AIRCRAFT WHEEL & BRAKE DIVISION

PARKER HANNIFIN CORPORATION

AVON, OHIO

PARTS LIST

199-69

CONVERSION KIT FOR ERCOUPE

MODELS: Erco 415-C, Erco 415-CD, Erco 415-D, Erco-E, Erco G, Forney F-1 and Forney F-1A

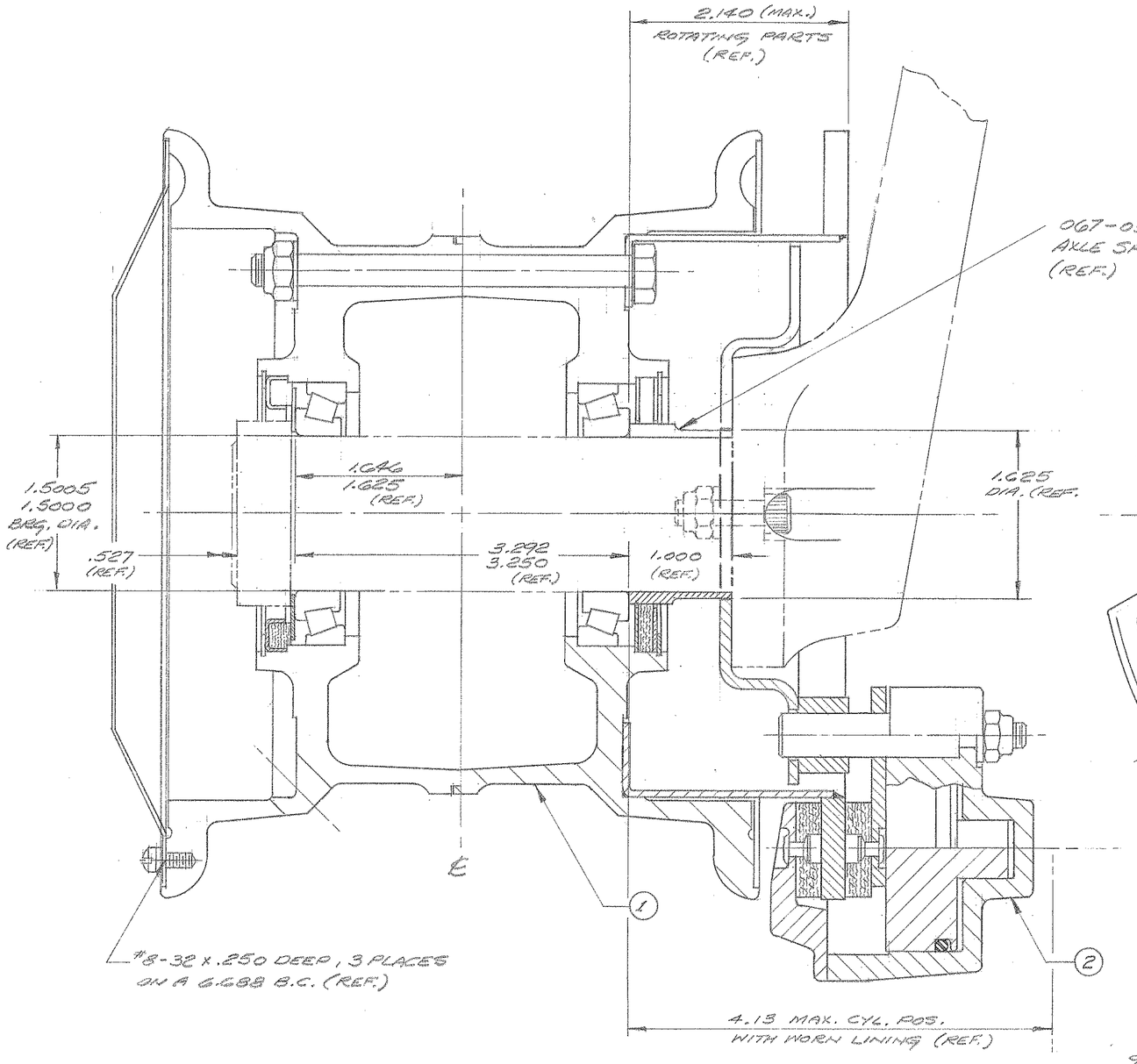
	PART NO.	IBM CODE	DESCRIPTION	QUANTITY
	40-41	040-04100	Wheel Assembly	2
	30-30	030-03000	Brake Assembly	2
	50-41	050-04100	Installation Drawing	1
	SA120GL		Supplemental Type Certificate (415-C & 415-CD)	1
	SA127GL		Supplemental Type Certificate (Erco E, G & 415-D, Forney F-1 and F-1A)	1
	20-171	020-17100	Wheel & Brake Assembly	1
(B)	PRM13A	-	Non Asbestos Lining Conditioning Procedure.	1

