

SINGLE CAR TESTING DEVICE

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## CODE OF TESTS

AS ADOPTED BY THE  
ASSOCIATION OF  
AMERICAN RAILROADS



INSTRUCTION PAMPHLET

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## Single Car Testing Device

The purpose of the Single Car Testing Device is to provide a means of making a general check on the condition of the brake equipment on “in date” cars while in service and on cars having undergone “periodic repairs”, without removing any device from the car.

There are two types of the single car testing device which are similar in appearance, one is for passenger cars and the other for freight cars. The passenger device, however, can be identified by the name plate which is marked “PASS.”, while the name plate on the freight device is marked “FRT.”

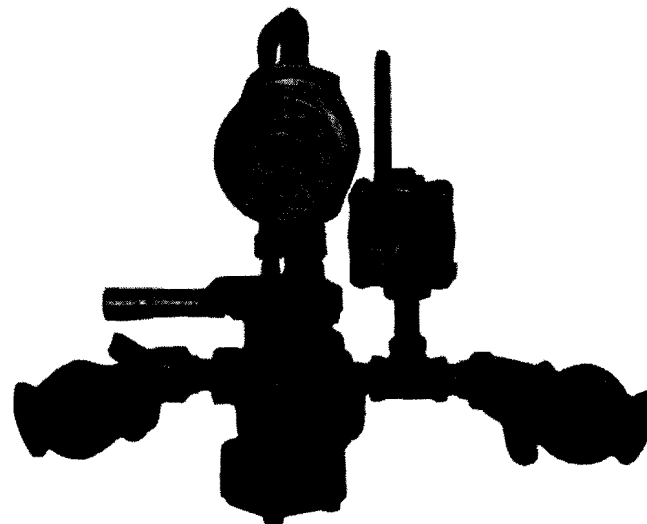


Fig. 1. Front View of the Single Car Testing Device

The single car testing device arrangement must include a suitable feed valve in the supply line for the purpose of providing a constant pressure source as defined in the test codes, and an efficient air filter in the supply line ahead of the feed valve.

Between the testing device and the outlet hose coupling, which connects to the brake pipe hose on the car, the use of a hose is optional. If used, such outlet hose must be of  $\frac{3}{4}$ " size with  $\frac{1}{2}$ " connecting nipples and not greater than 8 feet in length.

With this device, tests can be made to determine if the control or triple valve or any associated device should be removed from the car for tests on their respective test racks. Results obtained with the Single Car Testing Device must be considered as a preliminary check, because the exact condition of any device can be determined only on a standard test rack provided for that purpose.

In event of the valve failing to pass the specified tests, it should be ascertained that the Single Car Testing Device is not at fault, and *under no condition should the valve be condemned before having been tested on the A.A.R. standard test rack.*

Care should be exercised in moving the test device handle back to position No. 3 (Lap) after making brake pipe reductions of 15 pounds or more in position No. 5. When snapped back, the temperature effect will cause the brake pipe pressure to rise  $1\frac{1}{2}$  to 2 pounds and may be the cause of an undesired release. The device handle should be moved slowly toward Lap position.

When testing cars having double equipment, each equipment must be tested separately, that is, one control or triple valve must be cut out while the other equipment is being tested, and vice versa. A complete test (including brake pipe leakage) must, however, be made with each equipment. The brake pipe leakage test with each equipment is necessary in order to detect any leakage past the branch pipe cut-out cock, pipe connections, etc.

NOTE—Air Signal Equipment must be tested as provided in Instruction Leaflet No. 2377-2.

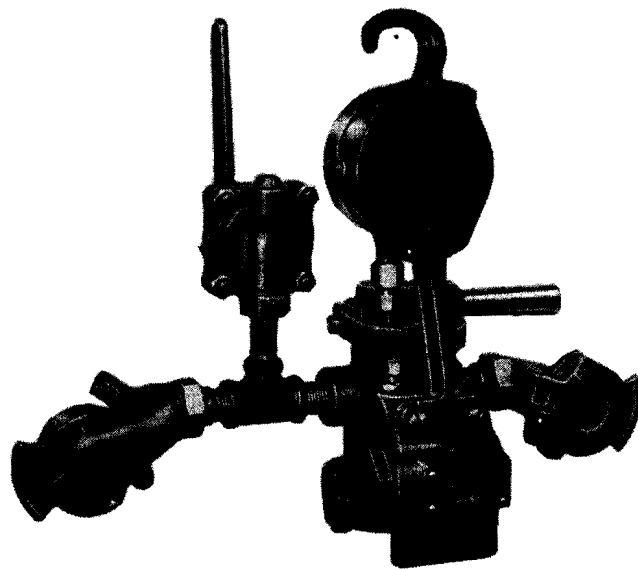


Fig. 2. Rear View of the Single Car Testing Device

# Passenger Equipment

## U-12 Universal Valve, No. 3-E Control Valve and L Triple Valves

### TEST CODE

The tests are to be made with the feed valve or reducing valve adjusted for 90 pounds. Before the test apparatus is attached to the supply line, the line must be blown out.

#### Test for Testing Device

Before coupling the device or device outlet hose (if used), move the device handle to position No. 3 (Lap) and open the cock in the supply pipe. There should be no escape of air from the brake pipe connection or exhaust port of the device.

#### Connecting Device to Car

Connect the device end marked B. P., or the coupling end of the device outlet hose, to the brake pipe hose at one end of the car (preferably at "B" end of car). Move device handle to position No. 1. With both angle cocks open, note that a continuous blow of air from the open hose occurs at the other end of the car. Couple on a dummy hose coupling and charge the brake pipe and reservoirs to 90 pounds pressure.

#### 1. Brake Pipe Leakage Test

Move device handle to position No. 5, reducing the brake pipe pressure 20 pounds, then return handle slowly to position No. 3 (Lap).

Observe the pressure on the brake pipe gage. Leakage in the brake pipe will be indicated by a drop in pressure, which must not exceed  $2\frac{1}{2}$  pounds per minute.

## 2. Auxiliary Reservoir and Graduating Valve Leakage

During the brake pipe leakage test, if the valve releases the brake in less than one minute with the device handle in position No. 3 (Lap), it indicates a leaky graduating valve, a leak from the auxiliary reservoir, or a leak into the brake pipe past the rotary valve of the test device.

## 3. Graduated Release Test

*This test need not be made when Graduated Release is not used.*

Move the device handle to position No. 1 until brake pipe pressure has increased 5 to 6 pounds, then return handle to position No. 3 (Lap). Repeat the operation several times. At least three graduations must be obtained.

## 4. Application Test

Move the device handle to position No. 1 to recharge the brake system. Move the device handle to position No. 4, reducing the brake pipe pressure 10 pounds, then return handle to position No. 3 (Lap). The brake must apply before the brake pipe pressure is reduced the amount specified. Failure to apply indicates that the valve must be removed for further investigation on the A.A.R. standard test rack.

## 5. Release Test

If the brake applies, and the brake pipe reduction is made as specified in the Application Test, move the

device handle to position No. 2. The piston and slide valve must move to release position within one minute. Failure to release in the time specified indicates that the valve must be removed for further investigation on the A.A.R. standard test rack.

During release, the feed or reducing valve pressure must not vary more than 2 pounds.

### 6. Service Stability Test

Move the device handle to position No. 1 to recharge the brake system. Move device handle to position No. 5, reducing the brake pipe pressure 20 pounds. This test must not produce emergency. If an emergency application is obtained, it would indicate that the valve must be removed for further investigation on the A.A.R. standard test rack.

### 7. Emergency Test

Move the device handle to position No. 1 to recharge the brake system. When testing non-quick service universal (UC) valves, move device handle to position No. 6, reducing brake pipe pressure 30 pounds, except when testing valves on cars having 1" brake pipe, in which case a 20 pound brake pipe reduction must be made. When testing control valves (PC) and L triple valves, or a non-quick service universal valve on a car that is over 80 feet long and has  $1\frac{1}{4}$ " brake pipe with long branch pipes to universal valve, emergency-brake (conductor's) valve, etc., move the device handle to position No. 3 (Lap). Open test device  $\frac{3}{8}$ " cock ( $\frac{3}{8}$ " orifice) and reduce the brake pipe pressure 30 pounds. This test must produce emergency. If an emergency application is not obtained,

it indicates that the valve must be removed for further investigation on the A.A.R. standard test rack.

### 8. Emergency-Brake (Conductor's) Valve Test

Move the device handle to position No. 1 to recharge the brake system. With the equipment completely charged, open the emergency-brake (conductor's) valve, observing carefully that there are no obstructions to the free and full movement of the valve handle, and that there is no binding of parts. The opening of the valve must produce an emergency application. If an emergency is not obtained, a restriction to air flow in the valve or valve pipe is disclosed, which must be located and removed. It may also be due to failure of the application valve in the emergency-brake (conductor's) valve line to open, if the car is equipped with such.

Repeat the above operation for each emergency-brake (conductor's) valve if the car is equipped with more than one valve.

At the completion of the test, move the device handle to position No. 6.

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NOTE—For Brake Cylinder and Retaining Valve Tests see instructions on Page 67.

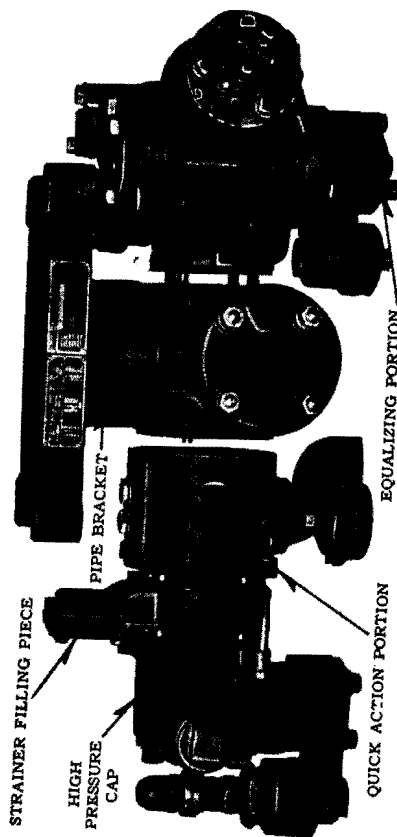


Fig. 3. View of the U-12-BD Universal Valve, Showing the Different Portions

## Passenger Equipment

U-12-B, U-12-BC and U-12-BD

Quick Service Universal Valves

### TEST CODE

The tests are to be made with the feed valve or reducing valve adjusted for 90 pounds. Before the test apparatus is attached to the supply line, the line must be blown out.

#### Test for Testing Device

Before coupling the device or device outlet hose (if used), move the device handle to position No. 3 (Lap) and open the cock in the supply pipe. There should be no escape of air from the brake pipe connection or exhaust port of the device.

#### Connecting Device to Car

Connect the device end marked B. P. or the coupling end of the device outlet hose to the brake pipe hose at one end of the car (preferably at "B" end of car). Move device handle to position No. 1. With both angle cocks open, note that a continuous blow of air from the open hose occurs at the other end of the car.

When testing a car having  $1\frac{1}{4}$ " brake pipe, couple on a dummy hose coupling and charge the brake pipe and reservoirs to 90 pounds pressure.

When testing a car having 1" brake pipe, connect the signal pipe to the brake pipe at the other end of car by means of a Type "HUF" hose coupling, Pc. 46150 (N.Y. A. B. Pc. N-5499). With both signal pipe cocks open, note that there is a continuous blow of air from the open

signal pipe hose. Then close the signal pipe cock behind the open hose and charge the brake pipe and reservoirs to 90 pounds pressure.

### 1. Brake Pipe Leakage Test

Close the branch pipe cut-out cock to eliminate quick service. Move the device handle to position No. 5, reducing brake pipe pressure 20 pounds, then return the handle slowly to position No. 3 (Lap). The branch pipe between the cut-out cock and the universal valve, and all valve connections and reservoir pipes, should be coated with soap suds to determine leakage.

Observe the pressure on the brake pipe gage. Leakage in the brake pipe will be indicated by a drop in pressure which must not exceed  $2\frac{1}{2}$  pounds per minute.

### 2. Auxiliary Reservoir and Graduating Valve Leakage

Move the device handle to position No. 1 to recharge the brake pipe, then open branch pipe cut-out cock. Move the device handle to position No. 5, reducing the brake pipe pressure 20 pounds, then return handle slowly to position No. 3 (Lap). If the valve releases the brake in less than one minute, it indicates a leaky graduating valve, a leak from the auxiliary reservoir volume, or a leak into the brake pipe past the rotary valve of the test device.

### 3. Graduated Release Test

*This test need not be made when graduated release is not used.*

Move the device handle to position No. 1 until brake pipe pressure has increased 5 to 6 pounds, then return

handle to position No. 3 (Lap). Repeat the operation several times. At least three graduations must be obtained.

