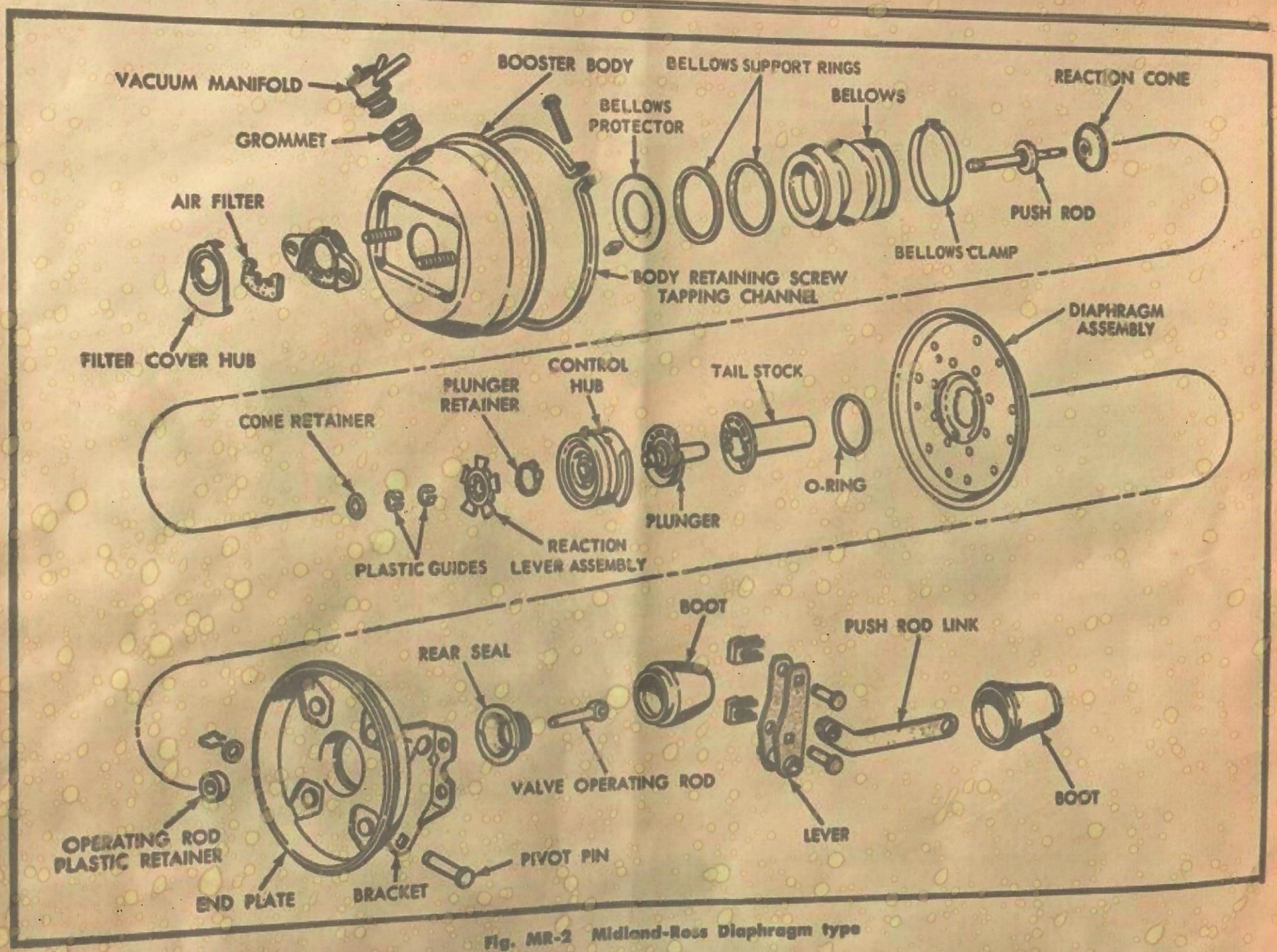
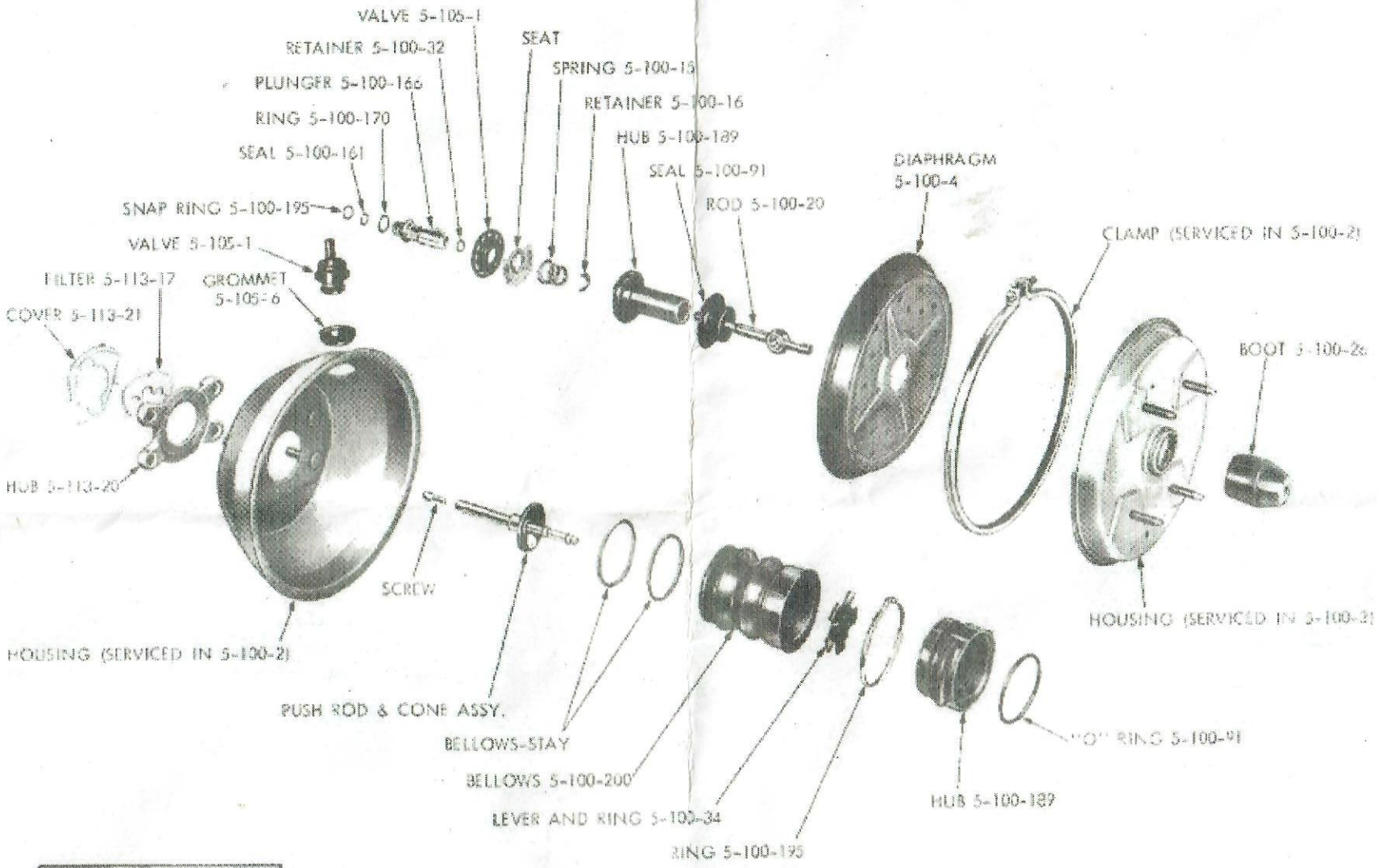


