



AIRCRAFT WHEEL & BRAKE DIVISION
 PARKER HANNIFIN CORPORATION
 AVON, OHIO

LIST OF PARTS

WHEEL & BRAKE SHIP SET

ORDER CODE: 199-10303

FOR GENERAL USAGE

<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
30-9C	Main Brake Assembly (FAA Approved per TSO C26a)	2
40-78A CHROME	Main Wheel Assembly with chrome disc (FAA Approved per TSO C26a)	2
102-00600	Screw, Dust Shield (FAA TSO Detail Component for 40-78A)	6
157-00800	Dust Shield (FAA TSO Detail Component for 40-78A)	2
<u>Publication Package (P/N PP199-10303) Consists of the following</u>		
199-10303 P/L	Parts List for Order Code: 199-10303 (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 "199-10303" 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 199-10303 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: 199-10303 P/L
 NC 03-09-1984 (273-63)
 Rev. A 09-14-1984 (274-78)
 Rev. B 03-04-1985 (275-80)
 Rev. C 12-23-1987 (287-22)
 Rev. D 06-12-2001 (0342-62)
 Rev. E 08-01-2006 (0370-75)

NOTE:

199-103 CHROME is identical to 199-103 except the 40-78A Chrome Wheel assemblies are furnished in lieu of the 40-78J Wheel Assemblies.

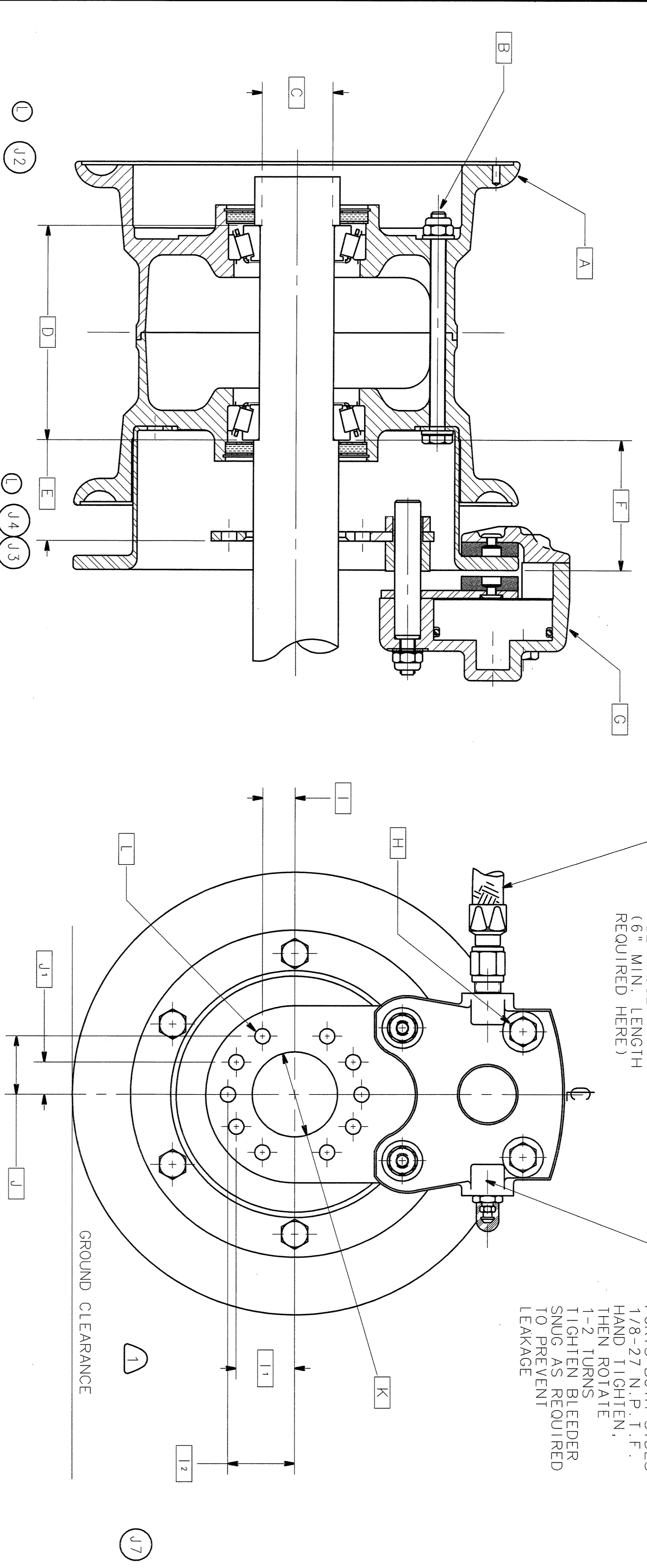
The 40-78A Chrome wheels are equipped with Chrome Plated discs and chrome plated cups and cones for high corrosion resistance.

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

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 OF AIRCRAFT COMPATIBILITY IS THE RESPONSIBILITY OF THE INSTALLER.

USER INFORMATION

CHANGE NO.	REV.	DESCRIPTION OF CHANGE	CHK BY	DATE	APPROVED
001	1	ISSUED AND REVISIONS	BN	06-12-2001	B. BRUNER
002	2	REVISIONS	BN	09-09-2003	O. MILLER
003	3	REVISIONS	BN	08-01-2006	B. BRUNER



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).

