

operation & maintenance instruction

“28-A” DOUBLE CHECK VALVE PORTION, Pc. No. 650143

NOVEMBER, 1989

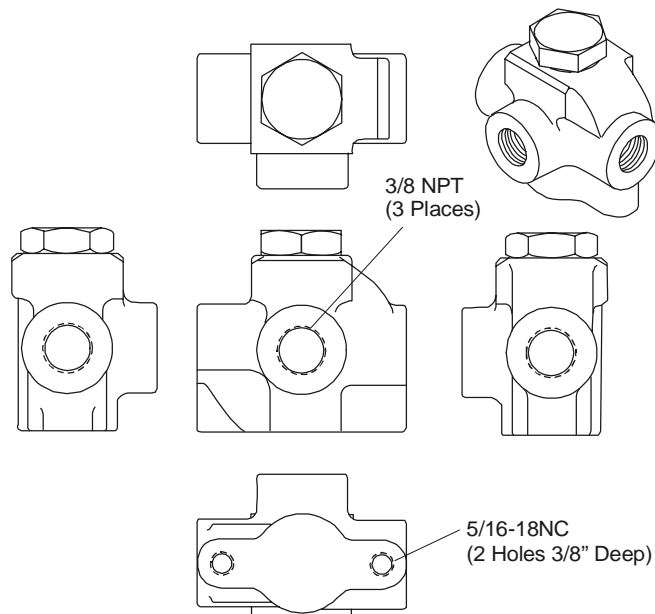
Supersedes issue dated January, 1989

NOTE: The following description and 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 this and any other applicable Wabtec Corporation publications.

⚠ WARNING: At the time any part is replaced in this device, the operation of the complete device must pass a series of tests prescribed in the latest issue of the applicable Wabtec Test Specification. At the time this device is applied to the brake equipment arrangement, a stationary vehicle test must be made to insure that this device functions properly in the total brake equipment arrangement. (Consult your local Wabtec Representative for identity of the test specification, with latest revision date, that covers this device.)

IMPORTANT: Only Wabtec supplied parts are to be used in the repair of this device in order to obtain satisfactory operation. Commercially available non-O.E.M. parts are unacceptable.

NOTE: The part numbers and their associated descriptions are the property of Wabtec Corporation and may not be replicated in any manner or form without the prior sole written consent of an Officer of Wabtec Corporation.



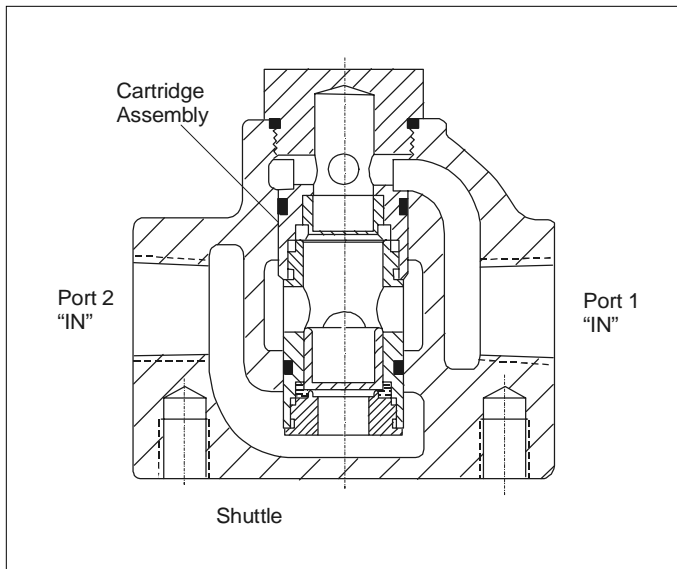


Figure 2 - Assembly View

1.0 DESCRIPTION (Figure 1)

Designed for "in-line" piping, the "28-A" Double Check Valve may be used in equipment arrangements where the air pressure does not exceed 150 psig. This Double Check Valve functions to permit the flow of air under pressure to another device to be controlled by either of two other devices. It consists of a Body and a Check Valve Cartridge Assembly. All of the "working parts" of the "28-A" Double Check Valve are included in the Check Valve Cartridge Assembly. This arrangement permits "quick" change out of the internal valve parts when maintaining the Check Valve. The body has two "inlet" ports and one "outlet" port and a cartridge type sub-assembly which includes a shuttle valve and o-ring seals. The "inlet" ports are designated as ports 1 and 2 and the "outlet" port as port 3. Each port has a 3/8" NPT tap for pipe connection. Two 5/16-18NC taps are provided on the bottom of the body for panel mounting.

