



REPAIR TRACK
MAINTENANCE
2391, S.1

APRIL, 1991

(REPRINTED JANUARY, 2002)

Freight Air Brake Control Valve Portions:
AB TYPE

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AAR Specifications for lubricants referred to in this publication are as follows:

<u>LUBRICANT</u>	<u>CURRENT AAR SPECIFICATION</u>
Triple Valve Oil	M-912
Dry Graphite	M-913
Brake Cylinder Lubricant	M-914
Journal Box Oil	M-963

Air brake shop containers must be stencilled with AAR specifications identification.

Table 1 - AAR Specification for Lubricants

1.0 PROCEDURE FOR CLEANING AND TESTING “AB” TYPE BRAKES ON REPAIR TRACKS

1.1 GENERAL REQUIREMENTS

- 1.1.1 Each brake cleaner gang must be provided with a grease can so arranged that both the grease and brush can be protected against dirt, one extra set of shipping covers for the service and emergency portions of the “AB” Type Control Valve and the retaining valve, a release valve stem guard for “ABD” and ABDW” valve service portions, a blower hose and suitable tools such as wrenches, scrapers, clamps, etc. Representative tools are specified in Figures 16 and 16A.
- 1.1.2 Record the car number, owner and last cleaning date if required for billing purposes. All old cleaning marks must be scraped off and painted over with quick drying paint, preferably black.
- 1.1.3 Close the branch pipe cock and drain the air out of the auxiliary reservoir, emergency reservoir and brake cylinder. Remove the cup from the dirt collector and leave it off until cleaned valve portions are applied. Disconnect the release valve handle or handles, leaving attached to the release rod or rods.
- 1.1.4 Blow any dirt or water out of the yard air line and supply hose connection to car. If the brake tests are to be made by the same men who clean the brake, couple the single car testing device to yard air line and car brake pipe at one end of car. Otherwise, couple the yard air supply directly to the car brake pipe. Charge brake pipe and leave yard air supply connected to it. Blow out the brake pipe by opening angle cock at opposite end of car, then apply a dummy coupling to this end and leave both angle cocks open. Open the branch pipe cock to blow dirt from the branch pipe, then close it.

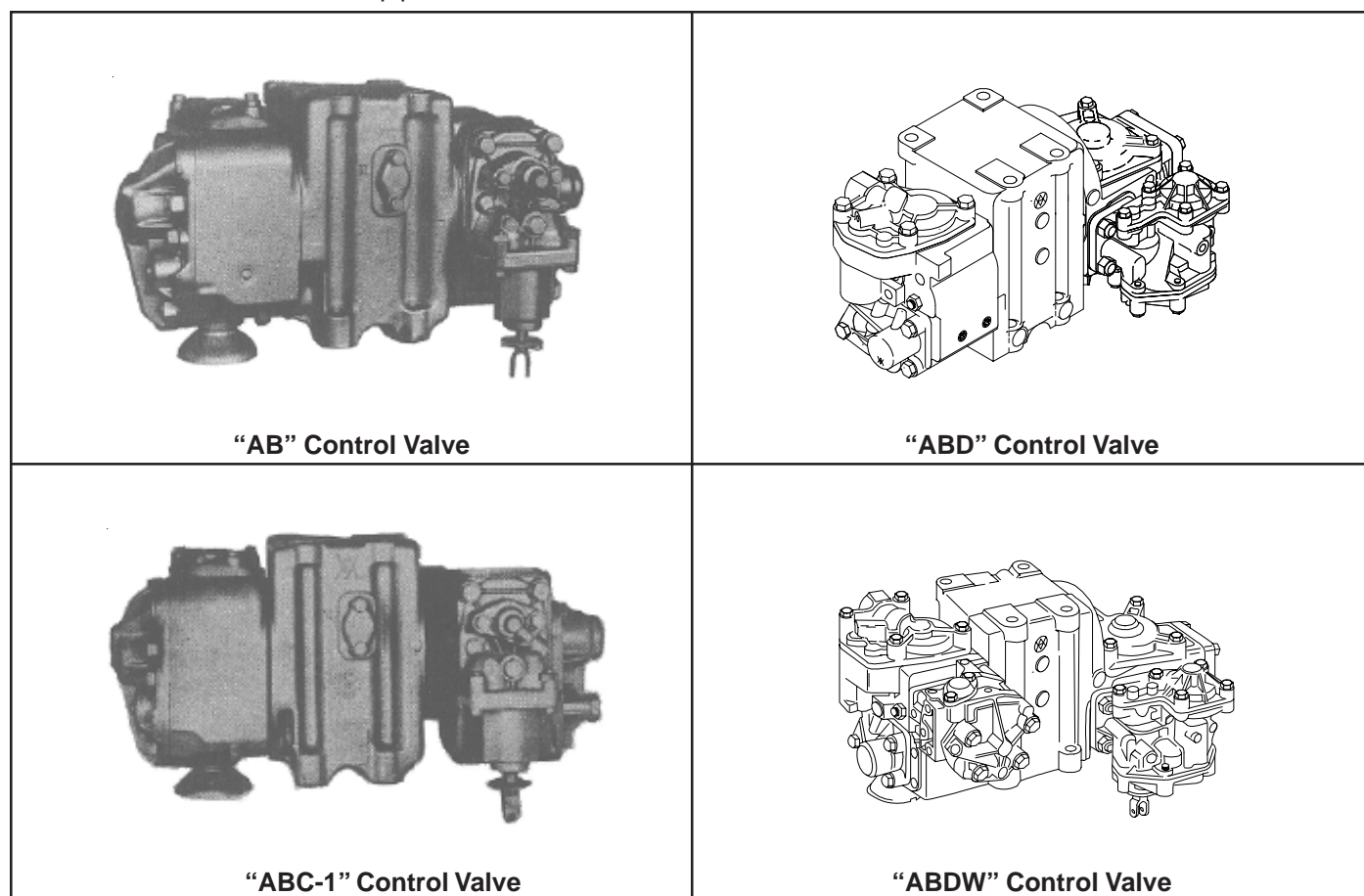


Figure 1 - Views of AB Type Control Valves Showing the Operating Portions and Pipe Bracket

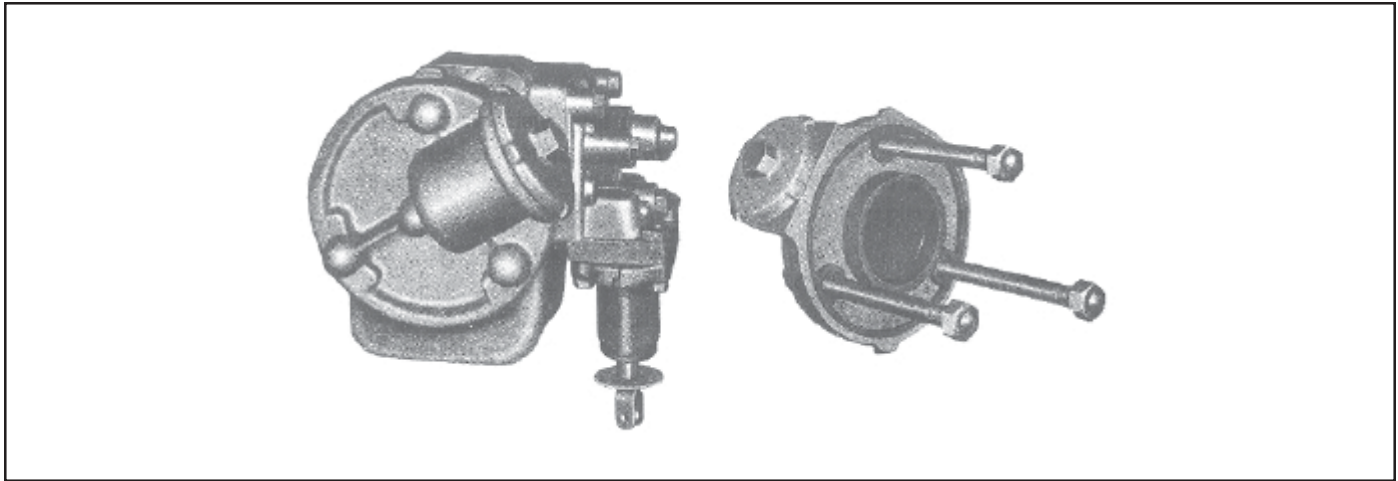


Figure 2 - AB Control Valve Service Portion with Shipping Cover and Inside View of the Cover

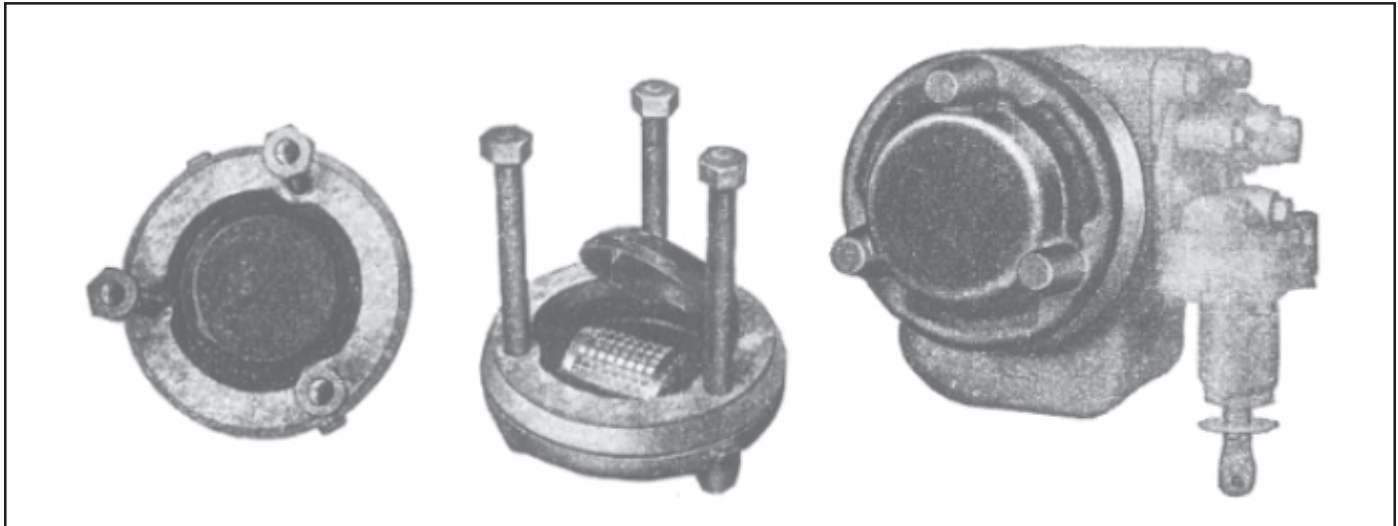


Figure 3 - AB Control Valve Service Portion with Old Style Shipping Cover and Inside Views of the Cover

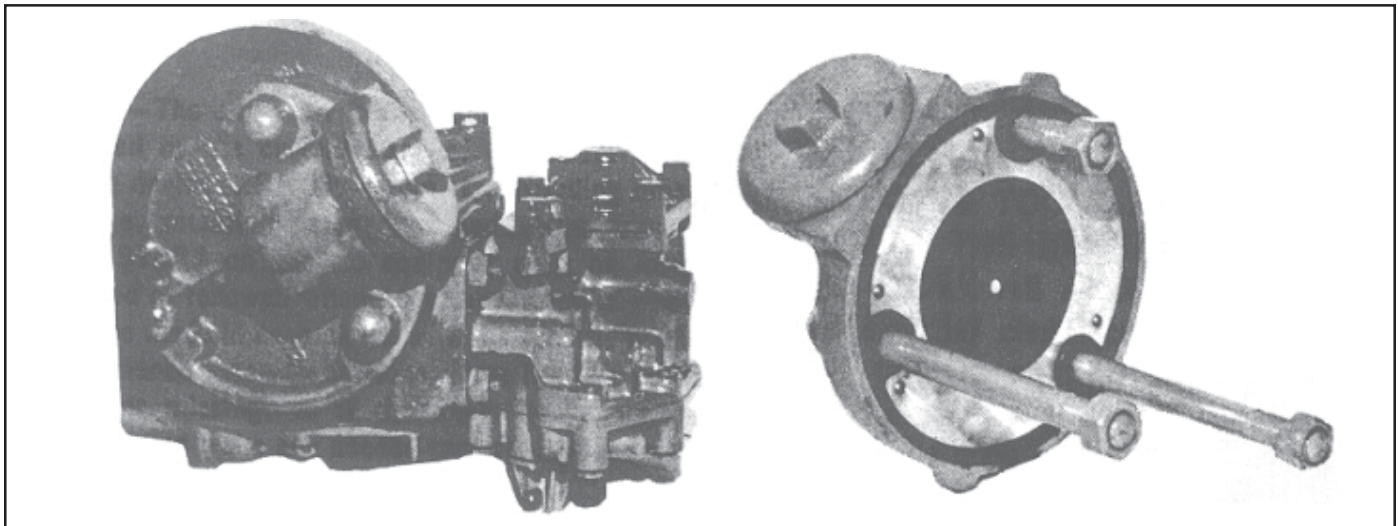


Figure 4 - ABD Control Valve Service Portion with Shipping Cover and Inside View of the Cover

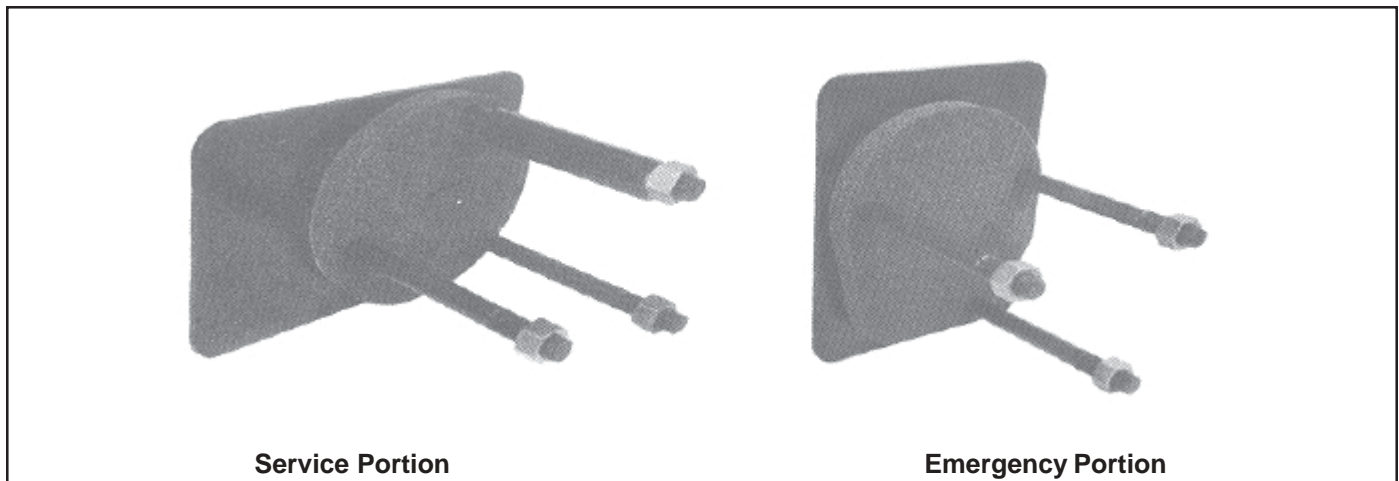


Figure 4.1 - Alternate Approved Shipping Covers



Figure 5 - Release Valve Stem Guards

- 1.1.5** Scrape, wipe and blow off all dirt adjacent to the gaskets between the pipe bracket and the valve portions, then, using the blower hose, blow off all loose dirt on the control valve portions, pipe bracket, hopper slopes, car underframes, etc., that may otherwise get into the control valve portions or bracket when the portions are being removed and cleaned portions applied.
- 1.1.6** The operating portions or parts thereof must never be dismantled or have any parts removed or replaced (unless authorized by AAR Interchange Rule) at the car. All cleaning and relubricating of the valve portion parts must be done by a competent workman at a suitable bench in a clean, well-lighted location.
- 1.1.7** Remove the vent protector from the emergency portion and apply a manufacturer's standard or alternate vent protector plug, a shown in Figure 7, then remove the emergency portion and, after moving the piston ("AB" only) into release position, immediately apply to it the spare shipping cover and tighten its holding nuts. The emergency portion must be carefully handled to avoid entrance of dirt, water or damage to internal parts.
- 1.1.7.1** Remove the service portion and the pipe bracket strainer. Apply shipping cover to the service portion and tighten its holding nuts. The service portion must be carefully handled to avoid entrance of dirt, water or damage to internal parts. Apply standard or alternate stem guard (Figure 5) to ABD & ABDW portions and hold in place with cotter pin. Pipe bracket strainer on Control Valves must be renewed.

