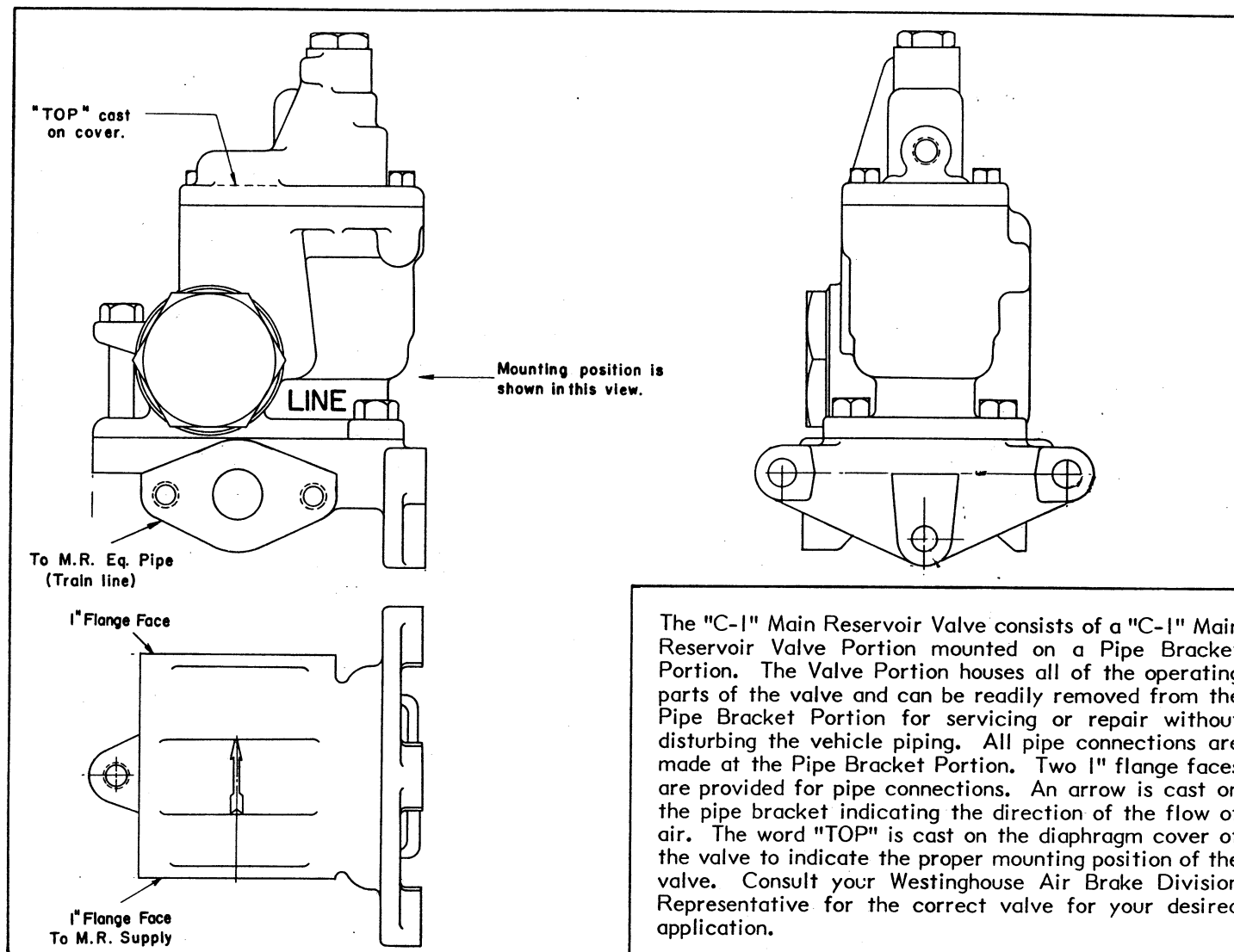




WESTINGHOUSE AIR BRAKE DIVISION
AMERICAN STANDARD INC.
Wilmerding, Pennsylvania 15148

*operation &
maintenance
information*

"C-1" MAIN RESERVOIR CUT-OFF VALVE, Pc. No. 525978 and Pc. No. 529451



OUTLINE VIEW - FIGURE 1

NOTE: The following description of operation is based on this device and its components being new or this device and its components having been repaired, tested, installed and maintained in accordance with instructions issued by the appropriate governing bodies and this and any other applicable WABCO publications.

