BENDIX SINGLE DIAPHRAGM

American Motors
Chevrolet
Chrysler Corp.
Ford Motor Co.

DESCRIPTION

Vacuum suspended, self-contained, vacuum-hydraulic unit which utilizes engine manifold vacuum and atmospheric pressure to provide its power. Vacuum power unit contains power piston assembly, which houses control valve, reaction mechanism, and return spring. Control valve consists of air valve, floating control valve assembly, and push rod. Reaction mechanism consists of reaction plate and levers. A vacuum check valve is mounted in front housing for connection to vacuum source.

REMOVAL & INSTALLATION

Power unit removal will vary on all models. The following are special instructions that apply to specific models. They should be used in conjunction with the complete procedures that follow:

American Motors – Begin by disconnecting power push rod and brakelight switch at brake pedal.

Chevrolet – Remove air cleaner as necessary.

Chrysler Corp. – Remove lower pivot bolt on models equipped with linkage type power unit.

- All models disconnect battery.
- All except Continental, Ford, Mark VI and Mercury – Remove air cleaner. Remove hydraulic lines from outlet ports of master cylinder.
- All with 2300 cc engine – Disconnect accelerator cable from carburetor and accelerator shaft bracket. Remove accelerator shaft bracket bolts at manifold and rotate toward engine. If necessary, remove horn.
- All models – Disconnect wires from stop light switch, remove retaining clip from brake pedal pin and remove switch.
- Speed control equipped models – Remove and set aside control amplifier.

Removal – 1) Remove and cap vacuum hose from power unit check valve.

CAUTION – *Do not bend or kink hydraulic lines.*

2) Remove master cylinder from power unit without removing hydraulic lines and position out of way.

3) Disconnect power push rod from brake pedal.

4) Remove power unit from dash panel.

Installation – Reverse removal procedure and note the following:

- Check push rod length.
- Adjust push rod length if necessary.
- Check hydraulic lines for proper installation.
- Check for hydraulic leaks.
- Bleed hydraulic system if necessary.

NOTE – *American Motors brake pedal has two mounting holes; install pedal bolt in lower hole for power brake unit.*

OVERHAUL

NOTE – *American Motors, Chrysler Corp., and Ford Motor Co. do not recommend overhaul of this power brake unit.*

Disassembly – Disconnect master cylinder from power unit and power unit from vehicle. Scribe power unit housings for reassembly reference. Continue disassembly in following order:

- Remove front housing seal and piston rod.
- Attach power unit front housing to holding fixture base (Chevrolet No. J-22805) and clamp base in vise with power section up.

CAUTION – *Ensure proper tool alignment to avoid damage to check valve in front housing.*

- Remove lock nut and push rod clevis.
- Remove rear housing mounting bracket.
- Remove dust boot retainer, boot, silencer and air filter.

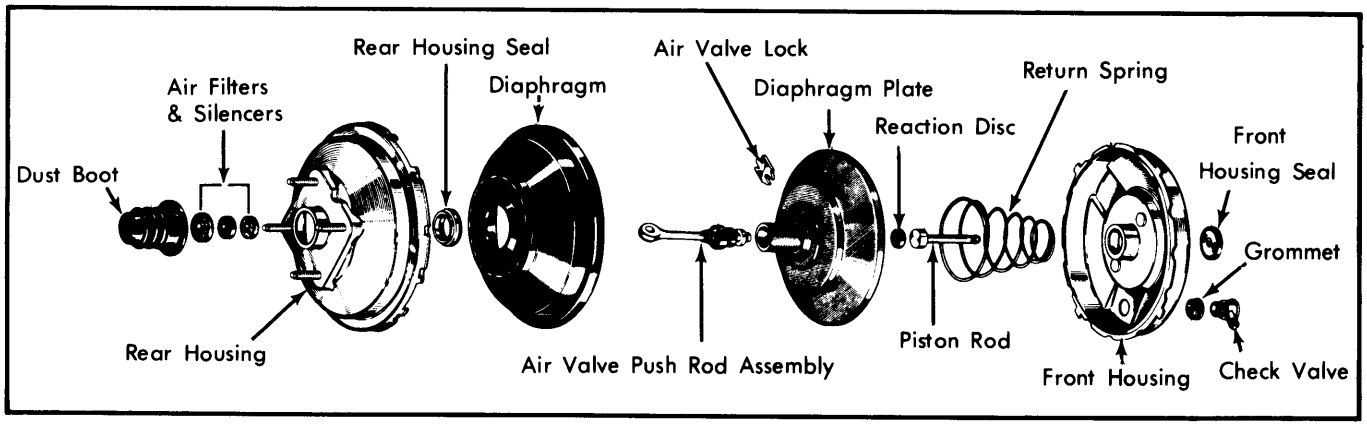

Fig. 1 Exploded View of a Bendix Single Diaphragm Assembly

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- Partially straighten the four deepest tabs on rear housing.
- Place a spanner wrench (Chevrolet No. J-9504) onto studs of rear housing.
- Press down and turn rear housing clockwise to separate 2 housings.
- Carefully remove rear housing.

