



AIRCRAFT WHEEL & BRAKE DIVISION  
 PARKER HANNIFIN CORPORATION  
 AVON, OHIO

LIST OF PARTS

WHEEL & BRAKE SHIP SET

ORDER CODE: 199-10403

FOR GENERAL USAGE

<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
30-59A	Main Brake Assembly (FAA Approved per TSO C26b)	2
40-59A CHROME	Main Wheel Assembly with chrome disc (FAA Approved per TSO C26b)	2
102-00600	Screw, Dust Shield (FAA TSO Detail Component for 40-59A)	6
157-00900	Dust Shield (FAA TSO Detail Component for 40-59A)	2
<u>Publication Package ( P/N PP199-10403) Consists of the following</u>		
199-10403 P/L	Parts List for Order Code: 199-10403 (This document)	1
50-76	Installation Drawing	1
PRM62	Conversion Kit / Chrome Disc Data Sheet	1
PRM13A	Non Asbestos Lining Conditioning Procedure	1

NOTES:

- The Cleveland Wheels & Brakes as listed are FAA TSO-C26 approved, quantity are furnished in pairs for replacement of existing equipment on FAA Type Certificated Aircraft (Original Equipment TC Approved or per TC holder Service Bulletin) or initial installation on an experimental non FAA Type Certificated Aircraft.
- Note! For a product to be TSO qualified, it has to have successfully demonstrated its ability to meet minimum performance standards in accordance with FAA recognized rating methods. The TSO approval of a product does not constitute installation approval or applicability on an FAA Type Certificated Aircraft.** It is the responsibility of those installing these products to determine that the aircraft installation and its wheel and brake performance requirements are compatible for the TSO ratings of the wheel and brake. TSO approved products must have separate approval for installation in a FAA type certificated aircraft. TSO Approved Products may be installed only if performed under Title 14 CFR Part 43 or the applicable airworthiness requirements.
- Be advised that number "199-10403" is an Order Code Number only, to identify the grouping of a pre-packaged ship set of TSO Approved wheels and brakes for customer ordering and shipping convenience. At time of installation of parts contained within, the installer is to refer only to the Part Number of each listed wheel and brake assembly to indicate what parts have been installed on the aircraft. Do not refer to the 199-10403 order code number for installation purposes, as it is not an FAA recognized part number.
- Bearings are packed with MIL-G-81322 bearing grease. Prior to installing on aircraft, lightly coat the I.D. and exposed face of grease seal felts with MIL-G-81322 bearing grease in the inboard and outboard wheel hubs.

Order Code Number: 199-10403 P/L  
 NC 03-09-1984 (273-63)  
 Rev. A 02-08-1985 (275-68)  
 Rev. B 05-04-1988 (289-72)  
 Rev. C 06-12-2001 (0342-62)  
 Rev. D 08-01-2006 (0370-75)

UNITED STATES PATENT AND TRADEMARK OFFICE  
 THIS DOCUMENT IS UNCLASSIFIED  
 DATE 11-19-2008 BY 60322 UCBAW/SJS

THE INFORMATION LISTED ON THIS DRAWING IS FOR REFERENCE PURPOSES ONLY. DIMENSIONAL LIMITS WHERE SHOWN MUST BE MAINTAINED TO OBTAIN PROPER OPERATIONAL CHARACTERISTICS. EQUIPMENT SELECTION AND AIRCRAFT COMPATIBILITY IS THE RESPONSIBILITY OF THE INSTALLER.

USER INFORMATION

ALL WHEELS AND BRAKES SHOWN ARE ISO APPROVED. THEY HAVE BEEN PACKAGED TO OFFER VARIOUS CONFIGURATIONS ACCORDING TO BRAKE KINETIC ENERGY (KE) AND STATIC LOAD CAPACITIES. SELECT EQUIPMENT PER THE AIRCRAFT MANUFACTURER'S RECOMMENDATIONS OR CALCULATE THE KINETIC ENERGY LEVEL THAT EACH WHEEL & BRAKE ASSEMBLY WILL BE REQUIRED TO ABSORB. USE THIS CALCULATED KE VALUE TO SELECT EQUIPMENT OF PROPER CAPACITY. KINETIC ENERGY REQUIREMENTS ON THE AIRCRAFT MAY BE CALCULATED AS FOLLOWS (REFERENCE FAR PART 23.735):

