

A detailed, close-up photograph of an aircraft wheel and brake assembly. The image shows the intricate mechanical components, including the hub, brake discs, and various bolts and nuts. The lighting highlights the metallic textures and the complex geometry of the parts. The background is a solid green color, which contrasts with the metallic tones of the wheel.

Cleveland

Wheels & Brakes

Technician's Service Guide

Parker
Aerospace

Reference

MANUALS

Refer to the Component Maintenance Manual for detailed maintenance/overhaul procedures. Refer to the Product Catalog for Illustrated Parts Breakdown. Consult the Aircraft Maintenance Manual and Airframe Log Books (for optional installations) to confirm the approved part numbers for the particular aircraft application. If any inconsistencies are observed in this data, please notify Cleveland Customer Support.

WARRANTY

The warranty clause for the wheel and brake commercial product line is found on the inside back cover of the current Cleveland Wheels & Brakes Price List.

IMPORTANT NOTE

Use of other manufacturer's components with original Cleveland wheel and brake assemblies will void the Cleveland warranty.

TECHNICAL ASSISTANCE

For technical questions and assistance, call the

TECHNICAL SERVICE HOTLINE
1-800-BRAKING (272-5464)

or

440-937-1272 • FAX 440-937-5409

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This manual has been created to assist the maintenance technician on the shop floor.

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A. Conditioning Procedures

When new linings have been installed, it is important to condition them properly to obtain the service life designed into them. The metallic and organic linings are not conditioned in the same manner because they have different operating characteristics. Separate conditioning procedures are given for metallic and organic linings.

NONASBESTOS ORGANIC LININGS	METALLIC LININGS
<ol style="list-style-type: none"> 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 the brakes to cool for 10 to 15 minutes. 3. Apply brakes and check for restraint at high static throttle. If brakes hold, conditioning is complete. 4. If brakes cannot hold aircraft during static run-up, allow brakes to completely cool and repeat steps 1 through 3. 	<ol style="list-style-type: none"> 1. Perform two (2) consecutive full stop braking applications from 30 to 35 knots. Do not allow the brake discs to cool substantially between the stops. 2. Allow the brakes to cool for 10 to 15 minutes. 3. Apply brakes and check for restraint at high static throttle. If brakes hold, conditioning is complete. 4. If brakes cannot hold aircraft during static run-up, allow brakes to cool completely and repeat steps 1 through 3.

CAUTION: DUE TO THE EFFICIENCY OF THESE BRAKES, EXTREMELY HARD BRAKING ON AIRCRAFT WITH TAIL WHEELS COULD RESULT IN LIFTING THE TAIL FROM THE GROUND.

These conditioning procedures will wear off high spots and 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.

Properly conditioned linings will provide many hours of maintenance free service. A visual inspection of the brake disc will indicate the lining condition. A smooth surface, one without grooves, indicates the linings are properly glazed. If the disc is rough (grooved), the linings must be reglazed. The conditioning procedure should be performed whenever the rough disc condition is observed. Light use, such as in taxiing, will cause the glaze to be worn rapidly.

B. Brake Lining Wear Limits

The minimum replacement thickness on metallic and organic linings is 0.100 inch (2.54 mm). Refer to Figure A1.

NOTE: On some designs the metallic lining is bonded directly to the pressure plate and back plate. In these cases, the part should be replaced when the lining material is less than 0.020 inch (0.51 mm) thick.

For equipment used on Piper Aztec (using either 164-00206 or 164-03206 disc), see PRM19 or follow the procedure below:

- First, measure linings as shown in Figure A1. Linings worn below .100 inch are cause for replacement.
- If linings are still usable or are replaced, measure the cumulative thickness of two linings, disc and pressure plate as shown in Figure A1-1. If the stack measures less than 1.00 (1 inch) with good linings (linings above .100 inch) the brake disc is considered below minimum wear thickness and should be replaced.

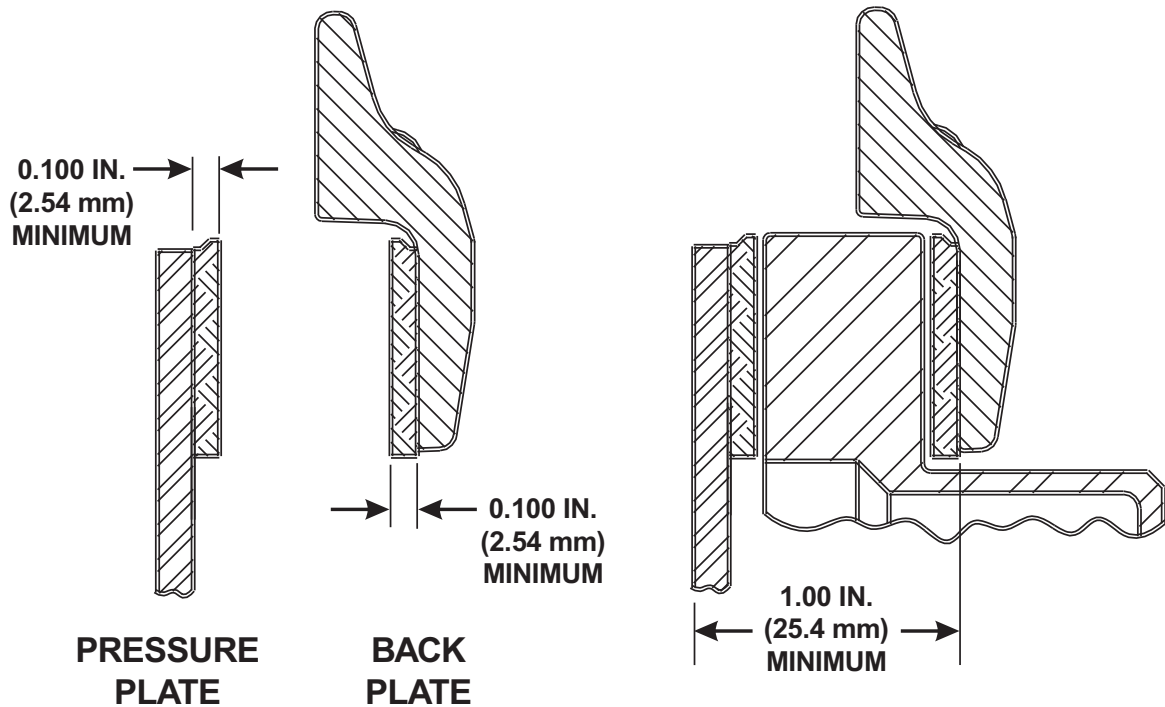
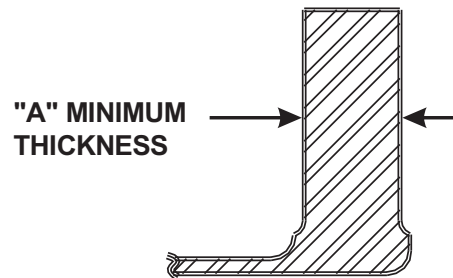


