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 – *NOTE – Information not available at time of publication.*

OVERHAUL

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

Disassembly (Power Cylinder) – 1) Scribe mark on housing for reassembly. Remove master cylinder, if not done during removal. Attach front housing to suitable holding fixture (J22805). Separate housing using a suitable spanner wrench (J9504). Press down and turn counterclockwise. *CAUTION – Separate slowly because unit is under internal pressure. Ensure no pressure is put on plastic power piston.*

2) Remove power piston return spring (retainer plate may come out with spring). If defective, remove check valve and grommet. Remove front housing seal. If equipped, remove push rod clevis and lock nut, from rear housing. Remove boot, felt silencer, power piston group, and seal from center of rear housing.

Disassembly (Power Piston) – 1) Remove diaphragm support ring from under secondary diaphragm. If not already disengaged, remove retainer plate from secondary piston, then remove piston rod retainer and rod. Place suitable power piston tool (J-23101) in vise. Position secondary power piston on tool, grip edge of support plate (not diaphragm) and rotate counterclockwise, to separate power pistons. *NOTE – Primary support plate may unlock before primary power piston releases; however, continue turning until separation is complete.*

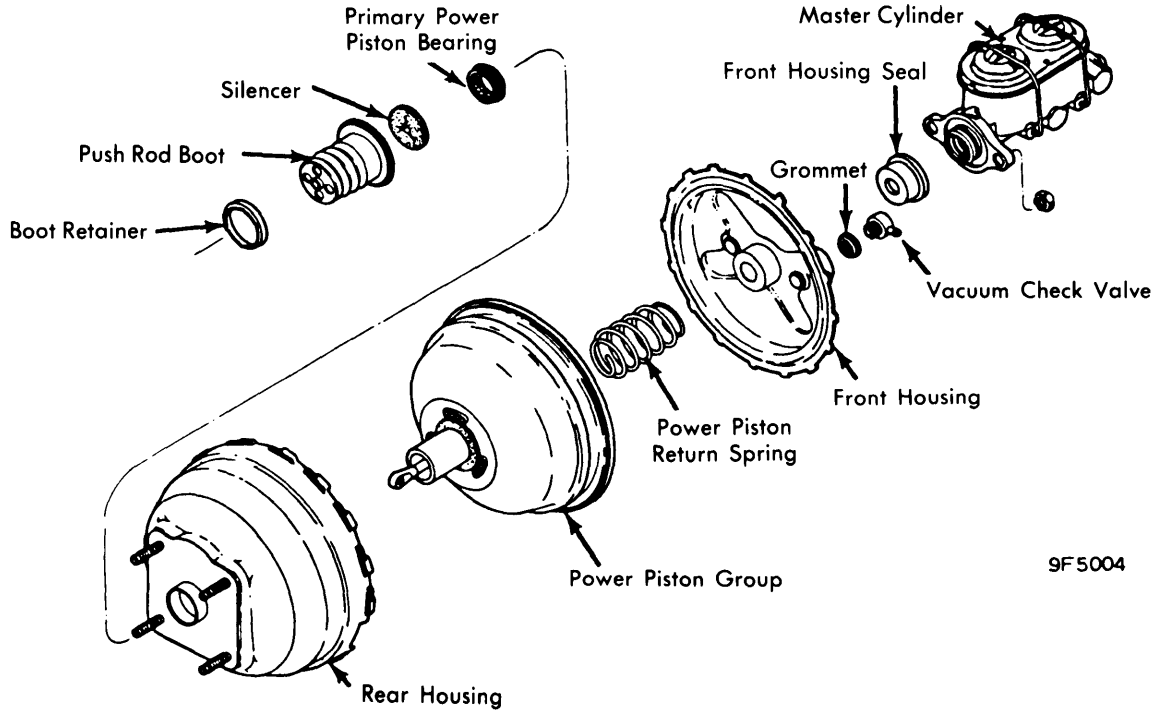

Fig. 1 Exploded View of Delco-Moraine Tandem Power Cylinder

DELCO-MORAINE DUAL DIAPHRAGM (Cont.)