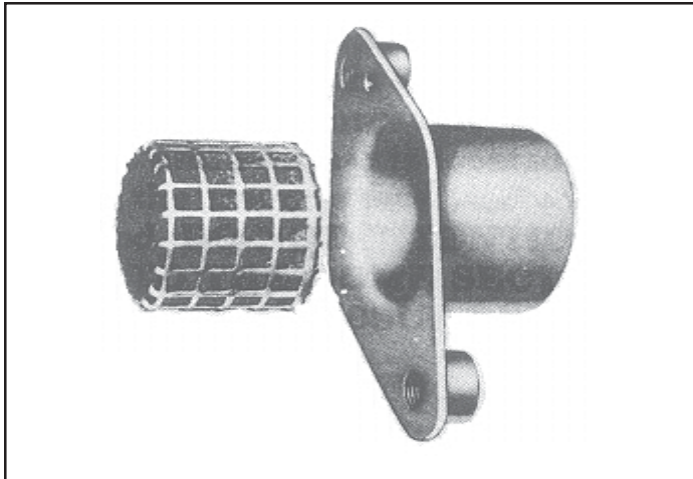


Figure 6 - Shipping Cover for Retaining Valve

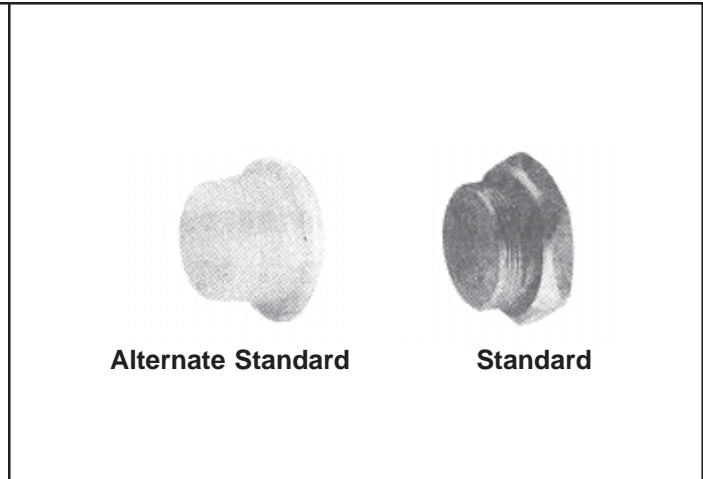


Figure 7 - Vent Protector Plugs

- 1.1.8** If the car is equipped with a brake cylinder release valve, disconnect the handle, leaving it attached to the release rods. Clean adjacent areas as with control portions. Remove the brake cylinder release valve from the pipe bracket or adapter and immediately apply shipping cover and tighten holding nuts.
- 1.1.8.1** If the car is equipped with empty and load type of equipment, the component parts such as the changeover portion, the strut cylinder, the transfer valve portion, the cutoff valve portion, the relay valve and the pilot valve portion, the check valve case, the L-1 Detector Valve portion, the S-1 Load Sensor Valve portion and the P-1 Load Proportional Valve portion must be removed. Clean adjacent area as with the control valve portions, then, remove the portion. Apply shipping covers where provided and transport to the shop for maintenance. The procedure specified beginning in Paragraph 1.1.14 must be followed when portions are remounted. The L-1 Detector Valve and the S-1 Load Sensor Valve adjustments are made at the time of Single Car Test.
- 1.1.9** If the car is equipped with either a quick service valve, vent valve, or reduction relay valve, clean adjacent areas as with control portions, then remove the valve portions.
- 1.1.10** If the car is equipped with a "J" type relay valve, clean adjacent areas as with control portions, then remove the valve portion. Immediately apply the shipping cover to relay valve and tighten its holding nuts.

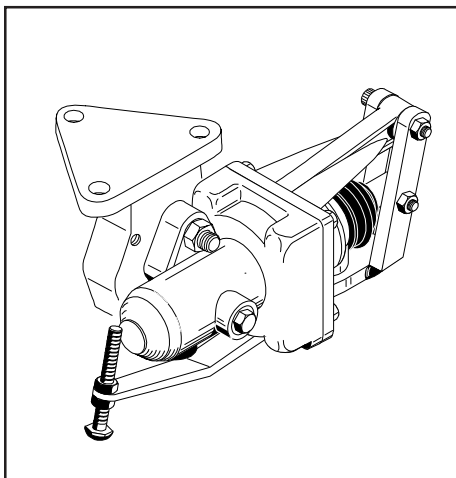


Figure 8 - S-1 Load Sensor Valve

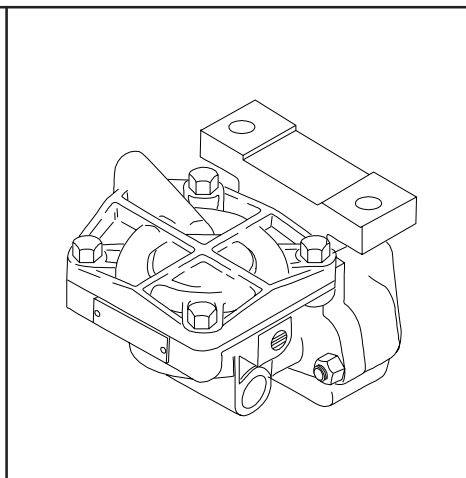


Figure 9 - P-1 Lead Proportional Valve

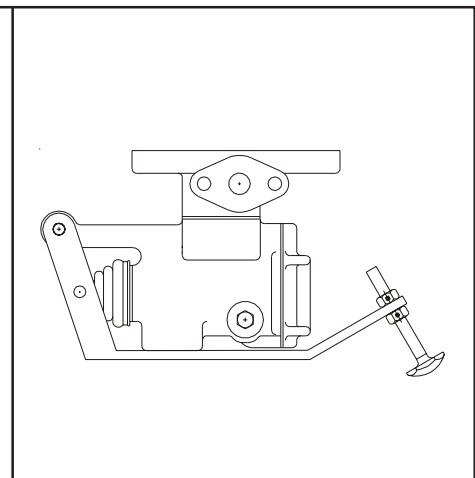


Figure 10 - L-1 Detector Valve

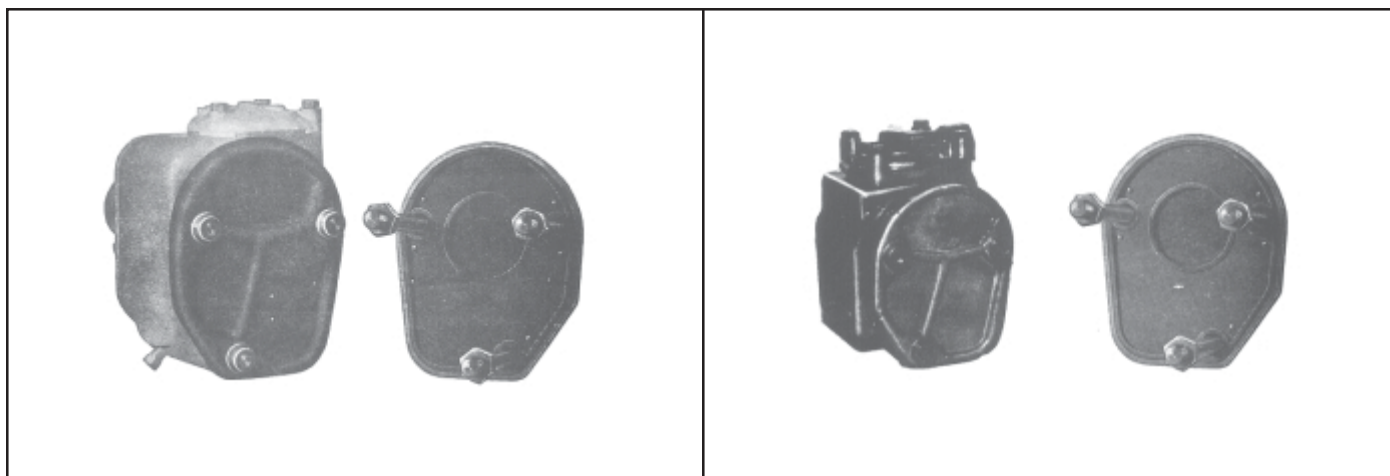


Figure 11 - AB Control Valve Emergency Portion with Shipping Cover and Inside View of Cover

Figure 12 - ABD Control Valve Emergency Portion with Shipping Cover and Inside View of Cover

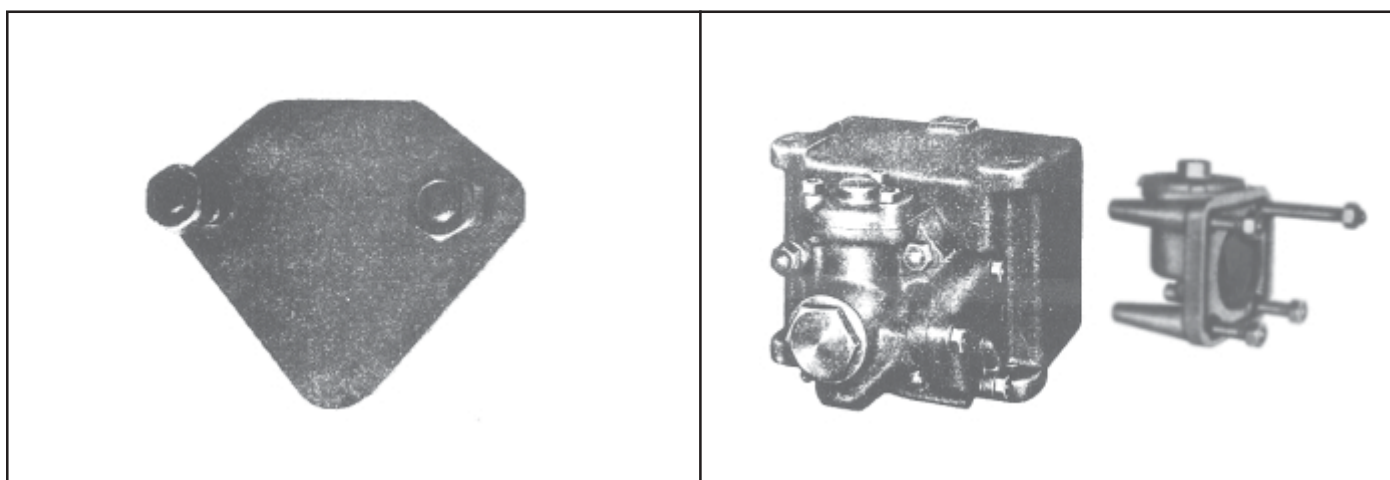


Figure 13 - Shipping Cover for Brake Cylinder Release Valve

Figure 13.1 - View of A-2-A Quick Service Valve and Shipping Cover

NOTE: The valve portions removed from car must be transported to the shop for cleaning, lubricating and testing, in accordance with current Issue of Instruction Leaflets No. 2391, Sup. 3 and manufacturer's specifications.

- 1.1.11** If car is equipped with a reservoir charging check valve (mounted on "AB" Type Pipe Bracket), remove the cap nut, spring and check valves. Examine the internal parts for excessive wear or damage and replace if necessary. Reassemble the check valve.
- 1.1.12** Using scrapers of suitable form, loosen any dirt in the brake pipe passages, strainer chamber and other connecting passages of the pipe brackets and adapter, if used, then, using the blower hose fitted with a nozzle shown as No. 7 on Figure 16, remove any loose dirt and scale from the retaining valve bracket and pipe by blowing from both the pipe brackets, adapter, if used, and retaining valve ends, blow the dirt from face of the brackets, also strainer chambers and branch pipe passage toward the open dirt collector.
- 1.1.13** When the valve portions are removed and 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 directed in Section 7.

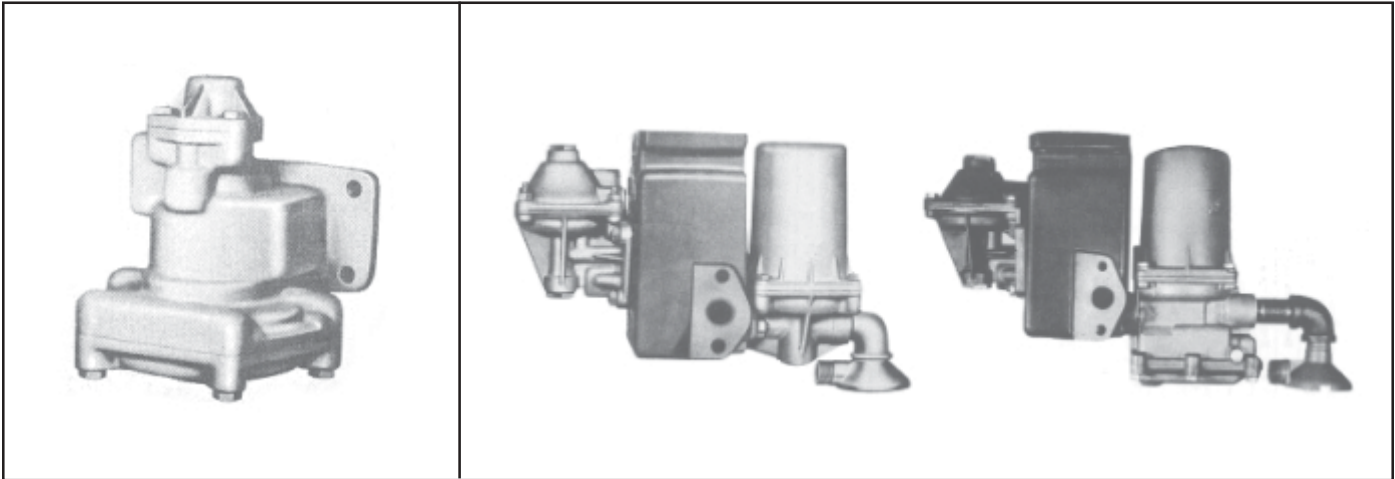


Figure 14 - J-1 Relay Valve

Figure 15 - Views of Reduction Relay Valves

1.1.14 Pipe bracket gaskets on Control Valves (both portions) must be removed and replaced with new gaskets.

1.1.15 The shipping cover must not be removed from the clean emergency portion until prepared to mount the portion on the pipe bracket. With the service and emergency portion gaskets in place on the pipe bracket and fully seated at their locking projection, remove the shipping cover from the clean emergency portion. Inspect emergency piston ("AB" only) to insure that it is in release position. Damage to the piston and bush will result if piston is out of the bush while portion is mounted on the pipe bracket. Immediately mount the portion, sliding it slowly and carefully on the studs against the pipe bracket, then, after coating the threads lightly with brake cylinder lubricant, or a compound consisting of one part graphite and two parts of oil (SAE-20) by weight, tighten its holding nuts evenly and then firmly.

NOTE: When reassembling valve portions or individual valve portions to their respective pipe brackets, it is important that cap screws and nuts are sufficiently tightened to prevent gasket leakage and yet not excessively to cause distortion of covers and gaskets.

Clean, or renew, if necessary, the vent protector, then remove the vent protector plug and apply and securely tighten protector to the cleaned emergency portion.

1.1.16 Pipe bracket strainer on control valves must be renewed. A wood 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 its holding nut and tighten it firmly with the special wrench provided. Next, remove the shipping cover from the clean service portion, and with the piston ("AB" only) in release position, immediately apply the portion to the pipe bracket and, after coating the threads lightly with brake cylinder lubricant or a compound consisting of one part graphite and two parts of oil (SAE-20) by weight, tighten its holding nuts evenly and then firmly. The shipping cover must not be removed from the clean service portion until prepared to mount the portion on the pipe bracket. Remove stem guard. ("AB")

1.1.17 If car is equipped with a brake cylinder release valve, remove the shipping cover from the clean valve portion and immediately apply the latter to its respective mounting face. The shipping cover must not be removed from the clean brake cylinder release valve portion until prepared to mount the portion on the pipe bracket or adapter, if used.

