DELCO-MORAINE DUAL DIAPHRAGM

Chevrolet
GMC
Jeep

DESCRIPTION

Unit is mounted on firewall and connected directly to brake pedal. A combination of vacuum and atmospheric pressure is used to provide power assist. Power cylinder houses power piston assembly which contains primary and secondary diaphragms, pistons, floating control valve, reaction piston, and disc.

REMOVAL & INSTALLATION

CHEVROLET & GMC

Removal & Installation – Remove vacuum hose from check valve in front of power unit. Remove nuts securing master cylinder to power cylinder. Pull forward on master cylinder until cylinder clears mounting studs on power unit. Carefully move master cylinder aside and support to avoid strain on attached brake lines. **CAUTION** – *Move master cylinder only enough to allow room for removal of power cylinder.* Remove power unit attaching nuts and brake pedal push rod-to-pedal retainer (or bolt, nut and cotter pin on "P" models). Disconnect push rod from pedal and remove power cylinder assembly. To install, reverse removal procedure and check brake light switch for proper adjustment. If brake lines were disconnected, bleed system after installation is completed.

JEEP

Removal & Installation – 1) Disconnect power brake unit push rod at brake pedal. Discard attaching bolt and nut. Disconnect vacuum hose at unit check valve.

2) Remove nuts and washers securing master cylinder to unit. Move master cylinder to one side. Do not disconnect brake lines at master cylinder.

3) On CJ models, remove nuts and bolts attaching unit bellcrank to firewall. Remove power unit and bellcrank as an assembly.

4) On remaining models, remove nuts securing power unit to firewall and remove power unit.

5) To install power unit, reverse removal procedure. Use a new replacement bolt to secure rod to pedal.

OVERHAUL

NOTE – *Jeep Corp. does not recommend overhaul of this unit; it is serviced as an assembly.*

Disassembly – 1) Scribe a line across front and rear housing for reassembly. Remove vacuum valve and grommet from front housing and discard.

2) Attach a suitable holding fixture (J-22805) to front housing studs and tighten nuts. Bolt a suitable spanner wrench (J-9504) to studs on rear housing.

