



**REPAIR TRACK
MAINTENANCE
2391, S.5**

SEPTEMBER, 2004

(SUPERSEDES ALL PREVIOUS ISSUES OF 2391, S.5 & S-4017)

Freight Air Brake Control Valve Portions:
ABDX, ABDXL, ABDX-R, ABDXL-R

SAFETY PROCEDURES AND WARNINGS:

The following statements of warning apply all or in part to the procedures and information contained within this document. Failure to observe these precautions may result in serious injury to those performing the work and/or bystanders.

- ⚠ WARNING:** When performing work and testing these devices and the associated brake details, the vehicle on which the equipment is installed must be properly chocked and blue flagged to protect against inadvertent vehicle movement which could result in injury to personnel present and/or damage to equipment.
- ⚠ WARNING:** The use of an air jet, which must be less than 30 psi, to blow parts clean or to blow them dry after being cleaned will cause particles of dirt, contaminants and/or droplets of the cleaning liquid to be air borne. These conditions may cause skin and/or eye irritation. Avoid direct contact with this air stream or possible flying debris.
- ⚠ WARNING:** When using an air jet do not direct it toward another person. Improper use of the jet could result in bodily injury.
- ⚠ WARNING:** Personal eye protection, must be worn when performing any work on the equipment and associated details to avoid possible injury to eyes.
- ⚠ WARNING:** When blowing out the brake pipe, and/or the opening and closing of air valves, make sure all personnel are clear of the ends of the vehicle as well as under the vehicle to protect against injury from flying debris as well as potential movement of brake rigging, cylinders, etc.
- ⚠ WARNING:** When handling valve portions, care must be taken to prevent the portion from falling which could result in portion damage and/or injury to personnel. Also protection of the open face of the valve portion is required to protect against the entrance of contaminants which could result in unsafe brake operation of the vehicle on which the portion is installed.
- ⚠ WARNING:** Cast iron air brake portions are very heavy. Extreme care is essential when applying, removing or lifting the complete control valve including the pipe bracket, service and emergency portions to preclude personal injury. Adequate support or lifting mechanism is required.

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1.0 SCOPE

- 1.1 The purpose of this manual is to describe appropriate repair track procedures to be followed by maintainers of these control valve portions and to avoid unnecessary expense due to careless handling.

IMPORTANT: This procedure covers the replacement of the ABDX Type Control Valve Portions only. For repair track information on AB Type Control Valves (AB, ABD, ABC-1, & ABDW), please see Instruction Leaflet 2391, Sup. 1.

- 1.2 Rule 3 - Testing of Air Brake Equipment **MUST BE** in accordance with the current Field Manual of the AAR Interchange Rules.

2.0 GENERAL REQUIREMENTS

- 2.1 Each repair track location must be provided with containers so arranged that both the lubricants and brushes can be protected against dirt, one extra set of shipping covers for service and emergency portions, a release stem guard for the service portion and a vent protector plug for the emergency portion, a blower hose and suitable tools such as wrenches, scrapers, clamps, etc.

NOTE: The air brake shop containers with known approved AAR lubricants must be appropriately stenciled with AAR specification identification.

| Lubricant | Current AAR Specification |
|--------------------------|---------------------------|
| Dry Graphite | M-913 |
| Brake Cylinder Lubricant | M-914 |

- 2.2 The operating portions or parts thereof must never be dismantled or have any parts removed or replaced at the car. All cleaning and re-lubricating of the valve portion parts must be done as per WABCO Freight Car Products recommendation by an AAR Certified shop in accordance with AAR S-477.

The valve portions removed from the car must be transported to the shop for cleaning, lubricating and testing in accordance with current issue of Instruction Leaflet 2391, Sup. 4 and other WABCO Freight Car Products specifications.

- 2.3 The entire air brake equipment must be tested in accordance with the latest issue of the Code of Air Brake System Tests for Freight Equipment (AAR Standard S-486, latest revision).
- 2.4 Inspect angle/end cocks for external damage, including worn, broken or missing handle stops/lugs. Handles with excessive free movement due to pin wear and/or broken or worn top cover stop lugs exceeding $1/16$ " on the top or sides are cause for immediate angle cock removal. Wabtec recommends to replace with an AAR approved new or satisfactorily repaired and tested cock at least once every 144 months or more frequently if conditions cited above exist.
- 2.5 All rubber parts, including pipe bracket gaskets and the control valve pipe bracket strainer must be replaced with NEW WABCO Freight Car Products parts at the time the portion is renewed and a suitable replacement applied.

NOTE: Control valve pipe bracket strainer must be replaced with NEW WABCO Freight Car Products parts at any time it is exposed whether access is from the service portion or emergency portion side of the pipe bracket.

- 2.6** When the valve portions are removed, if conditions are found in the portions or the pipe brackets evidencing that the car brake equipment has been submerged in water, special additional cleaning operations not regularly performed will be required as per instructions outlined in Section 4.

IMPORTANT: The ABDX Type Control Valve Portions and associated air brake equipment details, including brake pipe angle cocks, are to be removed from the equipment arrangement and taken to a repair facility for complete overhaul. Wabtec recommends that the portions and other details must be completely disassembled and the parts must be cleaned or renewed, lubricated, assembled and tested for correct operation at least once every 144 months, or more frequently if service conditions so indicate.