Fig. MR-2 Midland-Ross Diaphragm type



PARTS INDICATED BY NAME ONLY - ORDER BY DESCRIPTION

19a0358A

POWER BRAKE POWER UNIT (MIDLAND ROSS TYPE) - PLYMOUTH, DODGE AND CHRYSLER C1-2

SI unit of pressure.

From: 0 to 99 by: 1 with precision: 9

Pressure | inHg | cmHg | inHg>cmHg

inch of mercury	centi-meter of mercury	inch of mercury	centi-meter of mercury	inch of mercury	centi-meter of mercury	inch of mercury	centi-meter of mercury	inch of mercury	centi-meter of mercury
0	0.000000000	20	50.800000000	40	101.600000000	60	152.400000000	80	203.200000000
1	2.540000000	21	53.340000000	41	104.140000000	61	154.940000000	81	205.740000000
2	5.080000000	22	55.880000000	42	106.680000000	62	157.480000000	82	208.280000000
3	7.620000000	23	58.420000000	43	109.220000000	63	160.020000000	83	210.820000000
4	10.160000000	24	60.960000000	44	111.760000000	64	162.560000000	84	213.360000000
5	12.700000000	25	63.500000000	45	114.300000000	65	165.100000000	85	215.900000000
6	15.240000000	26	66.040000000	46	116.840000000	66	167.640000000	86	218.440000000
7	17.780000000	27	68.580000000	47	119.380000000	67	170.180000000	87	220.980000000
8	20.320000000	28	71.120000000	48	121.920000000	68	172.720000000	88	223.520000000
9	22.860000000	29	73.660000000	49	124.460000000	69	175.260000000	89	226.060000000
10	25.400000000	30	76.200000000	50	127.000000000	70	177.800000000	90	228.600000000
11	27.940000000	31	78.740000000	51	129.540000000	71	180.340000000	91	231.140000000
12	30.480000000	32	81.280000000	52	132.080000000	72	182.880000000	92	233.680000000
13	33.020000000	33	83.820000000	53	134.620000000	73	185.420000000	93	236.220000000
14	35.560000000	34	86.360000000	54	137.160000000	74	187.960000000	94	238.760000000
15	38.100000000	35	88.900000000	55	139.700000000	75	190.500000000	95	241.300000000
16	40.640000000	36	91.440000000	56	142.240000000	76	193.040000000	96	243.840000000
17	43.180000000	37	93.980000000	57	144.780000000	77	195.580000000	97	246.380000000
18	45.720000000	38	96.520000000	58	147.320000000	78	198.120000000	98	248.920000000
19	48.260000000	39	99.060000000	59	149.860000000	79	200.660000000	99	251.460000000