### 4. Application Test

Move the device handle to position No. 1 to recharge the brake system. Move the device handle to position No. 4, reducing the brake pipe pressure 10 pounds, then return handle to position No. 3 (Lap). The brake must apply before the brake pipe pressure is reduced the amount specified. Failure to apply indicates that the valve must be removed for further investigation on the A.A.R. standard test rack.

### 5. Release Test

If the brake applies, and the brake pipe reduction is made as specified in the Application Test, move the device handle to position No. 2. The piston and slide valve must move to release position within one minute. Failure to release in the time specified indicates that the valve must be removed for further investigation on the A.A.R. standard test rack.

During the release test, the feed or reducing valve pressure must not vary more than 2 pounds.

### 6. Service Stability Test

Move the device handle to position No. 1 to recharge the brake system. Move device handle to position No. 5, reducing brake pipe pressure 20 pounds. This test must not produce emergency. If an emergency application is obtained, it would indicate that the universal valve must be removed for further investigation on the A.A.R. standard test rack.

### 7. Emergency Test

Move the device handle to position No. 1 to recharge the brake system. Move device handle to position No. 6, reducing brake pipe pressure 20 pounds. This test must produce emergency. If an emergency application is not obtained, it indicates that the valve must be removed for further investigation on the A.A.R. standard test rack.

### 8. Emergency-Brake (Conductor's) Valve Test

Move the device handle to position No. 1 to recharge the brake system. With the equipment completely charged, open the emergency-brake (conductor's) valve, observing carefully that there are no obstructions to the free and full movement of the handle, and that there is no binding of parts. The opening of the emergency-brake (conductor's) valve must produce an emergency application. If an emergency is not obtained, a restriction to air flow in the valve or valve pipe is disclosed, which must be located and removed. It may also be due to failure of the application valve in the emergency-brake (conductor's) valve line to open, if the car is equipped with such.

Repeat the above operation for each emergency-brake (conductor's) valve if car is equipped with more than one valve.

At the completion of this test, move the device handle to position No. 6 and disconnect the 1" brake pipe from the signal pipe if previously connected for these tests.

NOTE—For Brake Cylinder and Retaining Valve Tests see Instructions on Page 67.

## Passenger Equipment

**D-22-A, D-22-AR, D-22-B, D-22-BR, D-22-C**  
**Control Valves**

### TEST CODE

The tests are to be made with the feed valve or reducing valve adjusted for 90 pounds. Before the test apparatus is attached to the supply line, the line must be blown out.

#### Test for Testing Device

Before coupling the device or device outlet hose (if used), move device handle to position No. 3 (Lap) and open the cock in the supply pipe. There should be no escape of air from the brake pipe connection or exhaust port of the device.

#### Connecting Device to Car

Connect the device end marked B. P. or the coupling end of the device outlet hose to the brake pipe hose at one end of the car (preferably at "B" end of car). Move device handle to position No. 1. With both angle cocks open, note that a continuous blow of air from the open hose occurs at the other end of the car. Couple on a dummy hose coupling and charge the brake pipe and reservoirs to 90 pounds pressure.

#### 1. Application Test

Move the device handle to position No. 3 (Lap) for five seconds to determine if the equipment is completely charged. If the brake pipe pressure drops, the reservoirs are not charged to brake pipe pressure. With the equipment fully charged, move the device handle to position No. 5 until a five pound brake pipe reduction is obtained,



then slowly return the handle to position No. 3 (Lap). The brake pipe pressure must continue to drop until the quick service limiting valve closes, so that the total brake pipe reduction will be not more than 10 pounds. The brake must apply. A further drop in brake pipe pressure may be due to brake pipe leakage or failure of the quick service limiting valve to close, or leakage from the displacement reservoir system.

NOTE—When testing single cars equipped with Type "A" Quick Service Valve, a greater quick service activity will be indicated, and the brake pipe reduction may exceed the 10 pounds maximum specified above. If the total brake pipe reduction, however, exceeds 16 pounds, it may be due to excessive quick service valve piston friction or failure of the quick service limiting valve to close, or leakage from the displacement reservoir system.

## 2. Brake Pipe Leakage Test

Observe the pressure on the brake pipe gage. Leakage in the brake pipe will be indicated by a drop in pressure which must not exceed  $2\frac{1}{2}$  pounds in one minute. If brake pipe leakage exceeds this limit and no leakage of the brake pipe and its connections can be detected by means of soap suds, excessive leakage may be due to failure of quick service limiting valve to close. If a continuous or intermittent exhaust of air at the relay valve exhaust occurs, it may indicate leakage from the displacement reservoir system. A slight pumping action of the emergency piston, indicated at the quick action exhaust, will not affect the leakage test.

## 3. Auxiliary Reservoir and Displacement Reservoir Leakage Test

During the brake pipe leakage test, if the control valve releases the brake in less than one minute, with the

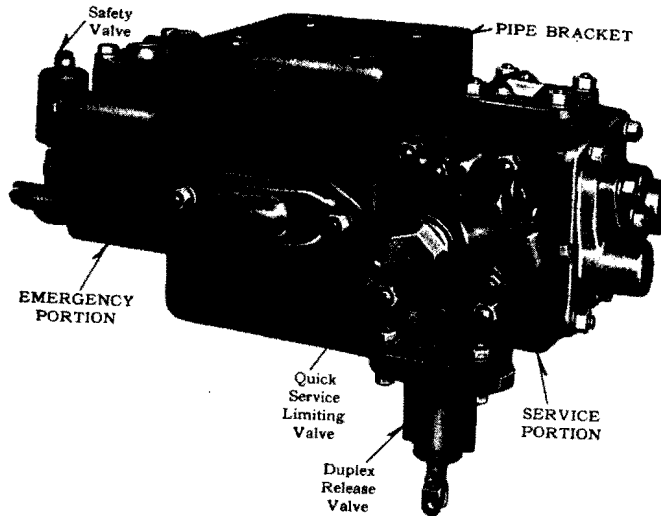


Fig. 4. Front View of the D-22-A Control Valve

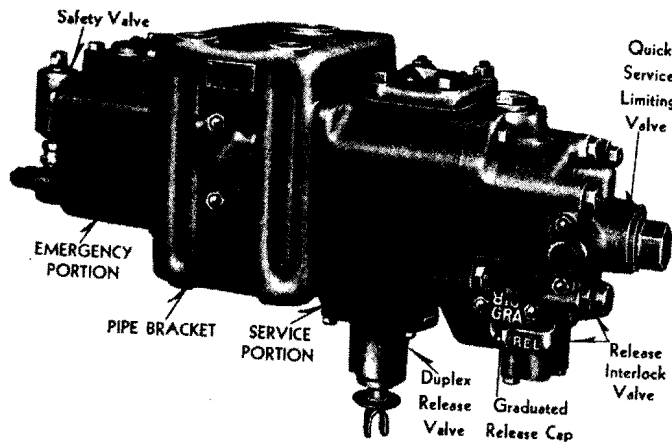


Fig. 5. Front View of the D-22-AR Control Valve

device handle in position No. 3 (Lap), it indicates a leak from the auxiliary reservoir, graduating valve, slide valve, auxiliary reservoir pipe, or a leak into the brake pipe past the device.

**NOTE**—Loss of brake cylinder pressure in case of leakage in the brake cylinder line is compensated for by the maintaining function of the relay valve. If the car is equipped with a brake cylinder gage, usually located near the speed governor relay cabinet, brake cylinder leakage may be detected by pressure fluctuations indicated on this gage.

#### 4. Release Test

Move the device handle to position No. 2. The piston and slide valve of the D-22 control valve service portion must move to release position within 20 seconds, plus 5 seconds for each one pound brake pipe leakage.

Continue the test until the brake cylinder pistons return to their normal release position.

During the release test, the feed or reducing valve pressure must not vary more than 2 pounds.

Failure of the brake cylinder pistons to return to release position may be due to the D-22 control valve service portion, relay valve or excessive brake rigging resistance. The following procedure will indicate which part of the equipment is responsible for this condition.

**D-22 CONTROL VALVE**—During the release test, an exhaust of air at the exhaust port in the pipe bracket, or from the retaining valve exhaust if one is included in the equipment, shows that the service piston and slide valve have returned to release position. A continuous blow at this exhaust port, however, indicates that the service portion should be removed for further investigation on the A. A. R. standard test rack.

**BRAKE RIGGING**—Close the brake cylinder cut-out cocks, and vent brake cylinder air to atmosphere. If the brake cylinder pistons return to release position, it indicates the brake rigging is not at fault. Open the brake cylinder cut-out cocks.

**RELAY VALVE**—If the trouble has not been located in the D-22 control valve or brake rigging, it indicates that the difficulty is with the relay valve. A plugged or obstructed atmospheric vent port leading to the outer face of the inshot diaphragm, or leading to the space between the differential diaphragms, may be the cause of the failure of the brake to release. If the vent ports are open, the portion should be removed for further investigation on the A. A. R. standard test rack.

#### 5. Service Stability Test

Move the device handle to position No. 1 to fully recharge the brake pipe and reservoirs. Move the device handle to position No. 5, reducing brake pipe pressure 20 pounds, then slowly return the handle to position No. 3 (Lap). This test must not produce an emergency application.

#### 6. Graduated Release Test

*This test need not be made when graduated release is not used.*

Move the device handle to position No. 1 until brake pipe pressure has increased 5 to 6 pounds, then return

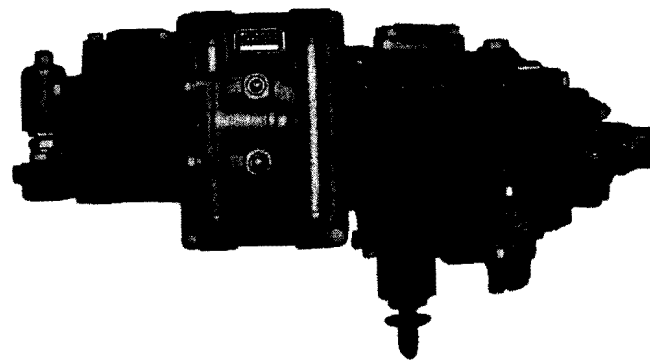


Fig. 6. D-22-BR Control Valve

handle to position No. 3 (Lap). Repeat the operation several times. At least three graduations must be obtained.

### 7. Emergency Test

Move the device handle to position No. 1 to fully recharge the brake pipe and reservoirs. Move the device handle to position No. 3 (Lap) for 5 seconds to determine if the equipment is completely charged. If the brake pipe pressure drops, the reservoirs are not charged to brake pipe pressure. With the equipment fully charged, move the device handle to position No. 3 (Lap), then open the test device  $\frac{3}{8}$ " cock. This test must produce emergency as indicated by the opening of the vent valve by the time the brake pipe pressure drops 10 pounds.

NOTE—In rare instances, failure to obtain emergency in Test No. 7 may be caused by a decrease in the quick action chamber volume in the pipe bracket, due to the accumulation of excessive moisture or, by a restricted quick action chamber charging choke.

### 8. Release Test After Emergency

At the completion of the Emergency Test, wait approximately 30 seconds before attempting to release, in order to permit the vent valve to close. Move the device handle to position No. 1, and charge the brake pipe to 15 pounds, then move the device handle to position No. 3 (Lap). Note that the brake pipe pressure continues to rise, indicating that the emergency piston has moved to accelerated release position. Then move the device handle to position No. 1 until the brake cylinder pistons move to release position.

### 9. Emergency-Brake (Conductor's) Valve Test

With the equipment completely charged, and device handle in position No. 1, open the emergency-brake

(conductor's) valve, observing carefully that there are no obstructions to the free and full movement of the handle, and that there is no binding of parts. The opening of the emergency-brake (conductor's) valve must produce an emergency application. If an emergency is not obtained, a restriction to air flow in the valve or valve pipe is disclosed, which must be located and removed. It may also be due to failure of the application valve in the emergency-brake (conductor's) valve line to open, if the car is equipped with such.

Repeat the above operation for each emergency-brake (conductor's) valve if car is equipped with more than one valve.

At the completion of test, move device handle to position No. 3 (Lap). Wait approximately 30 seconds before attempting to release, in order to permit the vent valve to close, then move device handle to position No. 1 to recharge the brake system.

### 10. Brake Cylinder Leakage and Retaining Valve Tests

#### SECTION "A" BRAKE CYLINDER LEAKAGE

Attach an exhaust gage fitting with bleed cock closed, such as is shown in Fig. 20 (Page 67) to one of the following alternate locations:

- (a) to the relay valve exhaust, or
- (b) to the lubricator port connection on one of the brake cylinders and tightly plug the relay valve exhaust.

Make applications and releases of the brake until 50 pounds or more brake cylinder pressure is indicated on the exhaust fitting air gage when the handle of the single

car testing device is in No. 1 position. If in excess of 50 pounds, the pressure must be reduced to 50 pounds through the bleed cock.