3.0 PROCEDURES FOR CLEANING ABDX, ABDXL, ABDX-R, & ABDXL-R CONTROL VALVES ON REPAIR TRACKS

3.1 SERVICE PORTION

If the valve requiring attention is an ABDX or ABDX-R service portion (Figure 1 and 3), the following steps should be taken:

- 3.1.1** Close the branch pipe cut-out cock and drain the air out of auxiliary reservoir, emergency reservoir and brake cylinder by pulling the release valve handle on the service portion.
- 3.1.2** Remove gaskets in both brake pipe end hose couplings and replace with NEW WABCO Freight Car Products coupling gaskets. Follow Rule 5 - in the current Field Manual of the AAR Interchange Rules as to hose renewal.
- 3.1.3** Blow any dirt or water out of the air supply line and couple air supply to approved Single Car Test Device.
- 3.1.4** Couple Single Car Test Device to one end of the car, preferably the "B" end.
- 3.1.5** With both angle cocks open, blow out the brake pipe by moving the test device handle to Position 1. Close the angle/end cock to apply a dummy coupling. Once the dummy coupling is applied leave both angle/end cocks open.
- 3.1.6** Remove the bowl from the dirt collector and leave it off until a cleaned service portion is applied.

NOTE: Inspect the dirt collector check valve. If made from aluminum, it must be removed, scrapped and replaced with a NEW WABCO Freight Car Products replacement part.

⚠ WARNING: When blowing out the brake pipe, and/or the opening and closing of air valves, make sure all personnel are clear of the ends of the vehicle as well as under the vehicle to protect against injury from flying debris as well as potential movement of brake rigging, cylinders, etc.

- 3.1.7** Carefully open the branch pipe cut-out cock for a few seconds to expel dirt from the branch pipe, then close.
- 3.1.8** Disconnect the release valve handle or handles, leaving it attached to the release rod or rods.
- 3.1.9** Scrape, wipe and blow off with a jet of low pressure air (less than 30 psi) all dirt adjacent to the gasket between the pipe bracket and valve portion. Using the blower hose, blow off the service portion, pipe bracket, hopper slopes, car underframe, etc., to free them of all loose dirt that may otherwise get into the service portion or pipe bracket when the portion is being removed and reapplied.

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- 3.1.10** The cleaned service portion must be handled with care to avoid entrance of dirt or water which could damage the internal parts.
- IMPORTANT:** The shipping cover must not be removed from the clean service portion until it is ready to be mounted to the pipe bracket on the car.
- 3.1.11** Remove the failed service portion and apply shipping cover (Figure 4) and tighten nuts.
- 3.1.12** Apply standard or alternate stem guard (Figure 5) to the removed service portion and hold in place with cotter pin.
- 3.1.13** Remove service portion pipe bracket gasket and discard properly.
- 3.1.14** Remove the pipe bracket strainer using strainer nut wrench.
- 3.1.15** Install a NEW WABCO Freight Car Products pipe bracket strainer. A wooden mandrel of suitable form will assist in guiding the strainer into proper position. Make certain its inner end is in engagement with the sealing bead (if inserted properly, all nut threads will be visible), then apply the holding nut and tighten it firmly using the strainer nut wrench.
- 3.1.16** Install a NEW WABCO Freight Car Products service portion pipe bracket gasket.
- 3.1.17** Remove the shipping cover from the new or satisfactorily repaired and tested service portion and immediately apply the portion to the pipe bracket. Coat the threads of the mounting studs lightly with brake cylinder lubricant (M-914) or a compound consisting of one part graphite, Wabtec Specification M-07695-02 (AAR Specification M-913), and two parts oil (SAE-20) by weight.
- 3.1.18** Tighten the holding nuts evenly and firmly in order to sufficiently prevent gasket leakage and yet not excessively to cause distortion of covers and gaskets. (Wabtec recommended tightening sequence: starting at 3 o'clock position on each valve portion and going in counter clockwise direction, torque all hex nuts to 30 foot-pounds first. Then apply final torque of 70 foot-pounds in same direction and order.)
- 3.1.19** Remove release valve stem guard from the new or repaired service portion and reconnect the release valve handle or handles (which has been left attached to release rod) to release valve handle end plate with a new cotter pin.
- 3.1.20** Clean and blow out the dirt collector bowl. Apply a NEW WABCO Freight Car Products gasket, then assemble, lubricating the bolt threads lightly with brake cylinder lubricant (M-914) or a compound consisting of one part graphite, Wabtec Specification M-07695-02 (AAR Specification M-913) and two parts oil (SAE-20) by weight.
- 3.1.21** If car is equipped with a reservoir charging check valve mounted on AB Type Pipe Bracket, remove the cap nut, spring and check valve. Examine the internal parts for excessive wear or damage and replace rubber check valve with a NEW WABCO Freight Car Products supplied check valve. Worn parts are to be renewed. Reassemble the check valve.
- 3.1.22** Check the brake cylinder, reservoir and pipe bracket for loose or missing supporting bolts and nuts and replace or tighten as necessary.
- 3.1.23** If any pipe clamps are loose or missing, or if angle/end cocks are broken or improperly located, make necessary repairs.
- 3.1.24** After the control valve service portion has been reinstalled and all repairs have been completed, the entire air brake equipment must be tested in accordance with the latest issue of the Code of Air Brake System Tests for Freight Equipment (AAR Standard S-486, latest revision).

