AIRCRAFT WHEEL & BRAKE DIVISION
PARKER HANNIFIN CORPORATION
AVON, OHIO

FAA-PMA

PARTS LIST
199-60 CONVERSION KIT

CESSNA AIRCRAFT
MODEL SERIES 180, 185, 206 & 210
6.00-6 EQUIPMENT

PART NUMBER	DRAWING REVISION	DESCRIPTION	QUANTITY
30-52	Rev. N, dated 02-03-2006	Brake Assembly	2
40-75B	Rev. K, dated 06-20-2011	Wheel Assembly	2

Publication Package (P/N PP199-60)

IM199-60	Rev. NC, dated 10-01-2003	Installation Manual
20-64	Rev. H, dated 01-04-1996	Wheel and Brake Assembly Drawing
50-34	Rev. B, dated 10-01-2003	Installation Drawing
50-35	Rev. C, dated 10-01-2003	Installation Drawing
SA52GL		Supplemental Type Certificate (210 Series Aircraft)
SA62GL		Supplemental Type Certificate (180, 185,and 206 Series Aircraft)
PRM13A	-------	Product Reference Memo - “Conditioning Procedure for Non-Asbestos Organic Brake Lining”
-------		Pilot Operating Manual Inserts
-------		Product Registration Card

NOTES:

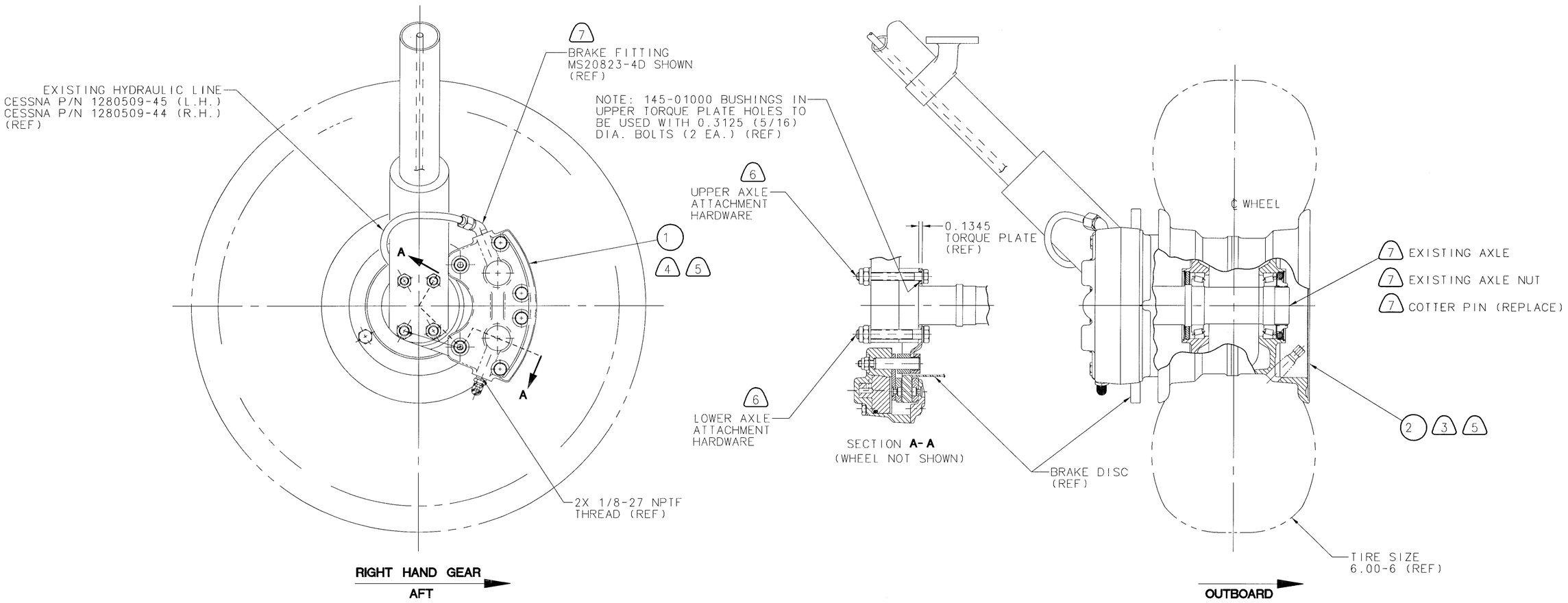
1. This kit will convert one aircraft to Cleveland Wheels and Brakes.
2. For use with MIL-H-5606 hydraulic fluid.

199-60	
Rev. NC	04-25-1974 / 09-03-1980
Rev. A	12-23-1987 (C/N 287-22)
Rev. B	10-01-2003 (DCN 0357-89)
Rev. C	06-05-2008 (DCN 0380-25)
Rev. D	10-31-2013 (ECO-0027764)
Rev. E	12-03-2013 (ECO-0029214)

DWG. NO. 50-34 | SHEET 1/2 | REV. B

REVISIONS

CHANGE NOTICE	REV	DESCRIPTION OF CHANGE	CHG BY	CHK BY	DATE	APPROVED
0299-89	A	NOTE 4. REMOVE "USE IS OPTIONAL"	DB	BB	90-03-26	.
0357-89	B	REDRAWN ON CAD; REVISED PER C/N	PMH	RH	03-10-01	R. HARTLAUB



NOTES:

1. SEE SHEET 2 FOR FLAT SPRING LANDING GEAR INSTALLATION.
2. REFER TO IM199-60 INSTALLATION MANUAL FOR DETAILED INSTALLATION INSTRUCTIONS.

(3.) FOR PARTS IDENTIFICATION, SEE IM199-60; 40-75B WHEEL ASSEMBLY IPL.

(4.) FOR PARTS IDENTIFICATION, SEE IM199-60; 30-52 BRAKE ASSEMBLY IPL.

(5.) COMPONENTS SUPPLIED IN KIT 199-60, 199-60 CHROME, OR 199-60 GOLD.

(6.) CONSULT CESSNA PARTS CATALOG FOR EXISTING COMPONENT PART NUMBERS.

A. WHEN REPLACING MCCAULEY EQUIPMENT WITH CLEVELAND, USE THE SAME MOUNTING HARDWARE THAT IS LISTED FOR MCCAULEY EQUIPMENT.

B. WHEN REPLACING GOODYEAR EQUIPMENT WITH CLEVELAND, USE THE SAME WASHERS AND NUTS THAT ARE LISTED FOR THE GOODYEAR EQUIPMENT WITH THE FOLLOWING BOLTS:
AN5-23 (UPPER AXLE ATTACHMENT)
TORQUE NUTS TO BETWEEN 100 TO 140 IN-LB.
AN6-23 (LOWER AXLE ATTACHMENT)
TORQUE NUTS TO BETWEEN 160 TO 190 IN-LB.

(7.) COMPONENTS NOT SUPPLIED IN KIT 199-60, 199-60 CHROME, OR 199-60 GOLD. CONSULT CESSNA PARTS CATALOG FOR COMPONENT PART NUMBER.

APPLICABILITY OF AIRCRAFT INSTALLATION FOR CLEVELAND KIT 199-60, 199-60 CHROME OR 199-60 GOLD

CESSNA MODEL	TIRE SIZE	PLY	TYPE	PRESSURE
SERIES 210 WITH TUBULAR LANDING GEAR	6.00-6 TYPE III	6 PLY OR 8 PLY	TUBETYPE	PER CESSNA MAINTENANCE MANUAL

TUBULAR LANDING GEAR INSTALLATION

PARTS LIST

QTY	ITEM NO.	CAGE CODE	PART NO.	DESCRIPTION	MATERIAL/SPECIFICATION	WGT.(LB)
1	2	33269	40-75B	WHEEL ASSEMBLY 6.00-6 TYPE III	.	.
1	1	33269	30-52	BRAKE ASSEMBLY	.	.

. A CONTRACT ALTERED ITEM EXISTS FOR THIS PART NUMBER

QTY | FINAL ASSY | QTY | NEXT ASSY

APPLICATION (NOT MAINTAINED)

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

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

GENERAL NOTES: UNLESS OTHERWISE SPECIFIED

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

MISMATCH, DRAFT ANGLE, DIMENSIONS GIVEN TO SHARP PROJECTED CORNERS

STRESS	DATE
.	.
MFG ENGRG	.
.	.
QUAL ASSUR	.
.	.