Figure A1
Minimum Lining Thickness

Figure A1-1
Disc Wear Measurement
(Piper Aztec)

C. Brake Disc Minimum Thickness

Figure A2 – Disc Thickness Measurement



Under average field conditions, a brake disc should give years of trouble free service. However, unimproved fields, standing water, heavy industrial pollution or infrequent use of the aircraft may necessitate more frequent inspection of discs to prolong the life of the brake lining.

Generally, the disc faces should be checked for wear (Figure A2 Dim. "A"), grooves, deep scratches, excessive general pitting or coning of the brake disc. Coning beyond 0.015 inch (0.381 mm) in either direction would be cause for replacement.

Single or isolated grooves up to 0.030 inch (0.76 mm) deep should not be cause for replacement, although general grooving of the disc faces will reduce lining life.

Discs are plated for special applications only; therefore, rust in varying degrees can occur. If a powder rust appears, one or two braking applications during taxi should wipe the disc clear. Rust allowed to progress beyond this point may require removal of the disc from wheel assembly to properly clean both faces. Wire brushing followed by sanding with 220 grit sandpaper can restore the braking surface for continued use.

C. Brake Disc Minimum Thickness

Part Number	"A" in/mm
159-00104	0.225/5.715
159-00204	0.475/12.065
164-00206	See Page 3
164-00300	0.205/5.207
164-00400	0.162/4.115
164-00500	0.157/3.988
164-00700	0.345/8.763
164-00806	0.334/8.484
164-00900	0.227/5.766
164-01000	0.345/8.763
164-01100	0.345/8.763
164-01300	0.227/5.764
164-01406	0.334/8.484
164-01501	0.327/8.306
164-01506	0.327/8.306
164-01600	0.157/3.988
164-01700	0.167/4.242
164-01900	0.227/5.766
164-02000	0.205/5.207
164-02201	0.345/8.763
164-02300	0.345/8.763
164-02501	0.445/11.303
164-02502	0.445/11.303
164-02503	0.445/11.303
164-02504	0.445/11.303
164-02505	0.445/11.303
164-02601	0.205/5.207
164-02700	0.330/8.382
164-02701	0.340/8.636
164-02706	0.330/8.382
164-02707	0.330/8.382
164-02800	0.227/5.766
164-02900	0.580/14.732
164-03006	0.282/7.163
164-03106	0.163/4.140
164-03206	See Page 3
164-03300	0.235/5.969
164-03506	0.260/6.604
164-03600	0.327/8.306
164-03601	0.327/8.306
164-03700	0.345/8.763
164-03906	0.600/15.240
164-04000	0.205/5.207
164-04300	0.205/5.207
164-04406	0.334/8.484
164-04600	0.405/10.287
164-04700	0.345/8.763
164-04800	0.327/8.306
164-05006	0.475/12.065
164-05500	0.492/12.497
164-05606	0.395/10.033
164-05700	0.525/13.335

Part Number	"A" in/mm
164-05806	0.395/10.033
164-06106	0.475/12.065
164-06306	0.465/11.81
164-06406	0.465/11.811
164-06506	0.240/6.096
164-06700	0.220/5.588
164-06900	0.205/5.207
164-07200	0.492/12.497
164-07306	0.395/10.033
164-07400	0.492/12.497
164-07500	0.205/5.207
164-07700	0.470/11.938
164-07800	0.450/11.43
164-07906	0.465/11.811
164-08100	0.450/11.43
164-08200	0.327/8.306
164-08300	0.327/8.306
164-08406	0.330/8.382
164-08500	0.325/8.255
164-08800	0.190/4.826
164-08900	0.330/8.382
164-09000	0.330/8.382
164-09100	0.492/12.497
164-09200	0.190/4.826
164-09300	0.190/4.826
164-09400	0.190/4.826
164-09500	0.325/8.255
164-09600	0.325/8.255
164-09700	0.325/8.255
164-09900	0.275/6.985
164-10500	0.157/3.988
164-10700	0.345/8.763
164-10900	0.227/5.766
164-11501	0.327/8.306
164-11700	0.167/4.242
164-11800	0.162/4.115
164-11900	0.227/5.766
164-12000	0.205/5.207
164-12300	0.345/8.763
164-12501	0.445/11.303
164-12502	0.445/11.303
164-12504	0.445/11.303
164-12505	0.445/11.303
164-12601	0.205/5.207
164-13300	0.235/5.969
164-13600	0.327/8.306
164-13601	0.327/8.306
164-14000	0.205/5.207
164-14300	0.205/5.207
164-14800	0.327/8.306
164-16700	0.220/5.588
164-17500	0.205/5.207
164-18300	0.327/8.306

