

Bendix® PP-7™ Trailer Supply Valve

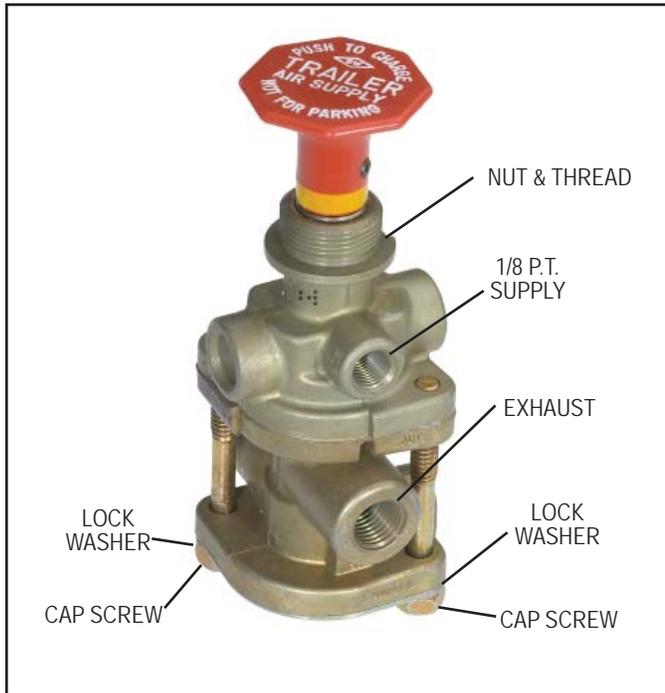


FIGURE 1 - EXTERIOR

FUNCTION AND DESCRIPTION

The PP-7™ trailer supply valve provides in cab control for the tractor protection system and functions in conjunction with the park control valve. It is responsible for synchronizing the tractor and trailer parking and emergency brakes.

It is essentially a combination of two non-modulating, on-off control valves in a single, compact package.

Each of the four pipe tapped ports of the PP-7™ valve are identified with cast in, raised letters. The supply and control ports have 1/8 inch N.P.T.F. dry seal pipe threads while the delivery and exhaust ports have 1/4 inch N.P.T.F. dry seal pipe threads.