Observe the test gage for leakage from the combined volumes of the brake cylinders and their related piping. The drop in pressure, indicated on this gage, must not exceed the amount specified below.

3 pounds in one minute (from 50 pounds) when testing a car on which the brake equipment has been given the attention specified in A.A.R. Maintenance Rule 110 for a car with stencil "Out-Of-Date".

5 pounds in one minute (from 50 pounds) when testing an "In-Date" car (A.A.R. Maintenance Rule 102).

If the drop in pressure exceeds the amount specified, inspect the brake cylinder pipe, and eliminate any leakage. If no leakage is found, or if the elimination of the leakage found does not reduce the leakage observed on the test gage to less than the limits specified, it indicates a faulty brake cylinder (or cylinders), in which case the defective conditions must be corrected; and furthermore, A.A.R. Maintenance Rule 110 must be applied, if on an "In-Date" car. If the drop in pressure does not exceed the above specified limits, open the gage fitting bleed cock to release all brake cylinder pressure, then remove the gage fitting and the plug (if used) from the relay valve exhaust, and proceed to Section "B" Retaining Valve and Displacement Reservoir Leakage Tests.

#### SECTION "B" RETAINING VALVE AND DISPLACEMENT RESERVOIR SYSTEM LEAKAGE TESTS

Insert the exhaust gage fitting as shown by Figure 20, into the tapped retaining valve gage connection.

Close the gage fitting bleed cock and turn the retaining valve handle up to approximately 45° from the vertical position.

On cars having no retaining valve, connect the exhaust gage fitting to the exhaust connection of the D-22 control valve pipe bracket and close the bleed cock.

Make applications and releases of the brake until 50 pounds or more displacement reservoir pressure is indicated on the exhaust fitting air gage when the handle of the single car testing device is in No. 1 position. If in excess of 50 pounds, the pressure must be reduced to 50 pounds through the bleed cock.

Observe the test gage for leakage from the combined volumes of the relay valve diaphragm chamber, displacement reservoir, retaining valve (if used) and their related piping, which must not exceed 2 pounds in one minute.

If the drop in pressure exceeds 2 pounds in one minute, inspect the retaining valve and retaining valve pipe (if used) as well as all other related piping, and eliminate any leakage. If no leakage is found, or if the elimination of the leakage found does not reduce the drop in pressure observed on the test gage to less than the limit specified, it indicates either a faulty relay valve, displacement reservoir or control valve, or a combination of these, in which case the defective conditions must be corrected; and furthermore, A.A.R. Maintenance Rule 110 must be applied, if on an "In Date" car. If the drop in pressure does not exceed the above specified limit, continue with the retaining valve test on Page 70, if the car is equipped with a retaining valve.

# Passenger Equipment

## Types "P" and "PS" Triple Valves

### TEST CODE

The tests are to be made with the feed valve or reducing valve adjusted for 90 pounds. Before the test apparatus is attached to the supply line, the line must be blown out.

#### Test for Testing Device

Before coupling the device or device outlet hose (if used), move the device handle to position No. 3 (Lap) and open the cock in the supply line. There should be no escape of air from the brake pipe connection or exhaust port of the device.

#### Connecting Device to Car

Connect the device end marked B.P. or the coupling end of the device outlet hose to the brake pipe hose at one end of the car (preferably at "B" end of car). Move device handle to position No. 1. With both angle cocks open, note that a continuous blow of air from the open hose occurs at the other end of the car. Couple on a dummy hose coupling and charge the brake pipe and reservoirs to 90 pounds pressure.

#### 1. Brake Pipe Leakage Test

Move device handle to position No. 5, reducing the brake pipe pressure 20 pounds, then return handle slowly to position No. 3 (Lap).

Observe the pressure on the brake pipe gage. Leakage in the brake pipe will be indicated by a drop in pressure, which must not exceed  $2\frac{1}{2}$  pounds per minute.

## 2. Auxiliary Reservoir and Graduating Valve Leakage

During the brake pipe leakage test, if the valve releases the brake in less than one minute with the device handle in position No. 3 (Lap), it indicates a leaky graduating valve, slide valve, a leak from the auxiliary reservoir, or a leak into the brake pipe past the rotary valve of the test device.

## 3. Application Test

Move the device handle to position No. 1 to recharge the brake pipe and auxiliary reservoir. Move the device handle to position No. 5, when testing "P" valves or position No. 4 when testing "PS" valves, reducing the brake pipe pressure 10 pounds, then return handle to position No. 3 (Lap). The brake must apply before the brake pipe pressure is reduced the amount specified. Failure to apply indicates that the valve must be removed for further investigation on the A.A.R. standard test rack.

## 4. Release Test

If the brake applies, and the brake pipe reduction is made as specified in the Application test, move the device handle to position No. 2. The piston and slide valve must move to release position within one minute. Failure to release in the time specified indicates that the valve must be removed for further investigation on the A.A.R. standard test rack.

During the release test, the feed or reducing valve pressure must not vary more than 2 pounds.

### 5. Service Stability Test

Move the device handle to position No. 1 to recharge the brake pipe and auxiliary reservoir. When testing "P" valves, move the device handle to position No. 5, reducing the brake pipe pressure 20 pounds for 12" equipment, or 16 pounds for 14" and 16" equipment. This test must not produce emergency. If emergency application is obtained, it would indicate that the valve must be removed for further investigation on the A.A.R. standard test rack.

When testing type "PS" valves, move the device handle to position No. 5, reducing the brake pipe pressure 25 pounds. This test must not produce emergency either in the vent valve or the triple valve. If emergency action is initiated at the vent valve, it would indicate that this valve should be removed for further investigation on the standard vent valve test rack. If the vent valve does not produce emergency action but the triple moves to emergency position, indicated by the absence of any exhaust at the safety valve, it would indicate that the triple valve must be removed for further investigation on the A.A.R. standard test rack.

### 6. Emergency Test

Move the device handle to position No. 1 to recharge the brake pipe and auxiliary reservoir. When testing "P" valves, move the device handle to position No. 3 (Lap). Open the test device  $\frac{3}{8}$ " cock ( $\frac{3}{8}$ " orifice) and reduce brake pipe pressure 20 pounds for 12" and 14" equipment. When testing 16" equipment, move the device handle to position No. 6 and reduce brake pipe pressure 25 pounds. This test must produce emergency.

If an emergency application is not obtained, it indicates that the valve must be removed for further investigation on the A.A.R. standard test rack.

When testing type "PS" valves, move the device handle to position No. 6, reducing the brake pipe pressure 20 pounds. This test must produce emergency action of the vent valve. If emergency action is not obtained, it indicates that the vent valve must be removed for further investigation on the standard vent valve test rack.

### 7. Emergency-Brake (Conductor's) Valve Test

Move the device handle to position No. 1 to recharge the brake system. With the equipment completely charged, open the emergency-brake (conductor's) valve, observing carefully that there are no obstructions to the free and full movement of the handle, and that there is no binding of parts. The opening of the emergency-brake (conductor's) valve must produce an emergency application. If an emergency is not obtained, a restriction to air flow in the valve or valve pipe is disclosed, which must be located and removed. It may also be due to failure of the application valve in the emergency-brake (conductor's) valve line to open, if the car is equipped with such.

Repeat the above operation for each emergency-brake (conductor's) valve if car is equipped with more than one valve.

At the completion of the test, move the device handle to position No. 6.

NOTE—For Brake Cylinder and Retaining Valve Tests see Instructions on Page 67.

- 1 Air Strainer, Pc. 70800 or N-958.
- 1  $\frac{3}{4}$ " Supply Cock, Pc. 519873 or N-5523.
- 1 Type F Feed Valve Pipe Bracket, Pc. 18240 or EV-715C.
- 1 10"x24" Supply Reservoir, Pc. 530851 or N-6506.
- 2  $\frac{1}{2}$ " Cut-out Cock, Pc. 96878 or 179-TA (Cocks 1 and 2).
- 2  $\frac{3}{4}$ "x60" Hose with FP-3 Coupling and  $\frac{1}{2}$ " Nipple, Pc. 33987 or N-2414.
- 1 10"x24" Operating Reservoir, Pc. 530869.
- 2 Single Pointer Air Gage, Pc. 88882 or N-1796.

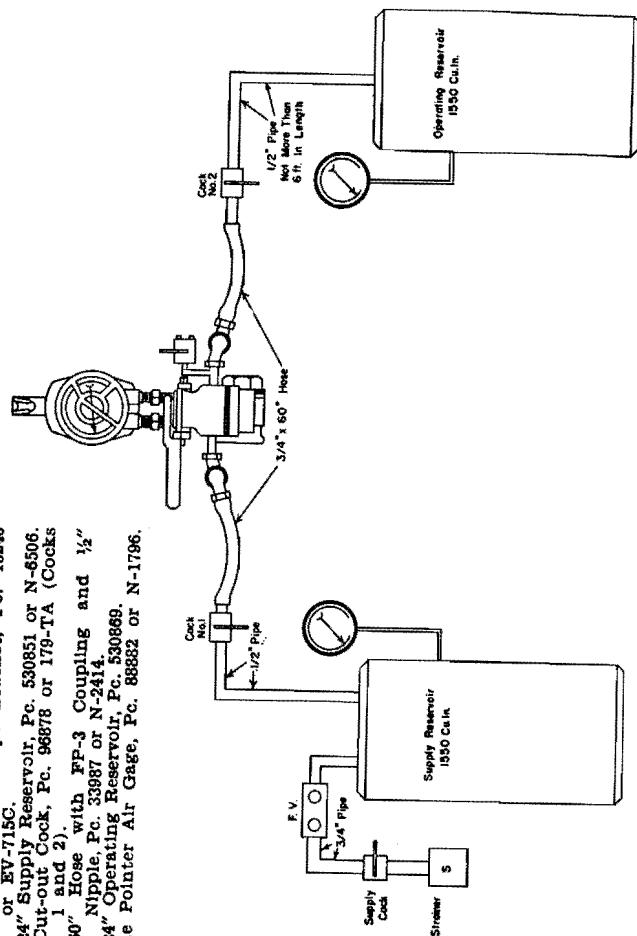


Fig. 7. Diagrammatic View of Arrangement for Testing the PASSENGER Single Car Testing Device

## GENERAL INSTRUCTIONS

### for TESTING and MAINTAINING the PASSENGER SINGLE CAR TESTING DEVICE

To secure reliable and uniform results with the *Single Car Testing Device*, it must be kept free from leakage and must be tested not less than once every 30 days, or oftener if necessary, and any leakage discovered must be corrected.

As often as service conditions require, the rotary valve must be lubricated with a suitable grease. With the standard quick opening diaphragm cock, it is necessary to apply only a small amount of suitable grease to the cam part of the handle where it contacts the actuating plunger. Where test device with key type cock is in use, the key should be removed, cleaned, and lubricated with suitable grease.

The test gage must be kept accurate, and must be compared with a master gage as often as the device itself is being tested.

#### \*Operation Test

Assemble the device on the rack as shown by Fig. 7. Open supply cock.

The feed valve must be set to close at 70 pounds.

Operate the valve several times by moving the device handle from position No. 1 to position No. 6, finally leaving the handle in position No. 3 (Lap).

Commence test with all numbered cocks closed and the device handle in position No. 3 (Lap). Open cock 1 and the test device  $\frac{3}{8}$ " cock. Coat the opening of the  $\frac{3}{8}$ "

\*NOTE—For Alternate Method of Test, see page 75.

cock with soap suds in order to detect rotary valve leakage to brake pipe. Close the  $\frac{3}{8}$ " cock and coat the device exhaust port with soap suds for rotary valve leakage in

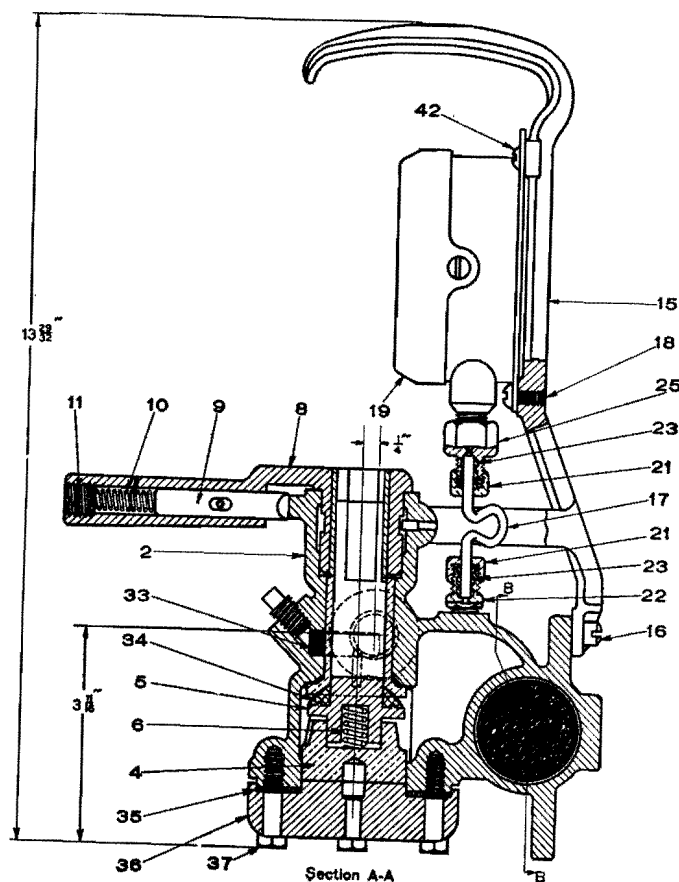


Fig. 8. Sectional View of the Single Car Testing Device

all positions. Leakage permitted for the above test is a bubble not larger than 1" in diameter in 5 seconds. At the completion of test, move the device handle to position No. 2.