Part Number	"A" in/mm
164-18800	0.190/4.826
164-18900	0.330/8.382
164-19000	0.330/8.382
164-19200	0.191/4.826
164-19300	0.190/4.826
164-19400	0.190/4.826
164-19500	0.325/8.255
164-19600	0.325/8.255
164-19700	0.325/8.255
164-20100	0.250/6.350
164-20206	0.334/8.484
164-20306	0.465/11.811
164-20500	0.525/13.335
164-20600	0.455/11.557
164-20700	0.410/10.414
164-20806	0.475 /12.065
164-20900	0.410/10.414
164-21000	0.436/11.074
164-21100	0.492/12.497
164-21200	0.327/8.306
164-21406	0.334/8.484
164-21600	0.405/10.287
164-21700	0.475/12.065
164-21900	0.590/14.986
164-22000	0.360/9.144
164-22201	0.537/13.640
164-22202	0.537/13.640
164-22400	0.385/9.779
164-22900	0.410/10.414
164-23000	0.565/14.351
164-23001	0.582/14.783
164-23100	0.345/8.763
164-23300	0.475/12.065
164-23400	0.205/5.207
164-23600	0.190/4.826
164-23900	0.325/8.255
164-24000	0.325/8.255
164-24100	0.325/8.255
164-24200	0.167/4.242
164-24400	0.290/7.366
164-24500	0.327/8.306
164-30007	0.190/4.826
164-30195	0.190/4.826
164-30388	0.325/8.255
164-30398	0.325/8.255
164-30414	0.325/8.255
164-30440	0.190/4.826
164-30615-1	0.190/4.826
164-30615-2	0.330/8.382
164-30615-3	0.330/8.382
164-30804-1	0.190/4.826
164-30804-2	0.330/8.382
164-30804-3	0.330/8.382

D. Chrome Disc Maintenance

The primary purpose of chrome discs is to retard corrosion on the disc flange (rubbing surface) which, if pitted, will wear out linings rapidly. Chrome is a porous material which allows moisture to work its way through the layers and discolor, giving the appearance of corrosion. Discoloration in areas other than the disc rubbing surface should be cleaned with steel wool, then touched up with silver paint. The main area of concern should be the disc flange. As long as it is clean and corrosion-free, the disc will provide the service life designed into it.

The chrome plating will increase the life of a standard disc. When the chrome wears off, which it eventually will, you then have a standard disc to wear down to the minimum thickness. The added benefit is the chrome plating will be intact on the nonrubbing surfaces as opposed to the paint on a standard disc.

E. Assembly/Lining Cross-Reference

This cross-reference identifies the proper brake lining for each of the brake assemblies listed. All linings require conditioning prior to use.

Abbreviations:

Pp = Pressure Plate

Tp = Torque Plate

N/A = Not Available

Bp = Back Plate

Cp = Carrier Plate

Brake Assembly	Lining	Qty
35-200A (30-1)	066-11100	2
C2000 (30-2)	066-00504	2
C7000 (30-3)	066-00504	2
C7000A (30-3A)	066-00504	2
30-4	066-11100	2
30-5	N/A	
30-6	066-11100	2
30-7	066-11160	2
37-200-2 (30-8)	066-10600	8
30-9	066-10600	2
30-9A	066-10600	2
30-9C	066-10600	2
30-9D	066-10600	2
30-9E	066-10600	2
3000-250 (30-12)	066-10600	4
3000-500 (30-13)	066-10600	4
30-18	066-10600	2

Brake Assembly	Lining	Qty
30-19	066-10600	2
30-19A	066-10600	2
30-21	066-10600	4
30-23	066-06500 Pp	2
	066-06200 Bp	2
30-23A	066-06500 Pp	2
	066-06200 Bp	2
30-23B	066-06500 Pp	2
	066-06200 Bp	2
30-23C	066-06500 Pp	2
	066-06200 Bp	2
30-23D	066-06500 Pp	2
	066-06200 Bp	2
30-24	066-10600	4
30-28B	066-03300	6
30-28C	066-03300	6
30-28D	066-03300	6

E. Assembly/Lining Cross-Reference

Brake Assembly	Lining	Qty
30-30	066-10500	2
30-31	066-11700 Tp	4
	066-11900 Cp	4
	066-11800 Bp	4
30-32	N/A	
30-32A	066-10600	4
30-32B	066-10600	4
30-32C	066-10600	4
30-32D	066-10600	4
30-32E	066-10600	4
30-35	066-10600	4
30-40	066-10600	2
30-40A	066-10600	2
30-41	066-10600	4
30-41A	066-10600	4
30-41B	066-10600	4
30-45	066-11100	2
30-51	066-10600	4
30-51A	066-10600	4
30-51B	066-10600	4
30-52	066-10500	4
30-52A	066-10500	4
30-52B	066-10500	4
30-52D	066-10500	4
30-52E	066-10500	4
30-52F	066-10500	4
30-52G	066-10500	4
30-52H	066-10500	4
30-52K	066-10500	4
30-52L	066-10500	4
30-52M	066-10500	4
30-52N	066-10500	4
30-52P	066-10500	4
30-52Q	066-10500	4
30-52S	066-10500	4
30-52T	066-10500	4
30-52U	066-10500	4
30-52V	066-10500	4
30-52W	066-10500	4
30-52X	066-10500	4
30-52Y	066-10500	4
30-53	066-11200	2
30-53A	066-11200	2
30-54	066-10500	4
30-54A	066-10500	4
30-54B	066-10500	4
30-54C	066-10500	4
30-55	066-10500	2
30-55B	066-10500	2
30-56	066-10500	2
30-56A	066-10500	2
30-56B	066-10500	2
30-56C	066-10500	2
30-56D	066-10500	2
30-56F	066-10500	2
30-58A	N/A	

Brake Assembly	Lining	Qty
30-58B	N/A	
30-59	066-11200	2
30-59A	066-11200	2
30-75A	066-10500	2
30-75B	066-10500	2
30-75X	066-10500	2
30-79	066-10500	2
30-79A	066-10500	2
30-79B	066-10500	2
30-83	066-06200	4
30-59D	066-11200	2
30-60	066-10600	4
30-60A	066-10600	4
30-61	066-10500	4
30-61A	066-03600	4
30-61B	066-03600	4
30-61D	066-10500	4
30-61E	066-10500	4
30-61F	066-10500	4
30-63	066-10500	2
30-63A	066-10500	2
30-63B	066-10500	2
30-63D	066-10500	2
30-63E	066-10500	2
30-63F	066-10500	2
30-63J	066-10500	2
30-63K	066-10500	2
30-63M	066-10500	2
30-63P	066-10500	2
30-63Q	066-10500	2
30-63S	066-10500	2
30-65	066-10500	4
30-65A	066-10500	4
30-65E	066-10500	4
30-66	066-04400	4
30-66A	066-11000	4
30-66B	066-11000	4
30-66C	066-02200	4
30-66D	066-02200	4
30-66F	066-04400	4
30-66G	066-09700	4
30-66H	066-02200	4
30-67	066-10800	4
30-67A	066-10800	4
30-67B	066-10800	4
30-67C	066-10800	4
30-67D	066-10800	4
30-67E	066-10800	8
30-67X	066-10800	4
30-68	066-03300	6
30-68A	066-03300	6
30-68B	066-03300	6
30-69A	066-02200	4
30-69B	066-02200	4
37-200A	066-06500 Pp	4
(30-72)	066-06200 Bp	4