Back to Tables and Charts

Vacuum Conversion Table

%Vacuum	inHg (rel)	ft H2O (rel)	Torr (abs) mmHg (abs)	mbar (abs)	psia (abs)
0%	0.00	0.00	760.0	1013.3	14.70
10%	2.99	3.39	684.0	911.7	13.23
20%	5.98	6.78	608.0	810.4	11.76
30%	8.98	10.17	532.0	709.1	10.29
40%	11.97	13.56	456.0	607.8	8.82
50%	14.96	16.95	380.0	506.5	7.35
60%	17.95	20.34	304.0	405.2	5.88
70%	20.94	23.73	228.0	303.9	4.41
80%	23.94	27.12	152.0	202.6	2.94
90%	26.93	30.51	76.0	101.3	1.47
91%	27.23	30.85	68.4	91.2	1.32
92%	27.53	31.19	60.8	81.0	1.18
93%	27.83	31.53	53.2	70.9	1.03
94%	28.13	31.87	45.6	60.8	0.88
95%	28.42	32.21	38.0	50.6	0.73
96%	28.72	32.54	30.4	40.5	0.59
97%	29.02	32.88	22.8	30.4	0.44
98%	29.32	33.22	15.2	20.3	0.29
99%	29.62	33.56	7.6	10.1	0.15
99.1%	29.65	33.59	6.8	9.1	0.13
99.2%	29.68	33.63	6.1	8.1	0.12
99.3%	29.71	33.66	5.3	7.1	0.10
99.4%	29.74	33.70	4.6	6.1	0.09
99.5%	29.77	33.73	3.8	5.1	0.07
99.6%	29.80	33.76	3.0	4.1	0.06
99.7%	29.83	33.80	2.3	3.0	0.04
99.8%	29.86	33.83	1.5	2.0	0.03
99.9%	29.89	33.87	0.8	1.0	0.01
<100%	29.92	33.90	0.0	0.0	0.00

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International: Telephone: 530-243-2200; Fax 530-243-3761; Email: isales@tedpella.com

Condition	Possible Cause	Correction
GRABBING BRAKES	(a) Grease or brake fluid on linings.	(a) Inspect for a leak and replace the lining as required.
	(b) Sticking actuating valve.	(b) Free up the valve.
PEDAL GOES TO FLOOR (OR ALMOST TO FLOOR)	(a) Self-adjusters not operating.	(a) Inspect the self-adjuster operations.
	(b) Air in hydraulic system.	(b) Bleed the brakes.
	(c) Hydraulic leak.	(c) Locate and correct the leak.
	(d) Fluid low in master cylinder.	(d) Add brake fluid.
	(e) Shoe hanging up on rough platform.	(e) Smooth and lubricate the platforms.
	(f) Broken plunger stem.	(f) Replace valve plunger assembly.
HARD PEDAL (POWER UNIT TROUBLE)	(a) Faulty vacuum check valve.	(a) Replace the check valve.
	(b) Collapsed or leaking vacuum hose.	(b) Replace the hose.
	(c) Plugged vacuum fittings.	(c) Clean out the fittings.
	(d) Leaking vacuum chamber.	(d) Locate and correct the leak.
	(e) Diaphragm assembly out of place in housing.	(e) Position the diaphragm.
	(f) Vacuum leak in forward vacuum housing.	(f) Locate and correct the leak.

SERVICE PROCEDURES

REMOVING THE POWER BRAKE

Should it become necessary to remove the power brake for repair or overhaul, refer to (Fig. 1) and proceed as follows:

(1) With engine turned off, apply brakes several times to balance internal pressure of the brake.

(2) Disconnect the hydraulic brake line from master cylinder.

(3) Disconnect vacuum hose from power brake.

(4) From under instrument panel, remove nut and attaching bolt from power brake push rod and brake pedal linkage.

(5) Remove four power brake attaching nuts and washers.

(6) Remove power brake and master cylinder from vehicle and place on a service bench for further disassembly.

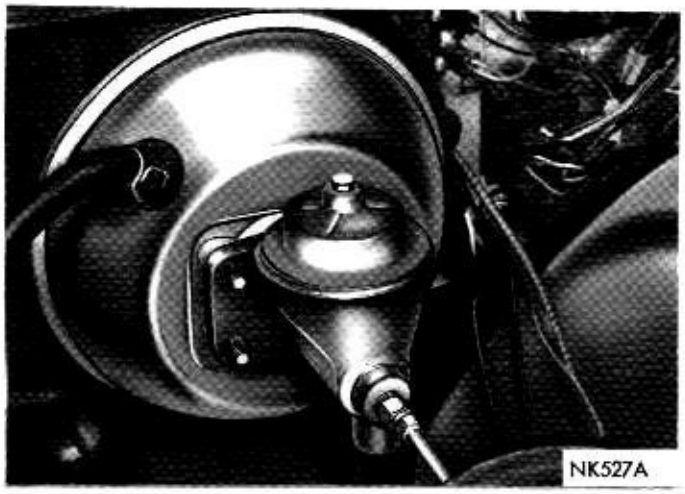

Fig. 1—Power Brake and Master Cylinder

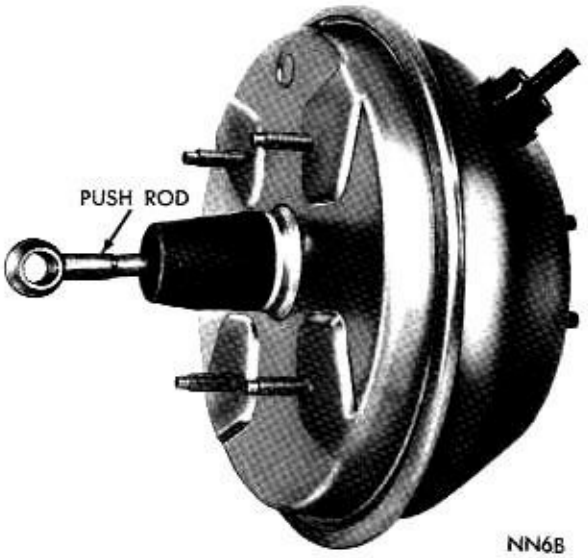

Fig. 2—Power Brake Assembly

DISASSEMBLING THE POWER BRAKE

To disassemble the power brake unit for repair or overhaul refer to (Fig. 2) then proceed as follows:

(1) Remove four nuts that attach master cylinder to power brake unit. Remove master cylinder.

(2) Remove air filter cover assembly from power brake unit, separate the cover and retainer, then remove air filter (Fig. 3).

(3) Remove check valve and rubber grommet from power brake unit.

(4) Remove rubber boot from operating rod.

(5) Scribe a line across front cover, clamp band and rear cover (Fig. 4).

(6) Push the bellows lip into vacuum chamber to separate bellows, control valve and diaphragm assembly from front and rear covers (Fig. 5).

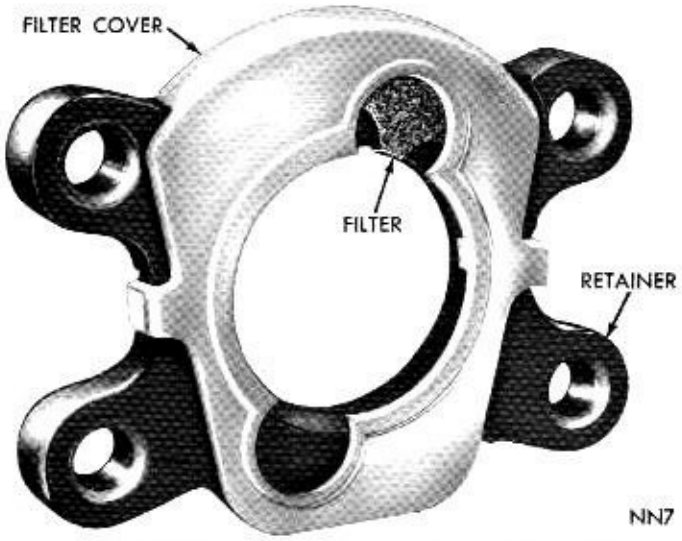

Fig. 3—Filter, Retainer and Cover Assembly

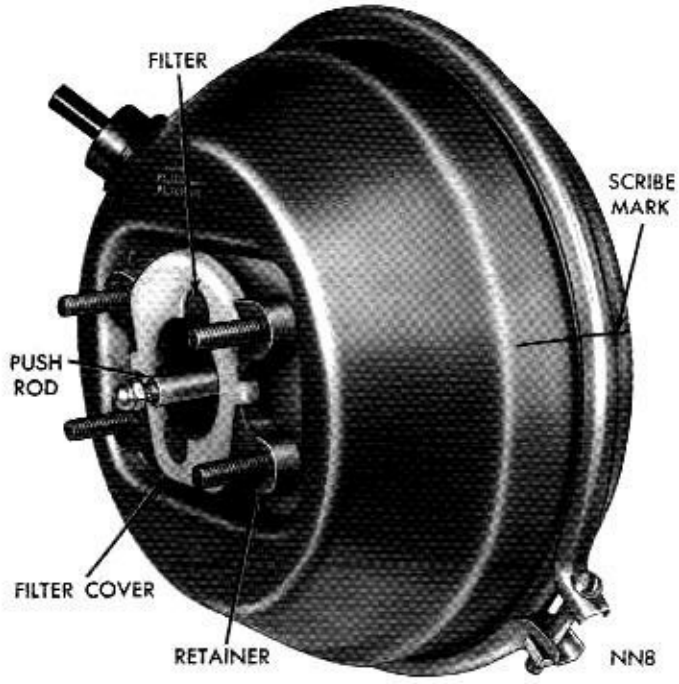

Fig. 4—Scribe Marks on Front Cover, Clamp Band and Rear Cover

(7) Remove clamp band screw and nut and remove clamp band. Separate front and rear covers.

(8) Remove rear seal from rear cover (Fig. 6).

(9) Remove bellows clamp and the support rings from bellows (Fig. 7).

(10) Remove the bellows from control hub (Fig. 8).

(11) Remove push rod and reaction lever assemblies (Fig. 9) from control hub.

(12) Remove two plastic push rod guides, cone retainer and reaction cone from push rod (Fig. 10).

(13) Remove operating rod from plunger, by holding rod firmly and forcing plunger off rod; shearing plastic retaining ring. (If the plunger is to be used again, remove all broken pieces of plastic retaining ring from groove in the plunger.)

