

DELCO-MORAINE SINGLE DIAPHRAGM

Chevrolet
GMC
Jeep

DESCRIPTION

A combined vacuum-hydraulic unit which uses a combination of intake manifold vacuum and atmospheric pressure to provide power assist. Reserve vacuum supply and vacuum check valve allow several brake applications, with vacuum assist, after engine has stopped. Unit is composed of two main sections: vacuum power cylinder and dual master cylinder. Vacuum power cylinder contains power piston assembly, which houses control valve, reaction mechanism, and power piston return spring.

REMOVAL & INSTALLATION

Removal & Installation — Disconnect push rod from brake pedal. Disconnect vacuum hose from vacuum check valve. Remove nuts holding master cylinder to power cylinder and move master cylinder aside. Do not disconnect master cylinder hydraulic lines. Remove nuts holding power unit to dash panel. Remove power unit from vehicle. To install, reverse removal procedure.

OVERHAUL

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

Disassembly — 1) Scribe a mark on bottom of front and rear housings to facilitate reassembly. Mark staked interlocks so they will not be restaked, then straighten staked interlocks. Attach tool J-22805-01 to front of housing, and tool J-9504-01 to rear of housing and turn rear housing counterclockwise to unlocked position. Loosen housing carefully as it is spring loaded.

2) Lift rear housing and power piston assembly from unit. Remove return spring. Remove retaining ring on push rod then remove silencer. Remove seal, vacuum check valve and grommet from front housing.

NOTE — Care must be taken during the following procedures to prevent damage to diaphragm.

3) Remove power piston assembly from rear housing. Remove silencer from neck of power piston tube. Remove lock ring from

power piston by prying one end out from under large divided locking lug and then pulling ring from under other two locking lugs.

4) Remove reaction retainer, piston, reaction plate, 3 reaction levers and air valve spring. Remove reaction bumper and air valve spring retainer from air valve.

5) Place power piston tool J-21524 with square shank in vise. Hold support plate and power piston with tube of power piston up. Pull diaphragm edges away from support plate so a grip can be had on the support plate. Position assembly on tool J-21524 so 3 lugs on tool fit into 3 notches on power piston.

6) Press down on support plate and rotate counterclockwise until support plate separates from power piston. Remove diaphragm from support plate and set both parts aside.

7) Drill a 1 3/8" hole in the center of a 2" x 4" x 8" block of wood. Place power piston with tube down in block. Place block in vise and clamp in place. Do not clamp tube.

8) Remove snap ring on air valve. Place power piston, tube down in a press. Using a 3/8" drive extension, press out air valve assembly. Remove floating control valve, floating valve retainer, push rod limiter washer and air filter.

9) Remove floating control valve assembly from push rod. Discard control valve as a new one must be installed. Remove master cylinder push rod then remove "O" ring from push rod.

Cleaning & Inspection — Use denatured alcohol to clean all metal brake parts. Blow out all passages, orifices, and valve holes with clean, dry air. If any rust is found inside housings, remove with crocus cloth. Make sure there are no nicks, cuts or abnormalities in diaphragm.

Reassembly — 1) Install a new vacuum check valve and rubber grommet in front housing. Position a new seal in front housing. Make sure flat surface of cup lies against bottom of depression in housing.

2) Place a new "O" ring in master cylinder push rod. Wipe a thin film of power brake lubricant on "O" ring. Insert master cylinder push rod through reaction retainer. Round end of rod protrudes from tube end of retainer.