E. Assembly/Lining Cross-Reference

Brake Assembly	Lining	Qty
30-74B	066-06700	4
30-75	066-10500	2
30-83A	066-06200	4
30-84	066-10800	8
30-88	066-02200	8
30-89	066-10800	6
30-89A	066-10800	6
30-89B	066-10800	6
30-89C	066-10800	6
30-91	066-11300	12
30-93	066-04400	6
30-93A	066-02200	6
30-93B	066-04400	6
30-93C	066-09700	6
30-93D	066-04400	6
30-93E	066-04400	6
30-94	066-10800	8
30-95	066-03300	8
30-95A	066-06600	8
30-95B	066-06600	8
30-96	066-06200	8
30-97	066-06400	8
30-98	066-10800	12
30-98A	066-10800	12
30-98B	066-10800	12
30-98C	066-10800	12
30-98D	066-10800	12
30-99	066-06600	8
30-99A	066-06600	8
30-100	066-06600	8
30-103	066-11300	16
30-106	066-06800	16
30-107	066-09000	8
30-107A	OR-09000	8
30-107B	066-09000	8
30-107C	066-09000	8
30-107D	066-09000	8
30-111	066-10800	8
30-113	066-06400	8
30-113A	066-06400	8
30-123	066-06800	12
30-127	066-06200	4
30-127A	066-06200	4
30-127C	066-06200	4
30-127D	066-06200	4
30-129	066-06200	4
30-131	066-09000	8
30-133	066-10500	2
30-138	066-06800	6
30-139	066-06200	8
30-141	066-07300	8
30-142	066-07300	8
30-143	066-07300	8
30-144	066-09000	8
30-144A	066-09000	8
30-144B	066-09000	8
30-145	066-09700	6

Brake Assembly	Lining	Qty
30-146	066-09100 Pp	2
	066-09200 Bp	2
30-146A	066-09100 Pp	2
	066-09200 Bp	2
30-148	066-11300	16
30-149	066-06600	12
30-158	066-06800	8
30-159	066-09000	8
30-159A	066-09000	8
30-159B	066-09000	8
30-159C	066-09000	8
30-163	066-03300	8
30-164	066-06200	2
30-170	066-10000	8
30-176	066-10800	4
30-181 A	066-10600	2
30-182	066-03300	8
30-184	066-10800	8
30-195	066-10800	4
30-195A	066-10800	4
30-208	N/A	
30-208A	066-12901	2
30-210	066-13100	16
30-214	066-10500	2
30-214B	066-10500	2
30-220	066-13500 Pp	2
	066-13700 Bp	2
30-224	066-10500	2
30-231	066-06600	12
30-233	066-06200	4
30-236	066-10500	2
30-239	066-14100	2
30-239A	066-14100	2
30-241	066-10500	4
C-30018	066-30026	2
C-30018-1	066-30026	2
C-30018-2	066-30026	2
C-30018-3	066-30026	2
C-30018-4	066-30026	2
C-30018-5	066-30026	2
C-30018-6	066-30026	2
C-30018-7	066-30026	2
D-30118-3	066-30026	4
D-30118-4	066-30026	4
D-30118-5	066-30026	4
D-30118-6	066-30026	4
D-30118-7	066-30026	4
D-30118-8	066-30026	4
D-30118-9	066-30026	4
D-30118-1	066-30026	4
C-30764-5	066-30026	2
C-30764-6	066-30026	2
C-30764-7	066-30026	2
D-30793-3	066-30026	4
D-30793-4	066-30026	4
D-30793-5	066-30026	4
D-30793-6	066-30026	4

F. Wheel Assembly Torque Values

All wheel assembly tie bolt and nut torque values listed are to be applied to the nut only. A “D” shown adjacent to the torque value indicates the value to be a “Dry” torque only. An “L” shown adjacent to the torque value indicates the value to be a “Lubtork” value. “Lubtork” requires the application of an antiseize compound conforming the MIL-T-5544 to all friction surfaces, prior to torquing.

CAUTION: Do not “Lubtork” any bolt and nut combinations that are specified as a “Dry” torque value. If there is any conflict or question regarding dry torque, Lubtork or torque value on your assembly, please contact Cleveland Customer Support for resolution.

Wheel Assembly	Bolt Torque	
	in-lb	N•m
27-100D (40-1)	90 D	10.2
21-100D (40-2)	90 D	10.2
3080A (40-3)	90 D	10.2
3080B (40-4)	90 D	10.2
3070 (40-5)	90 D	10.2
3040 (40-6)	90 D	10.2
3050 (40-7)	90 D	10.2
3050A (40-7A)	90 D	10.2
38501 (40-8)	90 D	10.2
40-12	90 D	10.2
40-12A	90 D	10.2
40-18	90 D	10.2
40-19	90 D	10.2
40-19A	90 D	10.2
40-21	90 D	10.2
40-24	90 D	10.2
40-28	90 D	10.2
40-28D	90 D	10.2
40-30A	90 D	10.2
40-32	90 D	10.2
40-34	90 D	10.2
40-37	90 D	10.2
40-40A	135-145 D	15.3-16.4
40-40B	135-145 D	15.3-16.4
40-40C	90 D	10.2
40-40D	150 D	16.9
40-41	150 D	16.9
40-46	90 D	10.2
40-47	150 D	16.9
40-50	90 D	10.2
40-55	90 D	10.2
40-56	150 D	16.9
40-56B	150 D	16.9
40-56C	150 D	16.9
40-57	90 D	10.2
40-57A	90 D	10.2
40-58	90 D	10.2
40-59	150 D	16.9
40-59A	150 D	16.9