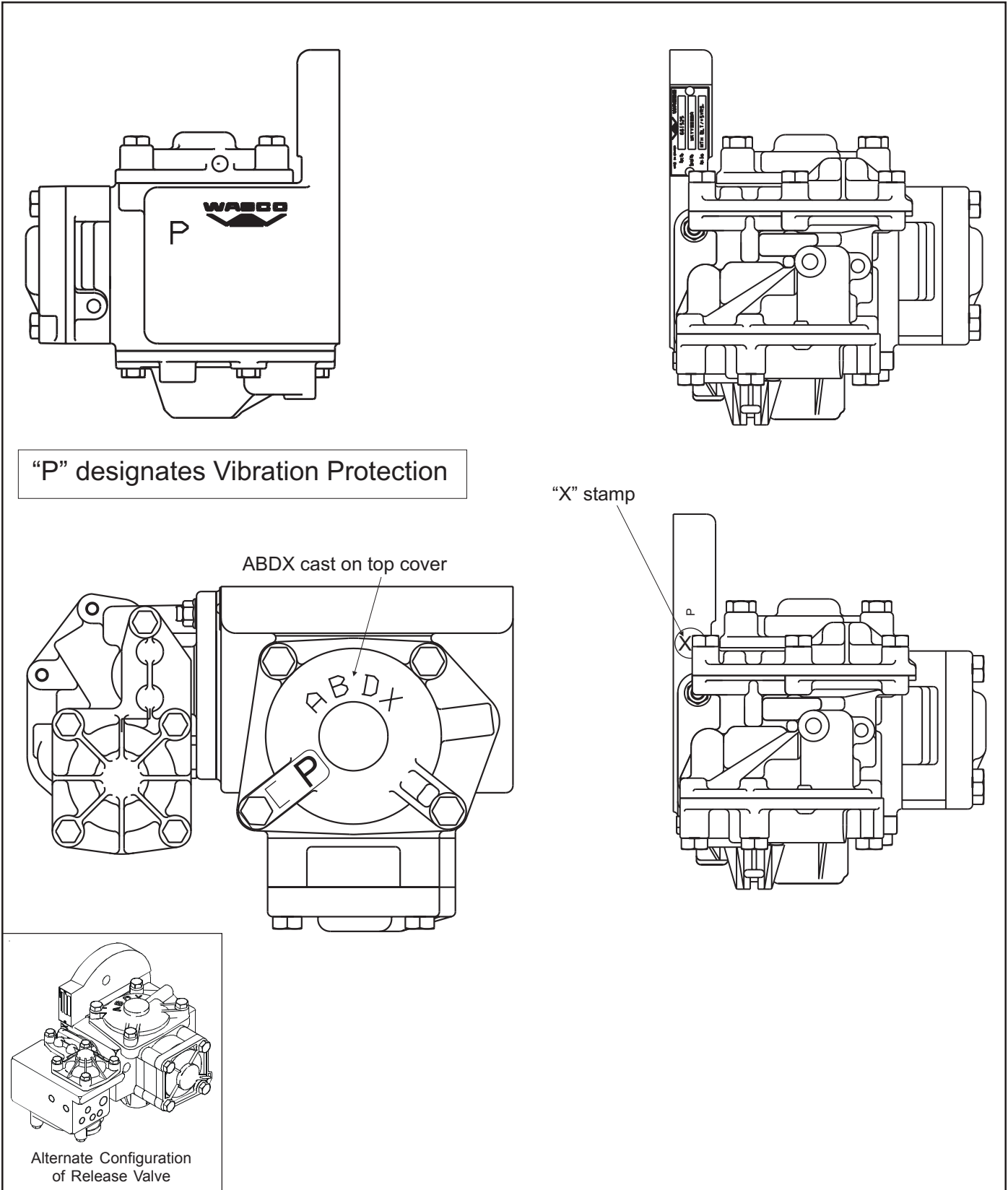


Figure 1 - ABDX Service Portion