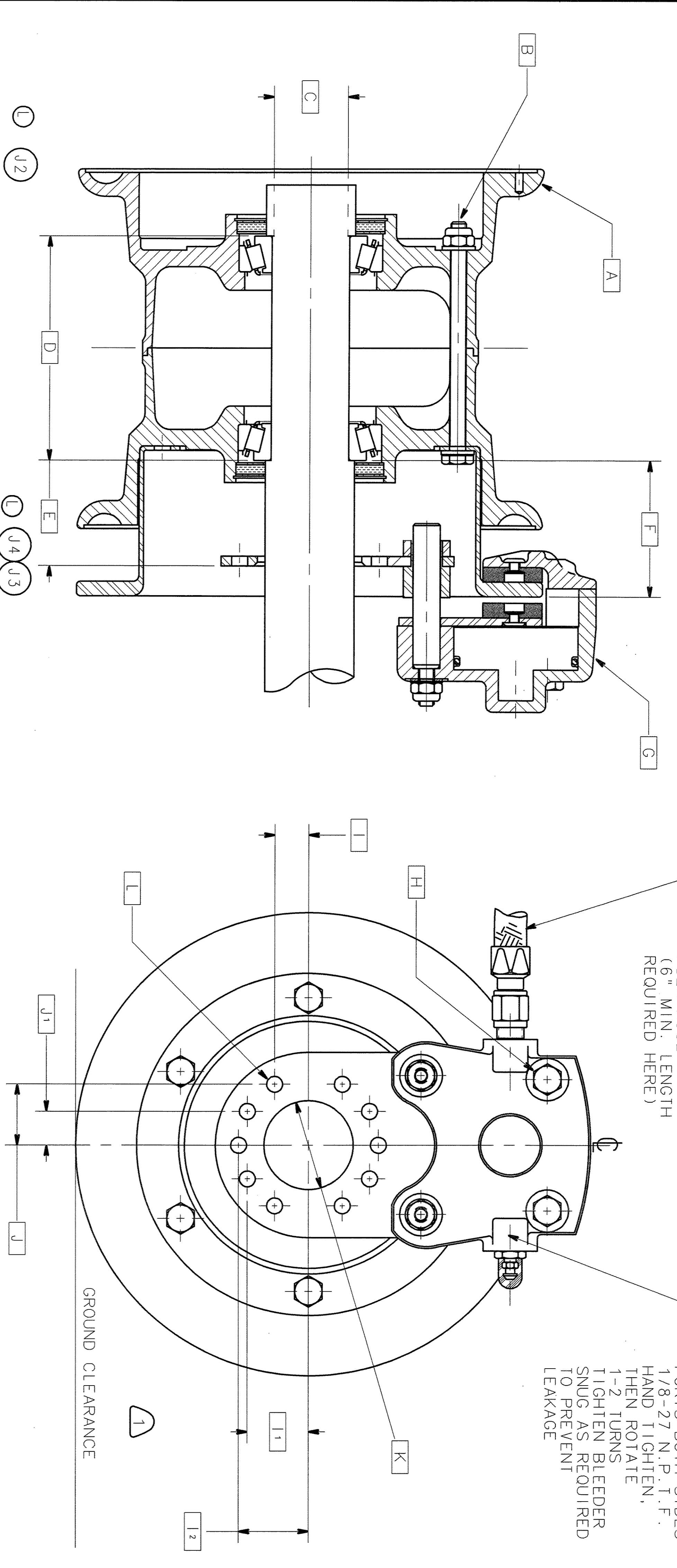
$$KE = \frac{0.443 \times W \times V^2}{N}$$

WHERE:  
 KE = KINETIC ENERGY PER WHEEL-BRAKE ASSEMBLY (FT-LBS)  
 W = DESIGN LANDING WEIGHT (LBS)  
 V = AIRCRAFT SPEED IN KNOTS. V MUST BE NOT LESS THAN VSO, THE POWEROFF STALLING SPEED OF THE AIRCRAFT AT SEA LEVEL, AT THE DESIGN LANDING CONFIGURATION.  
 N = NUMBER OF WHEELS WITH BRAKES.