PROGRAM/CONTRACT NO. .

DRAWN	DATE
J.B.	74-04-26
CHECKED .	.
ENGINEER .	.
DESIGN APPROVAL .	.
PROJ APPROVAL .	.
RELEASE DATE: .	

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

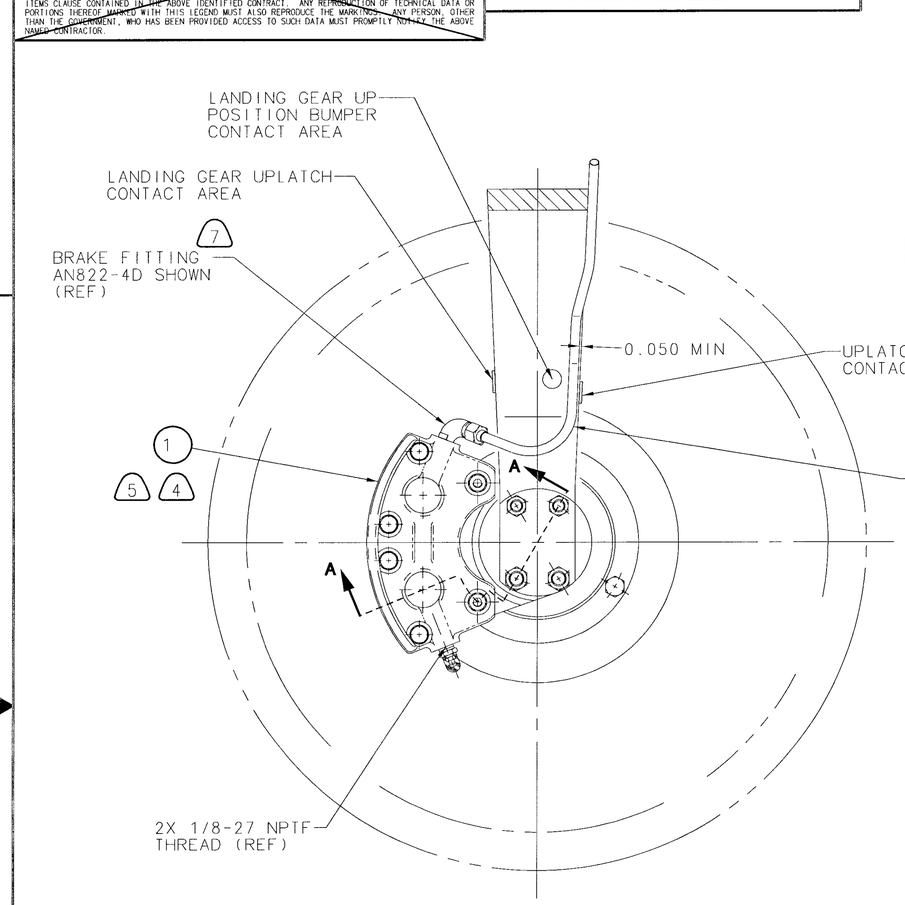
DWG. TITLE
INSTALLATION, WHEEL & BRAKE

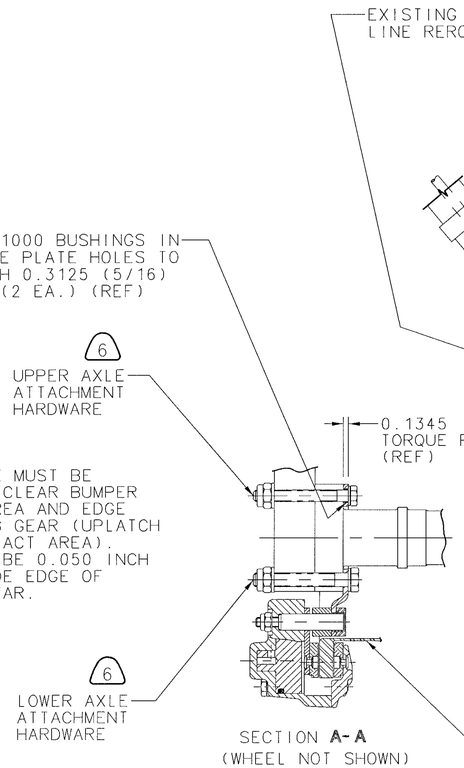
SIZE D | CAGE CODE 33269 | DWG. NO. 50-34 | REV. B

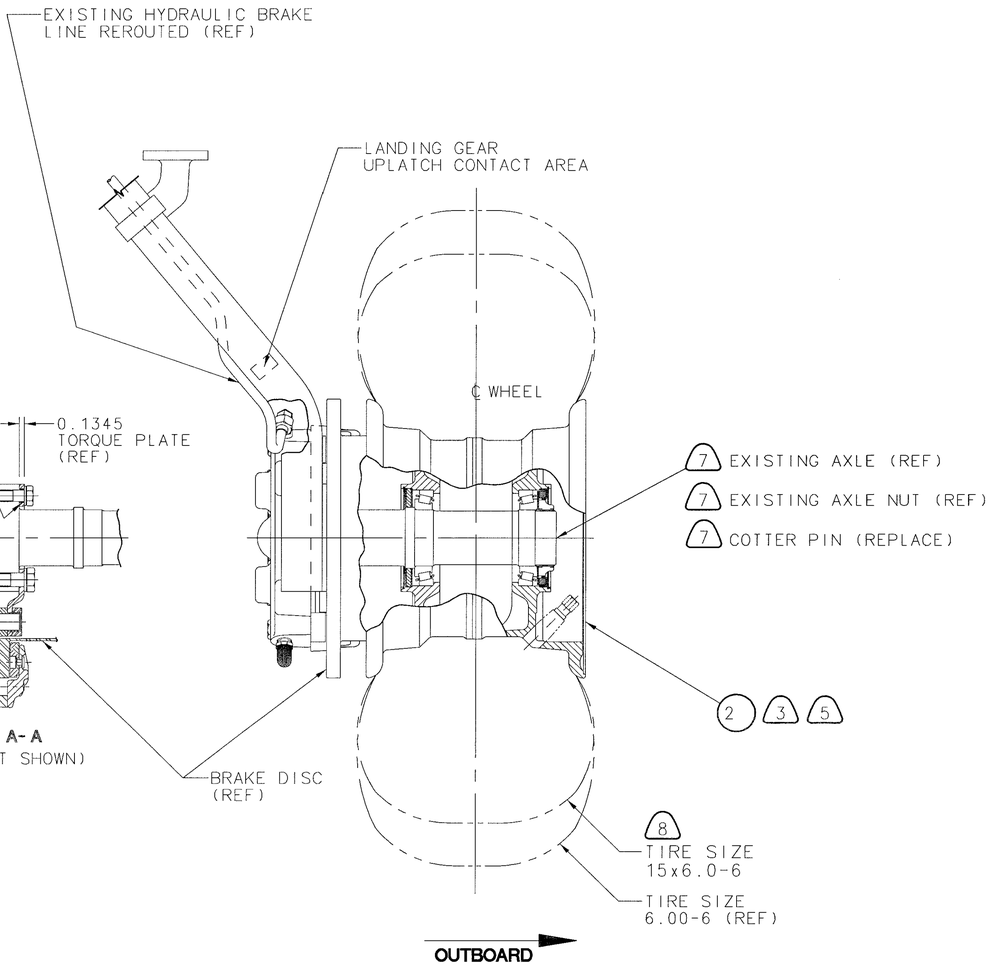
SCALE: .50:1 | UNIT WGT.: . | SHEET: 1 OF 2

REVISIONS

CHANGE NOTICE	REV	DESCRIPTION OF CHANGE	CHG BY	CHK BY	DATE	APPROVED
0299-89	A	NOTE 4. REMOVE "USE IS OPTIONAL"	DB	BB	90-03-26	.
0357-89	B	REDRAWN ON CAD; REVISED PER C/N	PMH	RH	03-10-01	R. HARTLAUB







NOTES:

1. SEE SHEET 1 FOR TUBULAR LANDING GEAR INSTALLATION.
2. REFER TO IM199-60 INSTALLATION MANUAL FOR DETAILED INSTALLATION INSTRUCTIONS.