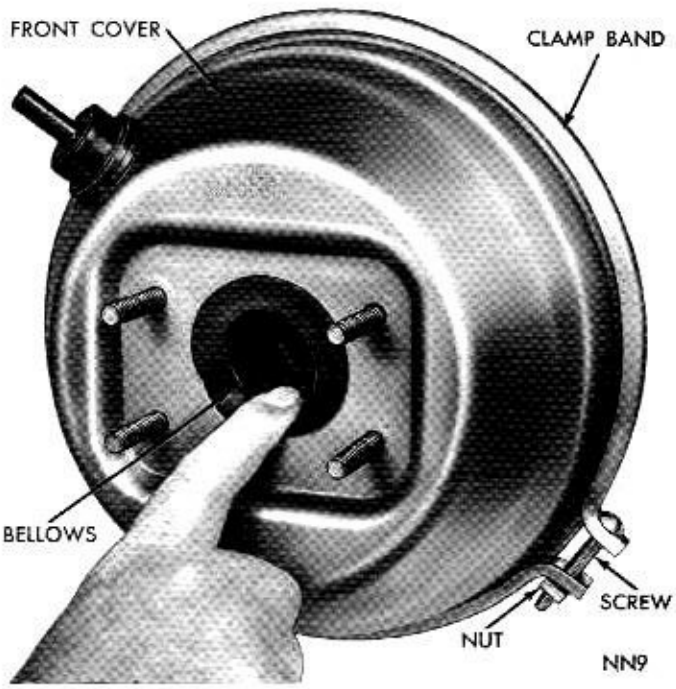

Fig. 5—Separating the Bellows from the Front Cover

(14) Using Tool C-3984, turn control hub clockwise while holding power piston (Fig. 11). Separate the tail stock and the "O" ring from diaphragm.

(15) Using snap ring pliers, remove retainer that holds plunger to control hub (Fig. 12). Separate control hub and plunger assembly (Fig. 13). **It may be**

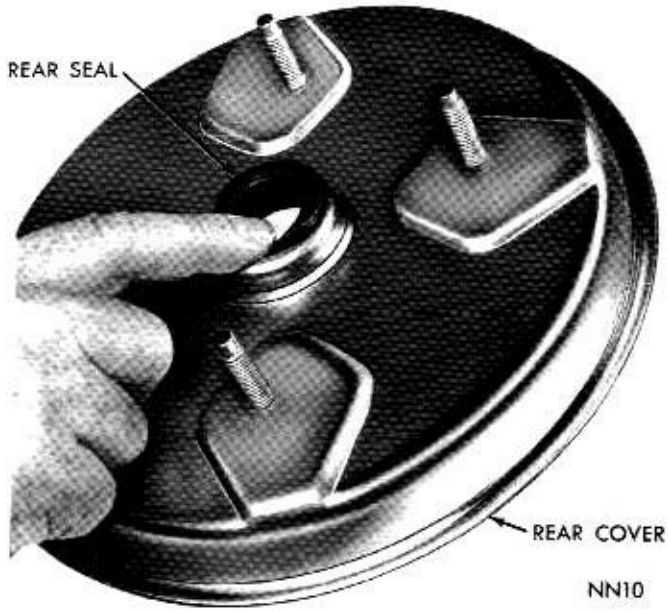

Fig. 6—Removing the Seal from the Rear Cover

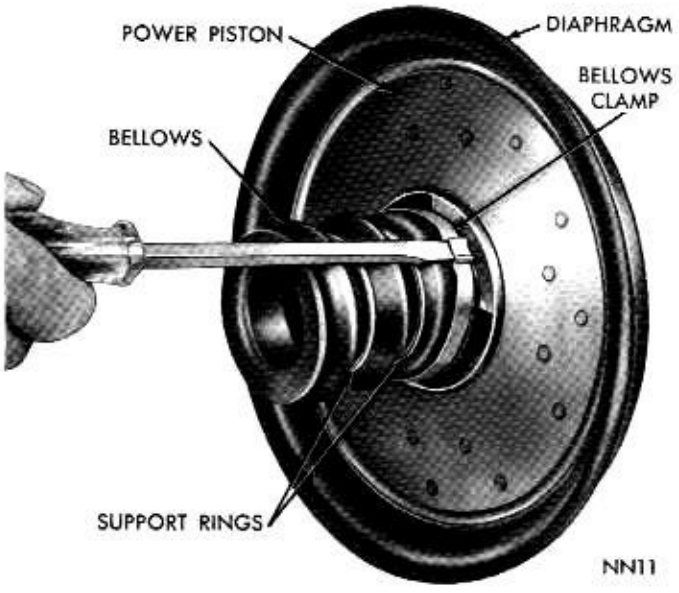

Fig. 7—Removing the Bellows Clamp

necessary to file any burrs that protrude from the end of plunger before it is removed from control hub. A score in this area can cause a leak.

(16) Using a screwdriver, compress spring toward rubber valve, then remove spring retainer (Fig. 14).

(17) Disassemble plunger by removing spring, washer, rubber valve, "O" ring, spring seat and fibre washer (Fig. 15).

CLEANING AND INSPECTION

Thoroughly wash all the metal parts in a suitable solvent and dry with compressed air. The power piston diaphragm, control hub and all plastic parts should be washed in a mild soap solution and water.