Open cock 2 and note that the operating reservoir charges from 5 to 20 pounds in 29 to 36 seconds, then move the device handle to position No. 1 and charge the reservoir to 70 pounds.

NOT LESS THAN 30 SECONDS MUST ELAPSE BEFORE COMMENCING EACH OF THE FOLLOWING TESTS.

Move the device handle to position No. 4. The operating reservoir pressure must reduce from 70 to 60 pounds in 10 to 13 seconds. At the completion of test, move the device handle to position No. 1 and recharge.

Move the device handle to position No. 5. The operating reservoir pressure must reduce from 70 to 40 pounds in 10 to 13 seconds. At the completion of test, move the device handle to position No. 1 and recharge.

Move the device handle to position No. 6. The operating reservoir pressure must reduce from 70 to 30 pounds in  $3\frac{1}{2}$  to 5 seconds. At the completion of test, move the device handle to position No. 1 and recharge.

Move the device handle to position No. 3 (Lap). Open the test device  $\frac{3}{8}$ " cock and observe on the operating reservoir gage that the operating reservoir pressure reduces from 70 to 10 pounds in 3 to  $3\frac{3}{4}$  seconds. At the completion of test, close all cocks and remove device from the test rack.



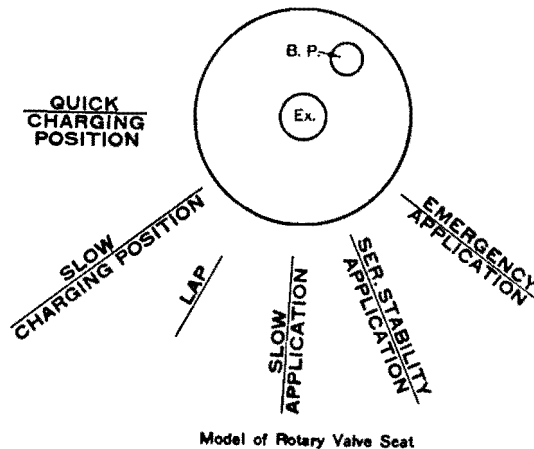
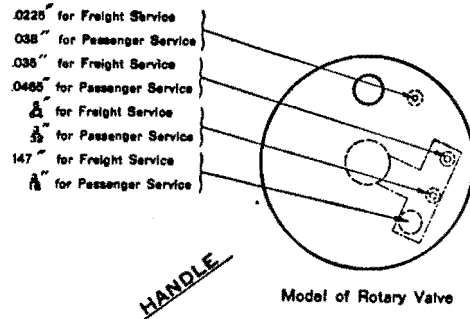


Fig. 9. Rotary Valve and the Rotary Valve Seat of the Single Car Testing Device

### Positions of Passenger Testing Device

Position No. 1—M. R. charges brake pipe through  $\frac{1}{4}$ " opening.

Position No. 2—M. R. charges brake pipe through .038" (No. 62 drill) opening.

Position No. 3—Lap.

Position No. 4—Brake pipe pressure reduces through .0465" (No. 56 drill) opening.

Position No. 5—Brake pipe pressure reduces through .09375" ( $\frac{3}{32}$ " drill) opening.

Position No. 6—Brake pipe pressure reduces through .1875" ( $\frac{3}{16}$ " drill) opening.

$\frac{3}{8}$ " Test Device Cock—Brake pipe pressure reduces through .375" ( $\frac{3}{8}$ " drill) opening.

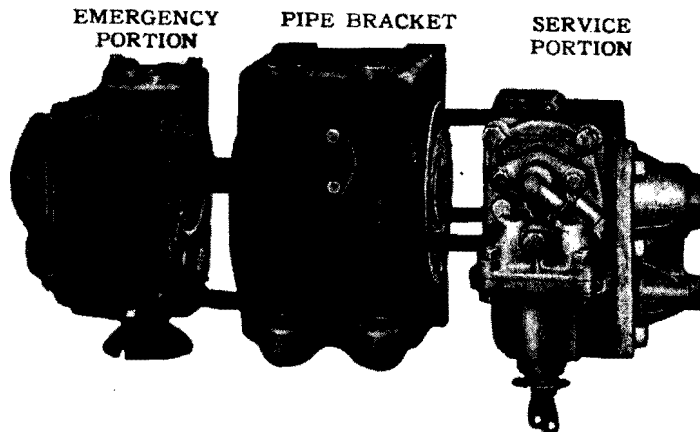


Fig. 10. View of the "AB" Valve Showing the Operating Portions and Pipe Bracket

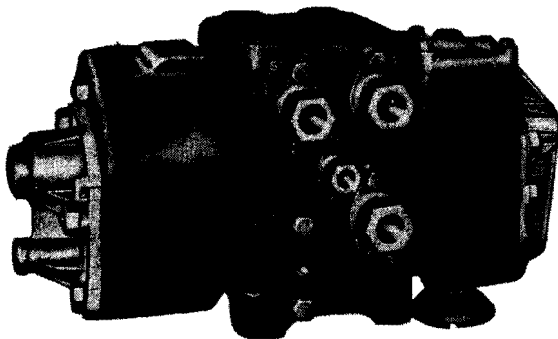


Fig. 11. Rear View of the "AB" Valve

## Freight Equipment

### "AB" Valves

#### TEST CODE

The tests are to be made with the feed valve or reducing valve adjusted for 70 pounds. Before the test apparatus is attached to the supply line, the line must be blown out.

#### Test for Testing Device

Before coupling the device or device outlet hose (if used), move device handle to position No. 3 (Lap) and open the cock in the supply pipe. There should be no escape of air from the brake pipe connection or exhaust port of the device.

#### Connecting Device to Car

Connect the device end marked B.P. or the coupling end of the device hose to the brake pipe hose at one end of the car (preferably at "B" end of car). Move device handle to position No. 1. With both angle cocks open, note that a continuous blow of air from the open hose occurs at the other end of the car. Couple on a dummy hose coupling and charge the brake pipe and reservoirs to 70 pounds pressure.

After 8 minutes the device handle may be moved at frequent intervals to position No. 3 (Lap) for five seconds to determine whether the equipment is fully charged to 70 pounds, which will be indicated by the brake pipe gage hand. Drop in pressure will indicate that reservoirs are not charged, or that excessive brake pipe leakage exists.

The time required to charge the equipment must not exceed 15 minutes.

### 1. Application Test

With the equipment charged to 70 pounds, move the device handle to position No. 4 until the brake starts to apply, then promptly return the handle to position No. 3, (Lap). This brake application must be obtained with a brake pipe reduction of not more than 3 pounds. The brake pipe pressure must continue to drop until the quick service limiting valve closes, so that the total brake pipe reduction will not be less than 4 pounds or more than 10 pounds. A further drop in brake pipe pressure may be due to brake pipe leakage or failure of the quick service limiting valve to close.

NOTE—When testing single cars equipped with "Type A" Quick Service Valve, a greater quick service activity will be indicated, and the brake pipe reduction may exceed the 10 pounds maximum specified above. If the total brake pipe reduction, however, exceeds 14 pounds, it may be due to excessive quick service valve piston friction or failure of the quick service limiting valve to close.

### 2. Brake Pipe Leakage Test

Make a further brake pipe reduction until a total of 15 pounds has been obtained, then return the device handle slowly to position No. 3 (Lap). Observe the pressure on the brake pipe gage. Leakage in the brake pipe will be indicated by a drop in pressure which must not exceed 2 pounds in one minute. If brake pipe leakage exceeds this limit and no leakage of the brake pipe and its connections can be detected by means of soap suds, excessive leakage may be due to failure of quick service limiting valve to close. A slight pumping action of the emergency piston, indicated at the quick action exhaust, will not affect the leakage test.

### 3. Auxiliary Reservoir Leakage Test

During the brake pipe leakage test, if the "AB" valve releases the brake in less than one minute with the device handle in position No. 3 (Lap), it indicates a leaky graduating valve, slide valve, auxiliary reservoir, auxiliary reservoir pipe, or a leak into the brake pipe past the rotary valve of the test device.

In AB-1-B equipment, release of brakes, as indicated by movement of the brake cylinder piston to release position, may be due to safety valve or selector valve diaphragm leakage.

### 4. Release Test

Move device handle to position No. 1 to charge equipment to 70 pounds.

Move device handle to position No. 3 (Lap) and note that equipment is fully charged. Move device handle to position No. 4 until brakes start to apply, then promptly return handle to position No. 3 (Lap). Allow brake pipe pressure to continue to drop until quick service limiting valve closes. Allow 10 seconds for pressure to settle. Move device handle to position No. 2. Brakes must release within 45 seconds. If service portion fails to release on Test No. 4, re-check brake pipe leakage, which must not exceed 2 pounds per minute.

During the release test, the feed or reducing valve pressure must not drop below 70 pounds, but if it does, means must be provided for increasing it to 70 pounds and the test repeated.

### 5. Service Stability Test

Move the device handle to position No. 1 to charge the brake pipe and reservoirs to 70 pounds. Move

the device handle to position No. 5, reducing brake pipe pressure 20 pounds, then slowly return the handle to position No. 3 (Lap). This test must not produce an emergency application.

### 6. Emergency Test

With the device handle still in position No. 3 (Lap), open the test device  $\frac{3}{8}$ " cock. This test must produce an emergency application as indicated by the venting of brake pipe pressure to zero.

NOTE—In rare instances, failure to obtain emergency in Test No. 6 may be caused by a decrease in the quick action chamber volume in the pipe bracket due to the accumulation of excessive moisture or by a badly restricted quick action chamber charging choke.

### 7. Release Test after Emergency

At the completion of the emergency test, wait approximately one minute before attempting a release in order to permit the quick action chamber pressure to exhaust to atmosphere.

Move the device handle to position No. 1 and charge the brake pipe to 28 pounds, then immediately return the device handle to position No. 3 (Lap) and note that the brake pipe pressure continues to rise, due to the air from the brake cylinder and auxiliary reservoir flowing into the brake pipe. This will indicate that the emergency piston has moved to accelerated release position.

When these pressures are nearly equalized, this additional flow of air to the brake pipe will be cut off, and the test device handle should then be moved to position No. 1 to permit the brake pipe to be charged until the "AB" valve service parts move to release position.

NOTE—For Brake Cylinder and Retaining Valve Tests see Instructions on Page 67.

## Freight Equipment

### "AB-1-B" Valves for Fast Freight Service

When testing cars equipped with AB-1-B Valves, the brake equipment must be subjected to all tests prescribed for Type AB Freight Valves. If the valve fails to pass these tests, or if any erratic action on the part of the control portion is discovered, the portions (including the selector valve portion) must be removed for further investigation on the AAR standard test rack. If a blow occurs at the selector valve portion vent port, with the control valve in either release or application position, it may indicate a ruptured diaphragm in the selector valve portion.

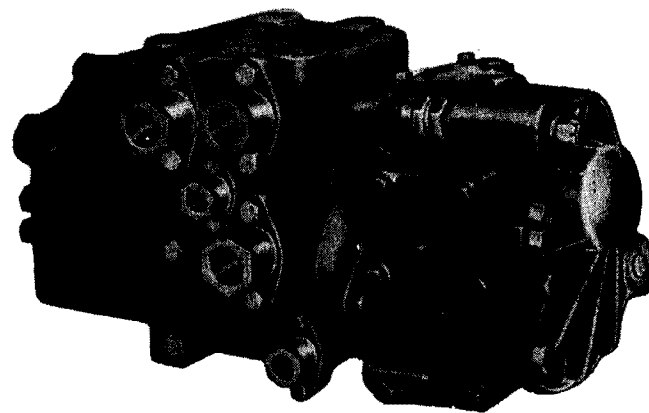


Fig. 12. Type AB-1-B Valve for Fast Freight Service

At the completion of these tests the Single Car Testing Device must then be connected to the Signal Pipe by means of a Type "HUF" Hose Coupling, Pc. 46150 (N.Y.A.B. Pc. N-5499), which consists of a double end coupling, one end suitable for coupling with the standard Signal Pipe Coupling, the other end suitable for coupling with the standard Brake Pipe coupling of the Single Car Testing Device. To the other end of the car couple on a dummy signal pipe hose coupling, Pc. 2134 (N.Y.A.B. Pc. HC-419).

