

Component Maintenance Manual

Main Wheel Assembly Aircraft Wheel and Brake, LLC Part No. 40-424

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Publication No.: CM40-424, Revision M

Manufacturer:



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TO: HOLDERS OF CM40-424 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-424.

Attached to this transmittal letter is Revision A of CM40-424 (dated December 15, 2000)

Revision A, Dated December 15, 2000

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

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

REVISION HIGHLIGHTS

<u>Section</u>	<u>Page No.</u>	<u>Description Of Change</u>
All sections	All pages	Initial Release (DCN 0341-45)
As Follows:		Rev A (DCN 0343-50):
Record of Rev.	RR-1	Update page to reflect Rev. A
Effective Pages	LEP-1&2	Update applicable effective dates to reflect Rev. A
D&O	1,2,3	Para 1., line 2, (NOW) "tubeless" tire (WAS) "tube-type" tire Para 1., line 15, (REMOVE) "...by bolts and nuts (115 and 120)"
Testing	1001	Para 1.C.(2), (NOW) "...minimum of 1-1/2 threads.." (WAS) "...flush to 1-1/2 threads.."
	1003	Para 1.D.(3), (NOW) "(tire growth stabilization).." (WAS) "(growth stabilization).."
Disassembly	3001	Table 3001 (ADD) torq-set® driver bit. Para 1.B. (ADD) reference to 50-155 dwg.
	3002	Para 1.C.(3) (ADD) "7/16 and 11/32 hex socket" references
Inspection/Check	5001	Table 5001, (ADD) "eddy current" and "fuse plug/rupture disc fixture"
	5002	(ADD) Para. B., "Maintenance Schedule" and Table 5002
	5003	(NOW) Para. "C. General Inspection" (WAS) Para. "B." Para C.(1) (NOW) reference to Table 5002, (WAS) detailed inspection interval Para. C(2), (ADD) identification for "metal" components
	5004	Para. C(6) (NOW) "...at each tire change.." (WAS) "at each overhaul.." (REMOVE) ref to items 70 and 85. Para. 2. (ADD) penetrant fluid warning. Para. 2.B.(ADD) ref to Table 5002 and para. 1.G. Para. 2.B.(2) (ADD) "Repack cones with Aeroshell Grease...."
	5005	Para 2.D. (ADD) "eddy current", Table 5002 and Figure 5003 reference. (NOW) reference to Table 5002 (WAS) detailed inspection interval
	5006	Para 2.D.(3) consolidate figures 5002 and 5003 into 5002.
	5007	(ADD) para 2.D. (4) eddy current. (NOW) Figure 5003 references eddy current probe criteria (WAS) inboard wheel half inspection
	5008	Para 2.E. (ADD) rupture disc assy inspection (WAS) para. 2.F.
	5009	Fig 5004 (NOW) "fuse plugs - rupture disc test" (WAS) "outbrd whl heat damage". (NOW) para 2.F "procedure for overheated whls" (WAS) "inspect rupture disc".
	5010	(ADD) Fig 5005 "fuse plugs and rupture disc test". (ADD) Fig 5006 "outbrd whl heat damage" (NOW Table 5003 (WAS) Table 5001.
Repair	6001, 6002	Table 6001, (ADD) hub support fixture and heli-coil tools.
	6006	Para 1.E. (ADD) "paint material toxic warning" and "1.E.(1) "clean part per.."
	6009, 6010	Para 1.F. (ADD) restriction to bearing cup removal. Para 1.G. (ADD) feeler gauge check.
	6011	Para 1.G consolidated Fig 6004 and 6005 into Fig 6004. Fig 6005 (WAS) 6006.
	6012	(ADD) Para. 1.H. insert repair. Fig 6006 (NOW) helicoil tool (WAS) bearing cup install. (ADD) Fig 6007 insert install
Assembly	7001, 7002	Table 7001 (ADD) torq-set® driver bit. Para 1.B.(7) and (8) (NOW) "...5.65 N-m"
	7003	(WAS) "...65 N-m". Fig 7001 (REVISED) to remove nut thread area of coverage
Fits/Clearances	8001	Table 8002 (ADD) torq-set® driver bit reference for screws (100)
Special Tools...	9001, 9002	Table 9001 (ADD) tools: hub support, torq-set® driver bit, fuse plug/rupture disc fixture Heli-coil tools, eddy current equip.
	9003, 9004	Para 1.C. (WAS) on pg 9003. ADD) Phillips Screw and Emhart Heli-Coil
	9005, 9006	(ADD) figures 9003 and 9004
IPL	10004	IPL Fig 1 re-numbered figure items
	10005	Para. 4 re-numbered detailed parts list and add melt temp. range for fuse plug (item 105)
Storage	15001	Para 1 Note, (ADD) "Lubricate the bearings cups..". Para 1.A.(2) -28.9°C (WAS) -6.7°C

TO: HOLDERS OF CM40-424 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-424.

Attached to this transmittal letter is Revision B of CM40-424 (dated October 02, 2001)

Revision B, Dated October 02, 2001

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

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

REVISION HIGHLIGHTS

<u>Section</u>	<u>Page No.</u>	<u>Description Of Change</u>
As Follows:		Rev B (DCN 0347-77):
Record of Rev.	RR-1	Update page to reflect Rev. B
Effective Pages	LEP-1	Update applicable effective dates to reflect Rev. B
Description & Operation	1	Para 1., (NOW) "...cups (55) are shrink-fit into the hubs of the outboard wheel half." (WAS) "...cups (55) are shrink-fit into the hubs of each wheel half."
Testing	1001	para. 1.C.(4): (NOW) "Visually inspect air valve assembly, rupture disc assembly and fuse plug O-rings (85 and 100) for damage." (WAS) "Visually inspect air valve assembly O-ring (85) for damage."
	1002	Para. 1.D.(2) (a): (NOW) "If air leaks occur around air valve assembly (80), rupture disc assembly (90) or fusible plugs (105), check torque or replace O-ring (85 or 100) or replace component." (WAS) "If air leaks occur around air valve assembly (80), check torque or replace O-ring (85) or replace air valve assembly."
	1002	Para. 1.D.(2) (a): (ADD) <u>NOTE:</u> If leakage persists, remove leaking component, check interface surfaces and replace O-ring. Insert into test fixture (Figure 9003) and test component per <u>INSPECTION / CHECK</u> , then reinstall or replace."
	1003	(NOW) heading "Table 1002" (WAS) "Table 1001"
	1003	Table 1002: (NOW) "Preformed packings (85 and 100)" (WAS) "Preformed packings (70 and 85)"
	1004	(NOW) heading "Table 1002" (WAS) "Table 1001"
Disassembly	3001	Para 1.B.: (ADD) "SAFETY WARNING: COMPLETELY DEFLATE THE TIRE BEFORE REMOVING THE VALVE CORE. VALVE CORES UNDER PRESSURE CAN BE EJECTED LIKE A BULLET."
	3001	(ADD) "(2) Remove cap from air valve assembly (80) and remove air from tire by depressing valve stem plunger until air can no longer be heard escaping from the tire."
	3001	(ADD) "(3) When all pressure has been relieved, remove the valve core."
	3002	Para 1.B.: (NOW) re-identify lines (4) thru (6) (WAS) identified as lines (2) thru (4)
Inspection/Check	5002	Table 5002, Unscheduled Maintenance: (REMOVE) task, "b. Detailed inspection per para. 2" from "At every tire change" (ADD) task for "All Components", "Detailed inspection per para. 2" to applicable tire change schedules (2 places). (NOW) "Overheating such that at least one of the three fusible plugs release in the Main Wheel Assembly." (WAS) "Overheating due to: Wheel Assembly fuse plugs releasing"

<u>Section</u>	<u>Page No.</u>	<u>Description Of Change</u>
Inspection/Check	5003	Para 1.C. (REMOVE) "1.B" reference (REMOVE) "Refer to paragraph 2. Detailed Inspection Procedures for items that require specific examination." (ADD) to para. 1.C. (1), "...rupture disc assembly (90), fusible plugs (105), fairing screws (135),..." (REMOVE) para. "1.C.(3). Visually examine all components of the wheel assembly with threaded features. Replace all parts with stripped or scored threads or obvious damage."
	5004	(NOW) renumbered para. "1.C.(3)" and "1.C.(4)" (WAS) para. "1.C.(4)" and "1.C.(5)" (NOW) renumbered para. "1.C.(5)" and "1.C.(6)" (WAS) para. "1.C.(6)" and "1.C.(7)" (REMOVE) from para. 1.C.(6). "Check individual parts as indicated in paragraph 2. Detailed Inspections."
	5007	Figure 5003: (NOW) "R .073" (WAS) "R .438"
	5008	Para 2.E.: (NOW) " E. Inspect Fuse Plugs, Rupture Disc Assy and Air Valve Assy (IPL, 1-105, 1-90, and 1-80) " (WAS) " E. Inspect Fuse Plugs and Rupture Disc Assembly (IPL, 1-105, and 1-90) "
	5008	Para 2.E.(1): (ADD) "...and air valve..." Para 2.E.(1): (NOW) "...Figure 5004..." (WAS) "...Figure 5003..." Para 2.E.(1) (a): (NOW) "Install rupture disc or air valve and fuse plugs..." (WAS) "Install rupture and fuse plugs..." Para 2.E.(1) (a): (NOW) "...preformed packings (100 or 85) installed..." (WAS) "...preformed packing (100) installed..." Para 2.E.(1) (a): (NOW) "Torque each to..." (WAS) "Torque to..." Para 2.E.(1) (c): (NOW) "Apply a soapy water solution to the components..." (WAS) "Apply a soapy water solution to the plugs..." Para 2.E.(1) (d): (NOW) "Discard all components that leak." (WAS) "Discard all plugs that leak." (ADD) para "2.E.(e) Replace all parts with stripped or scored threads or other obvious damage."
	5009	Figure 5004: (ADD) "Air Valve Assy" reference
	6004	Para 1.C.(4): (ADD) "For rupture disc, fuse plugs, and air valve bosses, the maximum repair is .010 inch deep."
	6005	Figure 6001: For disc, plug, & valve bosses, (NOW) designated area "4" (WAS) designated area "3" For inboard hub faces (NOW) designated area "4" (WAS) designated area "3" For bolt mounting faces (NOW) designated area "4" (WAS) designated area "3" or "2"
	6010	Para 1.G.(2): (NOW) " CAUTION: USE PROTECTIVE GLOVES WHEN HANDLING CHILLED PARTS." (WAS) " CAUTION: USE PROTECTIVE GLOVES WHEN WORKING WITH DRY ICE."
	6012	Figure 6006: (REVISED) to add "END OF COIL" reference.
Special Tools	9004	Para. 1.C.: (ADD) for Black & Decker Co., "www.emhart.com"
	9006	Figure 9003, heading: (ADD) "...and Air Valve..."
	9006	Figure 9003, port callout: (NOW) "...and tap for 0.3125-24 UNF-3B..." (WAS) "...and tap for 0.3125-24 UNF-2B..."
IPL	10005	Para 4, Detailed Parts List: (NOW) nomenclature for item 20, "MS28775-268 (WAS) "MS287750268"

TO: HOLDERS OF CM40-424 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-424.

Attached to this transmittal letter is Revision C of CM40-424 (dated October 10, 2003)

Revision C, Dated October 10, 2003

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

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

REVISION HIGHLIGHTS

Section/Page No.

Description Of Change

As Follows:

Rev C (DCN 0358-02):

Record of Rev pg. RR-1

Update page to reflect Rev. C

List of Effective Pages pg. LEP-1

Update applicable effective dates to reflect Rev. C

Description and Operation pg. 1

Paragraph 1:
(now) "(110A)" (was) "(110)"

pg. 2

Figure 1, item callout:
(now) 110A (was) 110

Testing and Fault Isolation pg. 1001

Paragraph 1.B.:
(now) "A test data sheet is given at the end of this section for reference."
(was) "Prior to testing, make photocopies of the test data sheet provided at the end of this section. One photocopy of the data sheet is required for each wheel assembly to be tested."

pg. 1001

Paragraph 1. C. (3):
(now) "(110A)" (was) "(110)"

pg. 1005

Test Data Sheet:
(remove) "A. Weight of Wheel Assembly:.....lb/kg
Maximum Weight: 16.50 lb (7.49kg)."
(now) "A. Quality of Workmanship:"
(was) "B. Quality of Workmanship:"
(now) "B. Pretest Checks"
(was) "C. Pretest Checks"
(now) "C. Pressure Test"
(was) "D. Pressure Test"
(now) "D. 24 Hour Pressure Test"
(was) "E. 24 Hour Pressure Test"

<u>Section/Page No.</u>		<u>Description Of Change</u>
Disassembly	pg. 3003	Paragraph 1. C. (10): (now) "(110A)" (was) "(110)"
Inspection/ Check	pg. 5004	Paragraph 2. A.: (now) "Inspect Drive Keys (IPL, 1-110A)" (was) "Inspect Drive Keys (IPL, 1-110)"
Repair	pg. 6007	Figure 6002, cross section view: (remove) flange tab graphics. (remove) "overspray permissible ($\varnothing$.201 holes-6 places)" (now) "6X 1.86" (was) "6X 2.08"
Assembly	pg. 7001	Table 7001: (now) " <u>NOTE:</u> Unless otherwise stated, equivalent substitutes may be used..." (was) " <u>NOTE:</u> Equivalent substitutes may be used..." (add) " <u>1</u> " flag to MIL-T-83483 callout (add) " <u>1</u> <u>CAUTION:</u> DO NOT MIX ANTI-SEIZE COMPOUNDS. THIS CAN RESULT IN IMPROPER TORQUE SETTINGS AND COULD RESULT IN FAILURE OF THE BOLT. THE USE OF ANTI-SEIZE COMPOUND IS LIMITED TO THAT SPECIFIED IN TABLE 7001."
Fits and Clearances	pg. 8001	Table 8001: (now) "(110A)" (was) "(110)"
Illustrated Parts List	pg. 10004	IPL Figure 1 Main Wheel Assembly: (add) in 1 places "110A" to "110" callouts (remove) inboard wheel flange tab graphics
	pg. 10005	Detailed Parts List: For line item 110, Assembly, Plate, Pressure: (add) for line Item 75, Key, Drive: "SUPSD BY Item 110A" (add) line Item "110A, 205-05201, Key, Drive, SUPSDS Item 110, Qty 6"

TO: HOLDERS OF CM40-424 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-424.

Attached to this transmittal letter is Revision D of CM40-424 (dated May 10, 2004)

Revision D, Dated May 10, 2004

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

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

REVISION HIGHLIGHTS

Section/Page No.

Description Of Change

As Follows:

Rev D (DCN 0361-04):

Record of Rev pg. RR-1

Update page to reflect Rev. D

Service Bulletin pg. SB-1
List

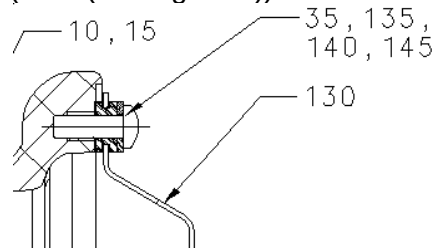
Update page to reflect issuance of SB7075

List of Effective pg. LEP-1
Pages

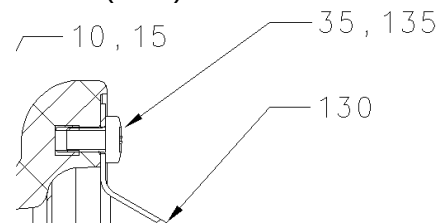
Update applicable effective dates to reflect Rev. D

Description and pg. 2
Operation

(Now (ref. Figure 1))



(Was)



Description and pg. 3
Operation

(Add)

140.	GROMMET
145.	WASHER

Testing pg. 1002
Pg. 1003

(Now) (30 and 50) (Was) (30 and 40)
(Now) (25 & 45) (Was) (25 & 35)

Disassembly pg. 3002
Disassemble
Wheel Assembly

Paragraph C.:

(Now) "Remove screws (135), washers (145), grommets (140), and fairing (130) from the outboard wheel half subassembly (45)."

(Was) "Remove screws (135), and fairing (130) from the outboard wheel half subassembly (45)."

Section/Page No.

Description Of Change

Cleaning pg. 4002
Inspection/Check pg. 5002

(Now) (25 and 45) (Was) (25 and 35)
Table 5002 - Scheduled Maintenance:
(Add)

At every tire change	Grommets (145)	Replace
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Assembly pg. 7005

Paragraph 1. B. (23):
(Now) "Install five grommets (140) into fairing (130). Apply MIL-T-83483 Anti-Seize to end of fasteners and threads of fasteners (135). Install one washer (145) onto each fastener (135). Attach fairing (130) to outboard wheel half subassembly. Torque fastener (135) to 20 – 25 in.-lbs. (2.26 – 2.82 N-m). Note that the fastener is designed to bottom in the outboard wheel half subassembly before fully compressing the grommet."

(Was) "Attach fairing (130) onto outboard wheel half subassembly with screws (135) and torque fasteners to 35 to 45 in-lb (3.95 to 5.08 N-m)."

Fits and Clearances pg. 8001

Table 8002
(Now)

Screws (135) - Fairing	20 to 25 in-lb (2.26 to 2.82 N-m).
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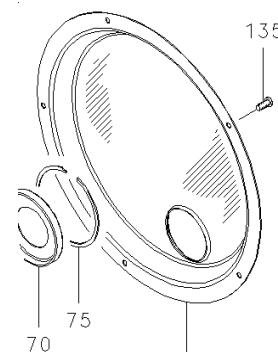
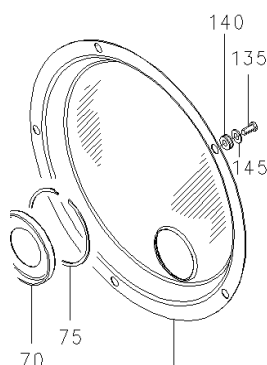
(Was)

Screws (135) - Fairing	35 to 45 in-lb (3.95 to 5.08 N-m).
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Illustrated Parts List pg. 10004

Figure 1
(Now)

(Was)



Illustrated Parts List pg. 10005

4. Detailed Parts List
(Now)

130	157-03500	FAIRING	1
135	102-35000	SCREW	5
140	217-01200	GROMMET (MS35489-4)	5
145	095-10300	WASHER (AN960-10)	5

(Was)

130	157-02100	FAIRING	1
135	102-33400	SCREW (MS35207-260)	5

TO: HOLDERS OF CM40-424 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-424.

Attached to this transmittal letter is Revision E of CM40-424 (dated June 15, 2004)

Revision E, Dated June 15, 2004

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

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

REVISION HIGHLIGHTS

Section/Page No.

Description Of Change

As Follows:

Rev E (DCN 0361-78):

Record of Rev pg. RR-1

Update page to reflect Rev. E

List of Effective Pages pg. LEP-1

Update applicable effective dates to reflect Rev. E

Repair pg. 6004

(now) paragraph C.(6) (was) identified as paragraph C.(5)

(add) CAUTION and paragraph to be identified as C.(5):

“CAUTION: DO NOT ATTEMPT TO REPAIR WEAR RUTS.”

“(5) In area 5, wear ruts of .050 inch maximum depth are permissible.

TO: HOLDERS OF CM40-424 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-424.

Attached to this transmittal letter is Revision F of CM40-424 (dated July 17, 2008)

Revision F, Dated July 17, 2008

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

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

REVISION HIGHLIGHTS

Section/Page No.

Description Of Change

As Follows:	DCN 0380-92
Record of Rev/pg RR-1	Update page to reflect latest revision
Service Bulletin List/pg SB-1	(ADD) SB7087 listing
List of Effective Pages pg LEP-1	Update applicable effective dates to reflect latest revision
Introduction pg INTRO-1	(UPDATE) contact information
Assembly pg 7002	Paragraphs E. (8) (NOW) '...disc assembly (90)' (WAS) '...disc assembly (100)'
Illustrated Parts List pg 10004	 IPL Figure 1: (ADD) items 70A and 100A
pg 10005	(ADD) line item 70A, 154-08401 grease seal (ADD) line item 100A, 101-00500 preformed packing
pg 10006	(ADD) line item 100A, 101-00500 preformed packing

TO: HOLDERS OF CM40-424 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-424.

Attached to this transmittal letter is Revision G of CM40-424 (dated May 11, 2010)

Revision G, Dated May 11, 2010

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

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

REVISION HIGHLIGHTS

Section/Page No.