Fig. 8—Removing or Installing the Bellows

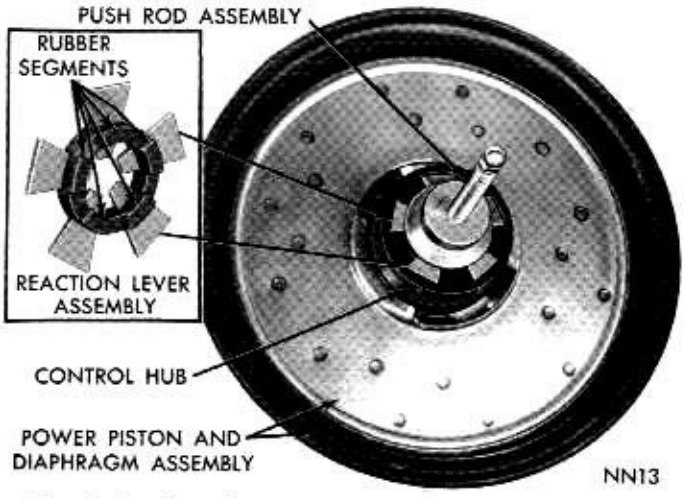

Fig. 9—Push Rods, Reaction Lever and Control Hub

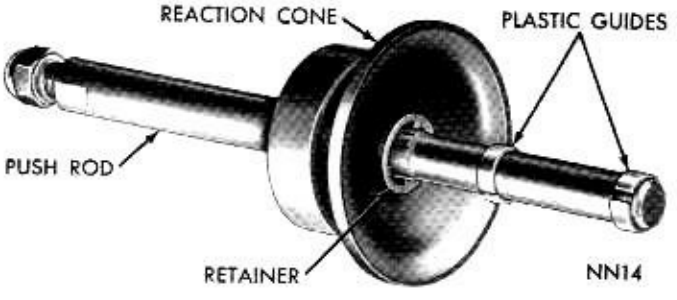

Fig. 10—Push Rod Assembly

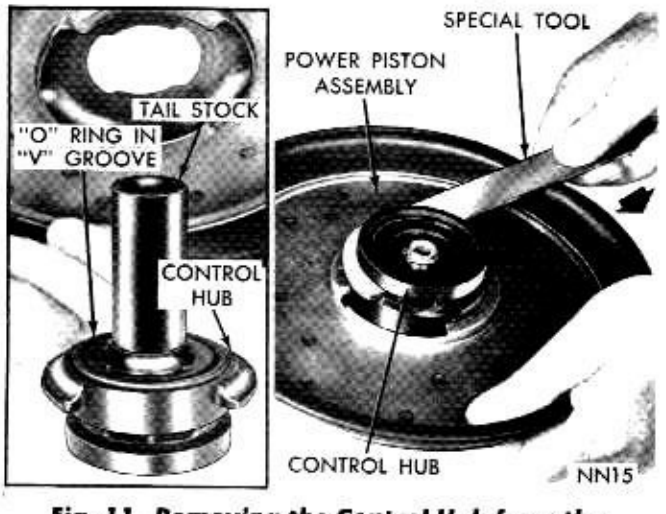

Fig. 11—Removing the Control Hub from the Power Piston Assembly

Using air pressure, blow out all internal passages. All rubber parts should be replaced regardless of condition. Install new air filter at reassembly.

Inspect all parts for scoring, pitting, dents or nicks. Small imperfections can be smoothed out, using crocus cloth. Replace all parts that are badly scored, nicked or damaged.

At reassembly, coat all rubber parts (including the diaphragm with silicone grease.

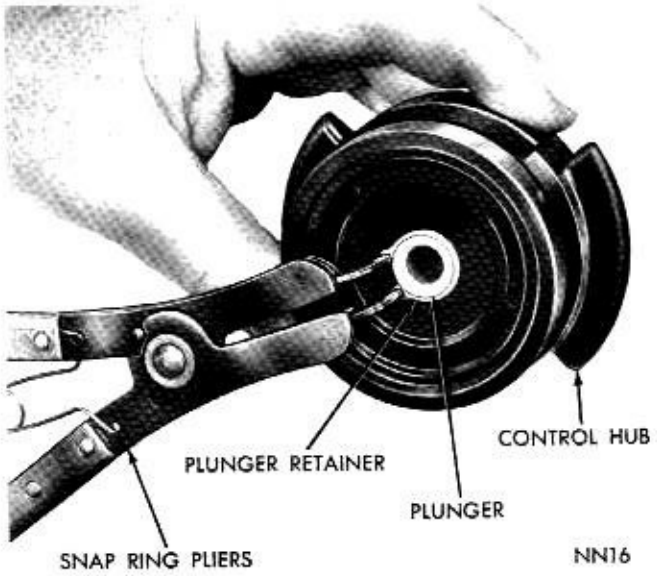

Fig. 12—Removing or Installing the Plunger Retainer

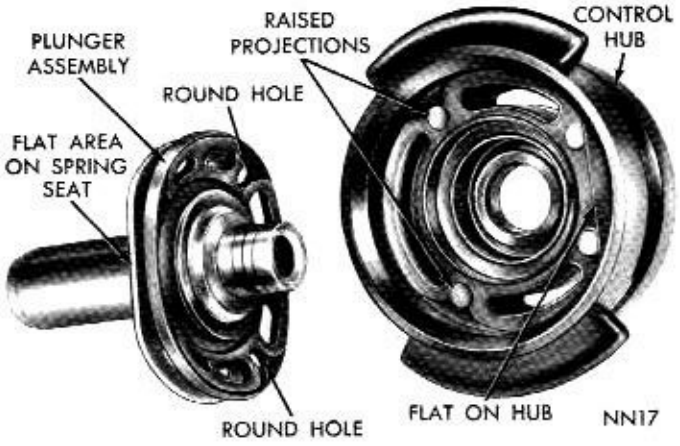

Fig. 13—Control Housing and Plunger Assembly

ASSEMBLING THE POWER BRAKE

To reassemble the power brake after cleaning and inspection, proceed as follows:

(1) Install rubber valve, spring seat, spring, "O" ring and fibre washer on plunger (Fig. 15).

