

ENGINEERING MEMO #226

TO: Memo Distribution

FROM: S. Hori

SUBJECT: REVISION TO CHANGE THE TAXICAB AND PASSENGER CAR DRUM BRAKES FROM WAGNER ELECTRIC BRAKES TO DELCO MORaine BRAKES AND INCORPORATE FRONT DISC BRAKE OPTION FOR TAXICABS AND PASSENGER CARS

1. Effective as soon as possible and with a minimum of obsolescence, a change will be made to the Delco Moraine Drum Brakes as standard equipment, with Delco Moraine Front Disc Brakes as optional equipment, on all models except Aerobus. (Power Brakes will be a required option when Front Disc Brake Option is used.)
2. Both the Wagner Electric "VA" brake and "C" brake will be replaced by the Delco Moraine Drum Brake.
3. The following are the basic changes to be made:
 - a. New steering knuckle and steering arms will be required.
 - b. New front hub and drum assemblies and rear drum assemblies will be required.
 - c. New rear axles with flanged shafts will be required.
 - d. New wheels with a 5" dia. bolt circle will be required.
 - e. New front suspension lower ball joints will be required.
4. Production will use up all the old style rear axle assemblies as soon as possible.
 - a. The (50) rear axle assemblies and related parts originally set aside for Israel Diesel Jobs will be used up at once on regular production cars.
 1. All future Israel Diesel Jobs will be equipped with the new axles and related parts.
 - b. The (28) Rail Car Rail Axles will be returned to the vendor for salvage value and the related parts originally set aside should be used on regular production cars.
 - c. In order to use up without obsolescence the (52) 3.73 old style axles on hand it has been decided to set aside sufficient quantities of steering knuckles, brakes and other related items.
5. Following is a complete list of parts to be affected:

ITEM	NAME	B OF M	OLD PART NUMBER	NEW PART NUMBER	I	A	REMARKS
1.	Knuckle-Steering (Forging)	B	94349	704449	NO	YES	Service
2.	Knuckle-Steering (Mach.)	M	94349	704450	NO	YES	Service
3.	Arm-Strg. (Forging)LH	B	702823	704417	NO	YES	Aerobus
4.	Arm-Strg. (Forging)RH	B	702824	704418	NO	YES	Aerobus

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ITEM	NAME	B or M	OLD PART NUMBER	NEW PART NUMBER	I	A	REMARKS
5.	Arm-Strg. (Mach.) LH	M	702735	704423	NO	YES	Aerobus
6.	Arm-Strg. (Mach.) RH	M	702736	704424	NO	YES	Aerobus
7.	Brkt.-Lwr. Ball Stud (Forging)	B	-----	704419	NO	YES	New Part
8.	Brkt.-Lwr. Ball Stud (Mach.)	M	-----	704425	NO	YES	New Part
9.	Joint Assem.-Ball Lower	B	92306	703305	NO	YES	Aerobus
10.	Brake Assem.-Frt. VA LH	B	703191	703341	NO	YES	Service
11.	Brake Assem.-Frt. VA RH	B	703192	703342	NO	YES	Service
12.	Brake Assem.-Rear VA LH	B	703193	703343	NO	YES	Service
13.	Brake Assem.-Rear VA RH	B	703194	703344	NO	YES	Service
14.	Brake Assem.-Frt. C LH	B	701915	703341	NO	YES	Service
15.	Brake Assem.-Frt. C RH	B	701916	703342	NO	YES	Service
16.	Brake Assem.-Rear C LH	B	701613	703343	NO	YES	Service
17.	Brake Assem.-Rear C RH	B	701614	703344	NO	YES	Service
18.	Caliper A.-Frt. Disc Brake LH	B	-----	703345	NO	YES	New Part
19.	Caliper A.-Frt. Disc Brake RH	B	-----	703346	NO	YES	New Part
20.	Brkt. A.-Frt. Disc Brake LH	B	-----	703347	NO	YES	New Part
21.	Brkt. A.-Frt. Disc Brake RH	B	-----	703348	NO	YES	New Part
22.	Shield A.-Splash LH	B	-----	703349	NO	YES	New Part
23.	Shield A.-Splash RH	B	-----	703350	NO	YES	New Part
24.	Hub & Drum Assem.-Front	B	701592	703351	NO	YES	Service
25.	Hub & Drum Assem.-Rear	B	701593	703352	NO	YES	Service
26.	Hub & Rotor Assem.-Frt.	B	-----	703353	NO	YES	New Part
27.	Wheel A.-15 x 6, 5 Hole, 5 B.C.	B	701360	703354	NO	YES	Service
28.	Axle A.-Rear (3.31:1)	B	97310	703355	NO	YES	Service
29.	Axle A.-Rear (3.31:1) PL	B	97311	703356	NO	YES	Service
30.	Axle A.-Rear (3.54:1)	B	97312	703357	NO	YES	Service
31.	Axle A.-Rear (3.54:1) PL	B	97313	703358	NO	YES	Service
32.	Axle A.-Rear (3.73:1)	B	97314	703359	NO	YES	Service
33.	Axle A.-Rear (3.73:1) PL	B	97315	703360	NO	YES	Service
34.	Axle A.-Rear (3.31:1) RC	B	701530	-----	NO	YES	Use
35.	Axle A.-Rear (3.73:1) RC	B	701531	-----	NO	YES	Use
36.	Axle A.-Rear (3.31:1) RC PL	B	701532	-----	NO	YES	Use
37.	Axle A.-Rear (3.73:1) RC PL	B	701533	-----	NO	YES	Use