Description Of Change

As Follows:

DCN 0388-22

Record of Rev/RR-1

Update page to reflect latest revision

Service Bulletin List/SB-1

Update rev levels of SB7075 and SB7087

List of Effective Pages
LEP-1 and LEP-2

Update applicable effective dates to reflect latest revision

Table of Contents/pg TC-1

(ACTIVATE) SPECIAL PROCEDURES section

Description & Operation/pg 3

Table 1 Leading Particulars

(NOW) Bearing Lubricant:

Primary: Mobil Aviation Grease SHC100

Optional: Aeroshell Grease 22 per MIL-G-81322

(WAS) Aeroshell Grease 22 per MIL-G-81322

(ADD) **CAUTION:** DO NOT INTERMIX AVIATION BEARING GREASES.

Disassembly/pg 3002

(CORRECTION) Para C.(5) (WAS) C.(6)

(CORRECTION) Para C.(6) (WAS) C.(7)

Para C. (6)

(NOW) Remove bolts (5), countersunk washers (10), tire change counter (150), if used, and nuts (15).

(WAS) Remove bolts (5), countersunk washers (10), and nuts (15).

(ADD) **NOTE:** Refer to the **SPECIAL PROCEDURES** section for information on the optional tire change counter.

(CORRECTION) Para C.(7) (WAS) C.(8)

Revision G, Dated May 11, 2010

<u>Section/Page No.</u>	<u>Description Of Change</u>
Inspection & Check/pg 5002	Table 5002 Scheduled Maintenance (ADD) to 'At every tire change': Refer to the <u>SPECIAL PROCEDURES</u> section for instructions on the use of the tire change counter.
pg 5004	Para. B. (2) (ADD) <u>CAUTION:</u> DO NOT INTERMIX AVIATION BEARING GREASES. (NOW) Repack cones with bearing grease (<u>ASSEMBLY</u> section, Table 7001) (WAS) Repack cones with Aeroshell Grease 22 per MIL-G-81322, grade A or equivalent.
Assembly pg 7001	Table 7001, Assembly Equipment and Materials List (ADD) Mobile Aviation Grease SHC100 (REVISE) Aeroshell Grease 22 to be listed as the optional grease. (ADD) <u>CAUTION:</u> DO NOT INTERMIX AVIATION BEARING GREASES.
pg 7002	Para. B. (5) (NOW) Lubricate wheel register preformed packing with a light coat of bearing grease (refer to Table 7001). (WAS) Lubricate wheel register preformed packing with a light coat Aeroshell Grease 22...
pg 7003	Para. B(11) (ADD) <u>STOP!</u> If using the optional tire change counter (150), refer now to the <u>SPECIAL PROCEDURES</u> section for installation instructions of the tire change counter and mounting hardware. If not using the optional tire change counter, continue to instruction (11) below.
pg 7003	Figure 7001, standardize graphics

Revision G, Dated May 11, 2010

<u>Section/Page No.</u>	<u>Description Of Change</u>
Assembly pg 7005	Para. B. (16) (NOW) Pack bearing cones (65) with bearing grease (refer to Table 7001). (WAS) Pack bearing cones (65) with Aeroshell Grease 22 per MIL-G-81322, grade A or equivalent.
pg 7005	Para. B. (20) thru B. (25) (ADD) Test the wheel assembly. Refer to the <u>TESTING AND FAULT ISOLATION</u> section. (RENUMBER) B.(20) thru B.(25)
Special Tools, Fixtures... pg 9003	Table 9002 (Sheet 2 of 2) Consumables List (ADD) Mobile Aviation Grease SHC100 (REVISE) Aeroshell Grease 22 to be listed as an optional grease. (ADD) Uni-Paint markers (ADD) <u>CAUTION:</u> DO NOT INTERMIX AVIATION BEARING GREASES.
pg 9004	Para. C List of Manufacturers and Vendors (ADD) Sanford Corporation (ADD) Exxon-Mobil Oil Company, Aviation Lubricants
Illustrated Parts List pg 10004	IPL Figure 1 Main Wheel Assembly (ADD) item (150) graphics (ADD) items 30A and 50A
pg 10005	Detailed Parts List - Main Wheel Assembly (ADD) item 30A, 151-19902 (ADD) item 50A, 152-19902 (ADD) flagnote (2): (2) 151-19902/152-19902 and 151-19901/152-19901 are procured thru different forging suppliers.
Illustrated Parts List pg 10006	(ADD) item 150, 139-39000, Tire Change Counter, qty. 1 (ADD) flagnote (3): (3) The optional tire change counter must be ordered as a separate kit (ref. Parker P/N 199-272). Refer to the <u>SPECIAL PROCEDURES</u> section for installation of the tire change counter.

Revision G, Dated May 11, 2010

Section/Page No.

Description Of Change

Special Procedures
pg 11001 to 11006

(ADD) Section for optional tire change counter

Storage
pg 15001

Para. 1. General
(NOW) for NOTE:

Lubricate the bearing cups (55) and cones (65) with bearing grease (refer to ASSEMBLY section, Table 7001).

(WAS) Lubricate the bearing cups (55) and cones (65) with Aeroshell Grease 22 per MIL-G-81322, grade A or equivalent...

TO: HOLDERS OF CM40-424 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-424.

Attached to this transmittal letter is Revision H of CM40-424 (dated October 15, 2011)

This revision 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 0394-56

Title Page./T-1

(ADD) proprietary and export statements.

Record of Rev./RR-1

Update to reflect latest revision.

Effective Pages/
LEP-1 & LEP-2

Update to reflect latest revision.

Introduction/INTRO-1

Update proprietary statement.
(ADD) export statement.

Illustrated Parts List/
10006

(NOW) 095-10800 (AN960-10L)
(WAS) 095-10300 (AN960-10)

TO: HOLDERS OF CM40-424 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-424.

Attached to this transmittal letter is Revision J of CM40-424 (dated April 05, 2014)

Revision J, Dated April 05, 2014

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

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

REVISION HIGHLIGHTS

Section/Page No.

Description Of Change

As Follows:	ECO-0034053
Record of Rev/pg RR-1	Update page to reflect latest revision
List of Effective Pages pg LEP-2	Update applicable effective dates to reflect latest revision
Illustrated Parts List pg 10004	IPL Figure 1 Main Wheel Assembly (ADD) items 30B and 50B
pg 10005	Detailed Parts List - Main Wheel Assembly (sheet 1 of 2) (ADD) item 30B, 151-19903 (ADD) item 50B, 152-19903 (NOW) flagnote (2): (2) 151-19903/152-19903, 151-19902/152-19902 and 151-19901/152-19901 are procured thru different forging suppliers. (WAS) flagnote (2): (2) 151-19902/152-19902 and 151-19901/152-19901 are procured thru different forging suppliers.
pg 10006	Detailed Parts List - Main Wheel Assembly (sheet 2 of 2) (MOVE) items 80 thru 100A from pg 10005

TO: HOLDERS OF CM40-424 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-424.

Attached to this transmittal letter is Revision K of CM40-424 (dated July 16, 2019)

Revision K, Dated July 16, 2019

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

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

REVISION HIGHLIGHTS

Section/Page No.

Description Of Change

As Follows:	ECO-0105780
Title Page/T-1	Update page to reflect latest revision
Record of Rev/pg RR-1	Update page to reflect latest revision
List of Effective Pages pg LEP-1	Update applicable effective dates to reflect latest revision
Introduction/ pg 1	(DELETE) 2. Data Rights and export statement. Now on title page
Inspection/Check pg 5002	Table 5002, Maintenance Intervals (ADD) Introductory paragraph: The maintenance schedule is intended to be a guideline based on laboratory testing whose purpose is to maintain continued airworthiness. Field operating requirements can vary from aircraft to aircraft. These variations will directly affect the wear rate of the wheel assembly components. Users may evaluate their operating conditions to determine a suitable schedule provided that continued airworthiness is maintained.

TO: HOLDERS OF CM40-424 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-424.

Attached to this transmittal letter is Revision L of CM40-424 (dated July 22, 2020)

Revision L, Dated July 22, 2020

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

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

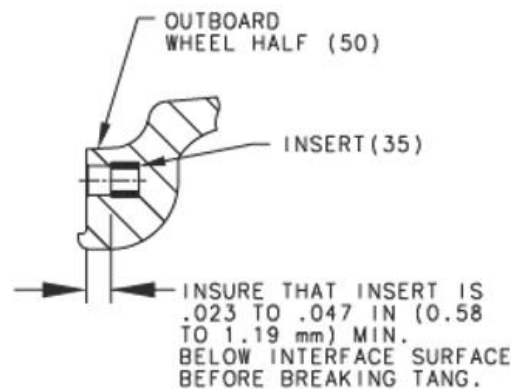
REVISION HIGHLIGHTS

Section/Page No.

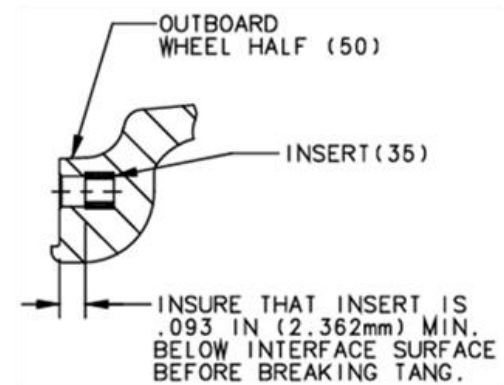
Description Of Change

As Follows:	ECO-0109319
Title Page/T-1	Update page to reflect latest revision
Record of Rev/pg RR-1	Update page to reflect latest revision
List of Effective Pages pg LEP-1	Update applicable effective dates to reflect latest revision
Repair pg 6012	Figure 6007, Insert Installation

(NOW)



(WAS)



Illustrated Parts List
pg 10006

4. Detailed Parts List
Items 85, 100 (NOW) (AS3582-010) (WAS) (MS9068-010)
Item 145, (NOW) (NAS1149F0332P) (WAS) (AN960-10)

TO: HOLDERS OF CM40-424 COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST FOR MAIN WHEEL ASSEMBLY PART NO. 40-424.

Attached to this transmittal letter is Revision M of CM40-424 (dated 2023-01-31)

Revision M, Dated 2023-01-31

REVISION L 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	Per ECO-0134271
All Sections/All Pages	Page Header (NOW) Aircraft Wheel and Brake, By Kaman logo (WAS) Parker logo
Title Page/T-1	(NOW) Aircraft Wheel and Brake proprietary rights statement and logo (WAS) Parker proprietary rights statement and logo
Record of Revisions/RR-1	Updated to reflect current revision
Service Bulletin List	(NOW) Aircraft Wheel and Brake, LLC (WAS) Parker Hannifin
List of Effective Pages/ LEP-1	Updated to reflect current revision
Introduction/ Pg INTRO-1	(NOW) Aircraft Wheel and Brake, LLC name and all sections updated per AWB CMM template/standard (WAS) Parker Hannifin name, contact info, and template
Pg INTRO-2	(NOW) Aircraft Wheel and Brake, LLC name and all sections updated per AWB CMM template/standard (WAS) Parker Hannifin name and template

Revision M, Dated 2023-01-31

<u>Section/Page No.</u>	<u>Description Of Change</u>
Description and Operation Pg 3	(NOW) MIL-PRF-83483 or MIL-T-83483 (WAS) MIL-T-83483 (NOW) Alternate: Aeroshell Grease 22 per MIL-G-81322 Aeroshell Grease 58 per SAE AMS3058 NYCO Grease GN 3058 per SAE AMS3058 (WAS) Optional: Aeroshell Grease 22 per MIL-G-81322 (NOW) MIL-PRF-83483 or MIL-T-83483 (WAS) MIL-T-83483 (NOW) <u>CAUTION:</u> DO NOT INTERMIX AVIATION BEARING GREASES. NEW WHEELS ARE PACKED WITH MOBIL AVIATION GREASE SHC 100. (WAS) <u>CAUTION:</u> DO NOT INTERMIX AVIATION BEARING GREASES.
Disassembly/Pg 3001	(NOW) Aircraft Wheel and Brake, LLC (WAS) Parker Hannifin
Inspection/Check/Pg 5004	(NOW) Replace drive key if the drive key width is less than the minimum limit at the locations which contact the brake rotating discs. (WAS) Replace drive key if constraint exceeds the limit or the area is damage
Repair/Pg 6001 & 6006	(NOW) MIL-C-5541, Class 1A or MIL-DTL-5541, Type I or Type II, Class 1A (WAS) MIL-C-5541, Class 1A
Assembly/Pg 7001	(NOW) Aircraft Wheel and Brake, LLC (WAS) Parker Hannifin (NOW) MIL-PRF-83483 or MIL-T-83483 (WAS) MIL-T-83483 (ADD) Aeroshell Grease 58 Alternate, SAE AMS3058, Shell Oil Company Lubricant Division NYCO Grease GN 3058 Alternate, SAE AMS3058, NYCO Corporation (NOW) <u>CAUTION:</u> DO NOT INTERMIX AVIATION BEARING GREASES. NEW WHEELS ARE PACKED WITH MOBIL AVIATION GREASE SHC 100. (WAS) <u>CAUTION:</u> DO NOT INTERMIX AVIATION BEARING GREASES.

Revision M, Dated 2023-01-31

<u>Section/Page No.</u>	<u>Description Of Change</u>
Pg 7003 & 7005	(NOW) MIL-PRF-83483 or MIL-T-83483 (WAS) MIL-T-83483
Fits and Clearances Pg 8001	(NOW) MIL-PRF-83483 or MIL-T-83483 (WAS) MIL-T-83483
Special Equipment and Consumables/Pg 9001 & 9004	(NOW) Aircraft Wheel and Brake, LLC (WAS) Parker Hannifin
Pg 9003	(NOW) MIL-PRF-83483 or MIL-T-83483 (WAS) MIL-T-83483 (NOW) MIL-C-5541, Class 1A or MIL-DTL-5541, Type I or Type II, Class 1A (WAS) MIL-C-5541, Class 1A (ADD) Aeroshell Grease 58 Alternate, SAE AMS3058, Shell Oil Company Lubricant Division NYCO Grease GN 3058 Alternate, SAE AMS3058, NYCO Corporation (NOW) CAUTION: DO NOT INTERMIX AVIATION BEARING GREASES. NEW WHEELS ARE PACKED WITH MOBIL AVIATION GREASE SHC 100. (WAS) CAUTION: DO NOT INTERMIX AVIATION BEARING GREASES.
Pg 9004	(NOW) Aircraft Wheel and Brake, LLC, www.kaman.com/cleveland (WAS) Parker Hannifin, www.parker.com/cleveland (NOW) www.exxonmobil.com Fairfax VA, 22037 USA 1-800-662-4525 (WAS) www.mobil.com 3225 Gallows Road Fairfax, VA 22037 USA (ADD) NYCO www.nyco.fr 66 Avenue Des Champs-Elysees BP 414 75366 Paris CEDEX 08 France +33 1 45 61 50 00 www.nycoamerica.com 87 Amlajack Way Newman, GA 30265 USA
Illustrated parts list/ Pg 10001, 10002, & 10006	(NOW) Aircraft Wheel and Brake, LLC (WAS) Parker Hannifin
Special Procedures/ Pg 11001	(NOW) Aircraft Wheel and Brake, LLC (WAS) Parker Hannifin (NOW) MIL-PRF-83483 or MIL-T-83483 (WAS) MIL-T-83483

RECORD OF REVISIONS

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	00-08-01	00-08-01	PHC				
A	00-12-15	00-12-15	PHC				
B	10-02-2001	10-02-2001	PHC				
C	10-10-2003	10-10-2003	PHC				
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E	06-15-2004	06-15-2004	PHC				
F	07-17-2008	07-015-2008	PHC				
G	05-11-2010	05-11-2010	PHC				
H	10-15-2011	10-15-2011	PHC				
J	04-05-2014	04-05-2014	PHC				
K	07-16-2019	07-16-2019	PHC				
L	07-22-2020	07-22-2020	PHC				
M	2023-01-31	2023-01-31	JAS				

SERVICE BULLETIN LIST

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

SERVICE BULLETIN NUMBER	SUBJECT	REV.	DATE INCORPORATED
SB7075	P/N 157-02100 Fairing – Inspect/Rework Or Replace	A	01-04-2010
SB7087	Main Wheel Assembly 40-424 – P/N 154-08400 Grease Seal Replacement	B	01-04-2010

LIST OF EFFECTIVE PAGES

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	1006	Blank	Clearances	8002	Blank
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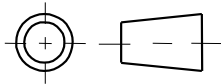
INTRODUCTION

1. General

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

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

THIRD ANGLE PROJECTION



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

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 Aircraft Wheel and Brake, LLC (AWB) for the latest revision.

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

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

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

2. Data rights and export statement

(Deleted)

INTRODUCTION

3. TSO Notice

This assembly carries a “TSO C26c” marking for FAR Part 23 usage, which identifies it as having been fully tested in the laboratory and qualified to applicable FAA (Federal Aviation Administration) requirements and specifications. Substitutions of critical parts or changes of processes or materials are not permitted without the written approval of the manufacturer.

4. Manual use

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

5. Warnings, cautions, and notes

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

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

6. Replacement parts

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

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

DESCRIPTION AND OPERATION

1. Main Wheel Description (Figure 1)

The main wheel assembly is a 7.50-10, Type III wheel designed for use with an 8.50-10, 10 PR tubeless tire. The divided type main 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.

An O-ring (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 (55) and cones, (65). The bearing cups (55) are shrink-fit into the hubs of the outboard wheel half. Rubber molded type seals (70) provide protection and lubricant retention for the bearing.

The inner wheel half has six drive lugs that engage the drive slots of the rotating brake discs. The drive lugs are lined with steel drive keys (110A) which are held in place by two screws (115) to provide a hard wearing surface for the rotor drive slots and to prevent damage to the softer metal of the wheel.

A stainless heat shield (120) is secured in the inboard wheel half.

Three fusible plugs (105) installed in the inboard wheel half will melt and release the tire pressure if the wheel becomes overheated. A rupture disc assembly (90) installed in the inboard wheel half will release if the tire is overpressurized.

2. Main Wheel Operation

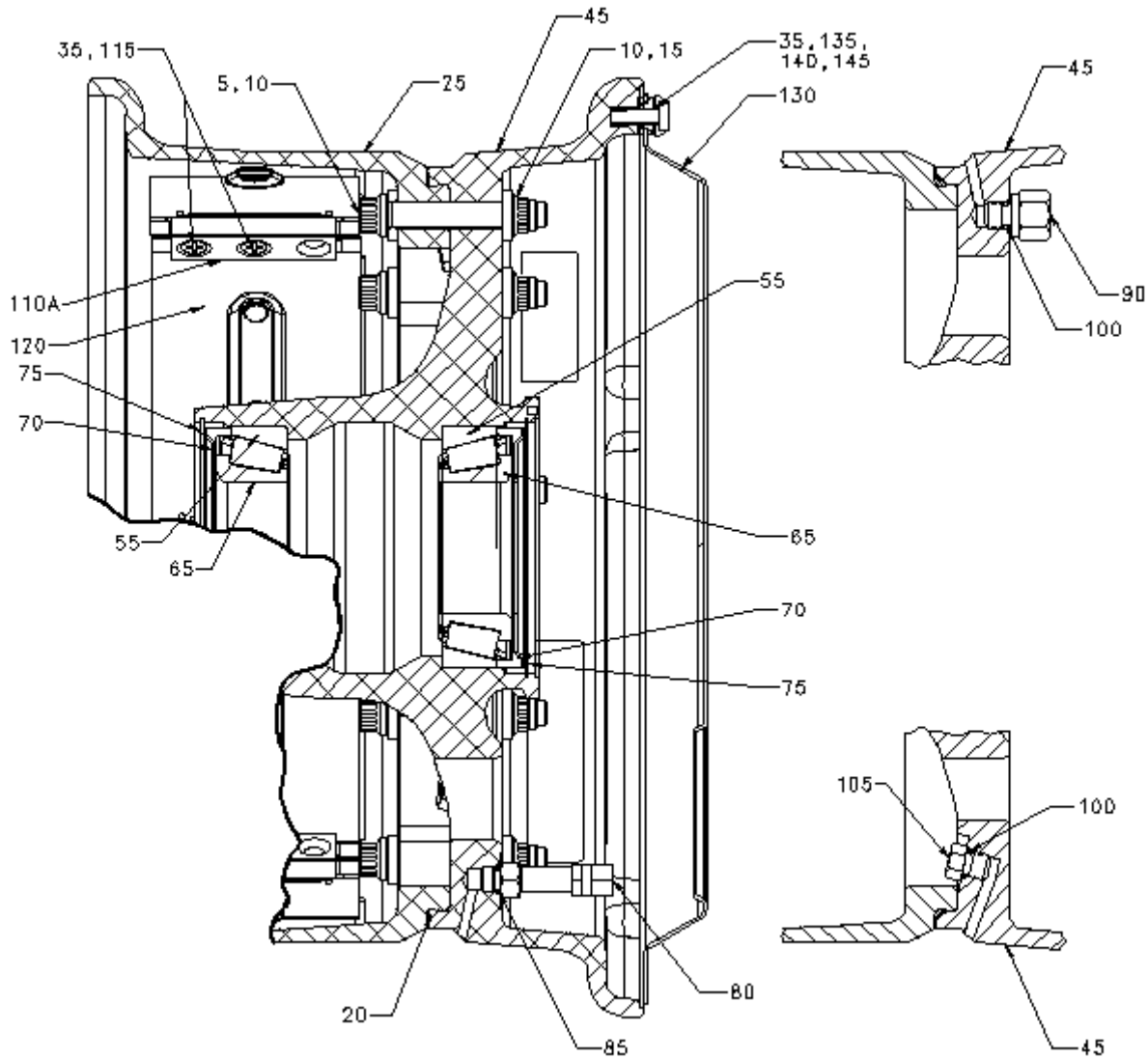
The main wheel assembly provides partial support of the weight of the aircraft and a means of steering control. When mated with the brake assembly, the wheel assembly provides the braking operation by driving the rotating disc members of the brake assembly.

