

Cleveland

Wheels & Brakes

Parker Hannifin Corporation

Aircraft Wheel & Brake

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PRODUCT REFERENCE MEMO

40-78, 40-78A, 40-78B, 40-78E, AND 40-78J WHEEL ASSEMBLIES, TIE BOLT / OVERHAUL SET AVAILABILITY

1. PLANNING INFORMATION

A. APPLICABILITY

All Parker Hannifin (Cleveland Wheels & Brakes) P/N 40-78, 40-78A, 40-78B, 40-78E, & 40-78J Wheel Assemblies used on:

- **AVIAT** Model Husky A-1A and A-1B, the Pitts Special S-2C, and Eagle II Aircraft
- **EXTRA** Model 200,300L,300LP,330LT,330LX,330XC Aircraft
- **AS Alexander Schleicher GmbH & Co.** Model ASK21, ASH26, ASW27, ASW22, ASH25, ASW28 Aircraft
- **DIAMOND AIRCRAFT** Industries Model DA40-NG, DA42-NG,DV20, DA20, HK36, D-JET, DA50 MAGNUM Aircraft
- **WIPAIRE** Model 2100, 2350, 3000, 3450, 6100, 7000, 8000, 8750, 10000, 13000 floats

B. REASON

CAUTION: OWNER/OPERATORS ARE ADVISED THAT THE ENTIRE FASTENER SYSTEM SHOULD BE CHANGED TO MAINTAIN PROPER TORQUE-TENSION RELATIONSHIP. IT IS RECOMMENDED TO CHANGE THE FASTENER SYSTEM AS A COMPLETE SET AT EACH TIRE CHANGE OR OVERHAUL.

To bring these wheels into compliance with Cleveland's current fastener design standard and inform Owner/Operators of the resulting new washer thickness and low profile nut for the subject wheel assemblies.

The original tie bolt system guidance from the 1972 standard, AC43.13.1A, Chapter 5, Section 1, Para 230 (a) (2), permits just the chamfer or round end of the bolt to be seen at the top of the nut. No failure has occurred as a result of this original tie bolt system.

Cleveland's current fastener design standard, AC43.13-1B, Chapter 7, Section 4, Para. 7-64 (f) recommends a minimum of one thread exposure above the nut.

Thus we are updating these assemblies with low profile all metal lock nuts that meet the minimum of one thread exposure above the nut under all conditions. The low profile nut provides distinct visual indication of proper thread engagement. Use of the existing nut is still an accepted configuration; however, a different torque value is required. Refer to Figures 1 and 2 for configuration examples.



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C. DESCRIPTION

This PRM provides the inspection guidance and replacement instructions of tie bolt set in the subject wheel assemblies. The following procedures are provided to assure proper installation of low profile tie bolt nuts when accomplishing an overhaul.

The Cleveland Wheels & Brakes Component Maintenance Manual Number AWBCMM0001, latest issue, is available and should be used for general maintenance guidelines for External Design Wheels and brakes. Download AWBCMM0001 from: www.clevelandwheelsandbrakes.com then select *LITERATURE* from the Parker menu.

D. COMPLIANCE

Optional, at owner's discretion. The existing tie bolt nut remains an acceptable configuration for the subject wheel assemblies.

E. APPROVAL

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

F. WEIGHT AND BALANCE

Not affected.

G. OTHER PUBLICATIONS AFFECTED

AWBCMM0001Component Maintenance Manual, External Design Wheels & Brakes
AWBTSG0001Technician's Service Guide

2. ACCOMPLISHMENT INSTRUCTIONS

A. INSPECTION

Refer to Hardware Reference Identification Photos

- (1) At next tire change or overhaul replace the tie bolt set and incorporate the low profile nut per this Product Reference Memo.
- (2) At next available maintenance interval, and at Owner's discretion, inspect tie bolt system for evidence of one complete thread exposed from the nut. If one complete bolt thread is exposed above the nut, aircraft may be returned to service at Owner's discretion.



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B. REPLACEMENT INSTRUCTIONS

NOTE: Refer to Component Maintenance Manual, AWBCMM0001, latest issue for all wheel assembly service procedures.

SAFETY WARNING:  WHEN INFLATING DEFLATING TIRES OR CONDUCTING INFLATION CHECKS FOLLOWING A DISASSEMBLY, ALWAYS USE A BLASTPROOF EXPLOSION CAGE TO PROTECT FROM PERSONAL INJURY.