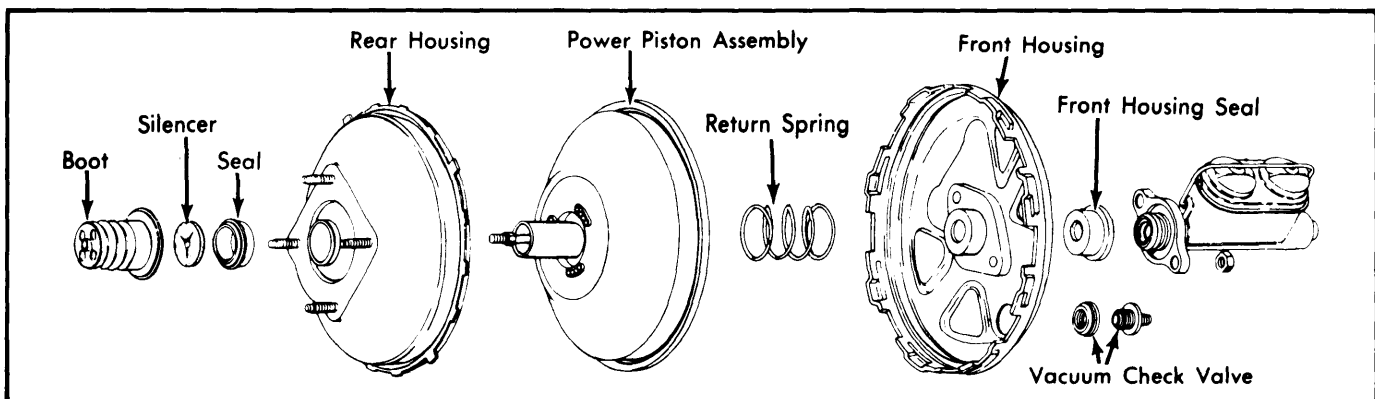


Fig. 1 Exploded View of Delco-Moraine Single Diaphragm Power Unit

Power Brake Units

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3) Place power piston wrench J-21524 in a vise. Place power piston on wrench so that lugs in wrench align with notches in power piston. Place a new "O" ring in second groove on push rod end of air valve.

4) Place a new floating control valve on push rod air-valve assembly. Make sure plate face of floating valve seats against valve seat on air valve.

5) Place a thin coat of power brake lubricant on outer diameter of floating control valve and on "O" ring on air valve. Press air valve push rod assembly onto seat in tube of power piston.

6) Place floating control valve retainer over push rod so that flat side seats on floating control valve. Start floating control valve and retainer into power piston tube.

7) Press floating control valve and retainer into tube until seated. Install retainer by pushing down using a suitable installation tool (J-21601-01).

8) With floating control valve seated, position rod limiter washer over push rod and down into floating control valve. Stretch air filter element over push rod and press into power piston tube.

9) Assemble power piston diaphragm to support plate from side of support plate opposite locking tangs. The raised flange on diaphragm is pressed through hole in center of support plate.

10) Make sure edge of center hole fits into groove in diaphragm flange. Pull diaphragm away from outer diaphragm of support plate so that both hands can be used to grip support plate.

11) With power piston still positioned on tool in vise, coat bead portion of diaphragm that contacts power piston with power brake lubricant.

12) Hold metal portion of support plate by hand with locking tangs down. Position support plate and diaphragm over power piston tube. Diaphragm flange will fit into power piston groove.

13) Press down and rotate support plate clockwise until lugs on power piston stop against notches in support plate. Place assembly over wood block fabricated during disassembly. Clamp assembly and wood block in a vise.

14) Install snap ring in groove in air valve. Place air valve spring retainer on snap ring. Install reaction bumper into groove in end of air valve. Place air valve with large end down on spring retainer.

15) Place 3 reaction levers into position in power piston with wide end in slots. The narrow end will rest on top of air valve return spring.

16) Place reaction plate, with numbered side up, on top of reaction levers. Press down on plate until large ends of reaction levers pop up so that plate rests on lever flats. Make sure plate is centered.

17) With round end of master cylinder push rod up and reaction retainer held toward top of rod, place small end of rod in center of reaction plate. Line up ears on reaction retainer with notches in power piston. Push reaction retainer down until ears seat in notches.

18) Maintain pressure on retainer and install large lock ring over push rod. Place one end of lock ring under lug with raised divider in center and to one side of divider.

19) As the lock ring is worked its way around, it goes over an ear of reaction retainer, under a lug on power piston and so forth. The other end of lock ring should end up under other half of lug with divider.

20) Place a new power piston bearing in center of rear housing. Make sure flange on center hole of housing fits into power piston bearing groove. The large power piston bearing flange will be on stud side of housing.

21) Coat inside of power piston bearing with power brake lubricant. Place silencer over holes on tube of power piston. Apply power brake lubricant to power piston tube.

22) Install power piston on rear housing. Apply power brake lubricant to reaction retainer tube. Attach a suitable holding fixture (J-22805) to front housing.

23) Clamp base of holding fixture in a vise. Install power piston return spring over insert in front housing. Apply power brake lubricant to inside diameter of support plate seal, reaction retainer tube, and beaded edge of diaphragm.

24) Position rear housing assembly over front housing assembly. Align scribe marks made during disassembly.