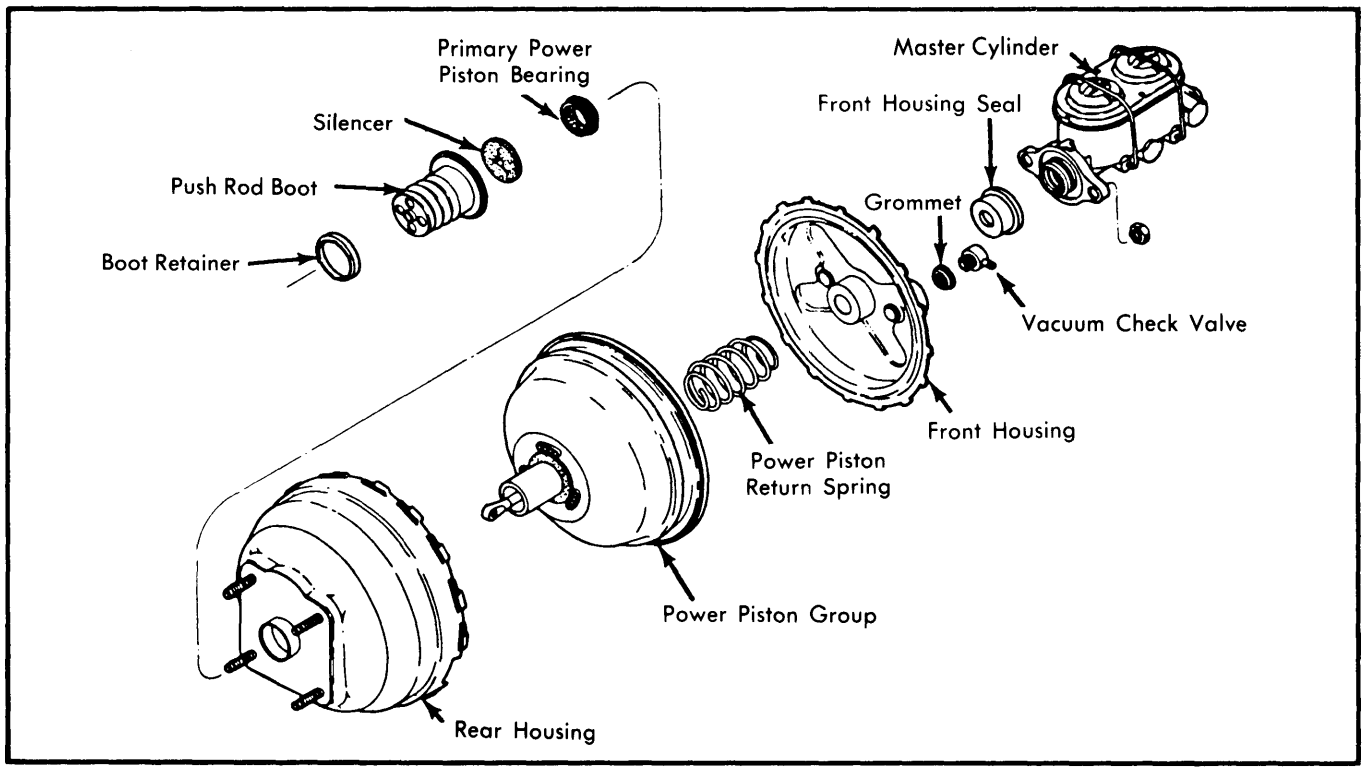

Fig. 1 Exploded View of Delco-Moraine Dual Diaphragm Power Brake Unit.

DELCO-MORAINE DUAL DIAPHRAGM (Cont.)

3) Clamp base of holding fixture in a vise with power section up. Press down on spanner wrench and rotate counterclockwise to separate housings.

CAUTION – *Care must be taken not to damage studs in housing or plastic power piston.*

4) Remove tools from housings. Remove power piston return spring and front housing seal. Remove boot and retainer from rear housing and push rod. Remove power piston assembly. Remove power piston bearing from center opening in rear housing.

5) Remove reaction retainer and piston rod from power piston. Remove silencer from neck of piston tube. Turn power piston upside down so end of push rod is against a hard surface. Use a slight force or impact on push rod to remove diaphragm retainer.

6) Remove diaphragms, support plates and divider from power piston. Separate primary and secondary diaphragms from support plate.

7) Remove reaction body retainer using a screwdriver. Remove reaction body. Using a small dowel, push down on the end of reaction piston and remove reaction disc and piston from reaction body.

8) Remove air valve spring. Remove rubber reaction bumper from end of air valve. Remove retaining ring from air valve. Remove air filter from tube portion of power piston.