NO.	TOOL	PURPOSE	PRINCIPAL DIMENSION
1	Reversible Ratchet	1/2" sq. drive for all sockets (Plated)	10 1/2" long
2	Extra Deep Socket	For 1/2" cap screw, Flange Fittings	3/4" hex opening
3	Extra Deep Socket	For 3/8" cap screw, Flange Fittings	9/16" hex opening
4	1" Socket	For 3/8" nuts - Service & Emerg. Portions	1" hex opening
4A	15/16" Socket	For 5/8" nuts - Service & Emerg. Portions	15/16" hex opening
5	13/16" Socket	For 1/2" nuts - "AB" Empty & Load Change-Over Valves	13/16" hex opening
5A	3/4" Socket	For 1/2" nuts - "AB" Empty & Load Change-Over Valves	3/4" hex opening
6	5/8" Socket	For 3/8" nut on non-pressure head of Brake Cyl.	5/8" hex opening
6A	9/16" Socket	For 3/8" nut on non-pressure head of Brake Cyl.	9/16" hex opening
7	Nozzle (1/4" extra heavy pipe)	For No. 10	8" long
8A	Strainer nut	For various types of strainers	
8B	Wrench		
9	Universal Joints	Used with ratchet, sockets and extension bars	
10	Blowing Nozzle Valve (E Type)	For blowing off complete equipment and ports in "AB" pipe bracket	
11	Double Ended Wrench	For 1/2" bolts and cap screws on dirt collector	13/16" & 3/4" "S" open end
12	Short Extension Bar	Used with ratchet, sockets and universal joint	5 1/4" long
13	Long Extension Bar		10 1/2" long

Figure 16 - List of Air Brake Cleaner's Tools

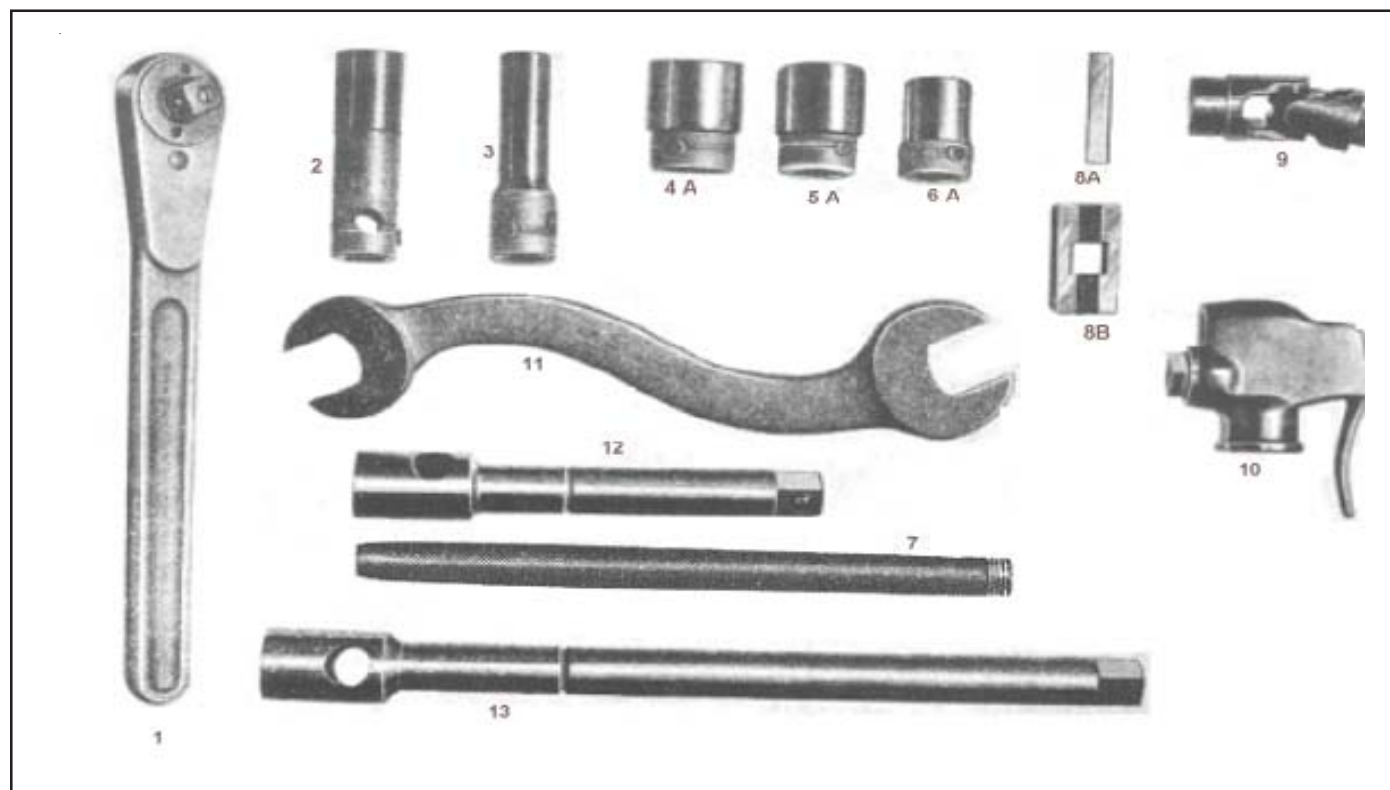


Figure 16A - Air Brake Cleaner's Repair Track Tools

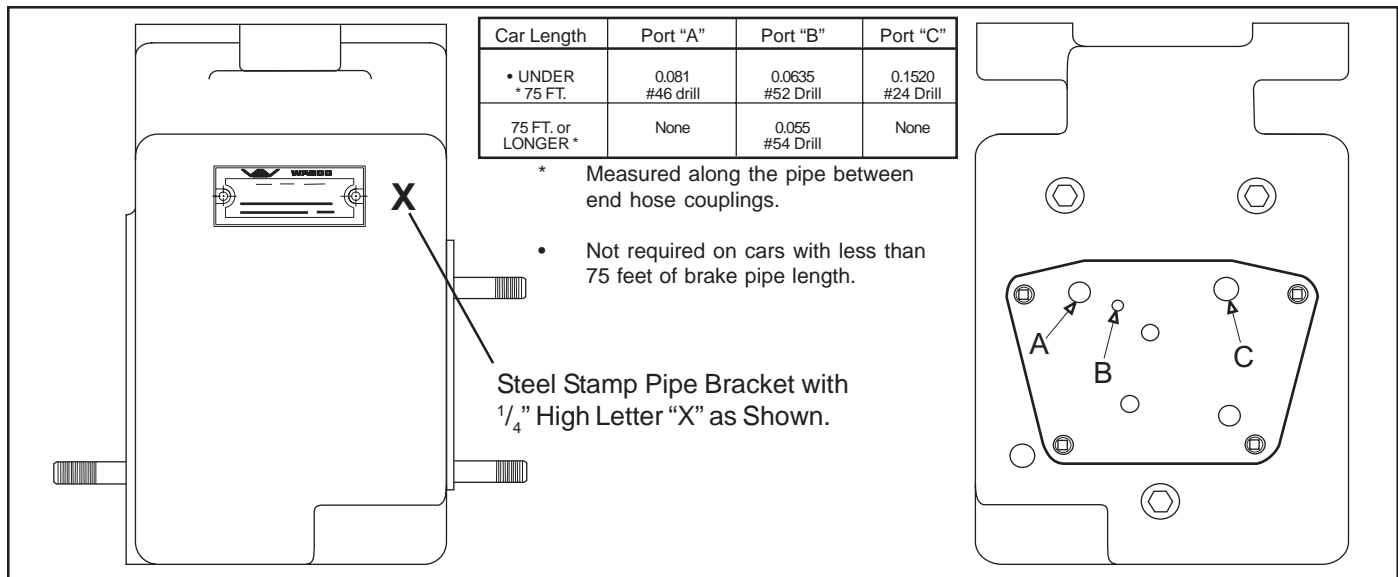


Figure 17 - B-1 Quick Service Valve - Pipe Bracket Choke Arrangement

1.1.18 If car is equipped with either a quick service valve, vent valve or reduction relay valve, apply clean valve portion to pipe bracket after new strainer is applied. Orifice $\frac{3}{64}$ " drill plug in A-2-A Pipe Bracket must be clear of obstruction and the proper size. Choke plugs in B-1 Quick Service Valve face of pipe bracket must be clear of obstruction and proper size (See Fig. 17). When the car (75 ft. and over in brake pipe length) is on the repair or shop track for periodic COT&S, air brake equipment attention, Choke "B", Part No. 94033, with a #62 drill choke must be removed and replaced with Part No. 578254 with a #54 drill choke. Stamp pipe bracket body with $\frac{1}{4}$ " high letter "X" as shown (See Fig. 17) to permanently indicate that the modification has been made.

1.1.18.1 If car is equipped with a "J" type relay valve, remove the shipping cover from the clean valve portion and immediately apply the latter to its respective mounting face. The shipping cover must not be removed from the clean relay valve portion until prepared to mount the portion on the pipe bracket.

NOTE: Following Paragraph 1.1.19 is to be disregarded if car is equipped with older type pressure retaining valve.

1.1.19 Insert a new strainer properly into the pipe bracket, then, with the gasket firmly in place, immediately attach retaining valve to pipe bracket and fasten securely in place with the two cap screws. The shipping cover must not be removed from a new or cleaned retaining valve until prepared to mount device on its pipe bracket.

1.1.20 Reconnect the release valve handle or handles (which has been left attached to release rod) to release valve handle end plate with a $\frac{3}{16}$ " cotter. Note that a $\frac{5}{16}$ " cotter is provided to connect rod to handle, if not, replace with a $\frac{5}{16}$ " cotter.

Clean and blow out the dirt collector dirt chamber. Clean the check valve. Renew the gasket, then assemble, lubricating the bolt threads lightly with brake cylinder lubricant AAR Specification M-914, or a compound consisting of one part graphite AAR Specification M-913 and two parts of oil (SAE-20) by weight.

1.1.21 Check the cylinder, reservoir and pipe bracket for loose supporting bolts and nuts and if missing or loose, they must be renewed or tightened. Tighten all flange pipe fittings solidly.

1.1.22 Replace retaining valve with new or reconditioned 3-position retaining valve. Application of appropriate pipe bracket may be required.

1.1.23 Brake cylinders must be cleaned as described in Sections 1.2 and 1.3.

- 1.1.24** The entire air brake equipment must be tested as required by the current issue of test codes for single car testing device (5039-4 Sup. 1), including brake cylinder leakage, retaining valve tests and piston travel. SLACK ADJUSTERS on cars so equipped must be inspected and repaired or renewed when necessary. Repairs when required must be made in accordance with the specific manufacturer's maintenance recommendations. Note if any pipe clamps are loose or missing, or if the angle cocks are improperly located, and make any needed repairs. Apply new gaskets to both brake pipe hose couplings.
- 1.1.25** APPLY NEW C.O.T. & S. DATE WITH A STENCIL AFTER ALL WORK HAS BEEN COMPLETED.
- 1.1.26** REPRESENTATIVE TOOLS AND EQUIPMENT ARE NECESSARY FOR THE BRAKE CLEANER FOR PERFORMING THE WORK AS ABOVE DIRECTED. To secure the required external clearances and strength and reduce the cleaning time to a minimum, the tools are specially designed and made of high tensile steel. They may be obtained from the brake manufacturers.
- 1.1.27** Suitable covers or containers to protect the brake cylinder piston, hollow rod and non-pressure head assemblies from dirt or damage should be provided when transporting assemblies to and from the car.

1.2 BODY MOUNTED CYLINDERS

- 1.2.1** Drain air from all reservoirs and brake cylinders. Disconnect and remove the brake cylinder push rod. To avoid personal injury which may occur if the non-pressure head assembly is not secured by the hollow rod collar, examine the collar to determine that it will hold securely, then remove the piston, release spring and non-pressure head complete.

NOTE: The non-pressure head of the "UC" Type Brake Cylinder can be removed from the brake cylinder providing the hollow rod collar is retained in position.

These parts must be transported to a suitable shop for reconditioning. The piston assembly must be handled at the car and while being transported to and from the car, so that the piston packing cup, lubricator swab assembly and other parts will be effectively protected against damage and contact with any kind of dirt. It will be the responsibility of individual railroads to provide such adequate protective means.

- 1.2.2** Remove non-pressure head and gasket, clean its seat when cleaning the brake cylinder and apply new gasket when assembling cylinder.
- 1.2.3** Thoroughly clean the brake cylinder by first using a dull rounded scraper for removal of all grease and any dirt. Use a suitable solvent, if necessary, to soften gummy deposits and remove rust spots, then wipe dry and clean with rags. When the cylinder is cleaned, unless the cleaner is prepared to immediately apply the piston and non-pressure head assembly, the cylinder should be covered to protect it from dust and dirt. The lubricant should be applied to the cylinder just before the cleaned and lubricated piston is installed. Packing cups must be renewed. "ABD/ABDW" equipped cars must be equipped with non-pressure head and integral return spring guide and designed to utilize the latest type hollow rod packing seal.
- 1.2.4** Coat the cylinder wall bearing surface of the packing cup and fill the grease groove of the swab retainer with brake cylinder lubricant. Immediately apply these parts to the cylinder making sure that the non-pressure head exhaust and strainer is located in the down position and tighten the non-pressure head bolts. Apply and connect the push rod. DO NOT INTENTIONALLY APPLY LUBRICANT TO THE DOME SECTION OF THE PACKING CUP OR THE PRESSURE HEAD OF THE CYLINDER.

1.3 TRUCK MOUNTED CYLINDERS

NOTE: For truck mounted brake assemblies other than WABCOPAC and NYCOPAC Brake Units covered herein, refer to specific manufacturer's maintenance recommendations

1.3.1 Drain air from all reservoirs and brake cylinders.

Work done at car is best accomplished by disconnection brake cylinder hoses at cylinder flanges and hand brake chain, then jacking the car and rolling truck out. While working on truck, wheels should be chocked to prevent unwanted roll. If work can be done with car over a pit or depressed area between rails, jacking of car is not required. When hoses are disconnected, inspect hoses for abrasion, cracks, soft spots, and loose or defective fittings.

Remove brake shoes.

If any cylinders and/or levers are found damaged or missing refer to car badge plate (See Fig. 24) for correct cylinders and lever sizes.

Any welding found necessary must be done in compliance with manufacturer's instructions and specifications.

Remove old brake cylinder and piston assemblies for cleaning by the following procedure:

Examine push rod holder to determine that it is securely in place (See Fig. 18). Should it be missing or insecure, caution must be exercised in removing the brake cylinder body since it is spring loaded and will tend to "spring" toward the axle.

Remove cotter pin, then remove push rod pin.

Push brake unit body toward bolster, using two wrenches loosen push rod locking nut, then remove push rod and place on bolster. If push rod is damaged, return it to shop for repair and replace with one of the same length.

Remove brake cylinder nuts and bolts. Remove cylinder and piston assembly and transport assembly to shop for cleaning, upgrading and lubricating in accordance with Section 4.0. Protect assembly from damage and contamination during handling to and from shop.

1.3.2 Apply cleaned brake cylinder assemblies as follows:

Remove brake cylinder gasket. Clean rust and other dirt from bolting face (See Fig. 19).

Clean spring cavity and renew strainer in unit body.

Make certain hollow rod guide gasket of hollow rod guide is in place, align spring seat stop and cylinder flange bolt holes with those of the unit body making certain spring seat stop drain hole is facing downward. Position the assembly in the unit body cavity and start nuts on top bolts. Position the hollow rod guide in the unit body recess by grasping the push rod end and shifting until release spring pushes guide into place (See Fig. 20). Install lower bolts and tighten all nuts evenly and securely.



Figure 18



Figure 19

NOTE 1: Use a thin film of brake cylinder lubricant on both sides of spring seat stop flange and on unit body bolting face to hold gaskets in place.

NOTE 2: Six-bolt cylinders are not interchangeable with those used in four-bolt assemblies. Care should be exercised to avoid an improper application when replacing six-bolt details. Clean push rod threads and lubricate with brake cylinder lubricant then replace push rod. +Turn push rod into push rod end two (2) turns beyond the mark previously placed on push rod, align pin holes in push rod with pin holes in brake unit bodies, then insert pins and lock with cotter pins (See Fig. 21).

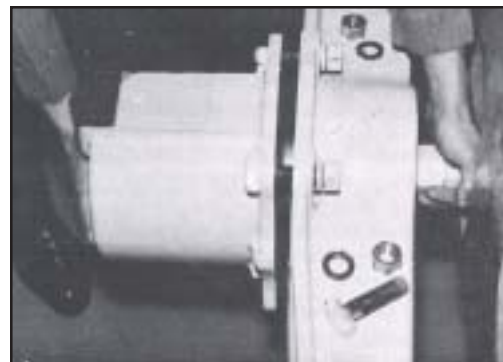


Figure 20

+NOTE: Push rods on new installations should also be lubricated as above before assembly into brake cylinder push rod end.

1.3.3 Piston Travel Adjustment - Must be performed on new cars, after COT&S, after any new or turned wheel replacement on affected truck, and after truck replacement.

Insert spacing blocks, shown on Fig. 23, between brake heads of both unit bodies and four (4) wheels as close as possible to the flange (See Fig. 22). If push rod adjustment is necessary to permit spacing block insertion, rotate the push rod end to shorten the push rod (when facing the bolster from the pressure end of brake cylinder and with wrench handle upward, moving the wrench handle to the right will shorten the rod and moving to the left will lengthen the rod).

Adjust both push rods to snug spacing blocks against wheels by rotating both push rod ends to lengthen push rods. After both push rods have been snugged with spacing blocks against wheels, rotate both push rod ends $\frac{1}{2}$ turn to the right to shorten the rod for easy spacing lock removal.

Remove spacing blocks and mount shoes. If new shoes are mounted, use only $1\frac{1}{4}$ " or $1\frac{1}{2}$ " thick shoes.

Tighten push rod locking nut securely (Use two wrenches).

Reinstall truck under car, remove hose fitting flange face protection making certain that the strainer is in place (if cylinder is so equipped). Renew hose flange fitting gaskets, then connect brake cylinder hoses. Also (on hand brake truck) apply hand brake chain and pull rod at hand brake levers and install cotter pins. The correct piston travel with all new shoes per truck is $1\frac{1}{4}$ " for $1\frac{1}{4}$ " thick shoes and $\frac{3}{4}$ " for $1\frac{1}{2}$ " thick shoes.



Figure 21



Figure 22

1.3.4 Hand Brake Adjustment - Perform on New Cars, After Any New or Turned Wheel Replacements and After Truck Replacements.

Adjustment of the hand brake is not normally required unless truck wheels have been replaced. The following procedure will allow for proper adjustment at such time. Refer to Fig. 24.

- (a) Release hand brake fully. The horizontal hand brake chain should have minimal slack. If so, hand brake adjustment is proper. If not so, follow to "b"
- (b) Disconnect adjustment pin at anchor clevis. Pull on pull rod by hand and insert pin in farthest hole possible. If this brings horizontal chain to have minimal slack, slack adjustment is proper. If the chain is still loose, move back one (1) hole, then make adjustment at bottom rod as in "c".