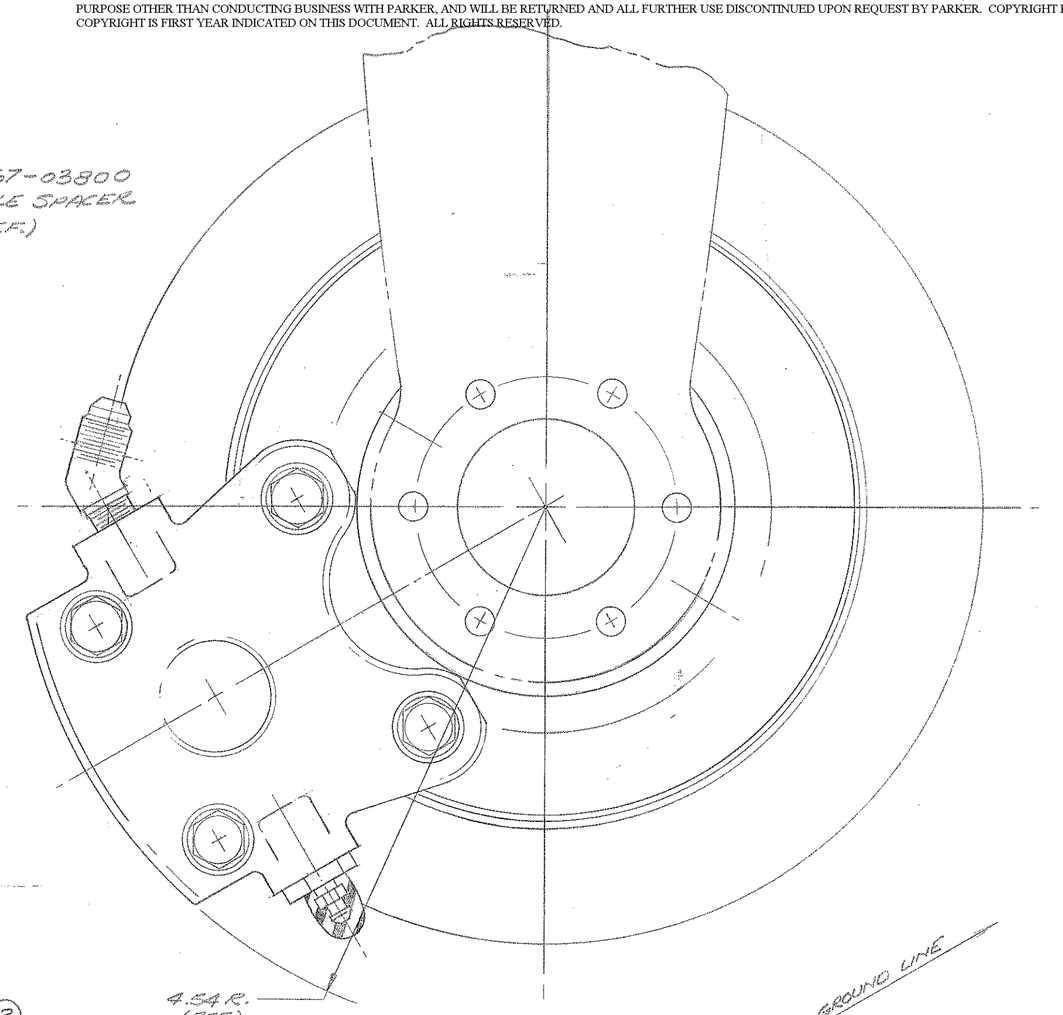
This kit will convert one aircraft to Cleveland Wheel & Brakes.

