

BENDIX VACUUM POWER SERVICE MANUAL

Service and Maintenance Instructions for 1939-1947 Chevrolet Vacuum Gear Shift Cylinders

373241 Gear Shift Cylinder For 1939 Models

BK-22200 Gear Shift Cylinder For 1940-1947 Models

BK-22228 Repair Kit For BK-22200 Cylinder

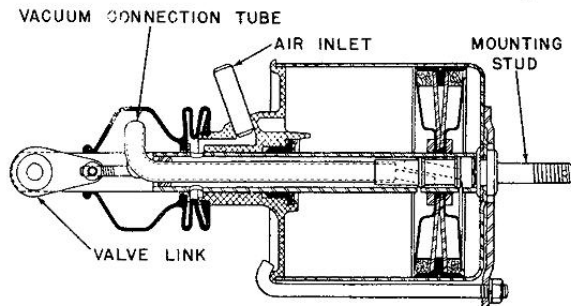


Fig. 1—Cylinder For 1939 Model Chevrolets

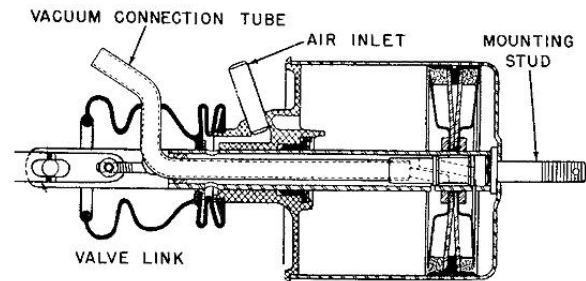


Fig. 2—Cylinder For 1940-1947 Model Chevrolets

OPERATION

The vacuum gear shift cylinder is a double acting atmospheric suspended power cylinder with an internal valve operated from the gear shift lever on the steering column through a system of rods and levers. The gear shift lever selects the transmission gear and opens the proper valve ports of the gear shift cylinder which permits the power cylinder to complete the shift. With the gear shift lever in neutral position, the valve rod is also at its mid or neutral position. In this position both ends of the power cylinder are open to atmospheric pressure. When the gear shift lever is moved forward (second or reverse gear) the valve rod moves forward to connect the forward end of the cylinder to the engine vacuum, causing the power cylinder piston to move forward.

As the gear shift lever is moved backward (low or high gear) the valve rod moves backward, opening the forward end of the power cylinder to atmospheric pressure and the rear end of the cylinder to engine vacuum, causing the piston to move backward.

In order to complete the shift, it is necessary to keep moving the gear shift lever ahead of the power cylinder piston movement.

LUBRICATION

To lubricate the vacuum power cylinder, remove the vacuum hose and pull the valve rod forward to open the vacuum passage into the forward end of the cylinder. Insert one half ounce of BK vacuum cylinder oil into the forward end of the cylinder through the vacuum connection tube.

Push the valve rod all the way into the piston rod to open the vacuum passage into the rear end of the cylinder. Insert one half ounce of BK vacuum cylinder oil through the vacuum connection tube.

Work the piston rod back and forth a number of times to distribute the oil.

REMOVAL & REPLACEMENT

Removal—1. Remove the vacuum and air hoses, outer half of the reactionary lever metal boot, and disconnect the piston rod yoke and valve links from the reactionary linkage.

2. Disconnect the cylinder from the mounting bracket by removing the cotter pin, nut, flat washer, stud retainer and rubber cushion.

Replacement—1. Assemble a rubber cushion and steel retainer on the cylinder mounting stud. Insert the stud through the hole in the mounting bracket and assemble a steel retainer, rubber cushion, flat washer, and castle nut on the mounting stud. Tighten nut just enough to insert the cotter pin and no more. Flexibility must be maintained at this point.

2. Connect the valve link and piston rod yoke to the "Reactionary Linkage".

3. Connect the vacuum and air cleaner hoses, and tighten the hose clamps.

OPERATIONAL TEST

After replacing the gear shift cylinder and making the necessary connections, test the operation of the unit.

If properly installed and adjusted, the shift from neutral into any gear position or from any gear position back to neutral, should be accomplished without lag as the gear shift lever on the steering column is moved into the various gear positions. If the gear shift cylinder fails to complete any shift, or it jumps out of any gear, it may be necessary to adjust the valve in the cylinder. To adjust the valve, proceed as follows:

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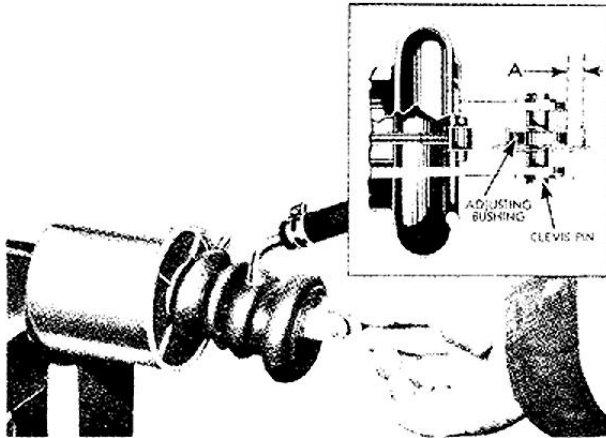