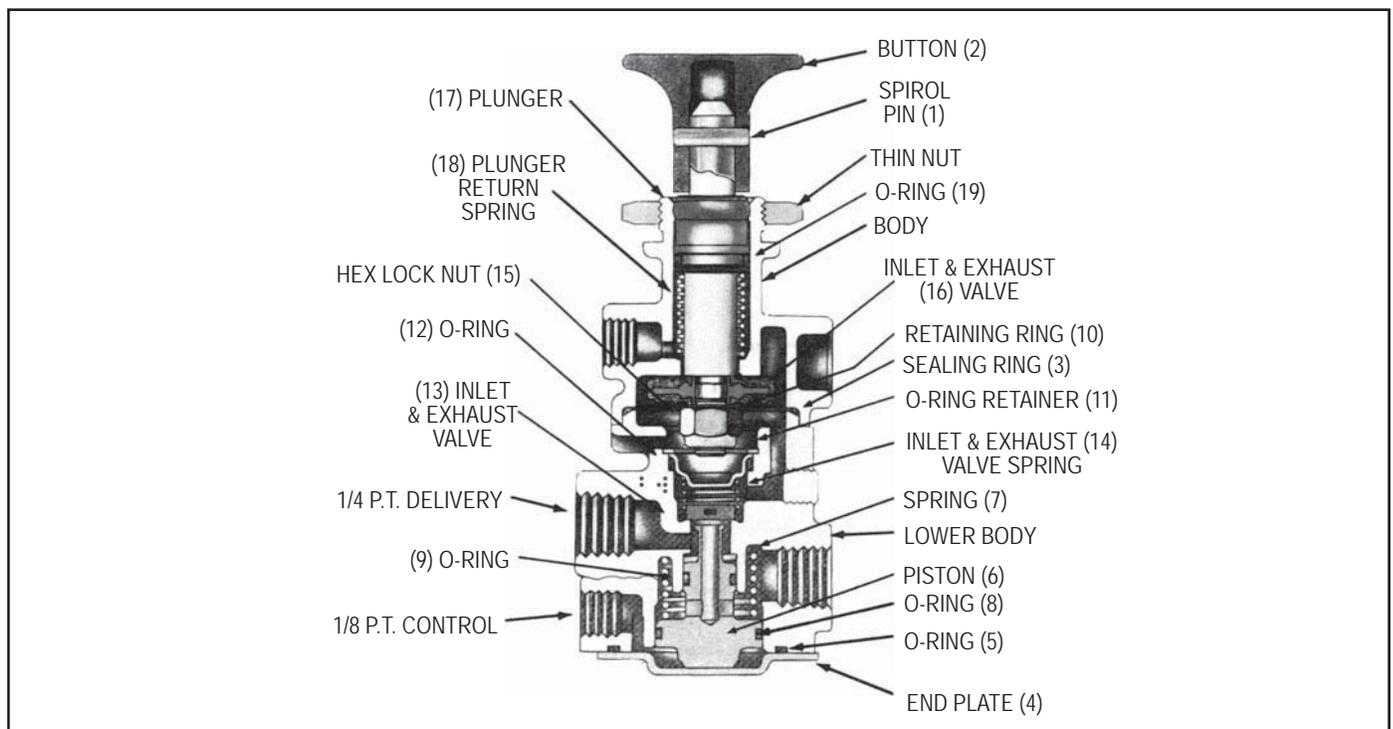


FIGURE 2 - SECTIONAL

TRACTOR DUAL AIR BRAKE SYSTEM

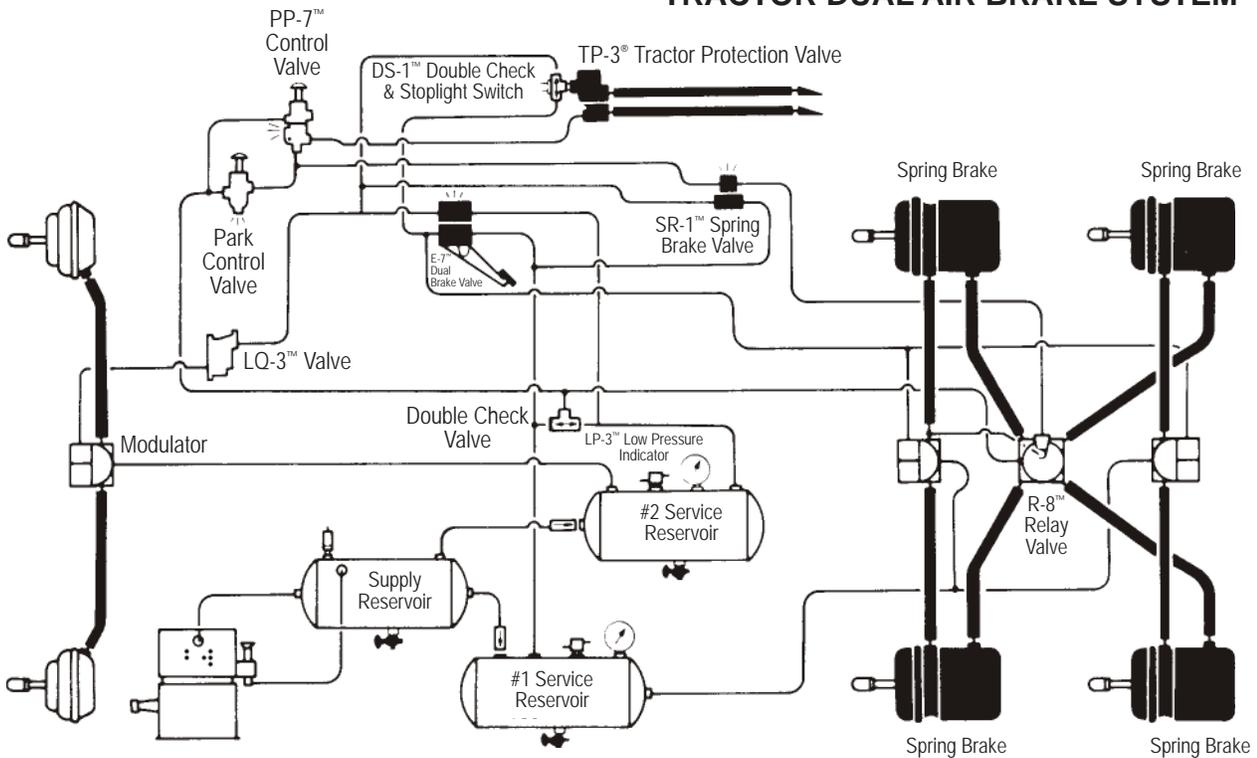


FIGURE 3 - PIPING DIAGRAM

PP-7™ VALVE LESS THAN 50 PSI SYSTEM PRESSURE

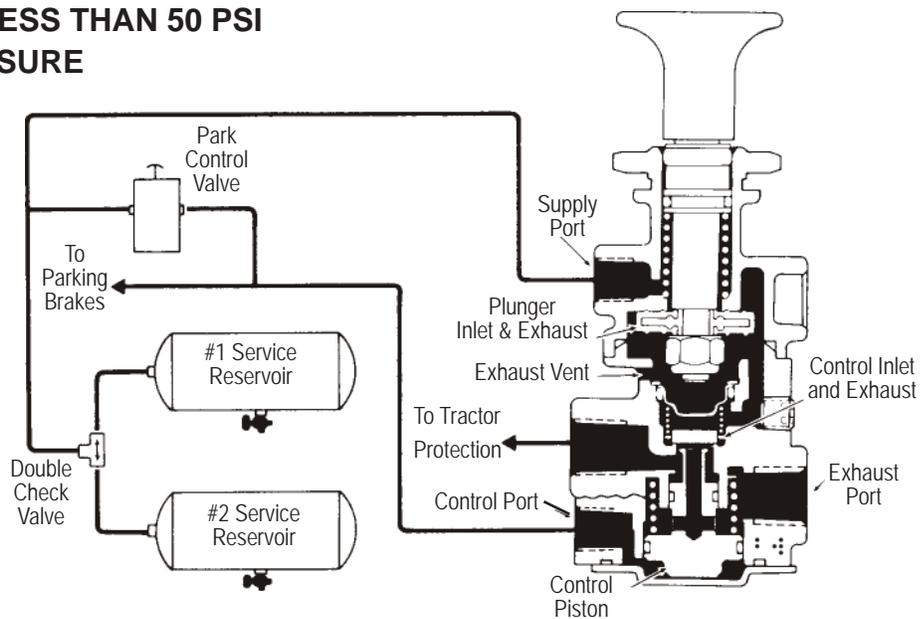


FIGURE 4 - PP-7™ TRAILER SUPPLY VALVE LESS THAN 50 PSI SYSTEM PRESSURE

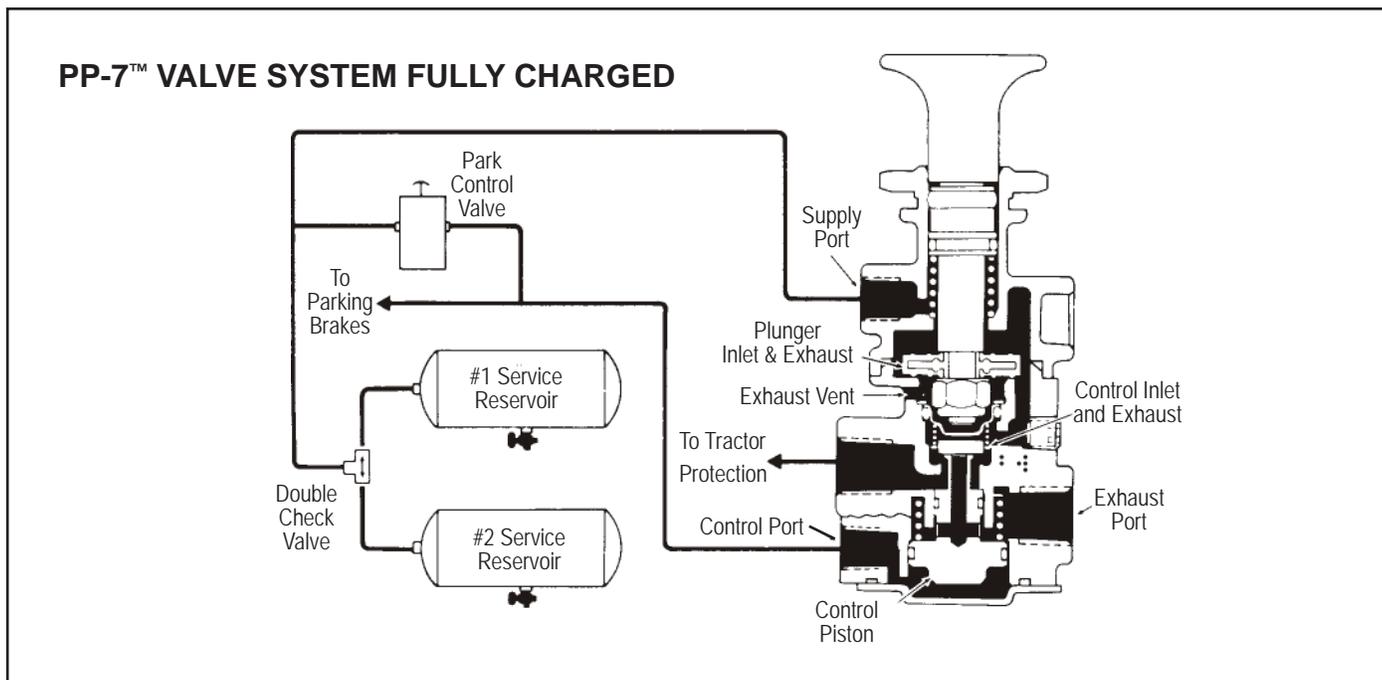


FIGURE 5 - PP-7™ TRAILER SUPPLY VALVE SYSTEM FULLY CHARGED

GENERAL OPERATION

The PP-7™ trailer supply valve is a dash panel mounted, push-pull operated control valve. The button of the PP-7™ valve must be manually depressed, but will automatically pop out and exhaust if supply air is below 40 p.s.i. Fifty p.s.i. or greater supply air pressure is required for the button to remain in after it is depressed, and it will remain in until supply air pressure falls below 40 P.S.I. or until the valve is manually actuated.

OPERATION - LESS THAN 50 P.S.I. SYSTEM PRESSURE

