

PN K050007-K050012: Rebuild Kit for Delco Non-Delay Height Control Valve

APPLICATION: 1959 – 1989
Cadillac, Oldsmobile, Buick, GMC Truck,
Ford, Fruehauf Trailer

INTRODUCTION

This kit provides the necessary parts and instructions to rebuild Delco/King of the Road non-delay valves. Several parts, including the valve body, cover and arm, are no longer available and must be re-used or sourced as second-hand parts.

NOTE: This rebuild should only be performed by experienced technicians. Read all instructions prior to starting rebuild in order to understand overall process.

NOTE: Non-delay valves were produced in multiple configurations, with many variations in the arm, cover and air fittings. For this reason, these instructions may not exactly match the arrangement of a specific valve. **Be sure to carefully document your valve configuration(s) with sketches, photos, etc., before beginning the rebuild.**

NOTE: If rebuilding several valves, work on only one valve at a time. Several parts are similar and can be easily confused between the right and left hand version of the valve.

IDENTIFYING YOUR VALVE

These valves were manufactured in many different versions, not all of which were well documented. To identify your valve, look on the control arm for a stamped part number (see figure 4 – pg 7). The number may be hidden below a layer of road grime and corrosion; it may be necessary to clean the arm with Scotch-Brite in the areas indicated in order to read the number.

In addition to the part number, there will also be a date code and possibly manufacturer's information (depending on the date of manufacture).

HCV OVERHAUL

The height control valve (HCV) is a precision-built mechanism. All parts should be carefully handled and assembled. Use only recommended tools and take care to prevent the entrance of dirt or moisture during the overhaul.

TOOLS AND SUPPLIES REQUIRED

1. Valve Core Tool Kent-Moore J-6888 or equivalent Schrader valve core tool
2. Dial indicator and stand
3. Water filled tank for leak test
4. Silicone o-ring grease
5. Kent-Moore J-8424 or equivalent
6. Safety glasses
7. Detergent based cleaner

PARTS INCLUDED IN KIT P/N K050007:

	Qty	Item
Outlet Adapter	3	1,2,6
Intake/Check Adapter Assy.	1	4,5,6
Valve Body Screen	3	3,8
Gasket, Adapter	3	6
Cover Gasket	1	10
Cover Screw (#8-32)	4	11
Intake Valve Core (RED)	1	12
Exhaust Valve Core	1	13
Valve Lever	1	15
Valve Lever Screw (#8-32)	1	16
Alignment Bracket Screw	1	20
Overtravel Bolt and Nut	1	22
Overtravel Body w/ Stud	1	25,26
O-ring	5	2,5,7,29
Overtravel Spring	1	30
Overtravel Piston	1	32
Overtravel Plug	1	33
Overtravel Seal	1	34
Spring Clip (Fastener)	1	35
Locknut, 1/4-28	1	37
DOT Adapter	2	38
Long Nut non-DOT Adapter	2	39

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PARTS NOT INCLUDED IN KIT:

	Item
Exhaust Fitting	7
Alignment Bracket	21
Guide	23
Shaft	27
Control Arm	36
Valve Body	

Note 1: Exhaust Fitting - Kit includes Check Valve Core and O-ring to rebuild Exhaust Check Valve Assemblies included on some models.

Note 2: P/N K050012 does not include DOT Adapters and Nuts.

DISASSEMBLY

NOTE: Key numbers in following text refer to figure 5 unless otherwise indicated.

NOTE: There are features depicted in figure 5 that are not present on earlier (generally pre-1960) valves.

NOTE: Figure 5 represents one hand of the valve, the same figure applies to the opposite hand, but parts will be in slightly different positions than represented in figure 5.

NOTE: Non-delay valves were manufactured with both 3/8 and 7/16 threaded ports machined in the valve body. Parts are included in this kit for both size ports.

NOTE: Retain all parts until assembly is complete and operational.

1. Remove air fittings from the inlet and air spring ports.

NOTE: Air fittings are connected to the inlet adapter/check valve assembly (4) and the outlet adapter (1).

2. Remove inlet adapter/check valve assembly (4) and outlet adapter (1) from valve body. If adapters are to be reused, remove adapter o-rings (2) and remove air line fitting gaskets (6) from adapters. Remove adapter screens (3) from valve body, if present.