Wheel Assembly	Bolt Torque	
	in-lb	N•m
40-59D	150 D	16.9
40-59E	150 D	16.9
40-60	90 D	10.2
40-60A	90 D	10.2
40-61	90 D	10.2
40-66	90 D	10.2
40-67	90 D	10.2
40-74	90 D	10.2
40-74A	90 D	10.2
40-74B	90 D	10.2
40-75B	150 D	16.9
40-75D	150 D	16.9
40-75E	150 D	16.9
40-75F	150 D	16.9
40-75G	150 D	16.9
40-75H	150 D	16.9
40-75J	150 D	16.9
40-75S	150 D	16.9
40-75T	150 D	16.9
40-75W	150 D	16.9
40-76A	150 D	16.9
40-76B	150 D	16.9
40-76C	150 D	16.9
40-76D	150 D	16.9
40-76E	150 D	16.9
40-76F	150 D	16.9
40-76G	150 D	16.9
40-76H	150 D	16.9
40-76-1	150 D	16.9
40-77	90 D	10.2
40-77A	90 D	10.2
40-77B	90 D	10.2
40-77C	90 D	10.2
40-77D	90 D	10.2
40-77E	90 D	10.2
40-77F	90 D	10.2
40-77G	90 D	10.2
40-78	90 D	10.2
40-78A	90 D	10.2

F. Wheel Assembly Torque Values

Wheel Assembly	Bolt Torque	
	in-lb	N•m
40-78B	90 D	10.2
40-78E	95 D	10.7
40-79A	150 D	16.9
40-83	150 D	16.9
40-83A	150 D	16.9
40-83B	150 D	16.9
40-84	150 D	16.9
40-84A	150 D	16.9
40-86	150 D	16.9
40-86A	150 D	16.9
40-86B	150 D	16.9
40-86E	150 D	16.9
40-87	90 D	10.2
40-87A	90 D	10.2
40-87C	90 D	10.2
40-87D	90 D	10.2
40-87F	90 D	10.2
40-87G	115-135 D	13.0-15.3
40-88C	150 D	16.9
40-90	150 D	16.9
40-90A	150 D	16.9
40-90B	150 D	16.9
40-90D	150 D	16.9
40-90E	150 D	16.9
40-90F	150 D	16.9
40-96E	150 D	16.9
40-97A	150 D	16.9
40-97B	150 D	16.9
40-97C	150 D	16.9
40-97D	150 D	16.9
40-97E	150 D	16.9
40-97F	150 D	16.9
40-98	150 D	16.9
40-98A	150 D	16.9
40-98D	150 D	16.9
40-98E	150 D	16.9
40-98F	150 D	16.9
40-98G	150 D	16.9
40-98H	150 D	16.9
40-98N	150 D	16.9
40-98P	150 D	16.9
40-99	90 D	10.2
40-101	90 D	10.2
40-101A	90 D	10.2
40-101D	90 D	10.2
40-101E	90 D	10.2
40-102	90 D	10.2
40-102A	90 D	10.2
40-103	90 D	10.2
40-103A	90 D	10.2
40-106	150 D	16.9
40-106A	150 D	16.9
40-107A [A5-3]	300 L	33.9
40-110	90D	10.2
40-110B	90D	10.2
40-111	150 D	16.9

Wheel Assembly	Bolt Torque	
	in-lb	N•m
40-111A	150 D	16.9
40-112	90 D	10.2
40-113	90 D	10.2
40-113A	90 D	10.2
40-113B	90 D	10.2
40-113C	90 D	10.2
40-113X	90 D	10.2
40-115	90 D	10.2
40-115A	115-135 D	13.0-15.3
40-115B	115-135 D	13.0-15.3
40-115C	115-135 D	13.0-15.3
3080D (40-116)	90 D	10.2
40-117A	150 D	16.9
40-120	150 D	16.9
40-120A	150 D	16.9
40-120C	150 D	16.9
40-124	180 D	20.3
40-127	180 L	20.3
40-128	180 D	20.3
40-128A	180 D	20.3
40-128C	180 D	20.3
40-128D	180 D	0
40-128E	180 D	20.3
40-129	90 D	10.2
40-130	90 D	10.2
40-131	90 D	10.2
40-132 [A5-1]	150 D	16.9
40-133	150 D	16.9
40-134 [A5-2]	150 D	16.9
40-134A [A5-2]	150 D	16.9
40-135	90 D	10.2
40-135A	150 D	16.9
40-137	180 D	20.3
40-138A	150 D	16.9
40-139	150 D	16.9
40-140	150 D	16.9
40-140A	150 D	16.9
40-140B	150 D	16.9
40-140C	150 D	16.9
40-141	150 D	16.9
40-142	150 D	16.9
40-142A	150 D	16.9
40-143	150 D	16.9
40-148 [A5-3]	300 D	33.9
40-151	90 D	10.2
40-151A	90 D	10.2
40-152	90 D	10.2
40-162	150 D	16.9
40-163	150 D	16.9
40-166 [A5-1]*	300 D	33.9
40-167*	300 D	33.9
40-168	90 D	10.2
40-169 [A5-1]*	150 D	16.9
40-170 (A5-3)	300 L	33.9
40-170A [A5-3]	300 L	33.9

*Dry torque brake disc bolts to 150 in-lb

F. Wheel Assembly Torque Values

Wheel Assembly	Bolt Torque	
	in-lb	N•m
40-170B [A5-3]	300 L	33.9
40-171	180 D	20.3
40-172	180 D	20.3
40-174	300 L	33.9
40-175	150 D	16.9
40-176 [A5-1]	300 D	33.9
40-176A [A5-1]	300 D	33.9
40-177A	150 D	16.9
40-179	150 D	16.9
40-181B [A5-1]	180 D	20.3
40-181C [A5-1]	180 D	20.3
40-193	150 D	16.9
40-195	150 D	16.9
40-196	90 D	10.2
40-198 [A5-3]	300 L	33.9
40-199	90 D	10.2
40-199A	90 D	10.2
40-202 [A5-1]	300 L	33.9
40-203 [A5-4]	290-300 L	32.8-33.9
40-204 [A5-4]	290-300 L	32.8-33.9
40-205 [A5-1]	180 D	20.3
40-210 [A5-1]	150 D	16.9
40-211 [A5-3]	300 D	33.9
40-21101 [A5-3]	300 L	33.9
40-212 [A5-1]	150 D	16.9
40-223	90 D	10.2
40-230	90 D	10.2
40-234	90 D	10.2
40-239 [A5-6]	300 L	33.9
40-23901 [A5-6]	300 L	33.9
40-240A [A5-6]	125 L	14.1
40-255 [A5-1]	90-100 D	10.2-11.3
40-256	135-145 D	15.3-16.4
40-258	300 D	33.9
40-259 [A5-1]	95-105 L	10.7-11.8
40-260 [A5-1]	95-105 L	10.7-11.8
40-262A [A5-6]	90 D	10.2
40-270 [A5-6]	115-135 L	13.0-15.3
40-273 [A5-5]	300 L	33.9
40-273A [A5-4]	290-300 L	32.8-33.9
40-276 [A5-6]	90-100 L	10.2-11.3
40-279 [A5-3]	300 L	33.9