- (1) Deflate the tire and remove the wheel assemblies from the aircraft in accordance with the aircraft manufacturer's instructions.

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

- (2) Remove the valve core from the tire.
- (3) Prior to disassembly, note the orientation of washers, bolts and nuts relative to the disc so the same orientation is used during reassembly.
- (4) Disassemble and service the wheel and proceed as follows: Remove and discard the tie bolts, nuts, washers, grease felts, and grease rings. Deepwell 1/2 and 3/8, 6-point sockets are recommended.
- (5) Thoroughly clean wheel assembly. Completely remove the contained grease and clean the bearings and bore. Pack bearings with Mobile SHC-100. Install new grease seals lubricated with Mobile SHC-100.
- (6) Align tube on wheel half and join inner and outer wheel halves assuring that the tube is free from the joint line between wheel halves.

SAFETY WARNING:  NEVER INFLATE THE MOUNTED TUBE WITHOUT ALL TIE BOLTS INSTALLED AND PROPERLY TORQUED.

- (7) Install new tie bolts, washers, and nuts as a set. The bolt head must be located against the brake disc flange and the washers are installed under the nuts.



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WARNING: FAILURE TO PROPERLY TORQUE THE WHEEL ASSEMBLY BOLTS MAY RESULT IN PREMATURE FAILURE OF THE MATING COMPONENTS OR HARDWARE.

CAUTION: THE USE OF POWER TOOLS TO INSTALL NUTS AND BOLTS IS NOT A RECOMMENDED PRACTICE. IT MAY CAUSE OVER TORQUING OF THE FASTENER SYSTEM AND RESULT IN DAMAGE TO THE FASTENER OR MATING COMPONENTS.

NOTE: Fastener torque information is also available in the Cleveland Wheels & Brakes Component Maintenance Manual, AWBCMM0001, latest issue, or Technician's Service Guide, AWBTSG0001, latest issue. If there is any conflict or question regarding dry torque value on your assembly, contact Cleveland Customer Support for assistance.

- (8) Reassemble wheel per maintenance manual instructions installing one (1) washer under each nut and DRY torque the nuts in two steps; first to 35 lb-in (3,95 N-m) then to 75 lb-in (8,5 N-m). ALWAYS restrain the bolt head and torque the nuts using a crisscross pattern until all nuts are properly torqued. Lubricant is **NOT** to be used.
- (9) Place warning label adjacent to valve hole.
- (10) Place identification label opposite valve hole.
- (11) Reinstall wheel on aircraft per applicable aircraft manual.

C. RETURN TO SERVICE

- (1) When returning the wheel assembly to service, apply a liberal amount of Mobile Aircraft grease SHC-100 to the bearings per PRM78, and the mating cavity areas. Install rubber lip grease seals.
- (2) After installation of the wheel assembly on the aircraft, torque the axle nut to manufacturer's recommendation and secure with cotter pin as specified in the Airframe Owner's Handbook, install hubcap and secure with snap ring as applicable.
- (3) Make a logbook entry referencing the change of hardware Record the flight hours from the Hobbs meter, the length of time wheels have been in service, number of tire changes, the torque applied to the tie bolt nuts, inflation pressure, and date that the aircraft is returned to service.