3. Remove four cover screws and washers (11) from cover (9). Remove cover (9) and gasket (10).

4. Remove plastic guide (23). Remove valve lever screw and washer (16) from valve lever. Remove valve lever (15) from valve body.

5. Pull overtravel assembly and shaft (24) from valve body. Remove alignment screw (20) and bracket (21).

6. Remove intake valve core (12) with tool (J-6888) or equivalent Schrader tool.

NOTE: Intake valve core is accessed from inside the valve body.

7. Remove exhaust fitting (7) and screen (8) (if present), then remove exhaust valve core (13) with tool (J-6888) or equivalent Schrader tool.

NOTE: Exhaust valve core is accessed from outside of the valve body.

8. Remove plug retainer (35) from overtravel control body (25) (retainer will often break). Remove overtravel body plug (33).

NOTE: Before removing the overtravel arm in step 9, mark or note the relative positions of the overtravel arm (36) and overtravel control body (25). There is a short slot where these are screwed together, and this adjustment will affect the ride height of the vehicle.

9. Remove arm nut (37) from overtravel arm stud. Remove arm (36) from body. Alternatively, remove nut and bolt securing arm (36) to overtravel body (25).

CAUTION: The following step involves compressing a heavy spring by hand. Make sure parts are securely clamped and wear appropriate eye protection.

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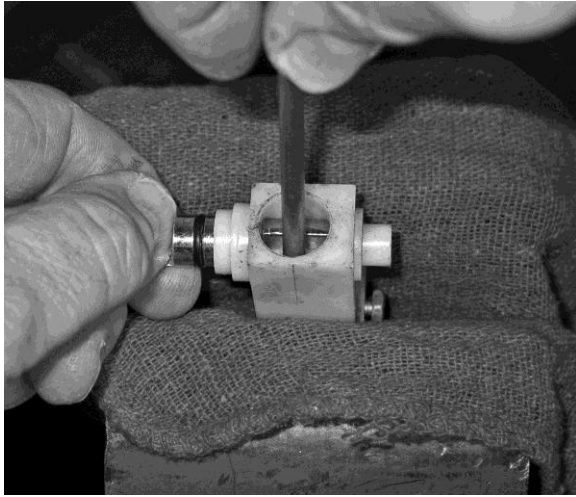


Figure 1

NOTE: The factory tool for this task is Kent-Moore J-8424; no longer available except through second-hand sources.

10. Clamp overtravel control (24) in vise with bore positioned at the top (figure 1). Position a small wrench on the smaller flat of the overtravel control shaft (27) where it protrudes from the overtravel control body (25) and rotate the overtravel control shaft (27) until the large flat inside the overtravel control body (25) is vertical. This will compress the overtravel piston and spring (30 and 32). Using a medium screwdriver (ex: Torx T20), force the overtravel piston (32) down just enough to allow the overtravel control shaft (27) to be moved part way out of the overtravel control body (25). Reposition the screwdriver on the overtravel piston (32) past the end of the overtravel control shaft (27) and force the piston (32) down just enough to permit the overtravel control shaft (27) to be fully removed. Release the overtravel piston (32) carefully. Remove the overtravel control body (25) from vise.

11. Remove overtravel control body seal (34) from overtravel body (25) or valve body. Remove shaft o-rings (29). Remove overtravel piston (32), overtravel lever spring (30) from body.

CLEANING AND INSPECTION

1. Thoroughly clean all metallic parts in a suitable cleaning detergent. Blow parts dry with compressed air.

2. Inspect all bearing and rubbing surfaces for scoring, fractures, or noticeable wear. Discard all damaged or worn parts and replace with new parts.

ASSEMBLY

NOTE: Height control valve parts must be kept free from dirt and moisture.

1. Mount alignment bracket to valve body (kit includes new screw).

2. Lubricate bore in overtravel control body with silicone o-ring grease. Assemble overtravel components as follows:

a. Lubricate overtravel lever spring (30) and place inside piston (32). Lubricate face of piston and insert piston/spring in control body (25).

b. Place two new O-rings (29) on overtravel control shaft (27). Lubricate shaft and o-rings with silicone o-ring grease.

