AIRCRAFT WHEEL & BRAKE DIVISION
PARKER HANNIFIN CORPORATION
AVON, OHIO

PARTS LIST

199-79 CONVERSION KIT

DeHAVILLAND CHIPMUNK

MODELS DHC-1-21, -22, -22A AND

DHC-1B-2-S3, -S5

PART NUMBER	DRAWING REVISION	DESCRIPTION	QUANTITY
30-63P	Rev. C dated 11-06-1995	Brake Assembly	2
40-97D	Rev. G dated 10-06-2011	Wheel Assembly	2
067-04400	Rev. A dated 08-22-1979	Axle Spacer	2
103-10100	----------	Bolt (AN4-5A)	12
095-10400	----------	Washer (AN960-416) (install under nut)	12
094-10300	----------	Nut (MS21044-N4)	12

Publication Package (P/N PP199-7900)

199-79 P/L	----------	Kit Parts List (This document)
50-49	Rev. B dated 08-08-1990	Installation Drawing
SA1011SO	Amend date 09-24-1990	Supplemental Type Certificate
SA2748SO	Amend date 09-24-1990	Supplemental Type Certificate
PRM13A	----------	Non-Asbestos Lining Conditioning Procedure
PRM69	----------	General Maintenance Information
	----------	Warranty Registration Card

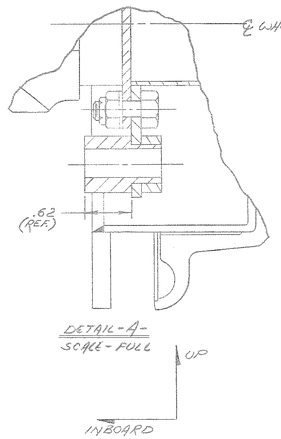
NOTES:

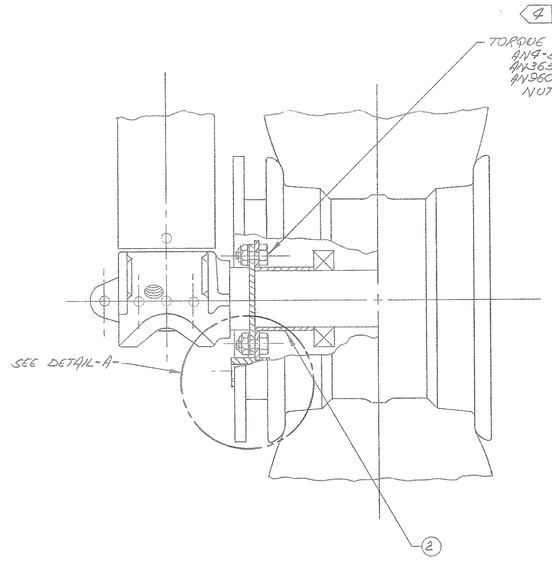
1. This kit will convert one aircraft to Cleveland Wheels and Brakes.
2. For use with MIL-H-5606 (Red Fluid).

199-79	05-16-1979
REV. NC	01-14-1980
REV. A	12-23-1987 (287-22)
REV. B	08-08-1990 (0301-09)
REV. C	11-19-2007 (0377-28)
REV. D	12-13-2011 (0394-99)
REV. E	