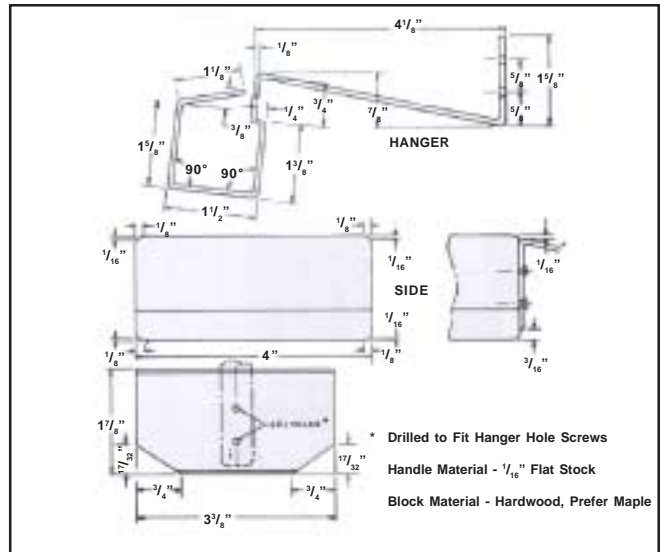


Figure 23 - Suggested Hardwood Spacing Blocks

- (c) If necessary, as in "b", move pin at one end of bottom rod to outside hole. This should bring horizontal chain taut. If not, tighten chain at anchor clevis as in (a) and (b).

NOTE: Movement of the pin at the anchor clevis one hole toward the body anchor will shorten the horizontal chain travel approximately 3". Movement of the pin at the bottom rod one hole towards the end of the rod will shorten the chain travel 4 3/8".

PROCEDURE FOR RECONDITIONING AND TESTING BRAKE CYLINDER PISTONS AND ASSOCIATED PARTS IN THE SHOP

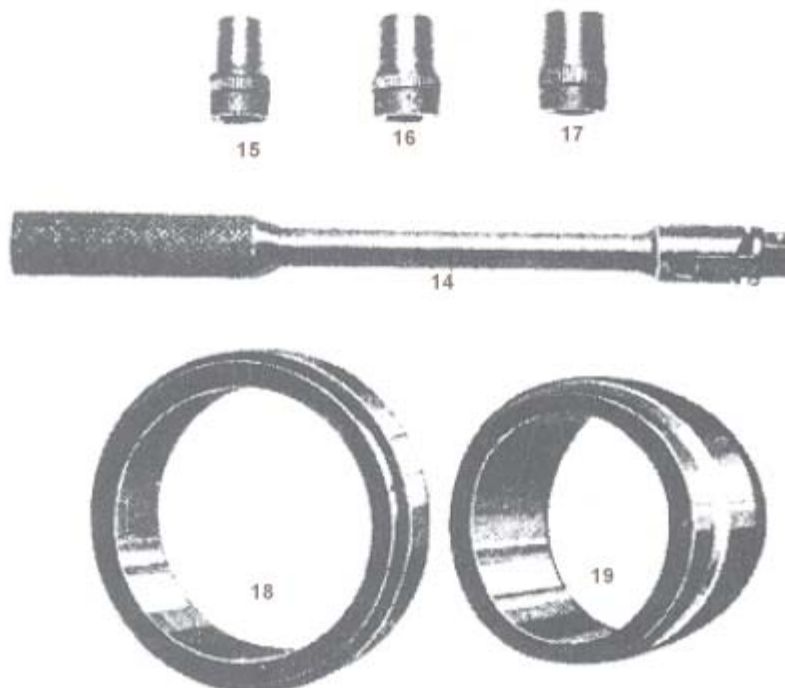
The car badge plate serves to identify the size of the cylinder ("E"), the connecting rod length ("C"), and fulcrum lengths for the levers ("A" & "B").

CONNECTION CODE	COMPENSATION AT EACH SHOE	EQUIVALENT HORIZONTAL CHAIN TRAVEL
HAAA	Normal	Normal
HKAA	7/16"	3"
HLBA	5/8"	4 3/8"
HKBA	1 1/16"	7 3/8"
HLBB	1 1/4"	8 3/4"
HKBB	1 11/16"	11 3/4"

The Brake Assembly Hand Brake can be adjusted to compensate for shoe and wheel wear through pin connections at the connecting rod and the anchor clevis. The connecting rod length can be varied by means of the two holes, 1 3/4" apart at each end (Ref. "A" & "B"). The anchor clevis can also be adjusted in this manner. It contains two holes 3" apart (Ref. "K" & "L") for maximum adjustments.

The above table shows the adjustments that are obtained by connecting these holes in accordance with the letter code indicated.

Figure 24 - Hand Brake Adjustment



NO.	TOOL	PURPOSE	PRINCIPAL DIMENSION	PART NO.
14	Hinged Off-Set Handle	For Non-Pressure Head Assembly	$\frac{3}{8}$ " Lock	513074
15	$\frac{3}{8}$ " Socket	For Non-Pressure Head Assembly	$\frac{3}{8}$ " hex opening	513071
16	$\frac{7}{16}$ " Socket	Non-Pressure Head Assembly	$\frac{7}{16}$ " hex opening	513072
17	$\frac{1}{2}$ " Socket	Non-Pressure Head Assembly	$\frac{1}{2}$ " hex opening	513073
18	Compression Ring Assembly Tool	Used to apply brake cylinder hollow rod lubricator		513075
19	Hollow Rod Packing Seal and Retainer Assembling Sleeve	Used to Apply Hollow Rod Packing Seal and Retainer	13 $\frac{1}{4}$ " Long	526333

Figure 25 - Representative Tools for Reconditioning Brake Cylinder Pistons and Associated Parts

2.0 “AB” CYLINDER REPAIR, IN SHOP

2.1 DISASSEMBLY

- 2.1.1 Piston packing cup and strainer on brake cylinders must be removed and replaced with a new piston packing cup and strainer.

Non-pressure heads used with “ABD” and “ABDW” Control Valves must have integral return spring guide and must use latest type hollow rod packing seal.

- 2.1.2 Remove the swab retainer. Plastic guide rings (See Fig. 27) must not be removed or replaced unless worn to piston diameter.

NOTE: If piston is equipped with a lubricator swab, the swab must be removed and omitted from future assembly. (See Fig. 26).

Clean the piston guide ring or swab retainer with a suitable solvent.

- 2.1.3 Place the piston and non-pressure head assembly in a holding fixture, which will hold the release spring partially compressed, and proceed as follows:

2.1.4 LUBRICATOR SWAB OR METAL RING-PACKED ON-PRESSURE HEAD

NOTE: The metal rings and adjacent lubricator swab may be substituted by lubricator swab, if so desired. (See Fig. 28).

- (a) Remove the hollow rod collar, the lubricator swab or seal ring retaining plate, lubricator swab or seal rings, lubricator swab and swab compression ring.

Then remove the non-pressure head and the release spring from the hollow rod. Remove the strainer.

- (b) Blow all of the dirt out of the non-pressure head and at the same time blow any loose dirt from the strainer cavity. Apply new strainer.

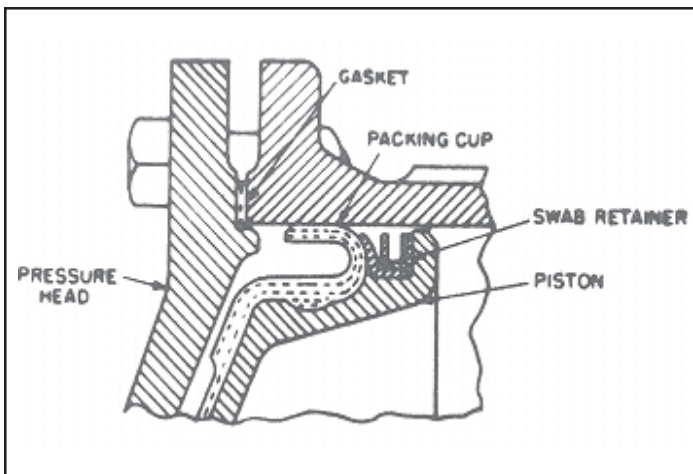


Figure 26 - Partial Section of Brake Cylinder Showing the Swab Retainer

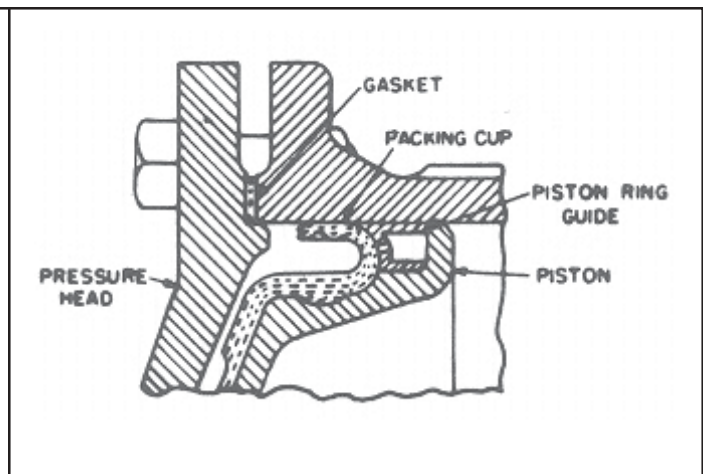


Figure 27 - Partial Section of Brake Cylinder Showing the Piston Ring Guide

- (c) Using a scraper and then a suitable solvent, clean the lubricator swab or seal ring recess in the non-pressure head, and the non-pressure head gasket face. Then, using a suitable file, break any sharp edges from the ends of the opening in the non-pressure head which guides the hollow rod.
- (d) Clean the piston and hollow rod, removing any rust or rough surfaces, using emery cloth if necessary.
- (e) Clean release spring, remove rust spots and apply rust preventative or brake cylinder lubricant.
- (f) Clean the lubricator swab or seal ring retaining plate. If metal rings are used, clean the rings and renew any ring which does not close firmly on the hollow rod. Use repair ring Part No. 524469 if wear in diameter of hollow rod has developed.
- (g) The new hollow rod lubricator swab must be saturated with oil as per Paragraph 2.2.4.

2.1.5 FELT RING-PACKED NON-PRESSURE HEAD

NOTE: If non-pressure head is equipped with hollow rod felt seal ring, the felt seal ring must be substituted by new hollow rod packing seal and retainer (See Fig. 29).

- (a) Remove the hollow rod collar, the non-pressure head, the hollow rod packing seal and retainer, the spring seat and release spring. Remove the strainer.
- (b) Blow all of the dirt out of the non-pressure heads and at the same time blow any loose dirt from the strainer cavity. Apply new strainer.
- (c) Using a suitable file, break any sharp edges from the ends of the opening in the non-pressure head which guides the hollow rod.
- (d) Clean the piston and hollow rod, removing any rust or rough surfaces, using emery cloth, if necessary. Check hollow rod interior with a feeler gage or similar to detect proper unobstructed free depth. If obstruction is detected, foreign material must be removed.
- (e) Clean release spring, remove rust spots and apply rust preventative or brake cylinder lubricant.
- (f) The new hollow rod packing seal and retainer must be saturated with oil as per Paragraph 2.2.4.

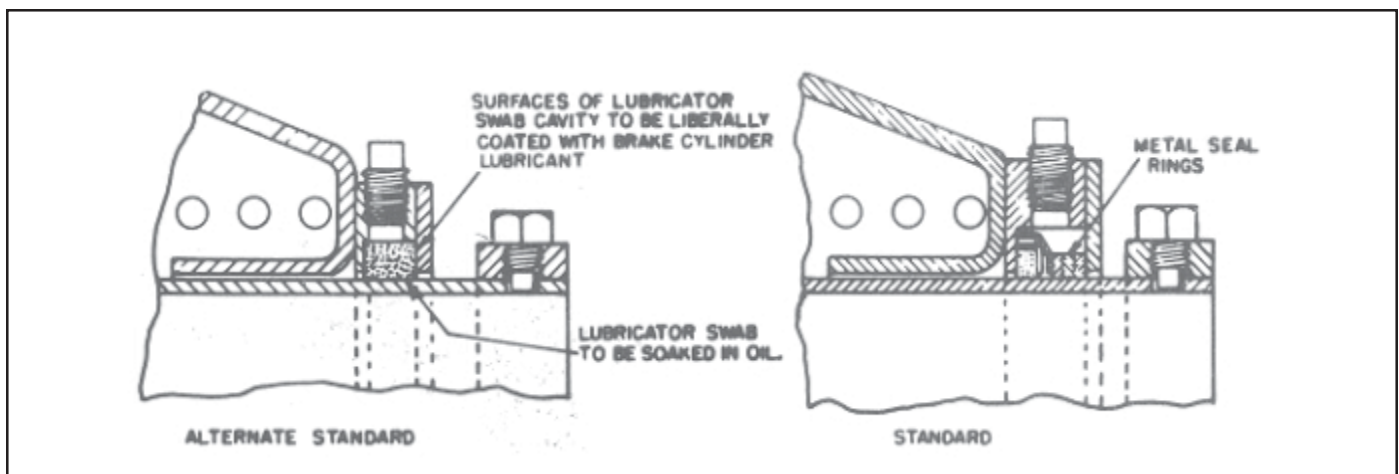


Figure 28 - When Converting from Standard to Alternate Standard Arrangement, Remove Swab, Retainer and Metal Seal Rings and Apply Lubricator Swab

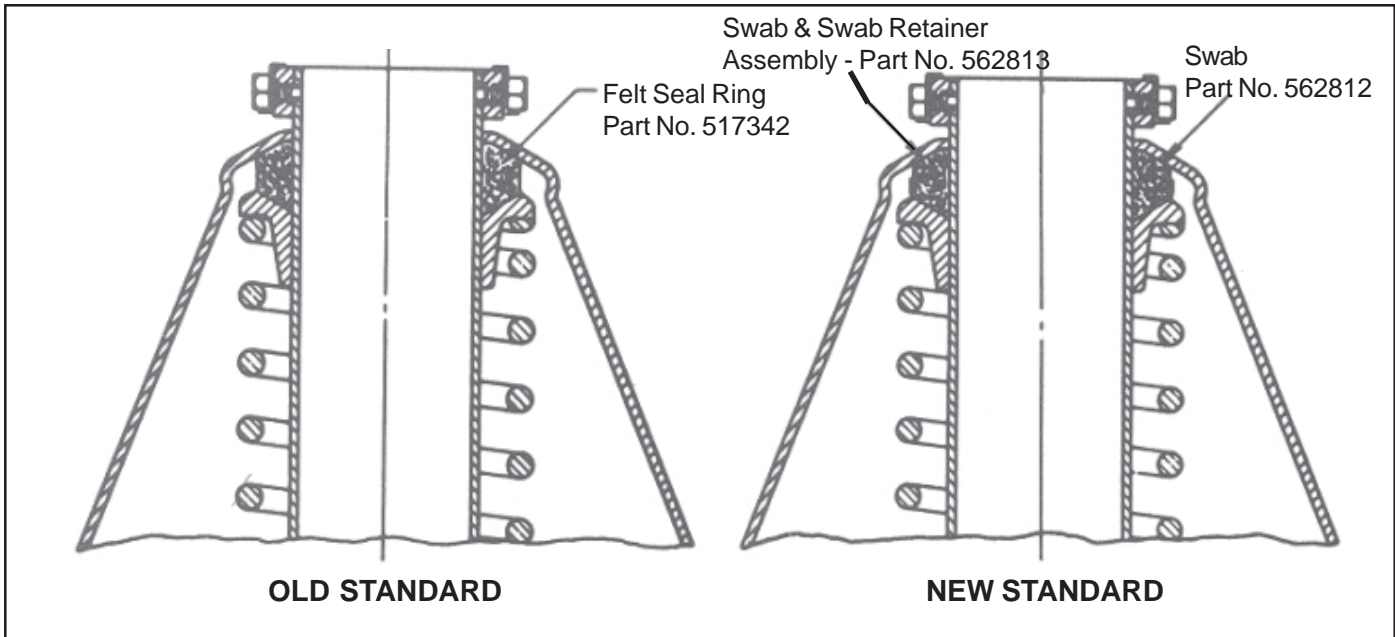


Figure 29 - "AB" Brake Cylinder Hollow Piston Rod Packing Seal

2.2 REASSEMBLE THE PISTON AND NON-PRESSURE HEAD PARTS

2.2.1 LUBRICATOR SWAB OR METAL RING-PACKED NON-PRESSURE HEAD

- (a) After completely coating the hollow rod with brake cylinder lubricant, place the piston and hollow rod in the holding fixture used while dismantling. Then apply the release spring and non-pressure head, using the locking mechanism of the fixture to hold the release spring partly compressed.
- (b) For metal rings - place the hollow rod lubricator swab, after it has been saturated with oil, over the hollow rod and push into the recess in the non-pressure head. Put the swab compression ring on the inner portion of the assembly tool (No. 18, Fig. 25) then slide the assembly tool over the outer end of the hollow rod until it contacts the lubricator swab. Next, with the assembly tool held securely in this position, push firmly on the outer portion, forcing the swab compression ring off the tool into position around the lubricator swab.

Place swab retainer over the lubricator swab, then assemble seal rings with their openings staggered. Apply the seal ring retaining plate, and fasten it with cap screws secured with lock washers.

For lubricator swab, (See Fig. 28) liberally coat the surfaces of lubricator swab cavity with brake cylinder lubricant. Place the lubricator swab, after it has been saturated with oil (See 2.2.4), over the hollow rod and push into the recess in the non-pressure head. Apply the retaining plate and fasten it with cap screws secured with lock washers.

