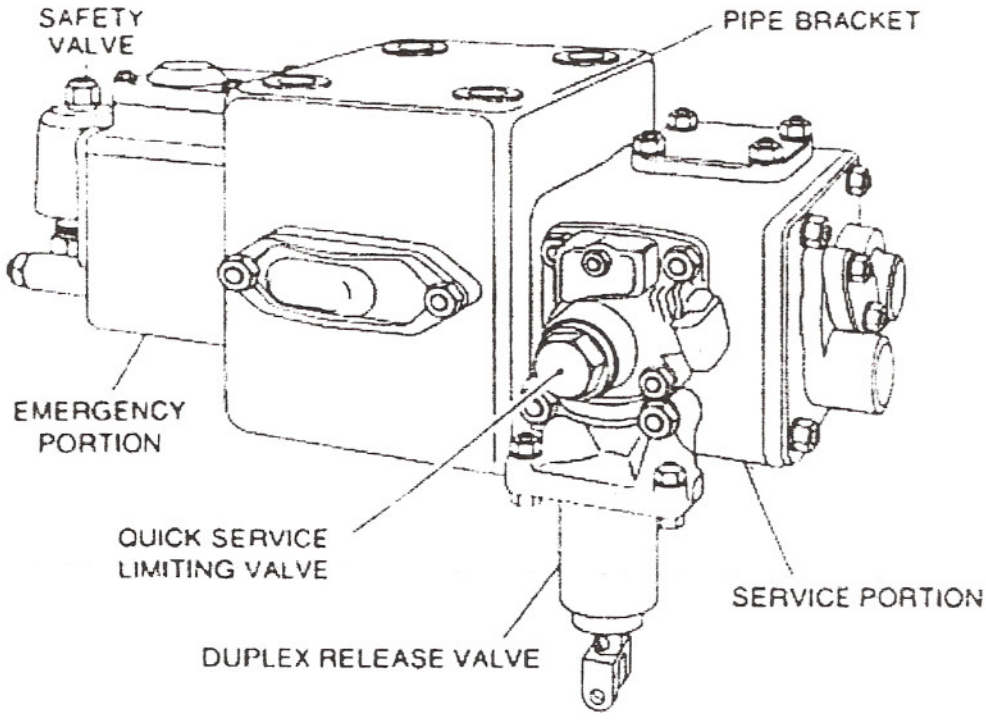
INSTRUCTION PAMPHLET

No. 5039-4, Sup. 3

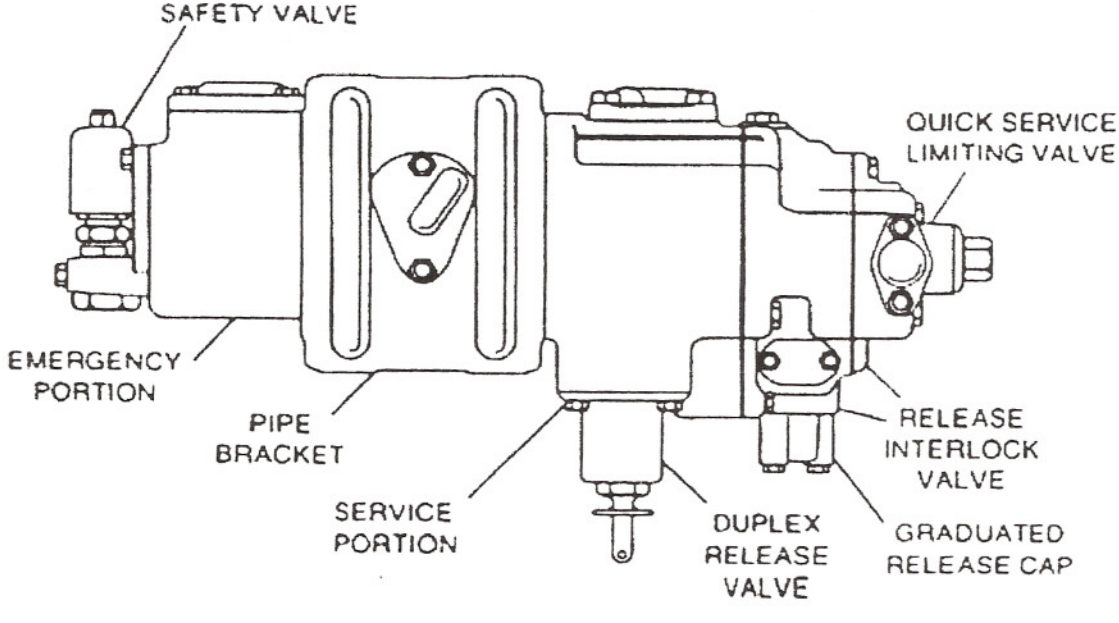
Standard S-044
Effective April 1, 1991

SINGLE CAR
TESTING DEVICE

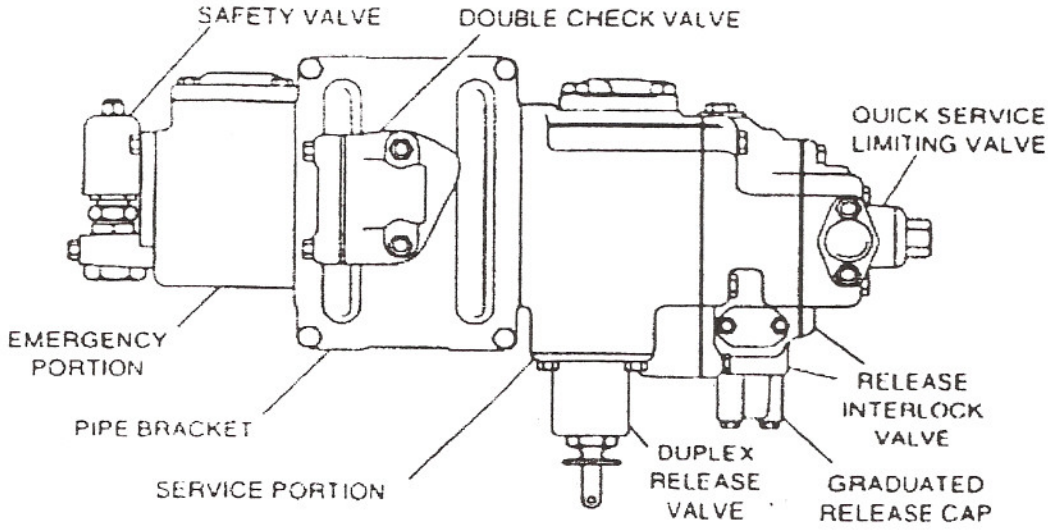
CODE OF TESTING FOR
PASSENGER CAR EQUIPMENT



D-22-A Control Valve



D-22-AR Control Valve



D-22-BR Control Valve

3.0 TESTS – D-22 TYPE CONTROL VALVES BY MEANS OF STANDARD SINGLE CAR TESTING DEVICE (WITH FLOWRATOR)

3.1 Preliminary Procedures

3.1.1 The tests are to be made with the feed valve adjusted for 90 psi. Before the test apparatus is attached to the supply line, the line must be blown out. *Daily Test for Single Car Testing Device as in SECTION 2.3 must be performed at least once a day before testing brake system.*

3.2 Connecting Device to Car

3.2.1 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 the device handle to Position 1 after making sure that the FLOWRATOR by-pass cock is open. With both angle cocks open, note that a continuous blow of air from the open hose occurs at the end of the car. Couple on a dummy hose coupling and charge the brake pipe and reservoirs to 90 psi.

3.3 System Leakage Test

3.3.1 Close the FLOWRATOR by-pass cock. If the float is not above the condemning lines, open the FLOWRATOR by-pass cock and proceed directly to TEST 3.4. If any part of the float is above the condemning line, make a complete check for leakage (with soap suds when weather conditions permit) of all pipes and pipe connections including angle cocks, hoses and auxiliary devices. If leakage is found, make repairs necessary to reduce it to where the float of the FLOWRATOR stays below the condemning line, then open the FLOWRATOR by-pass cock and proceed to TEST 3.4.

3.3.1.1 Excessive brake system leakage may be caused by absorption of air by water raising system or other auxiliary devices.