3. Main Wheel 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.

DESCRIPTION AND OPERATION



40-424 Main Wheel Assembly
Figure 1

DESCRIPTION AND OPERATION

Key to Figure 1

5. Bolt, External Wrenching	80. Assembly, Valve, Air
10. Washer, Double Countersunk	85. Packing, Preformed
15. Nut, Self-Locking	90. Assembly, Disc, Rupture
20. Packing, Preformed	100. Packing, Preformed
25. Subassembly, Wheel Half, Inboard	105. Plug, Fusible
35. Insert	110. Key, Drive
45. Subassembly, Wheel Half, Outboard	115. Screw
55. Cup, Bearing	120. Shield, Heat
65. Cone, Bearing	130. Fairing
70. Seal, Grease	135. Screw
75. Ring, Retaining	140. Grommet
	145. Washer

Table 1
Leading Particulars

PARAMETER	SPECIFICATION
Wheel Size and Type	7.50-10, Type III for use with 8.50-10 10PR Tubeless Tire
Assembly Weight	16.50 lb (7.49 kg) Maximum Guaranteed
Wheel Bolt Nut Torque	Torque 170-190 in-lb (19.21-21.47 N-m) with MIL-PRF-83483 or MIL-T-83483 Anti-seize
Wheel Material	Aluminum Alloy Forging
Bearing Lubricant	¹ Primary: Mobil Aviation Grease SHC 100 Alternate: Aeroshell Grease 22 per MIL-G-81322 Aeroshell Grease 58 per SAE AMS3058 NYCO Grease GN 3058 per SAE AMS3058
Wheel Half Coatings	Surface Pretreatment: MIL-A-8625, Type II, Class 1 Primer Coating: MIL-P-85582B, Type I, Class C2 or MIL-PRF-85582C, Type I, Class C2 Finish Coating: MIL-C-85285B, Type I, Color No. 17925 per FED-STD-595 (Untinted White)

¹ **CAUTION:** DO NOT INTERMIX AVIATION BEARING GREASES. NEW WHEELS ARE PACKED WITH MOBIL AVIATION GREASE SHC 100.

TESTING

1. General

This section contains test procedures that can be used both as troubleshooting measures and means to test overhauled wheel assemblies

A. Test Equipment and Materials. Refer to Table 1001.

Table 1001
Testing Equipment and Materials List

PART NUMBER	NOMENCLATURE	SPECIFICATION	SOURCE OF SUPPLY
N/A	Inflation Cage	N/A	Commercial Source
N/A	Tire Pressure Gage	To assure recommended inflation pressure (per airframe mfr.)	Commercial Source
N/A	Socket Set with Assorted Wrenches	12 pt. External Drive and Hex Head, Inch	Commercial Source
N/A	Torque Gage	0 to 200 in-lb capacity (0 to 22.60 N-m)	Commercial Source
N/A	Soap Solution	N/A	Commercial Source
N/A	Screw Driver Bits	Regular, Phillips	Commercial Source
N/A	Torq-Set® Driver Bit	(NASM33781)	Phillips Screw Company

B. Preparation for Testing

A test data sheet is given at the end of this section for reference.

C. Pretest Check (Refer to IPL, Figure 1)

Perform the following inspections and checks to prepare the main wheel assembly for testing. Do not perform testing on any main wheel assembly that exhibits visible signs of wheel or tire damage.

- (1) Visually inspect the wheel for corrosion, cracks, or other visible damage.
- (2) Check wheel nuts (15) to be sure they are properly installed and have not worked loose. Bolt threads should have a minimum of 1-1/2 threads extending beyond the nut.
- (3) Check for loose or worn drive keys (110A).
- (4) Visually inspect air valve assembly, rupture disc assembly and fuse plug O-Rings (85 and 100) for damage.

TESTING

- (5) Visually inspect tires for cuts, flat spots, and tread or sidewall damage.

NOTE: Refer to tire manufacturer's service and maintenance manuals for recommended servicing procedures.

D. Procedure

Mounted wheel assemblies may be tested in accordance with the following procedure.
Refer to IPL, Figure 1.

SAFETY WARNING:  **INFLATION OF TIRE CAN BE EXTREMELY DANGEROUS AND IT IS RECOMMENDED THAT INFLATION BE PERFORMED IN AN INFLATION CAGE TO PREVENT INJURY TO PERSONNEL FROM POSSIBLE EXPLOSION.**

CAUTION: COVER HUB OPENINGS OF WHEEL HALVES TO PREVENT CONTAMINATION OF BEARING AREA.

- (1) Place wheel/tire assembly in an inflation cage and inflate to recommended operating pressure.
- (2) Coat entire wheel/tire assembly with soap solution. Check carefully for air leaks in the form of soap bubbles.

- (a) If air leaks occur around air valve assembly (80), rupture disc assembly (90) or fusible plugs (105), check torque or replace O-ring (85 or 100) or replace component.

NOTE: If leakage persists, remove leaking component, check interface surfaces and replace O-ring. Insert into test fixture (Figure 9003) and test component per INSPECTION / CHECK, then reinstall or replace.

- (b) If air leaks occur around tire bead seat, completely deflate tire and remove wheel/tire assembly from inflation cage.

- 1 Remove tire from wheel and examine wheel bead seat and tire for damage. If wheel bead seat is scratched, nicked or pitting, repair in accordance with paragraph 1.C. of REPAIR section.

NOTE: Refer to DISASSEMBLY section for removal of tire.

- (c) If air leaks through wheel, completely deflate tire and remove wheel/tire assembly from inflation cage.

- 1 Remove tire from wheel and penetrant inspect wheel halves (30 and 50) for cracks in accordance with INSPECTION/CHECK section. Replace cracked wheel halves.

NOTE: Refer to DISASSEMBLY section for removal of tire.

TESTING

- (3) Place wheel/tire assembly in an inflation cage and inflate to recommended operating pressure. After the initial 24 hours (tire growth stabilization), re-inflate to recommended operating pressure.
- (a) Check pressure after an additional 24 hours. If the reduction in pressure exceeds five percent of inflation pressure, replace wheel O-ring (20) and retest wheel/tire assembly in accordance with step (2).

NOTE: Refer to DISASSEMBLY section for removal of wheel O-ring.

E. Troubleshooting (Refer to IPL, Figure 1)

Table 1002 (Sheet 1 of 2)
Wheel Assembly Troubleshooting

TROUBLE	PROBABLE CAUSE	CORRECTION
Loss of tire pressure	Preformed packing (20) on wheel register worn, damaged or twisted on Wheel register groove	Replace preformed packing (20) and realign on register taking care not to twist packing
	Preformed packings (85 and 100)	Replace preformed packings
	Loss of preload on wheel tie bolts	Inspect and replace self-locking nuts (15) if locking feature is destroyed
	Crack in inboard or outboard wheel half subassemblies (25 & 45)	Penetrant inspect wheel half assemblies (25 & 45) per <u>INSPECTION AND CHECK</u> section and replace with new part if crack is found
Excessive drag on wheel when rotating	Improper preload or torque on axle nut	Loosen and retighten per <u>ASSEMBLY</u> section
	Damage to bearing cones (65) and or bearing cups (55)	Inspect bearing cones (65) and cups (55). Replace if damaged or corroded. Repack new cones with grease

TESTING

Table 1002 (Sheet 2 of 2)
Wheel Assembly Troubleshooting

TROUBLE	PROBABLE CAUSE	CORRECTION
Cracked or distorted wheel or wheel half	Hitting rocks or other hard objects during landing or takeoff	Inspect wheel per <u>INSPECTION/CHECK</u> section to determine condition and replace with new part if crack is found
	Use of sharp objects to break tire bead	Replace wheel or wheel half
	Landing with flat tire or abnormally hard landing	
	Landing in crabbing position in crosswind causing excessive side force	
	Normal fatigue failure when used beyond expected wheel life	
Damaged bearing cone	Misalignment of bearings	Replace bearing cone (65)
	Axle nut improperly torqued	Replace and torque axle nut to aircraft manufacturer's specifications
	Foreign matter in bearing grease	Check bearing cone (65) integrated grease seals for damage. Replace cones and be sure bearing grease is free from foreign matter
	Lack of bearing grease	Replace bearing cones (65) and cups (55) and repack with grease
Worn or damaged bearing grease seals	Normal wear or improper installation	Replace bearing grease seals (70)

TEST DATA SHEET

Work Order No. _____ Date _____ Wheel Serial No. _____

A. **Quality of Workmanship:** Accept _____ Reject _____

Comments: _____

B. **Pretest Checks**

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

Comments: _____

C. **Pressure Test** Accept _____ Reject _____

Tire inflation pressure: _____ psig Required: Recommended operating pressure

Leakage around inflation valve: Yes _____ No _____

Leakage around bead seat: Yes _____ No _____

Leakage through wheel: Yes _____ No _____

Comments: _____

D. **24 hour Pressure Test** Accept _____ Reject _____

Tire inflation pressure: _____ psig Required: Recommended operating pressure

Pressure after 24 hrs.: _____ psig Required: Only 5% allowable pressure loss

Pass _____ (less than 5% pressure loss)

Fail _____ (more than 5% pressure loss) – Retest per step D. Pressure Test

Comments: _____

Tester: _____

Date: _____

Inspector: _____

Date: _____

DISASSEMBLY

1. General

To service the main wheel assembly, it will be necessary to remove it from the aircraft.

NOTE: Refer to TESTING section to establish the condition of the component or most probable cause of detected malfunction(s) to determine extent of disassembly required.

A. Disassembly Equipment and Materials. Refer to Table 3001.

Table 3001
Disassembly Equipment and Materials List

PART NUMBER	NOMENCLATURE	SPECIFICATION	SOURCE OF SUPPLY
199-18	Preformed Packing Extraction Tool Set	N/A	Aircraft Wheel and Brake, LLC
N/A	Socket Set with Assorted Wrenches	12 pt. External Drive and Hex Head, Inch	Commercial Source
N/A	Portable Tire Bead Breaker	N/A	Commercial Source
N/A	Soap Solution	N/A	Commercial Source
N/A	Screw Driver Bits	Regular, Phillips	Commercial Source
N/A	Torq-Set® Driver Bit	(NASM33781)	Phillips Screw Company

B. Remove Wheel Assembly

Refer to 50-155 Wheel and Brake Installation drawing and IPL Figure 1 for identification of wheel assembly components.

SAFETY WARNING:  INSURE AIRCRAFT IS SECURE AND STABLE BEFORE BEGINNING ANY WORK. WORKING UNDER AN IMPROPERLY STABILIZED AIRCRAFT COULD 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.

- (1) Jack and support aircraft per aircraft maintenance manual. Perform any additional preliminary functions to prep aircraft prior to equipment removal
- (2) Remove cap from air valve assembly (80) and remove air from tire by depressing valve stem plunger until air can no longer be heard escaping from the tire.
- (3) When all pressure has been relieved, remove the valve core.

DISASSEMBLY

CAUTION: AIR VALVE REMOVAL IS REQUIRED TO INSURE TIRE DEFLATION.

- (4) Remove air valve assembly (80). Discard preformed packing (85).
- (5) Support wheel/tire; remove and retain applicable axle mounting hardware.
- (6) Remove wheel/tire from axle as a unit and place on a clean flat surface.

C. Disassemble Wheel Assembly (Refer to IPL, Figure 1)

SAFETY WARNING:  DO NOT ATTEMPT TO DISASSEMBLE WHEEL UNTIL TIRE HAS BEEN COMPLETELY DEFLATED. OTHERWISE SERIOUS INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT CAN RESULT.

- (1) Confirm that tire is fully deflated.
- (2) Remove screws (135), washers (145), grommets (140), and fairing (130) from the outboard wheel half subassembly (45).
- (3) With a 7/16 inch hex socket remove rupture disc assy (90), and with a 11/32 inch (9mm) hex socket remove fuse plug assy's (105) from the outboard wheel half subassembly (45). Discard preformed packings (100).
- (4) Remove retaining rings (75), grease seals (70), and bearing cones (65) from the outboard wheel half subassembly (45).

CAUTION: DO NOT USE TIRE IRONS OR SCREW DRIVERS TO PRY THE TIRE AWAY FROM THE WHEEL FLANGES AS THEY MAY DAMAGE THE SEALING SURFACE OF THE WHEEL. APPLICATION OF A MILD SOAP SOLUTION AROUND THE TIRE BEAD AND WHEEL FLANGE WILL USUALLY BE ENOUGH TO WORK THE TIRE LOOSE.

- (5) Using a tire bead breaker, unseat tire beads from both wheel flanges by applying pressure in even increments around entire sidewall as close to tire beads as possible.

CAUTION: DO NOT USE IMPACT OR POWER WRENCHES TO REMOVE WHEEL NUTS AND BOLTS.

- (6) Remove bolts (5), countersunk washers (10), tire change counter (150), if used, and nuts (15).

NOTE: Refer to the SPECIAL PROCEDURES section for information on the optional tire change counter.

- (7) Separate the wheel halves and remove tire.

DISASSEMBLY

- (9) Remove and discard preformed packing (20) from wheel register groove of inboard wheel half subassembly (25).

NOTE: It is recommended that a new preformed packing (20) be installed at each tire change.

- (10) Drive keys (110A) should only be removed if excessively worn, cracked, loose, for inspection of the inboard wheel half, or for inspection of the drive key.

CAUTION: THE BEARING CUPS MUST BE REMOVED IF CHEMICALS ARE USED TO REMOVE PAINT FINISH FROM THE INBOARD WHEEL HALF.

- (11) Bearing cups (55) **should not** be removed from the outboard wheel half subassembly unless cups are damaged or loose and replacement is required. Refer to **REPAIR** section for removal and installation procedures.

CLEANING**1. General****A. Cleaning Equipment and Materials.** Refer to Table 4001.

NOTE: Equivalent substitutes may be used for items listed.

Table 4001
Cleaning Equipment and Materials List

PART NUMBER	NOMENCLATURE	SPECIFICATION	SOURCE OF SUPPLY
N/A	Air Supply, Compressed Dry Filtered	30 psig maximum (2.07 bar)	N/A
N/A	Cleaning Cloths	Lint Free	Commercial Source
N/A	Brushes	Soft Bristled	Commercial Source
N/A	Solvent, Stoddard Type 1	P-D-680	Commercial Source
N/A	Cleaner/Degreaser, Water Based	AMS 1526	Commercial Source
N/A	Isopropyl Alcohol	N/A	Commercial Source

CLEANING

WARNING: CLEANING SOLVENTS CAN BE TOXIC AND VOLATILE. USE ONLY IN WELL VENTILATED AREAS. AVOID PHYSICAL CONTACT WITH SOLVENT AND DO NOT INHALE VAPORS. KEEP SOLVENT CONTAINERS COVERED WHEN NOT IN USE. OBSERVE FIRE PRECAUTIONS.

B. Cleaning Metallic Components (Refer to IPL, Figure 1)

- (1) Clean metallic hardware (bolts, washers, nuts) in Type 1 Stoddard Solvent (per P-D-680). Use a soft bristled cleaning brush to remove stubborn deposits.

CAUTION: CLEAN BEARING CONES (65) CAREFULLY IN A SEPARATE CONTAINER OF CLEAN SOLVENT TO AVOID CONTAMINATION.

- (2) In a separate container, clean bearing cones in Type 1 Stoddard Solvent (per P-D-680). Use a soft bristled cleaning brush to remove stubborn deposits.

NOTE: Bearing cones will be repacked with grease in accordance with ASSEMBLY section.

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

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

C. Cleaning Aluminum Components (Refer to IPL, Figure 1)

- (1) Inner and outer wheel half subassemblies (25 and 45) can be washed with Type 1 Stoddard Solvent (per P-D-680). Use a soft bristled cleaning brush to remove stubborn deposits.
- (2) Finish cleaning aluminum parts in a water based cleaner/degreaser (per AMS 1526).
- (3) Dry parts thoroughly after cleaning, using low pressure compressed air, 30 psig maximum (2.07 bar). Wipe dried parts with lint free cleaning cloths.

D. Cleaning Rubber Components

- (1) Clean rubber parts with a mild detergent cleaner or a water based cleaner/degreaser (per AMS 1526) or isopropyl alcohol. Follow up by wiping with a clean, lint free cloth.

INSPECTION / CHECK**1. General**

In order to facilitate inspection of components, parts must be cleaned prior to inspection. Refer to CLEANING section for applicable instructions. Refer to the illustrations in this section for important areas and areas of greatest wear. Where indicated, refer to FITS AND CLEARANCES section to find if the part can be used, repaired, or replaced.

A. Inspection/Check Equipment and Materials. Refer to Table 5001.

NOTE: Equivalent substitutes may be used for items listed.

Table 5001
Inspection/Check Equipment and Materials List

PART NUMBER	NOMENCLATURE	SPECIFICATION	SOURCE OF SUPPLY
N/A	Magnetic Particle Inspection Kit	ASTM E1444	Commercial Source
N/A	Fluorescent Penetrant Inspection Kit	ASTM E1417 or MIL-STD-6866, Type 1, Method A, Sensitivity Level 2	Commercial Source
N/A	Eddy Current Inspection Equipment	ASNT-460 or MIL-HDBK-728/2	Commercial Source
N/A	Magnifier	X10 Magnification	Commercial Source
N/A	Vernier Dial Calipers	0 to 6.00 in. (0 to 150 mm)	Commercial Source
N/A	Fuse Plug and Rupture Disc Test Fixture	Per Figure 9003 SPECIAL TOOLS.....	Outside Manufacture

INSPECTION / CHECK

B. Maintenance Schedule (Refer to Table 5002)

Refer to IPL Figure 1 for identification of wheel assembly components.

The maintenance schedule is intended to be a guideline based on laboratory testing whose purpose is to maintain continued airworthiness. Field operating requirements can vary from aircraft to aircraft. These variations will directly affect the wear rate of the wheel assembly components. Users may evaluate their operating conditions to determine a suitable schedule provided that continued airworthiness is maintained.

Table 5002
Scheduled Maintenance

SCHEDULED MAINTENANCE	ITEM	TASK
At every tire change Refer to the SPECIAL PROCEDURES section for instructions on the use of the tire change counter.	All components	General inspection per para. 1.C.
	Fasteners (115)	Check torque (Torq-Set® driver bit) 35-45 in-lb (3.95-5.08 N-m)
	O-Rings (20)	Replace
	Grommets (145)	Replace
At the following tire changes: 5 th , 10 th , 15 th , 18 th , 21 st , 24 th	Wheel Halves (30 and 50)	a. Visual inspection per para. 2.D. b. Penetrant or eddy current inspect per para. 2.D.
	Bolts (5)	a. Visual inspection per para. 1.C.(1) b. Magnetic particle inspect per para. 1.C.(1)(a).
	All Components	Detailed inspection per para. 2.
	O-Rings (85, 100)	Replace
At the 25 th tire change and every tire change thereafter	Wheel Halves (30 and 50)	a. Visual inspection per para. 2.D. b. Mandatory penetrant inspect per para. 2.D.
	Bolts (5)	a. Visual inspection per para. 1.C.(1) b. Magnetic particle inspect per para. 1.C.(1)(a).
	All Components	Detailed inspection per para. 2.
	O-Rings (85, 100)	Replace
Every tire change – or – 12 months whichever comes first	Bearing Cones (65)	Re-pack per para. 2.B.(2).
UNSCHEDULED MAINTENANCE	ITEM	TASK
Overheating such that at least one of the three fusible plugs release in the Main Wheel Assembly	All Components	a. General inspection per para. 1.C. b. Detailed inspection per para. 2
	Inner Whl Half (30)	Hardness test per para. 2.E.(2).
	Fuse plugs (105)	Replace as necessary
	O-Rings (20, 85, 100)	Replace

INSPECTION / CHECK

C. General Inspection Procedure

Refer to IPL Figure 1 for identification of wheel assembly components.