(3) FOR PARTS IDENTIFICATION, SEE IM199-60; 40-75B WHEEL ASSEMBLY IPL.

(4) FOR PARTS IDENTIFICATION, SEE IM199-60; 30-52 BRAKE ASSEMBLY IPL.

(5) COMPONENTS SUPPLIED IN KIT 199-60, 199-60 CHROME, OR 199-60 GOLD.

(6) CONSULT CESSNA PARTS CATALOG FOR EXISTING COMPONENT PART NUMBERS.

A. WHEN REPLACING MCCAULEY EQUIPMENT WITH CLEVELAND, USE THE SAME MOUNTING HARDWARE THAT IS LISTED FOR MCCAULEY EQUIPMENT.

B. WHEN REPLACING GOODYEAR EQUIPMENT WITH CLEVELAND, USE THE SAME WASHERS AND NUTS THAT ARE LISTED FOR THE GOODYEAR EQUIPMENT WITH THE FOLLOWING BOLTS:
AN5-23 (UPPER AXLE ATTACHMENT)
TORQUE NUTS TO BETWEEN 100 TO 140 IN-LB.
AN6-23 (LOWER AXLE ATTACHMENT)
TORQUE NUTS TO BETWEEN 160 TO 190 IN-LB.

(7) COMPONENTS NOT SUPPLIED IN KIT 199-60, 199-60 CHROME, OR 199-60 GOLD. CONSULT CESSNA PARTS CATALOG FOR COMPONENT PART NUMBER.

(8) CONSULT CESSNA PARTS CATALOG FOR SERIAL NUMBER EFFECTIVITY OF THE 15.00 x 6.00-6 (LOW PROFILE) TIRE USAGE.

APPLICABILITY OF AIRCRAFT INSTALLATION FOR CLEVELAND KIT 199-60, 199-60 CHROME OR 199-60 GOLD

CESSNA MODEL	TIRE SIZE	PLY	TYPE	PRESSURE
SERIES 210 WITH FLAT SPRING LANDING GEAR	6.00-6 TYPE III	6 PLY OR 8 PLY	TUBETYPE	PER CESSNA MAINTENANCE MANUAL
LOW PROFILE TIRE USED ON 1960-1961 MODELS (8)	15.00 X 6.00-6 TYPE III			

FLAT SPRING LANDING GEAR INSTALLATION

PARTS LIST

QTY	ITEM NO.	CAGE CODE	PART NO.	DESCRIPTION	MATERIAL/SPECIFICATION	WGT.(LB)
1	2	33269	40-75B	WHEEL ASSEMBLY 6.00-6 TYPE III	.	.
1	1	33269	30-52	BRAKE ASSEMBLY	.	.

GENERAL NOTES: UNLESS OTHERWISE SPECIFIED

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

QTY | FINAL ASSY | QTY | NEXT ASSY
APPLICATION (NOT MAINTAINED)

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

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

A CONTRACT ALTERED ITEM EXISTS FOR THIS PART NUMBER

MISMATCH | DRAFT ANGLE | DIMENSIONS GIVEN TO SHARP PROJECTED CORNERS

STRESS	DATE
MFG ENGRG	
QUAL ASSUR	

PROGRAM/CONTRACT NO.

DRAWN	J.B.	74-05-02
CHECKED		
ENGINEER		
DESIGN APPROVAL		
PROJ APPROVAL		
RELEASE DATE:		

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

DWG. TITLE
INSTALLATION, WHEEL & BRAKE

SIZE	CAGE CODE	DWG. NO.	REV.
D	33269	50-34	B

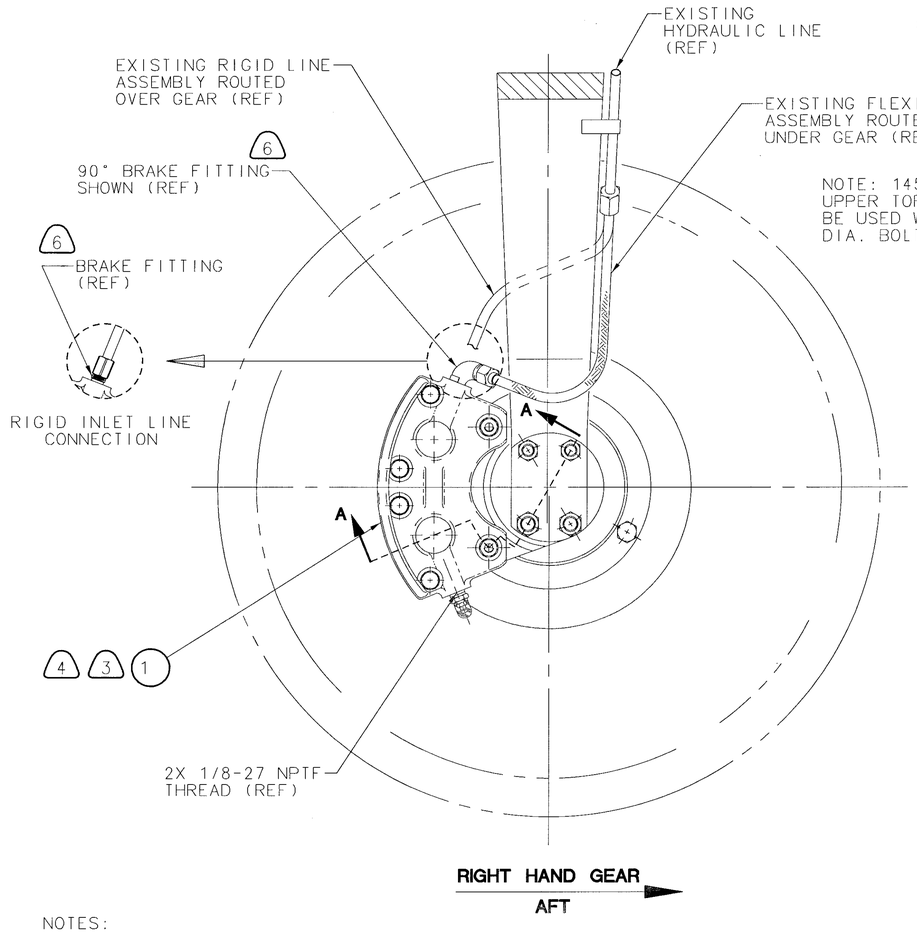
SCALE: .50: 1 | UNIT WGT.: . | SHEET: 2 OF 2

PD-D-GENL-PC-00

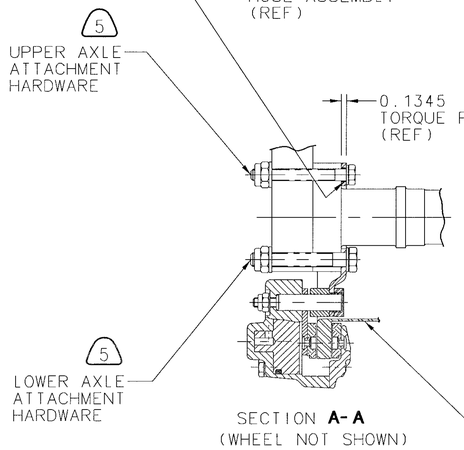
REVISIONS						
CHANGE NOTICE	REV	DESCRIPTION OF CHANGE	CHG BY	CHK BY	DATE	APPROVED
0255-66	A	ADDED AXLE REFERENCE	JB	.	74-10-04	.
0306-98	B	REVISE BRAKE LINE INSTALL	BB	BB	92-10-26	.
0357-89	C	REDRAWN ON CAD; REVISED PER C/N	PMH	RH	03-10-01	R. HARTLAUB