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ITEM	DESCRIPTION	B OF M	OLD PART NUMBER	NEW PART NUMBER	I	A	REMARKS
38.	Ball Joint A.-Frt.Susp.Upr.	B	92305	703362	YES	YES	Use
39.	Retainer-Frt.Wheel Grease	B	94375	-----	NO	YES	Aerobus
40.	Seal-Frt.Wheel Grease	B	94415	703361	NO	YES	Service
41.	Gasket-Grease Retainer	B	-----	704459	NO	YES	New Part
42.	Cone Assem.-Frt.Wheel Brg.-In.	B	94367	96174	NO	YES	Service
43.	Bolt - 9/16-18 x 2-1/2 Type AA Hex. Lock	B	-----	626815	NO	YES	New Part
44.	Bolt-Brake Anchor	B	-----	626816	NO	YES	New Part
45.	Bolt - 1/2-20 x 2-1/4 Hex.Hd.	B	181707	626817	NO	YES	Reduce Use
46.	Bolt - 3/8-24 x 1-1/4 Hex.Hd.	B	181639	181696	NO	YES	Reduce Use
47.	Lockwasher-3/8 Med.Spring	B	186417	-----	NO	YES	Reduce Use
48.	Nut - 3/8-20 Hex.	B	120369	-----	NO	YES	Reduce Use
49.	Nut - 1/2-20 Hex.Top Lock	B	96290	-----	NO	YES	Reduce Use
50.	Lockwasher-1/2 Heavy Spring	B	131101	-----	NO	YES	Reduce Use
51.	Spring-Frt.Chev.C	B	702327	704460	NO	YES	Service
52.	Tie Rod Assem.	B	701555	701010	NO	YES	Aerobus
53.	Cable A.-Park.Brake Rear 120 WB.	B	93954	703444	NO	YES	Service
54.	Key-Rear Hub	B	80294	-----	NO	YES	Service
55.	Washer-Rear Spindle	H	80029	-----	NO	YES	Service
56.	Caster Pin - 1/8 x 1-3/4	B	103388	-----	NO	YES	Service
57.	Hub Fitting - 1/8 Type CC	B	191758	-----	NO	YES	Service
58.	Gasket-Rear Brake Oil Seal	B	94382	-----	NO	YES	Service
59.	Ret.R.-Rear Brake Oil Seal	B	95051	-----	NO	YES	Service
60.	Kamp A.-Rear Brake Cable	H	92606	-----	NO	YES	Service
61.	Spnc.-Rear Brake Cable Kamp	M	92607	-----	NO	YES	Service

ENGINEERING MEMO #226 (Cont'd.)