Items that do not require special detailed examination are to be given a general inspection in accordance with this paragraph.

- (1) Visually examine the following items for damage or looseness: bolts (5), washers (10), nuts (15), air valve assembly (80), rupture disc assembly (90), fusible plugs (105), fairing screws (135), and drive key screws (115). Replace all parts with stripped or scored threads or obvious damage. Additionally:

CAUTION: NO REWORKING OF BOLTS IS PERMITTED. ANY STRIPPING OF PLATING FOR INSPECTION PURPOSES IS PROHIBITED.

NOTE: Aircraft Wheel and Brake, LLC recommends inspection of the bolts at the intervals shown in Table 5002.

- (a) Inspect for bent, or cracked or thread damaged bolts (5). Inspect for evidence of cracks especially in the radius under the bolt head and in the threaded area adjacent to the bolt shank using magnetic particle inspection in accordance with ASTM E1444 or equivalent.

NOTE: If **any** of the bolts are damaged, replace **all** of the bolts.

- (b) Inspect nuts for damaged threads and for loss of self-locking feature. If nut can be turned by hand onto the bolt (5) past the top of the nut, then self-locking feature is destroyed.

NOTE: If **any** of the nuts are damaged, replace **all** of the nuts.

- (2) Visually examine all metal components of the wheel assembly such as (70, 75, 110, 120 and 130) for wear, scoring, cracks, chips, nicks, burrs, pitting, corrosion, flaws, and other obvious signs of damage. Replace or repair all parts showing evidence of these defects.
 - (3) Check all parts with sealing surfaces and grooves for distortion, damage, burrs, or corrosion which might damage preformed packings during installation and/or operation or which might permit leakage. Replace part if sealing surfaces and grooves are damaged.
 - (4) Check heat shield bumpers (125) for heat discoloration and/or cracking.

INSPECTION / CHECK

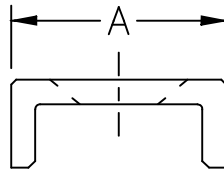
- (5) The following items are to be replaced at each tire change regardless of condition:
All preformed packings (20).
- (6) Repair or replace any parts that do not meet INSPECTION / CHECK requirements.

2. Detailed Inspections

WARNING: PENETRANT FLUID CAN BE TOXIC AND VOLATILE. USE ONLY IN WELL-VENTILATED AREAS. AVOID PHYSICAL CONTACT WITH FLUID AND DO NOT INHALE VAPORS. KEEP FLUID CONTAINERS COVERED WHEN NOT IN USE. OBSERVE FIRE PRECAUTIONS.

A. Inspect Drive Keys (IPL, 1-110A). See Figure 5001

- (1) Inspect the drive keys for cracks, battering, or excessive corrosion. Replaced cracked, battered or corroded parts. Width must not exceed dimension A per FITS AND CLEARANCES, Table 8001. Replace drive key if the drive key width is less than the minimum limit at the locations which contact the brake rotating discs.



Drive Key Inspection Limits
Figure 5001

B. Inspect Bearing Cups and Cones (IPL, 1-55 and 1-65)

Refer to Table 5002 for maintenance interval. Replace damaged cups and cones in accordance with paragraph 1.F. and 1.G. of REPAIR section.

NOTE: Bearing cups are a designed shrink fit into the outboard wheel half (IPL, 1-50) and should not be removed unless replacement is necessary due to damage or if chemicals are used to remove paint finish from wheel half.

- (1) Inspect cups in the wheel half for looseness, wear, corrosion, spalling, brinelling, nicks, scratches, water staining, pitting, and heat discoloration.

CAUTION: DO NOT INTERMIX AVIATION BEARING GREASES.

- (2) Inspect roller surfaces of cones for wear, corrosion, spalling, pitting and heat discoloration. Repack cones with bearing grease (ASSEMBLY section, Table 7001).

INSPECTION / CHECK

- (3) Inspect bearing cage for dents or distortion and for wear of sides, corners and at ends of roller pockets.

NOTE: ¹ See bearing manufacturer's brochure for visual illustrations.

- (4) Visually inspect the bearing cone integrated grease seals for cuts, nicks, distortion or other damage. Inspect the integrity of the rubber-to-metal interface. Replace seals that have any tears in the rubber-to-metal interface. If the rubber is cracked or if seal is distorted and unable to fit snug in hub cavity, then sealing characteristics of the seal are damaged and should be replaced.

C. Inspect Grease Seals (IPL, 1-70)

- (1) Examine seals for cuts, nicks, distortion, and other damage. Check for security of rubber-to-metal bond. Replace seals having any of these defects.

D. Inspect Inner and Outer Wheel Halves (IPL, 1-30 and 1-50)

Repair damaged areas in accordance with paragraph 1.C. of REPAIR section.

Examine the wheel half assemblies for cracks and corrosion using penetrant or eddy current inspection procedures. Refer to Table 5002 and Figure 5003.

NOTE: Paint must be removed from inboard and outboard wheel half assemblies (IPL, 1-25 and 1-45) to conduct an accurate method for the fluorescent penetrant inspection. Refer to paragraph 1.B. of REPAIR section for paint removal instructions.

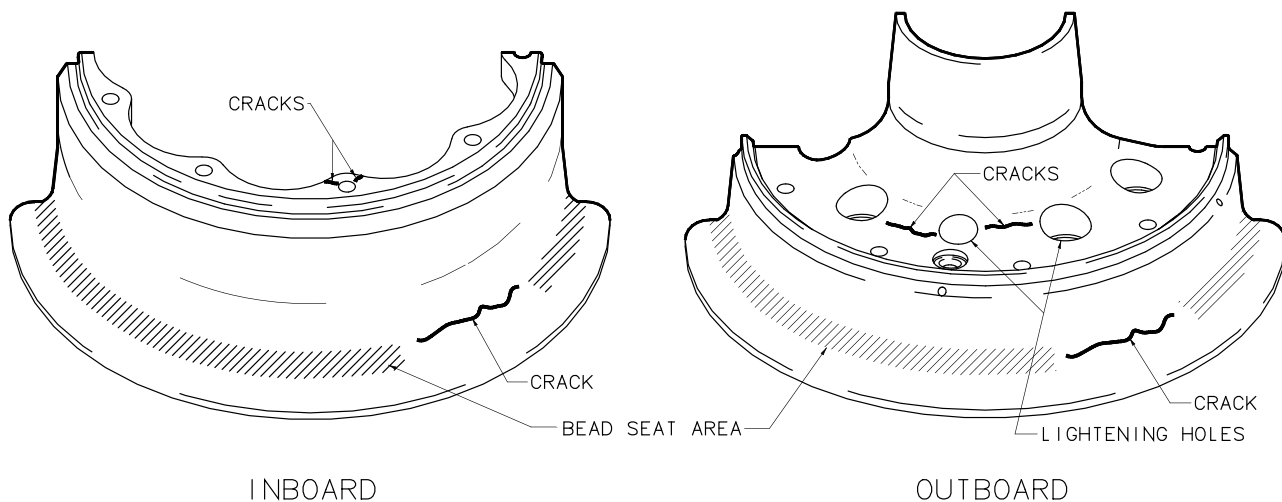
- (1) Visually inspect wheel halves for nicks, corrosion or other damage. Replace severely corroded wheels.
- (2) Inspect inner and outer wheel half register grooves. Damage to register sections hampering sealing of wheel O-ring (IPL, 1-20) is cause for wheel half replacement.

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

INSPECTION / CHECK

- (3) Refer to Figure 5002 and visually inspect wheel halves for cracks and structural damage. Take particular note of the bead seat, fusible plug, rupture disc and valve areas. The tire bead seat area of a wheel is typically an area of stress concentration and possibly subjected to trauma from tire beads and tools used to remove tires. For the outboard wheel half, specifically, check the areas between the lightening holes. For the inboard wheel half, specifically, check the bolt bosses. These areas should receive special attention when inspecting for defects at a tire change to determine airworthiness.

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

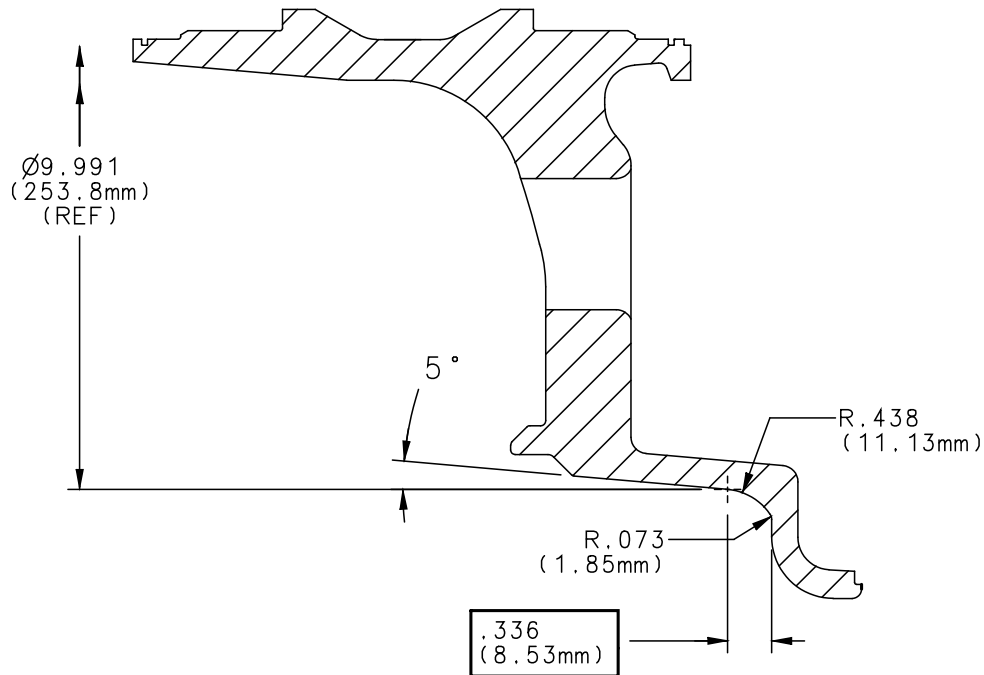


Inboard/Outboard Wheel Half Inspection
Figure 5002

INSPECTION / CHECK

(4) Eddy Current Inspection Requirements

- (a) Examine the beadseat area shown in Figure 5003. Examination of the other areas is recommended.
- (b) Calibrate the eddy current equipment to detect a 0.060 inch (1.52mm) long by 0.030 inch (0.76mm) deep elox notch. An elox notch is produced by electrical discharge machining.
- (c) Remove all dirt and grease from the wheel half assemblies. If the wheel has no scratches, chips, nicks, and cracks, the paint does not need to be removed.
- (d) Eddy current probe must fit the beadseat area defined in Figure 5003.



TYPICAL FOR BOTH WHEEL HALVES

Eddy Current Probe Criteria
Figure 5003

INSPECTION / CHECK

E. Inspect Fuse Plugs, Rupture Disc Assy and Air Valve Assy(IPL, 1-105, 1-90, and 1-80)

- (1) Visually examine fuse plugs, rupture disc and air valve for damage. If required, check for leaks using the fixture shown in Figure 5004 and the following procedure:
 - (a) Install rupture disc or air valve and fuse plugs in the fixture, with preformed packings (100 or 85) installed on each. Torque each to 50 to 60 in-lb (5.65 to 6.78 N-m).
 - (b) Connect air hose to fixture inlet and pressurize to 75 to 95 psig (5.2 to 6.6 bars).
 - (c) Apply a soapy water solution to the components and look for bubbles for two minutes.
 - (d) Discard all components that leak.
 - (e) Replace all parts with stripped or scored threads or other obvious damage.
- (2) Check the fusible plugs (105) in the outboard wheel subassembly (45) for melting of the fusible material. Replace fusible plugs that are blown or that show evidence of melting. This is indicated by the loss of fusible alloy or by irregular openings in the fusible alloy at either end of the plug. If one plug shows evidence of melting, replace all plugs.

NOTE: Refer to paragraph 2.F., Procedure for Overheated Wheels if the fuse plugs have blown or melted.

- (a) Inspect packing (100) for damage. Replace old or damaged packing.

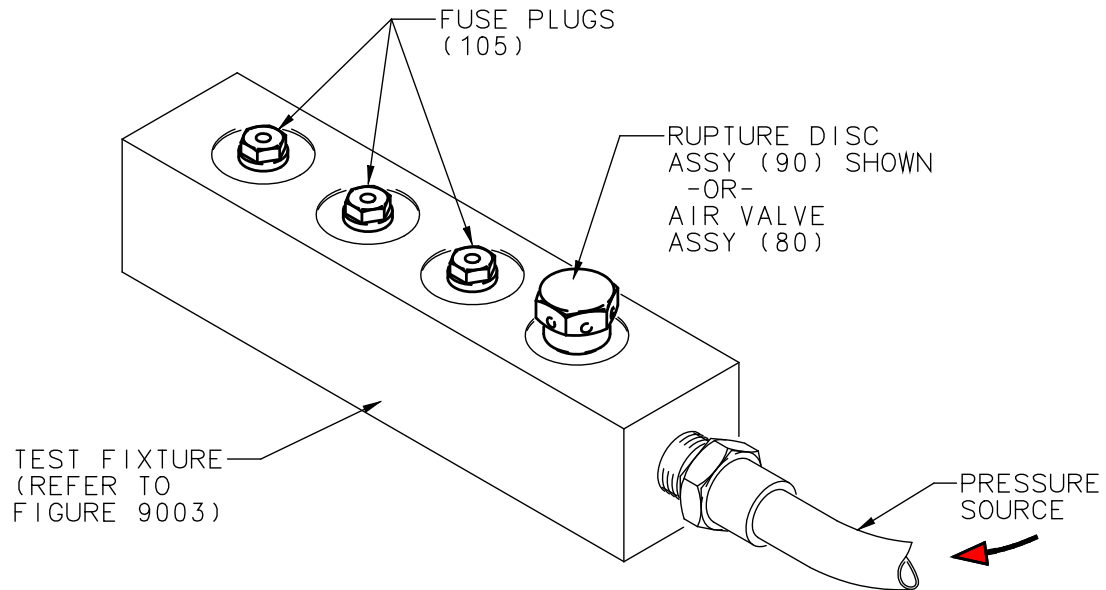
NOTE: It is recommended that a new packing (100) be installed at each tire change.

- (3) Check the rupture disc (95) in the outboard wheel subassembly (45) for loss of the inlet body (disc material). The rupture disc shall rupture when subjected to a pneumatic pressure of 185 ± 25 psi and a temperature of -40°F (-40°C) to 212°F (100°C). Replace disc that is blown or that shows evidence of damage.

- (a) Inspect packing (100) for damage. Replace old or damaged packing.

NOTE: It is recommended that a new packing (100) be installed at each tire change.

INSPECTION / CHECK



Fuse Plugs and Rupture Disc and Air Valve Test
Figure 5004

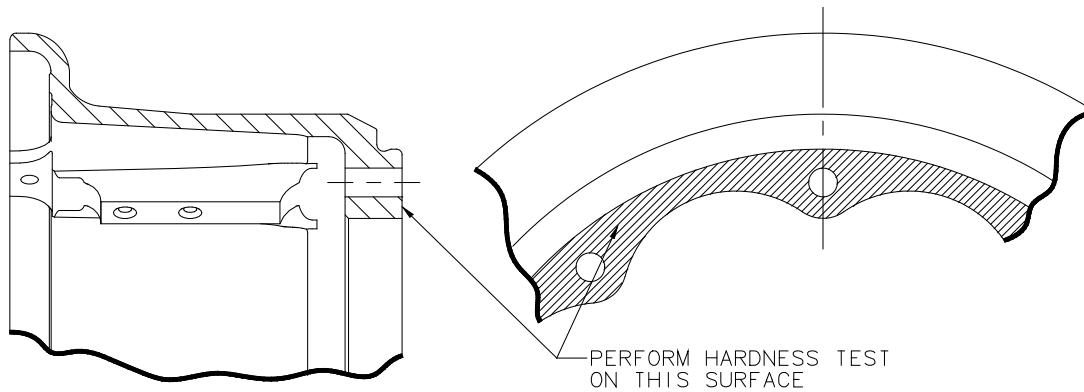
F. Procedure for Overheated Wheels

- (1) If any fuse plugs (105) are blown or melted, perform the following hardness check on the inboard wheel half (30). Refer to Figure 5005 and Table 5003 for locations and acceptance values.

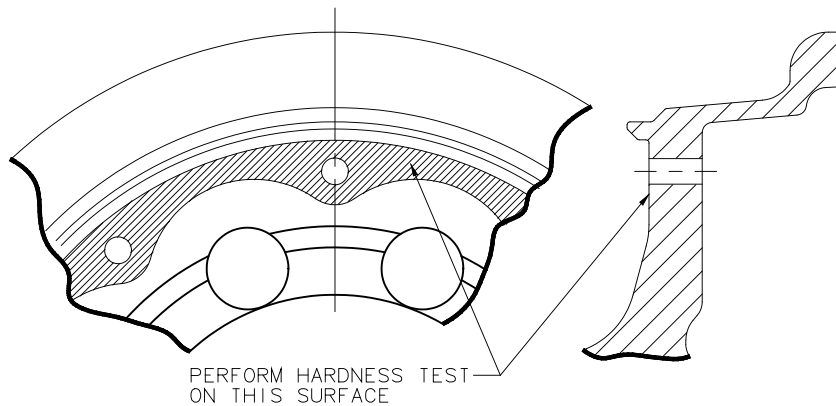
NOTE: Topcoat and primer must be removed from surfaces prior to being tested.

- (a) Perform a hardness test in the area shown in Figure 5005. Obtain a minimum of three hardness readings, equally spaced. If any reading is below BHN 125 as specified in Table 5003, replace the wheel half.
- (b) Inspect the outboard wheel half (50) on the mating face between the bolt holes as shown in Figure 5006 only if the inboard wheel half fails the hardness test. Obtain a minimum of three hardness readings, equally spaced. If any reading is below BHN 125 as specified in Table 5003, replace the wheel half

INSPECTION / CHECK



Hardness Test – Inboard Wheel Half
Figure 5005



Hardness Test – Outboard Wheel Half
Figure 5006

ITEM	BRINELL TEST
BALL DIAMETER	10 mm
TEST LOAD	500 kg.
MINIMUM NUMBER OF READINGS (EQUALLY SPACED)	3
ACCEPTABLE MINIMUM AVERAGE HARDNESS	125

Hardness Test Readings
Table 5003

REPAIR

1. General

Certify that a component is serviceable per INSPECTION/CHECK section prior to attempting repair. Disassemble the wheel assembly only to the level necessary to do the repairs or replace components. Repairs are limited to the replacement of parts and to the repairs specified in this section. No attempt should be made to repair cracked, severely corroded or badly damaged parts.

A. Repair Equipment and Materials. Refer to Table 6001.

NOTE: Equivalent substitutes May be used for items listed.