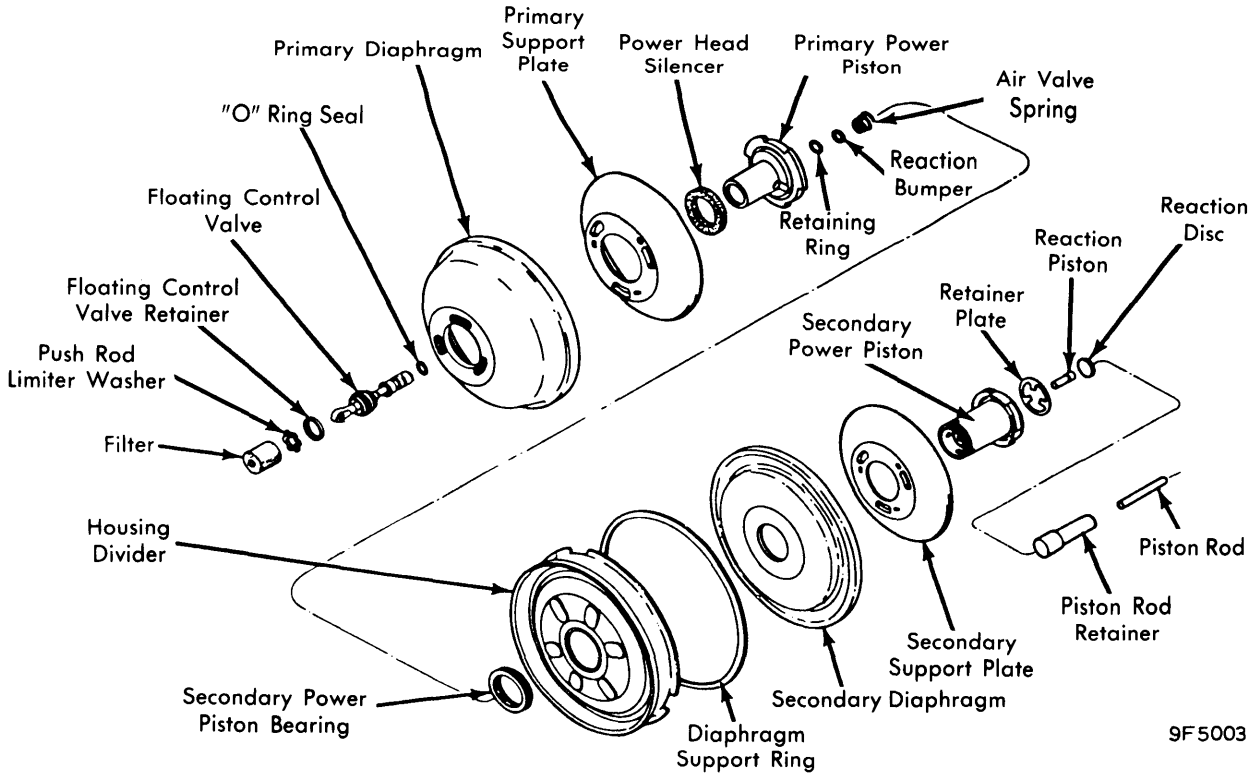

Fig. 2 Exploded View of Delco-Moraine Tandem Power Piston

2) Remove housing divider from secondary power piston, and bearing from divider. With secondary power piston still on tool, grip support plate (not diaphragm) and rotate clockwise, to unlock secondary support plate from secondary power piston. Remove secondary diaphragm. Push reaction piston and disc out of secondary power piston. Remove the air valve spring, if necessary.

3) Turn power piston tool over (small diameter end up). Remove primary power piston and diaphragm in same manner as secondary power piston. Remove air filter and silencer from power piston tube. Remove rubber reaction bumper and retaining ring from air valve. Using suitable rod (not exceeding 1/2" diameter), press air valve-push rod assembly from primary power piston. 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.

NOTE – Prior to installation of rubber, plastic, and metal friction parts, lubricate with suitable silicone lube (5459912).