2.2.2 FELT RING-PACKED NON-PRESSURE HEAD

After completely coating the hollow rod with brake cylinder lubricant, place the piston and hollow rod in the holding fixture used while dismantling. Apply the release spring, then place the hollow rod packing seal and retainer assembling sleeve on the end of the hollow piston rod, next, place the spring seat, then the hollow rod packing seal and retainer, after it has been saturated with oil, on the release spring. Force the non-pressure head over this arrangement of parts. Use the locking mechanism of the holding fixture to hold the release spring partly compressed and fasten the hollow rod collar to the hollow rod with self locking set screws.

2.2.3 LUBRICATOR SWAB OR METAL RING-PACKED OR FELT RING-PACKED NON-PRESSURE HEADS

Apply the piston ring guide+ or piston lubricator swab retainer, with swab omitted, to piston with the flat side next to piston. Apply new packing cup to piston by starting the cup over one edge of piston and, while holding it in this position, work the cup into place with the hands. If the cup does not seat properly due to trapped air, the air can be removed by raising one side of the cup, using the wooden tool, and pushing the cup into place with the hands.

2.2.4 The oil employed for soaking the lubricator swabs of the piston and hollow rod packing seal and retainer herein must be New Journal Box Oil, or as an alternate, Triple Valve Oil.

+ If it is necessary to replace the plastic type guide ring, which is a press fit over the piston, it is important that the temperature of the ring be higher than 60° F to avoid possible ring damage.

3.0 'UC' CYLINDER REPAIR, IN SHOP

3.1 'UC' TYPE

3.1.1 Piston packing cup and strainer on brake cylinders must be removed and replaced with a new piston packing cup and strainer.

3.1.2 Remove the swab retainer.

NOTE: If piston is equipped with a lubricator swab, the swab must be removed and omitted from future assembly. (See Fig. 31)

Clean the swab retainer with a suitable solvent.

3.1.3 Remove the load pressure indicator and proceed as follows:

- (a) Make certain that the $\frac{3}{64}$ " drill choke orifice in the load pressure indicator bolting face on the brake cylinder is clear of obstructions.
- (b) Dismantle the load pressure indicator and examine all parts for wear and damage. All damaged parts must be replaced. Clean the spring, removing rust spots with emery cloth, if necessary, then coat the spring with a rust preventative. Remove all rust spots and rough surfaces from the various parts, then reassemble the load pressure indicator completely.

3.1.4 Place the brake cylinder piston and non-pressure head assembly in a holding fixture, which will hold the release springs partially compressed, then proceed as follows:

- (a) Detach the hollow rod collar, then remove the assembly from the holding fixture and dismantle completely.

NOTE 1: If small piston is equipped with a lubricator swab, the swab must be removed and omitted from future assembly.

NOTE 2: If non-pressure head is equipped with hollow rod felt seal ring, the felt seal ring must be substituted by new hollow rod packing seal and retainer. (See Fig. 29).

- (b) The small piston packing cup and gaskets must be renewed.
- (c) Blow all dirt out of non-pressure head. Remove strainer, blow out any loose dirt in strainer cavity and renew strainer. Wipe the cylinder with a rag and remove rust or rough surfaces with emery cloth, if necessary.

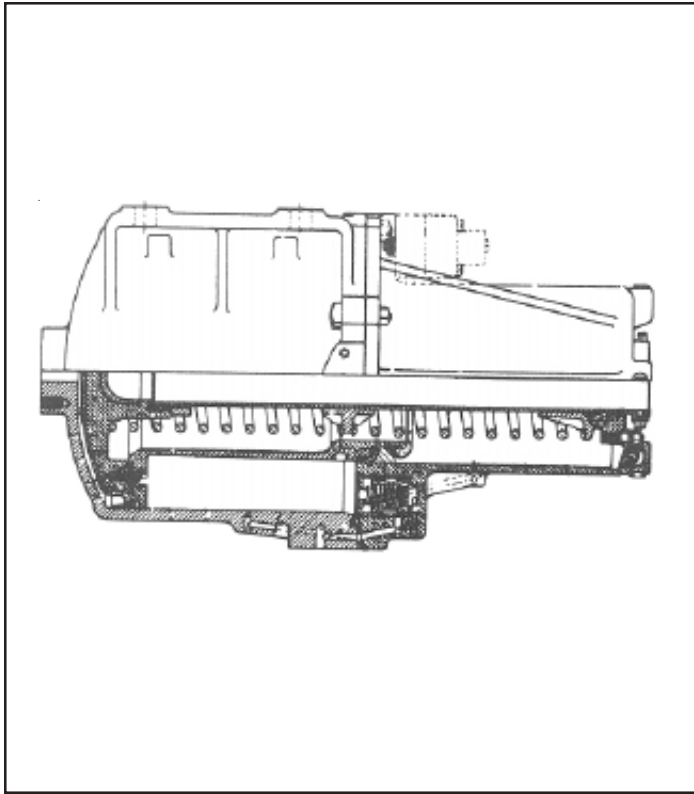


Figure 30 - "UC" Type Brake Cylinder

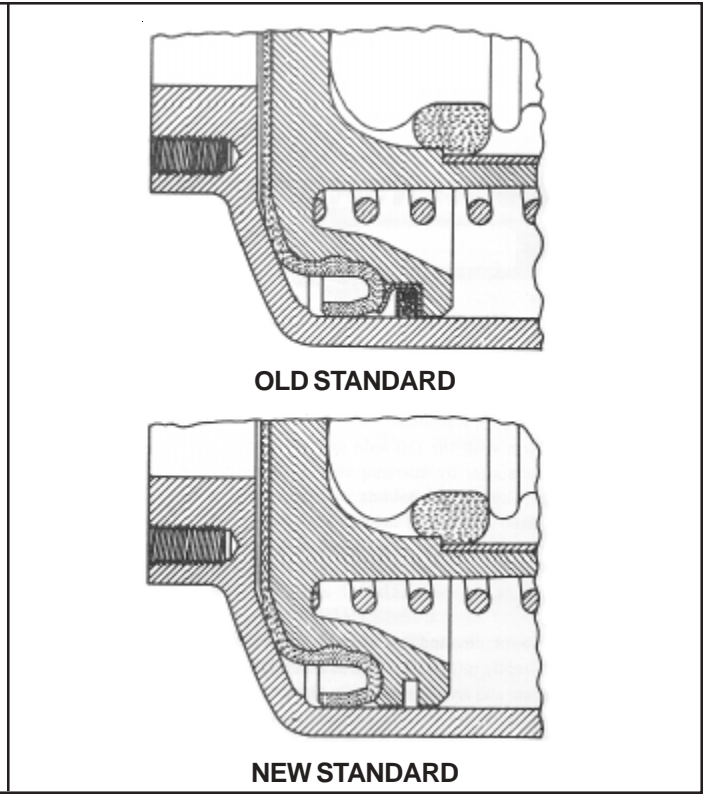


Figure 31 - "U" Type Brake Cylinder Redesigned to Eliminate Lubricator Swab

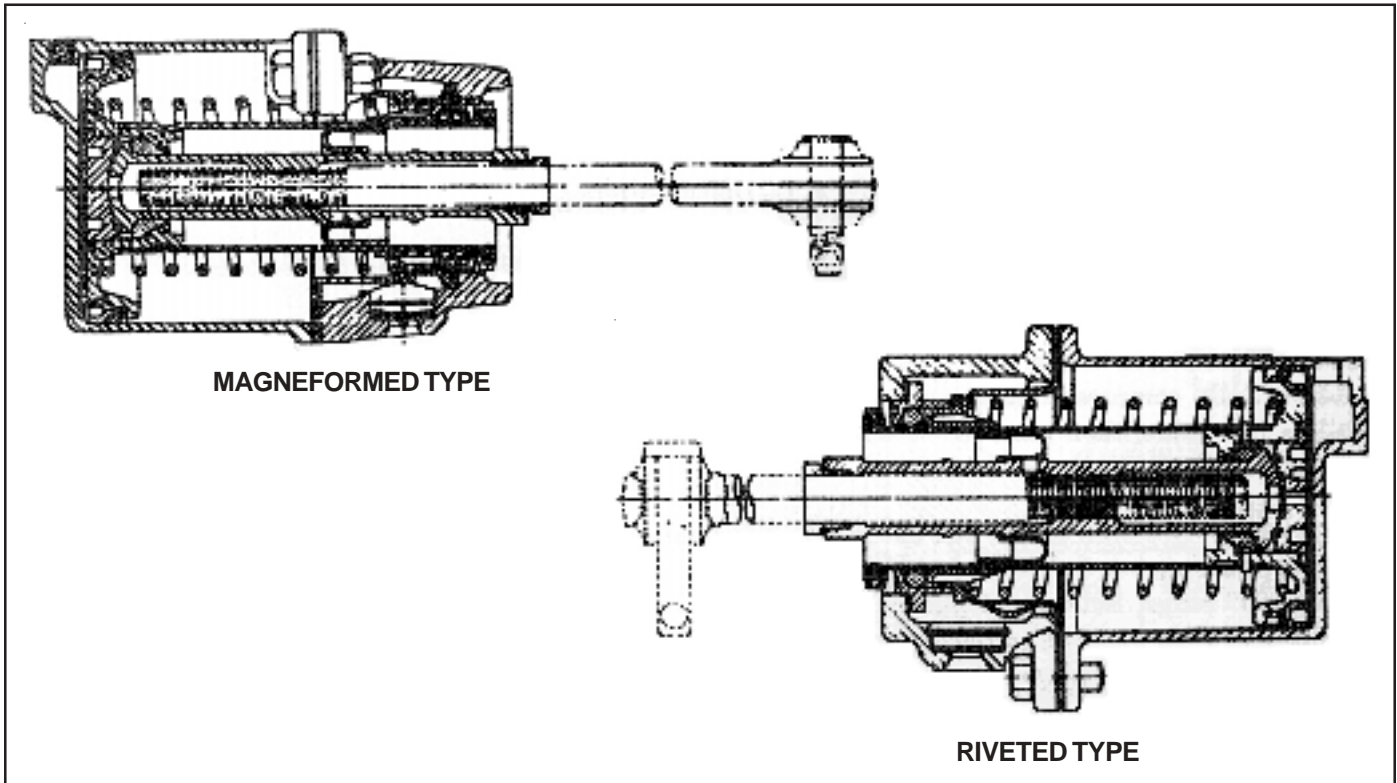


Figure 32 - WABCOPAC and NYCOPAC Brake Cylinder Assemblies

- (d) Using a suitable file, break all sharp edges from the ends of the openings in the spring cage, spring guide and spring seat.
- (e) Clean pistons, piston tube, release spring and hollow rod, removing rust or rough surfaces. Use emery cloth, if necessary, to give satisfactory results.
- (f) The new hollow rod packing seal and retainer must be saturated with oil as per Paragraph 2.2.4.

3.2 Reassemble the piston and non-pressure head

- (a) Coat the hollow rod and piston tube as well as the release spring and cylinder walls and the sealing periphery of the packing cup with brake cylinder lubricant. **DO NOT INTENTIONALLY APPLY LUBRICANT TO THE DOME SECTION OF THE PACKING CUP OR THE PRESSURE HEAD OF THE CYLINDER.** Place the piston and hollow rod assembly in the holding fixture used while dismantling. Place the release springs and piston guide in position, then place the spring seat and the hollow rod packing seal and retainer, after it has been saturated with oil (See 2.2.4), on the release spring. Attach the spring cage to the non-pressure head, then place the non-pressure head over the piston and spring assembly. Use the holding fixture to partly compress the release springs and fasten the hollow rod collar to the hollow rod with self locking set screws.
- (b) Apply piston lubricator swab retainer, with swab omitted, to piston with the flat side next to piston. Apply packing cup to piston by starting the cup over one edge of the piston, then, while holding it in this position, work the cup into place by hand. If the cup does not seat properly due to trapped air, the air can be released by raising one side of the cup, using the wooden tool, then pushing the cup into place by hand.

- 3.2.1** Mount cleaned load pressure indicator on the non-pressure head, making certain that the mounting face is wiped clean and the gasket is in place.

4.0 PROCEDURE FOR RECONDITIONING WABCO PAC & NYCOPAC TYPE BRAKE ASSEMBLIES

4.1 DISASSEMBLY

- 4.1.1** Lift and remove piston hollow rod assembly from brake cylinder.

- (a) Remove packing cup by using a wooden tool about 1" wide and $\frac{3}{32}$ " thick, or equivalent, with rounded edges to prevent damage to guide ring.
- (b) Do not remove piston guide ring unless worn to piston diameter.

- 4.1.2** Place piston hollow rod assembly in holding fixture and partially compress release spring by contacting the hollow rod guide, then remove set screws and push rod holder (See Fig. 33).

- 4.1.3** Remove piston hollow rod assembly from holding fixture, then remove hollow rod guide gasket, hollow rod guide, o-rings, hollow rod packing seal, spring seat, spring seat stop, gasket and release spring.

- 4.1.4** **SCRAP WABCO PAC RIVETED HOLLOW ROD ASSEMBLIES (WITH OR WITHOUT KEEPER PINS). SCRAP (OR WELD*) ALL MAGNEFORMED PISTON ASSEMBLIES WHICH DO NOT HAVE THE LETTERS "PF" OR "PFS" ON THE PISTON (AS SHOWN ON FIGURE 35) AND HAVE NOT BEEN WELDED. SEE TABLE 2 ON PAGE 27.**

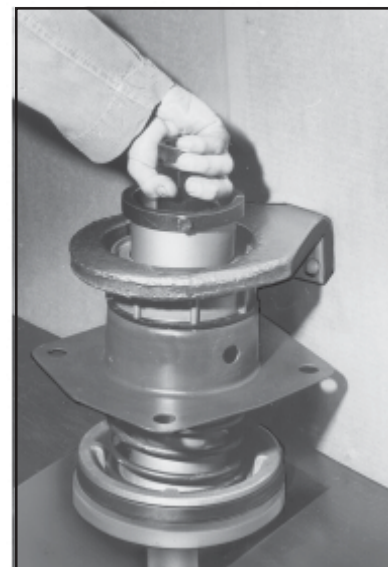
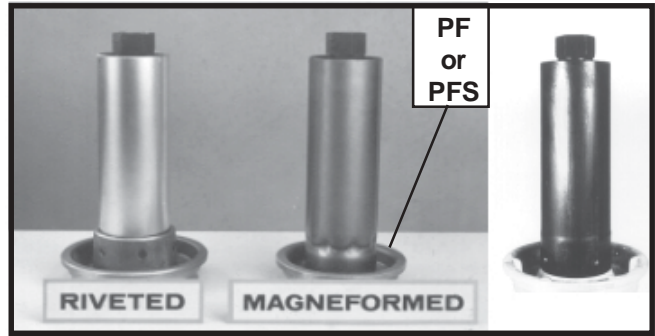


Figure 33



Figure 34



WABCO

NYABCO

Figure 35

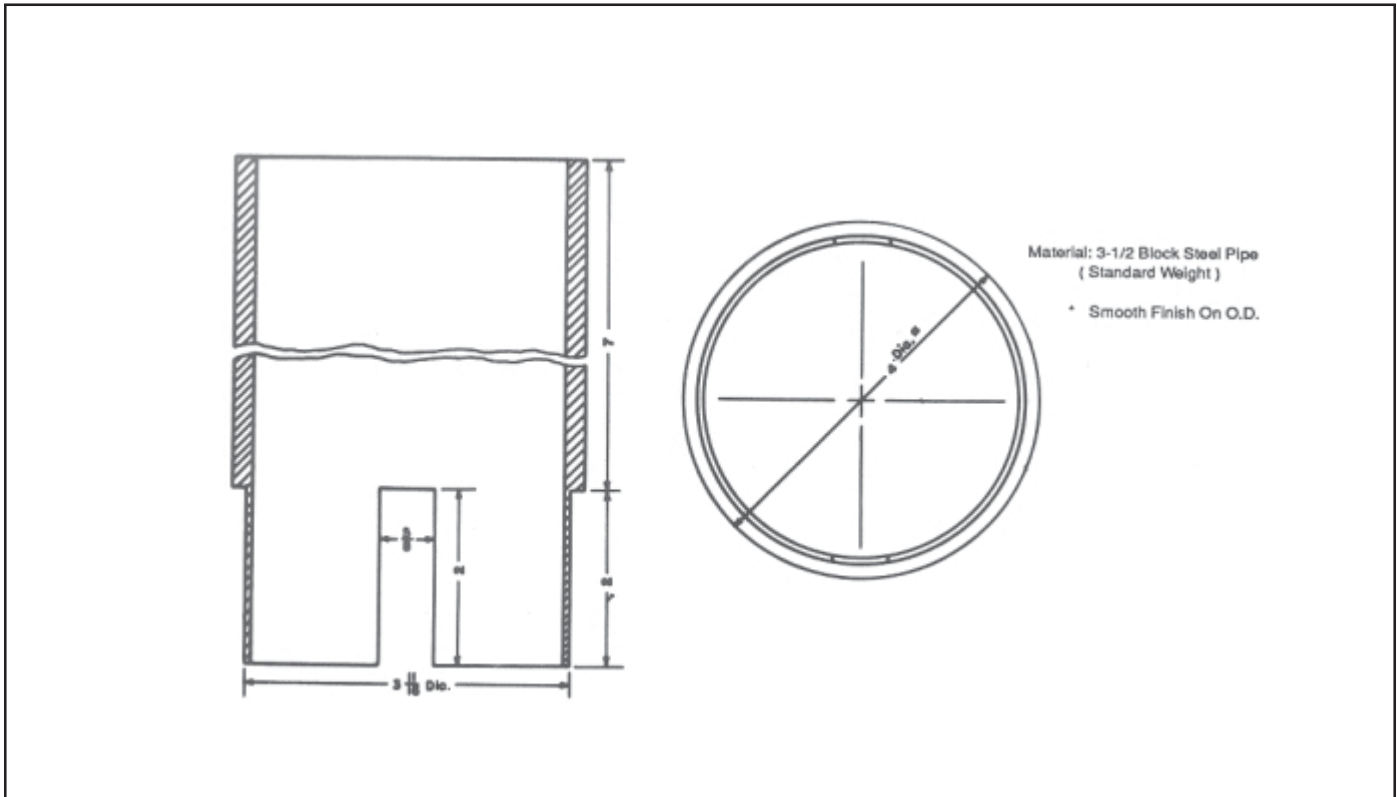


Figure 36 - Assembling Sleeve

*NOTE: Magneformed pistons can be salvaged by welding as per instructions in WABCO brochure No. 9013-7, titled WABCOPAC Brake Assembly, dated November 1978.