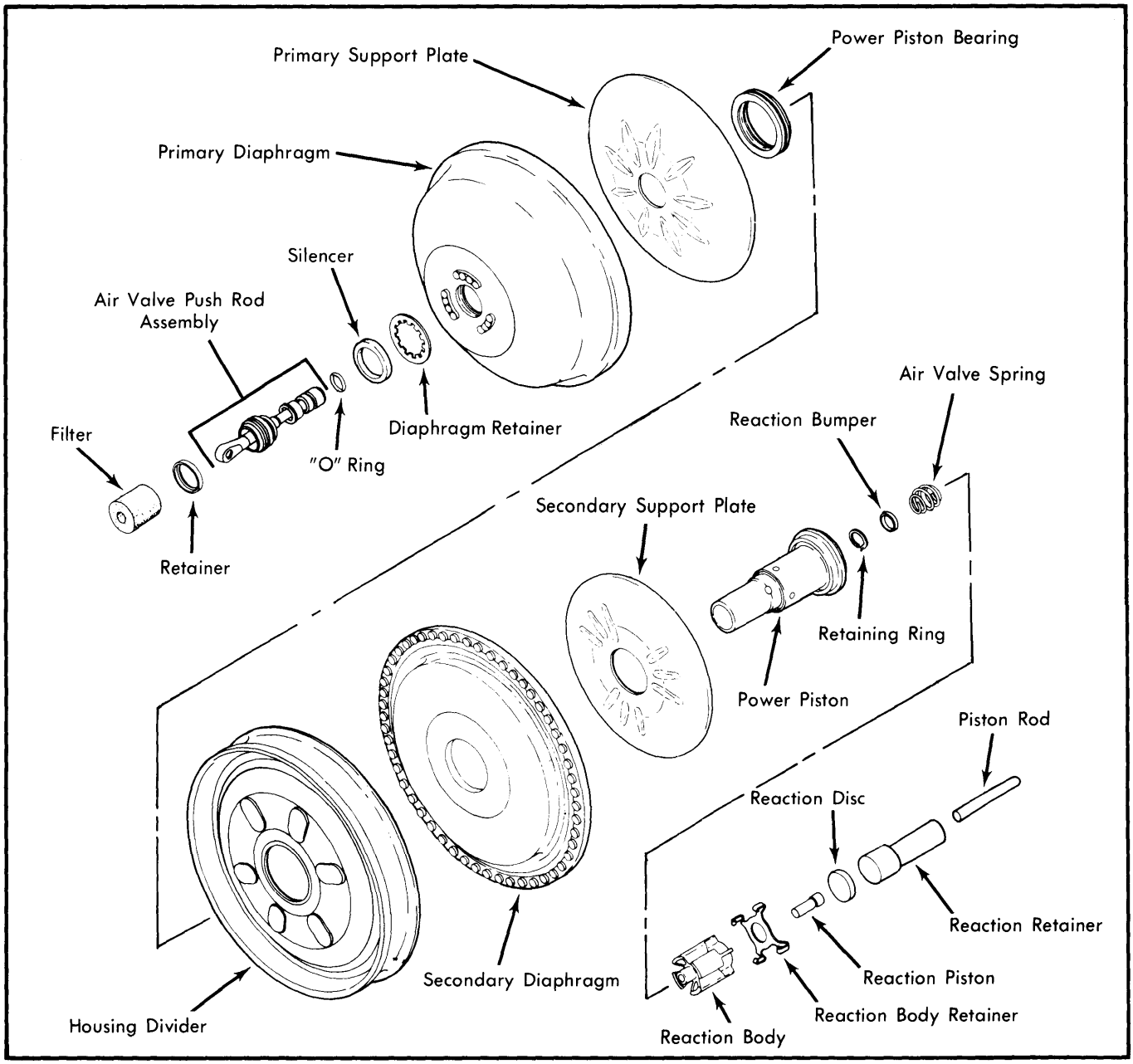

Fig. 2 Exploded View of Power Piston Assembly

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NOTE – *If air valve push rod has a formed eye on the end, it cannot be serviced and must be replaced as an assembly.*

9) Remove air valve push rod assembly from push rod end of power piston by pressing out using an arbor press. Use a mandrel no larger than ½" diameter.

NOTE – *The push rod can be removed by inserting a heavy shanked screwdriver on both sides of push rod and pulling straight out. A considerable amount of force will be required.*

10) With air valve push rod removed, control valve retainer can be removed. Remove "O" ring from air valve.

Cleaning & Inspection – Clean all plastic, metal, and rubber parts in denatured alcohol. Blow out all passages, orifices, and valve holes. Air dry all parts. Slight rust on housing may be cleaned with crocus or emery cloth (then reclean). Do not replace any rubber parts with cuts, nicks, or distortion. If in doubt, replace the part.

Reassembly – **1)** Install new check valve grommet, check valve and seal in front housing. Lubricate air valve "O" ring with power brake lubricant and install on air valve.

2) Apply power brake lubricant to outside of floating control valve.

NOTE – *If floating control valve needs replacement, replace complete air valve push rod assembly.*

3) Position air valve end of push rod in power piston. Press down on push rod so that floating control valve bottoms on tube section of power valve.

4) Place retainer lip on the outside of retainer installation tool (J-23175). Press retainer in until seated in power tube piston. Install filter element over push rod eye and press into power piston tube.

5) Install snap ring in groove in air valve. Install rubber reaction bumper on end of air valve. Install air valve spring on end of air valve.

6) Install reaction body with large hole up. Install reaction body retainer. Install reaction piston into reaction body with large diameter up.

7) Apply power brake lubricant to the outside of the rubber reaction disc. Place disc in cavity in reaction body.

8) Place power piston on bench with push rod up. Install assembly cone (J-28458) over push rod end of piston.

9) Install secondary diaphragm on secondary support plate. Press raised flange on the diaphragm through the center hole on support plate. Make sure edge of support plate fits into groove in diaphragm flange.

10) Apply power brake lubricant to the inside diameter of the secondary diaphragm. With assembly cone on power piston place secondary diaphragm and support plate on power piston and push down until it bottoms on power piston.

11) Hold housing divider so that flange that holds primary diaphragm faces down. Place power piston bearing in the inside of divider so that extended lip of the bearing faces up.

12) Apply power brake lubricant to inside diameter of power piston bearing. With assembly cone on power piston, hold housing divider so that flange that holds primary diaphragm faces up.