ANY UNAUTHORIZED MODIFICATIONS OF EQUIPMENT WITHOUT THE EXPRESS WRITTEN CONSENT OF PARKER HANNIFIN CORP., AIRCRAFT WHEEL & BRAKE WILL VOID ALL WARRANTIES AND ISO APPROVALS.

FOR ADDITIONAL INFORMATION CONTACT CUSTOMER SUPPORT,  
 440-937-1272 OR FAX 440-937-5409.  
 WEBSITE: WWW.PARKER.COM/CLEVELAND  
 TECHNICAL SERVICES HOTLINE: 1-800-BRAKING (272-5464).

CHANGE NO.	REV.	DESCRIPTION OF CHANGE	CHK BY	DATE	APPROVED
212-89	2	REVISED AND REWORKED	BN	06-12-2001	B. BRUNER
212-89	3	PRODUCTION CHANGE - SEC. C7N	BN	09/09/2003	O. MILLER
212-72	1	PRODUCTION CHANGE - SEC. C7N	DL	08-01-2006	B. BRUNER



SHIP SET NUMBER	DESCRIPTION	WHEEL ASSEMBLY	TIRE SIZE & PLY RATING	TORQUE WHEEL NUTS	TIRE INFLATION PRESSURE	STATIC LOAD CAPACITY	KINETIC ENERGY CAPACITY	BEARING DIA.	BEARING SPACING	AXLE SPACING	MAX ROTATING PARTS	BRAKE ASSEMBLY	DRY TORQUE TIE BOLTS	BOLT HOLE LOCATION	BOLT HOLE LOCATION	TORQUE PLATE CENTER HOLE DIA.	BOLT HOLE DIA.	TOTAL KIT WT. TUBES & TIRE
199-10200 OR	5.00-5 MAG. ALUM. WHEEL BRAKE	40-78B	5.00-5 6 PLY.	90 IN-LBS.	31 PSI	1260 LBS.	117,500 FT-LB	1.2505	3.034	.947	1.495	30-9	90 IN-LBS.	.470	.847	1.377/1.379	.255-.262	10.80 LBS.
199-10203	5.00-5 MAG. ALUM. WHEEL BRAKE	40-78B CHROME	5.00-5 6 PLY.	90 IN-LBS.	31 PSI	1260 LBS.	117,500 FT-LB	1.2500	2.992	.947	1.495	30-9	90 IN-LBS.	.470	.847	1.377/1.379	.255-.262	12.40 LBS.
199-10300 OR	5.00-5 ALUM. WHEEL BRAKE	40-78J	5.00-5 6 PLY.	90 IN-LBS.	31 PSI	1260 LBS.	117,500 FT-LB	1.2505	3.034	.947	1.495	30-9C	90 IN-LBS.	.470	.847	1.377/1.379	.255-.262	10.80 LBS.
199-10303	5.00-5 ALUM. WHEEL BRAKE	40-78A CHROME	5.00-5 6 PLY.	90 IN-LBS.	31 PSI	1260 LBS.	117,500 FT-LB	1.2500	2.992	.947	1.495	30-9C	90 IN-LBS.	.470	.847	1.377/1.379	.255-.262	12.40 LBS.