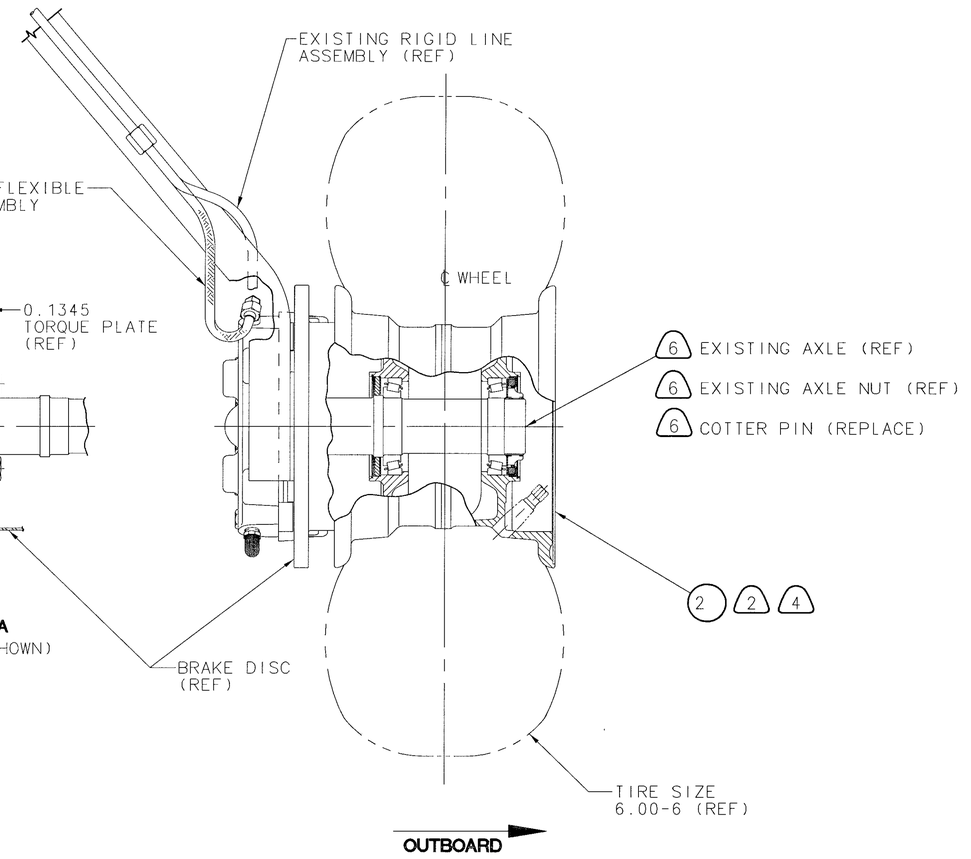
OPTIONAL FLEXIBLE INLET HOSE INSTALLATION FOR AIRCRAFT WITH EXISTING RIGID HYDRAULIC INLET LINE:

1. CUT OFF EXISTING -3 OR -4 RIGID HYDRAULIC LINE AT 9 IN. ABOVE BRAKE INLET.
2. FLARE END TO ACCOMMATE MS20819 SLEEVE AND AN818 NUT (-3 OR -4).
3. INSTALL A 12 IN. LONG FLEXIBLE BRAKE INLET HOSE: STRATOFLEX P/N 111417-4S-0120 (OR EQUIV.), USING CONNECTOR AN815-4D (FOR -4 LINE) OR AN919-2D REDUCER (FOR -3 LINE).
4. CONNECT TO BRAKE USING MS20822-4; 90° FITTING.
5. ALL ABOVE WORK TO BE DONE IN ACCORDANCE WITH STANDARD MAINTENANCE PROCEDURES PER FAA AC43.13-1, LATEST ISSUE, CHAPTER 10.



NOTE: 145-01000 BUSHINGS IN UPPER TORQUE PLATE HOLES TO BE USED WITH 0.3125 (5/16) DIA. BOLTS (2 EA.) (REF)





NOTES:

1. REFER TO IM199-60 INSTALLATION MANUAL FOR DETAILED INSTALLATION INSTRUCTIONS.

(2) FOR PARTS IDENTIFICATION, SEE IM199-60; 40-75B WHEEL ASSEMBLY IPL.

(3) FOR PARTS IDENTIFICATION, SEE IM199-60; 30-52 BRAKE ASSEMBLY IPL.

(4) COMPONENTS SUPPLIED IN KIT 199-60, 199-60 CHROME, OR 199-60 GOLD.

(5) CONSULT CESSNA PARTS CATALOG FOR EXISTING COMPONENT PART NUMBERS.

A. WHEN REPLACING MCCAULEY EQUIPMENT WITH CLEVELAND, USE THE SAME MOUNTING HARDWARE THAT IS LISTED FOR MCCAULEY EQUIPMENT.

B. WHEN REPLACING GOODYEAR EQUIPMENT WITH CLEVELAND, USE THE SAME WASHERS AND NUTS THAT ARE LISTED FOR THE GOODYEAR EQUIPMENT WITH THE FOLLOWING BOLTS:
AN5-23 (UPPER AXLE ATTACHMENT)
TORQUE NUTS TO BETWEEN 100 TO 140 IN-LB.
AN6-23 (LOWER AXLE ATTACHMENT)
TORQUE NUTS TO BETWEEN 160 TO 190 IN-LB.

(6) COMPONENTS NOT SUPPLIED IN KIT 199-60, 199-60 CHROME, OR 199-60 GOLD. CONSULT CESSNA PARTS CATALOG FOR COMPONENT PART NUMBER.

APPLICABILITY OF AIRCRAFT INSTALLATION FOR CLEVELAND KIT 199-60, 199-60 CHROME OR 199-60 GOLD

MODEL	TIRE SIZE	PLY	TYPE	PRESSURE
CESSNA MODELS: SERIES 180, 185 AND 206	6.00-6 TYPE III	6 PLY OR 8 PLY	TUBETYPE	PER CESSNA MAINTENANCE MANUAL

FLAT SPRING LANDING GEAR INSTALLATION ON AIRCRAFT EQUIPPED WITH RIGID TUBE OR FLEXIBLE HOSE BRAKE LINES

QTY	ITEM NO.	CAGE CODE	PART NO.	DESCRIPTION	MATERIAL/SPECIFICATION	WGT.(LB)
1	2	33269	40-75B	WHEEL ASSEMBLY 6.00-6 TYPE III	.	.
1	1	33269	30-52	BRAKE ASSEMBLY	.	.

PARTS LIST

QTY	FINAL ASSY	QTY	NEXT ASSY
APPLICATION (NOT MAINTAINED)			

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

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

GENERAL NOTES: UNLESS OTHERWISE SPECIFIED

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

STRESS	DATE
MFG ENGRG	
QUAL ASSUR	

PROGRAM/CONTRACT NO.	
DRAWN J.B.	DATE 74-05-02
CHECKED	
ENGINEER	
DESIGN APPROVAL	
PROJ APPROVAL	
RELEASE DATE:	

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

DWG. TITLE
INSTALLATION, WHEEL & BRAKE

SIZE	CAGE CODE	DWG. NO.	REV.
D	33269	50-35	C

SCALE: .50:1 | UNIT WGT.: | SHEET: 1 OF 1

. A CONTRACT ALTERED ITEM EXISTS FOR THIS PART NUMBER

PD-D-GENL-PC-00

Technical Publication

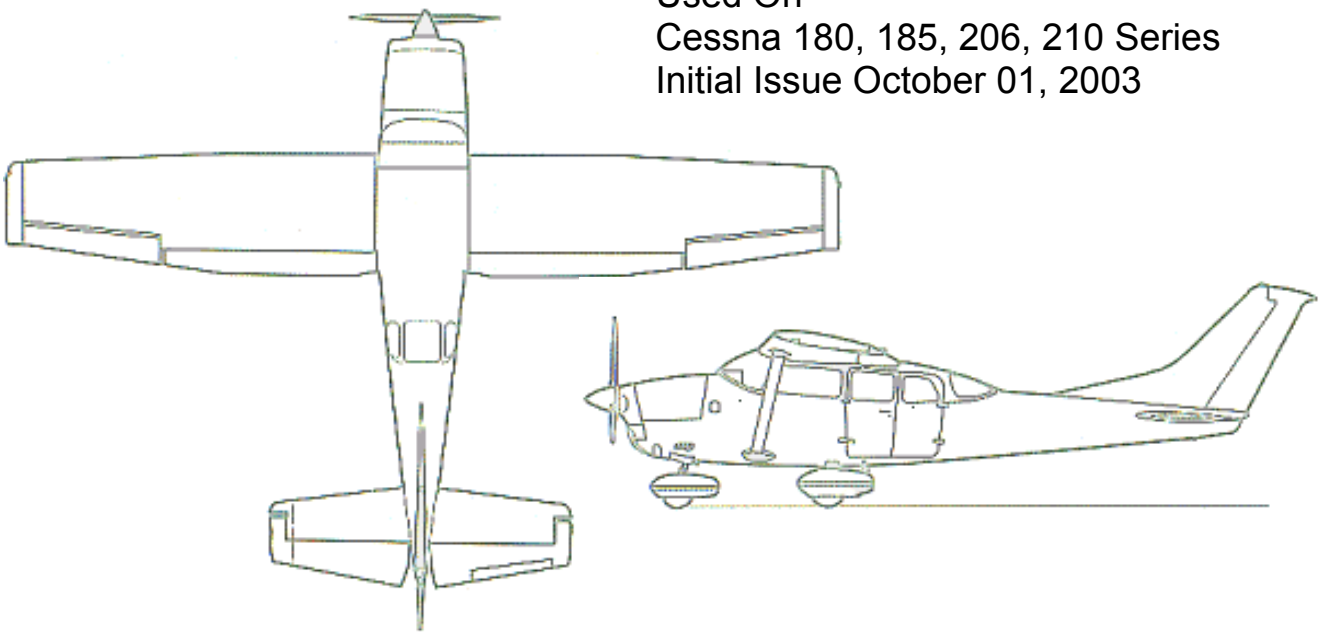
Conversion Kit Installation Manual With Illustrated Parts List