ITEM	NAME	E O R M	OLD PART NUMBER	NEW PART NUMBER	I	A	REMARKS
62.	Ramp-Rear Brake Cable	M	92608	-----	NO	YES	Service
63.	Cont.Arm A.-Lwr.Comp. LH	M	92313	703363	NO	YES	Rework or Service
64.	Cont.Arm A.-Lwr.Comp. RH	M	92312	703364	NO	YES	Rework or Service
65.	Arm & Joint A.- Steering	M	-----	703367 703368	NO	YES	New Part
66.	Knuckle, Brake & Drum A.- Frt.	M	-----	703365 703366	NO	YES	New Part
67.	Knuckle & Disc Brake A.-Frt.	M	-----	703369 703370	NO	YES	New Part
68.	Nut-Steering Knuckle	B	98120	-----	YES	YES	Revise Use
69.	Cable A.-Parking Brake Rr. 129WB	B	97500	703445	NO	YES	Service
70.	Clamp-Parking Brake Cable Rr. Guide RH/LH	B	92604 92605	704559	NO	YES	Service
71.	Felt-Park.Brake Cable Anchor	B	-----	704560	YES	YES	New Part
72.	Hose Assem.-Brake-Front	B	703251	-----	NO	YES	Service
73.	Hose Assem.-Brake-Front	B	701455	-----	NO	YES	Increase Usage
74.	Gasket-Hose	B	94411	-----	NO	YES	Reduce Usage
75.	Gasket-Brake Hose Front	B	23138	-----	NO	YES	Increase Usage
76.	Hose Assem.-Brake	B	-----	703453	NO	YES	New Part
77.	Fitting-Brake Hose Bolt	B	-----	704568	NO	YES	New Part
78.	Bolt-Brake Mounting	B	-----	626821	NO	YES	New Part
79.	Nut-3/8-24 Hex.Special	B	-----	626822	NO	YES	New Part
80.	Screw-5/16-24 x 3/4 Hex.Hd.	B	181595	-----	NO	YES	Increase Usage
81.	Lockwasher-5/16 Med.Spring	B	120214	-----	NO	YES	Increase Usage
82.	Washer 21/32 ID x 1-5/16 OD PL	B	131016	-----	NO	YES	Reinstate
83.	Screw 5/16-16 x 5/8 Hex.Hd. Tapp	B	-----	448665	NO	YES	New Part
84.	Screw 1/4-28 x 1/2 Hex.Hd.Tapp.	B	448655	-----	NO	YES	Reduce Usage
85.	Cyl.Assy.-Pwr.Brake (Drum)	B	701980	-----	NO	YES	Reduce Usage
86.	Cyl.Assy.-Pwr.Brake (Disc)	B	-----	703469	NO	YES	New Part
87.	Shock Abs. Assem. Front	B	-----	703472	NO	YES	New Part
88.	Shock Abs. Assem. HD Front	B	-----	703473	NO	YES	New Part
89.	Shock Abs. Assem. Front	B	701964	-----	NO	NO	Return for Credit or Serv
90.	Shock Abs. Assem. HD Front	B	701973	-----	NO	NO	

ENGINEERING MEMO #226 (Cont'd.)

ITEM	NAME	B or M	OLD PART NUMBER	NEW PART NUMBER	I	A	REMARKS
91.	Valve A.-Pressure Metering	B	-----	703483	NO	YES	New Part
92.	Arm-Upper Control (Rework)	H	702728	-----	NO	YES	Reduce Usage
93.	Arm A.-Upper Control	M	92434	703484	NO	YES	Use W/O Obsoles.
94.	Arm & Socket A.-Upper Control	M	92845 LH 92844 RH	703485 LH 703486 RH	NO	YES	Use W/O Obsoles.
95.	Arm-Upper Control	B	92282	-----	NO	YES	Revise Usage
96.	Stop-Steering Arm	M	702413	-----	NO	YES	Reduce Usage
97.	Stop-Lower Cont.Arm Bump	M	-----	704589	NO	YES	New Part
98.	Arm Sub.A.-Lower Control	M	701303 LH 701304 RH	703481 LH 703482 RH	NO	YES	Rework
99.	Arm & Bush.A.-Lower Control	M	92437 LH 92436 RH	703479 LH 703480 RH	NO	YES	Rework
100.	Control Arm A.-Low.Complt.	M	703363 LH 703364 RH	Chg."A"	NO	YES	Rework
101.	Spring-Front 2000#	B	92292	-----	NO	YES	Rework 800
102.	Spring-Front 2240#	B	98506	-----	NO	YES	Revise Usage
103.	Tube A.-Brake Warning Valve to Junction	M	701897	703475	NO	YES	Revise Usage
104.	Tube A.-Junction to Brake Hose LH Front	M	701901	703476	NO	YES	Revise Usage
105.	Tube A.-Junction to Brake Hose RH Front	M	701902	703477	NO	YES	Revise Usage
106.	Junction-Brake Tube	B	94414	704568	NO	YES	Revise Usage
107.	Tube-3/16 O.D. x .025 Wall x 18-3/4" Long	M	94253	704302	NO	YES	Revise Usage
108.	Tube-3/16 O.D. x .025 Wall x 28" Long	M	94279	704304	NO	YES	Revise Usage
109.	Tube-3/16 O.D. x .025 Wall x 26-1/8" Long	M	-----	704303	NO	YES	New Part
110.	Tube A-Br.Warn.Vlv.to Junct.	M	701897	703471	NO	YES	Revise Usage
111.	Tube-3/16 O.D. x .025 Wall x 87-1/4 Long	M	94283	704305	NO	YES	Revise Usage

ENGINEERING MEMO #226 Cont'd.)