2.0 OPERATION (Figure 2)

The "28-A" Double Check Valve functions to select the higher value inlet air pressure and directs this higher inlet air pressure to the outlet port of the body. The higher inlet air pressure forces the shuttle of the cartridge sub-assembly to seal on its seat on the low pressure side. This seating of the shuttle closes the passage between the low pressure inlet port and the outlet port of the body. Air then flows from the high pressure inlet port, through passages of the cartridge sub-assembly and body to the outlet port.

NOTE: In Figure 2 the high pressure inlet port is inlet port 1.

3.0 MAINTENANCE SCHEDULE

IMPORTANT: The "28-A" Double Check Valve should be removed in its entirety from the equipment arrangement, taken to the shop, be completely disassembled and the parts cleaned, inspected, lubricated and then re-assembled, using a NEW Wabtec Corporation Check Valve Cartridge Assembly, or re-assembled, using NEW Wabtec Corporation rubber parts and other specified NEW parts. The assembled Portion is then to be tested for correct operation according to the following vehicle application schedule, or more frequently if service conditions so indicate.

RECOMMENDED TYPE OF APPLICATION	FREQUENCY - AT LEAST ONCE EVERY
Locomotives	24 Months
Cab Cars	24 Months
Passenger (Interstate)	36 Months
Transit	24 Months

4.0 PARTS CATALOG AND REPLACEMENT PARTS INFORMATION

4.1 PARTS CATALOG

4.1.1 IMPORTANT: Refer to the current issue of the Wabtec Corporation Parts Catalog 3216-24, S.44 when ordering replacement parts for the "28-A" Double Check Valve, Part No. 650143.

NOTE: The reference numbers used in this publication and those used in the parts catalog may differ. Check the descriptive part name and part number to be sure that the desired part is ordered.

4.2 REPLACEMENT PARTS

4.2.1 IMPORTANT: To obtain satisfactory operation and reliability of the "28-A" Double Check Valve, ONLY Wabtec Corporation replacement parts are to be used in the maintenance of this device.

5.0 SAFETY PROCEDURES & WARNINGS

Regular owner-operating property and shop safety procedures are to be followed.

The work area is to be clean.

⚠ WARNING

The following statements of warning apply all or in part wherever the symbol ⚠ appears in the maintenance procedures.



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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 components 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.
- All air supply and/or electric current to this device and/or to any components part must be cut-off before this device and/or any component part is removed from the equipment arrangement.
- "Bottled" up air under pressure (even though air supply is cut-off) may cause gaskets and/or particles of dirt to become airborne and an increase in sound level when this device and/or any component part is removed from the equipment arrangement.
- Personal eye and ear protection must be worn and care taken to avoid possible injury when performing any work on this device and/or component part.
- To prevent receiving electrical shock when performing electrical tests, hands must be clear of electrical components, contacts and housing and there must be no bodily contact with the work bench. Failure to heed this warning could result in severe injury or death.

6.0 CLEANING SOLVENT AND LUBRICANT

6.1 CLEANING SOLVENT

6.1.1 **IMPORTANT:** The solvent used to clean reusable parts **MUST BE** an aliphatic organic solution, such as mineral spirits or naphtha, that will dissolve oil or grease and that will permit the parts to be cleaned without abrasion.

6.2 LUBRICANT

6.2.1 **IMPORTANT:** Number 2 Silicone Grease, Wabtec Corporation Specification M-7680-2, such as Dow Corning Corporation Molykote 55M is required for the lubrication of specified o-ring, o-ring grooves or shoulders and the bearing surfaces of bushings into which o-ring assemblies are installed.

7.0 SPECIAL TOOLS

7.1 **IMPORTANT:** In addition to the regular shop tools, the following **MUST BE** available to the repair person.

7.1.1 A piece of 1/4" diameter steel rod.

7.1.2 A 1" wrench

7.1.3 A 5/16" Allen Wrench

7.1.4 A vise equipped with jaw-protectors

8.0 MAINTENANCE PROCEDURES - "IN-SHOP"

IMPORTANT: When performing the procedures which follow, **DO NOT** use hard or sharp metal tools to remove o-rings and gaskets. Exercise care so that no damage is done to metal parts.

⚠ 8.1 DISASSEMBLY (Figures 3, 4, and 5)

8.1.1 Place the "28-A" Double Check Valve in a jaw protected vise so that the jaws clamp on the sides of the body (11). **DO NOT** overtighten the vise.