3.4 Service Stability Test

3.4.1 Install an air gage in the brake cylinder line. With the equipment fully charged, move the device handle to Position 5, reducing brake pipe pressure 25 psi, then slowly return handle to Position 3 (Lap). This test must not produce an emergency application. Observe brake cylinder gage. Allow 20 seconds for the brake cylinder gage to stabilize, then note that brake cylinder pressure increases no more than 3 psi in 1 minute.

3.5 Graduated Release Test

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

3.5.2 Move the device handle to Position 1 until brake pipe pressure has increased 5 to 6 psi, then return handle to Position 3 (Lap). Repeat the operation several times. At least three graduations must be obtained.

3.6 Application Test

3.6.1 Move the device handle to Position No. 1 to fully recharge the brake pipe and reservoirs. Move the device handle to Position 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 5 until a 5 psi brake pipe reduction is obtained, then slowly return the handle to Position 3 (Lap). The brake pipe pressure must continue to drop to within a 84 psi maximum and 80 psi minimum allowable pressure range. At some point between these values the reduction should decrease in rate or stop entirely. When testing cars equipped with an accelerated
application (AAV) feature and /or a B-1 Quick Service Valve, a greater quick service will be indicated. If brake pipe pressure has not stopped dropping before it reaches 80 psi, as indicated by the gage on the single car test device, move the device handle to Position No. 2 until the brake pipe pressure stops reducing, then immediately move the device handle back to Position No. 3. If the pressure does not stop reducing before 74 psi, while the device handle is in Position No. 2, the valve is defective.

3.6.1.1 Allow 20 seconds for the brake cylinder gage to stabilize. If the brake cylinder pressure increase at the end of a 1 minute period is more than 3 psi, the control valve is defective and should receive
periodic attention COT&S, With this application, the brake cylinder piston must extend from the cylinder.

3.7 Release Test

3.7.1 Move the device handle to Position 2.

3.7.2 Brakes must start to release in not more than 90 seconds. Failure to release in the time specified indicates that the valve must be removed.

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

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

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

3.7.5.1 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 valve has returned to release position. A continuous blow at the exhaust port, however, indicates that the service portion should be removed.

3.7.5.2 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 rigging is not at fault. Open the brake cylinder cut-out cocks.

3.7.5.3 Relay Valve

If the trouble has not been located in the 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 in-shot 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 valve ports are open, the portion should be removed.

3.7.6 Move device handle to Position 1 to fully recharge brake pipe and reservoirs. Remove air gage from brake cylinder line and apply proper plug for type of test fitting.

3.8 Emergency Test

3.8.1 Move the device handle to Position 1 to fully recharge the brake pipe reservoirs. Move the device handle to Position 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 3 (Lap), then open the test device 3/8" cock. This test must produce an emergency application as indicated by the opening of the vent valve by the time the brake pipe pressure drops 10 psi.

3.8.1.1 In rare instances, failure to obtain an emergency 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.

3.9 Release Test After Emergency

3.9.1 At the completion of the Emergency Test, wait approximately 30 seconds before attempting to release, in order to permit the vent valve to close. Close the test device 3/8" cock. Move the device handle to Position 1, and recharge the brake pipe to 28 psi then immediately move the device handle to Position 3 (Lap), and note that the brake pipe pressure continues to rise, indicating that the emergency piston has moved to accelerated release position. Move the device handle to Position 1 until the brake cylinder
pistons move to release position.

3.10 Emergency Brake (Conductor's) Valve Test

3.10.1 With the equipment completely charged, and device handle in Position 1, open the emergency brake (conductor's) valve observing carefully that there are no obstructions to 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.

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

3.10.3 At the completion of test, move device handle to Position 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 1 to recharge the brake system.

3.11 Displacement Reservoir, Retaining Valve and Brake Cylinder Leakage Tests

3.11.1 Displacement Reservoir and Retaining Valve System Leakage

3.11.1.1 Insert ate exhaust gage fitting (Figure 10) into the tapped retaining valve exhaust connection. Close the gage fitting bleed cock and turn the retaining valve handle to "Direct Exhaust" position.