ITEM	NAME	B or M	OLD PART NUMBER	NEW PART NUMBER	I	A	REMARKS
112.	Arm & Socket A.-Upper Control	M	701633LH 701633RH	----- -----	YES	YES	Revise Usage
113.	Arm & Shaft A.-Upper Control	M	701631LH 701632RH	----- -----	YES	YES	Revise Usage
114.	Brace-Lower Control Arm	M	704207	-----	YES	YES	Revise Usage
115.	Control Arm A.-Lwr. Complete	M	703097LH 703098RH	----- -----	YES	YES	Revise Usage
116.	Arm & Bushing A.-Lwr. Control	M	703095LH 703096RH	----- -----	YES	YES	Revise Usage
117.	Arm A.-Lwr. Control-Welded	M	703093LH 703094RH	----- -----	YES	YES	Revise Usage
118.	Reinf.-Upper Control Arm	M	702797	-----	YES	YES	Revise Usage
119.	Arm A.-Upper Control	M	701629LH 701630RH	----- -----	YES	YES	Revise Usage
120.	Rivet-7/16 x 1 Button Hd.	B	189475	-----	YES	YES	Revise Usage
121.	Reinf.-Lwr. Cont. Arm Rear	M	96217LH 96218RH	----- -----	YES	YES	Revise Usage
122.	Extension-Lwr. Cont. Arm Rear	M	96215LH 96216RH	----- -----	YES	YES	Revise Usage
123.	Extension-Lwr. Cont. Arm Frt.	M	96213LH 96214RH	----- -----	YES	YES	Revise Usage
124.	Reinf.-Lwr. Cont. Arm Front	M	96212	-----	YES	YES	Revise Usage
125.	Channel-Lower Control Arm	M	96205	-----	YES	YES	Revise Usage
126.	Reinf.-Upper Cont. Arm Short	M	96162	-----	YES	YES	Revise Usage
127.	Arm A.-Lower Control	B	95713LH 95714RH	----- -----	YES	YES	Revise Usage
128.	Seat A.-Lwr. Cont. Arm Spring	M	95663	-----	YES	YES	Revise Usage
129.	Seat A.-Lwr. Cont. Arm Spring	F	95652	-----	YES	YES	Revise Usage
130.	Shock Absorber A.-H.D. Frt.	B	701965	-----	YES	YES	Revise Usage
131.	Plate-Frt. Shock Abs. Mtg. Lwr.	M	96067	92294	YES	YES	Revise Usage
132.	Arm A.-Lower Control	B	92298RH 92299LH	----- -----	YES	YES	Revise Usage
133.	Clip-Rear Spring	B	98326	-----	NO	YES	Reduce Usage
134.	Clip-Rear Spring	B	98308	-----	NO	YES	Reduce Usage
135.	Clip-Rear Spring Outer	B	-----	704572	NO	YES	New Part
136.	Clip-Rear Spring-Outer	B	-----	704569	NO	YES	New Part
137.	Nut - 5/8-18 Hex. Slotted	B	-----	125267	NO	YES	New Part

ENGINEERING MEMO #226 (Cont'd.)

ITEM	NAME	B or M	OLD PART NUMBER	NEW PART NUMBER	I	A	REMARKS
138.	Control Arm A.-Lower Complete V-8	M	-----	703507LH 703508RH	NO	YES	New Part
139.	Arm & Bush.A.-Lwr.Cont. V-8	M	-----	703509LH 703510RH	NO	YES	New Part
140.	Arm Sub-A.-Lwr.Cont. V-8	M	-----	703511LH 703512RH	NO	YES	New Part
141.	Proportioning Vlv.A.	B	-----	703544	NO	YES	New Part
142.	Tube A.-Warning Vlv.to Prop.Vlv.	M	-----	703545	NO	YES	New Part
143.	Tube-3/16 O.D. x .025 Wall x 8-1/16	M	-----	704307	NO	YES	New Part
144.	Nut - 7/16-24 Inv.Fl.3/16 Tube	B	-----	702965	NO	YES	Increase Usage
145.	Nut - 3/8-24 Inv.Fl.3/16 Tube	B	-----	137396	NO	YES	Increase Usage
146.	Tube A.-Prop.Vlv.to Union	M	-----	703546	NO	YES	New Part
147.	Tube-(3/16 O.D. x .025 Wall x 22-1/8)	M	-----	704306	NO	YES	New Part
(A)148.	Bolt - 1/4-20 x 5/8 Hex.Hd.	B	120854	-----	NO	YES	Increase Usage
(A)149.	Nut - 1/4-20 Hex.	B	120375	-----	NO	YES	Increase Usage
(A)150.	Lockwasher-1/4 Med.Spr.	B	120380	-----	NO	YES	Increase Usage
(A)151.	Tube A.-Brake Warn.Vlv.to Union	M	701898	-----	NO	YES	Decrease Usage
152.	Brake Proportioning Vlv.Inst.		-----	SK-2834	---	---	Ref. Only
(A)153.	Brkt.-Up.Control Arm-Frame	M	94525	Chg."D"&"E"	NO	NO	Rework