I. DESCRIPTION

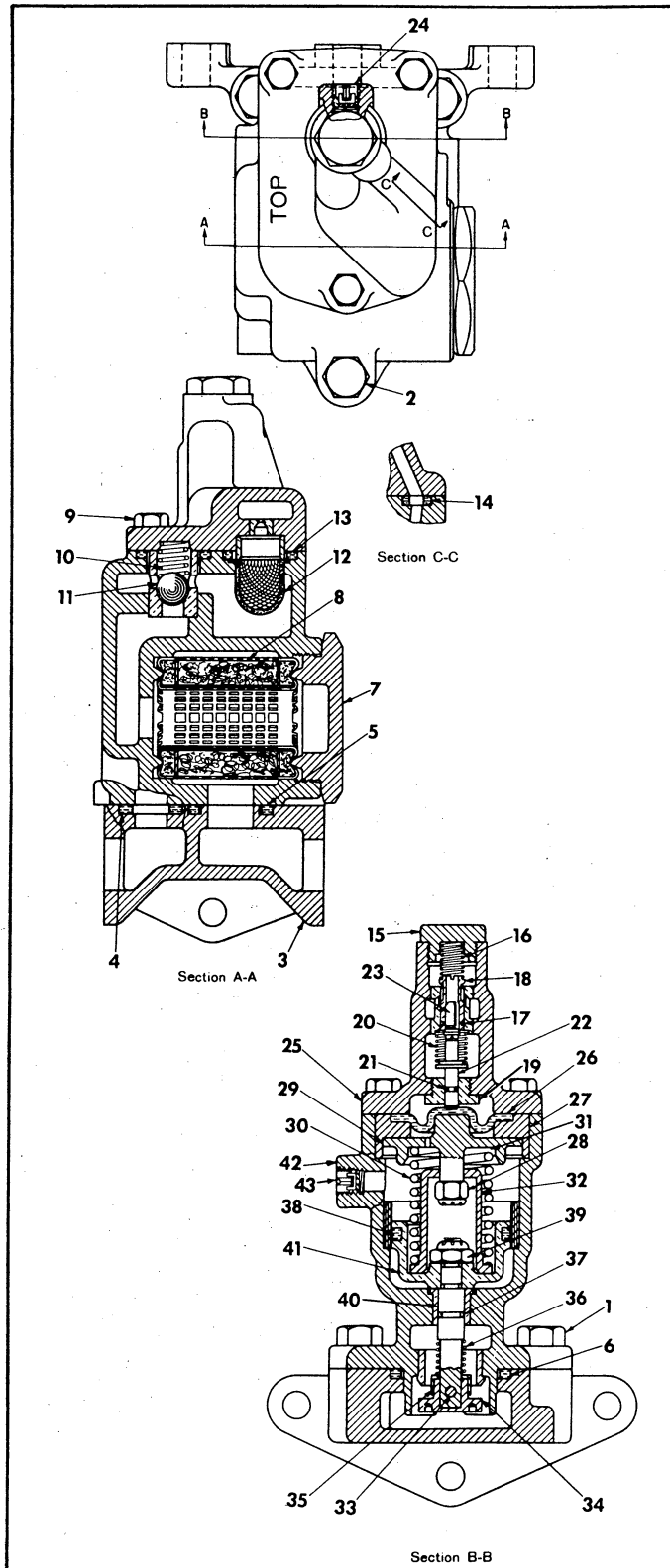
Refer to the Outline View Figure 1. The "C-1" Main Reservoir Valve is normally located in the main reservoir branch pipe of a locomotive. When properly installed and maintained, the valve is designed to function to assist in preventing a total loss of air from the main reservoir if a broken main reservoir equalizing pipe or broken hose should occur.