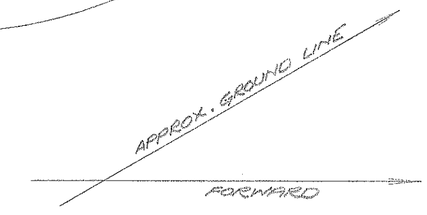
199-69
04-19-76
05-07-76 REV A
12-23-87 REV B (287-22)

DO NOT SCALE

20-171					A
CHANGE NOTICE	LETTER	DESCRIPTION OF CHANGE	CHG. BY	DATE	CHK'D. BY
2591/8	A	REVISED TORQUE 150 IN. LBS. WAS 60-75 IN. LBS.	MA	5-26-76	





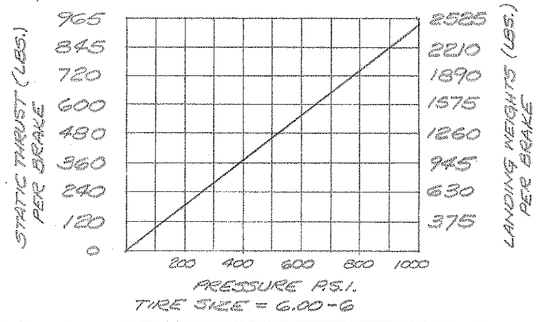


NOTES:

1. TIRE SIZE - 6.00-6
2. WHEEL RATINGS PER FAA-T.S.O.-C26b
   - STATIC RATING = 1500 LBS.
   - LIMIT RATING = 9000 LBS.
   - LIMIT AXIAL LOAD = 3600 LBS.
   - COMBINED (LIMIT) RADIAL & SIDE LOAD RATING = 9700 LBS.
3. MAXIMUM BRAKE LINE OPERATING PRESSURE = 868 PS.I.
4. BRAKE FLUID DISPLACEMENT:
   - MAXIMUM - NEW TO FULLY WORN = 1.04 CU. IN.
   - NORMAL CLEARANCE TO 400 PS.I. = .19 CU. IN.
5. BRAKE KINETIC ENERGY CAPACITY:
   - NORMAL CAPACITY 181,000 FT. LBS., 100 STOPS FROM 58.11 KNOTS AT 10 FT./SEC./SEC. DECELERATION WITHOUT DISC OR LINING CHANGE
6. TORQUE WHEEL NUTS TO 150 IN. LBS.

(A)

PRESSURES TO WITHSTAND STATIC THRUST AND TO PRODUCE 10 FT./SEC./SEC. DECELERATION AT VARIOUS WEIGHTS



TIRE SIZE = 6.00-6

WEIGHTS:

WHEEL	3.875
DISC	2.062
BRAKE CYL.	1.562
TORQUE PL.	.550
TOTAL	8.049 LBS.

QTY	QTY	ITEM	PART NO.	DESCRIPTION	MATERIAL & SPEC.	HEAT TREAT & SPEC.	FINISH & SPEC.	WGT.
	1	2	30-30	BRAKE ASSY				
	1	1	40-41	WHEEL ASSY				
		X	20-171	WHEEL & BRAKE ASSEMBLY				

NEXT ASSEMBLY 50-41

QTY | FINAL ASSEMBLY | QTY

THIS DESIGN IS THE PROPERTY OF CLEVELAND WHEELS & BRAKES AND IS NOT TO BE COPIED, DUPLICATED, OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF EQUIPMENT WITHOUT WRITTEN PERMISSION.

ZYGLO PER MIL-I-6866 STAMP M ON PART

MAGNAFLUX PER MIL-I-6868 STAMP P ON PART

√ MACHINED SURFACES PER MIL STD 10 UNLESS OTHERWISE NOTED

UNLESS NOTED ALL THREADS PER MIL-S-7742

PATTERN, CASTING OR BLANK NO.

WORK TO DIMENSIONS -- DO NOT SCALE
TOLERANCE FOR .XXX ± .010
TOLERANCE FOR .XX ± .030
TOLERANCE FOR ANGULAR DIMS. ± 1/2°
TOLERANCE FOR FRACTIONAL DIMS. ± .030

BREAK SHARP EDGES .010 UNLESS NOTED. REMOVE ALL BURRS BEFORE PLATING. DRILL PER INSP. PROCEDURE NO. 114.