Table 6001 (Sheet 1 of 2)
Repair Equipment and Materials List

PART NUMBER	NOMENCLATURE	SPECIFICATION	SOURCE OF SUPPLY
N/A	Aluminum Oxide Cloth	400 Grit or Finer Wet or Dry	Commercial Source
N/A	Plastic Media, Acrylic	MIL-P-85891, Type V	U.S. Technology Corp.
N/A	Plastic Media Stripping Equipment	N/A	Commercial Source
N/A	Sub-Zero Freezer	-30°F to -60°F (-34.4°C to -51.1°C)	Commercial Source
N/A	Dry Ice (Alternate for Sub-Zero Freezer)	N/A	Commercial Source
N/A	Oven	250°F capacity (121°C)	Commercial Source
N/A	Corrosion Preventative Alodine 1200 or Equiv.	MIL-C-5541, Class 1A or MIL- DTL-5541, Type I or Type II, Class 1A	Commercial source
N/A	Paint Application Equipment	N/A	Commercial source
N/A	Removal Tool, Bearing Cup	Per Figure 9001 SPECIAL TOOLS.....	Outside Manufacture
N/A	Installation Tool, Bearing Cup	Per Figure 9002 SPECIAL TOOLS.....	Outside Manufacture
N/A	Hub Support, Wheel Half	Per Figure 9004 SPECIAL TOOLS.....	Outside Manufacture

REPAIRTable 6001 (Sheet 2 of 2)
Repair Equipment and Materials List

PART NUMBER	NOMENCLATURE	SPECIFICATION	SOURCE OF SUPPLY
N/A	Arbor Press	N/A	Commercial Source
44-GN-36 Components A and B	Primer Coating	MIL-PRF-85582C Type I, Class C2	Deft Chemical Coatings
44-GN-24 Components A and B	Primer Coating, Alternate	MIL-P-85582B Type I, Class C2	Deft Chemical Coatings
03-W-127A Components A and B	Finish Coating	MIL-C-85285B, Type I No. 17925 (FED-STD-595) Untinted White	Deft Chemical Coatings
1227-6	Heli-Coil Extracting Tool	MIL-T-21309	Black & Decker Co.
7552-3	Heli-Coil Installation Tool	MIL-T-21309	Black & Decker Co.
3695-3	Heli-Coil Tang Removal Tool	MIL-T-21309	Black & Decker Co.

B. Paint Removal Procedure For Wheel Halves (IPL, 1-30 and 1-50)

WARNING: STRIPPING SOLVENTS CAN BE TOXIC AND VOLATILE. USE ONLY IN WELL VENTILATED AREAS. AVOID PHYSICAL CONTACT WITH SOLVENTS AND DO NOT INHALE VAPORS. KEEP SOLVENT CONTAINERS COVERED WHEN NOT IN USE. OBSERVE FIRE PRECAUTIONS.

CAUTION: REFER TO THE APPLICABLE MANUFACTURER'S INSTRUCTIONS FOR DISPOSAL OF CHEMICAL STRIPPING SOLUTIONS OR PLASTIC STRIPPING MEDIA.

CAUTION: MAIN WHEEL MUST BE DISASSEMBLED TO THE LEVEL REQUIRED FOR STRIPPING AND REPAINTING.

CAUTION: IF CHEMICAL STRIPPING IS USED, IT IS RECOMMENDED THAT THE BEARING CUP (IPL, 1-55) BE REMOVED FROM THE WHEEL HALF SUBASSEMBLY PRIOR TO PROCEEDING.

- (1) Degrease inner and outer wheel halves per CLEANING section.

REPAIR

- (2) Strip paint from the inboard and outboard wheel halves (IPL, 1-30 and 1-50) using plastic media.

NOTE: For best results, always refer to the applicable plastic media manufacturer's instructions for application and use.

NOTE: Chemical stripping agents are commercially available and may be used only if plastic media stripping equipment is not available. Refer to the manufacture of the primer and finish coating for recommended stripping agents. For best results, always refer to the applicable chemical manufacturer's instructions for application and use.

C. Corrosion and Surface Repair Procedure For Wheel Halves (IPL, 1-30 and 1-50)

Refer to Figure 6001 and using 400 grit or finer, wet or dry aluminum oxide cloth, remove all corrosion and surface damage from wheel halves (IPL, 1-30 and 1-50) in accordance with the limits specified in the following procedure.

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

CAUTION: REMOVAL OF CORROSION AND SURFACE DAMAGE WILL PREVENT STRESS CONCENTRATIONS AND PREMATURE WHEEL FAILURE, BUT ANY EXCESSIVE REMOVAL OF MATERIAL WILL SHORTEN THE ROLL LIFE OF THE WHEEL; THEREFORE IT IS RECOMMENDED THAT MATERIAL REMOVED BY BLENDING BE LIMITED TO THE MINIMUM REQUIRED FOR REMOVING CORROSION OR SURFACE DAMAGE.

CAUTION: REPAIR MUST NOT AFFECT SEALING CHARACTERISTICS OF SEALING SURFACES.

REPAIR

Dimensional tolerances unless otherwise specified:

.xxx = $\pm .010$

.xx = $\pm .030$

Angular = $\pm 1/2^\circ$

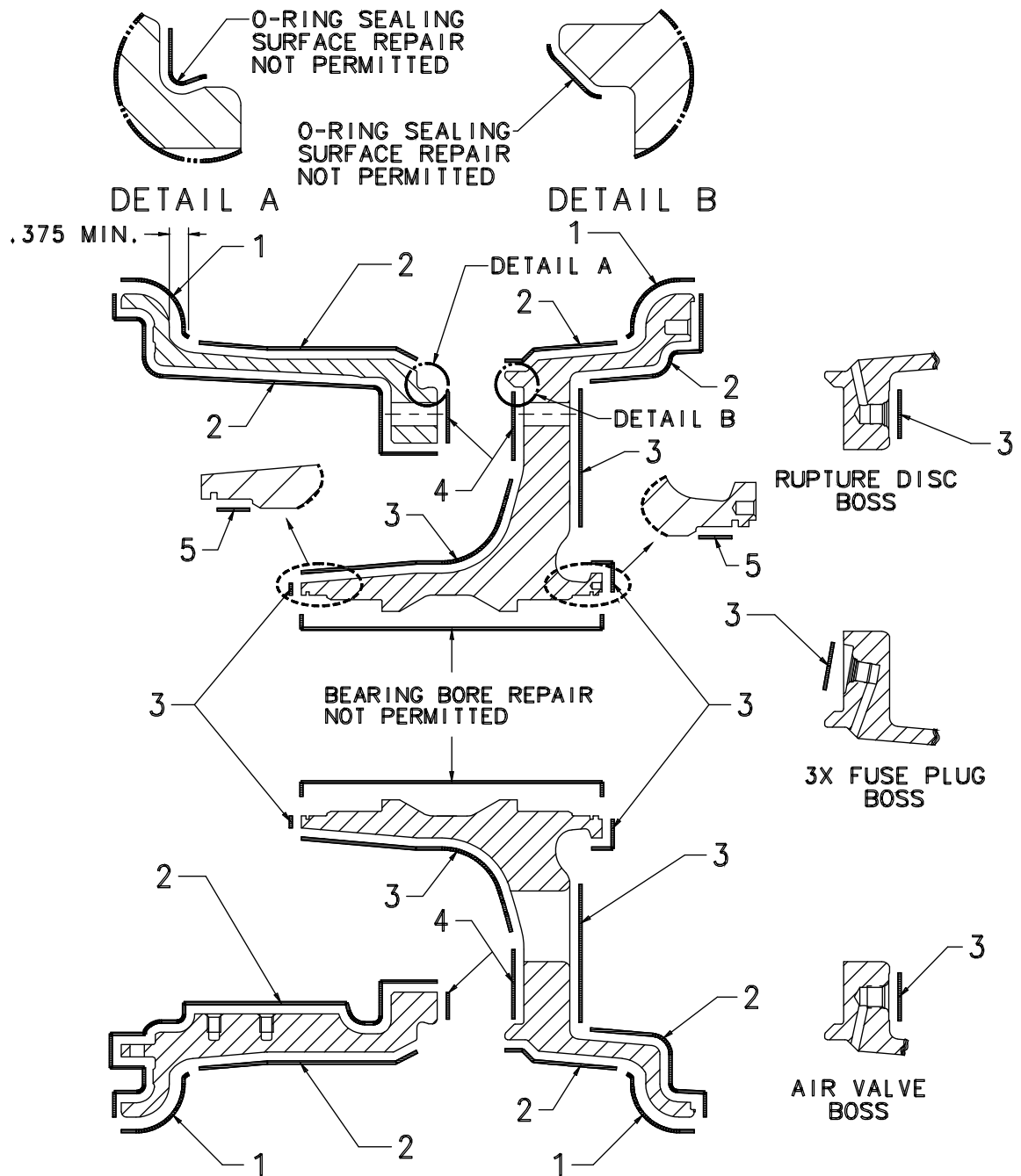
Surface Finish = not to exceed 125 microinches RMS

- (1) In area 1, polish out corrosion pits, scratches, and tool marks to .015 in. max. depth and .50 in. long. Surface finish should be 32 microinches RMS.
- (2) In area 2, blend out and polish imperfections to .020 in. max. depth and 1.00 in. long. Reworked area is not to exceed 1.00 square inch. Do not remove metal if surface directly opposite was previously reworked. Surface finish should be 32 microinches RMS.
- (3) In area 3, blend out and polish imperfections to .030 in. max. deep and reworked area not to exceed 1.00 square inch in area. Surface finish should be 63 microinches RMS.
- (4) In area 4, the maximum repair is .010 inch deep and .50 square inch. For rupture disc, fuse plugs, and air valve bosses, the maximum repair is .010 inch deep.

CAUTION: DO NOT ATTEMPT TO REPAIR WEAR RUTS.

- (5) In area 5, wear ruts of .050 inch maximum depth are permissible.
- (6) Clean part per CLEANING section.

REPAIR



Wheel Half Repairable Limits
Figure 6001

REPAIR

D. Surface Treatment Procedure For Wheel Halves (IPL, 1-30 and 1-50)

- (1) Treat repaired areas with corrosion preventative (Alodine 1200 or equivalent) per MIL-C-5541, Class 1A or MIL-DTL-5541, Type I or Type II, Class 1A

E. Repaint Procedure For Wheel Halves (IPL, 1-30 and 1-50)

Refer to Figures 6002 and 6003 and repaint wheel halves in accordance to the following procedure.

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.

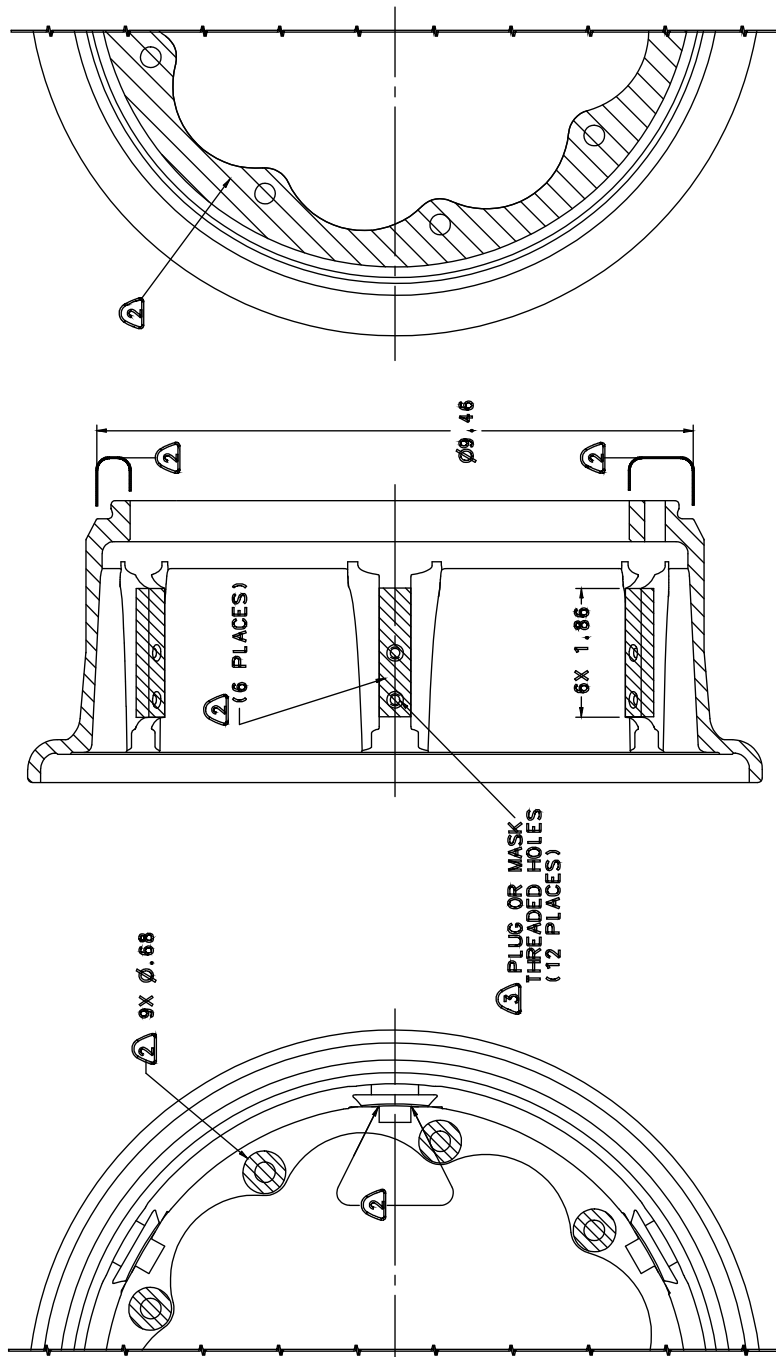
CAUTION: DO NOT GET PAINT ON ROLLER CONTACTING SURFACES OF BEARING CUPS. PAINT ON THESE SURFACES WILL CONTRIBUTE TO BEARING FAILURE.

CAUTION: REFER TO THE APPLICABLE PAINT MANUFACTURER'S INSTRUCTIONS FOR DISPOSAL OF PRIMER AND TOPCOAT MEDIA.

NOTE: To achieve best results, always refer to the applicable paint manufacturer's instructions for application and use.

- (1) Clean part per CLEANING section.
- (2) Mask and apply primer to wheel halves. The dry film thickness of the primer shall be .0006 to .0009 inches (.015 to .023 mm).
- (3) Mask and apply topcoat to wheel halves. The total dry film thickness (including primer and topcoat) shall be .0023 to .0032 inches (.058 to .081 mm).

REPAIR



NOTES: UNLESS OTHERWISE INDICATED

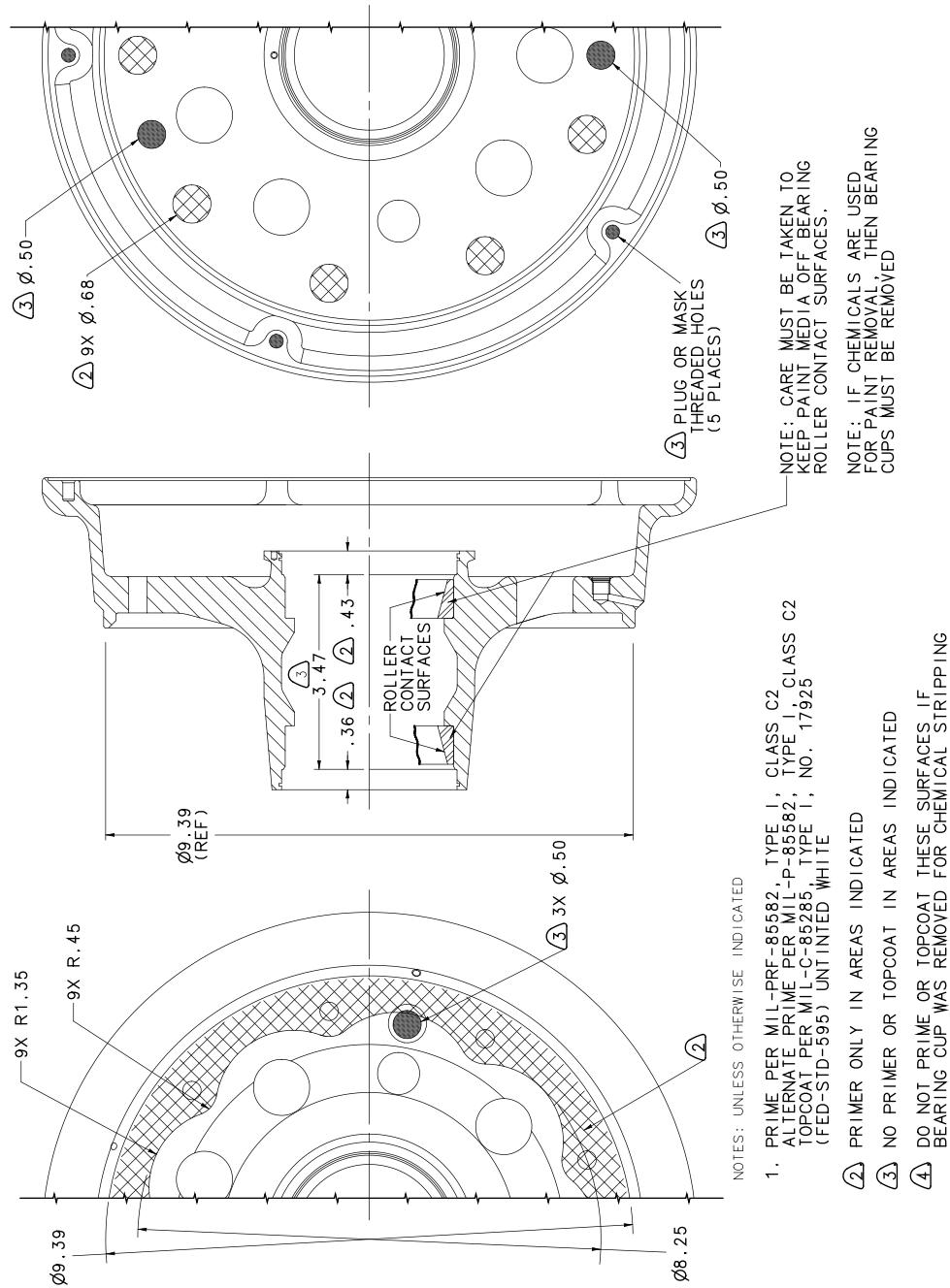
1. PRIME PER MIL-PRF-85582, TYPE I, CLASS C2
ALTERNATE PRIME PER MIL-P-85582, TYPE I, CLASS C2
TOPCOAT PER MIL-C-85285, TYPE I, NO. 17925
(FED-STD-595) UNTINTED WHITE

2. PRIMER ONLY IN AREAS INDICATED

3. NO PRIMER OR TOPCOAT IN AREAS INDICATED

Inner Wheel Half Masking Instructions
Figure 6002

REPAIR



Outer Wheel Half Masking Instructions
Figure 6003

REPAIR

F. Remove Bearing Cups (IPL, 1-55)

Both bearing cups are a designed shrink fit into the outboard wheel half (IPL, 1-50). Bearing cups should only be removed if determined to be damaged or chemicals are used to remove paint from wheel half. Refer to Figures 6004 and 6005 and remove bearing cups in accordance to the following procedure.

CAUTION: DO NOT HEAT WHEEL ABOVE $200^{\circ} \pm 15^{\circ}\text{F}$ ($93.3^{\circ} \pm 8.3^{\circ}\text{C}$)

- (1) Heat outboard wheel half (IPL, 1-50) to $200^{\circ} \pm 15^{\circ}\text{F}$ ($93.3^{\circ} \pm 8.3^{\circ}\text{C}$) for not longer than 30 minutes.

CAUTION: USE PROTECTIVE GLOVES WHEN HANDLING HEATED PARTS.

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

CAUTION: AVOID RAISING BURRS IN THE HUB BORE WHEN REMOVING BEARING CUP.

- (2) Remove wheel half from heat source and place wheel on a support block. Place fabricated removal tool (refer to Figure 9001) on back face of cup. Use an arbor press to apply even pressure to the removal tool. Bearing cup should drop out.

NOTE: An alternate method would be to tap the cup out evenly with a fiber drift pin or phenolic punch after removing from heat source.

- (3) Turn the wheel half over and repeat step (2) for remaining cup.

REPAIR

G. Install Bearing Cups (IPL, 1-55)

Refer to Figure 6006 and install bearing cups in accordance to the following procedure.

CAUTION: WORK SWIFTLY AS THERMAL EXPANSION AND CONTRACTION OF PARTS WILL PRECLUDE EASE OF INSTALLATION.

- (1) Make sure that bearing bore and shoulder are clean and free of burrs.

CAUTION: USE PROTECTIVE GLOVES WHEN HANDLING CHILLED PARTS.

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

CAUTION: DO NOT HEAT WHEEL ABOVE 200° ± 15°F (93.3° ± 8.3°C)

- (3) Heat outboard wheel half (IPL, 1-50) to 200° ± 15°F (93.3° ± 8.3°C) for not longer than 30 minutes.

CAUTION: USE PROTECTIVE GLOVES WHEN HANDLING HEATED PARTS.