The "C-1" Main Reservoir Valve consists of a "C-1" Main Reservoir Valve Portion mounted on a Pipe Bracket Portion. The Valve Portion houses all of the operating parts of the valve and can be readily removed from the Pipe Bracket Portion for servicing or repair without disturbing the vehicle piping. All pipe connections are made at the Pipe Bracket Portion. Two 1" flange faces are provided for pipe connections. An arrow is cast on the pipe bracket indicating the direction of the flow of air. The word "TOP" is cast on the diaphragm cover of the valve to indicate the proper mounting position of the valve. Consult your Westinghouse Air Brake Division Representative for the correct valve for your desired application.

II. OPERATION

Refer to the Assembly View Figure 2. As shown in Section B-B, the valve parts are positioned when there is no air under pressure in the valve. When the brake equipment arrangement is charged, main reservoir air flows past cut-off valve 34 to the connecting vehicle and also through filter 12 Section A-A, to the top of diaphragm 26 Section B-B, where it flows past unseated pilot valve 18 through a cored passage to the chamber below piston 41. The valve is in this position until pressure reaches about 30 pounds when piston 41 moves up closing cut-off valve 34.

The cut-off valve parts remain in the closed position until the air pressure on top of diaphragm 26 reaches approximately 115 psi. This moves diaphragm 26 and follower 29 downward, compressing piston spring 30. Supply valve 18 moves down and is seated as exhaust



ASSEMBLY VIEW - FIGURE 2

valve 23 opens, and air flow to the chamber below piston 41 is cut off and connected to exhaust by valve 23. The main reservoir is connected to the main reservoir equalizing pipe and the valve parts remain as described, supply valve seated, exhaust valve 23 open, and cut-off valve 34 unseated.

When a reduction of air pressure in the chamber on top of diaphragm 26 takes place, as when a hose bursts between two vehicles, spring 30 moves diaphragm follower and diaphragm 26 upward. This unseats supply valve 18, closes exhaust valve 23, which connects air to the chamber below piston 41 so that with the pressure under cut-off valve 34, piston 41 is moved upwards compressing spring 30 and cut-off valve 34 is seated at about 85 psi. Main reservoir air flow is thus cut-off past cut-off valve 34 into the main reservoir equalizing pipe. The valve parts will thus remain in this position until the air is again recharged on top of diaphragm 26 and the valve will operate as previously described in charging.

The ball check valve 11, Section A-A, permits a connection from the main reservoir equalizing line into the main reservoir irrespective of the position of cut-off valve 34. Air from the line lifts the ball check 11 and flows to the top of diaphragm 26 and operates the cut-off valve as previously described. The ball check valve 11 prevents any flow from the main reservoir into the line and air flowing in this direction is controlled by cut-off valve 34. The supply and exhaust valves 18 and 23 prevent any loss of air to the atmosphere except during the movement of diaphragm 26. The large capacity of cut-off valve 34 insures an equal distribution of main reservoir air between the various vehicles and this is of particular advantage when a compressor synchronization system is used.

III. CLEANING SOLVENT AND LUBRICANT

- The solvent used for cleaning the metal parts and the strainer of the "C-I" Main Reservoir Cut-Off Valve **MUST** be an aliphatic, organic solution, such as mineral spirits or naphtha, that will dissolve oil and grease and that will permit all parts to be cleaned without abrasion.
- No. 2 Silicone Grease, WABCO Specification M-7680-2 **MUST** be used to lubricate all packing rings and/or o-rings.
- A compound consisting of one part graphite, WABCO Specification M-7695-2 (AAR Specification M-913) and two parts of SAE-20 oil **MUST** be available when servicing choke plugs.

IV. SAFETY PROCEDURES AND WARNINGS

REGULAR SHOP SAFETY PROCEDURES **MUST** BE FOLLOWED WHEN WORKING ON THIS DEVICE.



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THE WORK AREA MUST BE CLEAN AND FREE OF DEBRIS.