NOTE: This revision, including brake, wheel and spindle change incorporated with the following rear axle assembly effective points:

703355 Axle A(3.31)replaced 97310 at Ch. 92076 Models B-11,B-11E,B-12,B-12E,B-12W

703356 Axle A(3.31 P.L.)replaced 97311 at Ch. 92096 Models B-11,B-11E,B-12,B-12E,B-12W

703357 Axle A(3.54)replaced 97312 at Ch. 92078 Models B-11,B-11E,B-12,B-12E,B-12W

703358 Axle A(3.54 P.L.)replaced 97313 at Ch. 92412 Models B-11,B-11E,B-12,B-12E,B-12W

REVISED & REWRITTEN
 1-13-69

TO: Memo Distribution
 FROM: S. Hori
 SUBJECT: REVISION TO CHANGE THE TAXICAB AND PASSENGER CAR
 DRUM BRAKES FROM WAGNER ELECTRIC BRAKES TO DELCO
 MORAINÉ BRAKES AND INCORPORATE FRONT DISC BRAKE
 OPTION FOR TAXICABS AND PASSENGER CARS

1. Effective with a minimum of obsolescence but not later than Jan. 1, 1969, a change will be made to the Delco Moraine drum brakes with the front disc brakes available as optional equipment on all Models except the Aerobuses and Rail Cars. (Power Brakes will be a required option when the Frt. Disc Brk. opt. is used)
2. Both the Wagner Electric "VA" brakes and "C" brakes will be replaced by the Delco Moraine drum brakes.
3. The following are the basic changes to be made:
 - a. New steering knuckle and steering arms will be required.
 - b. New front hub and drum assemblies and rear drum assemblies will be required.
 - c. New rear axles with flanged shafts will be required.
 - d. New wheels with a 5" dia. bolt circle will be required.
 - e. New front suspension lower ball joints will be required.
4. The Rail Car conversion jobs will continue to be built using the present steering knuckles and arms, present upper and lower front suspension ball joints, present rear axle assemblies, present wheels, present Wagner Electric "C" brakes and present Budd Co. hub and drum assemblies until the current stock of Rail Car rear axles is exhausted.
5. Any balance of the present 225 Israel Diesel order is to be built with present steering knuckles, brakes, and axles. Sufficient parts will have to be set aside for the balance of Israel Diesel to be built in 1969.

Following is a complete list of parts to be affected:

ITEM	NAME	B OR M	OLD PART NUMBER	NEW PART NUMBER	I	A	REMARKS
DB	1. Knuckle-Steering (Forging)	B	94349	704449	NO	YES	Rail Car or Service
DB	2. Knuckle-Steering (Mach.)	M	94349	704450	NO	YES	Rail Car or Service
	3. Arm-Strg. (Forging) LH	B	702823	704417	NO	YES	Rail Car & Aerobus
	4. Arm-Strg. (Forging) RH	B	702824	704418	NO	YES	Rail Car & Aerobus
	5. Arm-Strg. (Mach.) LH	M	702735	704423	NO	YES	Rail Car & Aerobus
	6. Arm-Strg. (Mach.) RH	M	702736	704424	NO	YES	Rail Car & Aerobus
	7. Brkt.-Lwr. Ball Stud (Forging)	B	-----	704419	NO	YES	New Part
	8. Brkt.-Lwr. Ball Stud (Mach.)	M	-----	704425	NO	YES	New Part
B	9. Joint Assem.-Ball Lower	B	92306	703305	NO	YES	Rail Car & Aerobus
	10. Brake Assem.-Frt. VA LH	B	703191	703341	NO	YES	Service
	11. Brake Assem.-Frt. VA RH	B	703192	703342	NO	YES	Service