DO NOT SCALE

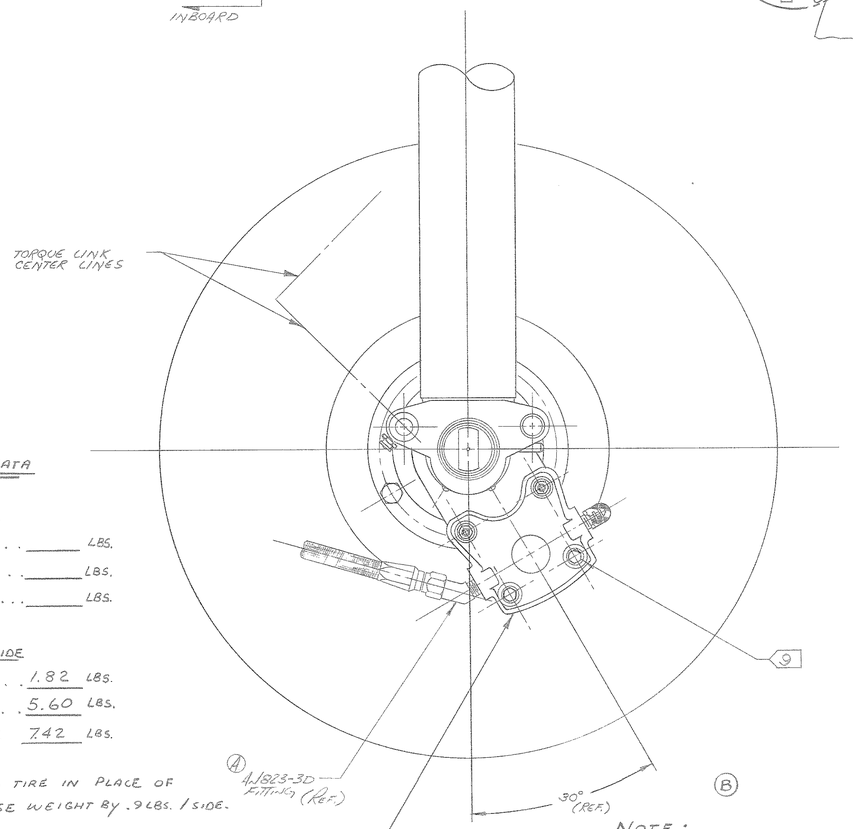
50-49					B
CHANGE NOTICE	LETTER	DESCRIPTION OF CHANGE	CHG. BY	DATE	CHK'D. BY
265/33	A	ADDED AJ823-3D FITTING AS REFERENCE	MJ	6-9-80	
301/9	B	SEE C/N	BB	8-8-90	BB

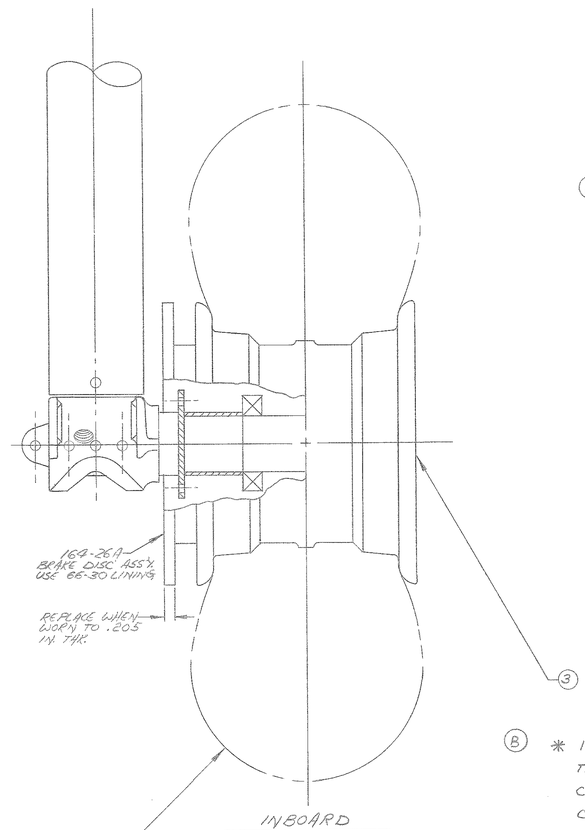




(B) APPLICABILITY OF AIRCRAFT INSTALLATION CLEVELAND KIT 199-79

MODEL	TIRE SIZE	PLY RATING	PRESSURE
DE HAVILLAND CHIPMUNK DHC-1-21, -22, -22A DHC-18-2-S3, -S5	6.00-6 TYPE III OR 7.00-6 TYPE III (OPTIONAL)	4 PLY 4 OR 6 PLY	40 PSI 40 PSI