△ V. MAINTENANCE PROCEDURES AND TECHNIQUES △

! WARNING

The following statements of warning apply all or in part wherever this symbol **△** appears in the maintenance procedures. Failure to observe these precautions may result in serious injury to those performing the work and/or bystanders.

- The use of an air jet, which must be less than 30 p.s.i.g., to blow parts clean or to blow them dry after being cleaned with a solvent will cause particles of dirt and/or droplets of the cleaning solvent to be airborne. Wire brushing may also cause particles of dirt, rust, and scale to become airborne. These conditions may cause skin and/or eye irritation.
- When using an air jet do not direct it toward another person. Improper use of air jet could result in bodily injury.
- Personal eye protection must be worn when performing any work on this device or its component parts to avoid any possible injury to the eyes.
- The use of solvents as cleaning agents and the use of lubricants can involve health and/or safety hazards. The manufacturers of the solvents and lubricants should be contacted for safety data (such as OSHA Form OSHA-20 or its equivalent). The recommended precautions and procedures of the manufacturers should be followed.
- When performing any test or work on devices or equipment while they are on the vehicle (on car test etc.) special precautions must be taken to insure that vehicle movement will not occur which could result in injury to personnel and/or damage to equipment.
- Assembly may be under a spring load. Exercise caution during disassembly so that no parts "Fly Out" and cause bodily injury.

IMPORTANT: REFER TO FIGURE 2. THE STRAINER (8) LOCATED IN THE BODY OF THE "C-1" MAIN RESERVOIR CUT-OFF VALVE MUST BE REMOVED AND EITHER CLEANED OR REPLACED ONCE EVERY

SIX, (6) MONTHS OR MORE FREQUENTLY, IF SERVICE CONDITIONS SO DICTATE. THE STRAINER (8) MUST BE REPLACED WITH A NEW FILTER AT LEAST ONCE EVERY TWELVE (12) MONTHS. The following procedure is to be followed when cleaning the strainer.

1. Refer to Figure 2. The "C-1" Main Reservoir Cut-Off Valve Portion does not have to be removed from the locomotive to service the strainer (8).
2. Using a clean, lint-free cloth, remove all "free" dirt on the body (42) and the cap nut (7) or blow the body and cap nut clean using a low pressure (less than 30 psig) jet of clean, dry air.
3. Remove the cap nut (7) and the strainer (8) from the body (42).
4. Wipe the strainer cavity of the body using a clean, lint-free cloth.
5. Wash the strainer (8) using the cleaning solvent described in paragraph III.A. After cleaning, blow the strainer completely dry using a low pressure (less than 30 psig) jet of clean, dry air. **IMPORTANT:** If the strainer cannot be easily cleaned, it **MUST** be replaced.
6. Install the cleaned or a NEW strainer (8) in to the cavity in the body (42) and secure it in place using the cap nut (7). Tighten the cap nut.

IMPORTANT: THE "C-1" MAIN RESERVOIR CUT-OFF VALVE PORTION SHOULD BE REMOVED FROM THE LOCOMOTIVE, TAKEN TO THE SHOP, THOROUGHLY CLEANED, LUBRICATED AND TESTED AT LEAST ONCE EVERY TWENTY FOUR MONTHS OR MORE FREQUENTLY IF SERVICE CONDITIONS SO INDICATE.

△ VI.A. DISASSEMBLY △

Refer to Figure - 2

1. Remove the "C-1" Reservoir Cut-Off Valve Portion from the Pipe Bracket Portion (3) by removing the two 1/2" x 1-1/4" hex. head cap screws (1) and the 1/2" x 3" hex. head cap screw (2).
2. Remove and DISCARD the 1-1/4" O.D. gasket (4), the 1-5/8" O.D. gasket (5) and the 2-1/4" O.D. gasket (6) from the mounting face of the body (42).
3. Remove the three 3/8" x 1-1/8" hex. head cap screws (9) which secure the diaphragm cover assembly (15 to 25) to the body (42).
4. **CAUTION:** EXERCISE CARE DURING THE FOLLOWING PROCEDURES TO INSURE THAT NO PARTS ARE INADVERTENTLY EXPELLED AND CAUSE AN INJURY.