With less than 50 P.S.I. system air pressure, the button of the PP-7™ valve will remain out, and the park control valve will not deliver air to the control port of the PP-7™ valve. In this condition supply air cannot flow past the closed plunger inlet, and the plunger exhaust valve is off its seat. With no air pressure on the control port, the control inlet is seated, and the exhaust passage through the control piston is open.

OPERATION - ABOVE 50 P.S.I. SYSTEM AIR PRESSURE

When system air pressure is greater than 50 P.S.I., the button of the PP-7™ valve can be depressed and will stay in. If the vehicle is in the running condition, the park control valve will be delivering system air pressure to the control port of the PP-7™ valve. (See Note.)

With the button of the PP-7™ valve depressed, the plunger

inlet will be open and the exhaust valve will be seated, sealing the exhaust vent. Supply air is permitted to flow through the body to the control inlet and exhaust valve. With the park control valve delivering full system pressure to the control port of the PP-7™ valve, the control piston moves into contact with the control valve, closing the exhaust passage through the piston and opening the inlet. Opening the control inlet permits supply air to flow out the delivery port of the PP-7™ valve. (See Note.)

NOTE: If the vehicle is parked and system air pressure is above 50 P.S.I., the park control valve will not be delivering air to the PP-7™ valve control port and the control inlet valve will be closed. In this case no air will be flowing from the delivery port of the PP-7™ valve.

OPERATION - MANUAL OR AUTOMATIC EMERGENCY

MANUAL

In order to disconnect the tractor and trailer, the button of the PP-7™ valve is pulled by the operator. Pulling the button closes the plunger inlet and unseats the exhaust valve. Air that was flowing out the delivery port returns to the PP-7™ valve and is exhausted from the vent in the midsection of the PP-7™ valve.

NOTE: If the parking brakes were applied prior to pulling the PP-7™ valve button, no delivery air would be present to exhaust. Delivery air would have been exhausted when the parking brakes were applied. See "Operation Park Application."