CAUTION – *Housings are under internal spring pressure.*

- Remove air filter from plate extension.
- Remove diaphragm from plate. Do not damage diaphragm.
- Hold diaphragm plate so push rod is horizontal.
- Depress and rotate rod until air valve lock falls out.
- Remove reaction disc.

CAUTION – *Do not chip diaphragm plate.*

CAUTION – *Remove seal only if new one is available. Do not reuse old seal once it has been removed.*

- Remove rear housing bearing seal.
- Remove vacuum check valve and grommet.
- Remove front housing and holding fixture from vise and remove front housing.

Cleaning & Inspection – Clean and inspect as follows:

- Use only denatured alcohol or clean brake fluid to clean parts.
- Use clean dry air to blow out all passages, orifices, and valve holes.
- Blow dry all parts.
- Polish any areas with slight rust, on inside of housing, with crocus cloth.
- Replace any rubber parts that are cut, nicked, or distorted.

Reassembly – 1) Install vacuum check valve grommet (beveled edge on inside) after dipping part in denatured alcohol.

2) Install front housing on a holding fixture (Chevrolet No. J-22805), and clamp fixture in a vise.

3) Install new rear housing seal using seal installer tool (Chevrolet No. J-22677, tool bottoms on housing when seal is in place).

4) Assemble diaphragm plate assembly as follows:

- Lubricate outer diameter of diaphragm plate, extension, valve, plunger bearing surfaces and edge of poppet valve.
- Install valve and rod into diaphragm plate extension.
- Depress pushrod and install lock.
- Install rolling diaphragm in diaphragm plate groove.
- Lubricate and install reaction disc.
- Use master cylinder push rod to seat disc in diaphragm bore.

NOTE – *If disc is not fully seated, push rod height will be incorrect.*

- Lubricate inside of bearing seal and diaphragm contact surface of rear shell.
- Install diaphragm plate assembly in rear housing.
- Install air filter and retainer into diaphragm plate extension.

5) Complete assembly as follows:

- Place spanner wrench on rear housing.
- Press wrench down and turn rear housing counterclockwise to lock housings together. Make sure scribe marks align.
- Bend tabs back into place so housings will not come apart.
- If any tabs are broken, replace housing.
- Install air silencers, push rod boot and retainer.
- On clevis type push rods, install lock nut and clevis.
- Lubricate piston rod (except rounded end).
- Install rod into center bore until seated against reaction disc.
- Install front housing seal in same manner as rear seal.
- Install master cylinder and bleed system if necessary.

PUSH ROD CHECK & ADJUSTMENT

NOTE – *American Motors boosters, Chrysler Corp. boosters and Ford gold-anodized boosters use factory adjusted or non-adjustable push rods. Do not attempt to adjust this type of push rod.*

Push Rod Check – Push rod height check is necessary if:

- Master cylinder and power unit were separated.
- Push rod is replaced with a new one.
- Push rod is transferred from one unit to another.
- If push rod misadjustment is diagnosed as braking problem.