5. Remove the following parts from the body (42).
 - a. Diaphragm cover assembly (15 to 25)
 - b. Check valve spring (10)
 - c. 5/8" ball check (11)
 - d. Two 1-7/16" O.D. port gasket (13). DISCARD the gaskets.
 - e. 1/2" O.D. port gasket (14). DISCARD the gasket.
 - f. Filter element (12).
6. Disassemble the diaphragm cover assembly (15 to 25) by removing the following parts from the cover (25).
 - a. Cap nut (15)
 - b. Supply valve spring (16).
 - c. Supply valve (18) with 7/16" O.D. packing ring (17).
 - d. Plunger guide with plunger, plunger spring and exhaust valve (19 to 23) as a unit.
7. Remove the exhaust valve (23), and spring (20) from the plunger (22).
8. Remove the plunger (22) with 1/4" O.D. packing ring (21) from the plunger guide (19).
9. Remove and DISCARD the 1/4" O.D. packing ring (21) from the plunger (22).
10. Remove and DISCARD the 7/16" O.D. packing ring (17) from the supply valve (18).
11. Remove the following from the body (42):
 - a. Diaphragm (26) and DISCARD
 - b. Diaphragm seat (27)
 - c. Diaphragm follower - spring - spring cage assembly (28 to 32) as a unit.
12. Remove and DISCARD the 3/8" elastic stop nut (28) from the diaphragm follower (29).
13. Remove the spring cage (32), piston spring (30) and shims (31), if used, from the diaphragm follower (29).
14. Using the proper tool, CAREFULLY drift the .1875" x 5/8" pin (33) out of the cut-off valve (34) and piston stem (40).

15. Remove the cut-off valve (34), pin retainer (35) and retainer spring (36) from the piston stem (40).
16. Remove the piston and piston stem assembly (37 to 41) from the body (42) as a unit.
17. Remove and DISCARD the 2-1/4" O.D. packing ring (38) from the piston (41).
18. Remove and DISCARD the 3/8" elastic stop nut (39) from the piston stem (40).
19. Remove the piston stem with 1/2" O.D. packing ring (40, 37) from the piston (41).
20. Remove and DISCARD the 1/2" O.D. packing ring (37) from the piston stem (40).
21. Remove the cap nut (7) from the body (42), then remove the strainer (8) from the cavity in the body.

△ V.B. CLEANING, INSPECTING, AND REPAIRING △

IMPORTANT: When ordering replacement parts refer to WABCO Parts Catalog 3216-25. **CAUTION:** The reference numbers used in this publication and those used in the parts catalog may differ. Check the description (parts name) to insure that the desired part is ordered.

1. Rubber Parts

- a. All rubber parts are to be replaced with NEW parts obtained from the Westinghouse Air Brake Division of American Standard Inc.

2. Strainer

- a. The strainer should be washed in the cleaning solvent described in paragraph III.A.
- b. If the strainer cannot be easily cleaned, it MUST be replaced with a NEW strainer, Pc.No. 569146.
- c. After the strainer has been cleaned, it MUST be blown dry using a low pressure (less than 30 psig) jet of clean, dry air.

IMPORTANT: THE STRAINER MUST BE REPLACED WITH A NEW STRAINER AT LEAST ONCE EVERY TWELVE MONTHS OR MORE OFTEN, IF SERVICE CONDITIONS SO DICTATE.

3. Metal Parts

- a. Wash all of the metal parts in the cleaning solvent described in paragraph III.A.
- b. Use a clean, lint-free cloth that has been saturated in the prescribed cleaning solvent,

paragraph III.A. to clean the exterior surfaces of the body and cover.

- c. The springs may be wire brushed to assist in the removal of rust and scale.
- d. After the parts have been cleaned, they MUST be blown completely dry with a low pressure (less than 30 psig) jet of clean, dry air.
- e. Inspect the parts.

- (1) Replace any spring that is rusted, pitted or that has taken a permanent set. The following tabulation shows the approximate free height of the springs used in the "C-1" Main Reservoir Cut-Off Valve.