199-10400 OR	6.00-6 MAG. WHEEL BRAKE	40-59A	6.00-6 6 PLY.	150 IN-LBS.	42 PSI	1750 LBS.	185,000 FT-LB	1.5005	3.292	1.659	2.207	30-59A	90 IN-LBS.	.562	.974	1.675/1.685	.375-.382	16.36 LBS.
199-10403	6.00-6 MAG. WHEEL BRAKE	40-59A CHROME	6.00-6 6 PLY.	150 IN-LBS.	42 PSI	1750 LBS.	185,000 FT-LB	1.5000	3.250	1.659	2.207	30-59A	90 IN-LBS.	.562	.974	1.675/1.685	.375-.382	16.36 LBS.
199-10500 OR	6.00-6 ALUM. WHEEL BRAKE	40-113X	6.00-6 6 PLY.	90 IN-LBS.	37 PSI	1500 LBS.	200,000 FT-LB	1.5005	3.292	1.658	2.216	30-75X	90 IN-LBS.	.562	.974	1.675/1.685	.375-.382	19.20 LBS.
199-10503	6.00-6 ALUM. WHEEL BRAKE	40-113X CHROME	6.00-6 6 PLY.	90 IN-LBS.	37 PSI	1500 LBS.	200,000 FT-LB	1.5000	3.250	1.658	2.216	30-75X	90 IN-LBS.	.562	.974	1.675/1.685	.375-.382	19.20 LBS.
199-15200	5.00-5 MAG. WHEEL BRAKE	40-151	5.00-5 6 PLY.	90 IN-LBS.	50 PSI	1260 LBS.	192,000 FT-LB	1.2505	3.034	1.105	1.653	30-133	75-80 IN-LBS.	.470	.847	1.377/1.379	.255-.262	14.00 LBS.
199-15201	5.00-5 ALUM. WHEEL BRAKE	40-151A	5.00-5 6 PLY.	90 IN-LBS.	50 PSI	1260 LBS.	192,000 FT-LB	1.2505	3.034	1.105	1.653	30-133	75-80 IN-LBS.	.470	.847	1.377/1.379	.255-.262	15.80 LBS.
199-15600	5.00-5 MAG. ALUM. WHEEL BRAKE	40-230	5.00-5 6 PLY.	90 IN-LBS.	50 PSI	1260 LBS.	155,000 FT-LB	1.2505	2.992	1.060	1.608	30-181A	75-80 IN-LBS.	.470	.847	1.377/1.379	.255-.262	12.50 LBS.
199-19700	5.00-5 MAG. WHEEL BRAKE	40-151	5.00-5 6 PLY.	90 IN-LBS.	50 PSI	1260 LBS.	289,000 FT-LB	1.2505	3.034	1.105	1.653	30-164	75-80 IN-LBS.	.470	.847	1.377/1.379	.255-.262	14.10 LBS.
199-20400	6.00-6 MAG. WHEEL BRAKE	40-281	7.00-6 6 PLY.	90 IN-LBS.	38 PSI	1200 LBS.	141,115 FT-LB	1.2505	3.625	1.645	2.193	30-214	75-80 IN-LBS.	.562	.974	1.675/1.685	.255-.262	16.18 LBS.
199-22300	6.00-6 MAG. WHEEL BRAKE	40-281	7.00-6 6 PLY.	90 IN-LBS.	38 PSI	1200 LBS.	141,115 FT-LB	1.2500	3.583	1.645	2.193	30-214	75-80 IN-LBS.	1.125	.974	1.675/1.685	.255-.262	16.18 LBS.

NOTES:

- ROTATIONALLY ORIENTATE BRAKE CYLINDER TO PROVIDE GROUND CLEARANCE AND FLAT OR DEFLECTED TIRE SIDEWALL CLEARANCE.
- WHEEL & BRAKE COMPATIBLE FOR USE WITH FOLLOWING TUBE TYPE TIRES:  
 6.00-6 (4 OR 6 PLY.)  
 8.00-6 (6 OR 8 PLY.)
- TORQUE VALUES SHOWN ARE "FINAL DRY NUT TORQUES".
- DUST SHIELDS PROVIDED FOR ALL SHIP SETS EXCEPT 199-20400 AND 199-22300.
- MAXIMUM TIRE INFLATION PRESSURE:  
 OVER INFLATION MAY RESULT IN EXPLOSIVE FAILURE OR REDUCED WHEEL SERVICE LIFE. INFLATION PRESSURE MAY BE ADJUSTED DOWN TO OBTAIN DESIRED FLotation FOR SPECIFIC AIRCRAFT WEIGHT AND OPERATING ENVIRONMENT.
- CAPACITIES SHOWN ARE FOR EACH WHEEL & BRAKE ASSEMBLY AT A NORMAL DECELERATION RATE OF 10 FT/SEC-SEC.
- SEAL IS COMPATIBLE WITH MIL-H-5606 OR MIL-H-83282 HYDRAULIC FLUID.
- TORQUE PLATE MOUNTING HOLE LOCATIONS PROVIDE FOR SIMILAR ROTATIONAL ORIENTATION BETWEEN THE LEFT & RIGHT BRAKE USING A MINIMUM OF (4) .250 DIAMETER BOLTS.
- TORQUE PLATE HOLE MOUNTING CONFIGURATION MATCHES THE SAME HOLE PATTERN AS THE TORQUE PLATE USED IN THE 199-10200 AND 199-10300 KITS. MAY BE USED TO UPGRADE AN AIRCRAFT EQUIPPED WITH 199-10200 AND 199-10300 KIT PROVIDED THE EQUIPMENT IS COMPATIBLE WITH THE AIRCRAFT AND THE AXLE IS CHANGED TO ACCOMMODATE THE 6.00-6 WHEEL PER THE DIMENSIONAL REQUIREMENTS SHOWN.
- CONSIDER AIRCRAFT TIRE EXCESS FOR THIS PART NUMBER

QTY	UNIT	CODE	PART NO.	DESCRIPTION	MATERIAL/SPECIFICATION	WT. (LBS)
1	EA		790L-748	PROGRAM/CONTRACT NO.		
1	EA		790L-748	DATE		
1	EA		790L-748	REVISION		
1	EA		790L-748	ENGINEER		
1	EA		790L-748	DESIGN APPROVAL		
1	EA		790L-748	PROD APPROVAL		
1	EA		790L-748	RELEASE DATE:		

GENERAL NOTES: UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.

3 PLACE 1 X 1.1 X 1.0

2 PLACE 1 X 1.1 X 1.0

1 PLACE 1 X 1.1 X 1.0

INTERNAL RADIUS .005-.010

GENERAL MOUNTING SURFACES PER ANSI B96.1

CONTRACT NO. 790L-748

DATE 5-28-81

ENGINEER

DESIGN APPROVAL

PROD APPROVAL

RELEASE DATE:

SCALE: 1/1

REV. 1 OF 1

050-07600

# 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, P.O. Box 158  
Avon, Ohio 44011 USA  
1-800-BRAKING (272-5464)  
216-937-1272 • FAX 216-937-5409

# PRODUCT REFERENCE MEMO

## CONVERSION KIT / CHROME DISC DATA SHEET

The designation "CHROME" after the part number of the following Wheel and Brake Conversion Kits means that they contain wheels equipped with Cleveland Chrome Brake Discs. Wheels with chrome brake discs are FAA-TSO approved under the original model number.

<u>STANDARD KIT</u>	<u>CHROME DISC KIT</u>	<u>*WHEEL ASSEMBLY</u>	<u>CHROME DISC</u>
199-46	199-46 CHROME	40-97A	164-12601
199-48	199-48 CHROME	40-113C	164-14300
199-49	199-49 CHROME	40-83	164-12504
199-60	199-60 CHROME	40-75B	164-11501
199-60A	199-60A CHROME	40-75B	164-11501
199-62	199-62 CHROME	40-75D	164-13601
199-62A	199-62A CHROME	40-75T	164-18300
199-71	199-71 CHROME	40-60	164-16700
199-71A	199-71A CHROME	40-60A	164-16700
199-79	199-79 CHROME	40-97D	164-12601
199-84	199-84 CHROME	40-113	164-14000
199-84A	199-84A CHROME	40-113	164-14000
199-87	199-87 CHROME	40-97D	164-12601
199-102	199-102 CHROME	40-78B	164-11700
199-103	199-103 CHROME	40-78A	164-11700
199-104	199-104 CHROME	40-59A	164-17500
199-105	199-105 CHROME	40-113X	164-14000
199-124	199-124 CHROME	40-113C	164-14300

\* To order a Wheel Assembly equipped with a Cleveland Chrome Brake Disc, specify the Wheel Model Number followed by "CHROME".

EXAMPLE: 40-97A CHROME