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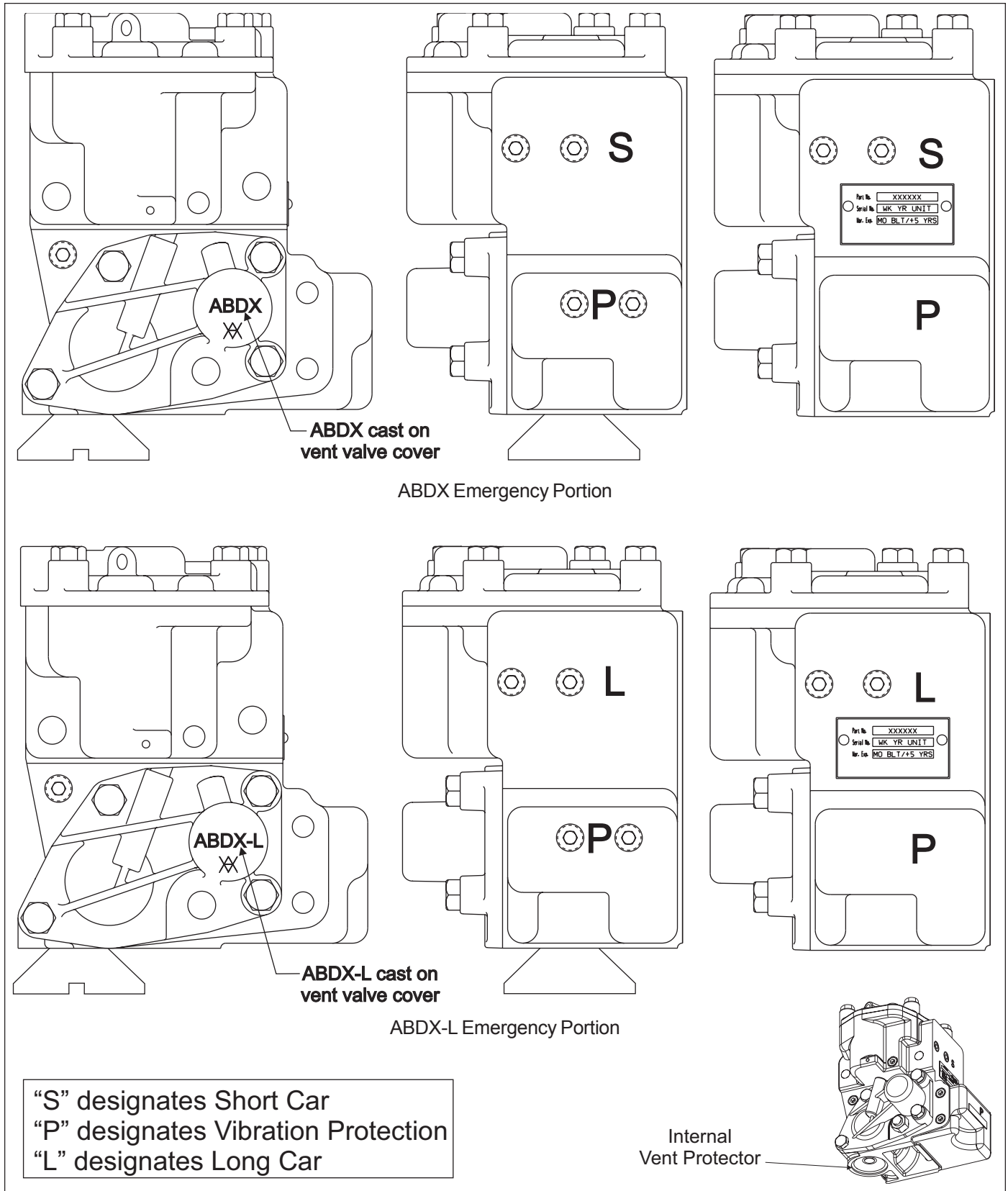