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	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	1.377/1.379	8 PLACES	10.80 LBS.
199-10203 OR	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	1.377/1.379	8 PLACES	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	1.377/1.379	8 PLACES	16.36 LBS.
199-10303 OR	5.00-5 ALUM. WHEEL BRAKE	40-78A CHROME	5.00-5 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	1.675/1.685	4 PLACES	19.20 LBS.
199-10400 OR	6.00-6 MAG. WHEEL BRAKE	40-59A	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	1.675/1.685	4 PLACES	14.00 LBS.
199-10403 OR	6.00-6 MAG. WHEEL BRAKE	40-59A 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	1.675/1.685	4 PLACES	14.00 LBS.
199-10500 OR	6.00-6 ALUM. WHEEL BRAKE	40-113X	6.00-6 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	1.377/1.379	8 PLACES	15.80 LBS.
199-10503 OR	6.00-6 ALUM. WHEEL BRAKE	40-113X CHROME	6.00-6 6 PLY.	90 IN-LBS.	50 PSI	1260 LBS.	192,000 FT-LB	1.2500	2.992	1.105	1.653	30-133	75-80 IN-LBS.	.470	1.377/1.379	8 PLACES	12.50 LBS.
199-15200	5.00-5 MAG. WHEEL BRAKE	40-151	5.00-5 6 PLY.	90 IN-LBS.	50 PSI	1260 LBS.	155,000 FT-LB	1.2505	3.034	1.105	1.653	30-181A	75-80 IN-LBS.	.470	1.377/1.379	8 PLACES	14.10 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	30-181A	75-80 IN-LBS.	.470	1.377/1.379	8 PLACES	14.10 LBS.
199-15600	5.00-5 MAG. ALUM. WHEEL BRAKE	40-230	5.00-5 6 PLY.	90 IN-LBS.	50 PSI	1260 LBS.	289,000 FT-LB	1.2500	2.992	1.105	1.653	30-164	75-80 IN-LBS.	.470	1.377/1.379	8 PLACES	16.18 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	1.377/1.379	8 PLACES	16.18 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	1.675/1.685	6 PLACES	17.63 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	30-214B	75-80 IN-LBS.	.470	1.379/1.3818	8 PLACES	17.63 LBS.

NOTES:
 1. ROTATIONALLY ORIENTATE BRAKE CYLINDER TO PROVIDE GROUND CLEARANCE AND FLAT OR DEFLECTED TIRE SIDEWALL CLEARANCE.
 2. WHEEL & BRAKE COMPATIBLE FOR USE WITH FOLLOWING TUBE TYPE TIRES:
 8.00-6 (6 OR 8 PLY.)
 8.00-6 (6 OR 8 PLY.)
 3. TORQUE VALUES SHOWN ARE "FINAL DRY NUT TORQUES".
 4. DUST SHIELDS PROVIDED FOR ALL SHIP SETS EXCEPT 199-20400 AND 199-22300.
 5. MAXIMUM TIRE INFLATION PRESSURE:
 OR REDUCED WHEEL SERVICE LIFE. INFLATION PRESSURE MAY BE ADJUSTED DOWN TO OBTAIN DESIRED FLotation FOR SPECIFIC AIRCRAFT WEIGHT AND OPERATING ENVIRONMENT.
 6. CAPACITIES SHOWN ARE FOR EACH WHEEL & BRAKE ASSEMBLY AT A NORMAL DECELERATION RATE OF 10 FT/SEC-SEC.
 7. SEAL IS COMPATIBLE WITH MIL-H-5606 OR MIL-H-83282 HYDRAULIC FLUID.
 8. TORQUE PLATE MOUNTING HOLE LOCATIONS PROVIDE FOR SIMILAR ROTATIONAL ORIENTATION BETWEEN THE LEFT & RIGHT BRAKE USING A MINIMUM OF (4) .250 DIAMETER BOLTS.
 9. 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.
 10. HIGH CORROSION CONVERSION KIT: WHEEL ASSEMBLY CONTAINS CHROME CUPS & CONES AND CORROSION RESISTANT BRAKE DISC.
 11. CONTACT PARKER FOR EXACT DIMENSIONS FOR THIS PART NUMBER.

REVISIONS

CHANGE NO.	REV.	DESCRIPTION OF CHANGE	CHK BY	DATE	APPROVED
001	1	ISSUED AND REVISIONS	BN	06-12-2001	B. BRUNER
002	2	REVISIONS	BN	09-09-2003	O. MILLER
003	3	REVISIONS	BN	08-01-2006	B. BRUNER

DESCRIPTION: AIRCRAFT WHEEL AND BRAKE DIVISION
 PART NO.: 790E-748
 PROGRAM/CONTRACT NO.: 790E-748
 DATE: 5-28-81
 ENGINEER: [Signature]
 CHECKED: [Signature]
 DATE: [Signature]
 SCALE: 1/1
 SHEET: 1 OF 1

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
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Avon, Ohio 44011 USA
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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