IM199-60

Wheel & Brake Assembly

Main Wheel Assembly
Part No. 40-75B
Main Brake Assembly
Part No. 30-52

Used On
Cessna 180, 185, 206, 210 Series
Initial Issue October 01, 2003



Cleveland
Wheels & Brakes

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

STOP!

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

- IMPORTANT -

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

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

SEE PARAGRAPH 4.1 FOR HARDWARE CONFIGURATION SPECIFIC TO CONVERSION KIT NO. 199-60.

For technical assistance, contact the

TECHNICAL SERVICES HOTLINE:

techhelp@parker.com

Fax: 440-937-5409

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

TABLE OF CONTENTS

SECTION	SUBJECT	PAGE
1.0	Introduction	1
1.1	Purpose	1
1.2	References	1
2.0	TSO Notice	1
3.0	Product Registration	1
4.0	Kit Applicability	2
4.1	Kit Equipment	2
5.0	Safety	2
6.0	Order Information	3
7.0	Equipment Description	3
7.1	Brake Assembly	3
7.2	Wheel Assembly	3
7.3	Operation	3
8.0	General Information	4
8.1	Bearing Cone Grease Packing Procedure	4
9.0	Kit Installation	5
9.1	Remove Original Equipment	5
9.2	Install Cleveland Equipment	6
9.3	System Checks	9
9.4	Brake Lining Conditioning	10
10.0	Weight and Balance Computations	10
10.1	Weight and Balance Data	10
11.0	Pilot Operating Manual Inserts	10
12.0	Wheel Assembly Illustrated Parts List	11
13.0	Brake Assembly Illustrated Parts List	12
14.0	Kit Parts List	13

LIST OF REVISIONS

Revision	Date	Section/Page No.	Description Of Change	Apvd
NC (DCN 0357-89)	10-01-2003	All sections/All pages	Production Release of Installation Instructions for Cleveland Wheels & Brakes Conversion Kit 199-60	

1.0 INTRODUCTION

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

1.1 PURPOSE

This manual provides the necessary procedures to accomplish the installation of an STC'd Cleveland Conversion Kit. For information regarding service limits, maintenance and component overhaul, consult the publications listed under 1.2 References. For wheel and tire preparation, use AWBCMM0001.

1.2 REFERENCES

Parker Hannifin, Cleveland Wheels & Brakes publications:

AWBCMM0001..... Maintenance Manual, External Design Wheels & Brakes
AWPC0001..... Product Catalog
PRM64 ..... Technician's Service Guide

2.0 TSO NOTICE

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

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

3.0 PRODUCT REGISTRATION

The product registration card is located at the front of this manual. The card is our way of tracking the conversion kits and your guarantee of receiving any future airworthiness information applicable to Conversion Kit No. 199-60. Please fill out the registration card completely and return promptly. Postage is prepaid.

4.0 KIT APPLICABILITY

NOTE: Service bulletins, service letters and similar documentation issued by the airframe manufacturer can affect the installation of Conversion Kit No. 199-60. Contact the airframe manufacturer for documentation applicable to your model aircraft before installing Conversion Kit No. 199-60.

The equipment supplied as Kit No. 199-60 is applicable to the following aircraft under the listed STC.

TABLE 1, APPLICABILITY

STC	MAKE	MODELS
SA62GL	Cessna	180, 180A, 180B, 180C, 180D, 180E, 180F, 180H, 180J, 185, 185A, 185B, A185E, A185F, 206E, 206F, TU206E, TU206F
SA52GL	Cessna	210, 210A, 210B, 210C, 210K, 210L, 210M, T210K, T210L, T210M

4.1 KIT EQUIPMENT

Refer to paragraph 14.0 for the kit parts list.

The following hardware is not included in the 199-60 Conversion Kit:

- Brake hydraulic fittings.
- Brake / axle attachment bolts, washers and nuts.
- Axle nut cotter pins.

Different brake hydraulic fittings, brake hydraulic supply lines and brake/axle attachment hardware configurations are used on the Cessna aircraft models listed in Table 1. The installer must consult with the appropriate aircraft parts catalog to identify the required hardware to complete the installation of the conversion kit.

Refer to paragraph 9.2 for more hardware configuration information.

5.0 SAFETY

Follow proper safety precautions when servicing aircraft braking systems.

- A **"SAFETY WARNING"** flagged by this symbol  , calls attention to possible serious or life threatening situations if procedures are not followed.
- A **"WARNING"** calls attention to use of materials, processes, methods, procedures, or limits which must be followed precisely to avoid injury to persons.
- A **"CAUTION"** calls attention to methods and procedures 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.

6.0 ORDER INFORMATION

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

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

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

7.0 EQUIPMENT DESCRIPTION

7.1 BRAKE ASSEMBLY

Refer to Figure 3 for identification of brake assembly components.

The brake is a single caliper, two piston external disc design, with non asbestos organic lining. It is suitable for use with brake fluid conforming to MIL-H-5606.

The cylinder (3-2) contains the brake fluid which operates the pistons (3-4) and pressure plate (3-7). Back plates (3-11) are secured to the cylinder with bolts and washers (3-15 and 3-16) on the opposite side of the brake disc. The back plates and pressure plate each hold brake linings (3-9). Two anchor bolts (3-12), attached to the cylinder with nuts and washers (3-14 and 3-13), slide or float in torque plate bushings. The torque plate assembly (3-20) is mounted to the landing gear axle.

7.2 WHEEL ASSEMBLY

Refer to Figure 2 for identification of wheel assembly components.

The wheel is cast magnesium and conforms to all tire and rim association standards for a 6.00-6 divided type wheel. It is a tube-type design only.

The wheel has inboard and outboard wheel half assemblies (2-2 and 2-4) which are fastened together with bolts (2-6), washers (2-7), and nuts (2-8). The brake disc (2-5) is attached to the wheel with the bolts. The wheel rotates on two tapered roller bearing cones (2-9), which seat in the bearing cups (2-3). Felt grease seals (2-11 and 2-13) provide protection and lubricant retention for the bearing.

7.3 OPERATION

Actuation of the toe pedals engages the master cylinder and delivers hydraulic pressure to the brake cylinder. The pressure flows through the cylinder and forces the pistons outward against the pressure plate. The anchor bolts slide freely in the torque plate assembly bushings and allows the pressure plate and back plate linings to squeeze the brake disc at the same time.

8.0 GENERAL INFORMATION

a. The brakes are shipped from the factory as a complete assembly.

b. The wheels are shipped from the factory as a complete assembly. The bearing cones are packed with grease and installed in the wheel halves.

NOTE: Extended storage (longer than two years) of lubricated bearings will require re-lubrication. Refer to paragraph 8.1 for bearing cone grease packing procedure.

8.1 BEARING CONE GREASE PACKING PROCEDURE

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

CAUTION: USE A MULTI-PURPOSE GREASE CONFORMING TO MIL-G-81322. DO NOT MIX WITH OTHER GREASES. GREASE INCOMPATIBILITY COULD RESULT IN CONTAMINATION AND LOSS OF GREASE PERFORMANCE.