INSTRUCTIONS

1. PROPERLY JACK UP AIRCRAFT
2. REMOVE AND CAP HYDRAULIC LINES FROM EXISTING BRAKES.
3. REMOVE EXISTING WHEELS, BRAKES AND AXLE SPACERS.
4. USING HARDWARE SUPPLIED IN KIT, INSTALL 75-190 TORQUE PLATE ASS'Y. AS SHOWN IN DETAIL -A-, AND TORQUE MOUNTING NUTS TO 90-90 IN.-LBS.
5. REMOVE AN365-528 NUTS FROM 40-97D WHEEL ASS'Y. TO SPLIT WHEEL. MOUNT 6.00-6 OR 7.00-6, 4 OR 6-PLY TUBE-TYPE TIRES. TORQUE WHEEL NUTS TO 150 IN-LBS. AFTER ASS'Y.
(B) * 6. INSTALL 067-04900 SPACER, PLACE WHEEL ASS'Y. ON AXLE AND START AXLE NUT ON THREADS. WHILE ROTATING THE WHEEL, HAND TIGHTEN THE AXLE NUT TO PROPERLY SEAT BEARINGS. WHEN THE BEARINGS ARE SEATED, HAND TIGHTEN THE NUT UNTIL IT STOPS, BACK OFF NUT TO THE NEAREST HOLE AND INSERT COTTER PIN.
7. REMOVE CPR-17AM BOLTS FROM BRAKE ASS'Y. TO REMOVE BACK PLATE (2 BOLTS).
8. SLIDE CYLINDER ASS'Y. INTO TORQUE PLATE.
9. SLIP BACK PLATE BETWEEN BRAKE DISC AND WHEEL, POSITION TO ALIGN HOLES, AND TIGHTEN THE BOLTS (CPR-17AM), TORQUE TO 75-90 IN.-LBS.
10. REMOVE THE FLEXIBLE BRAKE LINE AT THE UPPER END. CUT OFF THE LOWER END FITTING AS CLOSE AS POSSIBLE TO THE FITTING. REDUCE O.D. OF THE HOSE BY 1/16" IN THE SAME MANNER AS EXAMINATION WILL SHOW THAT THE ORIGINAL FITTING INSTALLATION WAS DONE. A BELT SANDER WORKS WELL, WORKING ON THE EDGE OF THE BELT. INSTALL AEROQUIP 931-3 (OR EQUIVELANT MS) STRAIGHT FLARED SWIVEL HOSE FITTING ASS'Y. INSTALL REWORKED HOSE ASS'Y.
11. BLEED BRAKES. REPEAT CYCLES UNTIL ALL AIR HAS BEEN PURGED FROM SYSTEM.
12. WITH THE AIRCRAFT STILL ON JACKS, APPLY BRAKE PRESSURE TO CHECK FOR SYSTEM LEAKAGE. REPEAT 3 TO 4 TIMES.
13. WITH PRESSURE AT 0, ROTATE EACH WHEEL TO CHECK FOR BINDING OR EXCESSIVE DRAG.
14. REMOVE AIRCRAFT FROM JACKS AND CONDITION LININGS PER ENCLOSED SHEET.

(B) * IT WILL BE NECESSARY TO REDUCE THE OVERALL DIAMETER OF THE AXLE NUT BY GRINDING OR MACHINING OFF THE SIX CORNERS OF THE NUT AS NEEDED TO ATTAIN A RADIAL CLEARANCE TO THE OUTER GREASE SEAL RETAINER OF 1/32" MINIMUM. THIS WILL PERMIT THE AXLE NUT TO BEAR ON THE OUTER BEARING CONE OF THE WHEEL.

WEIGHT AND BALANCE DATA

OLD REMOVED PER SIDE

BRAKE . . . . . _____ LBS.
WHEEL . . . . . _____ LBS.
TOTAL/SIDE . . . . _____ LBS.

