sunlight, very high or low temperatures, low humidity, ozone, contamination of fluids or lubricants, severe operating conditions, etc.

(1) The preformed packing (20) has a shelf life of 15 years from the date of manufacture (also known as the cure date).

(2) The bearing seals (65) and inflation valve grommet have a shelf life of 15 years.

B Storage Time

**NOTE:** Wheel assemblies stored without the rubber based components installed have an indefinite storage life.

(1) Use the instructions below to store a wheel assembly up to a maximum of 90 days.

(a) Plug or cover the wheel hub openings to help prevent dirt and moisture contamination.

(2) Use the instruction below to store a wheel assembly for longer than 90 days:

(a) Remove and store all rubber based components separately in ultraviolet protective containers.

(b) Remove and store the bearing cones (60) in a clean, dry container.

(c) Apply a coat of bearing grease to the exposed surfaces of the installed bearing cups (35) to prevent corrosion and plug or cover the wheel hub openings.

(d) Install a minimum of three sets of bolts, washers, and nuts (5, 10, and 15) at equally spaced locations. Tighten the nuts enough to keep the wheel halves secure. Do not tighten to the assembly torque value until the equipment is ready to be installed on the aircraft. Keep the remaining bolts, washers, and nuts in a clean, dry container.

(3) Storage Conditions

The wheel assembly and all its components must be stored in a clean, dry environment within a temperature range from 50° to 77°F (10° to 25°C). Exposure to extreme temperatures can effect service life.

**Cleveland**
Wheels & Brakes

Parker Hannifin Corporation
**Aircraft Wheel & Brake**
1160 Center Road
Avon, Ohio 44011 USA
1-800-BRAKING (272-5464)
440-937-1315 ● FAX 440-937-5409

# PRODUCT REFERENCE MEMO

## WHEEL ASSEMBLIES – PREFERRED BEARING GREASE (MOBIL AVIATION GREASE SHC 100)

EFFECTIVITY: All Parker Hannifin (Cleveland Wheels & Brakes) wheel assemblies.

APPLICABILITY: Any aircraft equipped with Parker Hannifin wheel assemblies.

REASON: ExxonMobil "Mobil Aviation Grease SHC 100" is the preferred bearing grease for use in all Parker Hannifin (Cleveland Wheels & Brakes) wheel assemblies.

DESCRIPTION: Mobil Aviation Grease SHC 100 is a high performance grease which combines a synthesized hydrocarbon base fluid with a lithium soap thickener. The thickener system provides a high dropping point, excellent resistance to water wash and a tenacious structural stability. The unique properties provide outstanding protection against wear, rust, corrosion and high temperature degradation. The grease is recommended for aviation applications which need a lubricant that can perform normal functions yet go far beyond in terms of high and low temperature and long-life performance. The grease has an operating temperature range of -65°F (-54°C) to + 350°F (+177°C). There is no Military specification for this product.

CAUTION: Aviation bearing greases should not be intermixed with each other. Precautions should be taken to ensure that this grease is not intermixed with other wheel bearing greases and is being used in accordance with the manufacturer's guidelines. For technical Data and MSDS sheets on Mobil Aviation Grease SHC 100, visit the manufactures Web Site at: www.mobil.com

COMPLIANCE: Recommended

APPROVAL: The engineering contents of this Product Reference Memo are FAA DER approved.

WEIGHT & BALANCE: Not applicable

PUBLICATIONS: The information contained in this Product Reference Memo (PRM78) is to be incorporated into the Product Catalog and Maintenance Manual at the next revision of each.

INSTRUCTIONS: At next tire change or overhaul remove and discard the grease felts. Thoroughly clean wheel assembly and completely remove the contained grease from the bearings, bearing bore and hub per Component Maintenance Manual. Refer to AWBCMM0001, latest issue, for grease packing instructions. Pack bearings with Mobile SHC-100. Install new felt grease seals lubricated with Mobile SHC-100.

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* SA02204CH

*This certificate issued to* Parker Hannifin Corporation
Aircraft Wheel & Brake Division
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 Parker Hannifin Nose Wheel Conversion Kit, Parts List 199-256, Revision B, dated November 17, 2005, or a later FAA approved revision, in accordance with Parker Hannifin's Conversion Kit Installation Manual with Illustrated Parts List, Report No. IM199-256, Revision A, dated November 17, 2005, or a later FAA approved revision.

*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:* April 27, 2005

*Date of issuance:* November 29, 2005

*Date reissued:*

*Date amended:*

*By direction of the Administrator*

(*Signature*)

for 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* SA02204CH

Date issued: November 29, 2005

*Limitations and Conditions.* (Continued from Page 1 of 3)

2. FAA approved Airplane Maintenance Manual Supplement for Raytheon Model 1900C and 1900D, dated November 29, 2005, or a later FAA approved revision is required with this modification.

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.

- END -