- (4) Remove the wheel half from the heat source and remove the bearing cups from refrigeration source.
- (5) Eliminate condensation by drying bearing cups thoroughly and then apply a wet film of primer coating into the bearing bore.
- (6) Place wheel half on a clean flat work surface and align bearing cup over bore. Place fabricated installation tool (refer to Figure 9002) on front face of cup. Press the bearing cup into the bearing bore by applying even pressure to the installation tool. Make sure the backing surface of the cup rests flush against the shoulder of the bearing bore.

NOTE: Avoid cocking the cup during installation. If bearing cup does not seat properly in wheel half, repeat procedure or replace wheel half subassembly.

- (7) Try inserting a 0.002 (0.051mm) feeler gauge between the cup and the base of the bearing bore in three places equally spaced. If the gauge can be put into the clearance below the cup, the cup is not seated. Repeat pressing operation.
- (8) Wipe off excess primer after installation.
- (9) Turn the wheel half over and repeat steps (5) through (7) for remaining cup.

REPAIR

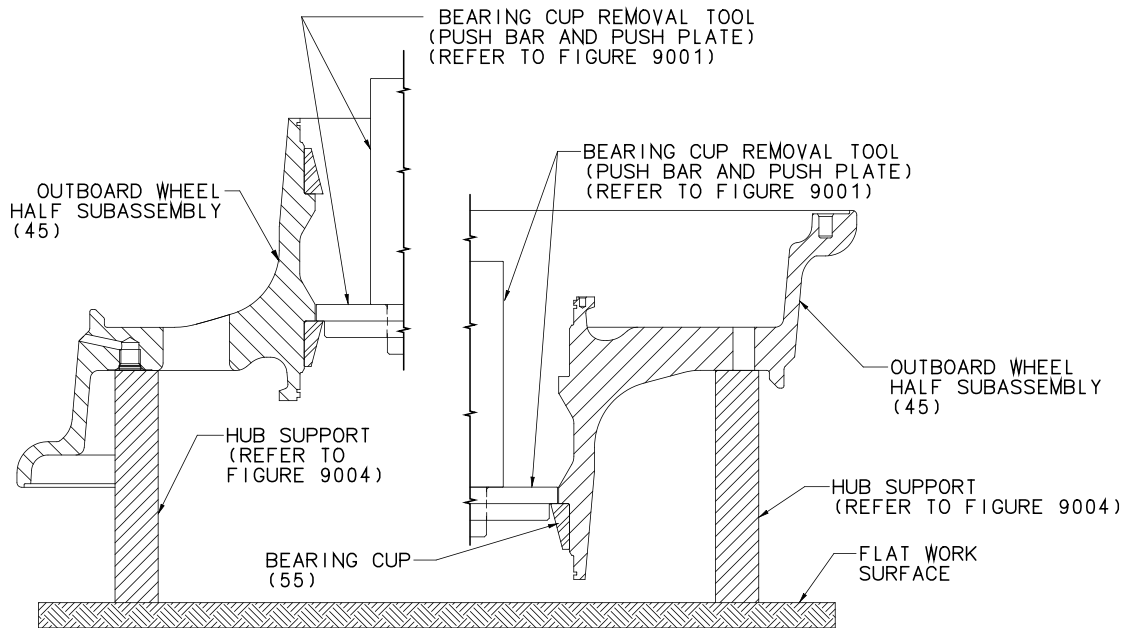


Figure 6004. Bearing Cup Removal

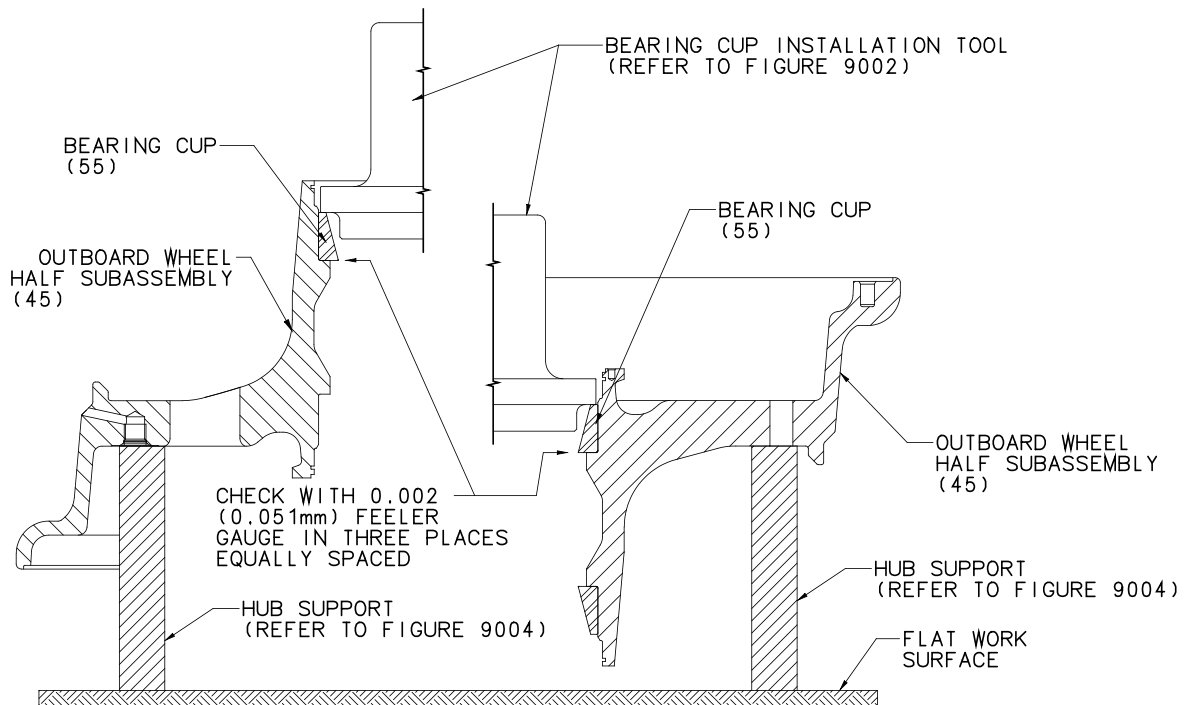


Figure 6005. Bearing Cup Installation

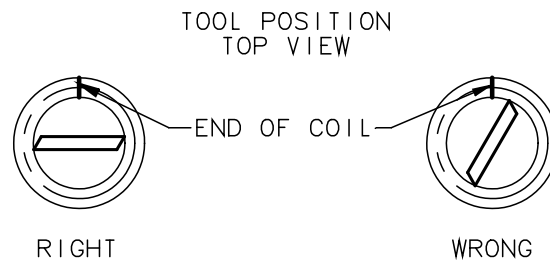
REPAIR

H. Insert Repair (IPL, 1-35)

Do not replace inserts unless damaged. Replace damaged inserts in accordance to the following procedure.

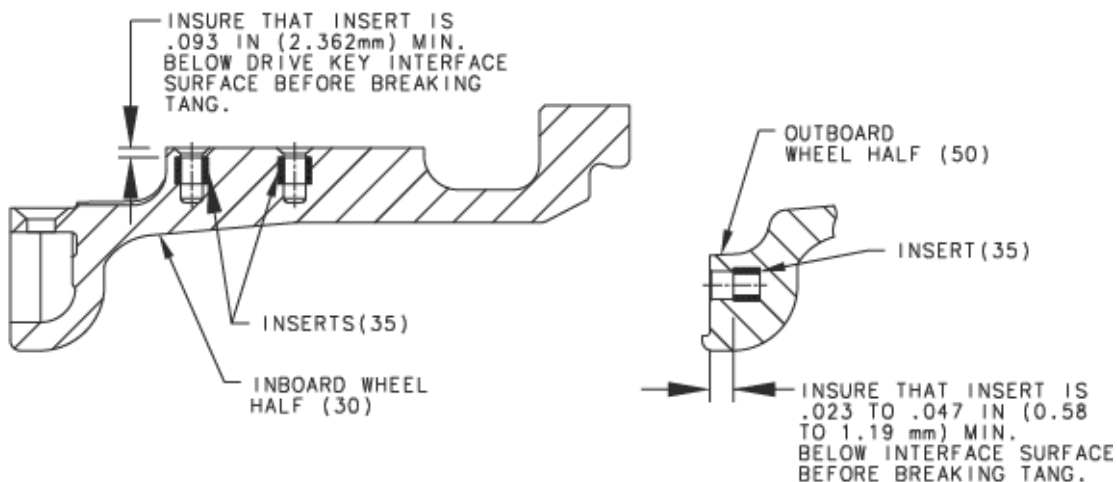
SAFETY WARNING:  **USE PROTECTIVE GOGGLES OR GLASSES WHEN STRIKING ANY TOOL.**

- (1) Refer to Figure 6006 and remove damaged inserts by applying the HeliCoil extracting tool to the insert, striking the head of the tool a light blow and turning it counterclockwise, maintaining steady downward pressure



HeliCoil Extracting Tool
Figure 6006

- (2) Install inserts into wheel halves (30 or 50) as shown by Figure 6007. Break off tang.



Insert Installation
Figure 6007

ASSEMBLY

1. General

Assembly of the main wheel is essentially the reverse of the disassembly procedures described in this manual.

A. Assembly Equipment and Materials. Refer to Table 7001.

NOTE: Unless otherwise stated, equivalent substitutes may be used for items listed.

Table 7001 Assembly Equipment and Materials List

PART NUMBER	NOMENCLATURE	SPECIFICATION	SOURCE OF SUPPLY
Mobil Aviation ² Grease SHC100 Primary	Lubricating Grease Equivalent substitutes are not allowed.	N/A	Exxon-Mobil Oil Co. Aviation Lubricants
Aeroshell ² Grease 22 Alternate	Lubricating Grease Equivalent substitutes are not allowed.	MIL-G-81322, Grade A	Shell Oil Company Lubricant Division
Aeroshell ² Grease 58 Alternate	Lubricating Grease Equivalent substitutes are not allowed.	SAE AMS3058	Shell Oil Company Lubricant Division
NYCO Grease GN 3058 ² Alternate	Lubricating Grease Equivalent substitutes are not allowed.	SAE AMS3058	NYCO Corporation
51094 Moly-50	Anti-seize Compound	MIL-PRF-83483 or MIL-T-83483 ¹	FEL-PRO Chemical
N/A	Isopropyl Alcohol	N/A	Commercial Source
N/A	Cleaning Cloths	Lint Free	Commercial Source
N/A	Rubber Cleaner	N/A	Commercial Source
199-18	Preformed Installation Extraction Tool Set	N/A	Aircraft Wheel and Brake, LLC
N/A	Socket Set with Assorted Wrenches	12 pt. External Drive and Hex Head, Inch	Commercial Source
N/A	Torque Gage	0 to 200 in-lb capacity (0 to 22.60 N-m)	Commercial Source
N/A	Inflation Gage	N/A	Commercial Source
N/A	Tire Pressure Gage	To assure recommended inflation pressure (per airframe mfr.)	Commercial Source
N/A	Screw Driver Bits	Regular, Phillips	Commercial Source
N/A	Torq-Set® Driver Bit	(NASM33781)	Phillips Screw Company

¹ **CAUTION:** DO NOT MIX ANTI-SEIZE COMPOUNDS. THIS CAN RESULT IN IMPROPER TORQUE SETTINGS AND COULD RESULT IN FAILURE OF THE BOLT. THE USE OF ANTI-SEIZE COMPOUND IS LIMITED TO THAT SPECIFIED IN TABLE 7001.

² **CAUTION:** DO NOT INTERMIX AVIATION BEARING GREASES. NEW WHEELS ARE PACKED WITH MOBIL AVIATION GREASE SHC 100.

ASSEMBLY

B. Assemble Main Wheel Assembly (Refer to IPL, Figure 1)

Assemble the wheel on a clean, flat work surface being careful not to nick, scratch or damage the protective finish or wheel halves.

- (1) If removed, install the bearing cups (55) now per paragraph 1.G. of REPAIR section.
- (2) New drive keys (115), if required, should be installed now.
 - (a) Align heat shield (120) between drive keys on the inboard wheel half subassembly (25). Place a drive key on a drive lug and the lip edge of each heat shield.
 - (b) Use Torq-Set® screw driver bit to fasten each drive key (115) onto the drive lug on the inboard wheel half (30) using two screws (120) for each drive key. Torque to 35 to 45 in-lb (3.95 to 5.08 N-m).
- (3) Inboard (25) and outboard (45) wheel half subassemblies are now ready for assembly.
- (4) Place inboard wheel half assembly (25) on clean, flat work surface with flange side down. Clean wheel flange, bead seat register and packing groove with a clean cloth dampened with isopropyl alcohol.

CAUTION: THE PREFORMED PACKING (20) MUST SEAT UNIFORMLY WITHOUT STRETCHING OR TWISTING.

- (5) Lubricate wheel register preformed packing (20) with a light coat of bearing grease (refer to Table 7001) and install in wheel register groove of inboard wheel half subassembly (25).

NOTE: It is recommended that a new preformed packing (20) be installed at each tire change.

- (6) Inspect air valve assembly preformed packing (85) for damage. Replace if necessary. Install air valve assembly (80) in outboard wheel half subassembly (45). Torque to 50 to 60 in-lb (5.65 to 6.78 N-m).
- (7) Inspect fuse plug preformed packing (100) for damage. Replace if necessary. Install fuse plugs (105) in outboard wheel half subassembly (45). Torque to 50 to 60 in-lb (5.65 to 6.78 N-m).
- (8) Inspect rupture disc preformed packing (100) for damage. Replace if necessary. Install rupture disc assembly (90) in outboard wheel half subassembly (45). Torque to 50 to 60 in-lb (5.65 to 6.78 N-m).

ASSEMBLY

- (9) Place serviceable 8.50-10, 10 PR tubeless tire over outboard wheel half subassembly (45) aligning the Red balancing dot on the tire adjacent to the air valve assembly (80).

NOTE: When mounting tires, bead lubrication is often desirable. A light coat of talc or approved liquid bead lubricant may be used.

- (10) Position the inboard wheel half subassembly (25) in the tire so that the bolt holes in both wheel halves are aligned.

STOP!

If using the optional tire change counter (150), refer now to the SPECIAL PROCEDURES section for installation instructions of the tire change counter and mounting hardware. If not using the optional tire change counter, continue to instruction (11) below.

- (11) Prior to installing mounting hardware, lubricate bolt (5) and nut (15) threads and bearing surfaces of bolt heads, washers (10) and nuts with anti-sieze compound, per MIL-PRF-83483 or MIL-T-83483. Refer to Figure 7001.

APPLY ANTI-SEIZE COMPOUND TO THE FOLLOWING AREAS:
A. CONTACT OF SURFACE UNDER BOLT HEAD.
B. BOTH FACES OF WASHERS.
C. THREADS ON BOLT SHANK.
D. CONTACT SURFACE OF NUT.

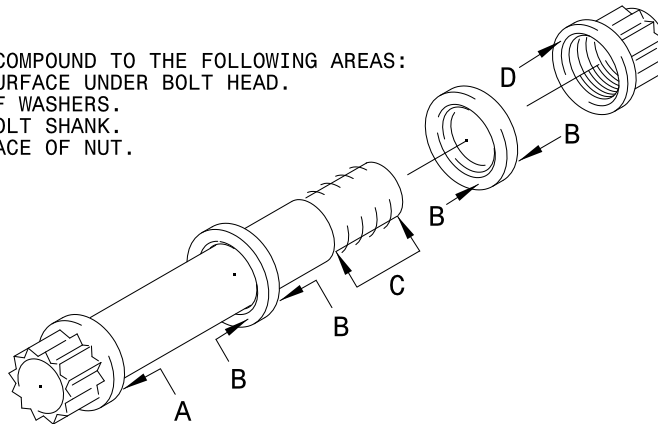


Figure 7001 Lubricating Mounting Hardware

- (12) Slide a double countersunk washer (10) onto each bolt (5).
- (13) Insert bolts (5) [with washer (10)] into the inboard wheel half subassembly (25). Compress the wheel halves together and install remaining double countersunk washers (10) and nuts (15) onto each of the nine bolts (5), thus fastening the wheel half subassemblies together.

NOTE: The nuts (15) should be located on the outboard wheel half subassembly (45) side.

ASSEMBLY

CAUTION: DO NOT USE IMPACT OR POWER WRENCHES TO INSTALL WHEEL NUTS AND BOLTS.

- (14) Preliminary torque nuts (15) to 190 in-lb maximum (21.46 N-m) in criss-cross pattern. Final torque nuts (15) to 170 to 190 in-lb (19.21 to 21.46 N-m) in clockwise sequence. See Figure 7002.

NOTE: A stripe of paint or inspector torque seal should be painted on the nuts and bolts (after final torquing) such that any rotation of the nuts relative to the bolts will be indicated by a broken stripe.

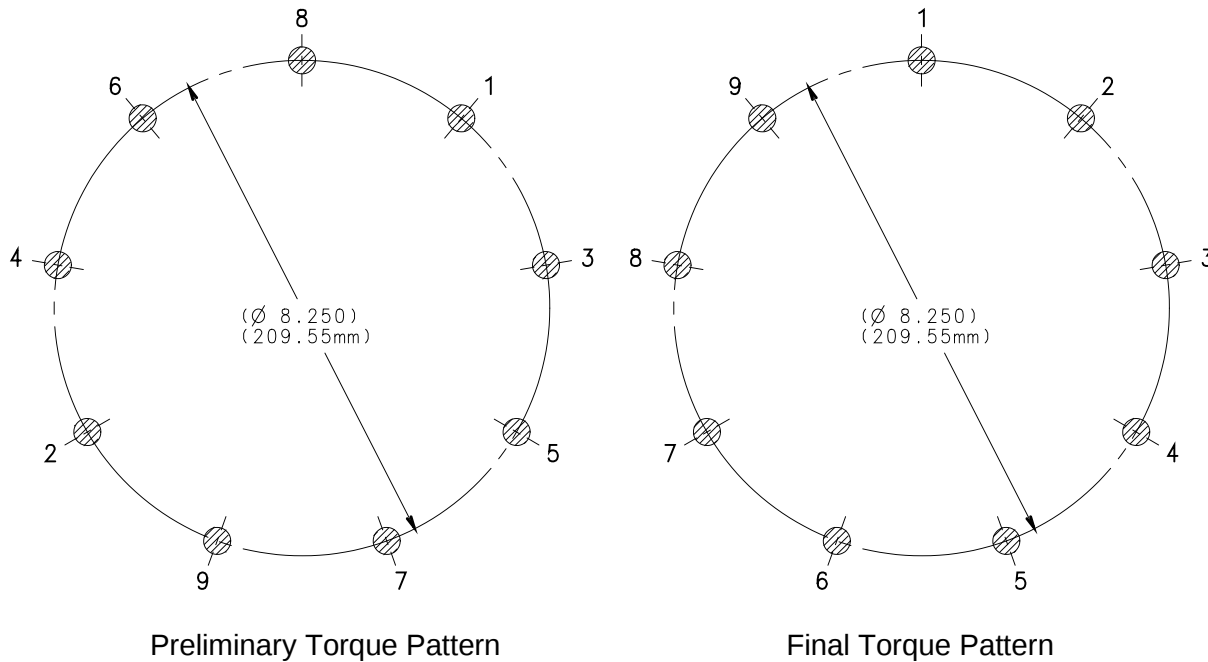


Figure 7003 Bolt Torquing Procedure

ASSEMBLY



INFLATION OF THE TIRE CAN BE EXTREMELY DANGEROUS, AND IT IS RECOMMENDED THAT INFLATION BE PERFORMED IN AN INFLATION CAGE TO PREVENT INJURY TO PERSONNEL FROM POSSIBLE EXPLOSION.

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

- (15) Place the wheel/tire assembly in an inflation cage for initial inflation. Inflate tire to tire manufacturer's specifications to seat the beads on wheel. Reduce tire pressure to recommended storage pressure (10 psig) and remove wheel/tire assembly from inflation cage.
- (16) Pack bearing cones (65) with bearing grease (refer to Table 7001).
- (17) Install bearing cone (65), into the outboard wheel half subassembly.
- (18) Install other bearing cone (65), into the other side of the outboard wheel half subassembly.
- (19) Install grease seals (70). Observe "**this side out**" instructions on seal. Install retaining rings (75) into appropriate grooves in outboard wheel half.
- (20) Test the wheel assembly. Refer to the TESTING AND FAULT ISOLATION section.
- (21) Mount wheel and tire assembly on the axle over the brake assembly.