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HARDWARE REFERENCE IDENTIFICATION PHOTOS

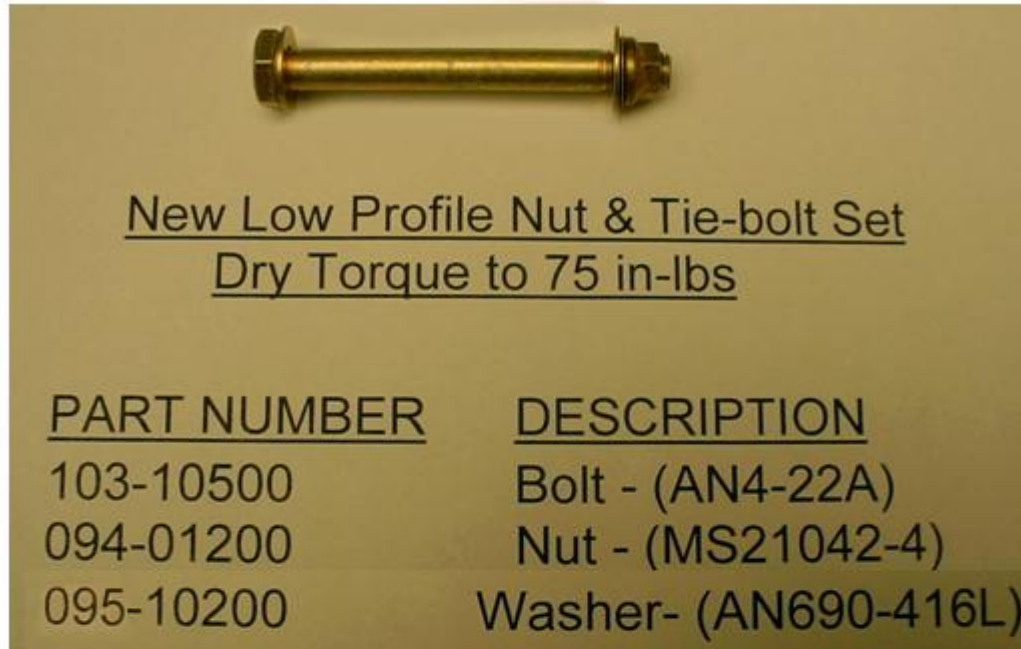


Figure 1 New Configuration

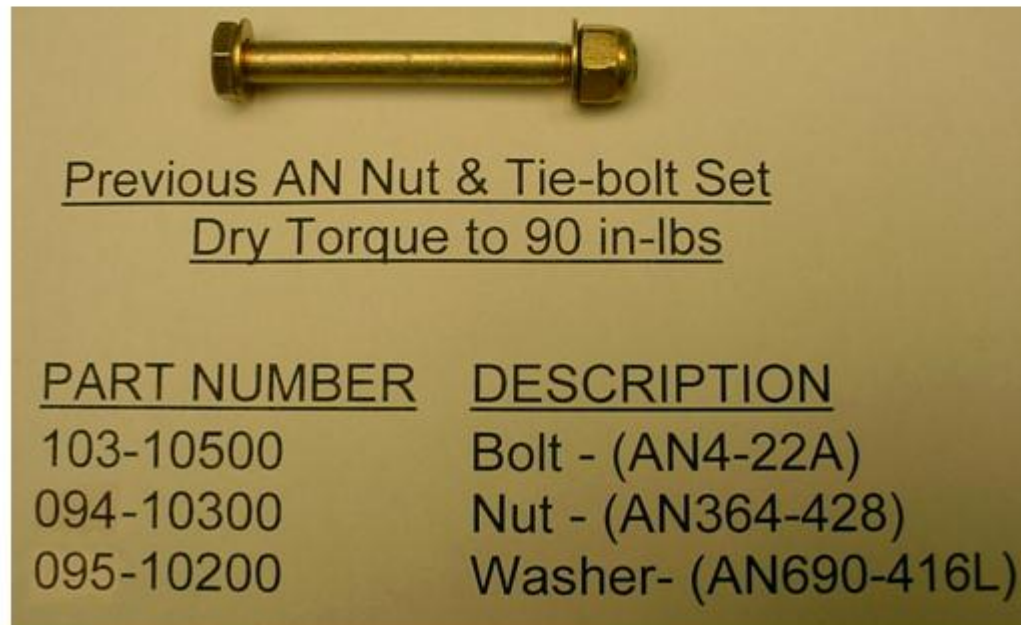


Figure 2 Previous Configuration



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3. MATERIAL INFORMATION

A. LIST OF COMPONENTS

Service kit 199-277 will upgrade and includes components to overhaul one (1) wheel assembly.

<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
103-10500	Bolt (AN4-22A)	3
095-10200	Washer (AN960-416L)	6
094-01200	Nut (MS21042-4)	3
217-00100	Grommet	1
154-13000	Grease seal	2
166-19700	Nameplate	1
166-20000	Nameplate, Warning	1
PRM13A	Product Reference Memo- Conditioning Procedure for Non Asbestos Organic Brake Lining	1
PRM73	Product Reference Memo- Wheels & Brakes – Preparation for Service – On- Aircraft Cleaning	1
PRM78	Product Reference Memo- Wheel Assemblies – Preferred Bearing Grease (Mobil Aviation Grease SHC 100)	1
PRM96	Product Reference Memo- 40-78, 40-78A, 40-78B, 40-78E, and 40-78J Wheel Assemblies, Tie Bolt / Overhaul Set Availability	1