8.1.2 Using a 1" wrench on the cartridge cap nut (2), remove the Check Valve Cartridge Assembly (1 to 11) from the body (12) as a unit.

8.1.3 Remove the body (12) from the vise.

8.1.4 **NOTE:** A NEW, Fully Assembled, Check Valve Cartridge Assembly is available by ordering Part Number 592735. This Assembly includes **ALL** of the internal parts

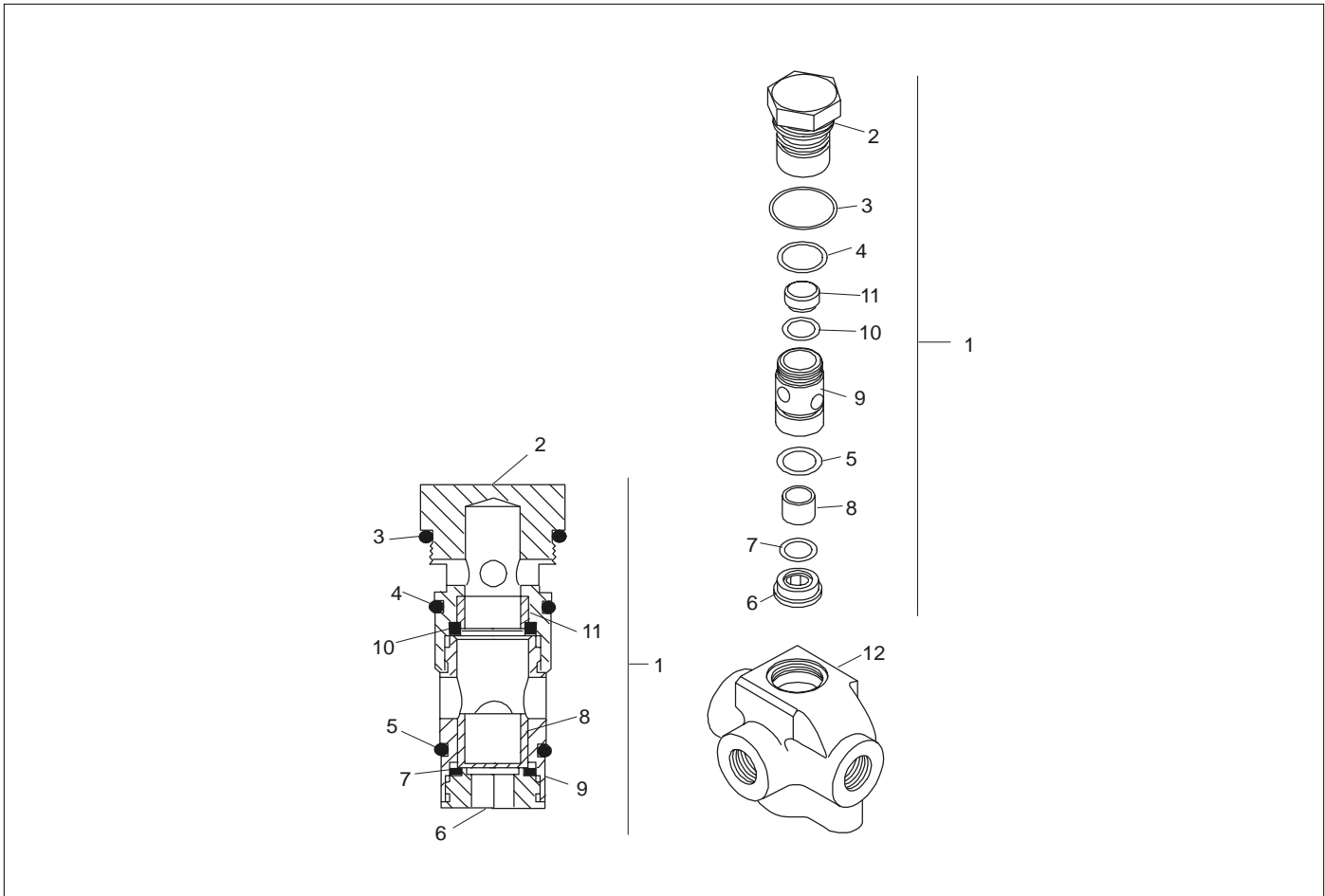


Figure 3 - Exploded View

of the Check Valve. If desired, the Check Valve Cartridge Assembly may be disassembled as follows:

8.1.5 Remove and SCRAP the $\frac{3}{4}$ " O.D. o-ring (5), the $\frac{13}{16}$ " O.D. o-ring (4) and the $\frac{15}{16}$ " O.D. o-ring (3) from their grooves on the Check Valve Cartridge Assembly (1).