Wheel Assembly	Bolt Torque	
	in-lb	N•m
40-281	90 D	10.2
40-289 [A5-1]	300 L	33.9
40-293 [A5-6]	180-190 L	20.3-21.5
40-403	150D	16.9
40-406	150 D	16.9
40-406A	150 D	16.9
40-407	150 D	16.9
40-414	150 D	16.9
40-414A	150 D	16.9
40-418	150 D	16.9
C-30174-1	95 D	10.7
C-30179	95 D	22.0
D-30204	95 D	10.7
D-30255	195 D	22.0
D-30260	195 D	22.0
D-30260-1	195 D	22.0
D-30291-1	195 D	22.0
D-30291-2	195 D	22.0
D-30291-3	195 D	22.0
D-30291-4	195 D	22.0
D-30291-5	195 D	22.0
D-30291-6	195 D	22.0
D-30380	95 D	10.7
C-30480	195 D	22.0
D-30500	145 D	16.4
D-30500-1	145 D	16.4
D-30570	195 D	22.0
D-30580	195 D	22.0
D-30585	195 D	22.0
D-30660-1	145 D	16.4
D-30660-2	145 D	16.4
D-30660-3	145 D	16.4
D-30660-4	145 D	16.4
D-30660-5	145 D	16.4
D-30660-6	145 D	16.4
D-30660-7	145 D	16.4
D-30660-8	145 D	16.4
D-30660-9	145 D	16.4
D-30660-10	145 D	16.4
D-30665	145 D	16.4
D-30665-1	145 D	16.4

[A5-#] Code for inflation valve stem torque. See appropriate dash number, #, in Table below for torque value.

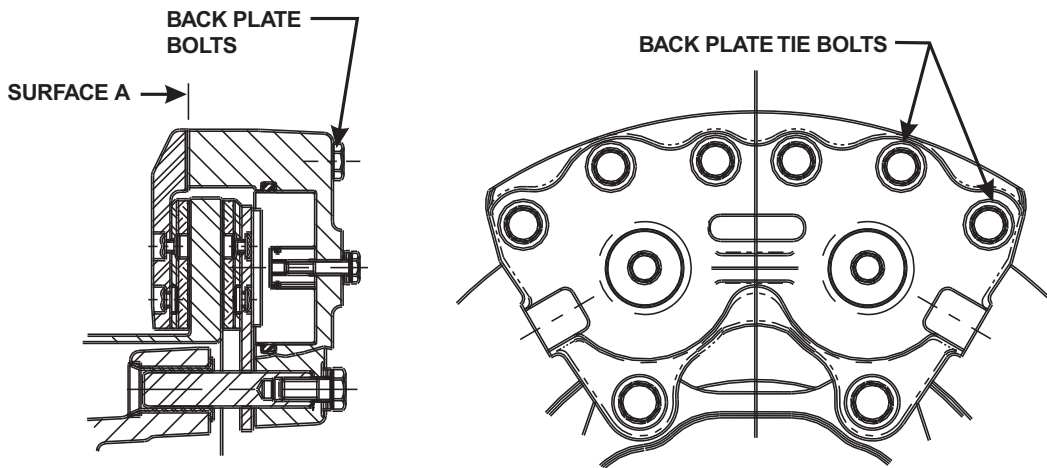
G. Tire Inflation Valve Stem Torque

Dash No.	Inflation Valve P/N	Recommended Torque	
		in-lb	N•m
A5-1	160-00700	50-60	5.7-6.8
A5-2	160-00900	165-200	18.7-22.6
A5-3	160-01100	75-100	8.4-11.3
A5-4	160-01200	35-45	4.0-5.1
A5-5	160-01500	70-80	7.9-9.0
A5-6	160-01900	50-60	5.7-6.8

H. Back Plate Tie Bolt Torque

A “D” shown adjacent to the torque value indicates the value to be a “Dry” torque only. An “L” shown adjacent to the torque value indicates a “Lubtork” torque only. Apply an antiseize compound conforming to MIL-T-5544 to all friction surfaces. Overtorquing (exceeding these values) could cause depressions in the brake cylinder, which result in dragging or bound up brakes. Use a torque wrench when installing back plate tie bolts to insure the proper torquing values are attained. Replace the back plate tie bolts with approved bolts as shown in the Cleveland Product Catalog. Depressions in the brake cylinder (surface A) exceeding 0.005 inch (0.127 mm) deep require replacement of the brake cylinder.

Figure A3 – Back Plate Tie Bolts



Brake Assembly	Bolt Torque	
	in-lb	N•m
35-200A (30-1)	60 D	6.8
30-4	60 D	6.8
30-5	60 D	6.8
30-6	60 D	6.8
30-7	60 D	6.8
37-200-2 (30-8)	90 D	10.2
30-9	75-80 D	8.5-9.0
30-9A	75-80 D	8.5-9.0
30-9C	75-80 D	8.5-9.0
30-9D	75-80 D	8.5-9.0
30-9E	75-80 D	8.5-9.0
3000-250 (30-12)	90 D	10.2
3000-500 (30-13)	90 D	10.2
30-18	90 D	6.8
30-19	75-80 D	8.5-9.0
30-19A	75-80 D	8.5-9.0