(2) Using a screwdriver, compress spring towards rubber valve then install the spring retainer on plunger, with the flange toward spring (Fig. 14).

(3) Install the control valve plunger into control hub (Fig. 13) so that round holes in rubber valve index with raised projections on hub and flat side on spring seat mates with flat projection on hub.

(4) Compress the valve spring and install retainer in plunger groove, using snap ring pliers (Fig. 12), thus securing control valve plunger in control hub.

(5) Install tail stock over the plunger, with flat on tail stock mating with flat surface on hub.

(6) Install the "O" ring over tail stock and into "V" groove formed by tail stock and hub (Fig. 11 insert).

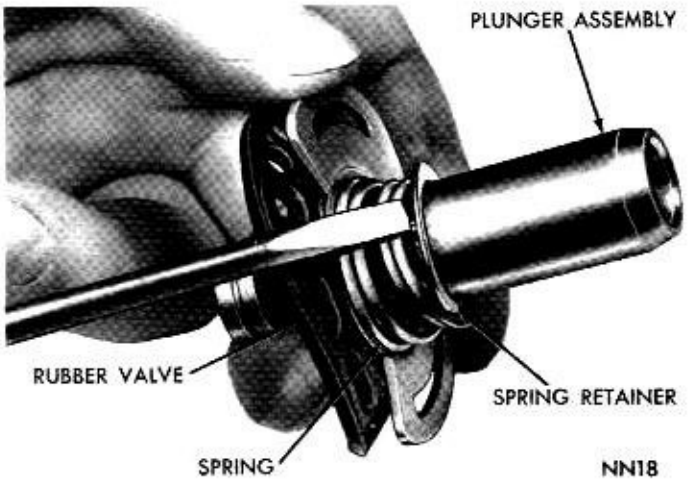

Fig. 14—Removing or Installing the Spring Retainer

(7) Lower power piston assembly over tail stock and control hub and seat. Using Tool C-3984, turn control hub counterclockwise to lock in place (Fig. 16).

(8) Install lever assembly in the control hub with rubber segments toward control hub.

(9) Slide the reaction cone over push rod (Fig. 10), then install retainer. Install two plastic guides on push rod. Install push rod assembly in valve hub so that push rod indexes in valve plunger (Fig. 9).

(10) Slide two bellows support rings over bellows and down into position in two larger folds (Fig. 17).

(11) Slide bellows over control hub until the lip of the bellows slides into recess of the hub (Fig. 8). Secure bellows on hub by using a new clamp on the diaphragm end of bellows (Fig. 17).

(12) Slide the rear seal into rear cover (Fig. 6) and position diaphragm, control valve components, and bellows as an assembly into rear cover (Fig. 17).

(13) Install rubber grommet in front cover with larger diameter side on outside of unit. Install check valve assembly through grommet.

(14) Assemble the front cover to rear cover. (Make sure the lip of diaphragm is evenly positioned on retaining radius of front and rear covers.) Now, pull front lip of bellows through front cover and position evenly around diameter of hole (Fig. 5).

(15) Install clamp band over lips of front cover and rear cover. Align scribe lines, compress the assembly together, and secure with clamp band bolt (Fig. 4). Tap clamp band with a fibre hammer around its circumference as bolt is being tightened. Tighten to 10 inch-pounds (Min.).

(16) Install the rubber boot to operating rod and assemble plastic retainer to end of the rod. Insert rod into plunger so that retainer engages groove in plunger. Install lip of boot in groove of rear seal.