Figure 2 - ABDX / ABDXL Emergency Portions

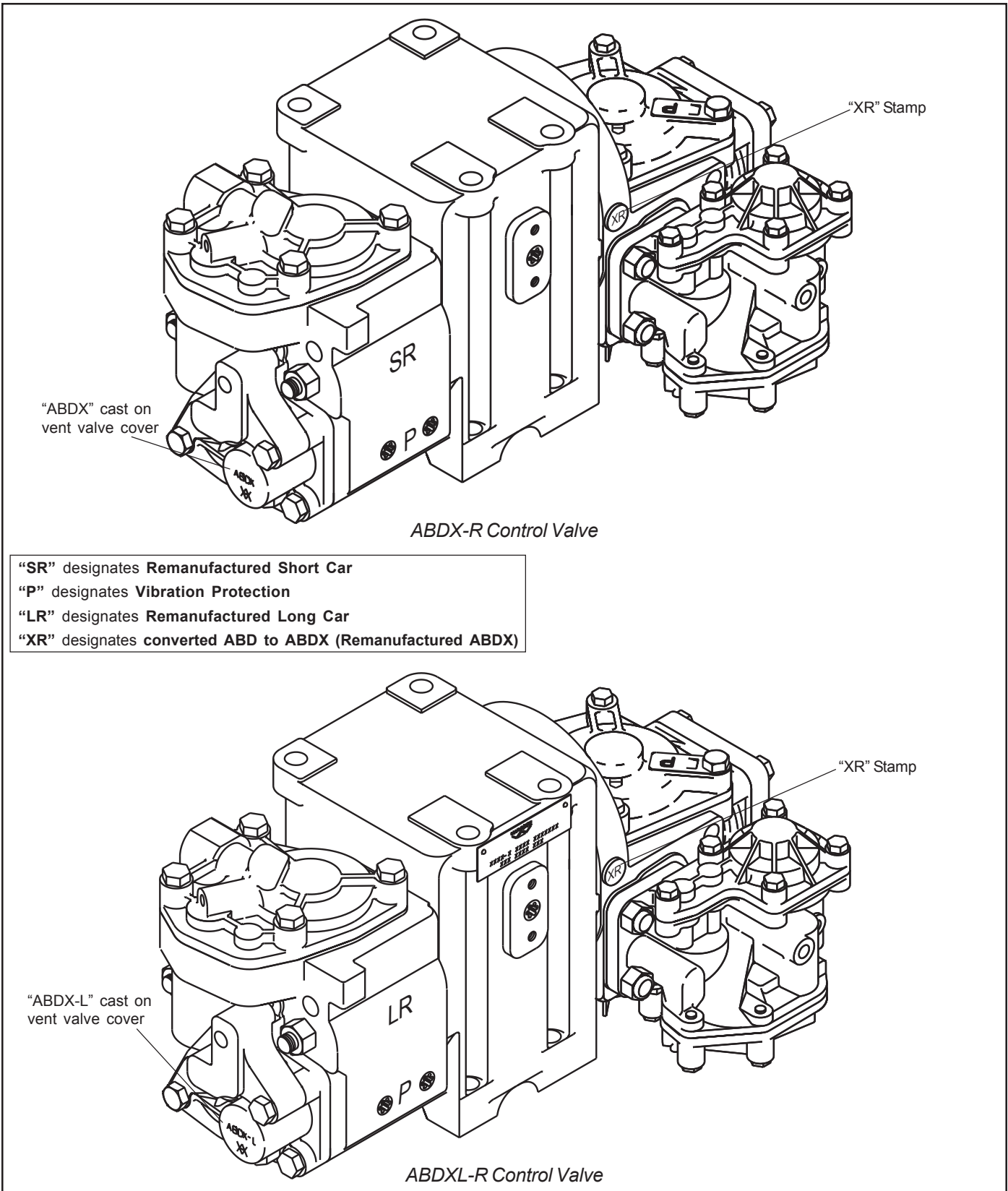


Figure 3 - ABDX-R / ABDXL-R Control Valves

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3.2 EMERGENCY PORTION

If the valve requiring attention is an ABDX, ABDXL, ABDX-R or ABDXL-R emergency portion (Figure 2 and 3), the following steps should be taken:

- 3.2.1 Close the branch pipe cut-out cock and drain the air out of auxiliary reservoir, emergency reservoir and brake cylinder by pulling the release valve handle on the service portion.
- 3.2.2 Remove gaskets in both brake pipe end hose couplings and replace with NEW WABCO Freight Car Products coupling gaskets. Follow Rule 5 - in the current Field Manual of the AAR Interchange Rules as to hose renewal.
- 3.2.3 Blow any dirt or water out of the air supply line and couple air supply to approved Single Car Test Device.
- 3.2.4 Couple Single Car Test Device to one end of the car, preferably the "B" end.
- 3.2.5 With both angle cocks open, blow out the brake pipe by moving the test device handle to Position 1. Close the angle/end cock to apply a dummy coupling. Once the dummy coupling is applied leave both angle/end cocks open.
- 3.2.6 Remove the bowl from the dirt collector and leave it off until a cleaned emergency portion is applied.

NOTE: Inspect the dirt collector check valve. If it is made from aluminum, it must be removed and scrapped and replaced with a NEW WABCO Freight Car Products replacement part.

⚠ WARNING: When blowing out the brake pipe, and/or the opening and closing of air valves, make sure all personnel are clear of the ends of the vehicle as well as under the vehicle to protect against injury from flying debris as well as potential movement of brake rigging, cylinders, etc.

- 3.2.7 Carefully open the branch pipe cut-out cock for a few seconds to blow dirt from the branch pipe, then close.
- 3.2.8 Scrape, wipe and blow off with a jet of low pressure air (less than 30 psi) all dirt adjacent to the gasket between the pipe bracket and valve portion. Using the blower hose, blow off the emergency portion, pipe bracket hopper slopes, car under frames, etc., to free them of all loose dirt that may otherwise get into the emergency portion or pipe bracket when the portion is being removed and reapplied.
- 3.2.9 On an emergency portion with an external vent protector assembly, remove the vent protector from the failed portion and apply a WABCO Freight Car Products standard vent protector plug, as shown in Figure 6. On a failed emergency portion with internal vent protector assembly, completely cover the internal vent protector assembly with duct tape or tape with equivalent coverage and adhesion.
- 3.2.10 The cleaned emergency portion must be handled with care to avoid entrance of dirt or water which could damage the internal parts.

IMPORTANT: The shipping cover must not be removed from the clean emergency portion until it is ready to be mounted to the pipe bracket on the car.

- 3.2.11 Remove the failed emergency portion and apply shipping cover, as shown in Figure 4, and tighten nuts.
- 3.2.12 Remove emergency portion pipe bracket gasket and discard properly.
- 3.1.13 If pipe bracket is single sided, the pipe bracket strainer nut will be visible. Remove the pipe bracket strainer using strainer nut wrench. Install a NEW WABCO Freight Car Products pipe bracket strainer. A wooden mandrel of suitable form will assist in guiding the strainer into proper position. Make certain its inner end

is in engagement with the sealing bead (if inserted properly, all nut threads will be visible), then apply the holding nut and tighten it firmly using the strainer nut wrench.