8.1.6 Using the 1" wrench on the cap nut (2) to hold the cartridge sub-assembly, insert a $\frac{5}{16}$ " Allen wrench in the retainer nut (6) and remove the nut (6) with $\frac{5}{8}$ " O.D. o-ring (7) from the shuttle cage (9) of the Check Valve Cartridge Assembly (1).

8.1.7 Remove and SCRAP the $\frac{5}{8}$ " O.D. o-ring (10) from the shoulder of the retainer nut (6).

8.1.8 Remove the valve shuttle (8) from the check valve cartridge assembly (1).

8.1.9 Insert a $\frac{1}{4}$ " diameter steel rod through the bottom cross holes of the shuttle cage (9) to assist in holding the

cage, then, using the 1" wrench on the cartridge cap nut (2), remove the cap nut (2) from the shuttle cage (9).

8.1.10 Remove the seal retainer sleeve with o-ring sub-assembly (10, 11) from the cartridge cap nut (2) as a unit.

8.1.11 Remove and SCRAP the $\frac{5}{8}$ " O.D. o-ring (10) from the shoulder of the seal retainer sleeve (11).

⚠ 8.2 CLEANING AND INSPECTING

8.2.1 NON-REUSABLE PARTS

8.2.1.1 **IMPORTANT: ALL** o-rings ARE TO BE SCRAPPED and replaced with NEW Wabtec Corporation parts during the assembly procedure.

NOTE: A Rubber Parts Kit, Part No. 592859, is available for the maintenance of the "28-A" Double Check Valve. See Parts Catalog 3216-24, S.45 for information.

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8.2.2 REMAINING PARTS

8.2.2.1 Wash ALL of the remaining parts using the cleaning solvent as described in Section 6.1.

8.2.2.2 A clean, lint-free cloth, which has been saturated with the prescribed cleaning solvent, may be used to assist in the cleaning of the interior and exterior surfaces of the body.

8.2.2.3 After the parts have been cleaned, they **MUST BE** completely dried. Use a low pressure jet of clean, dry air to blow the parts dry. Be sure that the internal passages of the body are dried. Exercise care so that no dirt is blown into the body passages.

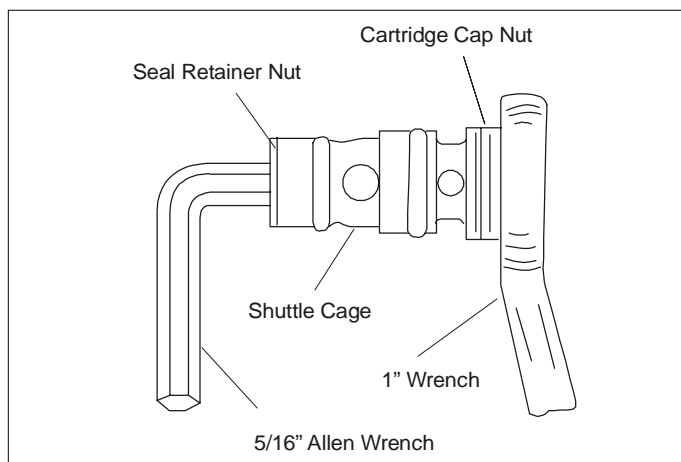


Figure 4

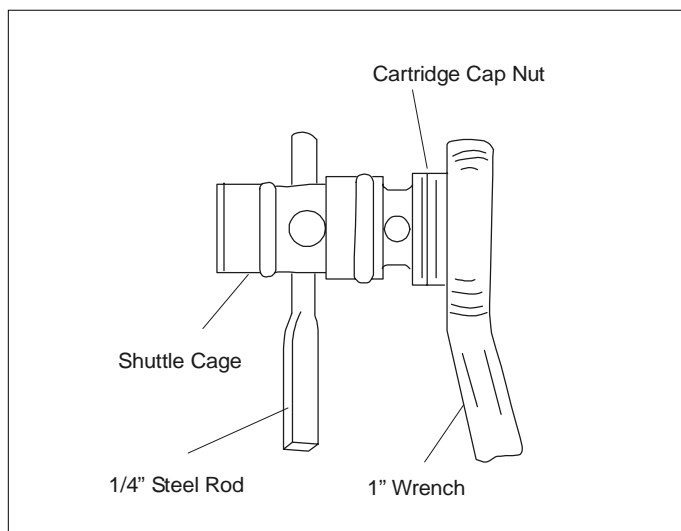


Figure 5

8.2.2.4 Inspect the parts. Replace ANY part that is cracked, cut, broken, bent, excessively worn, damaged in any way, or that is in such a condition that may result in the unsatisfactory operation of the "28-A" Double Check Valve.