Brake Assembly	Bolt Torque	
	in-lb	N•m
30-21	65-75 D	7.3-8.5
30-23	65-75 D	7.3-8.5
30-23A	65-75 D	7.3-8.5
30-23B	65-75 D	7.3-8.5
30-23C	65-75 D	7.3-8.5
30-23D	65-75 D	7.3-8.5
30-24	65-75 D	7.3-8.5
30-28B	80-90 D	9.0-10.2
30-28C	80-90 D	9.0-10.2
30-28D	80-90 D	9.0-10.2
30-30	90 D	10.2
30-31	85-90 D	9.6-10.2
30-32	65-75 D	7.3-8.5
30-32A	65-75 D	7.3-8.5
30-32B	65-75 D	7.3-8.5

H. Back Plate Tie Bolt Torque

Brake Assembly	Bolt Torque	
	in-lb	N•m
30-32C	65-75 D	7.3-8.5
30-32E	65-75 D	7.3-8.5
30-35	65-75 D	7.3-8.5
30-40	60 D	6.80
30-40A	75-80 D	8.5-9.0
30-41	65-75 D	7.3-8.5
30-41A	90 D	10.2
30-41B	65-75 D	7.3-8.5
30-45	60 D	6.8
30-51	65-75 D	7.3-8.5
30-51A	65-75 D	7.3-8.5
30-51B	65-75 D	7.3-8.5
30-52	90 D	10.2
30-52A	90 D	10.2
30-52B	90 D	10.2
30-52D	90 D	10.2
30-52E	90 D	10.2
30-52F	90 D	10.2
30-52G	90 D	10.2
30-52H	90 D	10.2
30-52K	90 D	10.2
30-52L	75-80 D	8.5-9.0
30-52M	90 D	10.2
30-52N	90 D	10.2
30-52P	90 D	10.2
30-52Q	90 D	10.2
30-52S	90 D	10.2
30-52T	90 D	10.2
30-52U	90 D	10.2
30-52V	90 D	10.2
30-52W	90 D	10.2
30-52X	90 D	10.2
30-52Y	90 D	10.2
30-53	75-80 D	8.5-9.0
30-53A	75-80 D	8.5-9.0
30-54	90 D	10.2
30-54A	90 D	10.2
30-54B	90 D	10.2
30-54C	85-90 D	9.6-10.2
30-55	75-80 D	8.5-9.0
30-55A	75-80 D	8.5-9.0
30-55B	75-80 D	8.5-9.0
30-56	75-80 D	8.5-9.0
30-56A	90 D	10.2
30-56B	75-90 D	8.5-10.2
30-56C	75-80 D	8.5
30-56D	75-80 D	8.5-9.0
30-56F	75-80 D	8.5-9.0
30-58A	75-80 D	8.5-9.0
30-58B	75-80 D	8.5-9.0
30-59	75-80 D	8.5-9.0
30-59A	75-80 D	8.5-9.0
30-59D	75-80 D	8.5-9.0
30-60	75-80 D	8.5-9.0
30-60A	65-75 D	7.3-8.5
30-61	90 D	10.2
30-61A	90 D	10.2
30-61B	65-75 D	7.3-8.5

Brake Assembly	Bolt Torque	
	in-lb	N•m
30-61D	90 D	10.2
30-61E	90 D	10.2
30-61F	90 D	10.2
30-63	75-80 D	8.5-9.0
30-63A	75-80 D	8.5-9.0
30-63B	75-80 D	8.5-9.0
30-63D	75-80 D	8.5-9.0
30-63E	75-80 D	8.5-9.0
30-63F	75-80 D	8.5-9.0
30-63J	75-80 D	8.5-9.0
30-63K	75-80 D	8.5-9.0
30-63M	75-80 D	8.5-9.0
30-63P	75-80 D	8.5-9.0
30-63Q	75-80 D	8.5-9.0
30-63S	75-80 D	8.5-9.0
30-65	75-90 D	8.5-10.2
30-65A	75-90 D	8.5-10.2
30-66	90 D	10.2
30-66A	90 D	10.2
30-66B	90 D	10.2
30-66C	90 D	10.2
30-66D	90 D	10.2
30-66F	90 D	10.2
30-66G	80-90 D	9.0-10.2
30-66H	75-90 D	8.5-10.2
30-67	85-90 D	9.6-10.2
30-67A	85-90 D	9.6-10.2
30-676	85-90 D	9.6-10.2
30-67C	85-90 D	9.6-10.2
30-67D	85-90 D	9.6-10.2
30-67E	85-90 D	9.6-10.2
30-67X	85-90 D	9.6-10.2
30-68	75-80 D	8.5-9.0
30-68A	75-80 D	8.5-9.0
30-68B	75-80 D	8.5-9.0
30-69A	90 D	10.2
30-69B	90 D	7.3-8.5
37-200A (30-72)	65-70 D	7.3-7.9
30-74B	60-75 D	6.8-8.5
30-75	75-80 D	8.5-9.0
30-75A	75-80 D	8.5-9.0
30-75B	75-80 D	8.5-9.0
30-75X	75-80 D	8.5-9.0
30-79	90 D	10.2
30-79A	90 D	10.2
30-79B	90 D	10.2
30-83	90 D	10.2
30-83A	90 D	10.2
30-84	80-90 D	9.0-10.2
30-88	75-80 D	8.5-9.0
30-89	80-90 D	9.0-10.2
30-89A	80-90 D	9.0-10.2
30-89B	80-90 D	9.0-10.2
30-89C	80-90 D	9.0-10.2
30-93	80-90 D	9.0-10.2
30-93A	80-90 D	9.0-10.2
30-93B	80-90 D	9.0-10.2
30-93C	80-90 D	9.0-10.2