Fig. 3—Valve Links Away From the Cylinder

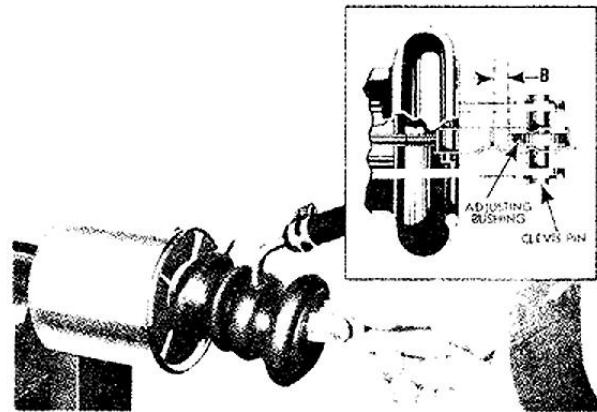


Fig. 4—Valve Links Toward the Cylinder

1940-1947 Model Chevrolets

1. Slip the forward end of the rubber boot off the rear end of the reactionary lever metal boot.
2. Remove the two screws which fasten the two halves of the metal boot together, and remove the outer half, exposing the reactionary levers.
3. Remove the piston and yoke clevis pin. Push the piston rod into the cylinder far enough to disconnect the yoke and valve from the reactionary levers. Install the special adjusting bushing and replace the clevis pin. (See Fig. 5 for details of adjusting bushing.)
4. With the engine running to provide vacuum, move the valve link away from the cylinder, until all clearance between adjusting bushing, and valve links is on the forward side, (See "A" of inset of Fig. 3.) In this position, the piston rod should move forward slowly.

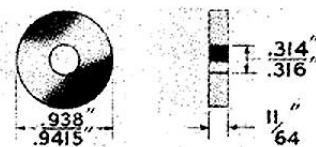


Fig. 5—Special Adjusting Bushing

Now move valve link toward cylinder until all clearance between the adjusting bushing and valve link is to the rear of the bushing. (See "B" of inset of Fig. 4.) In this position the piston rod should move slowly inward.

Should the piston move outward, but not inward, the valve link should be moved outward on the valve rod by unscrewing the valve link a half turn at a time until proper valve action is obtained. On the other hand, if the piston moves inward, but will not move outward, the valve link should be threaded onto the valve rod a half turn at a time until proper valve action is obtained.

5. Remove special adjusting bushing and reassemble the piston rod yoke and valve links to the reactionary linkage.

6. Replace metal boot over reactionary linkage, and slip forward end of rubber boot over reactionary linkage metal boot.

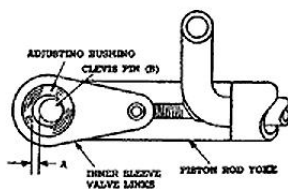


Fig. 7

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1. Remove the shift control rod clevis pin and then remove the leather boot from the reactionary lever system.
2. Remove the clevis pin from the vacuum cylinder piston rod yoke and reactionary linkage. Remove the two shift control rod links; thereby disconnecting the piston rod and valve links from the reactionary linkage. Push the piston into the cylinder to provide clearance for making adjustments. A special adjusting bushing should be made up for making the valve adjustments. Details of this bushing are shown in Fig. 6.
3. Insert the adjusting bushing through the edges of the valve links, then raise the valve links and adjusting bushing and insert clevis pin through piston rod yoke and bushing.

4. With the engine running, to provide a source of vacuum, move the valve links away from the cylinder until all clearance between the adjusting bushing and clevis pin is forward of the clevis pin. (See "A" Fig. 7.) In this position the piston rod should move slowly outward. Now move the valve links toward the cylinder until all clearance between the adjusting bushing and the clevis pin is rearward of the clevis pin. (See "B" Fig. 8.) In this position the piston rod should move slowly inward.

If the piston moves outward, but not inward, the valve links should be unscrewed from the valve a half turn at a time until the proper valve action is obtained.

On the other hand, if the piston moves inward, but will not move outward, the valve links should be screwed on to the valve rod a half turn at a time until proper valve action is obtained.

5. Reassemble piston rod yoke and valve links to the reactionary linkage. Replace leather boot and clevis pin.

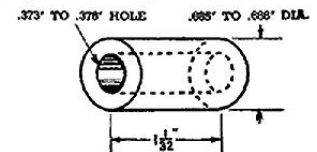


Fig. 6—Special Adjusting Bushing

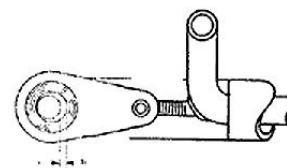


Fig. 8