DRAWN BY 12/18/75

CHECKED BY

SCALE FULL

Cleveland Wheels & Brakes
1160 Avon Center Road, Avon, Ohio 44011
a division of VanSickle Industries, Inc.
"the brake people"

NAME WHEEL & BRAKE ASSEMBLY

20-171

020-17100

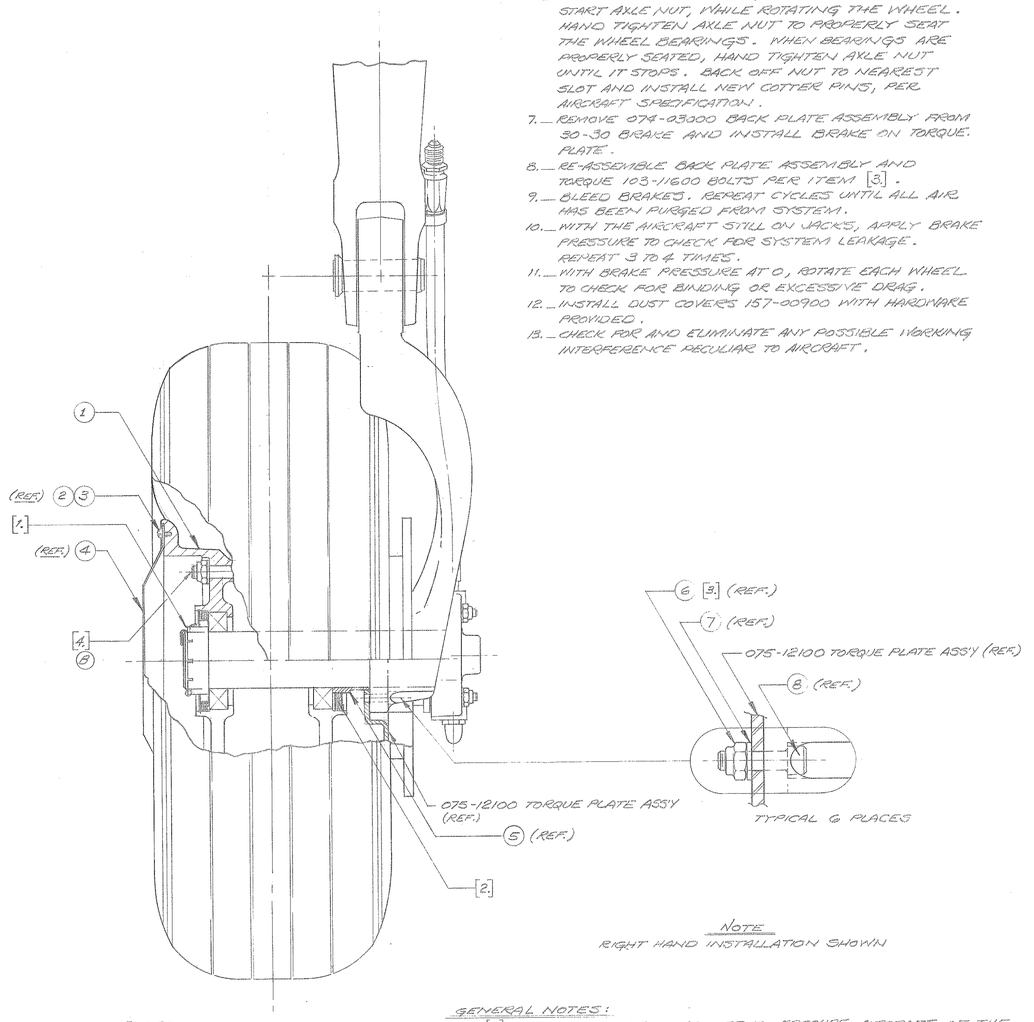
DO NOT SCALE

050-04100

50-41				B
CHANGE NOTICE	LETTER	DESCRIPTION OF CHANGE	CHG. BY	DATE	CHK'D. BY
6516/6	A	SEE C/N	KC	5-11-76	
6516/8	B	ADDED NOTE 4. REVISED SECTION VIEW TO SHOW WHEEL BOLTS	KC	5-26-76	