H. Back Plate Tie Bolt Torque

Brake Assembly	Bolt Torque	
	in-lb	N•m
30-93D	80-90 D	9.0-10.2
30-93E	90-100 D	10.2-11.3
30-94	80-90 D	9.0-10.2
30-95	60 D	6.8
30-95A	60 D	6.8
30-95B	60 D	6.8
30-96	60 D	6.8
30-97	80-90 D	9.0-10.2
30-98	80-90 D	9.0-10.2
30-98A	80-90 D	9.0-10.2
30-98B	80-90 D	9.0-10.2
30-98C	80-90 D	9.0-10.2
30-98D	80-90 D	9.0-10.2
30-99	75-80 D	8.5-9.0
30-99A	75-80 D	8.5-9.0
30-100	75-80 D	8.5-9.0
30-106	80-90 D	9.0-10.2
30-107	85-90 D	9.6-10.2
30-107A	85-90 D	9.6-10.2
30-107B	85-90 D	9.6-10.2
30-107C	85-90 D	9.6-10.2
30-107D	85-90 D	9.6-10.2
30-111	80-90 D	9.0-10.2
30-113	80-90 D	9.0-10.2
30-113A	80-90 D	9.0-10.2
30-123	80-90 D	9.0-10.2
30-127	90 D	10.2
30-127A	90 D	10.2
30-127C	90 D	10.2
30-127D	90 D	10.2
30-129	75-90 D	8.5-10.2
30-131	80-90 D	9.0-10.2
30-133	75-80 D	8.5-9.0
30-138	80-90 D	9.0-10.2
30-139	75-80 D	85.9
30-141	150 D	16.9
30-142	150 D	16.9
30-143	150 D	9.6-10.2
30-144	85-90 D	9.6-10.2
30-144A	85-90 D	9.6-10.2
30-144B	85-90 D	9.6-10.2
30-145	80-90 D	9.6-10.2
30-146	85-90 D	9.6-10.2
30-146A	85-90 D	9.6-10.2
30-149	80-90 D	9.0-10.2
30-158	80-90 D	9.0-10.2
30-159	85-90 D	9.6-10.2

Brake Assembly	Bolt Torque	
	in-lb	N•m
30-159A	85-90 D	9.6-10.2
30-159B	85-90 D	9.6-10.2
30-159C	85-90 D	9.6-10.2
30-163	85-90 D	9.6-10.2
30-164	75-80 D	8.5-9.0
30-170	80-85 L	9.0-9.6
30-176	85-90 D	9.6-10.2
30-181A	75-80 D	8.5-9.0
30-182	85-90 D	9.6-10.2
30-184	80-90 D	9.0-10.2
30-195	85-90 D	9.6-10.2
30-195A	85-90 D	9.6-10.2
30-210	80-85 L	9.0-9.6
30-214	75-80 D	8.5-9.0
30-214B	75-80 D	8.5-9.0
30-220	85-90 D	9.6-10.2
30-224	75-80 D	8.5-9.0
30-231	80-90 D	9.0-10.2
30-233	60-95 D	6.8-10.7
30-236	75-80 D	8.5-9.0
30-239	75-80 D	8.5-9.0
30-239A	75-80 D	8.5-9.0
30-241	90 L	10.2
C-30018	120-130 D	13.6-14.7
C-30018-1	120-130 D	13.6-14.7
C-30018-2	120-130 D	13.6-14.7
C-30018-3	120-130 D	13.6-14.7
C-30018-4	120-130 D	13.6-14.7
C-30018-5	120-130 D	13.6-14.7
C-30018-6	120-130 D	13.6-14.7
C-30018-7	120-130 D	13.6-14.7
D-30118-3	100-110 D	11.3-12.4
D-30118-4	100-110 D	11.3-12.4
D-30118-5	100-110 D	11.3-12.4
D-30118-6	100-110 D	11.3-12.4
D-30118-7	100-110 D	11.3-12.4
D-30118-8	100-110 D	11.3-12.4
D-30118-9	100-110 D	11.3-12.4
D-30118-10	100-110 D	11.3-12.4
C-30764-5	120-130 D	13.6-14.7
C-30764-6	120-130 D	13.6-14.7
C-30764-7	120-130 D	13.6-14.7
D-30793-3	100-110 D	11.3-12.4
D-30793-4	100-110 D	11.3-12.4
D-30793-5	100-110 D	11.3-12.4
D-30793-6	100-110 D	11.3-12.4

I. Special Tools

Item	Part Number	Description
Rivet Set Kit	199-1	Consists of Punch & Anvil
Parker O-Ring Extractor Kit	199-18	Consists of Multi-hook, Multi-ramp & Case
Brake Line Bleeder	087-00500	The brake line bleeder can be used to service all Cleveland products hydraulic brake assemblies or any other brake assembly utilizing the 079-00300 (FC6446) Bleeder Screw.

J. Elastomeric Compound Lubricants

- Pneumatic Applications -** Grease per MIL-G-4343
Dow Corning 55 O-Ring
Lubricant Compound
- Hydraulic Applications -** Use fluids compatible with the system
MIL-H-5606 / MIL-H-83282 (Red Oils)
- Skydrol – Only compatible with itself

K. Lubricants

- Wheel Bearings -** Grease per MIL-G-81322
Aeroshell 22
Mobil 28
- Amphibious Applications
HCF Grease P/N 605 – BG Products,
Wichita, KS
- Wheel Tie Bolts/Nuts -** Antiseize per MIL-T-5544
Lubtork – W.J. Ruscoe Co., Akron, OH
- Pipe Threads -** Apply to first 3 threads of brake cylinder
inlet fittings
Lubon #404 – Oil Center Research,
Lafayette, LA

L. Repair Materials

- Aluminum -** Conversion Coating per MIL-C-5541,
Class 1A, (Alodine)
- Magnesium -** Surface Pretreatment per MIL-M-3171
Type III (Dip), Type VI (Brush On) or
Type VIII (Dip)
IRIDITE 15, MacDermid Inc.,
Waterbury, CT (800-325-4158)

M. Primers and Paints

Gray Primer -	Columbia Paint Corporation (Huntington, WV) P/N 11-347Z
Dark Gray Primer -	Columbia Paint Corporation P/N 12-231A (For use on brake discs only)
White Paint -	Columbia Paint Corporation P/N 524 Gloss White II-358A
Silver Paint -	Columbia Paint Corporation P/N 524 Aluminum (7175) 12-3601
Cold Galvanizing - Compound	ZRC Products (Quincy, MA) Galvilite Galvanizing Compound (per MIL-P-26915A) P/N 11011-10014

N. Chemical Stripping Agents

Magnesium -	Spray or brush on application – Turco Products, Water Based Environmentally Advantaged Paint Remover P/N T-6813 or P/N T-6840S (for alloys AZ81 and AZ91)
Magnesium -	Tank type stripping application – Turco Products, Diphase Hot Tank Paint Remover P/N T-5668 (for alloys AZ81 and AZ91)

Cleveland

Wheels & Brakes



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