4.1.5 Disassemble Piston Hollow Rod Assembly

- (a) Straighten lock ring, then use spanner wrench shown on Fig. 40 to remove lock plug and lock ring from piston.

NOTE: To avoid hollow rod damage when disassembling or assembling lock plug piston hollow rod assembly must be restrained from rotation at lugs on underside of piston (See Fig. 41 - Fixture on Fig. 42 and 43). CAUTION - Do not place hollow rod in vise.

- (b) Remove push rod end, anti-rattler ring, and hollow rod seal from piston hollow rod (See Fig. 42).

4.2 Cleaning, Inspection and Lubricating

4.2.1 Wash all parts in a suitable solvent for a thorough cleaning. Remove rust or rough surfaces from piston, release spring, and hollow rod. Wire brush release spring, if necessary, to clean rust spots. If there is paint on the front portion of hollow rod guide, it need not be removed.

4.2.2 Examine all parts for damage or wear.

Dimensional checks of parts in following steps need not be made if inspection indicates no wear or very little wear. However, if inspection reveals any gouging, severe wear, thin walls, or other damage, check for maximum wear limits as specified.

- (a) Piston hollow rod must be replaced if diameter is worn to $3^{15/16}$ " or less.
- (b) Interlocking type spring seat which guides hollow rod must be replaced if bore diameter is $4^{5/32}$ " or more.
- (c) Cylinder must be replaced if bore diameter is $5/64$ " more than nominal.
- (d) Piston Guide Ring Thickness - With guide ring assembled to piston, check that ring is not worn to piston diameter.
- (e) Use interlocking type spring seats and hollow rod guides when replacement of either part is necessary.

NOTE: If it is necessary to replace piston guide ring, which is a press fit over the piston, it is important that the temperature of the ring be higher than 60° F to avoid possible guide ring damage.

Hollow rod guides which have $6^{1/2}$ " shoulder stops (OD) cannot be used in $6^{1/2}$ ", $7^{1/2}$ ", or $8^{1/2}$ " piston assemblies, but may be used in 9" or 10" assemblies. However, they may be altered to fit all assemblies as shown in Fig. 49.

4.3 ASSEMBLY

Items listed below must be incorporated in the reconditioned piston assembly. Earlier model piston assemblies were not manufactured with all components listed below.

1. *Hollow Rod Guide Gasket, Part No. 567268
 2. *Two O-Rings, Part No. 536589
 3. *Hollow Rod Packing Seal, Part No. 562965
 4. *Gaskets between spring seat stop, cylinder and beam, Part Nos. 566011 (2) and 566344 (2)
 5. Spring Seal Stop, Part No. 575926 and 575932
 6. *Push Rod Seal, Part No. 563210
 7. *Anti-Rattler Ring, Part No. 526478
 8. *Hollow Rod Seal, Part No. 571853
- *Items must be renewed

4.3.1 Insert assembling sleeve shown on Fig. 36 into end of piston hollow rod assembly.

- (a) Coat hollow rod and spring with brake cylinder lubricant or rust preventative.
- (b) Place release spring, gasket, spring seat stop, (omit spring seat stop on six bolt design) spring seat and new hollow rod packing seal which has been saturated with new journal box oil or triple valve oil. O-rings and hollow rod guide on hollow rod, (See Fig. 37) then place piston hollow rod assembly in holding fixture used during disassembling and partially compress release spring.
- (c) Remove assembling sleeve from piston hollow rod assembly.
- (d) Place push rod holder (solid ring for early version type or split ring type) on end of hollow rod and secure in place with $\frac{5}{16}$ " x $\frac{7}{16}$ " self-locking set screws. Tighten set screw securely (See Fig. 38) and remove piston hollow rod assembly from holding fixture.

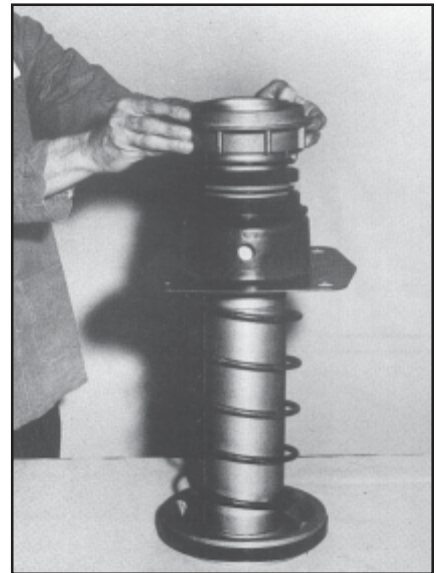


Figure 37

4.3.2 Assembling piston hollow rod assembly

- (a) Apply a light film of brake cylinder lubricant to the I.D. of anti-rattler ring to ease assembly. Place anti-rattler ring on push rod end, then insert push rod end into piston hollow rod.
- (b) Position lock ring on piston. Coat threads of lock plug with sealant (Mobil Jointite pipe joint compound or equivalent) and insert lock plug into piston. Use spanner wrench, shown on Fig. 40, to tighten lock plug to an equivalent of 80 to 110 ft. lbs. torque. Crimp lock ring into notch in piston and at either one of two notches in locking plug.

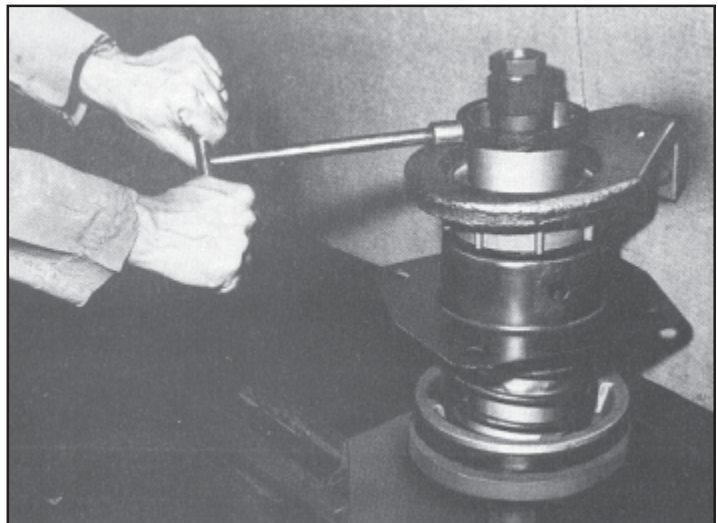


Figure 38

4.3.3 Replace hollow rod seal as follows:

- (a) Place funnel adapter, shown on Fig. 46, over end of hollow rod.
- (b) Coat O.D. and I.D. of hollow rod seal with brake cylinder lubricant to facilitate assembly.
- (c) With open portion of seal facing upward, stretch I.D. of seal over hex portion of push rod end. Push O.D. portion of seal down until flush with or just below top of funnel adapter.
- (d) Place inserting adapter, shown on Fig. 47 into cup of seal and push down until adapter stops on push rod end (See Fig. 48).
- (e) Remove inserting adapter and funnel adapter.

4.3.4 Apply new packing cup to piston by starting the cup over one edge of piston and, while holding it in this position, work cup into place with hands. If cup does not seat properly due to trapped air, remove air by raising one side of cup. It is recommended this be done by using wooden tool and pressing cup into place with hands working towards wooden tool. Lubricate the side walls of the cylinder, the piston guide ring and the sealing periphery of the packing cup with brake cylinder lubricant. **DO NOT INTENTIONALLY APPLY LUBRICANT TO THE DOME SECTION OF THE PACKING CUP OR THE PRESSURE HEAD OF THE CYLINDER.**

4.3.5 Insert piston hollow rod assembly into cylinder. Start piston by tilting head of piston across cylinder opening and press piston into cylinder until packing cup clears top of cylinder, then raise piston rod until it is parallel with bore of cylinder.

4.3.6 Position hollow rod guide gasket on hollow rod guide. Make certain gasket remains positioned properly by applying a light film of brake cylinder lubricant to the gasket before positioning (See Fig. 39).

4.3.7 Return cylinder piston assembly to car for installation on unit body. Protect against dirt and water while handling to car.

4.4 INSTRUCTIONS FOR REPAIRING DETAILS WHEN REQUIRED

4.4.1 If push rod end is loose in piston hollow rod, proceed as follows for disassembling WABCO magneformed and NYAB riveted piston hollow rod assemblies:

- (a) Straighten lock ring, then use spanner wrench shown on Fig. 40 to remove lock plug and lock ring from piston.

NOTE: To avoid hollow rod damage when disassembling or assembling lock plug, piston hollow rod assembly must be restrained from rotation at lugs on underside of piston (See Fig. 41 - Fixture on Fig. 42 and 43). **CAUTION** - Do not place hollow rod in vise.

- (b) Remove push rod end, anti-rattler ring, and hollow rod seal from piston hollow rod (See Fig. 42).

4.4.2 For reassembling WABCO magneformed and NYAB riveted piston hollow rod assembly:

- (a) Apply a light film of brake cylinder lubricant to the I.D. of anti-rattler ring to ease assembly. Place anti-rattler ring on push rod end, then insert push rod end into piston hollow rod.

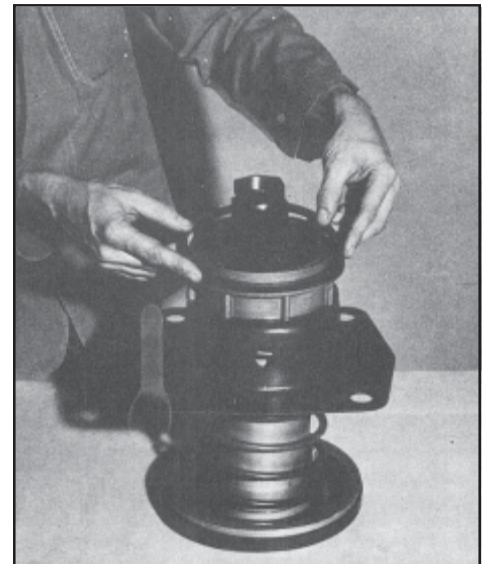


Figure 39



- (b) Position lock ring on piston. Coat threads of lock plug with sealant (Mobil jointite pipe joint compound or equivalent) and insert lock plug into piston. Use spanner wrench, shown on Fig. 40, to tighten lock plug to an equivalent of 80 to 110 ft. lbs. torque. Crimp lock ring into notch in piston and at either one of two notches in locking plug.

4.4.3 Dimensional checks of parts in following steps need not be made if inspection indicates no wear or very little wear. However, if inspection reveals either gouging, severe wear, thin walls, or other damage, check for maximum wear limits as specified.

- (a) Piston hollow rod must be replaced if diameter is worn to $3^{15/16}$ " or less.
- (b) Non-interlocking type hollow rod guide must be replaced if bore diameter is $4^{5/32}$ " or more.
- (c) Interlocking type spring seat which guides hollow rod must be replaced if bore diameter is $4^{5/32}$ " or more.
- (d) Cylinder must be replaced if bore diameter is $5/64$ " more than nominal.
- (e) Piston Guide Ring Thickness - With guide ring assembled to piston, check that ring is not worn to piston diameter.

Use interlocking type spring seats and hollow rod guides when replacement of either part is necessary.

NOTE: Hollow rod guides which have $6^{1/2}$ " shoulder stops (OD) cannot be used in $6^{1/2}$ ", $7^{1/2}$ ", or $8^{1/2}$ " piston assemblies, but may be used in 9" or 10" assemblies. However, they may be altered to fit all assemblies as shown in Fig. 49.

4.4.4 If push rod threads are damaged, use $1^{1/4}$ " - 7 UNC 2A thread die to clean up threads.

4.4.5 To replace hollow rod seal that is damaged, push damaged seal further into hollow rod using the tool shown on Fig. 45 and insert diaphragm type seal as follows:

- (a) Place funnel adapter, shown on Fig. 46, over end of hollow rod.
- (b) Coat O.D. and I.D. of hollow rod seal with brake cylinder lubricant to facilitate assembly.
- (c) With open portion of seal facing upward, stretch I.D. of seal over hex portion of push rod end. Push O.D. portion of seal down until flush with or just below top of funnel adapter.
- (d) Place inserting adapter, shown on Fig. 47 into cup of seal and push down until adapter stops on push rod end (See Fig. 48).
- (e) Remove inserting adapter and funnel adapter.

Proceed with brake cylinder reassembling in accordance with Section 4.3.

Piston Rod Assemblies	Required Action		
	Scrap	Weld	Add Sealant To Lock Plug
Rivet Type (NYAB)			X
Rivet Type (WABCO)	X		
Magneformed		X	X
Already Welded			X
Magneformed PF			X
Magneformed PFS			X

Table 2

5.0 PROCEDURE FOR CLEANING and TESTING “AB-1-B” TYPE BRAKES ON REPAIR TRACKS

- 5.1** All parts of the “AB-1-B” Type Freight Brake Equipment which are common to the standard “AB” Type Freight Brake Equipments must be cleaned in accordance with the procedure for cleaning and testing “AB” Type Brakes on repair tracks: Section 1. The following additional instruction will govern the cleaning and reconditioning of the parts special to these brake equipments.
- 5.2** The AB-1-B Type Control Valve, used with the AB-1-B Type Freight Brake equipment, is the same as the standard “AB” Type Control Valve except for the addition of a filling piece with selector valve portion and longer emergency portion bolting studs in the standard pipe bracket to compensate for the additional thickness of the filling piece, which is bolted on between the pipe bracket and the emergency portion.

The selector valve portion must be protected while off the car by the brake manufacturer’s standard shipping covers. When the car brake is cleaned, the selector valve portion must be replaced by a complete cleaned portion and the one removed, transported to the air brake repair shop.