PP-7™ VALVE MANUAL EMERGENCY

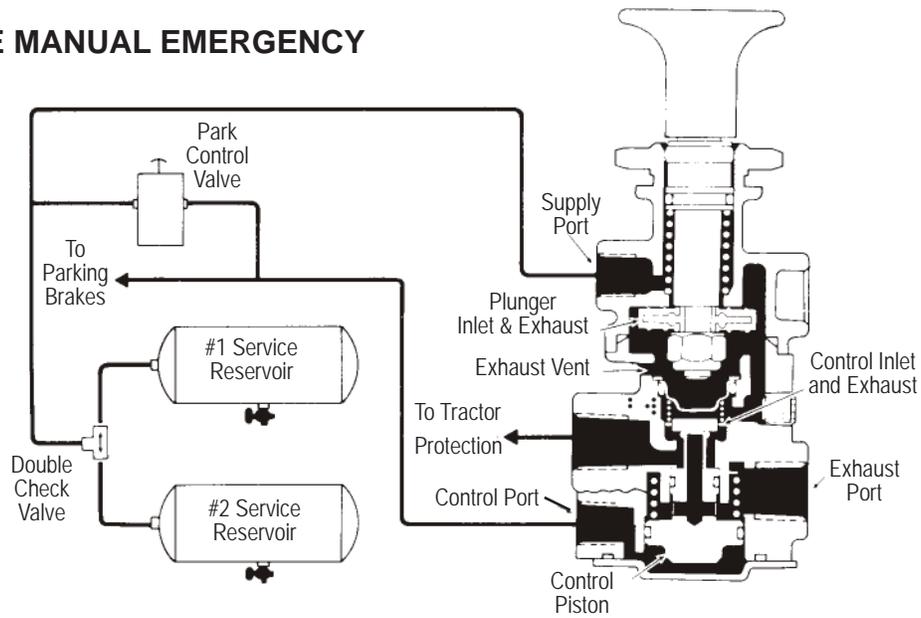


FIGURE 6 - PP-7™ TRAILER SUPPLY VALVE MANUAL EMERGENCY

PP-7™ VALVE PARK APPLICATION

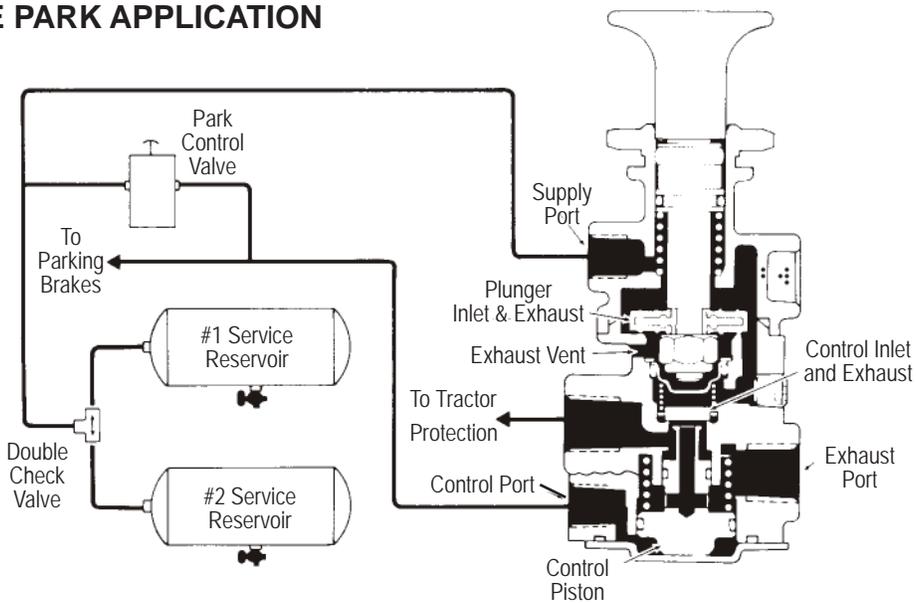


FIGURE 7 - PP-7™ TRAILER SUPPLY VALVE PARK APPLICATION

AUTOMATIC

In the event of trailer breakaway or a sudden complete failure of the trailer supply line, the button of the PP-7™ valve will pop out when air pressure in the supply line falls below 40 P.S.I.

OPERATION - AUTOMATIC EXHAUST (NO OVER RIDE)

If the driver holds the button of the PP-7™ valve in after supply air pressure has dropped below the 40 P.S.I. automatic pop out pressure, the control piston will move into the exhaust position when control port pressure falls below 20 P.S.I.