CAUTION: The following step involves compressing a heavy spring by hand. Make sure parts are securely clamped and wear appropriate eye protection.

NOTE: The factory tool for this task is Kent-Moore J-8424, no longer available except through second-hand sources.

c. Clamp overtravel control body (25) in vise with bore positioned at the top (figure 1). Locate large flat on overtravel control shaft (27) and introduce this end of shaft into large hole in the side of the overtravel control body (25) with the large flat oriented vertically. Using a medium screwdriver (ex: Torx T20), force overtravel piston (32) into bore just far enough to allow shaft to pass above piston. Once shaft is started into the

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hole, reposition screwdriver inside the overtravel control shaft (27) flat and force piston down just enough to permit shaft to pass further into overtravel control body (25). Work the shaft (27) fully into position in the hole in the opposite side of the body (25). Rotate the shaft (27) to allow the piston (32) to engage the overtravel control shaft (27) flat. Remove the assembled overtravel control (24) from vise.

d. Install overtravel arm (36) on overtravel control body. Place arm stud nut (37) on stud and tighten to 80 in-lb. (9 N·m) torque.

NOTE: Some versions of the non-delay valves used a nut and a bolt instead of the swaged stud. This kit includes a replacement nut and bolt for use if the old overtravel body is to be reused. Tighten nut/bolt assembly to 10-15 in-lb (.1 to .2 Nm).

e. Insert overtravel body plug (33) in bore of body. Force new plug retainer (35) in position over pivot and body plug.

NOTE: Use appropriate sized socket to force retainer into place, if necessary.

3. Install intake valve core (12) and exhaust valve core (13) in valve body and tighten to 3 - 6 in-lb (.3 - .6 Nm).

4. Place new overtravel control body seal (34) on shoulder of control body. Slide overtravel assembly into valve body. Insert carefully to avoid seal damage.

NOTE: The seal is V-shaped; the open end of the 'V' should face the overtravel body.

5. Place valve lever (15) in position on overtravel shaft. Make sure the fork on the exhaust lever side is around stem of exhaust valve core (13) and valve core is not binding against fork. Fork should be high enough on stem so that stem will not be held open. Insert valve lever screw (16) with captive washer and tighten to 10-15 in-lb (.1 to .2 Nm) Insert plastic guide (23).

NOTE: If original valve lever is in good condition, you may be able to re-use it and reduce or eliminate some of the adjustments required later in this procedure (inspections would still be required).

6. Using new O-rings (2,5) and air line fitting gaskets (6), install screens (3, not shown), air inlet adapter/check valve assembly (4) and outlet adapter (1) into valve body.

NOTE: If using new adapters, these have o-rings and air line fitting gaskets already installed. Remove yellow cap to install. Replace yellow cap until ready to connect air lines.

7. Make the following height control valve adjustments below before continuing:

- a. Overtravel lever center position adjustment
- b. Air intake and exhaust valve lever gap adjustment.

8. Install screen (8) and exhaust fitting (7).

NOTE: DO NOT USE SEALING COMPOUND ON THREADS. Sealer is unnecessary, and if used may cause valves to stick.

9. Install gasket (10) and cover (9) using 4 cover screws (11). Tighten in a cross-pattern to 15 - 20 in-lb (1.7 - 2.2 Nm)

10. Install air line fittings. Make sure that air line fitting gaskets (6) are still in place in adapters and are properly seated.

NOTE: This kit comes with several options for connecting the air lines, depending on the type of air line. If new fittings are used, match the type of fitting to the air line.

11. Perform height control valve bench leak check (below).

12. Install valve per factory manual for vehicle. Do not connect link. After installation, check air lines for leaks using soap bubble solution. Repair any leaks in air lines.

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Connect link to valve control arm.

NOTE: Do not over-tighten fittings.

13. Vehicle Height Adjustment: There is a limited amount of height adjustment available by adjusting the connection between the overtravel arm and the overtravel body. If it is necessary to make height adjustments, follow the adjustment procedure in the vehicle factory manual.

HEIGHT CONTROL VALVE ADJUSTMENTS

Two main adjustments are required and MUST be followed in proper sequence as indicated below:

1. Overtravel lever center position adjustment.
2. Air intake and exhaust valve lever gap adjustment.

OVERTRAVEL LEVER CENTER POSITION ADJUSTMENT

NOTE: This measurement will properly center the valve action on the physical dimensions of the valve. Failure to properly complete this step will can cause premature valve failure through excessive stroking of either the intake or exhaust valve core.