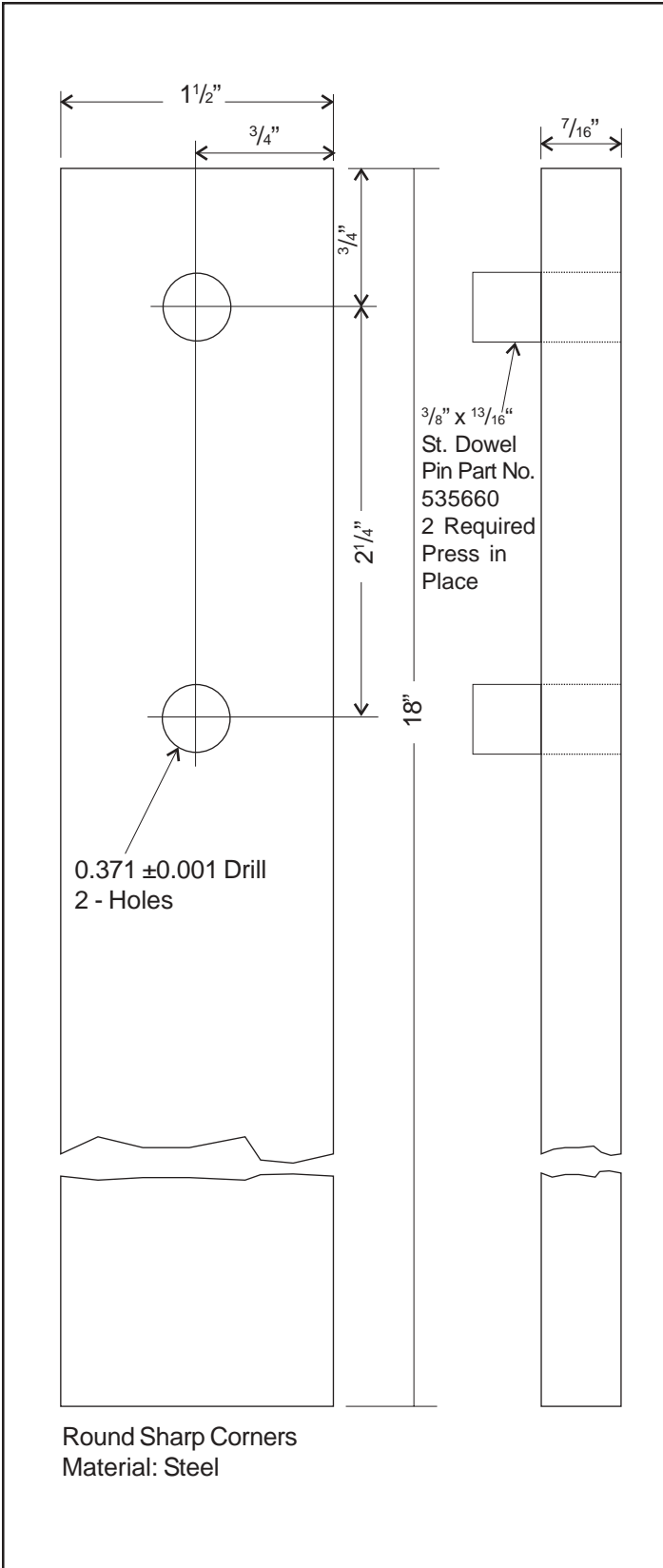


Figure 40 - Spanner Wrench for Lock Plug

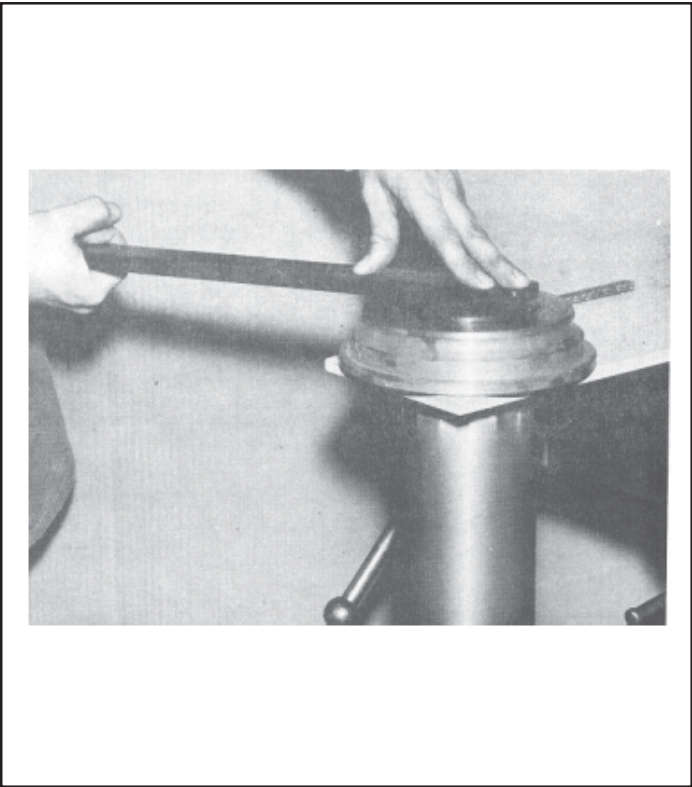


Figure 41



Figure 42

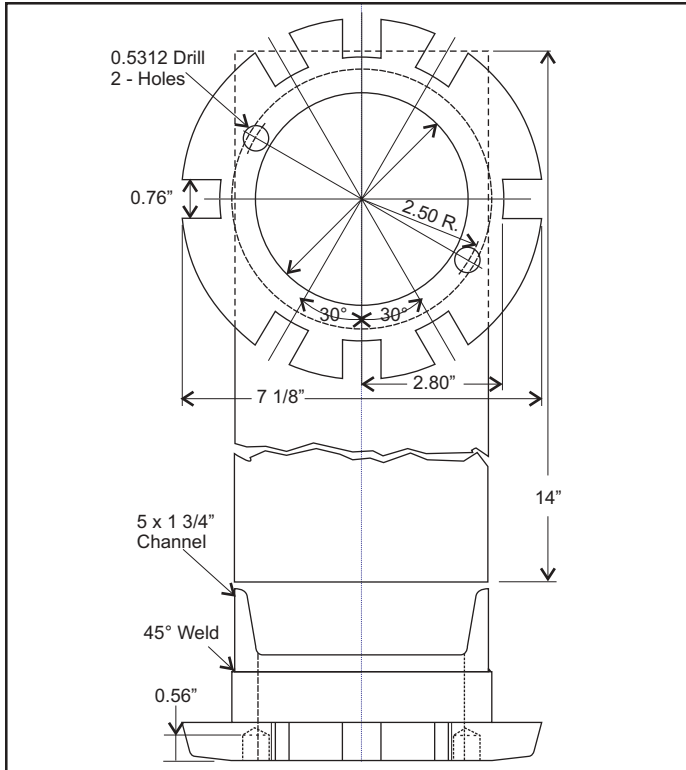


Figure 43 - Piston Assembly Jig for Removing and Installing Lock Plug 8 1/2, 9 and 10

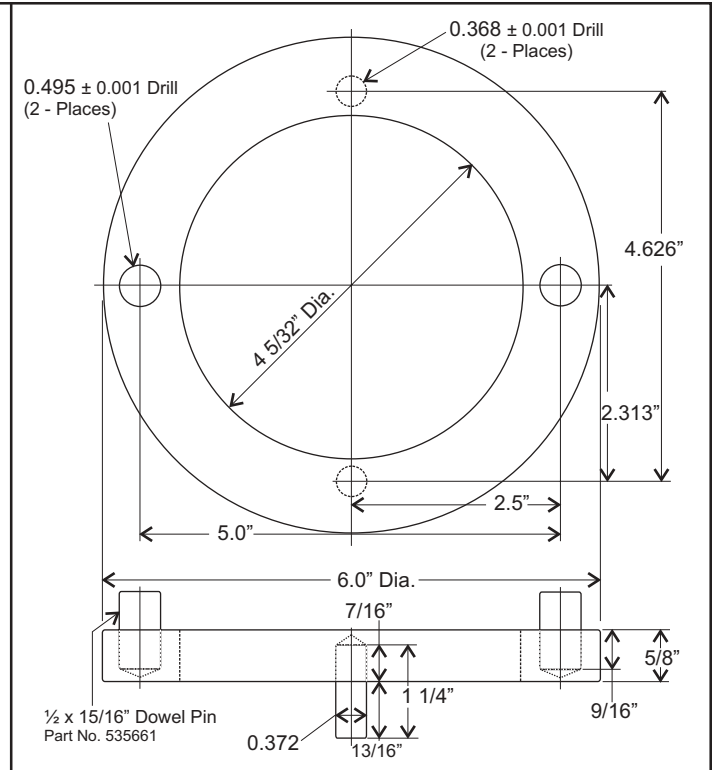


Figure 44 - Piston Assembly Jig for Removing and Installing Lock Plug 6 1/2 and 7 1/2

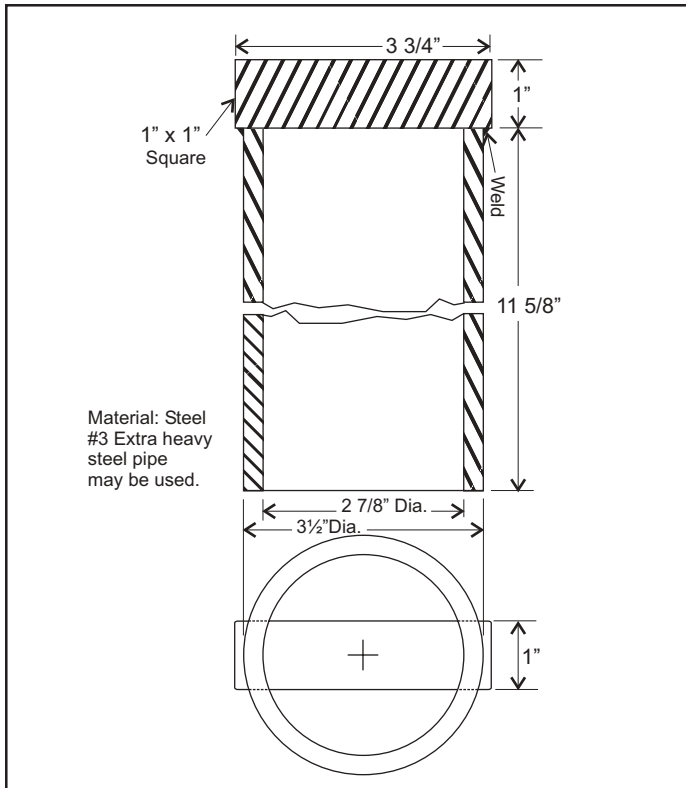


Figure 45 - Assembly Sleeve for Push Rod Keeper

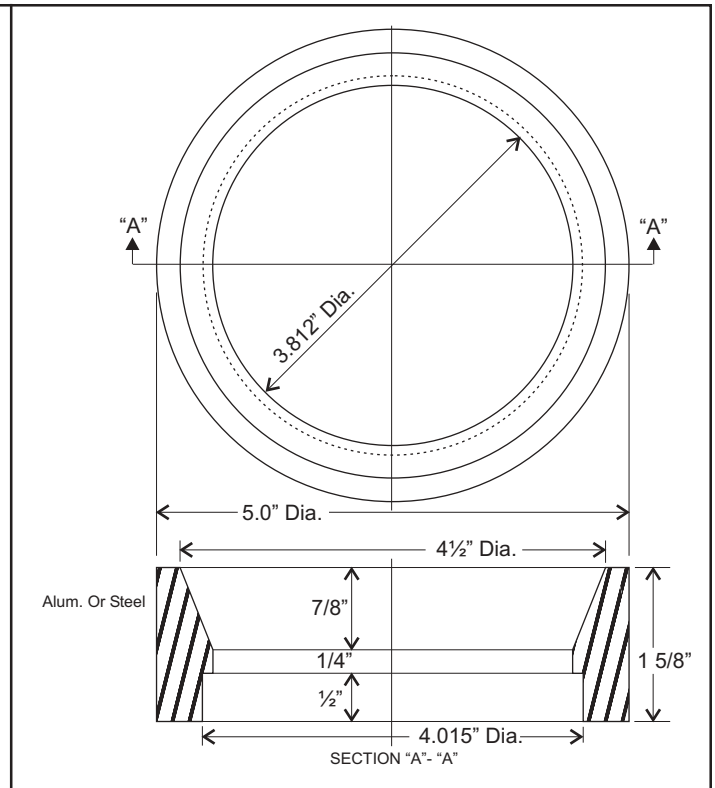


Figure 46 - Hollow Rod Seal Funnel Adapter

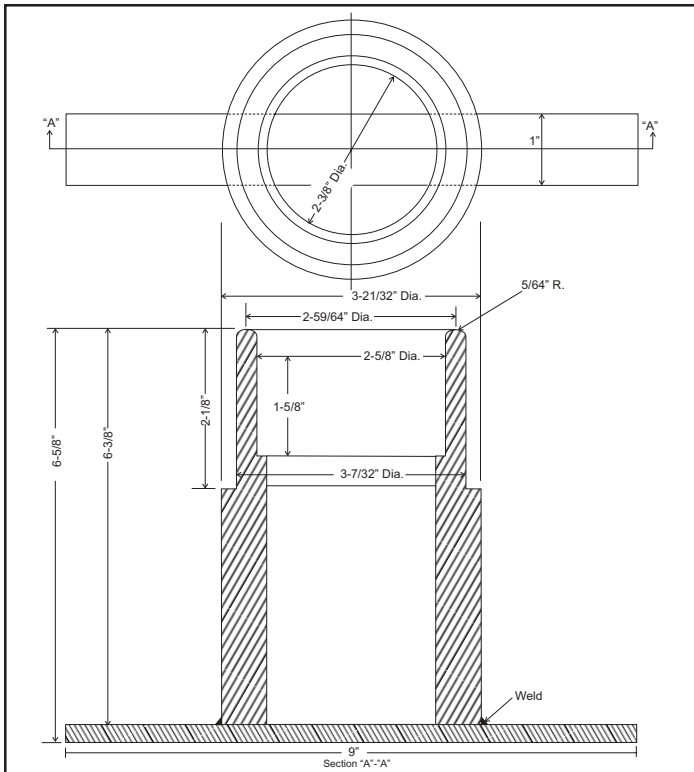


Figure 47 - Hollow Rod Seal Inserting Adapter

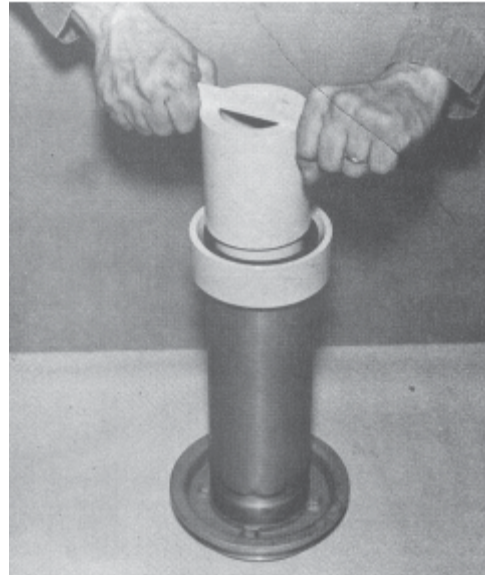


Figure 48

6.0 PROCEDURE FOR CLEANING AND TESTING EMPTY AND LOAD “AB” TYPE BRAKES ON REPAIR TRACKS

6.1 All parts of the empty and load freight brake equipments which are common to the standard “AB” Type Freight Brake Equipments must be cleaned in accordance with the procedure for cleaning and testing “AB” Type Brakes on repair tracks: Section 1. The following additional instructions will govern the cleaning and reconditioning of the parts special to these brake equipments.

6.1.1 The change-over valve of the “AB-8” Empty and Load Equipment is composed of a pipe bracket and three valve portions. The three valve portions are bolted together forming a unit and are mounted on a single pipe bracket face. The “AB-10” Equipment Change-Over Valve also has three valve portions similarly grouped but has a fourth valve portion mounted on an additional pipe bracket face. In each case the three valve portions, bolted together, must be handled as a unit when transporting from and to the car. These units, as well as the additional valve portion of the “AB-10” Equipment must be protected while off the car by the brake manufacturer’s standard shipping covers. When the car brake is cleaned, these valve units and portions must be transported to the air brake repair shop for cleaning and testing. The cleaner must be provided with a set of the shipping covers for the change-over and transfer valve portions. These covers must be applied promptly to the valve units and portions when they are removed, and the covers must not be taken off the cleaned units until the cleaner is prepared to mount them on the bracket.

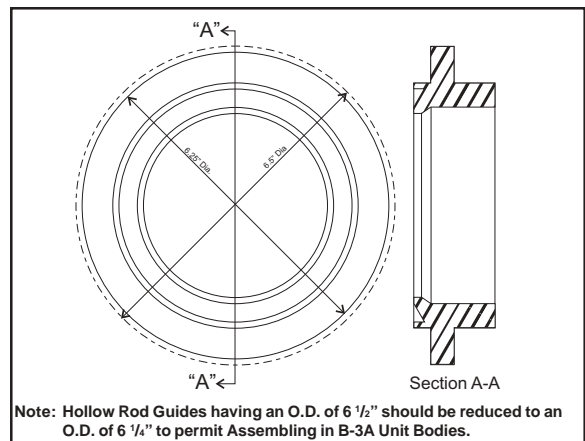


Figure 49 - Hollow Rod Guide Modification

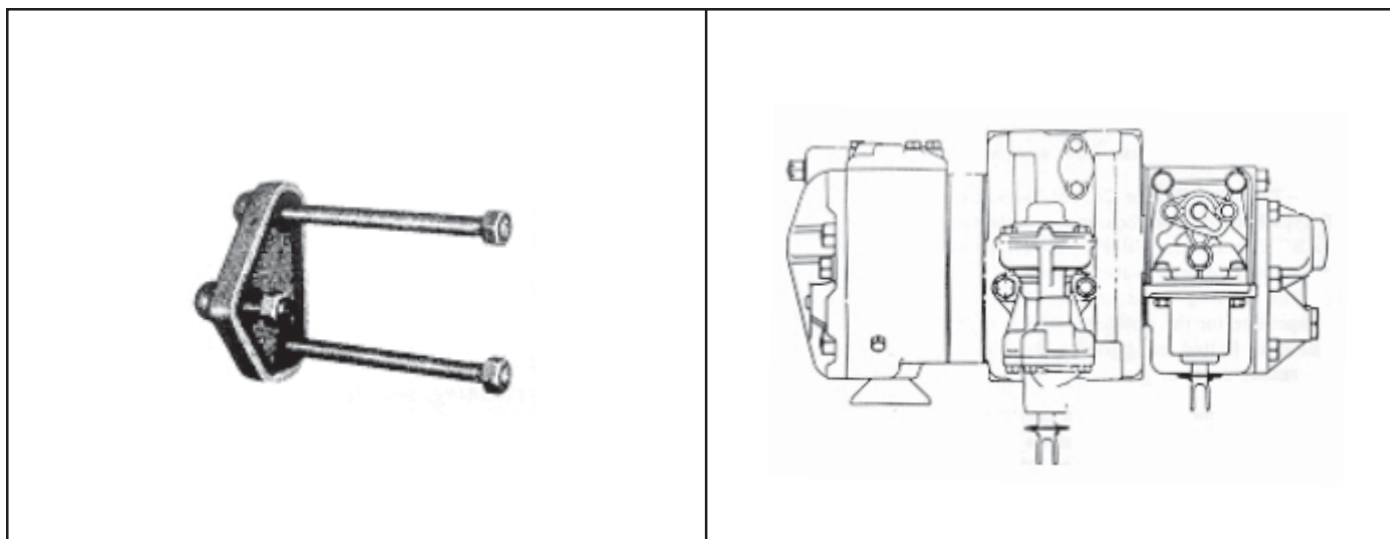


Figure 50 - Shipping Cover for AB-1B Selector Valve

Figure 51 - Outline View of AB-1B Selector Valve

6.1.2 The “J” Type Change-Over Valve is composed of a change-over valve portion, a relay valve portion, and a pipe bracket. While being transported to and from the car, the portions must be effectively protected against damage and contact with any kind of dirt. It will be the responsibility of individual railroads to provide such adequate protective means.