NOTE: Make sure the lugs on the wheel hub correctly engage in the slots on the brake discs.
- (22) Install the axle nut and additional axle mounting hardware per aircraft maintenance manual.
- (23) Inflate tire to aircraft manufacturer's recommended inflation pressure.
- (24) Install five grommets (140) into fairing (130). Apply MIL-PRF-83483 or MIL-T-83483 Anti-seize to end of fasteners (135). Install one washer (145) onto each fastener (135). Attach fairing (130) to outboard wheel half subassembly. Torque fastener (135) to 20 – 25 in.-lbs. (2.26 – 2.82 N-m). Note that the fastener is designed to bottom in the outboard wheel half subassembly before fully compressing the grommet.
- (25) Perform any additional post installation functions to complete aircraft readiness per aircraft maintenance manual.

FITS AND CLEARANCES

1. General

A. Assembly Wear Limits (Refer to IPL, Figure 1)

Table 8001 gives the in-service wear limits for the component parts of the wheel assembly. You must replace all components that are not within specified limits. Refer to the appropriate paragraphs in INSPECTION / CHECK section for more data.

Table 8001
Service Wear Limits

PART NAME (IPL ITEM NO.)	FIG AND DIMENSION REFERENCE	WORN AREA DESCRIPTION	WORN DIMENSION inches (mm)
Drive Key (110A)	5001, A	Drive Key Thickness	.636 in. minimum (16.15 mm) Use Torq-Set® driver bit

B. Assembly Torque Values (Refer to IPL, Figure 1)

Table 8002 provides the assembly torque values for the component parts of the wheel assembly.

NOTE: Refer to Figure 7001, ASSEMBLY section, for applying anti-seize compound per MIL-PRF-83483 or MIL-T-83483 to all applicable hardware.

Table 8002
Assembly Hardware Torque Values

PART NAME (IPL ITEM NO.)	TORQUE LIMITS in-lb or ft-lb (N-m)
Screws (115) - Drive Key	35 to 45 in-lb (3.95 to 5.08 N-m). use Torq-Set® driver bit
Air Valve Assembly (80)	50 to 60 in-lb (5.65 to 6.78 N-m)
Nuts (15)	170 to 190 in-lb (19.21 to 21.46 N-m) final torque apply MIL-T-83483 anti-seize per Figure 7001
Rupture Disc Assy (90)	50 to 60 in-lb (5.65 to 6.78 N-m).
Fuse Plug (105)	50 to 60 in-lb (5.65 to 6.78 N-m).
Screws (135) - Fairing	20 to 25 in-lb (2.26 to 2.82 N-m).

SPECIAL TOOLS, FIXTURES, EQUIPMENT AND CONSUMABLES

1. General

This section identifies the special tools, fixtures, equipment and consumables necessary to repair, maintain, and do tests on the main wheel assembly. Special tools necessary to perform the requirements of this manual are shown in Table 9001. The materials (consumables list) necessary are shown in Table 9002.

NOTE: Equivalent substitutes may be used for items listed.

A. Special Tools, Fixtures and Equipment. Refer to Table 9001.

Table 9001 (Sheet 1 of 2)
Special Tools, Fixtures and Equipment

PART NUMBER	NOMENCLATURE	SPECIFICATION	SOURCE OF SUPPLY
N/A	Inflation Cage	N/A	Commercial Source
N/A	Tire Pressure Gage	To assure recommended inflation pressure (per airframe mfr.)	Commercial Source
N/A	Torque Gage	0 to 200 in-lb capacity (0 to 22.60 N-m)	Commercial Source
199-18	Preformed Packing Extraction Tool Set	N/A	Aircraft Wheel and Brake, LLC Avon, OH 44011 U.S.A. www.kaman.com/cleveland
N/A	Socket Set with Assorted Wrenches	12 pt. External Drive and Hex Head, Inch	Commercial Source
N/A	Portable Tire Bead Breaker	N/A	Commercial Source
N/A	Plastic Media Stripping Equipment	N/A	Commercial Source
N/A	Sub-Zero Freezer	-30°F to -60°F (-34.4°C to -51.1°C)	Commercial Source
N/A	Oven	200°F capacity (93°C)	Commercial Source
N/A	Paint Application Equipment	N/A	Commercial source
N/A	Removal Tool, Bearing Cup	Per Figure 9001	Outside Manufacture

SPECIAL TOOLS, FIXTURES, EQUIPMENT AND CONSUMABLES

Table 9001 (Sheet 2 of 2)
Special Tools, Fixtures and Equipment

PART NUMBER	NOMENCLATURE	SPECIFICATION	SOURCE OF SUPPLY
N/A	Installation Tool, Bearing Cup	Per Figure 9002	Outside Manufacture
N/A	Hub Support, Wheel Half	Per Figure 9004	Outside Manufacture
N/A	Arbor Press	N/A	Commercial Source
N/A	Magnifier	X10 Magnification	Commercial Source
N/A	Vernier Dial Calipers	0 to 6.00 in. (0 to 150 mm)	Commercial Source
N/A	Screw Driver Bits	Regular, Phillips	Commercial Source
N/A	Torq-Set® Driver Bit	(NASM33781)	Phillips Screw Company
N/A	Fuse Plug and Rupture Disc Test Fixture	Per Figure 9003	Outside Manufacture
1227-6	Heli-Coil Extracting Tool	MIL-T-21309	Black & Decker Co.
7552-3	Heli-Coil Installation Tool	MIL-T-21309	Black & Decker Co.
3695-3	Heli-Coil Tang Removal Tool	MIL-T-21309	Black & Decker Co.
N/A	Eddy Current Inspection Equipment	ASNT-460 or MIL-HDBK-728/2	Commercial Source

B. Consumables List. Refer to Table 9002.

Table 9002 (Sheet 1 of 2)
Consumables List

PART NUMBER	NOMENCLATURE	SPECIFICATION	SOURCE OF SUPPLY
N/A	Magnetic Particle Inspection Kit	ASTM E1444	Commercial Source
N/A	Fluorescent Penetrant Inspection Kit	ASTM E1417 or MIL-STD-6866, Type 1, Method A, Sensitivity Level 2	Commercial Source
N/A	Aluminum Oxide Cloth	400 Grit or Finer Wet or Dry	Commercial Source

SPECIAL TOOLS, FIXTURES, EQUIPMENT AND CONSUMABLES

Table 9002 (Sheet 2 of 2)
Consumables List

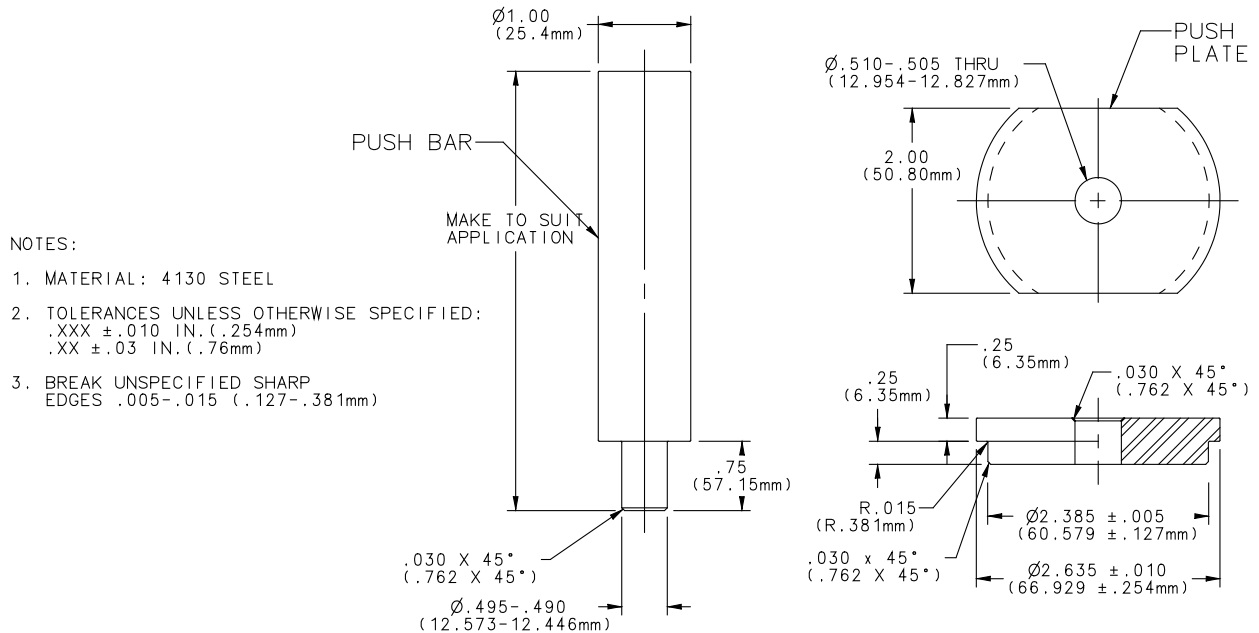
PART NUMBER	NOMENCLATURE	SPECIFICATION	SOURCE OF SUPPLY
N/A	Corrosion Preventative Alodine 1200 or Equiv.	MIL-C-5541, Class 1A or MIL-DTL-5541, Type I or Type II, Class 1A	Commercial source
N/A	Cleaner/Degreaser	AMS 1526	Commercial Source
44-GN-36 Components A and B	Primer Coating	MIL-PRF-85582C Type I, Class C2	Deft Chemical Coatings
44-GN-24 Components A and B	Primer Coating, Alternate	MIL-P-85582B Type I, Class C2	Deft Chemical Coatings
03-W-127A Components A and B	Finish Coating	MIL-C-85285B, Type I No. 17925 (FED-STD-595) Untinted White	Deft Chemical Coatings
Mobil Aviation ¹ Grease SHC100 Primary	Lubricating Grease Equivalent substitutes are not allowed.	N/A	Exxon-Mobil Oil Co. Aviation Lubricants
Aeroshell ¹ Grease 22 Alternate	Lubricating Grease Equivalent substitutes are not allowed.	MIL-G-81322, Grade A	Shell Oil Company Lubricant Division
Aeroshell ¹ Grease 58 Alternate	Lubricating Grease Equivalent substitutes are not allowed.	SAE AMS3058	Shell Oil Company Lubricant Division
NYCO Grease GN 3058 ¹ Alternate	Lubricating Grease Equivalent substitutes are not allowed.	SAE AMS3058	NYCO Corporation
N/A	Plastic Media, Acrylic	MIL-P-85891, Type V	U.S. Technology Corp.
51094 Moly-50	Anti-seize Compound	MIL-PRF-83483 or MIL-T-83483	FEL-PRO Chemical
N/A	Isopropyl Alcohol	N/A	Commercial Source
N/A	Rubber Cleaner	N/A	Commercial Source
N/A	Soap Solution	N/A	Commercial Source
N/A	Air Supply, Compressed Dry Filtered	30 psig maximum (2.07 bar)	N/A
N/A	Cleaning Cloths	Lint Free	Commercial Source
N/A	Dry Ice (Alternate for Sub-Zero Freezer)	N/A	Commercial Source
N/A	Brushes	Soft Bristled	Commercial Source
N/A	Solvent, Stoddard Type 1	P-D-680	Commercial Source
Uni-Paint 63602 – Red 63603 - Blue	Paint Marker – medium point	Oil-based, permanent, quick drying, weatherproof, fade proof and acid free	Sanford Corporation

¹ **CAUTION:** DO NOT INTERMIX AVIATION BEARING GREASES. NEW WHEELS ARE PACKED WITH MOBIL AVIATION GREASE SHC 100.

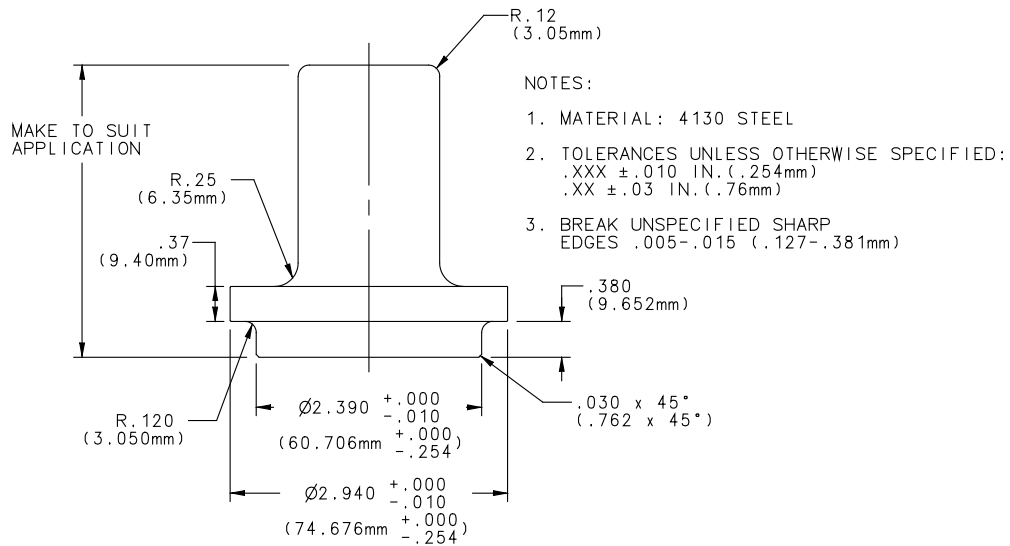
SPECIAL TOOLS, FIXTURES, EQUIPMENT AND CONSUMABLES**C. List of Manufacturers and Vendors**

<u>Name</u>	<u>Internet Address</u>	<u>Address</u>
Aircraft Wheel and Brake, LLC	www.kaman.com/cleveland	1160 Center Rd Avon, OH 44011 USA
U.S. Technology Corporation		220-T 7 th Street S.E. Canton, OH 44702 USA
Deft Chemical Coatings	www.deftfinishes.com	17451 Von Karman Ave. Irvine, CA 92714 USA
Shell Oil Lubricant Div.	www.shell.com	One Shell Plaza Houston, TX 77002 USA
Phillips Screw Company	www.phillips-screw.com	508 Edgewater Drive Wakefield, MA 01880 USA
Black & Decker Company Emhart Industrial Division (Heli-Coil)	www.emhart.com	Shelter Rock Lane Danbury, CT 06810 USA
Sanford Corporation	www.sanfordcorp.com	2707 Butterfield Road Oak Brook, IL 60523 USA
Exxon-Mobil Oil Company Aviation Lubricants	www.exxonmobil.com	Fairfax, VA 22037 USA 1-800-662-4525
NYCO	www.nyco.fr www.nycoamerica.com	66 Avenue Des Champs-Elysees BP 414 75366 Paris CEDEX 08 France +33 1 45 61 50 00 87 Amlajack Way Newman, GA 30265 USA

SPECIAL TOOLS, FIXTURES, EQUIPMENT AND CONSUMABLES

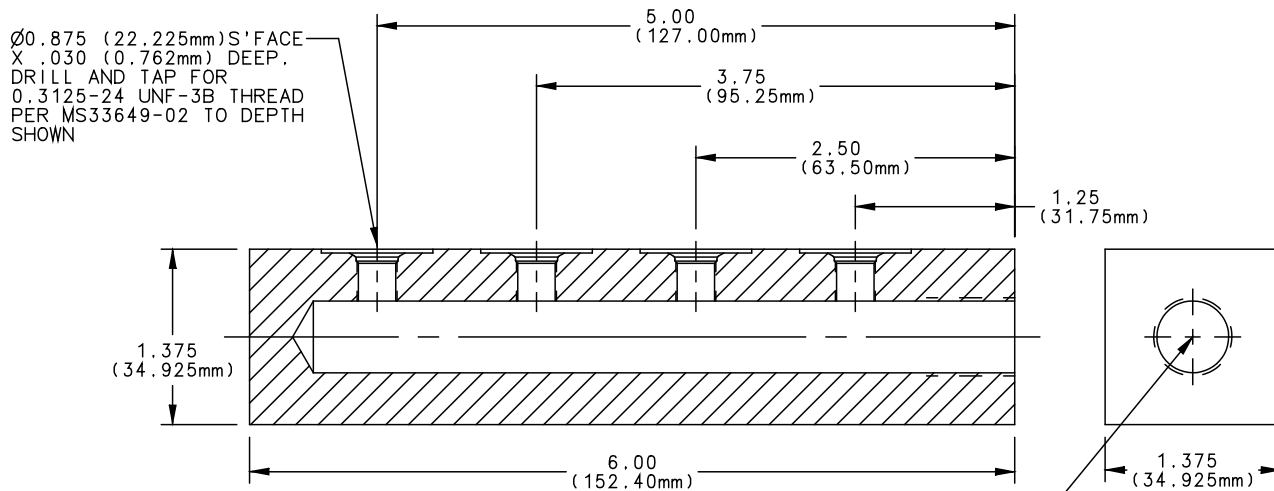


**Bearing Cup Removal Tool
Figure 9001**



**Bearing Cup Installation Tool
Figure 9002**

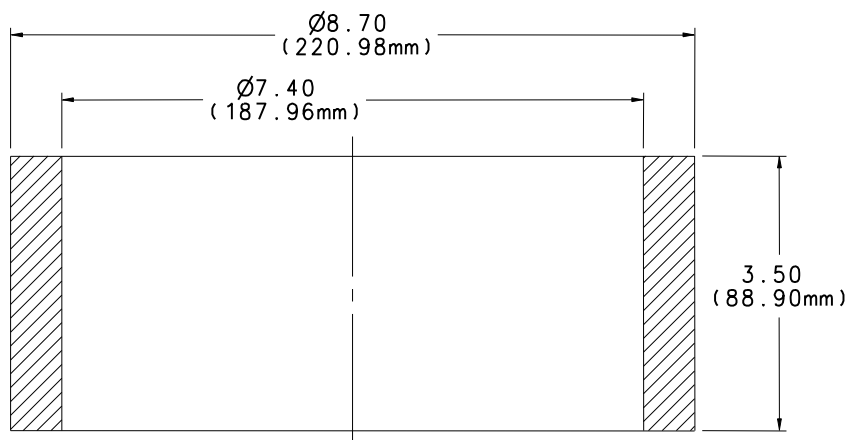
SPECIAL TOOLS, FIXTURES, EQUIPMENT AND CONSUMABLES



NOTES:

1. MATERIAL: 4130 STEEL
2. TOLERANCES UNLESS OTHERWISE SPECIFIED:
.XXX ± .010 IN. (.254mm)
.XX ± .03 IN. (.76mm)
3. BREAK UNSPECIFIED SHARP
EDGES .005-.015 (.127-.381mm)

Fuse Plug and Rupture Disc and Air Valve Test Fixture
Figure 9003



NOTES:

1. MATERIAL: 4130 STEEL
2. TOLERANCES UNLESS OTHERWISE SPECIFIED:
.XXX ± .010 IN. (.254mm)
.XX ± .03 IN. (.76mm)
3. BREAK UNSPECIFIED SHARP
EDGES .005-.015 (.127-.381mm)

Hub Support (Cup Removal and Installation)
Figure 9004

ILLUSTRATED PARTS LIST

1. General

The illustrated parts list describes and illustrates the detail parts of the Main Wheel Assembly.

All parts of the equipment are listed, except parts which lose their identities by being permanently fastened to other parts of assemblies and are not subject to disassembly.

A. Explanation of Columns

- (1) Figure/Item column: The figure and item numbers key the parts breakdown list to the applicable illustration. The first number represents the figure number of the illustration. The item numbers are arranged in sequence and generally reflect the order of disassembly.
- (2) Part Number column: This column contains the assigned Aircraft Wheel and Brake, LLC part number for the individual item.
- (3) Airline Stock Number column: This column contains 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 indenture 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 various 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 indicates the total number required per assembly or per 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)

RFReference
 (item listed for reference only)

ILLUSTRATED PARTS LIST**B. Part Numbering System**

Aircraft Wheel and Brake, LLC has assigned a part number to all purchased and government standard off-the-shelf parts. They are defined and used as follows:

When a purchased part is listed, the assigned Aircraft Wheel and Brake, LLC part number shall 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 federal supply code will be preceded by the letter "V".

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

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:

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

ILLUSTRATED PARTS LIST

D. Items Not Illustrated

Items not illustrated are indicated by a dash (-) ahead 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.