The signal pipe must then be charged to a pressure between 45 and 60 pounds by moving the device handle to position No. 1 and then back to position No. 3 (Lap). Should a blow occur at the selector valve portion vent port, it may also indicate a ruptured diaphragm.

With the device handle in position No. 3 (Lap), observe the brake pipe hand of the device gage for any drop in pressure, which may indicate signal pipe leakage. This drop must not exceed 3 pounds in one minute from 45 pound pressure.

## Freight Equipment

**"AB-8" and "AB-10" Empty and Load  
and "AB-4-12" Equipments**

### TEST CODE

The tests are to be made with the feed valve or reducing valve adjusted for 70 pounds. Before the test apparatus is attached to the supply line, the line must be blown out.

#### Test for Testing Device

Before coupling the device or device outlet hose (if used), move device handle to position No. 3 (Lap) and open the cock in the supply pipe. There should be no escape of air from the brake pipe connection or exhaust port of the device.

#### Connecting Device to Car

Connect the device end marked B.P. or the coupling end of the device hose to the brake pipe hose at one end of the car (preferably at "B" end of car). Move device handle to position No. 1. With both angle cocks open, note that a continuous blow of air from the open hose occurs at the other end of the car. Couple on a dummy hose coupling and charge the brake pipe and reservoirs to 70 pounds pressure.

After 8 minutes the device handle may be moved at frequent intervals to position No. 3 (Lap) for five seconds to determine whether the equipment is fully charged to 70 pounds, which will be indicated by the brake pipe gage hand. Drop in pressure will indicate that reservoirs are not charged, or that excessive brake pipe leakage

exists. The time required to charge the equipment must not exceed 15 minutes.

### 1. Application Test

With the equipment charged to 70 pounds, move the device handle to position No. 4 and reduce brake pipe pressure 12 pounds, then slowly return the handle to position No. 3 (Lap). Note that the brake pipe pressure does not continue to drop, and that the brake applies. A further drop in brake pipe pressure may be due to brake pipe leakage or failure of the quick service limiting valve to close. When the car is empty or less than half loaded, only one brake cylinder must apply; when the car is approximately half loaded to fully loaded, both brake cylinders must apply with the "AB" Empty and Load Equipment. With the "AB 4-12" Equipment, both the 4" and 12" brake cylinders must apply regardless of car loading.

### 2. Brake Pipe Leakage Test

Make a further brake pipe reduction until a total of 15 pounds has been obtained, then return the device handle slowly to position No. 3 (Lap). Observe the pressure on the brake pipe gage. Leakage in the brake pipe will be indicated by a drop in pressure which must not exceed 2 pounds in one minute. If brake pipe leakage exceeds the limit, and no leakage of the brake pipe and its connections can be detected by means of soap suds, excessive leakage may be due to failure of the quick service limiting valve to close. A slight pumping action of the emergency piston, indicated at the quick action exhaust, will not affect the leakage test.

### 3. Auxiliary Reservoir Leakage Test

During the brake pipe leakage test, if the "AB" valve releases the brake in less than one minute with the device handle in position No. 3 (Lap), it indicates a leaky graduating valve, slide valve, auxiliary reservoir, auxiliary reservoir pipe, or a leak into the brake pipe past the rotary valve of the test device.

### 4. Release Test

Move device handle to position No. 1 to charge equipment to 70 pounds.

Move device handle to position No. 3 (Lap) and note that the equipment is fully charged. Move device handle to position No. 4 until brakes start to apply, then promptly return handle to position No. 3 (Lap). Allow brake pipe pressure to continue to drop until quick service limiting valve closes. Allow 10 seconds for pressure to settle. Move device handle to position No. 2. Brakes must release within 45 seconds. If service portion fails to release on Test No. 4, re-check brake pipe leakage, which must not exceed 2 pounds per minute.

During the release test, the feed or reducing valve pressure must not drop below 70 pounds, but if it does, means must be provided for increasing it to 70 pounds and the test repeated.

### 5. Service Stability Test

Move the device handle to position No. 1 to charge the brake pipe and reservoirs to 70 pounds. Move the device handle to position No. 5, reducing brake pipe pressure 20 pounds, then slowly return the handle to position No. 3 (Lap). This test must not produce an emergency application.

### 6. Emergency Test

With the device handle still in position No. 3 (Lap), open the test device  $\frac{3}{8}$ " cock. This test must produce an emergency application as indicated by the venting of brake pipe pressure to zero.

NOTE—In rare instances, failure to obtain emergency in Test No. 6 may be caused by a decrease in the quick action chamber volume in the pipe bracket due to the accumulation of excessive moisture or by a badly restricted quick action chamber charging choke.

### 7. Release Test after Emergency

At the completion of the emergency test, wait approximately one minute before attempting a release in order to permit the quick action chamber pressure to exhaust to atmosphere.

Move the device handle to position No. 1 and charge the brake pipe to 28 pounds, then immediately return the device handle to position No. 3 (Lap) and note that the brake pipe pressure continues to rise, due to the air from the brake cylinder and auxiliary reservoir flowing into the brake pipe. This will indicate that the emergency piston has moved to accelerated release position.

When these pressures are nearly equalized, this additional flow of air to the brake pipe will be cut off, and the test device handle should then be moved to position No. 1 to permit the brake pipe to be charged until the "AB" valve service parts move to release position.

NOTE—For Brake Cylinder and Retaining Valve Tests see Instructions on Page 67.

### Strut Cylinder Test for AB-8 and AB-10 Equipment

Charge the brake pipe and maintain the pressure at not more than 25 pounds, then inspect the pipe and its hose connections leading from the change-over valve to the top of the strut cylinder and, if the car is empty, also inspect the duplicate of this pipe between the strut cylinder and the change-over valve. If the car is loaded, there will be no air pressure in this second pipe and it can be pressure tested only by jacking up the end of the car body. All leaks and other irregularities must be corrected.

With the brake pipe charged and maintained not to exceed 25 pounds, note that the strut cylinder piston foot is down. Slowly charge and maintain the brake pipe pressure at 40 pounds. Note that the strut cylinder piston foot moves or has moved up. In some instances it may require a few seconds after the brake pipe is charged to 40 pounds pressure before the strut cylinder piston starts to move. If the strut cylinder piston operates outside these limits, it may be due to improper operation of the cut-off valve portion or the strut cylinder.

### Strut Cylinder Adjustment

Fig. 13 shows the installation of the 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 re-turned 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.

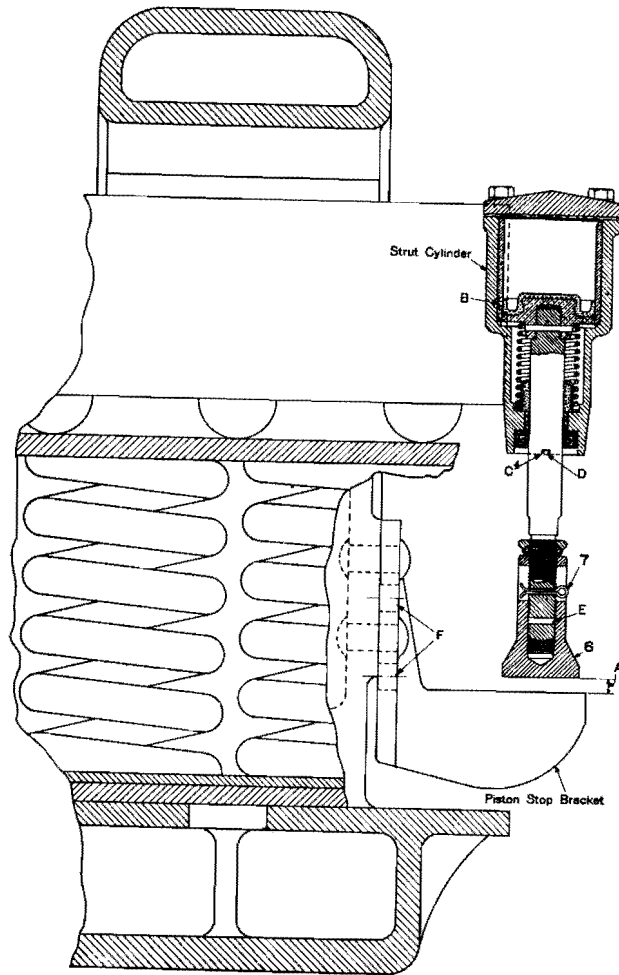


Fig. 13. Strut Cylinder Adjustment



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.

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 re-adjusted. 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, re-adjust 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.

## Freight Equipment "ABLC" Equipment

### WEIGHING GEAR ADJUSTMENT

With no air in the brake system, note that the length of the pull rod is such that, in its downward position, it permits from  $\frac{1}{32}$ " to  $\frac{1}{16}$ " clearance between the hook lever lug and the shaft body lug, as shown by Fig. 14. Adjust, if necessary, by means of the pull rod sleeve.

#### Weighing Gear Hook Adjustment—Empty Car

Move set gage, attached to the weighing gear hook, upward into measuring position and note that it just touches the bottom of the weighing bar, or interferes with it by not more than  $\frac{1}{16}$ ". Adjust the position of the hook, if necessary, and tighten the hook bolts.

#### Weighing Gear Hook Adjustment— Fully or Partially Loaded Car

To accurately adjust the position of the weighing gear hook when car is fully or partially loaded, follow instructions as outlined on Plate No. 1.

### TEST CODE

The tests are to be made with the feed valve or reducing valve adjusted for 70 pounds. Before the test apparatus is attached to the supply line, the line must be blown out.

#### Test for Testing Device

Before coupling the device or device outlet hose (if used), move device handle to position No. 3 (Lap) and open the cock in the supply pipe. There should be no escape of air from the brake pipe connection or exhaust port of the device.

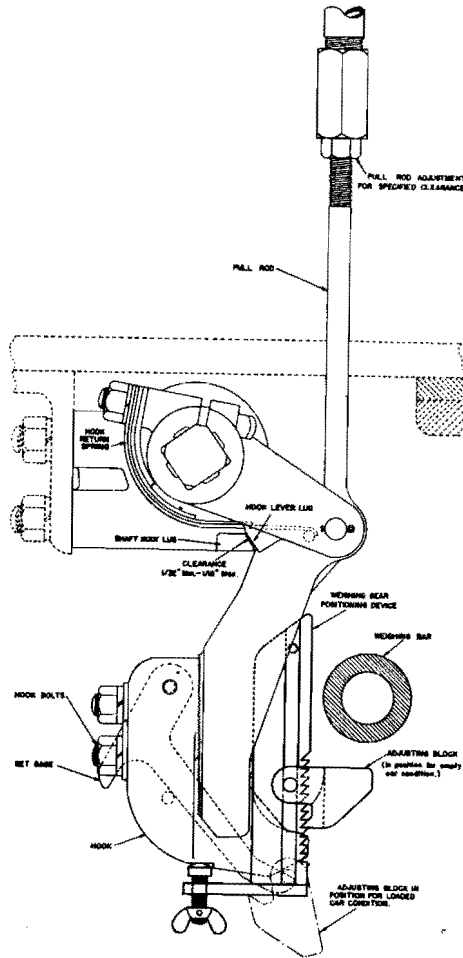


Fig. 14. Weighing Gear Mechanism with Positioning Device attached

### Connecting Device to Car

Connect the device end marked B.P. or the coupling end of the device hose to the brake pipe hose at one end of the car (preferably at "B" end of car).

Place the weighing gear positioning device (Fig. 15) on the weighing gear hook and tighten in place by means of the wing nut (see Fig. 16).

Force the weighing gear hook against the weighing bar, then, holding it there, slide the adjusting block upward until it touches the weighing bar, after which the block must be released to engage the nearest tooth on the positioning device. If the weighing gear hook is then released, the distance between the adjusting block and the weighing bar represents the correct movement of the hook for empty car condition.

Move device handle to position No. 1. With both angle cocks open, note that a continuous blow of air from the open hose occurs at the other end of the car. Couple on a dummy hose coupling and charge the brake pipe and reservoirs to 70 pounds pressure, noting that the weighing gear has moved up and then returns to its lower position automatically. If it does not, there is excessive friction or binding in the weighing gear, or the load compensating valve is not functioning properly, or the shaft spring of the weighing gear is broken or missing.

After 8 minutes, the device handle may be moved at frequent intervals to position No. 3 (Lap) for five seconds to determine whether the equipment is fully charged to 70 pounds, which will be indicated by the brake pipe gage hand. Drop in pressure will indicate that reservoirs are not charged, or that excessive brake pipe leakage

exists. The time required to charge the equipment must not exceed 15 minutes.