6.1.3 EMPTY AND LOAD BRAKE CYLINDERS

Disconnect the brake cylinder lever from both push rods. Remove the complete piston, rod, spring, and non-pressure head assembly from both cylinders and transport these parts to the shop for reconditioning and testing. The cleaner must then proceed to clean the empty and load cylinders in the same manner as specified for the 10” cylinder of the standard “AB” Type Equipment. The latch box and notched rod of the load cylinder should be dismantled in the brake shop.

Remove the piston packing cup and place the assembly in a holding fixture provided with a means for clamping the piston, so that the latch box can be unscrewed from the rod after the holding screws are removed and the non-pressure head is depressed against the release spring. The notched rod can then be withdrawn from the hollow piston rod with the latch box. The latch box parts must be inspected and cleaned, making certain the latch operates freely to its locked and unlocked positions. Then clean and recondition the piston and non-pressure head elements as directed for the “AB 10” cylinder.

NOTE: The Cover for “AB-1” and “AB-2” Valves is also used for AB-3-A” and “AB-4-A” Change-Over Valves.

6.1.4 The strut cylinder must be removed from its bracket on the truck bolster and transported to the air brake shop for reconditioning. Care must be exercised to protect this device against dirt and damage with shipping cover or other means after it is removed from its bracket and while being transported to and from the shop. If another cylinder is not to be applied immediately, the bracket ports must be protected against the entrance of dirt. When mounting, the cap screws which hold the strut cylinder on its bracket must be tightened firmly and the lock washers adjusted so that the screws cannot work loose.

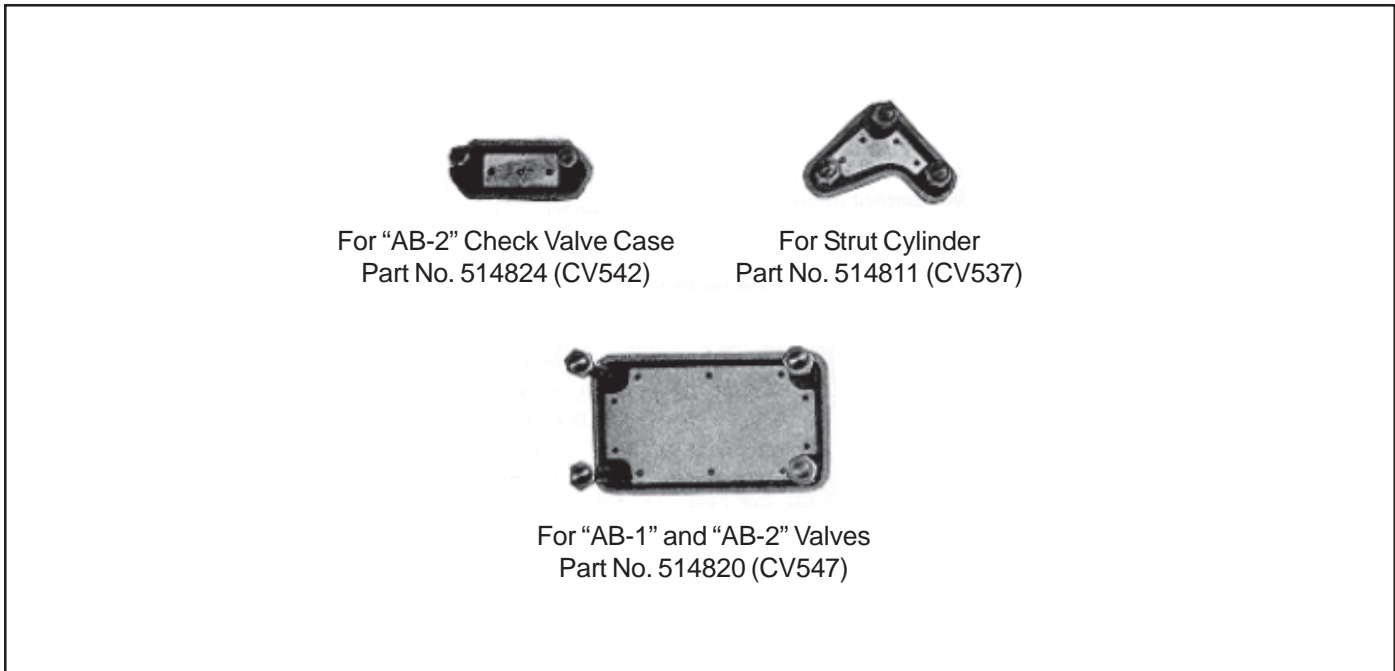


Figure 52 - Shipping Covers for "AB" Empty and Load Equipment

- 6.1.5** The strut cylinder hose and connections must be inspected for chafing and other evidence of damage, or any conditions which may lead to failures in service. This will include the hose clamps, the cap screws and clamping nuts of the flanged fittings, the pipe supporting clamps and the bolts attaching the strut cylinder to the bolster.
- 6.1.6** The "AB-10" Empty and Load Brake has a brake cylinder tee bolted to the brake cylinder connection on the "AB" Valve Pipe Bracket which must be removed and transported to the air brake repair shop to be dismantled, inspected and cleaned. Before reassembling, it must be known that the spring and check valve are in good condition, that the valve has a good bearing on its seat, and that choke fitting orifice is clean and of the proper size. This brake cylinder tee should be protected while off the car.
- 6.1.7** The entire brake equipment must be tested as required by the standard code of tests. The strut cylinder adjustment must be checked and adjusted as directed on following pages.
- 6.2** Tools and equipment required for "AB" Type Empty and Load Brake Devices are the same as those listed in the procedures for the standard "AB" Type Brake Equipment, and in addition, a set of manufacturer's standard shipping covers for the valve portions that are special to these equipments.

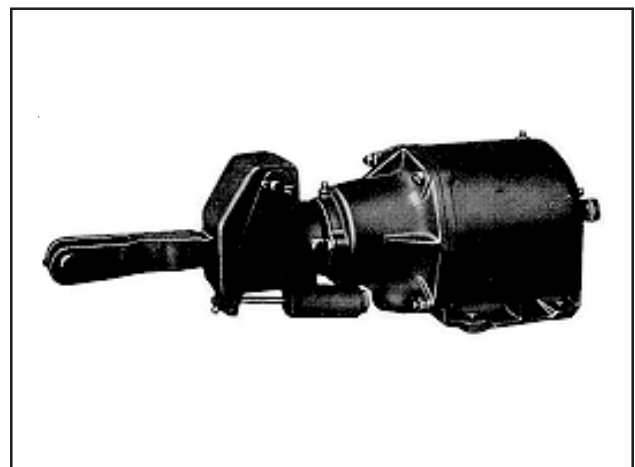


Figure 53 - Empty and Load Cylinder

6.2.1 STRUT CYLINDER ADJUSTMENT

Fig. 55 shows the "B" type strut cylinder, which is adjusted at the test rack during shop test.

Fig. 54 shows the installation of the ABEL and A-1-B strut cylinder on the car truck bolster with the piston at full stroke. To adjust the stroke, proceed as follows:

With the car empty and brake pipe charged, pull down the strut cylinder piston by hand until hole "D" through the piston rod, is exposed. Place a nail, of a size to make a fairly close fit, in this $\frac{1}{8}$ " hole and let the piston move back into the cylinder, being sure to have the nail in groove "C" in the strut cylinder non-pressure head.

Space "A", between the strut piston foot and piston stop bracket, should now be adjusted to one-half the approximate truck spring deflection from empty to fully loaded. For example, on cars with $\frac{3}{4}$ " spring deflection, the space "A" should be adjusted to $\frac{3}{8}$ ".

To adjust this space, remove cotter (7) and turn the piston foot (6) to the right to increase and to the left to decrease the space. A flat wrench hold is provided on the piston rod above the threaded portion to prevent the piston rod turning when adjusting the foot.

After proper adjustment has been made, cotter (7) must be replaced and the ends spread.

A $1\frac{1}{8}$ " open end wrench is required for the jam nut on the strut cylinder piston rod.

An additional hole "E" through the piston rod is provided for use in the event that smaller than nominal diameter wheels are being used for any reason and the truck is shimmed at the springs to provide proper car coupler height.

As a further provision for adjustment when smaller than nominal diameter wheels are used, such as returned steel wheels, additional rivet holes "F" are provided in the piston stop bracket in order that it may be located closer to the strut cylinder piston if necessary to obtain the required space.

After the space "A" has been properly adjusted, remove the nail from hole "D", reduce brake pipe pressure to less than 25 pounds, then charge the equipment and apply the brake. The brake should be in empty position, indicated by the piston of the empty brake cylinder moving out alone.

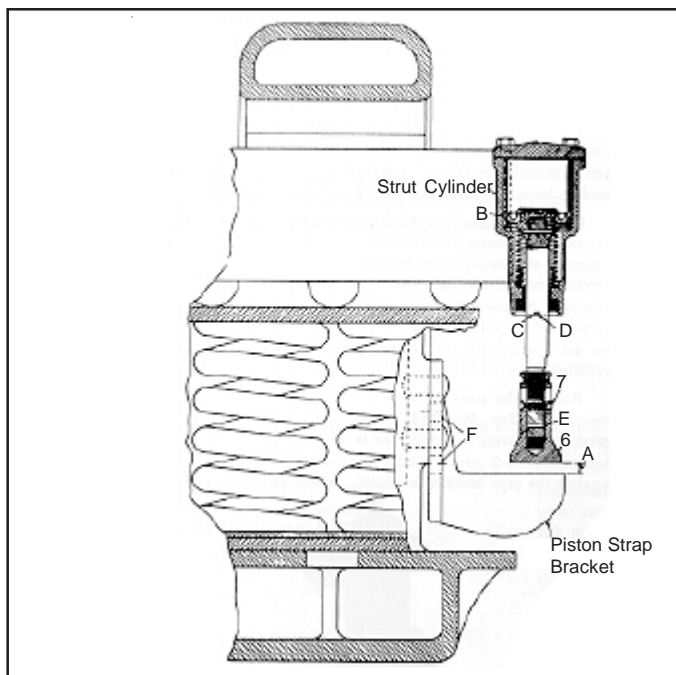


Figure 54 - ABEL & A-1-B Strut Cylinder Adjustment



Figure 55 - Type "B" Strut Cylinder

Next place a spacer $\frac{1}{16}$ " thicker than that for which space "A" has been adjusted (a nut of the correct thickness will serve) on the piston stop bracket so that it is between the bracket and piston rod foot (6). Again reduce brake pipe pressure to less than 25 pounds, recharge, and apply the brake. Both brake cylinder piston rods should move out, indicating that the equipment is in load position.

When, for any reason, the relation of the truck bolster and truck side frame is changed, as by altering the shimming up of the truck springs, the strut cylinder piston rod must be readjusted. If the car is empty, proceed as directed in preceding paragraphs.

If the car is loaded, before placing the lifting jacks under the car and with the strut cylinder piston fully retracted, measure accurately the distance between the end of the strut piston rod and its stop on the truck frame. After the shimming operation is completed and the jacks removed, readjust the strut cylinder piston rod so it will be at the original measured distance from its stop. It is preferable that the proper adjustment of the strut cylinder piston rod should be made only when the car is empty.

6.2.2 STRUT CYLINDER TEST

Charge the brake pipe and maintain the pressure between 20 and 25 pounds, then inspect the pipe and its hose connections leading from the change-over valve to the strut cylinder.

If the car is loaded and equipped with a B-2 strut cylinder or empty and equipped with either an ABEL or A-1-B strut cylinder, also inspect the duplicate of this pipe between the strut cylinder and change-over valve. If the car is empty and equipped with a B-2 strut cylinder or loaded and equipped with either an ABEL or A-1-B strut cylinder, there will be no air pressure in this second pipe and it can only be pressure tested as follows:

Remove the strut cylinder from its bracket, then attach special test plate, Part No. 554337 with gasket, Part No. 515123 to the pipe bracket with $\frac{1}{16}$ " drill hole in test plate against the pipe bracket for B-2 strut cylinder and milled slot in test plate against the pipe bracket for ABEL or A-1-B strut cylinder.

All leaks and other irregularities must be corrected.

Slowly increase the brake pipe pressure and note the value of this pressure when the strut cylinder piston retracts. This should not be less than 25 or more than 35 pounds pressure. If the cut-off pressure is outside these limits, replace the cut-off valve portion with one which is known to be properly adjusted.

7.0 PROCEDURE FOR CLEANING "AB" TYPE BRAKES THAT HAVE BEEN SUBMERGED

- 7.1 Remove all pipes from the "AB" pipe bracket and auxiliary air device pipe brackets, reservoirs, brake cylinder, and retaining valve and remove the pipe brackets from the car.
- 7.2 Remove and clean the emergency and auxiliary reservoir pipe strainers.
- 7.3 Loosen any foreign matter in the pipe bracket passages, using suitable shaped scrapers, and then blow out all passages with the highest available air pressure. Also wash out the passages with high pressure water, using a small nozzle which will enter the ports and then dry all ports and passages thoroughly by blowing air pressure through them with the pipe bracket placed in various positions.

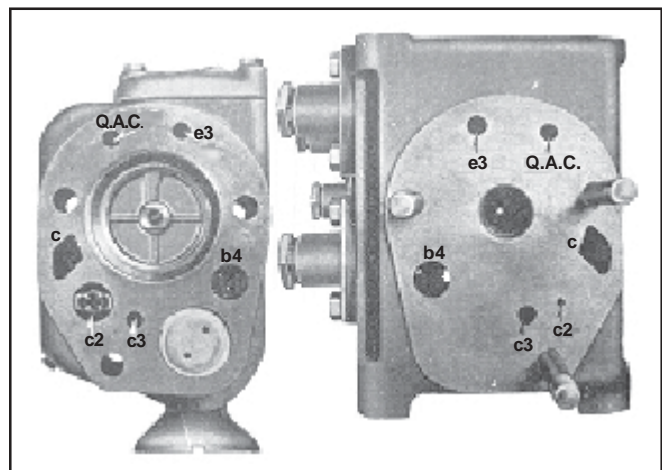


Figure 56 - Bolting Faces - Emergency Portion & Pipe Bracket Emergency Face

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- 7.4 The quick action chamber port marked "QAC", Fig. 56 must be thoroughly blown with air pressure to insure the removal of all water and dirt from the quick action chamber volume in the bracket.
 - 7.5 Clean all reservoirs and volumes by washing out with high pressure water using a suitable nozzle, then allow all water to drain until dry.
 - 7.6 Clean the inside of all pipes by first hammering, then wash and blow them out with air pressure.
 - 7.7 Apply the pipe brackets and reservoirs to the car, replace the auxiliary and emergency reservoir pipe strainers and, after coating the cap screw threads with grease, reconnect all pipes. All C.O.T. and S. procedures must be followed.

8.0 PROCEDURE FOR CLEANING AND TESTING SECONDHAND "AB" TYPE BRAKES PRIOR TO REAPPLICATION TO FREIGHT CARS

- 8.1.1 Remove service and emergency portions from pipe bracket and clean and test these portions in accordance with the procedure for cleaning and testing "AB" Type Brakes on repair tracks: Section 1.
- 8.1.2 Thoroughly clean and blow out all passages in pipe bracket and renew the strainer. Special care must be given the quick action chamber to insure that no moisture or dirt remains in the chamber.

Recondition threads in all threaded holes in pipe bracket, using a bottom tap of proper size for this purpose. This is to insure that cap screws will tighten firmly when attaching flanged pipe fittings.

Renew service and emergency portion gaskets.

- 8.1.3 Clean, inspect and lubricate brake cylinder in accordance with the procedure for reconditioning and testing brake cylinder pistons and associated parts in the shop: Section 2 "AB" Type. Remove pressure head and renew gasket.
- 8.1.4 Dismantle the double chamber reservoir, clean interior thoroughly and inspect for cracks, then spray the interior with suitable paint or rust preventative. Renew the reservoir gaskets when reassembling the reservoir. After reassembling, both compartments of the reservoir must be subjected to hydrostatic test of not less than 165 pounds. Both compartments must also be drained and blown dry with air. Special care must be used to see that separation plate is placed in proper position.
- 8.1.5 New gaskets and compression rings should be used when connecting pipes to flange type fittings of various parts of the "AB" Type Equipment.

9.0 RUBBER PARTS, SHELF LIFE, AND STORAGE

- 9.1 New rubber parts such as gaskets, o-rings, rubber seated check valves, seals, diaphragms, etc., must not be applied if over five years old.
- 9.2 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.
- 9.3 To determine shelf life, new rubber repair kits must be dated with the oldest date (half year) of rubber components contained within the kit.