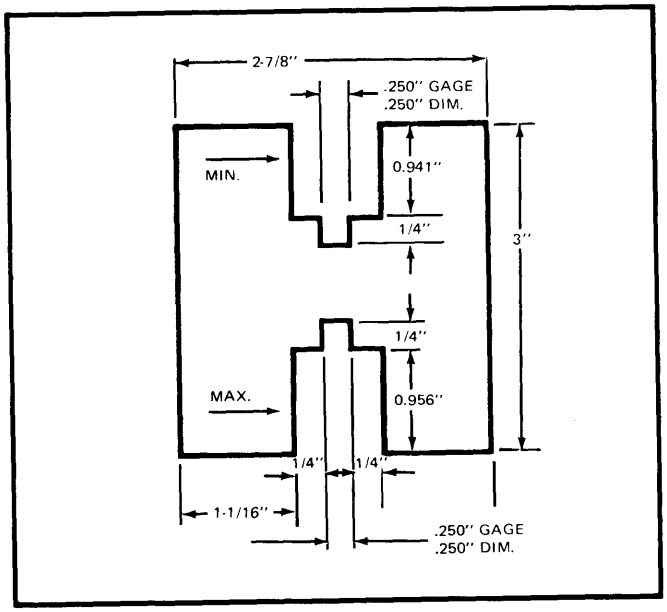

Fig. 2 Ford Brake Push Rod Gauge Showing Gauge Dimensions and Specifications

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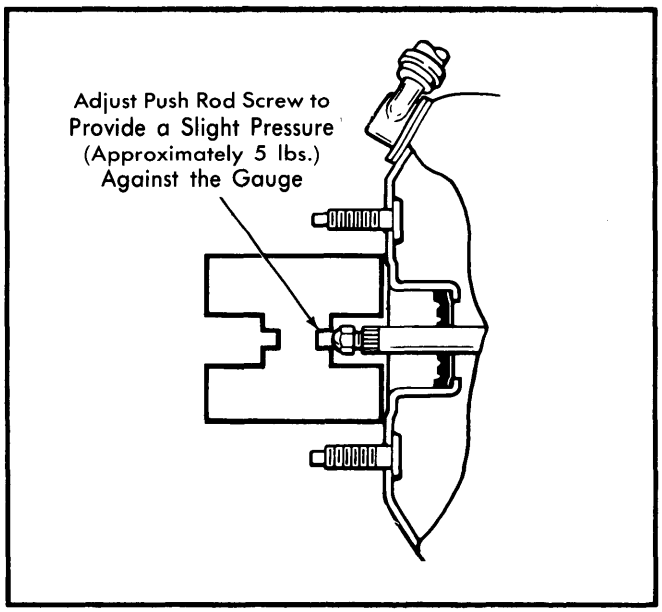

Fig. 3 Measuring Brake Push Rod Height (Ford Motor Co.)

Push Rod Adjustment (Ford Motor Co.) – 1) Make push rod gauge according to dimensions shown in *Fig. 2*. Remove master cylinder from power unit without removing hydraulic lines and set aside.

2) Start engine and place gauge over push rod. Adjust push rod nut to provide slight tension (approximately five pounds) against gauge. Reinstall master cylinder.

3) With engine idling and master cylinder reservoir cover removed, observe fluid surface when brake pedal is applied rapidly. Movement of fluid surface in forward reservoir indicates properly adjusted push rod. If fluid surface movement did not occur, push rod is adjusted too long and procedure must be repeated to prevent brake drag.

Chevrolet – 1) Remove power unit from vehicle and place power head assembly in padded vise with front housing up. Remove front housing seal.

2) Insert push rod (flat end first) into piston rod retainer. Depress rod with 40-50 pound force to ensure it is seated. Place "Go/No-Go" gauge (J-22647) over push rod. Make sure gauge does not contact studs.

3) "Go" or short tab on gauge should just clear push rod; "No-Go" or long tab on gauge should contact push rod. If push rod is too long or too short, an adjustable push rod must be used. Adjust new push rod to correct height using "Go/No-Go" gauge.

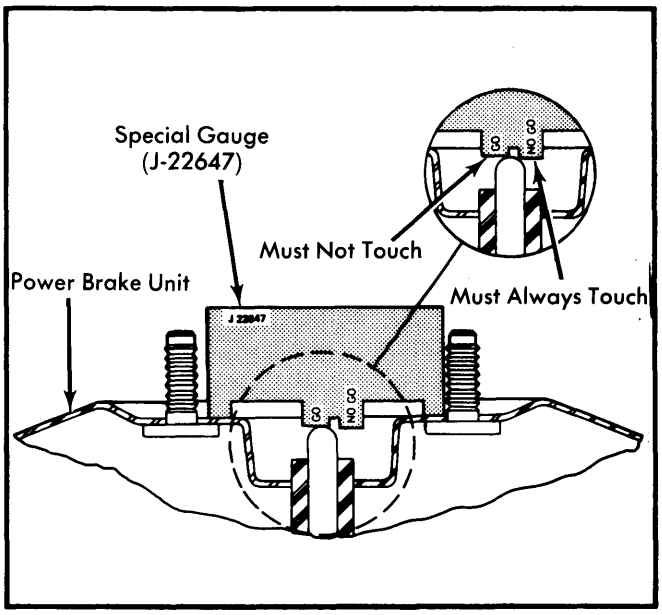

Fig. 4 Chevrolet Push Rod Gauging Method with "Go/No-Go" Gauge J-22647