NOTE: To prevent possible foreign matter contamination, pack bearing cones just prior to installing.

NOTE: Packing bearing cones with grease is best performed by mechanical means such as a bearing greaser.

a. Ensure bearings are completely dry before packing them with lubricant.

b. Pack the bearing cone from the wide (outer) side.

c. Force the grease up between rollers, cone and cage, making sure that all voids inside the cone are filled (see Figure 1). Also, make sure that a generous amount of grease is applied to the roller surfaces on the outside of the cone.

NOTE: Shaded area indicates the recommended amount of grease.

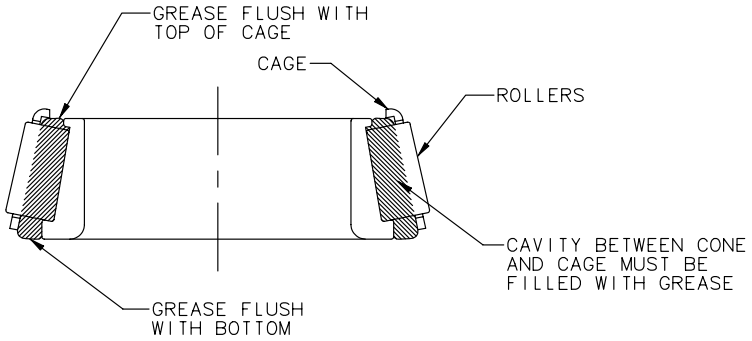


Figure 1, Packing Bearing Cones

9.0 KIT INSTALLATION

Read this installation manual and look at the installation drawings before removing and installing 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.

9.1 REMOVE ORIGINAL EQUIPMENT

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

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

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

c. Confirm that the tire is completely deflated.

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

NOTE: The cotter pin is not supplied as part of 199-60 kit and must be obtained separately. Refer to the airframe parts catalog for the part number and the quantity.

e. Remove and keep the axle hardware. Discard the cotter pin.

f. Remove the original equipment main landing gear wheels from the axle.

g. Disconnect the hydraulic line (original equipment flexible inlet hose or rigid inlet line) at the brake inlet fitting and seal the hydraulic line.

h. Remove and keep the inlet fitting from the original equipment brake assemblies.

i. Remove the original equipment brake assemblies from the axle.

9.2 INSTALL CLEVELAND EQUIPMENT

Refer to IPL Figure 2 and IPL Figure 3 for identification of wheel and brake assembly components.

The installation procedures are applicable to the aircraft models listed in Section 3.0 Applicability.

- Installation drawing 50-34 is applicable to Cessna model series 210 aircraft:
  - Sheet 1 covers tubular landing gear configuration.
  - Sheet 2 covers flat spring landing gear configuration.
- Installation drawing 50-35 is applicable to Cessna model series 180, 185, and 206 aircraft equipped with rigid tube or flexible hose brake lines.

9.2.1 Mount Tube-Type Tire

a. Remove the following items from both the inboard and outboard side of wheel assembly: snap rings (2-15), grease seal rings (2-10, 2-12, 2-14) and grease seal felts (2-11, 2-13). Place the removed items on a clean surface to prevent contamination

NOTE: Be careful with the bearing cones to prevent contamination or damage.

b. Next, remove the bearing cones (2-9). Place bearing cones on a clean surface to prevent contamination.

c. Inspect the bearing cones to make sure they are filled with grease. If they need grease, refer to paragraph 8.1, Bearing Cone Grease Packing Procedure to add grease to the bearing cones.

CAUTION: DO NOT USE AN IMPACT WRENCH OR A POWER WRENCH TO REMOVE OR INSTALL THE WHEEL NUTS AND BOLTS. THESE TOOLS CAN DAMAGE THE EXTERNAL FEATURES OF THE NUTS AND BOLTS. THESE TOOLS CAN CREATE TOO MUCH FORCE AND CAN DAMAGE THE MATING COMPONENTS.

d. Remove all three nuts (2-8), washers (2-7) and bolts (2-6) to separate wheel halves and place brake disc (2-5) to the side.

NOTE: Tire slippage may occur with new tires and tubes. Wipe the tire and tube with denatured alcohol, followed by soap and water.

e. Make sure the inside of the tire is clean and dry. Inspect the bead seat area and wipe it clean with denatured alcohol, followed by soap and water, then dry thoroughly.

f. Inflate the inner tube just enough to round it out.

NOTE: Refer to the airframe service manual for additional guidance on balancing the wheel and tire unit.

g. The inner tube heavy spot is indicated by a painted yellow stripe. Align the stripe on the tube with the tire red balance dot. If the tube has no balance mark, align the tube valve with the tire red balance dot.

NOTE: This procedure is usually sufficient to prevent vibration during high speed taxi. If excess vibration is encountered, check all fasteners for looseness and make sure that the components are correctly attached.

h. Install the tire and inner tube on the outer wheel half, inserting the valve stem through the valve hole in the wheel. Place the inner wheel half inside the tire and align the bolt holes.

i. Install the disc in inner wheel half and align bolt holes with wheel half.

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

NOTE: Install bolts with the bolt head against the brake disc.

j. Install the bolts through the brake disc bolt holes. Install the washers and nuts on the bolts. While using the dry torque procedure, observe the torque required to turn the nut (free running torque). This torque value must be added to the torque value stated on the wheel assembly nameplate to obtain a true torque value.

NOTE: Wheel assembly bolt torque values can also be referenced from Parker Hannifin publications, AWBCMM0001, Maintenance Manual and PRM64, Technician's Service Guide.

k. Lightly coat or dampen the grease seal felts with SAE 10 engine oil.

NOTE: Be careful with the bearing cones to prevent contamination or damage.

l. Place the bearing cones (2-9) in the bearing cups (2-3).

m. Re-assemble the grease seals (rings and felts) and snap rings.

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. TIRES AND WHEEL ASSEMBLIES MUST BE SERVICED WITH INFLATION EQUIPMENT THAT HAS BEEN SPECIFICALLY DESIGNED FOR THIS OPERATION.

m. Inflate tire per tire manufacturer's specifications to seat beads on wheel. Complete inflation to operating pressure per the airframe service manual. Set wheel/tire unit aside.

9.2.2 Mount Torque Plate

The brake and axle attachment hardware is not included in the 199-60 Conversion Kit. Refer to the applicable Parker Hannifin installation drawing for information on brake/axle attachment hardware.

a. Use one bushing (3-21) each in the upper torque plate/axle hole locations for the 0.3125 inch (5/16) dia. bolts.

b. Refer to the applicable installation drawing for torque plate mounting orientation. Attach the torque plate assembly (3-20) to the axle using the axle mounting hardware (bolts, washers, and nuts). Torque nuts to value specified in the airframe service manual.

9.2.3 Mount Wheel/Tire Assembly

a. Check the tire inflation pressure and adjust if necessary.

b. Carefully slide the wheel/tire unit onto axle.

c. Apply a thin coat of bearing grease to the axle nut and threads.

d. Refer to the airframe service manual and install the axle nut.

9.2.4 Mount Brake Assembly

NOTE: The bolts (3-15) and washers (3-16) can remain in the cylinder bolt holes.

a. Loosen the four back plate attachment bolts (3-15) and remove the two back plate assemblies (3-10).

CAUTION: DO NOT FORCE THE CYLINDER ANCHOR BOLTS INTO THE TORQUE PLATE ENGAGEMENT HOLES.

NOTE: A dry film lubricant, such as Dri-Slide (molybdenum disulfide) or silicon spray, can be applied to the anchor bolts and the torque plate engagement holes. This will help installation and give easier operation. A liquid type lubricant should not be used because it will allow dirt and moisture to collect and increase the risk of corrosion, binding and wear.

b. Engage the cylinder assembly (3-1) into the torque plate by sliding the anchor bolts (3-12) into the torque plate engagement holes (noted by the welded bushings on torque plate).

c. Position the back plate assemblies (3-10) between the brake disc (2-5) and the inner wheel flange. Align the back plate assemblies with the brake cylinder bolt holes and thread the bolts (3-15) [with installed washers (3-16)] into the back plate assemblies. Dry torque the bolts between 85 to 95 in-lb.