### 1. Application Test

With the equipment charged to 70 pounds, move the device handle to position No. 4 until the brake starts to apply, then promptly return the handle to position No. 3 (Lap). This brake application must be obtained with a brake pipe reduction of not more than 3 pounds. The brake pipe pressure must continue to drop until the quick service limiting valve closes, so that the total brake pipe reduction will not be less than 4 pounds or more than 10 pounds. A further drop in brake pipe pressure may be due to brake pipe leakage or failure of the quick service limiting valve to close.

NOTE—When testing single cars equipped with Type “A” Quick Service Valve, a greater quick service activity will be indicated and the brake pipe reduction may exceed the 10 pounds maximum specified above. If the total brake pipe reduction, however, exceeds 14 pounds, it may be due to excessive quick service valve piston friction or failure of the quick service limiting valve to close.

### 2. Brake Pipe Leakage Test and Compensating Valve Operation

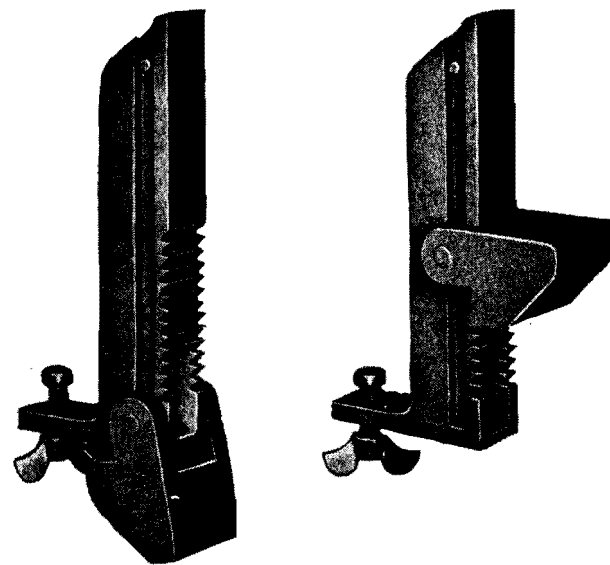
Make a further brake pipe reduction until a total of 15 pounds has been obtained, then return the device handle slowly to position No. 3 (Lap). Observe the pressure on the brake pipe gage. Leakage in the brake pipe will be indicated by a drop in pressure which must not exceed 2 pounds in one minute. If brake pipe leakage exceeds this limit and no leakage of the brake pipe and its connections can be detected by means of soap suds, excessive leakage may be due to failure of the quick service limiting valve to close. A slight pumping action

of the emergency piston, indicated at the quick action exhaust, will not affect the leakage test.

Note that the indicator plunger, attached to the compensating chamber of the brake cylinder, is in its outward position, thus indicating that air is properly supplied to the compensating chamber of the brake cylinder.

### 3. Auxiliary Reservoir Leakage Test

During the brake pipe leakage test, if the “AB” valve releases the brake in less than one minute with the



Loaded Car Condition

Empty Car Condition

Fig. 15. Weighing Gear Positioning Device  
Pc. 539456 (N-6970)

device handle in position No. 3 (Lap), it indicates a leaky graduating valve, slide valve, auxiliary reservoir, auxiliary reservoir pipe or a leak into the brake pipe past the back flow double check valve of the compensating valve or past the rotary valve of the test device.

#### 4. Release Test

Move device handle to position No. 1 to charge equipment to 70 pounds.

Move device handle to position No. 3 (Lap) and note that equipment is fully charged. Move device handle to position No. 4 until brakes start to apply, then promptly return handle to position No. 3 (Lap). Allow brake pipe pressure to continue to drop until quick service limiting valve closes. Allow 10 seconds for pressure to settle. Move device handle to position No. 2. Brakes must release within 45 seconds. If service portion fails to release on Test No. 4, re-check brake pipe leakage, which must not exceed 2 pounds per minute.

During the release test, the feed or reducing valve pressure must not drop below 70 pounds, but if it does, means must be provided for increasing it to 70 pounds and the test repeated.

#### 5. Service Stability Test

Turn the adjusting nut of the slack adjuster clockwise (facing the slack adjuster engine) to increase the piston travel beyond the maximum limit of 6", then move device handle to position No. 1 to charge the brake pipe and reservoirs to 70 pounds. Move the device handle to position No. 5, reducing brake pipe pressure 20 pounds, then slowly return the handle to position

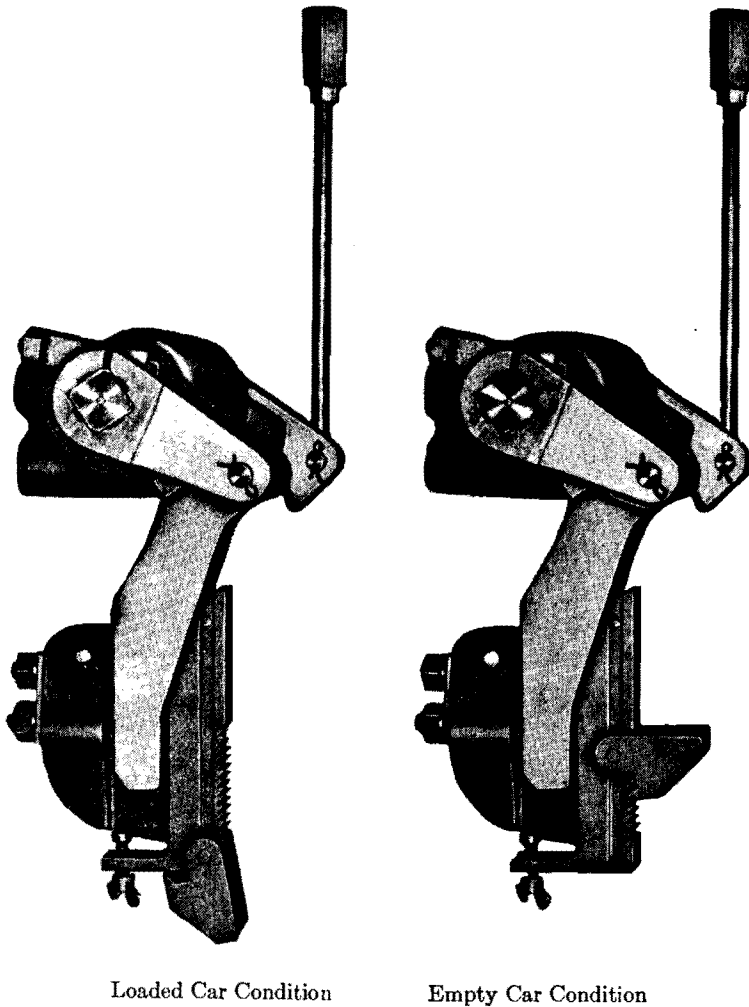


Fig. 16. Weighing Gear Mechanism with Positioning Device attached

No. 3 (Lap). This test must not produce an emergency application.

Soap the entire slack adjuster and all piping and fittings between the slack adjuster and brake cylinder with soap suds to detect leakage. No leakage is permitted.

Move device handle to position No. 1 to release brake and recharge reservoirs to 70 pounds, noting that the slack adjuster functions. Make the necessary adjustment of the slack adjuster to set the piston travel between  $4\frac{1}{2}$ " to 6" by turning the adjusting nut counter-clockwise and repeating the application.

#### 6. Emergency Test and Compensating Chamber Packing Cup Leakage

With the device handle still in position No. 3 (Lap), open the test device  $\frac{3}{8}$ " cock. This test must produce an emergency application as indicated by the venting of brake pipe pressure to zero.

NOTE—In rare instances, failure to obtain emergency in Test No. 6 may be caused by a decrease in the quick action chamber volume in the pipe bracket due to the accumulation of excessive moisture or by a badly restricted quick action chamber charging choke.

Coat the breather opening, located on the brake cylinder non-pressure head, with soap suds to detect compensating chamber packing cup leakage. If a soap bubble cannot be applied, leakage is excessive.

#### 7. Release Test after Emergency

At the completion of the emergency test, wait approximately one minute before attempting a release in order to permit the quick action chamber pressure to exhaust to atmosphere.

Place the adjusting block of the weighing gear positioning device in its extreme lower position, if not already in this position (see Fig. 16). This will insure loaded car condition for the brake cylinder leakage test.

Close the test device  $\frac{3}{8}$ " cock. Move the device handle to position No. 1 and charge the brake pipe to 28 pounds, then immediately return the device handle to position No. 3 (Lap) and note that the brake pipe pressure continues to rise, due to the air from the brake cylinder and auxiliary reservoir flowing into the brake pipe. This will indicate that the emergency piston has moved to accelerated release position.

When these pressures are nearly equalized, this additional flow of air to the brake pipe will be cut-off, and the test device handle should then be moved to position No. 1 to permit the brake pipe to be charged until the "AB" valve service parts move to release position.

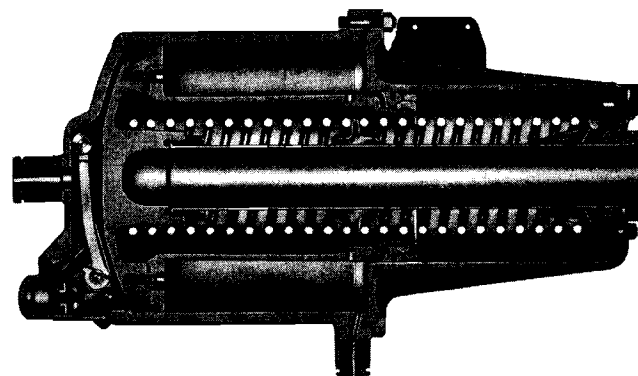


Fig. 17. Load Compensating Brake Cylinder

NOTE—For Brake Cylinder and Retaining Valve Tests see Instructions on Page 67.

## Freight Equipment

All Triple Valves (Including KD-4-12)  
Except AB Valves

### TEST CODE

The tests are to be made with the feed valve or reducing valve adjusted for 70 to 90 pounds. Before the test apparatus is attached to the supply line, the line must be blown out.

The specified length of cars and pressures used for testing are as follows:

Feed or Reducing Valve Pressure (Pounds)	Car Length (Feet)
70	Under 50
80	From 50 to 70
90	From 70 to 90

### Test for Testing Device

Before coupling the device or device outlet hose (if used), move the device handle to position No. 3 (Lap) and open the cock in the supply pipe. There should be no escape of air from the brake pipe connection or exhaust port of the device.

### Connecting Device to Car

Connect the device end marked B.P. or the coupling end of the device outlet hose to the brake pipe hose at one end of the car (preferably at "B" end of car). Move device handle to position No. 1. With both angle cocks open, note that a continuous blow of air from the open hose occurs at the other end of the car. Couple on a dummy hose coupling and charge the brake pipe and

auxiliary reservoir to the proper pressure as shown in the above tabulation.

### 1. Application Test\*

Move the device handle to position No. 4, reducing the brake pipe pressure 10 pounds, then return the handle to position No. 3 (Lap).

The brake must apply before the brake pipe pressure is reduced the amount specified.

Failure to apply indicates that the valve must be removed for further investigation on the A.A.R. standard triple valve test rack. *Triple valves that fail to apply after a release in position No. 1, must not be removed unless they fail to apply after being released in position No. 2.*

### 2. Brake Pipe Leakage Test

Move the device handle to position No. 5, and reduce the brake pipe pressure 5 additional pounds, then return handle slowly to position No. 3 (Lap).

Observe the pressure on the brake pipe gage. Leakage in the brake pipe will be indicated by a drop in pressure, which must not exceed 2 pounds in one minute

\*NOTE—When testing a car with KD-4-12 equipment, both the 4" and 12" brake cylinder pistons must apply. The 4" Take-Up Cylinder piston must move its full travel before the 12" cylinder piston commences to move.

If both the 4" and 12" cylinder pistons apply simultaneously, the transfer valve must be removed and tested per shop test rack code.

### 3. Auxiliary Reservoir and Graduating Valve Leakage

During the brake pipe leakage test, if the triple valve releases the brake in less than one minute with the device handle in position No. 3 (Lap), it indicates a leaky graduating valve, slide valve, a leak from the auxiliary reservoir volume, or a leak into the brake pipe past the rotary valve of the test device.

### 4. Release Test\*

Move device handle to position No. 1 to charge equipment to proper pressure. Move device handle to position No. 3 (Lap). Note that equipment is fully charged.

Move device handle to position No. 4, reducing brake pipe pressure 8 pounds. Move device handle to position No. 3 (Lap). Note that brakes apply. Allow 10 seconds for pressure to settle. Move device handle to position No. 2. Brakes must release within 45 seconds. If triple valve fails to release, re-check brake pipe leakage, which must not exceed 2 pounds per minute.

*During the release test, the feed or reducing valve pressure must not vary more than 2 pounds. When the variation is greater, means must be provided for maintaining a constant pressure and the test repeated.*

\*NOTE—When testing a car with KD-4-12 equipment, the 12" brake cylinder piston must move to release position before the 4" cylinder piston commences to return. If this sequence is not obtained, the transfer valve must be removed and tested per shop test rack code.