1. Clean exterior of control valve assembly.
2. Referring to the figure 2, scribe a line 1-3/8" from plug end of overtravel lever control body.
3. Place valve assembly in vise as shown in figure 2.
4. If vacuum source is available, attach supply hose to valve exhaust port. Do not apply vacuum at this time. Include a vacuum gauge in the vacuum line as near the valve exhaust port as possible.

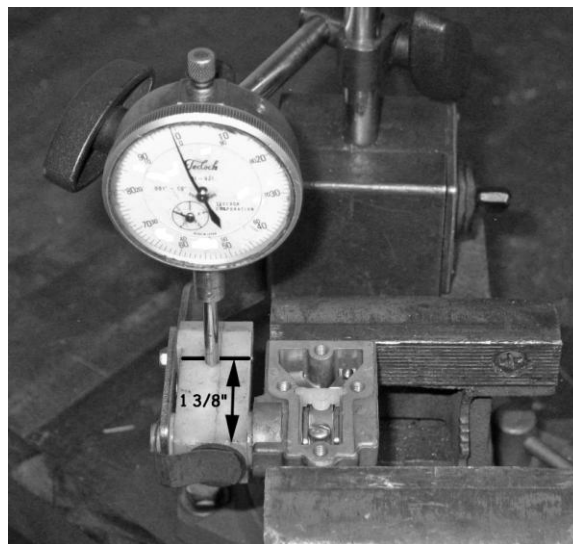


Figure 2

5. Attach air pressure supply hose to air inlet port. Do not apply pressure at this time.

6. Locate dial indicator in position as shown in figure 2. Move overtravel lever to full air exhaust position without overtraveling (position "C", figure 3). Relocate indicator push rod to just contact 1-3/8" mark on control body and reset indicator dial to zero (0) at this point (position "C", figure 3). Note: Use this indicator location for all valve measurements and adjustments.

7. Move overtravel lever to full air intake position without overtraveling (position "A", figure 3). Take indicator reading which may vary from 0.160" to 0.190"

8. Repeat steps 6 and 7 above to recheck this reading.

9. Divide the total travel dimension by two (example: $0.170" / 2 = 0.085"$), then move overtravel lever back this amount (0.085") to the center (position, "B", figure 3). This is the valve true center position.

NOTE: Without disturbing lever center position, reset indicator dial to zero (at position "B"), and then proceed with valve lever gap adjustments following.

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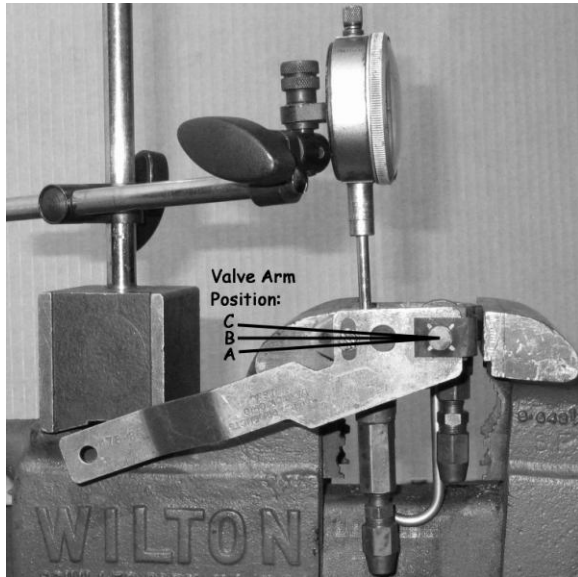


Figure 3

AIR INTAKE AND EXHAUST VALVE LEVER ADJUSTMENTS

NOTE: This adjustment will ensure that the valve has an appropriate center dead-band and will not consume excess air while also ensuring the vehicle ride height is maintained at a consistent level.

NOTE: Before making these adjustments the overtravel lever must be centered as explained previously.

Two methods of adjustment can be done using either the air pressure and vacuum method or the air pressure method only. If a vacuum source is available, this method will take less time to perform. The vacuum source is used to make the exhaust valve lever gap check only.