9.2.5 Connect Brake Assembly

a. Install the inlet fitting (the fitting retained when original equipment was removed) into the Cleveland brake assembly.

b. Follow the applicable installation drawing to route the hydraulic lines and connect the hydraulic lines to the brake assembly.

c. Upon completion of the installation, bleed the system per the airframe service manual.

d. Follow paragraph 9.3 System Checks prior to removing aircraft from jacks.

9.3 SYSTEM CHECKS

9.3.1 All Applicable Aircraft Models

a. After bleeding the brakes, the wheel assemblies should rotate freely. There should be no evidence of binding or excessive brake drag.

b. Check for possible interference peculiar to individual aircraft.

9.3.2 Cessna Series 210 With Flat Spring Landing Gear

Refer to installation drawing 50-34

a. While the aircraft is on jacks, slowly cycle both landing gears to make sure the hydraulic line does not interfere with the uplatch mechanism or bumper pad before returning the aircraft to service.

9.4 BRAKE LINING CONDITIONING

When new linings are installed, it is important to condition them properly to obtain the service life designed into them. Condition linings per attached product reference memo PRM 13A.

10.0 WEIGHT AND BALANCE COMPUTATIONS

Weigh the original equipment wheels and brakes. Subtract from the new weights to derive weight increase created by the kit installation. Multiply the weight increase by the applicable aircraft moment and revise the weight and balance information in the log book.

10.1 WEIGHT AND BALANCE DATA

New installed (per gear leg)

Wheel assy..... 6.75 lbs.
Brake assy ..... 3.00 lbs.
Total .....….. 9.75 lbs.

Complete form 337 and make appropriate log book entries.

11.0 PILOT OPERATING MANUAL INSERTS

Inserts are located in front with conversion kit documentation.

Attach the label in the pilot operating manual as close as possible to the original section labeled Main Wheel Assembly. Enter the correct arm and moment in the blocks provided. Zero the items out for the original main wheel and brake assemblies that have been removed.

Inserts are reprinted below for reference:

x	Two dual piston, single disc Brake Assemblies, Cleveland P/N 30-52	3.00 ea.
x	Two 6.00-6 Type III Wheel Assemblies, Cleveland P/N 40-75B	6.75 ea.

Cleveland Brake Assembly P/N 30-52 is a single caliper, single fixed disc design, using two pistons per caliper which respond to fluid pressure from the master cylinders for brake application.

12.0 WHEEL ASSEMBLY ILLUSTRATED PARTS LIST

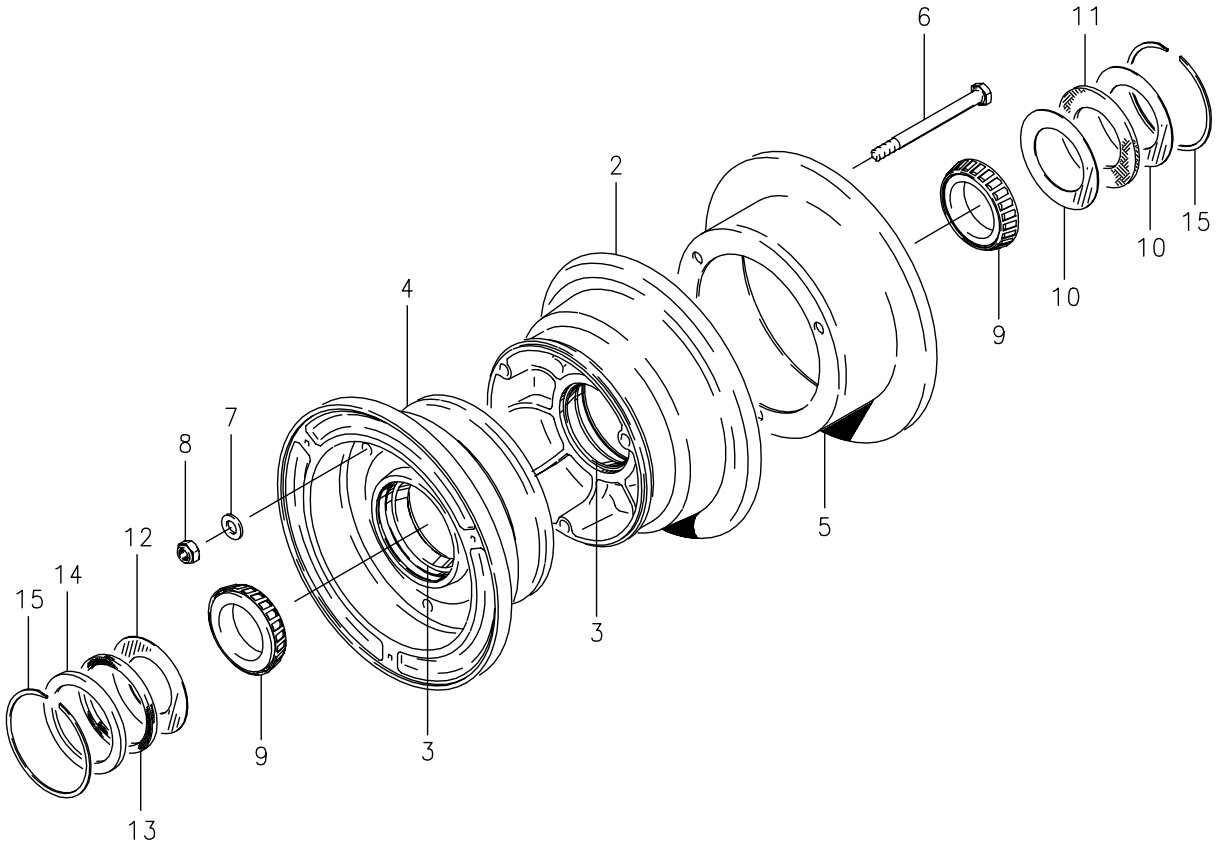


Figure 2, 40-75B Wheel Assembly Exploded View

FIG	PART NUMBER	DESCRIPTION	QTY
2-1	40-75B	Wheel Assembly (standard)	RF
	40-75B CHROME	Wheel Assembly	
	40-75B GOLD	Wheel Assembly	
2	161-03000	Inboard Wheel Half Assembly	1
3	214-00100	Cup-Bearing	1
4	162-02700	Outboard Wheel Half Assembly	1
3	214-00100	Cup-Bearing	1
5	164-01501	Brake Disc (standard)	1
	164-11501	Brake Disc (chrome)	
	164-41501	Brake Disc (gold)	
6	103-20400	Bolt (AN5-35A)	3
7	095-10500	Washer (AN960-516)	3
8	094-10400	Nut (MS21044-N5)	3
9	214-00200	Cone-Bearing	2
10	153-00400	Ring-Grease Seal	2
11	154-00300	Felt-Grease Seal	1
12	153-00300	Ring-Grease Seal	1
13	154-01300	Felt-Grease Seal	1
14	153-01500	Ring-Grease Seal	1
15	155-00100	Snap Ring	2
– 16	166-19700	Nameplate	1
– 17	166-20000	Nameplate	1