### 5. Emergency Test

Move the device handle to position No. 1 to recharge the brake pipe and auxiliary reservoir to proper pressure. When testing triples on cars under 46 feet in length, move device handle to position No. 6, reducing brake pipe pressure 20 pounds. When testing triples on cars over 46 feet in length, move device handle to position No. 3 (Lap) and open test device  $\frac{3}{8}$ " cock ( $\frac{1}{4}$ " orifice) reducing brake pipe pressure 20 pounds. This test must produce emergency. If emergency application is not obtained, it indicates that this triple valve must be removed for further investigation on the A.A.R. standard triple valve test rack. At the completion of test move the device handle to position No. 1 and note that there is no prolonged blow at the triple valve exhaust, indicating that the quick action parts have assumed their normal position.

### 6. Service Stability Test

\*With the device handle in position No. 1, recharge the brake pipe and auxiliary reservoir to proper pressure. Move device handle to position No. 5, reducing brake pipe pressure 20 pounds. This test must not produce emergency. If emergency application is obtained, it indicates that this triple valve must be removed for further investigation on the A.A.R. standard triple valve test rack. At the completion of this test, move the device handle to position No. 6.

NOTE—For Brake Cylinder and Retaining Valve Tests see Instructions on Page 67.

- 1 Air Strainer, Pc. 70800 or N-858.
- 1  $\frac{3}{4}$ " Supply Cock, Pc. 519873 or N-5523.
- 1 Type F Feed Valve Pipe Bracket, Pc. 18240 EV-715-C.
- 2  $\frac{1}{2}$ " Cut-out Cock, Pc. 96878 or 179-TA.
- 1 10"x24" Supply Reservoir, Pc. 530851 or N-6506.
- 2  $\frac{3}{4}$ "x60" Hose with WP-3 Couplings and  $\frac{1}{2}$ "
- 1 10"x14 $\frac{1}{2}$ " Operating Reservoir, Pc. 530848.
- 2 Single Pointer Air Gages, Pc. 88882 or N-1796.

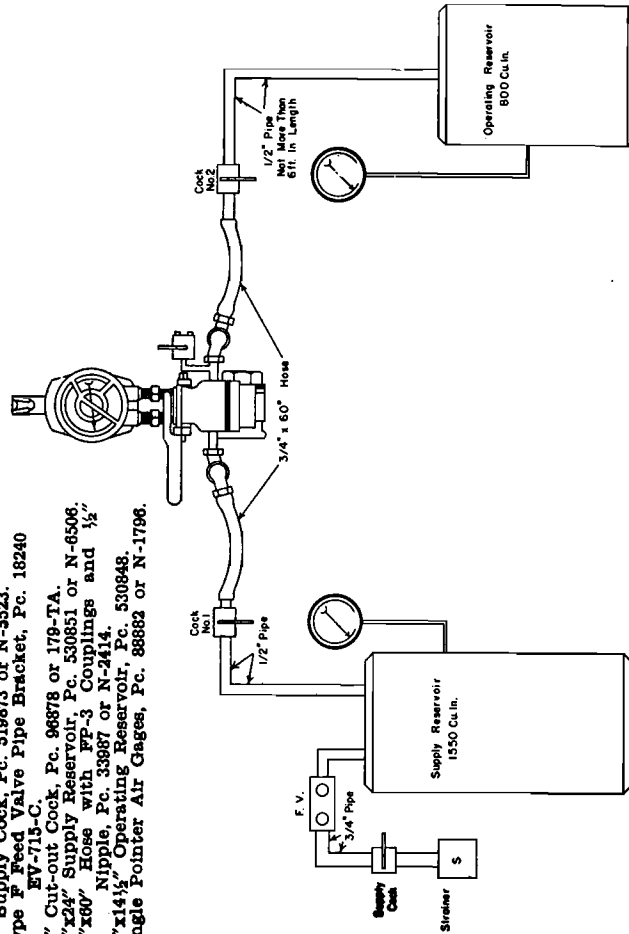


Fig. 18. Diagrammatic View of Arrangement for Testing the  
FREIGHT Single Car Testing Device

## GENERAL INSTRUCTIONS for TESTING and MAINTAINING the FREIGHT SINGLE CAR TESTING DEVICE

To secure reliable and uniform results with the *single car testing device*, it must be kept free from leakage and must be tested not less than once every 30 days, or oftener if necessary, and any leakage discovered must be corrected.

As often as service conditions require, the rotary valve must be lubricated with a suitable grease. With the standard quick opening diaphragm cock, it is necessary to apply only a small amount of suitable grease to the cam part of the handle where it contacts the actuating plunger. Where test device with key type cock is in use, the key should be removed, cleaned, and lubricated with suitable grease.

The test gage must be kept accurate, and must be compared with a master gage as often as the device itself is being tested.

NOTE—The  $\frac{3}{8}$ " Test Device Cock ( $\frac{1}{4}$ " orifice), Pc. 519871 (N. Y. A. B. Co. Pc. N-5522), is now furnished with new Freight Single Car Testing Devices. Install this cock on all freight car testing devices not so equipped.

### \*Operation Test

Assemble the device on the rack as illustrated by Fig. 18. Open the supply cock.

The feed valve must be set to close at 70 pounds.

Operate the valve several times by moving the device handle from position No. 1 to position No. 6, finally leaving the handle in position No. 3 (Lap).

\*NOTE—For Alternate Method of Test, see page 75.



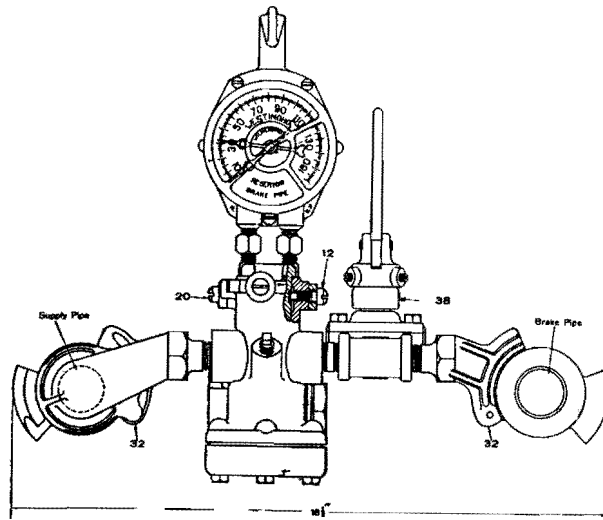
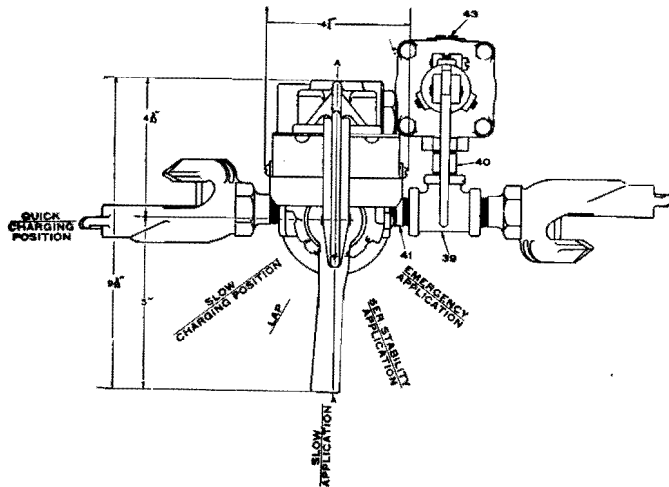


Fig. 19. Views from Assembly Drawing of the Single Car Testing Device

Commence test with all numbered cocks closed and test device handle in position No. 3 (Lap). Open cock 1 and the test device  $\frac{3}{8}$ " cock. Coat the opening of the  $\frac{3}{8}$ " cock with soap suds in order to detect rotary valve leakage to brake pipe. Close the  $\frac{3}{8}$ " cock and coat the device exhaust port with soap suds for rotary valve leakage in all positions. Leakage permitted for the above test is a bubble not larger than 1" in diameter in five seconds. At the completion of test, move the device handle to position No. 1.

Open cock 2, and when the operating reservoir pressure reaches 58 pounds, move the device handle to position No. 2. Note that the operating reservoir charges from 60 to 65 pounds in 25 to 30 seconds. At the completion of test, move the device handle to position No. 1 and charge the reservoir to 70 pounds.

NOT LESS THAN 30 SECONDS MUST ELAPSE BEFORE COMMENCING EACH OF THE FOLLOWING TESTS.

Move the device handle to position No. 4. The operating reservoir pressure must reduce from 70 to 60 pounds in 10 to 12 seconds. At the completion of test, move the device handle to position No. 1 and recharge.

Move the device handle to position No. 5. The operating reservoir pressure must reduce from 70 to 50 pounds in 5 to 7 seconds. At the completion of test, move the device handle to position No. 1 and recharge.

Move the device handle to position No. 6. The operating reservoir pressure must reduce from 70 to 30 pounds in  $3\frac{1}{2}$  to 5 seconds. At the completion of test, move the device handle to position No. 1 and recharge.

Move the device handle to position No. 3 (Lap). Open the test device  $\frac{3}{8}$ " cock and observe on the operating reservoir gage that the operating reservoir pressure reduces from 70 to 10 pounds in not more than  $3\frac{1}{2}$  seconds or less than 3 seconds. At the completion of test, close all cocks and remove device from the test rack.

### Positions of Freight Test Device

Position No. 1—M.R. charges brake pipe through  $\frac{1}{4}$ " opening.

Position No. 2—M.R. charges brake pipe through .0225" (No. 74 drill) opening.

Position No. 3—Lap.

Position No. 4—Brake pipe pressure reduces through .035" (No. 65 drill) opening.

Position No. 5—Brake pipe pressure reduces through .0781" ( $\frac{5}{64}$ " drill) opening.

Position No. 6—Brake pipe pressure reduces through .147" (No. 26 drill) opening.

$\frac{3}{8}$ " Test Device Cock—Brake pipe pressure reduces through .250" ( $\frac{1}{4}$ " drill) opening.

## Brake Cylinder and Retaining Valve

### TEST CODE

The following repair track test code, which covers the necessary tests for retaining valve and for brake cylinder leakage and piston travel according to A.A.R. Rules covering Maintenance of Brakes and Train Air Signal Equipment, supplements the tests prescribed on the preceding pages of this Instruction Pamphlet for other brake devices.

When testing cars equipped with a two or three position retaining valve or three position retaining valve converted to the equivalent of a four position Release Control Retainer, an Exhaust Gage Fitting as shown by Fig. 20 must be available. This fitting must be inserted

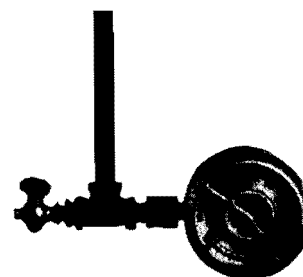


Fig. 20. Exhaust Gage Fitting for testing Retaining Valve with Tapped Exhaust Port.

W.A.B. Pc. 522598  
(N.Y.A.B. Pc. N-5524)

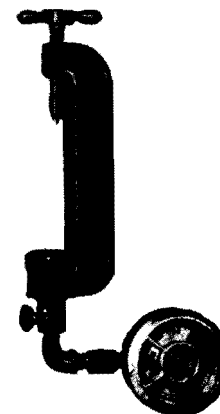


Fig. 21. Release Control Retainer Exhaust Gage Fitting.

W.A.B. Pc. 519117  
(N.Y.A.B. Pc. N-5308)

nto the tapped retainer exhaust port after the wasp excluder, if equipped with such, has been removed.

When testing cars with the four position Release Control Retainer, the Exhaust Gage Fitting as shown by Fig. 21 must be used and clamp-mounted to the retainer.

### Test No. 1. Leakage

Attach the proper exhaust gage fitting and close the bleed cock. Turn the retainer handle down to "Direct Exhaust" position.

Make applications and releases of the brake until 50 pounds or more brake cylinder pressure is indicated on the exhaust fitting air gage when the handle of the single car testing device is in No. 1 position. If in excess of 50 pounds, the pressure must be reduced to 50 pounds through the bleed cock.

On cars having standard "AB" or "K" single capacity brake equipment, the piston travel must be adjusted to 7 inches.

On cars with "ABLC" equipment, the piston travel is checked during Test No. 5, when empty car conditions prevail. Observe that the indicator plunger, attached to the compensating chamber of the brake cylinder, is in its inward position, thus indicating that there is no air in the compensating chamber.

Observe the test gage for leakage from the combined volumes of the brake cylinder, retaining valve and their related piping. The drop in pressure, indicated on this gage, must not exceed the amount specified below.