Cut-Off Valve Portion Pc.No.	Figure 2 Ref. No.	Spring Pc.No.	Approx. Free Height (Inches)
529239	10	30641	1-1/2
	16	569685	1-21/64
	20	528710	1-5/8
	30	528714	4-1/4
	36	507230	11/16
529452	10	30641	1-1/2
	16	569685	1-21/64
	20	528710	1-5/8
	30	529398	3-31/64
	36	507230	11/16

- f. Refer to Figure 2 - The wasp excluder with choke (24) located in the diaphragm cover (25) and the wasp excluder with choke (43) located in the body (42) MUST be cleaned according to the following procedure:

- (1) **IMPORTANT: REMOVE AND CLEAN ONLY ONE WASP EXCLUDER WITH CHOKE AT A TIME.**
- (2) Remove the wasp excluder with choke and place it in a bath of the cleaning solvent described in paragraph III.A. to soak. DO NOT USE METAL TOOLS TO CLEAN THE WASP EXCLUDER.
- (3) While the wasp excluder is soaking, check the passage from which it was removed to see that it is clean and unrestricted. Blow out the passage if necessary with a low pressure (less than 30 psig) jet of clean, dry air.

- (4) Remove the wasp excluder with choke from the cleaning solvent and blow it completely dry. Use a low pressure (less than 30 psig) jet of clean, dry air.

- (5) Inspect the wasp excluder. If the choke size has been changed or if the part is damaged in any way, it MUST be replaced. The choke size for both wasp excluders is 1/16".

- (6) Use a compound consisting of one part graphite, WABCO Specification M-7695-2, (AAR Specification M-912) and two parts of SAE-20 oil, by weight to lightly coat the threads of the wasp excluder, then install it in the passage from which it was removed.

- (7) Go to the next wasp excluder with choke and repeat steps (2) to (6).

- g. Replace any part that is cracked, cut, broken, excessively worn, damaged in any way or that is in such a condition that may result in unsatisfactory operation.

△ V.C. LUBRICATING AND ASSEMBLING △

- 1. Just prior to assembling, lubricate all packing rings (o-rings), the grooves in which the rings fit and the bushings into which the ring assemblies are installed with No. 2 Silicone Grease, WABCO Specification M-7680-2 according to the following procedure:

- a. Coat the packing ring with the lubricant.
- b. Fill the groove in which the packing ring will be installed with the lubricant.
- c. Lightly coat the bearing surfaces of the bushing into which the ring assemblies are installed with the lubricant.

- 2. Install the strainer (8) into the proper cavity in the body (42) and secure it in place with the cap nut (7).

- 3. Install a NEW lubricated 1/2" O.D. packing ring (37) in its groove on the piston stem (40). Lubrication procedure is found in paragraph V.C.1. Remove the excess lubricant by wiping with a soft, clean, lint-free cloth.

- 4. Install the piston stem with packing ring (37, 40) into the piston (41) and secure the stem (40) in place using a NEW 3/8" elastic stop nut (39).

- 5. Install a NEW lubricated 2-1/4" O.D. packing ring (38) in its groove on the piston (41). Lubrication procedure is found in paragraph V.C.1. Remove the excess lubricant by wiping with a soft, clean, lint-free cloth.