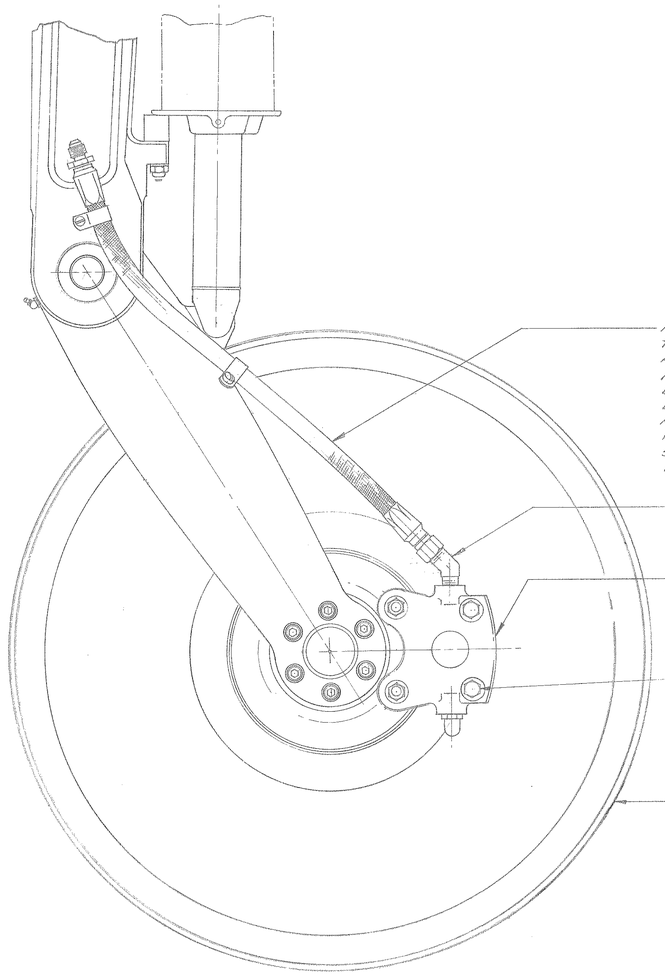
INSTALLATION CHECKLIST:

1. ___ REMOVE EXISTING WHEELS, BRAKES AND AXLE SPACERS.
2. ___ CLEAN AXLE AND APPLY A FILM OF LIGHT OIL.
3. ___ INSTALL 075-12100 TORQUE PLATE ASSEMBLY AS SHOWN ON ASSY DRAWING #20-171 AND LOOSELY INSTALL AS SHOWN BELOW.
4. ___ SLIDE 067-03800 WHEEL SPACER ON AXLE WITH SMALL DIAMETER INTO HOLE IN TORQUE PLATE.
5. ___ TIGHTEN TORQUE PLATE HARDWARE AS NOTED IN ITEM [3.] UNDER "GENERAL NOTES".
6. ___ SLIDE WHEEL ASSEMBLY 40-41 ON AXLE AND START AXLE NUT, WHILE ROTATING THE WHEEL. HAND TIGHTEN AXLE NUT TO PROPERLY SEAT THE WHEEL BEARINGS. WHEN BEARINGS ARE PROPERLY SEATED, HAND TIGHTEN AXLE NUT UNTIL IT STOPS. BACK OFF NUT TO NEAREST SLOT AND INSTALL NEW COTTER PINS, PER AIRCRAFT SPECIFICATION.
7. ___ REMOVE 074-03300 BACK PLATE ASSEMBLY FROM 30-30 BRAKE AND INSTALL BRAKE ON TORQUE PLATE.
8. ___ RE-ASSEMBLE BACK PLATE ASSEMBLY AND TORQUE 103-11600 BOLTS PER ITEM [3.].
9. ___ BLEED BRAKES. REPEAT CYCLES UNTIL ALL AIR HAS BEEN PURGED FROM SYSTEM.
10. ___ WITH THE AIRCRAFT STILL ON JACKS, APPLY BRAKE PRESSURE TO CHECK FOR SYSTEM LEAKAGE. REPEAT 3 TO 4 TIMES.
11. ___ WITH BRAKE PRESSURE AT 0, ROTATE EACH WHEEL TO CHECK FOR BINDING OR EXCESSIVE DRAG.
12. ___ INSTALL DUST COVERS 157-00900 WITH HARDWARE PROVIDED.
13. ___ CHECK FOR AND ELIMINATE ANY POSSIBLE WORKING INTERFERENCE PECULIAR TO AIRCRAFT.



NOTE
RIGHT HAND INSTALLATION SHOWN

OUTBOARD



AFT

GENERAL NOTES:

[1.] THIS INSTALLATION APPLIES TO ERCOUPE AIRCRAFT OF THE FOLLOWING MODELS:
415C, 415CD PER AIRCRAFT SPECIFICATION NO. A7A18
415D, ERCO "E", ERCO "G", FORNEY F-1 AND FORNEY F-1A PER AIRCRAFT SPECIFICATION NO. A7B7

[2.] LIGHTLY LUBRICATE ALL SURFACES OF INBOARD & OUTBOARD GREASE SEALS WITH NO. 10 OIL, BEFORE INSTALLING WHEEL ASSEMBLY.

[3.] TORQUE BOLTS AND/OR NUTS TO 75 TO 90 IN./LBS.

(B) [4.] TORQUE WHEELS NUTS TO 150 IN. LBS.