*5 pounds in one minute* (from 50 pounds) when testing a car on which the brake equipment has been given the attention specified in A.A.R. Maintenance Rule 110 for a car with stencil "Out-Of-Date".

*8 pounds in one minute* (from 50 pounds) when testing an "In-Date" car (A.A.R. Maintenance Rule 102).

If the drop in pressure exceeds the amount specified, inspect the retaining valve, retaining valve pipe and brake cylinder pipe, and eliminate any leakage. If no leakage is found, or if the elimination of the leakage found does not reduce the leakage observed on the test gage to less than the limits specified, it indicates a faulty brake cylinder (or in the "AB-1-B" equipment, safety valve leakage or ruptured selector valve diaphragm), in which case the defective conditions must be corrected: and furthermore, A.A.R. Maintenance Rule 110 must be applied, if on an "In-Date" car. If the drop in pressure does not exceed the above specified limits, proceed as follows:

## Test No. 2. Retaining Valve Test

### SECTION "A"

Cars equipped with "Two Position" or "Three Position" Retaining Valve

#### "TWO POSITION" FREIGHT RETAINING VALVE

Move the retaining valve handle up to "Retaining Position" and immediately open the bleed cock. Note that a continuous exhaust of air through the choked exhaust port in the retaining valve cap is obtained.

Three (3) minutes after the air commences to exhaust, move the retaining valve handle to "Direct Exhaust" position and note that a sufficient blow is obtained to indicate that effective brake cylinder pressure has been retained.

Replace the wasp excluder if the retaining valve is equipped with one.

#### "TWO POSITION" PASSENGER RETAINING VALVE

Move the retaining valve handle up to "Retaining" (horizontal) position and immediately open the bleed cock. Note that a continuous exhaust of air through the choked exhaust port in the retaining valve cap is obtained.

Forty (40) seconds after air commences to exhaust, move the retaining valve handle down to "Direct Exhaust" (vertical) position and note that a sufficient blow is obtained to indicate that effective brake cylinder pressure has been retained.

#### "THREE POSITION" RETAINING VALVE

Move the retaining valve handle up to "High Pressure" position and immediately open the bleed cock. Note that a continuous exhaust of air through the choked exhaust port in the retaining valve cap is obtained.

Fifteen (15) seconds after the air commences to exhaust, move the retaining valve handle to "Low Pressure" position and note that air continues to exhaust through the choked exhaust port.

Three (3) minutes after the air commences to exhaust, move the retaining valve handle to "Direct Exhaust" position and note that a sufficient blow is obtained to indicate that effective brake cylinder pressure has been retained.

Replace the wasp excluder if the retaining valve is equipped with one.

### SECTION "B"

Freight Cars equipped with either the "Four Position" Release Control Retainer or "Three Position" Retaining Valve converted to the Equivalent of the Release Control Retainer

#### CONVERTED "THREE POSITION" RETAINING VALVE

Move the retaining valve handle up to "Slow Direct Exhaust" position, open the bleed cock and note that a continuous exhaust of air through the bleed cock is obtained.

Fifteen (15) seconds after the air commences to exhaust, move the retaining valve handle to "High Pressure" position and note that a continuous exhaust of air through the choked exhaust port in the retaining valve cap is obtained.

Thirty (30) seconds after the air commences to exhaust, move the retaining valve handle to "Low Pressure" position and note that air continues to exhaust through the choked exhaust port in the retaining valve cap.

Three (3) minutes after the air commences to exhaust, move the retaining valve handle to "Direct Exhaust" position and note that a sufficient blow is obtained to indicate that effective brake cylinder pressure has been retained.

Remove the test gage and replace the wasp excluder if the retaining valve is equipped with one.

#### "FOUR POSITION" RELEASE CONTROL RETAINER

Move the retainer handle up to "Slow Direct Exhaust" position, open the exhaust gage fitting bleed cock and note that a continuous exhaust of air from the bleed cock is obtained.

Fifteen (15) seconds after the air commences to exhaust, move the retainer handle to "High Pressure" position and note that air continues to exhaust from the bleed cock.

Thirty (30) seconds after the air commences to exhaust, move the retainer handle to "Low Pressure" position and note that air continues to exhaust from the bleed cock.

Three (3) minutes after the air commences to exhaust, move the retainer handle to "Direct Exhaust" position and note that a sufficient blow is obtained to indicate that effective brake cylinder pressure has been retained.

Remove the Exhaust Gage Fitting from the Release Control Retainer.

If, during the above tests of the two position, three position or four position retaining valve, any erratic retaining valve operation is noted in any of the positions, such as failure of air to exhaust, abnormally slow or fast rates of brake cylinder pressure blow down, or air being entirely exhausted before the retaining valve handle is moved to "Direct Exhaust Position", the retaining valve must be repaired or removed from the car and replaced with one known to be in good repair. Any defective retaining valve which has been removed should be returned to the shop for repairs and more exhaustive tests in accordance with the shop test code.

*On cars having "ABLC" equipment, remove the weighing gear positioning device and leave the hook in its normal vertical position.*

### Quick Opening Diaphragm Cock

The distinctive features of this improved diaphragm cock are: (a) the quick opening lever type handle, the

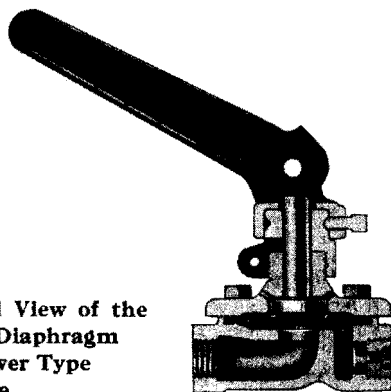


Fig. 22. Sectional View of the Quick Opening Diaphragm Cock with Lever Type Handle

radial position of which is adjustable to any angle, and (b) controlled diaphragm compression, by means of an adjustment which regulates the amount of travel of the parts transmitting handle movement to the diaphragm.

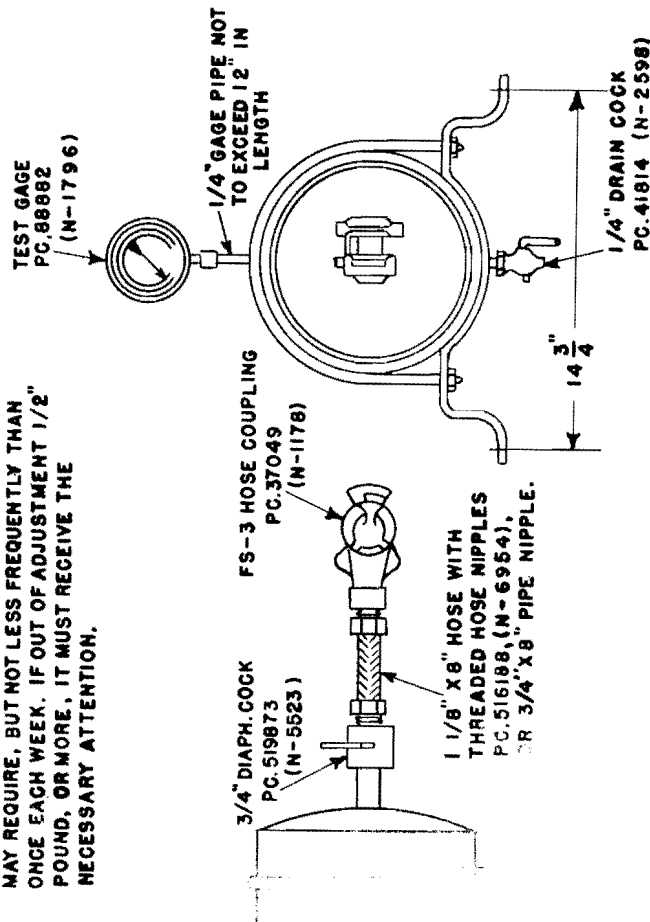
To adjust the diaphragm compression (or deflection), loosen the cap screw which serves to clamp the split coupling on the threaded portion of the cover and screw down or back off the coupling to increase or decrease the diaphragm compression until the force imparted to the diaphragm by the cam portion of the handle (through the medium of plunger and disc) is just sufficient to prevent leakage past the diaphragm with the handle in closed position.

The clamping cap screw should be tightened when the desired compression on the diaphragm is obtained. The handle position can then be adjusted to the desired angle by loosening three set screws in the handle fulcrum and rotating handle and fulcrum around the clamped coupling. The three set screws must be retightened to hold the handle in place and to permit proper operation of the diaphragm.

Care should be exercised in operating the diaphragm type cock in order to realize the benefits to be derived from the use of this improved type cock, that is, eliminating leakage (thereby giving consistent and dependable test results) and obviating the delay and annoyance incident to reseating, lubricating and replacing cock keys.

When the test device is not in use, the diaphragm cock should be open. This practice will prolong the life of the diaphragm by preventing permanent set as the diaphragm is in normal position with the cock open. (See Fig. 22.)

GAGE MUST BE TESTED AS OFTEN AS CONDITIONS MAY REQUIRE, BUT NOT LESS FREQUENTLY THAN ONCE EACH WEEK. IF OUT OF ADJUSTMENT 1/2" POUND, OR MORE, IT MUST RECEIVE THE NECESSARY ATTENTION.



Single Car Testing Device (Alternate Method)

## CODE FOR TESTING PASSENGER AND FREIGHT SINGLE CAR TESTING DEVICES (ALTERNATE METHOD)

The test device must be tested once every 30 days, or oftener if necessary, and any leakage discovered must be corrected.

As often as service conditions require, the rotary valve must be lubricated with suitable grease. With the standard quick opening diaphragm cock, it is necessary to apply only a small amount of suitable grease to the cam part of the handle where it contacts the actuating plunger. Where test device with key type cock is in use, the key should be removed, cleaned, and lubricated with suitable grease.

NOTE—The 3/8" Test Device Cock (1/4" orifice), Pc. 519871 (N. Y. A. B. Co. Pc. N-5522), is now furnished with new Freight Single Car Testing Devices. Install this cock on all freight car testing devices not so equipped.

Attach the end of test device marked "BP" to the volume reservoir coupling of the test rack (See Fig. 23), then couple the supply line to the test device end marked "MR".

The supply line pressure must be maintained at 70 pounds by means of a suitable feed valve.

With device handle in position No. 3 (Lap) and volume reservoir cut-out cock closed, open the supply cock and test device 3/8" cock. Coat the opening of the 3/8" cock with soap suds to detect rotary valve leakage to brake pipe. A 1" bubble in not less than five (5) seconds is permitted.

Close the 3/8" cock and move test device handle to position No. 6, then coat the device exhaust port with soap suds in positions 6, 5, 4, 3, 2 and 1 consecutively. A 1" bubble in not less than five (5) seconds is permitted.

With test device handle in position No. 1, open volume reservoir cut-out cock. After reservoir is charged to 70 pounds, compare gages and note that gage hands register within one-half ( $\frac{1}{2}$ ) pound.

By placing test device handle in the various positions indicated below, note that the volume reservoir charges or discharges within the rate limits specified for the respective device under test.

Not less than 30 seconds must elapse before commencing each of the following tests.

#### VOLUME RESERVOIR—RATE OF CHANGE IN PRESSURE

HANDLE POS.	PRESSURE	TIME-SEC.	CLASS
2*	Increase 40 to 60	26 to 29	Passenger
	Increase 40 to 50	38 to 43	Freight
4	Decrease 70 to 50	15 to 17	Passenger
	Decrease 70 to 50	27 to 31	Freight
5	Decrease 70 to 40	6 to 7	Passenger
	Decrease 70 to 50	5 to 7	Freight
6	Decrease 70 to 20	$3\frac{1}{2}$ to $4\frac{1}{2}$	Passenger
	Decrease 70 to 20	$5\frac{1}{2}$ to 7	Freight

\*NOTE—Begin test by first reducing volume reservoir pressure to about 30 pounds.

WESTINGHOUSE AIR BRAKE COMPANY  
AIR BRAKE DIVISION  
Wilmerding, Pa., U.S. A.

OFFICES

ATLANTA 3, - - - - -	Candler Building
BOSTON 16, - - - - -	Statler Building
CHICAGO 4, - - - - -	Railway Exchange Building
CLEVELAND 15, - - - - -	Midland Building
DENVER 2, - - - - -	Denver National Building
HOUSTON 2, TEX. - - - - -	Commerce Building
LOS ANGELES 14, - - - - -	Pacific Electric Building
MEXICO D. F., MEXICO - - - - -	Edificio Aztlan
NEW YORK 1, - - - - -	Empire State Building
ST. LOUIS 3, - - - - -	Shell Building
ST. PAUL 1, - - - - -	First National Bank Building
SAN FRANCISCO 5, - - - - -	Matson Building
SEATTLE 1, - - - - -	Securities Building
WASHINGTON 6, D. C. - - - - -	Ring Building





	DATE	TIME OF TEST	LOAD AT TIME OF TEST
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