25) Assemble adapter and spanner wrench used in disassembly. On all units, press down on spanner wrench and turn rear housing clockwise until fully locked with front housing.

26) Remove tools from unit. Push felt silencer over push rod and seat against end of power piston tube. Install snap ring to secure silencer against tube. Place plastic boot against rear housing. Raised tabs on side of boot will locate in holes in center of brackets.

CAUTION — The interlock tabs should not be staked more than once. Stake 2 of the retaining tabs. When all tabs have been staked, housing must be replaced.

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ADJUSTMENT

PUSH ROD ADJUSTMENT

NOTE — Chevrolet and GMC production push rod is not adjustable. If production rod is reused, gauging is to check proper assembly. If service push rod, which is adjustable, is used to replace production rod, gauging is to set correct rod length.

Chevrolet & GMC — Place suitable gauge (J-22647) over piston rod in a position which will allow gauge to be slipped to left or right without contacting studs. Center section of gauge has two levels. Piston rod should always contact longer section (lower level), and never contact shorter section (higher level). Any variation beyond these two limits would require replacement of production piston rod or adjustment of service piston rod.

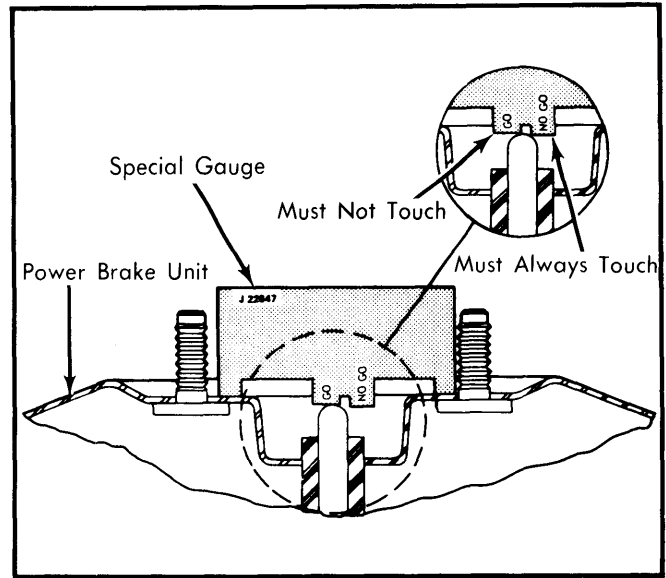


Fig. 2 Checking Piston Rod Height
Nonadjustable Production Rod Shown

Jeep — Piston rod of replacement units is preset at factory and require no field adjustment.

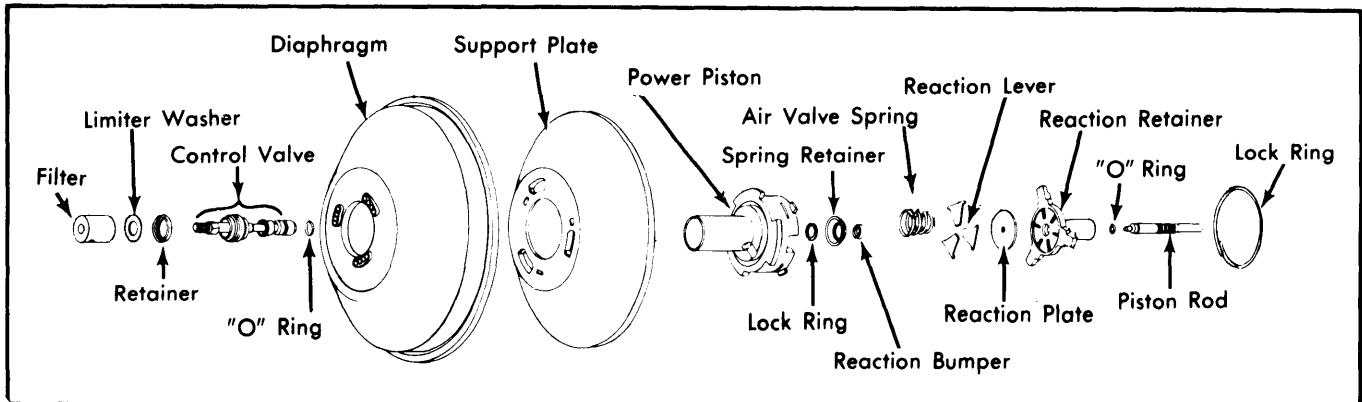


Fig. 3 Exploded View of Power Piston Assembly