⚠ 8.3 ASSEMBLY (Figures 3, 4 and 5)

IMPORTANT: If the Check Valve Cartridge Assembly was disassembled, it should be re-assembled at this time. A NEW completely assembled Check Valve Cartridge Assembly is available by ordering Part No. 592735.

8.3.1 Install a NEW, dry, (unlubricated) $\frac{5}{8}$ " O.D. o-ring (10) on the shoulder of the seal retainer sleeve (11), then install the seal retainer sleeve with o-ring sub-assembly (11, 10) into the cavity in the cartridge cap nut (2) so that the o-ring end of the sub-assembly is facing toward the open end of the cap nut (2).

8.3.2 Install the shuttle cage (9) into the cartridge cap nut (2). Insert a $\frac{1}{4}$ " diameter steel rod through the lower cross holes of the shuttle cage (9) to hold the cage. Then, using the 1" wrench on the cartridge cap nut (2), secure the cartridge cap nut and seal retainer sub-assembly (2, 10, 11) and shuttle cage (9) together by torquing the cap nut (2) to 20 foot pounds.

8.3.3 Install the shuttle (8), open end first, into the shuttle cage (9).

IMPORTANT: DO NOT lubricate the shuttle or the shuttle bearing surfaces of the shuttle cage (9).

8.3.4 Install a NEW, dry, (unlubricated) $\frac{5}{8}$ " O.D. o-ring (7) on the shoulder of the seal retainer nut (6).

8.3.5 Install the seal retainer nut with o-ring sub-assembly (6, 7) into the shuttle cage (9).

8.3.6 Insert a $\frac{5}{16}$ " Allen wrench into the seal retainer nut (6) and apply the 1" wrench to the cap nut (2), then secure the parts together by torquing to 20 foot-pounds.

8.3.7 Apply a light coating of Number 2 Silicone Grease, Wabtec Corporation Specification M-7680-2, to the surfaces of a NEW $\frac{15}{16}$ " O.D. o-ring (3), a NEW $\frac{13}{16}$ " O.D. o-ring (4) and a NEW $\frac{3}{4}$ " O.D. o-ring (5). Also fill the o-ring grooves on the cartridge sub-assembly (2, 6 to 11) and lightly lubricate the bearing surfaces of the cartridge bushing of the body (12) with the lubricant.

8.3.8 Install a NEW lubricated $\frac{15}{16}$ " O.D. o-ring (3) into its groove near the head of the cap nut (2) of the cartridge



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sub-assembly.

8.3.9 Install a NEW lubricated $1\frac{3}{16}$ " O.D. o-ring (4) into its groove on the cap nut (2) of the cartridge sub-assembly.

8.3.10 Install a NEW lubricated $\frac{3}{4}$ " O.D. o-ring (5) into its groove on the shuttle cage (9) of the cartridge sub-assembly.

8.3.11 Remove any excess lubricant from the exterior surfaces of the check valve cartridge assembly (1) by wiping with a clean, dry, lint-free cloth.

8.3.12 Place the body (12) in a jaw protected vise so that the opening of the cartridge bushing of the body is facing upward. **DO NOT** overtighten the vise.

8.3.13 Install the check valve cartridge assembly (1) as a unit into the body (12), then, using the 1" wrench on the cartridge cap nut (2), secure the check valve cartridge assembly in the body (12) by torquing the cap nut (2) to 20 foot-pounds.

8.4 TESTING AND ADDITIONAL INFORMATION

8.4.1 IMPORTANT: After the "28-A" Double Check Valve, Part No. 650143, has been assembled, **BUT BEFORE** it is returned to service, **IT MUST** pass a series of tests following the procedures of the current issue of the Wabtec Corporation Test Specification T-4035-D.

8.4.2 IMPORTANT: Whenever the "28-A" Check Valve, Part No. 650143, is removed from an equipment arrangement for any reason, and it is reinstalled or replaced with a NEW or overhauled and tested Portion, a stationary vehicle test **MUST BE** made to be sure that the "28-A" Double Check Valve functions properly in the total equipment arrangement.

8.4.4 Consult your Wabtec Corporation Representative if additional information is required.

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