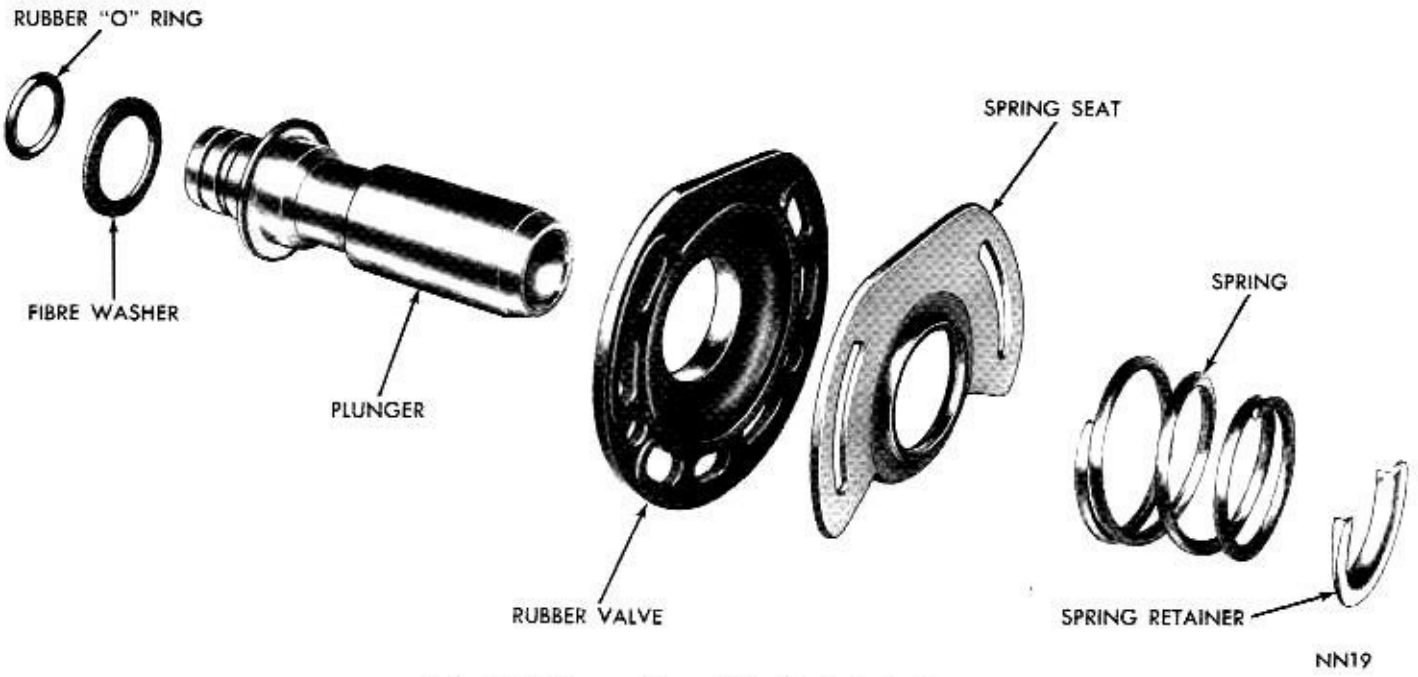

Fig. 15—Plunger Assembly (Exploded View)

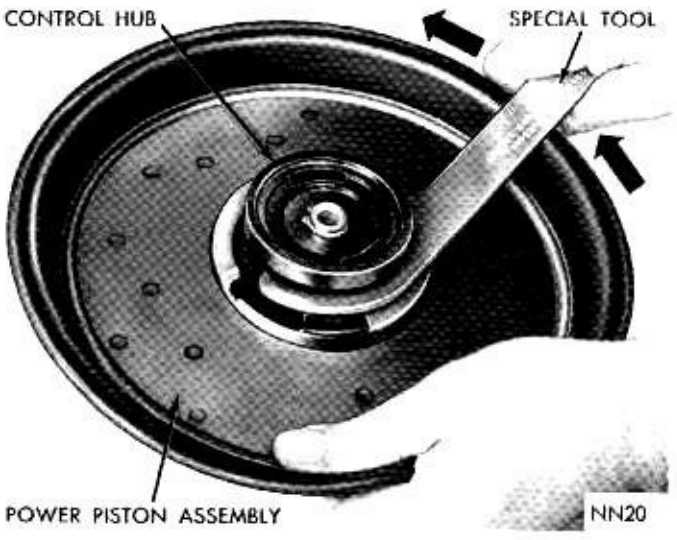

Fig. 16—Installing the Control Hub to the Power Piston

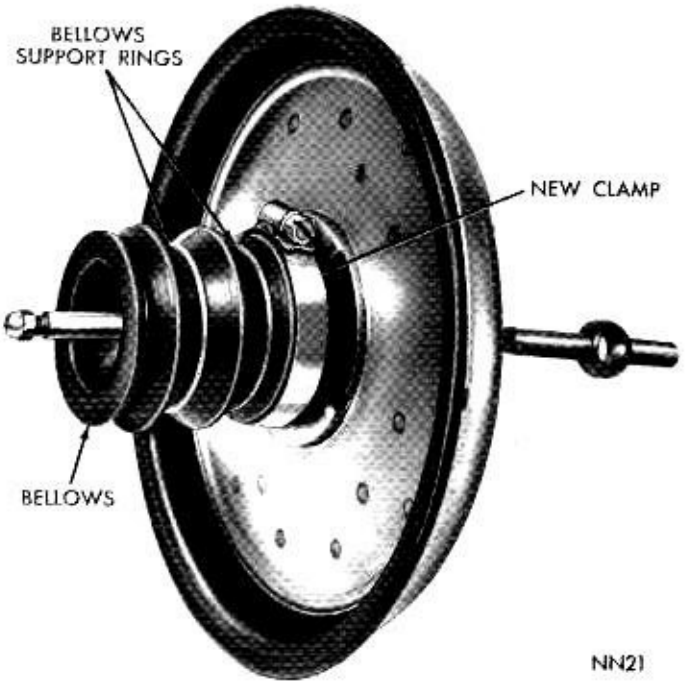

Fig. 17—Bellows Installed on the Power Piston

(17) Position air filter in plastic filter cover then snap cover and filter on metal hub with filter between (Fig. 3).

(18) Assembly cover, filter, and retainer assembly to unit with metal retainer against cover.

(19) Install master cylinder on power brake. Tighten mounting nuts to 100 inch-pounds.

INSTALLING THE POWER BRAKE

(1) Install power brake assembly on dash and tighten attaching nuts 200 inch-pounds.

(2) Connect brake line and vacuum hose.

(3) Install push rod to brake pedal attaching bolt and nut, and tighten to 30 foot-pounds.

(4) Refill master cylinder and bleed the brakes.