NEW INSTALLED PER SIDE

BRAKE . . . . . 1.82 LBS.
WHEEL . . . . . 5.60 LBS.
TOTAL/SIDE 7.42 LBS.

(B) NOTE: USE OF 7.00-6 TIRE IN PLACE OF 6.00-6 WILL INCREASE WEIGHT BY .9 LBS./SIDE.

(B) WEIGH EXISTING WHEELS AND BRAKES. TAKE DIFFERENCE BETWEEN "OLD" AND "NEW" TOTAL WEIGHTS PER SIDE AND MULTIPLY BY TWO (2) TO DETERMINE AIRCRAFT CHANGE IN WEIGHT. MULTIPLY WEIGHT CHANGE BY MOMENT ARM (LOCATION @ 22" FWD OF DATUM) AND REVISE WEIGHT AND BALANCE ENTRY IN AIRCRAFT LOG BOOK.

NOTE:

IT WILL BE NECESSARY TO DRILL (2) ADDITIONAL 1/4" DIAMETER HOLES IN THE BRAKE MOUNTING FLANGE ON SOME CANADIAN AIRCRAFT. THE BRAKE TORQUE PLATE SHOULD BE TEMPORARILY BOLTED IN PLACE WITH (9) BOLTS LOCATING THE PLATE, THUS LOCATING THE (2) ADDITIONAL HOLES. USE 1/8" OR #30 DRILL FOR PILOT HOLE, FOLLOWED BY 1/4" DRILL. REMOVE THE TORQUE PLATE, DEBURR THE HOLES, AND MOUNT THE TORQUE PLATE PER NOTE 4. THIS INSTALLATION WILL LOCATE THE BRAKE CYLINDER AT APPROXIMATELY 4 O'CLOCK (60°) POSITION INSTEAD OF 5 O'CLOCK (30°) AS SHOWN ABOVE.

	2	3	40-97D	WHEEL ASS'Y.					
	2	2	067-04900	AXLE SPACER					
	2	1	30-63P	BRAKE ASS'Y.					
		X	50-49	WHEEL & BRAKE INSTALLATION					
QTY	QTY	ITEM	PART NO.	DESCRIPTION	MATERIAL & SPEC.	HEAT TREAT & SPEC.	FINISH & SPEC.	WGT.	

NEXT ASSEMBLY	QTY	FINAL ASSEMBLY	QTY	PATTERN, CASTING OR BLANK NO.	DRAWN BY	Cleveland Wheels & Brakes
					CHECKED BY	1160 Avon Center Road, Avon, Ohio 44011
					SCALE 2:1	a division of VanSickle Industries, Inc. "the brake people"
					NAME CLEVELAND WHEEL & BRAKE INSTALLATION (CHIPMUNK) REF. KIT 199-79.	50-49

050-04900

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.

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

AVAILABILITY OF GENERAL MAINTENANCE INFORMATION AND TORQUING PROCEDURES

EFFECTIVITY: All Parker Hannifin (Cleveland Wheels & Brakes) External Disc Design wheel & brake assemblies.

APPLICABILITY: Aircraft converted per STC approved kits to use Cleveland External Disc Design wheel & brake assemblies.

REASON: This PRM is issued to inform Wheel & Brake Conversion Kit users and installers that information regarding general maintenance and proper bolt / nut torquing procedures is available. This information is contained in the Cleveland Wheels & Brakes Component Maintenance Manual (CMM) and in the Cleveland Technicians Service Guide, PRM64. Most Cleveland Conversion Kits were designed prior to creation of the CMM. Parker Hannifin is in process of upgrading kit paperwork to include a requirement to use the CMM and PRM64 as wheel & brake service information. This PRM serves the same purpose for kits whose paperwork has not yet been upgraded.

DESCRIPTION: The Cleveland Wheels & Brakes Component Maintenance Manual and PRM64, Technician's Service Guide shall be used as service information when performing general maintenance on Cleveland External Disc Design wheels & brakes. Particular attention should be paid to instructions regarding wheel bolt torquing procedures.