When the air pressure only method is used, it will take longer to perform adjustments as the valve cover must be in place each time air pressure is applied and then removed to permit adjustment of exhaust valve lever.

New valve levers must be bent to proper setting. In the valve both exhaust and intake levers are part of one unit which contains "score" marks to permit easy bending. This

operation may be done with lever in the valve body using a spark plug gap adjustment tool, or lever may be removed and bent on the bench.

NOTE: Old valve lever can be re-used, and often will not need adjustment. It is recommended, however, that the valve lever settings be checked before putting the valve in service because improper adjustment of the valve lever settings can cause the valve to consume a considerable amount of air.

Method Using Air Pressure and Vacuum

1. If air supply and vacuum lines were not connected to valve assembly previously when centering valve overtravel lever, connect lines.
2. Apply air pressure and regulate it to 80 to 110 psi. Apply vacuum and regulate it at approximately 15 inches.
3. Move overtravel lever fore and aft several times and then back to true center position.
4. Starting at true center position, slowly move lever until air intake valve just begins to open. Listen for escaping air. Note reading on dial at this point. Reading should be 0.025" to 0.027" from lever center position. If necessary, bend intake valve lever to correct setting.
5. Return overtravel lever to center position. Slowly move lever to exhaust side and at same time note the vacuum gauge reading. When vacuum just begins to fall off, the exhaust valve has opened. Valve should open when overtravel lever is moved 0.025" to 0.027" from center position. If necessary, bend exhaust valve lever to correct setting.
6. Recheck intake and exhaust valve lever gaps.

Method Using Air Pressure Only

1. Connect air supply hose (80 to 110 psi to air inlet port).

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2. To adjust air Intake valve lever gap:
 - a. Move the overtravel lever slowly from true center position to point where intake valve just begins to open. Listen for escaping air. Note reading on dial at this point which should register 0.025" to 0.027".
 - b. If necessary, bend intake valve lever to correct setting.
3. To adjust air exhaust valve lever gap:
 - a. Install valve cover on the valve using a new gasket and four attaching screws.
 - b. Being careful not to disturb indicator setting, disconnect air supply from the air inlet port and connect it to the bellows port (item 1).
 - c. Move overtravel lever slowly to open exhaust port while observing the indicator dial. Air should start to escape from exhaust port when indicator registers 0.025 " to 0.027". If adjustment is necessary, shut off air pressure supply and remove valve cover. Bend exhaust lever to correct setting, then install cover, turn on air supply and recheck valve opening dimension.
 - d. Recheck valve lever gap settings.

NOTE: Adjustment of one valve lever can often affect the other lever setting. It is important to double-check both valve lever settings after all adjustments are made.

HEIGHT CONTROL VALVE BENCH LEAK CHECK

After assembly and adjustment of valve, perform a leak check:

1. Connect pressure line to air spring port and open air pressure (80-110 psi).
2. Submerge unit in water. No air should escape between valve body and cover. If

bubbles appear, check and gasket placement, valve body surface and retighten screws.

3. No air should escape at air intake or exhaust. If bubbles appear at air inlet, verify o-ring at valve body connection and retighten intake check fitting. If bubbles appear at exhaust, remove, clean and reseal exhaust valve core.

4. Remove height control valve from water. Actuate overtravel lever to expel any water from unit.

5. Shut off air pressure and remove line from air spring port.

6. Connect air line to air intake port. Turn on pressure and actuate overtravel lever to expel any remaining water from unit.

FOR MORE INFORMATION

Control links and additional valve and link information available at:

www.levelingvalve.com

Dayton Air Control Products, LLC
Dayton, OH 45420

Email: info@levelingvalve.com

PART NUMBER IDENTIFICATION

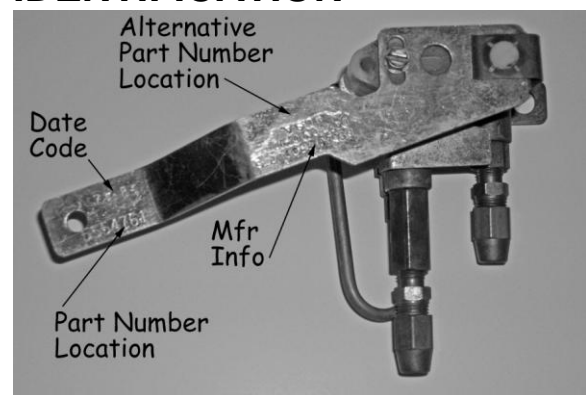


Figure 4

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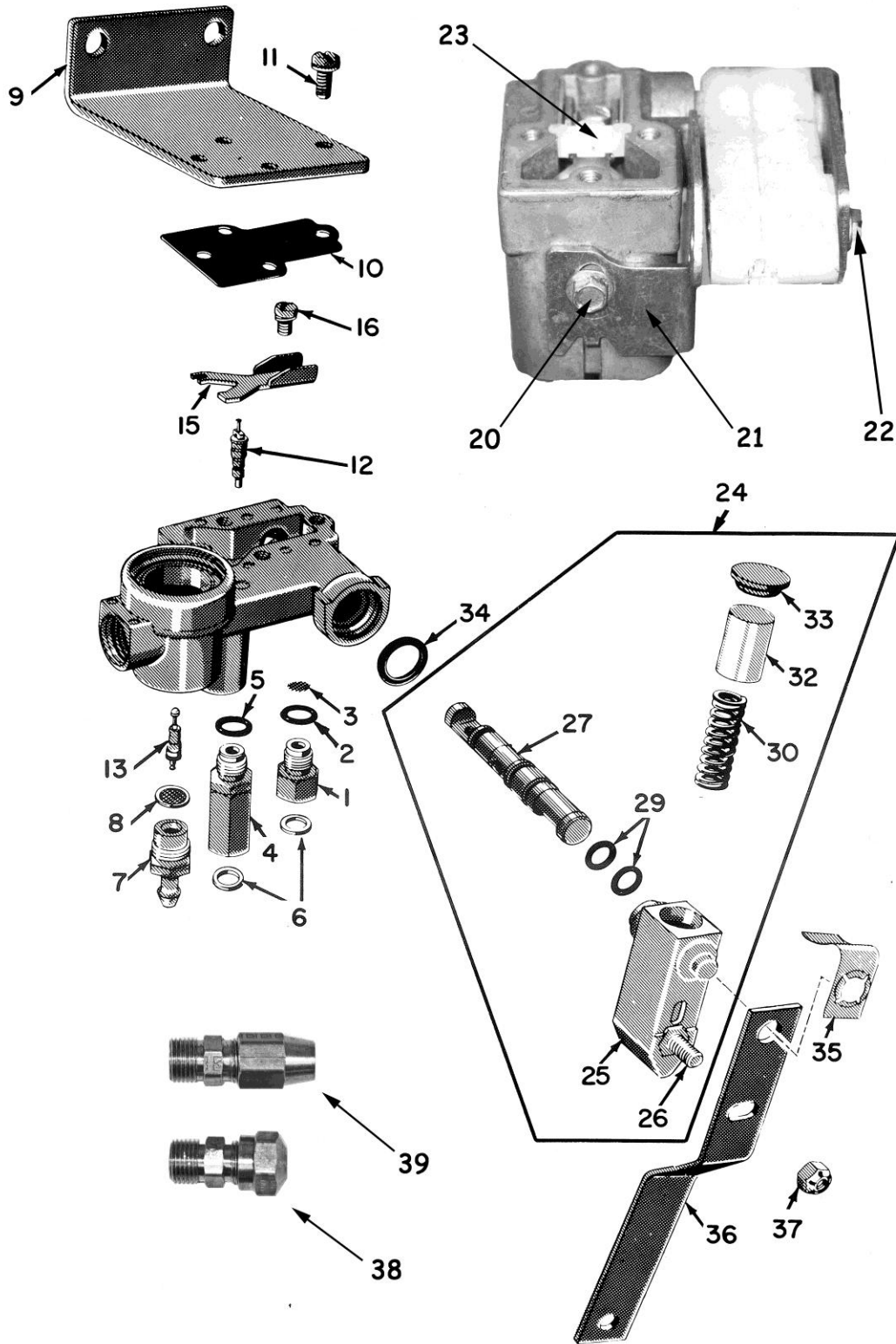


Figure 5