Reassembly – 1) Replace vacuum check valve, with new grommet. Install front housing seal. Place new "O" ring on air valve. Insert air valve end of air valve-push rod assembly into primary power piston tube. *NOTE – If floating control valve requires replacement, complete air valve-push rod assembly must be replaced.* Seat floating control valve retainer on valve assembly. Manually press assembly so that floating control valve bottoms on tube. Suitable installer tool (J-23175) may be used. Install air filter and retaining ring in primary power piston tube. Position rubber reaction bumper on end of air valve.

2) Place rubber reaction disc in large cavity of secondary power piston and seat disc on reaction piston. Unlock power pistons. Assemble primary diaphragm to primary support plate. Press raised flange of diaphragm I.D. through center hole of support plate (ensure plate fits in flange groove).

3) Mount power piston tool (J-23101) in vise, with small diameter end up. Position primary power piston on tangs of tool. Holding edge of primary support plate, place on power piston, press down, and rotate clockwise until assembly locks. Place power head silencer on tube of primary power piston, covering holes at base of tube.

4) Assemble secondary power piston, diaphragm, and support plate in same manner as primary power piston assembly (turn tool over, with large diameter end up).

5) Apply talcum powder to bead on O.D. of secondary diaphragm. Hold housing divider with primary diaphragm holding flange facing down. Install secondary bearing in I.D. of divider, with extended lip of bearing upward. Install suitable bearing protector tool (J-23188) on threaded end of secondary power piston. Hold housing divider with six oblong protrusions upward. Press divider down over tool and onto secondary piston tube (against diaphragm support ring). Remove bearing protector tool, but do not remove power piston tool.

DELCO-MORAINE DUAL DIAPHRAGM (Cont.)

6) Fold diaphragm away from O.D. of primary support plate. Position small end of air valve return spring on air valve. Set primary power piston on tubular portion of secondary power piston (ensure air valve return spring seats properly). Press down and screw power pistons tightly together. Pull diaphragm O.D. over flange of housing divider. Insert master cylinder piston rod into secondary power piston until flat end bottoms against rubber reaction disc.

7) Install new rear housing seal. Mount front housing on suitable holding fixture (J-22805). Assemble power piston group to rear housing. Press down until housing divider seats in rear housing and primary power piston bottoms against housing. Place piston rod retainer plate on end of power piston return spring in front housing.

8) Place housings in position to be locked (note location of scribe marks). Check to be sure piston rod retainer goes through center of retainer plate. Lock housings in reverse manner of separation, using appropriate tools.

9) Place silencer in closed end of power head boot. Stretch boot over push rod and over flange in center of rear housing. Install boot retainer. Install push rod clevis and lock nut, if equipped.

ADJUSTMENT

PUSH ROD ADJUSTMENT

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.

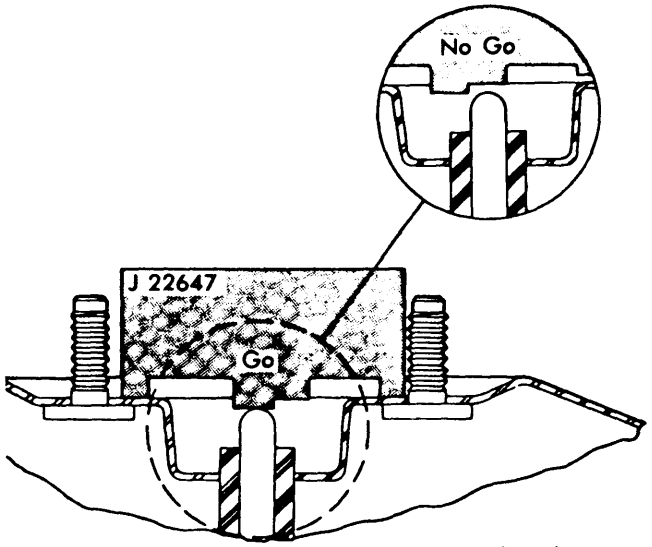

Fig. 3 Using a Gauge to Measure Push Rod Protrusion