13) Press divider down over tool and onto power piston tube until it rests against secondary diaphragm.

14) Install primary diaphragm on primary support plate. Press raised flange on diaphragm through center hole of support plate. Make sure edge of support plate fits in groove in diaphragm flange. Apply power brake lubricant to inside diameter of diaphragm.

15) Remove assembly cone from power piston. Fold primary diaphragm away from outside of primary support plate. Place primary diaphragm assembly over power piston. Push down until it bottoms.

16) Fold primary diaphragm back into position on support plate. Pull outside diameter of diaphragm over flange of housing divider. Make sure bead on diaphragm is seated evenly around entire area.

17) Position diaphragm retainer over power piston and onto diaphragm. Place assembly cone (J-28458) over power piston onto diaphragm retainer. Strike with hammer until retainer is locked on neck of power piston.

18) Apply a thin film of power brake lubricant to outside of piston rod retainer. Insert master cylinder piston rod retainer into cavity in power piston so that flat end bottoms against rubber reaction disc in bottom of cavity.

19) Install power piston bearing in rear housing center hole so that flange of center hole in housing fits into groove of power piston bearing. Thin lip of bearing will protrude to outside of housing. Apply power brake lubricant to the inside of power piston bearing.

20) Bolt a suitable holding fixture (J-22805) to front housing. Clamp base of holding fixture in a vise. Place power piston return spring over inset in front housing.

21) Install power piston assembly in rear housing by pressing tube of power piston through rear housing bore. Press down until housing divider seats in rear housing and power piston bottoms against housing.

22) Place piston rod retainer plate on end of power piston return spring in front housing. Place rear housing (mounting studs up) over front housing.

NOTE – *Make sure piston rod retainer does not move from position in power piston.*

23) Place rear housing on front housing so that when tangs are locked, scribe marks made during disassembly will be aligned. Lower rear housing onto front housing.

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24) Make sure power piston spring seats in depression of power piston retainer. Make sure bead on outside of secondary diaphragm is positioned between edges of housing.

25) Bolt spanner wrench to rear housing studs. Press down on spanner wrench and twist rear housing clockwise until it is locked with front housing. Remove spanner wrench.

NOTE – *If it is difficult to lock housings, hold them together and apply vacuum to check valve in front housing. Do not put pressure on power piston extension.*

26) Insert silencer in closed end of power head boot. Push retainer over boot. Stretch boot over push rod and flange in center of rear housing.

27) Remove unit from vise and separate support tool from unit.

ADJUSTMENT

PUSH ROD ADJUSTMENT

NOTE – *This adjustment applies to Chevrolet and GMC only. Jeep push rod is non adjustable.*

1) Place power unit in padded vise, with front housing up. **NOTE** – *Do not clamp tight.* Insert master cylinder piston rod, flat end first, into piston rod retainer. Ensure rod is properly seated. Remove front housing seal, to assure no vacuum is in unit.

2) Place suitable gauge (J-22647) over piston rod, in a position which will allow gauge to be moved right or left without contacting studs. Piston rod should contact longer section of gauge. Rod is non-adjustable; if out of limits, replace with proper service rod.

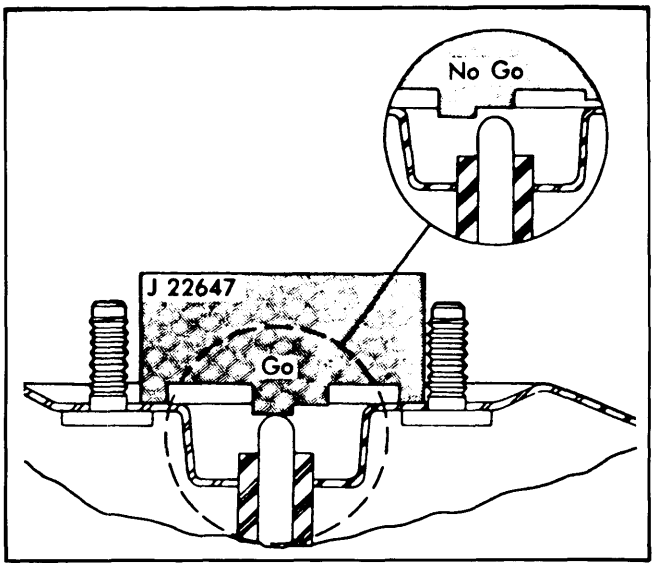

Fig. 3 Gauging Push Rod Position