QTY	QTY	ITEM	PART NO.	DESCRIPTION	MATERIAL & SPEC.	HEAT TREAT & SPEC.	FINISH & SPEC.	WGT.
	1	9	30-30	BRAKE CYL.				
	6	8	103-61100	SCREW-SOC. HD.	(REF.) (A)			
	6	7	095-10400	WASHER	(REF.) SEE 30-30			
	6	6	094-10300	NUT	(REF.)			
	1	5	067-03800	SPACER				
	1	4	157-00900	DUST SHIELD	(REF.) (A)			
	3	3	102-00600	SCREW	(REF.) SEE 40-41			
	3	2	095-15100	WASHER	(REF.)			
	1	1	40-41	WHEEL ASSEM.				
	X		50-41	WHEEL & BRAKE INST.				

NEXT ASSEMBLY	QTY	FINAL ASSEMBLY	QTY	PATTERN, CASTING OR BLANK NO.	DRAWN BY	Cleveland Wheels & Brakes
157-00900		ZYGLO PER MIL-I-6866 STAMP M ON PART		WORK TO DIMENSIONS – DO NOT SCALE TOLERANCE FOR .XXX ± .010 TOLERANCE FOR .XX ± .030 TOLERANCE FOR ANGULAR DIMS. ± 1/2° TOLERANCE FOR FRACTIONAL DIMS. ± .030	CHECKED BY	1160 Avon Center Road, Avon, Ohio 44011 a division of VanSickle Industries, Inc. "the brake people"
THIS DESIGN IS THE PROPERTY OF CLEVELAND WHEELS & BRAKES AND IS NOT TO BE COPIED, DUPLICATED, OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF EQUIPMENT WITHOUT WRITTEN PERMISSION.		MAGNAFLUX PER MIL-I-6868 STAMP P ON PART		BREAK SHARP EDGES .010 UNLESS NOTED. REMOVE ALL BURRS BEFORE PLATING. DRILL PER INSP. PROCEDURE NO. 114.	SCALE HALF	
		√ MACHINED SURFACES PER MIL STD 10 UNLESS OTHERWISE NOTED			NAME CLEVELAND WHEEL & BRAKE INSTALLATION	50-41
		UNLESS NOTED ALL THREADS PER MIL-S-7742				

50-41
B

050-04100

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
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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

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 SA12OGL

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 4a *of the* Civil Air *Regulations.* (See Aircraft Specification No. A-718 for complete Certification Basis)

Original Product — Type Certificate Number A-718
Make Erco
Model 415-C & 415-CD; S/N 813 and up

Description of Type Design Change
Install Cleveland Wheel and Brake Conversion Kit, P/N 199-69, per Installation Drawing No. 50-41, Revision B dated May 26, 1976.

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 those other previously approved modifications will introduce no adverse effect upon the airworthiness of that aircraft. This determination should include consideration of significant changes in weight distribution such as an increase in the fixed disposable weight in the fuselage.

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

Date of application April 19, 1976 *Date reissued* October 28, 1980

Date of issuance May 28, 1976 *Date amended* July 7, 1976

By direction of the Administrator

W. F. Horn, Jr. *(Signature)*
Chief, Engineering & Manufacturing Branch,
Great Lakes Region AGL-210
(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 SA127GL

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 Aircraft Specification No. A-787 for complete Certification Basis)

Original Product — Type Certificate Number A-787
Make Erco and Forney
Model Erco Models E, G, & 415-D
Forney Models F-1 & F-1A

Description of Type Design Change

Install Cleveland Wheel and Brake Conversion Kit, P/N 199-69, per Installation Drawing No. 50-41, Revision B dated May 26, 1976.

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FAA Form 8110-2 (10-68)

Cleveland
Wheels & Brakes

WEIGHT AND BALANCE

FOR

199-06900 KIT

Major components of this kit may differ in weight from existing equipment. Removed components as listed should be weighed. Subtract old installation weight from new installation weight to determine weight change created by installation of this kit. Multiply weight change by moment (applicable to aircraft) and revise weight and balance information in aircraft log book.

DATA

OLD INSTALLATION

Unit	Weight / Unit		# of Units		Weight	
Brake	_____	X	2	=	_____	LBS.
Wheel	_____	X	2	=	_____	LBS.
			TOTAL	=	_____	LBS.

NEW INSTALLATION

Unit	Weight / Unit		# of Units		Weight	
Brake	2.11	X	2	=	4.22	LBS.
Wheel	5.90	X	2	=	11.80	LBS.
			TOTAL	=	16.02	LBS.

Parker
General Aviation