LEGEND:
– Item Not Illustrated

13.0 BRAKE ASSEMBLY ILLUSTRATED PARTS LIST

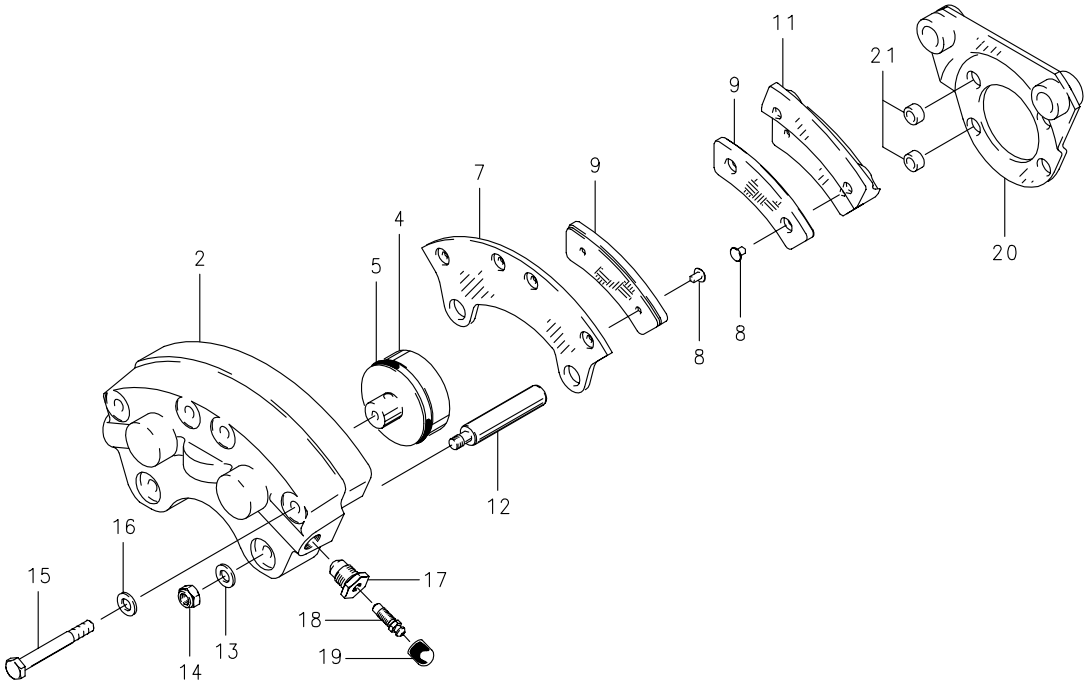


Figure 3, 30-52 Brake Assembly Exploded View

FIG	PART NUMBER	DESCRIPTION	QTY
3-1	30-52	Brake Assembly	RF
– 1	091-02100	Cylinder Assembly	1
2	061-01800	Cylinder	1
– 3	092-01600	Piston Assembly	2
4	062-01500	Piston	2
5	101-02700	O-Ring (MS28775-222)	2
– 6	073-01000	Pressure Plate Assembly	1
7	063-01100	Pressure Plate	1
8	105-00200	Rivet	4
9	066-10500	Lining	2
–10	074-01000	Back Plate Assembly	2
11	064-01500	Back Plate	2
8	105-00200	Rivet	4
9	066-10500	Lining	2
12	069-00400	Anchor Bolt	2
13	095-10200	Washer (AN960-416L)	2
14	094-10300	Nut (MS21044-N4)	2
15	103-11800	Bolt (ABP4-21AM)	4
16	095-10400	Washer (AN960-416)	4
17	081-00100	Seat-Bleeder	1
18	079-00300	Screw-Bleeder	1
19	183-00100	Cap-Bleeder	1
20	075-05401	Torque Plate Assembly	1
21	145-01000	Bushing	2
– 22	166-20100	Nameplate	1
– 23	215-00200	Cap, Shipping	1

LEGEND:
– Item Not Illustrated

14.0 KIT PARTS LIST

199-60 KIT (3) (4)

SEE NOTE	PART NUMBER	DESCRIPTION	QUANTITY
(1)	40-75B	Wheel Assembly	2
(2)	30-52	Brake Assembly	2
	IM199-60	Installation Manual for Conversion Kit 199-60	1
	50-34	Installation Drawing	1
	50-35	Installation Drawing	1
	SA52GL	Supplemental Type Certificate (210 Series)	1
	SA62GL	Supplemental Type Certificate (180, 185, 206 Series)	1
	PRM13A	Conditioning Procedure for Non Asbestos Organic Brake Lining	1
	-------	Pilot Operating Manual Inserts	1
	-------	Product Registration Card	1

(1) For Subassembly and Parts identification: See Figure 2; 40-75B IPL
(2) For Subassembly and Parts identification: See Figure 3; 30-52 IPL
(3) 199-60 CHROME is identical to 199-60 except for chrome plated brake disc: see Figure 2; 40-75B IPL
(4) 199-60 GOLD is identical to 199-60 except for performance gold brake disc: see Figure 2; 40-75B IPL

Cleveland
Wheels & Brakes

Parker Hannifin Corporation
Aircraft Wheel & Brake
1160 Center Road
Avon, Ohio 44011 USA
1-800-BRAKING (272-5464)
216-937-1272 ● FAX 216-937-5409

PRODUCT REFERENCE MEMO

CONDITIONING PROCEDURE FOR
NON ASBESTOS ORGANIC BRAKE LINING

The brake lining material used in this brake assembly is a non asbestos organic composition. This material must be properly conditioned in order to provide maximum performance and service life.

Conditioning may be accomplished as follows:

1. Taxi aircraft for 1500 feet with engine at 1700 rpm applying brake pedal force as needed to develop a 5 - 10 mph taxi speed.

2. Allow brakes to cool for 10 - 15 minutes.

3. Apply brakes and check to see if a high throttle static run up may be held with normal pedal force. If so, conditioning is completed.

4. If static run up cannot be held, repeat steps 1 through 3 as needed to successfully hold.

This conditioning procedure will generate sufficient heat to create a thin layer of glazed material at the lining friction surface. Normal brake usage should generate enough heat to maintain the glaze throughout the life of the lining.

Light brake usage can cause the glaze to wear off, resulting in reduced brake performance. In such cases, the lining may be conditioned again following the instructions set forth in this PRM.

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

Date: _ _/_ _/20_ _

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

To whom it may concern:

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

KIT NUMBER: 199-_____

FAA APPROVAL: 1) STC # _____

NO OTHER APPROVALS NECESSARY

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

A/C MAKE: _____

A/C MODEL_____

TAIL # _____

Regards,

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

United States of America

Department of Transportation — Federal Aviation Administration

Supplemental Type Certificate

Number SA52GL

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

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 *of the* Civil Air *Regulations.* See Type Certificate Data Sheet 3A21 for complete certification basis.

Original Product — Type Certificate Number 3A21
Make Cessna
Model 210, 210A, 210B, 210C, 210K, 210L, 210M, T210K, T210L, T210M, and P210N

Description of Type Design Change

On all models listed above, except P210N, install Parker Hannifin Corporation (Cleveland) Wheel & Brake Conversion Kit P/N 199-60 in accordance with Cleveland Installation Drawings 50-34 dated April 26, 1974 and 20-64, Revision F dated March 11, 1981, or later FAA approved revisions. On all Model P210N (Serial Numbers P21000001 through P21000150) install Parker Hannifin Corporation Wheel & Brake Conversion Kit P/N 199-60A in accordance with Cleveland Installation Drawing 50-63 dated August 13, 1980, or later FAA approved revisions.

Limitations and Conditions

Compatibility of this modification with other previously approved modifications must be determined by the installer.

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

Date of application May 2, 1974 *Date reissued* September 11, 1980

Date of issuance June 6, 1974 *Date amended* August 29, 1980, May 20, 1985

By direction of the Administrator

W. F. Horn *(Signature)*
Manager, Chicago Aircraft Certification Office
Central Region, ACE-115C
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47

FAA Form 8110-2 (10-68)

United States of America
Department of Transportation — Federal Aviation Administration

Supplemental Type Certificate

Number SA62GL

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

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 *of the* Civil Air *Regulations:* See Type Certification Date Sheets A4CE, 5A6, 3A24 for complete certification basis.

Original Product — Type Certificate Number A4CE, 5A6, 3A24

Make Cessna

Model 180, 180A, 180B, 180C, 180D, 180E, 180F, 180H, 180J, 185, 185A, 185B, A185E, A185F, 206E, 206F, TU206E, and TU206F

Description of Type Design Change

Install Cleveland Wheel and Brake Conversion Kit P/N 199-60 in accordance with Cleveland Installation Drawing 50-35, Revision A dated October 4, 1974, and 20-64 Revision F dated March 11, 1981, or later FAA approved revisions.

Limitations and Conditions

1. This kit is eligible only on Cessna axle P/N's 0541124 and 1441003-1.
2. This installation is not eligible for use on aircraft equipped with the optional crosswind (castering) landing gear.
3. Compatibility of this modification with other previously approved modifications must be determined by the installer.

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

Date of application May 2, 1974

Date of issuance August 6, 1974

Date reissued October 28, 1980

Date amended October 25, 1974, April 1, 1981
May 20, 1985

By delegation of the Administrator

W. F. Horn *(Signature)*
Manager, Chicago Aircraft Certification Office
Central Region, ACE-115C
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21 47

FAA Form 8110-2 (10-68)