OPERATION - PARK APPLICATION

During a parking brake application, the park control valve removes air pressure from the control port of the PP-7™ valve. The button of the PP-7™ valve remains in.

With air pressure removed from the control port of the PP-7™ valve, the control piston moves away from the control inlet and exhaust valve. The inlet valve seats and the exhaust passage through the control piston is open. Air at the delivery port of the PP-7™ valve is exhausted at the exhaust port of the PP-7™ valve.

PREVENTIVE MAINTENANCE

Important: Review the Bendix Warranty Policy before performing any intrusive maintenance procedures. A warranty may be voided if intrusive maintenance is performed during the warranty period.

No two vehicles operate under identical conditions, as a result, maintenance intervals may vary. Experience is a valuable guide in determining the best maintenance interval for air brake system components. At a minimum, the PP-7™ valve should be inspected every 6 months or 1500 operating hours, whichever comes first, for proper operation. Should the PP-7™ valve not meet the elements of the operational tests noted in this document, further investigation and service of the valve may be required.

OPERATING AND LEAKAGE CHECKS

To perform the following test, an accurate vehicle test gauge installed in a spare hose coupling is required. The vehicle dash gauge(s) should be checked for accuracy against the test gauge prior to making these tests.

1. Block or hold the vehicle by means other than the service air brakes.
2. With the PP-7™ trailer supply valve button out and the parking control valve in the exhaust, or brakes applied position, build the air system pressure to governor cut-out.
3. Apply a soap solution to the exhaust vent and the plunger stem of the PP-7™ valve to check for leakage. Leakage should not exceed a 1 inch bubble in 5 seconds at either point.
4. Depress the control button of the PP-7™ valve and apply a soap solution to the exhaust vent and the exhaust port. Leakage should not exceed a 1" bubble in 5 seconds at either point.
5. Install the test gauge and coupling on the trailer supply coupling (tractor emergency hose coupling) at the rear of the tractor.
6. Place the tractor parking control valve in the "brakes released" position and observe an immediate rise in pressure on the test gauge. The pressure registered on the test gauge should equal dash gauge or system pressure.
7. Apply a soap solution to the exhaust port of the PP-7™ valve. Leakage should not exceed a 1" bubble in 5 seconds.
8. With the tractor air system at governor cut-out pressure, shut off the engine and note the dash gauge pressure. Quickly disconnect the test gauge and hose coupling from the tractor-trailer supply line coupling. Leakage from the tractor-trailer supply line should cease and

the button of the PP-7™ valve should be out when the pressure in the supply line drops below 40 P.S.I.

9. Reconnect the test gauge to the tractor-trailer supply line and depress the button of the PP-7™ valve. Open the drain cocks of No. 1 and No. 2 service reservoirs slightly. Note at what pressure (descending) the button of the PP-7™ valve pops out and exhausts the tractor-trailer supply line. This should occur between 20-45 P.S.I. air system pressure.

If the PP-7™ trailer supply valve fails to function as described or if leakage is excessive, it is recommended that it be returned to the nearest Bendix authorized outlet for a factory remanufactured valve. If this is not possible, the valve should be repaired using only genuine Bendix replacement parts, in which case the following should prove helpful.

NOTE: Bendix Maintenance Kit piece number 287367 is available for the PP-7™ trailer supply valve from any authorized Bendix outlet. This kit contains all the necessary parts to completely repair the valve.

REMOVAL

1. Chock the vehicle wheels and drain all air system reservoirs completely.
2. Disconnect all air lines leading to and from the PP-7™ valve and mark them for proper reconnection.
3. Using a drift pin punch, remove the spirol pin (1) Fig. 2 which secures the button to the plunger. Remove the button (2).
4. Using a 1-5/16 inch wrench, remove the special thin nut which secures the PP-7™ valve to the panel and remove the valve.

DISASSEMBLY

1. Mark the upper and lower body halves to show their relationship to each other.
2. Remove the two 1/4 inch-20 cap screws, that secure the lower valve body to the upper valve body, using a 7/16 inch wrench. Separate the two body halves.
3. Remove and discard the square cut sealing ring (3) between the upper and lower body halves.
4. Remove the end plate (4) and o-ring (5) from the lower body and discard the o-ring.
5. Remove the control piston (6) and piston return spring (7).
6. Remove the large (8) and small diameter o-rings (9) from the piston and discard them.
7. Remove the internal truarc retaining ring (10) from the lower body.