NOTE: Refer to the CMM or PRM64 to determine the required torque procedure (Dry or Lubtork). While using the required torque procedure, observe the torque required to turn the nut (free running torque). This value must be added to the value stated on the casting or nameplate (or in the CMM or PRM64) to obtain a true torque value. Proper torque is imperative to prevent premature bolt or mating component failure.

COMPLIANCE: Highly Recommended.

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

WEIGHT & BALANCE: Not applicable.

PUBLICATIONS: Cleveland Wheels & Brakes Component Maintenance Manual and PRM64 are available from:

Customer Support
Parker Hannifin Corporation
Aircraft Wheel & Brake
1160 Center Road
Avon, Ohio

Phone: 1-800- BRAKING (272-5464)
FAX: 216-937-5409

DEPARTMENT OF TRANSPORT

Supplemental Type Approval

Number: SA92-86

This approval is issued to:

Aircraft Wheel and Brake Division
Parker Hannifin Corporation
1160 Center Road
Avon, OHIO
USA 44011

Issue No.: 1

Approval Date: 28 October 1992

Issue Date: 28 October 1992

Responsible Region: Ontario

Aircraft/Engine Type or Model: DeHavilland DHC-1B-2-S3, DHC-1B-2-S5

Canadian Type Approval or Equivalent: A-19

Description or Type Design Change:

Installation of Cleveland Main Wheels and Brakes in accordance with FAA Supplemental Type Certificate (STC) SA2748SO.

Installation/Operating Data, Required Equipment and Limitations:

1. This installation must be in accordance with Parker Hannifin Conversion Kit Parts List 199-79, Revision C, dated August 8, 1990 or later FAA Approved revision.

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, it shall be established that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of this modified product.

J. Diamant Boustead
Regional Airworthiness Engineer
For Minister of Transport

26-0402 (04-90)

Canada

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 SA1011SO

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 21.29 *of the* Federal Aviation *Regulations:* See Type Certificate Data Sheet A44EU for complete certification basis.

Original Product — Type Certificate Number A44EU

Make DeHavilland

Model DH.C1 Chipmunk 21, 22, 22A

Description of Type Design Change Installation of Cleveland Main Wheels and Brakes in accordance with Parker Hannifin Conversion Kit Parts List 199-79, Revision C, dated August 8, 1990, or later FAA Approved Revision.

Limitations and Conditions This approval should not be extended to other aircraft of this model on which other previously approved modifications are incorporated unless it is determined by the installer that the interrelationship between this change and any of the other previously approved modifications will introduce no adverse effect upon the airworthiness of that aircraft.

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 June 14, 1978

Date of issuance July 13, 1978

Date reissued July 13, 1990

Date amended September 24, 1990

By direction of the Administrator

Donald P. Michal

(Signature)

Donald P. Michal, Manager
Chicago Aircraft Certification Office

(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 SA2748SO

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 21.29 *of the* Federal Aviation *Regulations:* See Type Certificate Data Sheet A26NM for complete certification basis.

Original Product — Type Certificate Number A26NM

Make DeHavilland

Model DHC-1B-2-S3, -S5

Description of Type Design Change Installation of Cleveland Main Wheels and Brakes in accordance with Parker Hannifin Conversion Kit Parts List 199-79, Revision C, dated August 8, 1990 or later FAA Approved Revision.

Limitations and Conditions This approval should not be extended to other airplanes of this model on which other previously approved modifications are incorporated unless it is determined by the installer that the interrelationship between this change and any of the other previously approved modifications will introduce no adverse effect upon the airworthiness of that aircraft.

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 March 14, 1990

Date of issuance April 23, 1990

Date reissued July 13, 1990

Date amended September 24, 1990

By direction of the Administrator

(Signature)

Donald P. Michal, Manager
Chicago Aircraft Certification Office

(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)