3.2.14 Apply a NEW WABCO Freight Car Products emergency portion pipe bracket gasket.

NOTE: The appropriate type of emergency portion must be applied. There are two versions; the ABDX and ABDX-R for short cars (less than 75 feet of brake pipe) and the ABDXL and ABDXL-R for long cars (greater than 75 feet of brake pipe).

In order to preclude the misapplication of operating valve portions, the ABDXL and ABDXL-R pipe brackets have one slightly longer mounting stud than the ABDX and ABDX-R pipe brackets. This special stud located on the pipe bracket near the bottom, is intended to prevent a long car valve portion from being mounted to a short car.

3.1.15 Remove the vent protector plug or tape covering the vent protector exhaust from the new or satisfactorily repaired and tested emergency portion. Install a cleaned or renewed vent protector into the cleaned emergency portion.

3.2.16 Remove the shipping cover from the new or satisfactorily repaired and tested emergency portion and immediately apply the portion to the pipe bracket. Coat the threads of the mounting studs lightly with brake cylinder lubricant (M-914) or a compound consisting of one part graphite, Wabtec Specification M-07695-02 (AAR Specification M-913), and two parts oil (SAE-20) by weight.

3.2.17 Tighten the holding nuts evenly and firmly in order to sufficiently prevent gasket leakage and yet not excessively to cause distortion of covers and gaskets. (Wabtec recommended tightening sequence: starting at 3 o'clock position on each valve portion and going in counter clockwise direction, torque all hex nuts to 30 foot-pounds first. Then apply final torque of 70 foot-pounds in same direction and order.)

3.2.18 Clean and blow out the dirt collector bowl. Apply a NEW WABCO Freight Car Products gasket, then assemble, lubricating the bolt threads lightly with brake cylinder lubricant (M-914) or a compound consisting of one part graphite, Wabtec Specification M-07695-02 (AAR Specification M-913) and two parts oil (SAE-20) by weight.

3.2.19 If car is equipped with a reservoir charging check valve mounted on AB Type Pipe Bracket, remove the cap nut, spring and check valve. Examine the internal parts for excessive wear or damage and replace rubber check valve with a NEW WABCO Freight Car Products supplied check valve. Worn parts are to be renewed. Reassemble the check valve.

3.2.20 Check the brake cylinder, reservoir and pipe bracket for loose or missing supporting bolts and nuts and replace or tighten as necessary.

3.2.21 If any pipe clamps are loose or missing, or if angle/end cocks are broken or improperly located, make necessary repairs.

3.2.22 After the control valve emergency portion has been reinstalled and all repairs have been completed, the entire air brake equipment must be tested in accordance with the latest issue of the Code of Air Brake System Tests for Freight Equipment (AAR Standard S-486, latest revision).

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4.0 PROCEDURE FOR CLEANING WABCO FREIGHT CAR PRODUCTS “ABDX” TYPE BRAKES THAT HAVE BEEN SUBMERGED

- 4.1** Remove all associated piping from the pipe bracket, auxiliary air device pipe brackets, reservoirs, brake cylinders and retaining valve. Remove the pipe brackets and reservoirs from the car.
- 4.2** Remove and clean the emergency and auxiliary reservoir pipe strainers.
- 4.3** Appropriate equipment must be available to properly and satisfactorily clean the various pipe brackets associated with a set of air brake equipment. Since the condition of the pipe brackets is critical to proper valve operation, WABCO Freight Car Products recommends that all pipe brackets that have been submerged in water or other contaminants be returned to one of WABCO Freight Car Products' repair centers for restoration to satisfactory operating condition. Attempts to restore such pipe brackets by others is done so at their own risk.
- 4.4** Clean all reservoirs and volumes by washing out with high pressure water using a suitable nozzle and drain until completely dry.
- 4.5** Thoroughly clean the inside of all pipes by whatever means necessary (hammering, high pressure water, air, etc.).
- 4.6** Apply new or satisfactorily cleaned and repaired pipe brackets and thoroughly cleaned and dried reservoirs to the car, replace the auxiliary and emergency reservoir pipe strainers with new parts. Apply NEW WABCO Freight Car Products gaskets to all flange fittings. After coating the cap screw threads with grease, reconnect all pipes. All valves and valve portions reapplied to the car must be new or satisfactorily repaired and tested parts. Brake cylinders must be cleaned in accordance with Wabtec Instruction Leaflet 2391, Sup. 1.
- 4.7** After the necessary repairs have been completed, the entire air brake equipment must be tested in accordance with the latest issue of Code of Air Brake System Tests for Freight Equipment (AAR Standard S-486, latest revision).

5.0 RUBBER PARTS, SHELF LIFE AND STORAGE

- 5.1** New rubber parts such as gaskets, o-rings, rubber seated check valves, seals, diaphragms, etc., must not be applied if over five years old from date of manufacture. The primary parts such as gaskets and diaphragms contain date coding.
- 5.2** To determine shelf life, WABCO Freight Car Products new rubber repair kits are dated with the oldest date (half year) of rubber components contained within the kit. Major individual WABCO Freight Car Products rubber parts have the date molded into the rubber where practical.
- 5.3** The storage area for rubber parts must be cool, dark, and free from dampness and mildew. Since most rubber goods are affected by ozone, they must not be stored near electrical equipment that may generate ozone.