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ILLUSTRATED PARTS LIST

4. Detailed Parts List – Main Wheel Assembly (sheet 1 of 2)

FIG. ITEM	PART NUMBER	AIRLINE STOCK NUMBER	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY.
1 - 1	40-424		MAIN WHEEL ASSEMBLY		RF
5	103-22700		. BOLT (MS21250-05022)		9
10	095-14700		. WASHER, DBL C'SUNK (MS14155-5)		18
15	094-16400		. NUT, SELF-LOCKING (NAS1804-5N)		9
20	101-50268		. PACKING, PREFORMED (MS28775-268)		1
- 25	161-20501		. SUBASSEMBLY, WHEEL HALF, INBOARD		1
30	151-19901 ⁽²⁾		.. WHEEL HALF, INBOARD (alternate for item 30B)		NP
30A	151-19902 ⁽²⁾		.. WHEEL HALF, INBOARD (alternate for item 30B)		NP
30B	151-19903 ⁽²⁾		.. WHEEL HALF, INBOARD		NP
35	230-04700 ⁽¹⁾		.. INSERT (MS21209F1-10L)		12
- 45	162-20501		. SUBASSEMBLY, WHEEL HALF, OUTBOARD		1
50	152-19901 ⁽²⁾		.. WHEEL HALF, OUTBOARD (alternate for item 50B)		NP
50A	152-19902 ⁽²⁾		.. WHEEL HALF, OUTBOARD (alternate for item 50B)		NP
50B	152-19903 ⁽²⁾		.. WHEEL HALF, OUTBOARD		NP
55	214-13100		.. CUP, BEARING		2
35	230-04700 ⁽¹⁾		.. INSERT (MS21209F1-10L)		5
40	166-19700		.. NAMEPLATE		1
60	166-20000		.. NAMEPLATE "WARNING"		1
65	214-13200		. CONE, BEARING		2
70	154-08400		. SEAL, GREASE, SUPSD BY Item 70A		NP
70A	154-08401		. SEAL, GREASE, SUPSDS Item 70		2
75	155-14200		. RING, RETAINING		2

⁽¹⁾ Do not remove unless damaged.

⁽²⁾ 151-19903/152-19903, 151-19902/152-19902 and 151-19901/152-19901 are procured thru different forging suppliers.

ILLUSTRATED PARTS LIST

4. Detailed Parts List – Main Wheel Assembly (sheet 2 of 2)

FIG. ITEM	PART NUMBER	AIRLINE STOCK NUMBER	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY.
80	160-00700		. ASSY., VALVE, AIR		1
85	101-29700		. . PACKING, PREFORMED (AS3582-010)		1
90	106-01201		. ASSY., DISC, RUPTURE		1
95	106-01200		. . DISC, RUPTURE		1
100	101-62300		. . PACKING, PREFORMED (AS3582-010) SUPSD BY Item 100A		NP
100A	101-00500		. . PACKING, PREFORMED (MS28775-010) SUPSDS Item 100		1
105	106-01600		PLUG, FUSIBLE (271°-291°F melt range)		3
100	101-62300		PACKING, PREFORMED (AS3582-010) SUPSD BY Item 100A		NP
100A	101-00500		PACKING, PREFORMED (MS28775-010) SUPSDS Item 100		3
110	205-05200		. KEY, DRIVE, SUPSD BY ITEM 110A		NP
110A	205-05201		. KEY, DRIVE, SUPSDS ITEM 110		6
115	102-33300		. SCREW (NAS1102E3-6)		12
120	157-02600		. SHIELD, HEAT		6
125	110-15300		. BUMPERS, SHIELD, HEAT		12
130	157-03500		. FAIRING		1
135	102-35000		. SCREW		5
140	217-01200		GROMMET (MS35489-4)		5
145	095-10800		WASHER (NAS1149F0332P)		5
150	139-39000 ⁽³⁾		TIRE CHANGE COUNTER - Optional		RF

⁽³⁾ The optional tire change counter may be ordered as a separate kit (ref. Aircraft Wheel and Brake, LLC P/N 199-272). Refer to the SPECIAL PROCEDURES section for installation of the tire change counter.

SPECIAL PROCEDURES

1. General

This section contains special procedures for the 40-424 main wheel assembly.

2. Optional Tire Change Counter

The following instructions are to be followed for installation of the optional tire change counter (150).

A. Tire Change Counter Equipment and Materials

NOTE: Unless otherwise stated, equivalent substitutes may be used for items listed.

Table 11001 Tire Change Counter Equipment and Materials List

PART NUMBER	NOMENCLATURE	SPECIFICATION	SOURCE OF SUPPLY
199-272 ²	Tire Change Counter Kit	N/A	Aircraft Wheel and Brake, LLC
51094 Moly-50	Anti-seize Compound	MIL-PRF-83483 or MIL-T-83483 ¹	FEL-PRO Chemical
N/A	Socket Set with Assorted Wrenches	12 pt. External Drive and Hex Head, Inch	Commercial Source
N/A	Torque Gage	0 to 200 in-lb capacity (0 to 22.60 N-m)	Commercial Source
Uni-Paint 63602 – Red 63603 - Blue	Paint Marker – medium point	Oil-based, permanent, quick drying, weatherproof, fade proof and acid free	Sanford Corporation

¹ **CAUTION:** DO NOT MIX ANTI-SEIZE COMPOUNDS. THIS CAN RESULT IN IMPROPER TORQUE SETTINGS AND COULD RESULT IN FAILURE OF THE BOLT. THE USE OF ANTI-SEIZE COMPOUND IS LIMITED TO THAT SPECIFIED IN TABLE 11001.

² The 199-272 Tire Change Counter Kit contains the following component(s):

<u>Part Number</u>	<u>Description</u>	<u>Quantity</u>
139-39000	Tire Change Counter	1

SPECIAL PROCEDURES

B. Install the Tire Change Counter

NOTE: The tire change counter is approved for use on the outboard wheel half (50) only. The tire change counter is installed during assembly of the wheel.

- (1) Refer to the **ASSEMBLY** section and assemble the wheel following the instructions starting with paragraph 1.B.(1) up to and including paragraph 1.B.(10). This will include mounting a serviceable tire and position the wheel halves for tire change counter and mounting hardware installation.
- (2) Prior to installing the tire change counter and mounting hardware, apply anti-seize per MIL-T-83483 to the following per figure 11001:

- All 9 bolts (5)
- All 9 nuts (15)
- 17 of the washers (10)
- The tire change counter (150)

APPLY ANTI-SEIZE COMPOUND TO THE FOLLOWING AREAS:

- A. CONTACT OF SURFACE UNDER BOLT HEAD.
- B. BOTH FACES OF WASHERS.
- C. THREADS ON BOLT SHANK.
- D. CONTACT SURFACE OF NUT.
- E. CONTACT SURFACE AROUND MOUNTING HOLE ON FRONT AND BACK SIDE OF TIRE CHANGE COUNTER.

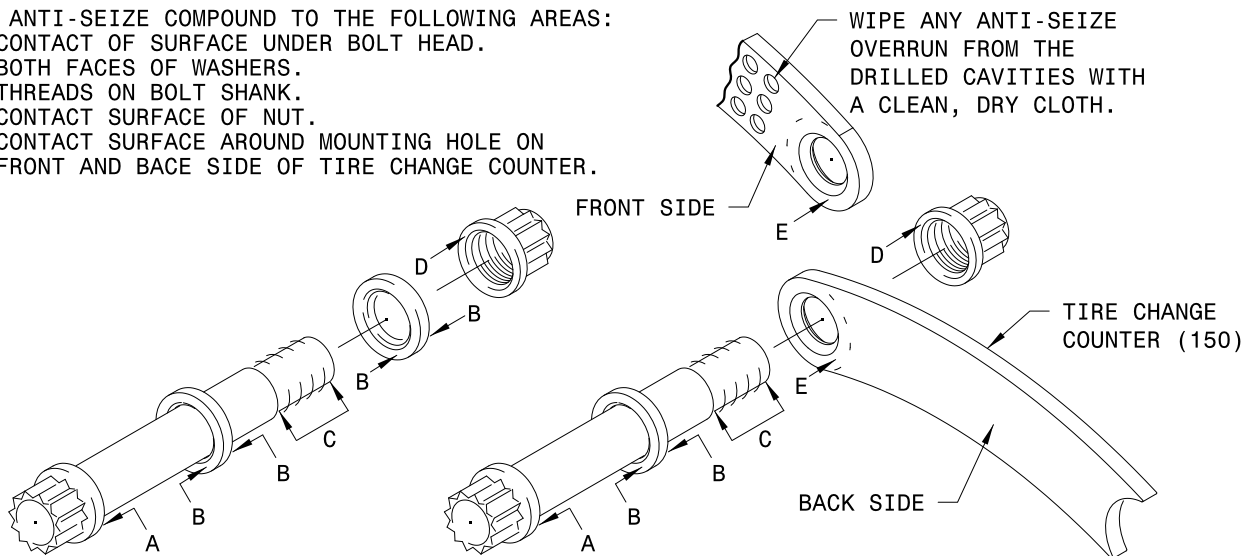


Figure 11001 Lubricating Mounting Hardware

SPECIAL PROCEDURES

- (3) Install the hardware as follows:
- first, insert the 9 bolts (5) [each with a countersunk washer (10)] into the inboard wheel half subassembly (25).
 - next, compress the wheel halves together and install a countersunk washer (10) onto 8 of the bolts (5).
 - next, install 8 nuts (15) onto eight of the bolts (5), thus fastening the wheel half subassemblies together.
- NOTE:** The nuts (15) should be located on the outboard wheel half subassembly (45) side.
- finally, install the tire change counter (150) onto the remaining bolt (5) as shown in Figure 11002 and install the remaining washer (10) and nut (15) onto the bolt.

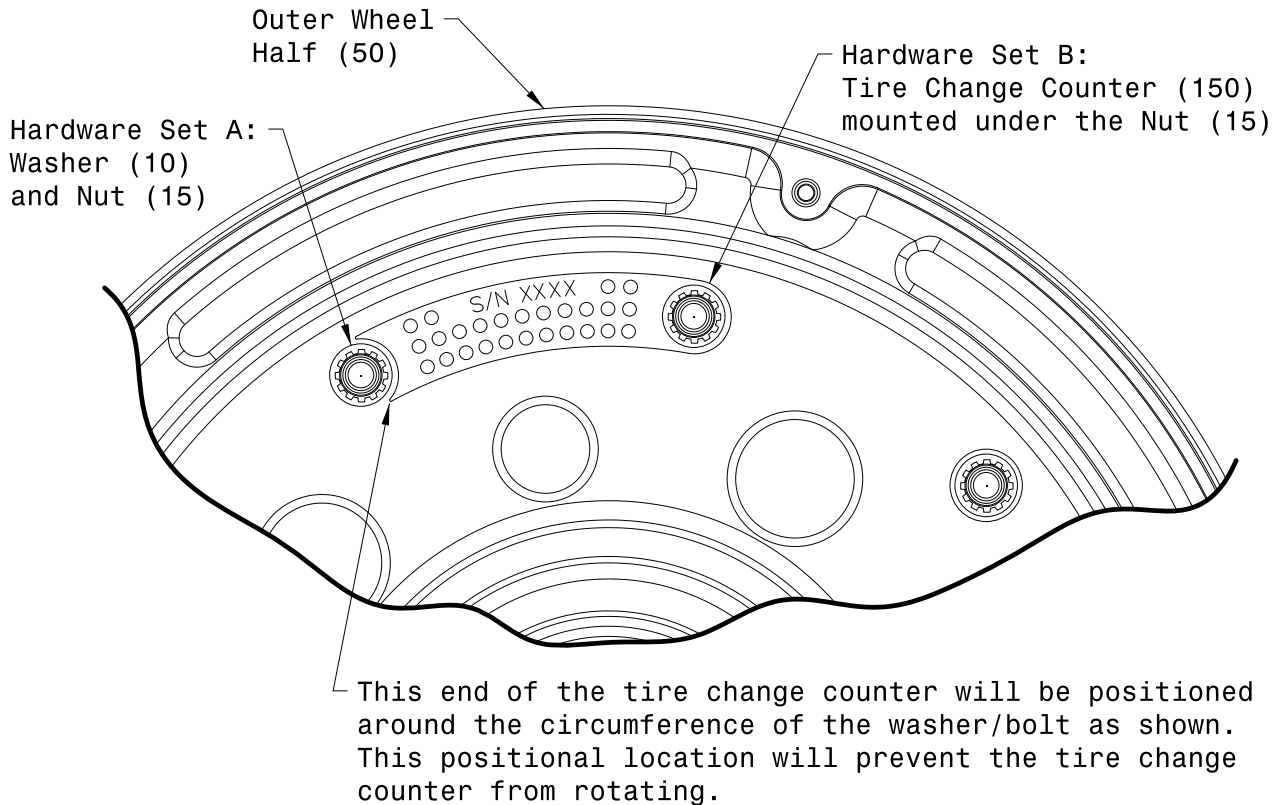


Figure 11002 Install the Tire Change Counter

- (4) Torque hardware set A and B to 40 in-lb (4,52 N-M) to properly locate the tire change counter before applying the preliminary and final torque limits.

SPECIAL PROCEDURES

CAUTION: DO NOT USE IMPACT OR POWER WRENCHES TO INSTALL WHEEL NUTS AND BOLTS.

- (5) Preliminary torque nuts (15) to 190 in-lb maximum (21.46 N-m) in criss-cross pattern. Final torque nuts (15) to 170 to 190 in-lb (19.21 to 21.46 N-m) in clockwise sequence. See Figure 7003.

NOTE: A stripe of paint or inspector torque seal should be painted on the nuts and bolts (after final torquing) such that any rotation of the nuts relative to the bolts will be indicated by a broken stripe.

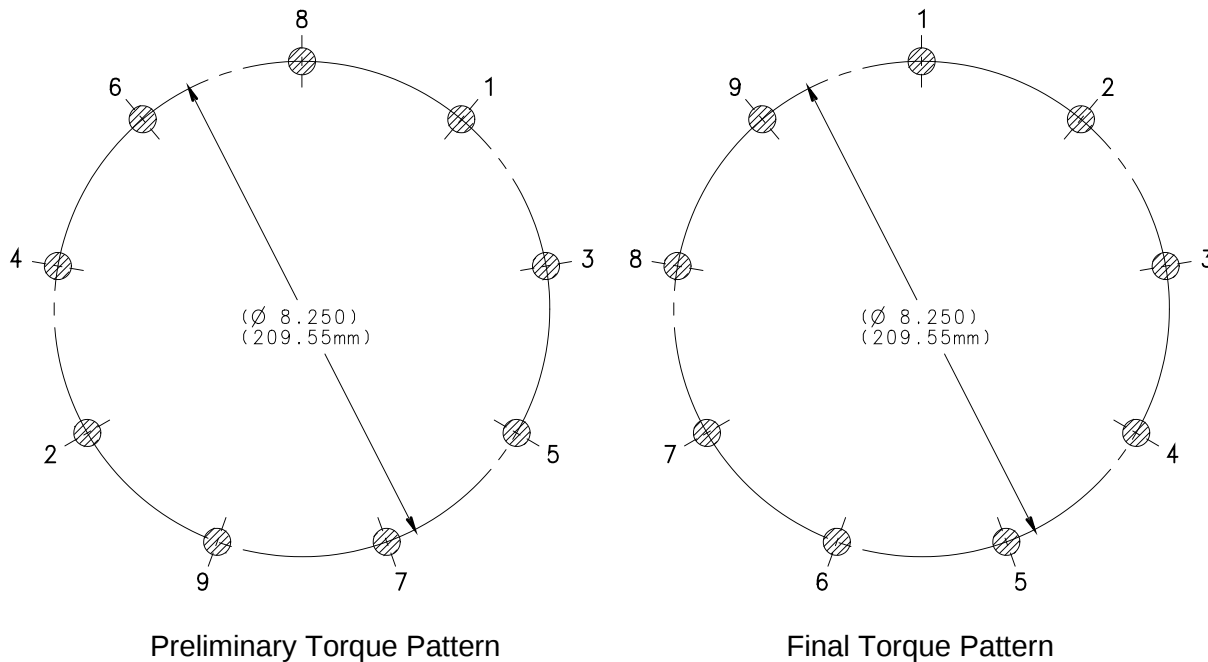


Figure 11003 Bolt Torquing Procedure

- (6) To complete assembly of the wheel, refer to the **ASSEMBLY** section and follow the instructions starting with paragraph 1.B.(15).

SPECIAL PROCEDURES

B. Recording Tire Changes

- (1) Record tire changes as shown in Figure 11004 and the following procedure.
 - (a) Wipe away any anti-seize residue from areas that are to be marked with the paint marker. Anti-seize residue will make it hard to apply the marker. Use a dry, clean cloth.
 - (b) At the location indicated, mark the tire change counter with the outboard wheel subassembly serial number. The tire change counter may be marked with the serial number by painting, engraving, dot peening, or vibro etching. Use the format: "S/N XXXX".
 - (c) The tire change counter has 26 drilled hole cavities. Use the red paint marker to paint one drilled hole cavity for each tire change. If the tire change count for the wheel exceeds 26 tire changes, a blue marker can be used to mark over each red mark. This will double the counter to a possible 52 tire changes.

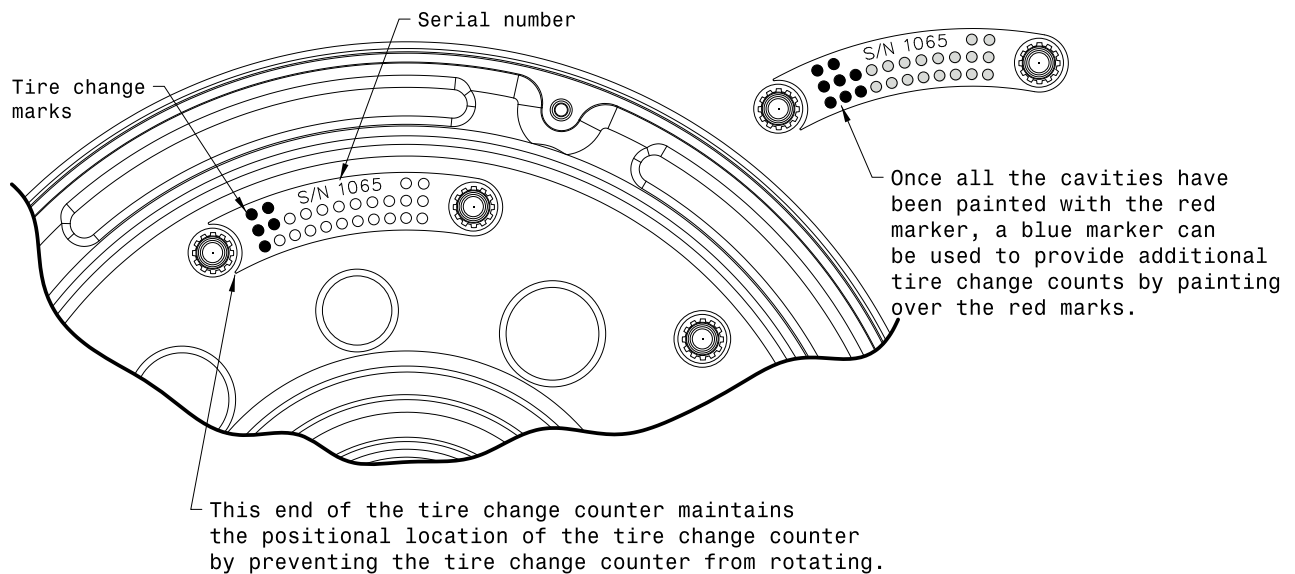


Figure 11004 Tire Change Counter

STORAGE

1. General

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

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

NOTE: Lubricate the bearing cups (55) and cones (65) with bearing grease (refer to ASSEMBLY section, Table 7001) and plug or cover bearing hub area during storage to prevent contamination.

A. Wheels Stored With Tires Installed

- (1) The length of time that a wheel assembly can be stored is governed by the storage life of its rubber components. The usable life may be shortened by exposure to sunlight, ozone, extreme temperatures, low humidity; and contamination by fluids.
- (2) The wheel assembly should be stored in a clean, dry storeroom. The desirable storeroom temperature range is from 50° to 77°F (10° to 25°C). If this temperature range cannot be maintained, temperatures as high as 125°F (51.7°C) and as low as -20°F (-28.9°C) can be tolerated for shorter periods. Total time above 100°F (37.8°C) shall not exceed three months. The recommended storage pressure for tires is 10 psig (0.69 bar).

B. Wheels Stored Without Tires Installed

- (1) Short-term storage of tubeless wheel assemblies may be stored with the wheel O-ring packing installed between the two halves.
- (2) Storage of components containing rubber for longer than two years should be assembled without the rubber based components. Those rubber based components, e.g., O-ring packings, molded rubber grease seals, etc., are to be placed in an ultraviolet protective package.
- (3) Wheels stored without rubber components installed have an indefinite storage life.