8. Remove the o-ring retainer (11) and remove and discard the o-ring (12).
9. Remove the inlet exhaust valve (13) and return spring (14).
10. Using a 7/16 inch wrench remove the special hex nut (15) from the plunger inlet exhaust valve and washer.
11. Remove the plunger inlet exhaust valve (16) and washer.
12. Remove the plunger (17) and plunger return spring (18) from the body.
13. Remove and discard the plunger o-ring (19).

CLEANING AND INSPECTION

1. Clean all metal parts in a good commercial solvent making sure all ports, passages, and bores are clean and open.
2. Dry the parts thoroughly and inspect the plunger and piston bores for scratches and nicks.
3. It is recommended that all non-metallic parts and springs be replaced, using only genuine Bendix replacements.

ASSEMBLY

Prior to assembly all internal bores and all non-metallic parts should be coated with a film of silicone lubricant, Bendix piece number 291126.

1. Install the control inlet exhaust valve (13) and return spring (14) in the lower body.
2. Install the o-ring (12) in the body, then the o-ring retainer (11) and the truarc retainer (10).
3. Install the end plate o-ring (5) in the oval groove in the lower body.
4. Install the plunger o-ring (19) and place the plunger return spring (18) and plunger (17) in the upper body.
5. Depress the plunger until the threaded portion extends sufficiently to install the plunger inlet and exhaust valve (16), the valve washer and special hex nut (15). Torque the special hex nut to 30-40 inch pounds.
6. Install the square cut seal ring (3) in the upper body.
7. Install the large (8) and small diameter o-rings (9) on the control piston (6).
8. Place the upper and lower bodies together taking care to align the marks made during disassembly.
9. Install the control piston return spring (7) and control piston in the lower body.
10. Install the end plate (4) on the lower body and secure it with the two 1/4 inch-20 cap screws.
11. Torque the cap screws to 30-40 inch pounds.

12. Reinstall the rebuilt valve on the vehicle in the reverse manner in which it was removed.

TESTING THE REBUILT VALVE

Test the rebuilt unit using the operation and leakage checks outlined in this manual.

GENERAL SAFETY GUIDELINES

WARNING! PLEASE READ AND FOLLOW THESE INSTRUCTIONS TO AVOID PERSONAL INJURY OR DEATH:

When working on or around a vehicle, the following general precautions should be observed at all times.

1. Park the vehicle on a level surface, apply the parking brakes, and always block the wheels. Always wear safety glasses.
2. Stop the engine and remove ignition key when working under or around the vehicle. When working in the engine compartment, the engine should be shut off and the ignition key should be removed. Where circumstances require that the engine be in operation, EXTREME CAUTION should be used to prevent personal injury resulting from contact with moving, rotating, leaking, heated or electrically charged components.
3. Do not attempt to install, remove, disassemble or assemble a component until you have read and thoroughly understand the recommended procedures. Use only the proper tools and observe all precautions pertaining to use of those tools.
4. If the work is being performed on the vehicle's air brake system, or any auxiliary pressurized air systems, make certain to drain the air pressure from all reservoirs before beginning ANY work on the vehicle. If the vehicle is equipped with an AD-IS® air dryer system or a dryer reservoir module, be sure to drain the purge reservoir.
5. Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in a manner that safely removes all electrical power from the vehicle.
6. Never exceed manufacturer's recommended pressures.
7. Never connect or disconnect a hose or line containing pressure; it may whip. Never remove a component or plug unless you are certain all system pressure has been depleted.
8. Use only genuine Bendix® replacement parts, components and kits. Replacement hardware, tubing, hose, fittings, etc. must be of equivalent size, type and strength as original equipment and be designed specifically for such applications and systems.

9. **Components with stripped threads or damaged parts should be replaced rather than repaired. Do not attempt repairs requiring machining or welding unless specifically stated and approved by the vehicle and component manufacturer.**
10. **Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.**
11. **For vehicles with Antilock Traction Control (ATC), the ATC function must be disabled (ATC indicator lamp should be ON) prior to performing any vehicle maintenance where one or more wheels on a drive axle are lifted off the ground and moving.**