6. CAREFULLY install the piston with piston stem assembly (37 to 41) into the body (42). Make certain the packing rings remain in place.
7. Install the following parts on the piston stem (40):
 - a. Retainer spring (36)
 - b. Pin retainer (35)
 - c. Cut-off valve (34)
8. Rotate the pin retainer and cut-off valve so that the pin holes line up with the pin hole in the piston shaft. Using the proper tool, install the .1875" x 5/8" pin (33) through the aligned holes to secure the parts together.
9. Install the following parts on the stem of the diaphragm follower (29).
 - a. Shims (31), if used
 - b. Piston spring (30)
 - c. Spring cage (32). (Inserted into the spring (30)).
10. Use a NEW 3/8" elastic stop nut (28) to secure the shims, spring and spring cage to the stem of the diaphragm follower.
11. Install the following parts into the body (42).
 - a. Diaphragm follower - spring - spring cage assembly (28 to 32) so that the assembly fits inside of piston (41).
 - b. Diaphragm seat (27)
 - c. A NEW diaphragm (26)
12. Install a NEW lubricated 7/16" O.D. packing ring (17) in its groove on the supply valve (18). Lubrication procedure is found in paragraph V.C.1. Remove the excess lubricant by wiping with a clean, lint-free cloth.
13. Install the supply valve with packing ring (18, 17) into the diaphragm cover (25).
14. Install the exhaust valve (23) into the supply valve (18).
15. Install a NEW lubricated 1/4" O.D. packing ring (21) in its groove on the plunger (22). Lubrication procedure is found in paragraph V.C.1. Remove the excess lubricant by wiping with a clean, lint-free cloth.
16. Install the plunger with packing ring (22, 21) into the plunger guide (19).
17. Install the plunger spring (20) in place on the plunger (22).
18. Install the plunger spring, plunger, plunger guide assembly (19 to 23) into the diaphragm cover (25).
19. Install the supply valve spring (16) on the supply valve (18) and secure it in place in the diaphragm cover (25) using the cap nut (15).
20. Install the following parts in place in the body (42).
 - a. The 5/8" ball check (11)
 - b. Check valve spring (10)
 - c. Filter element (12)
 - d. Two NEW 1-7/16" O.D. port gaskets (13)
 - e. A NEW 1/2" O.D. port gasket (13)
21. Place the diaphragm cover assembly (15 to 25) in position on the body (42) and secure it in place using the three 3/8" x 1-1/8" hex. head cap screws (9). Equally tighten the screws.

V.D. TESTING AND ADDITIONAL INFORMATION

1. After the "C-1" Main Reservoir Cut-Off Valve Portion has been assembled, BUT BEFORE it is returned to service, it MUST pass a series of tests following the procedure of the current issue of one of the following WABCO Test Specifications.
 - a. Test Specification T-1487-0 for use with the "4-B" Test Rack.
 - b. Test Specification T-1939-0 for use with the "4-C" Test Rack.
 - c. IMPORTANT: Check the Test Specification for correct "C-1" Main Reservoir Cut-Off Valve Portion piece number before beginning test.
2. Refer to Figure 2 - After the valve portion has passed the tests, it may be remounted on the Pipe Bracket Portion (3) as follows:
 - a. Install a NEW 1-1/4" O.D. gasket (4), a NEW 1-5/8" O.D. gasket (5), and a NEW 2-1/4" O.D. gasket (6) into the proper grooves in the mounting face of the body (42).
 - b. Position the "C-1" Main Reservoir Cut-Off Valve Portion on the Pipe Bracket Portion (3) and secure it in place using two 1/2" x 1-1/4" hex. head cap screws (1) and one 1/2" x 3" hex. head cap screw (2).



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3. **IMPORTANT:** WHENEVER THE "C-1" MAIN RESERVOIR CUT-OFF VALVE PORTION IS REMOVED FROM THE VEHICLE FOR ANY REASON, AND IT IS REMOUNTED OR REPLACED WITH A NEW OR REPAIRED AND TESTED PORTION, NEW MOUNTING GASKETS MUST BE USED. See paragraph V.D.2.a.
4. **IMPORTANT:** WHENEVER THE "C-1" MAIN RESERVOIR CUT-OFF VALVE PORTION IS REMOVED FROM THE VEHICLE FOR ANY REASON, AND IT IS REMOUNTED OR REPLACED WITH A NEW OR REPAIRED AND TESTED PORTION, A STATIONARY VEHICLE AIR BRAKE TEST MUST BE MADE TO INSURE THAT THE PORTION AND THE "C-1" MAIN RESERVOIR CUT-OFF VALVE FUNCTION PROPERLY IN THE BRAKE EQUIPMENT ARRANGEMENT.
5. Consult your Westinghouse Air Brake Division Representative if additional information is required.