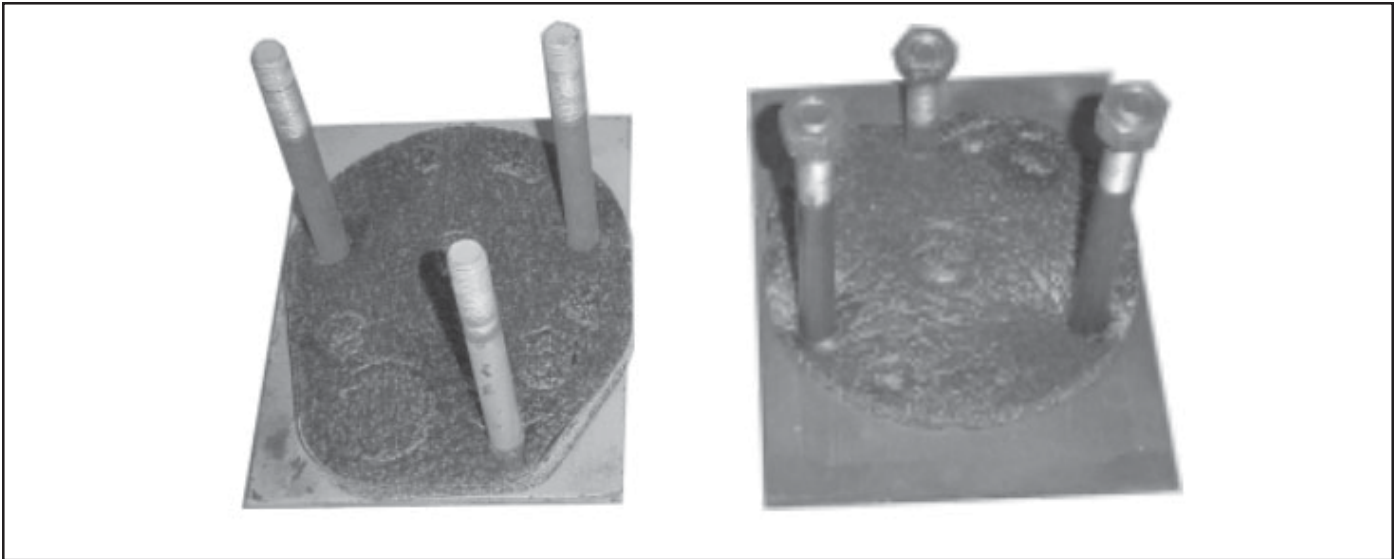


Figure 4 - Approved Shipping Covers

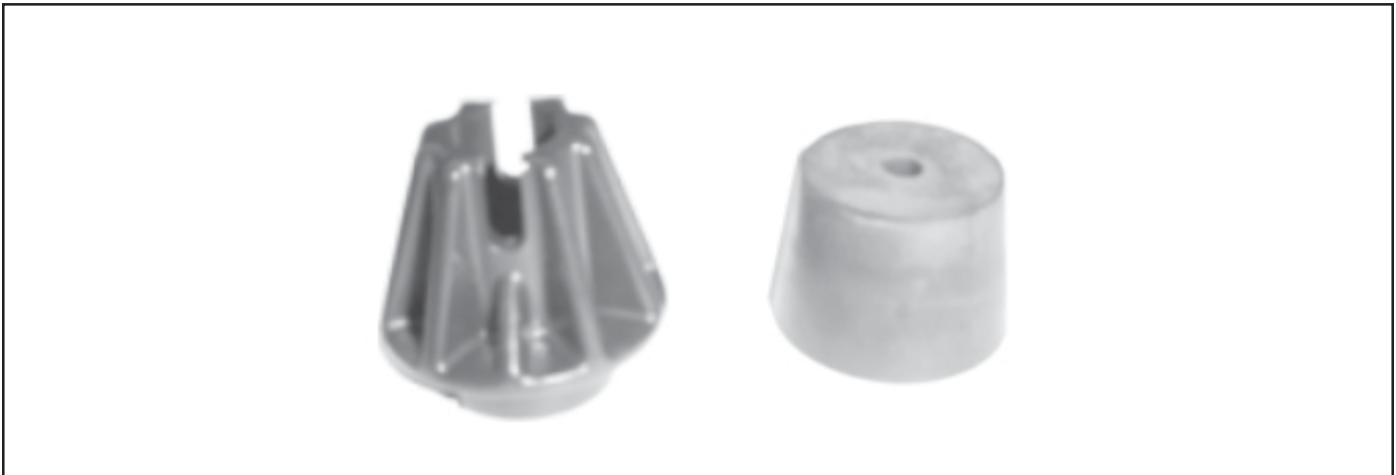


Figure 5 - Release Valve Stem Guard

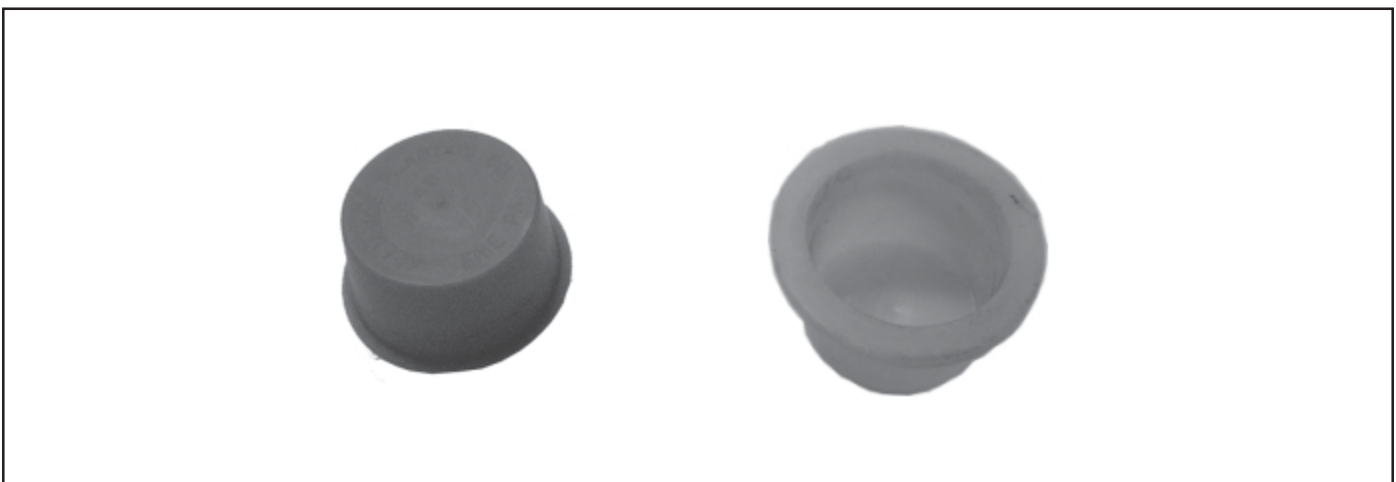
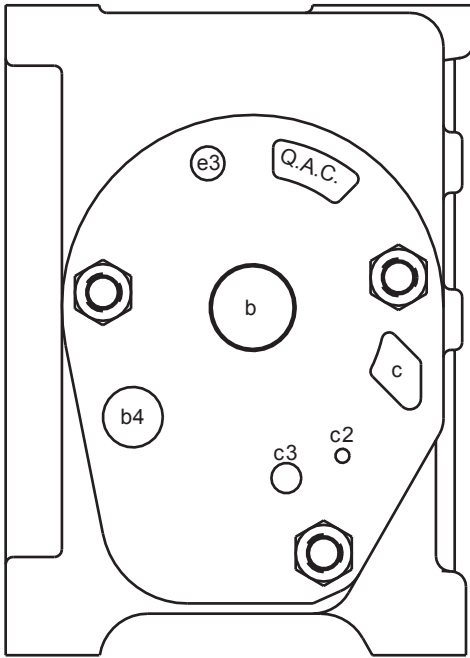


Figure 6 - Vent Protector Plug

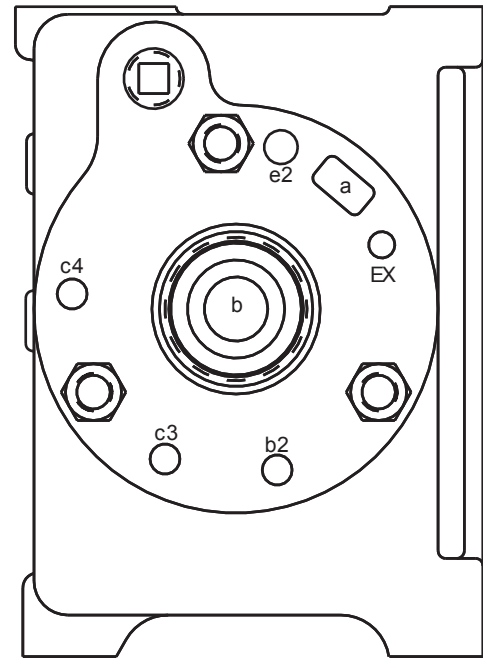
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Port

- b - To Brake Pipe.
- b4 - To Brake Pipe Passage b.
- c - To Brake Cylinder.
- c2 - To Passage c3.
- c3 - To Service Face and Branch Ports c2 and c4.
- e3 - To Emergency Reservoir and Service Face.
- Q.A.C. - To Quick Action Chamber.

Figure 6 - Port Identification Emergency Face



Port

- a - To Auxiliary Reservoir.
- b - To Brake Pipe.
- b2 - To Strainer Nut Cavity.
- c3 - To Emergency Face and Branches c2 and c4.
- c4 - To Passage c3.
- e2 - To Emergency Reservoir and to Emergency Face.
- EX - To Retaining Valve.

Figure 7 - Port Identification Service Face



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