On cars having no retaining valve, connect the exhaust gage fitting to the exhaust connection of the control valve pipe bracket by means of a suitable pipe bushing and close the bleed cock.

3.11.1.2 Make application and release of the brake until 50 psi or more pressure is indicated on the exhaust fitting air gage. Leave the handle of the Single Car Testing Device in Position 1. If in excess of 50 psi, the pressure must be reduced to 50 psi through the bleed cock.

3.11.1.3 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 psi in 1 minute.

3.11.1.4 If the drop in pressure exceeds 2 psi in 1 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 leakage found dose 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. If the drop in pressure does not exceed the above specified limit, proceed to paragraph 3.11.2, Brake Cylinder Leakage.

3.11.2 Brake Cylinder Leakage

3.11.2.1 For Cars with Plain Relay Valve (Such as Type "B" or "J-1")

a) Attach a second exhaust gage fitting (Figure 10) with bleed cock closed to relay valve by means of a suitable pipe bushing.

b) If the displacement reservoir pressure, as indicated on its respective exhaust gage fitting is less than 50 psi, make additional application and releases of the brake until the pressure is restored to 50 psi or more, when device handle is in Position 1.

c) Reduce displacement reservoir pressure to 44 psi by means of its respective exhaust gage fitting bleed cock. Reduce brake cylinder pressure to 50 psi through the bleed cock of the relay valve exhaust gage fitting.

3.11.2.2 For Cars with Differential Relay Valve (Such as Type "F" or "J-16")

a) Open the bleed cock and remove the exhaust gage fitting from the control valve or the retaining valve and insert it into relay valve exhaust by means of a suitable pipe bushing. Close the bleed cock.

b) Move device handle to Position 5 and reduce brake pipe pressure until the control valve safety valve opens, then return device handle to Position 1.

3.11.2.3 Observe the relay valve exhaust 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.

a) 3 psi in 1 minute (from not more than 50 psi) when testing a car on which the brake equipment has been given COT&S attention as specified in A.A.R. Rules of interchange.

b) 5 psi in 1 minute (from not more than 50 psi) when testing an "In-Date" car.

3.11.2.4 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 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. If the drop in pressure does not exceed the above specified limits, open gage fitting bleed cock (or Cocks) and remove exhaust gage fitting (or fittings).

3.11.3 If the car is equipped with a retaining valve, proceed to Retaining Valve Tests, Paragraph 9.0, *Beginning on page 22.*

4.0 TESTS D-22 TYPE CONTROL VALVES BY MEANS OF ALTERNATE STANDARD SINGLE CAR TESTING DEVICE

4.1 Preliminary Procedures

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

4.2 Test for Testing Device

Before coupling the device or device outlet hose (if used) move device handle to Position 3 (Lap) and open the cock in the supply pipe. Leakage from the brake pipe connection or exhaust port of the device, when detected with soap suds, must not exceed a 1" bubble in 5 seconds.

4.3 Connecting Device to Car

4.2.1 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 the device handle to Position 1. With both angle cocks open, note that a continuous blow of air from the open hose occurs at the end of the car. Couple on a dummy hose coupling and charge the brake pipe and reservoirs to 90 psi.

4.4 Service Stability Test

4.4.1 Install an air gage in the brake cylinder line. Move device handle to position 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 5, reducing brake pipe pressure 25 psi, then slowly return handle to Position 3 (Lap). This test must not produce an emergency application. Observe brake cylinder gage. Allow 20 seconds for the brake cylinder gage to stabilize, then note that brake cylinder pressure does not increase more than 3 psi in 1 minute.

4.5 System Leakage Tests

4.5.1 Brake Pipe Leakage

4.5.1.1 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 1 psi in 1 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. A slight pumping action of the emergency piston, indicated at the quick action exhaust, will not affect the leakage test.

4.5.2 Reservoir Leakage

4.5.2.1 During the brake pipe leakage test, if the control valve releases the brake in less than 1 minute, with the device handle in Position 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.

4.5.3 Brake Cylinder Leakage

4.5.3.1 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, brake cylinder leakage may be detected by pressure fluctuations indicated on this gage.

4.6 Graduated Release Test

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

4.6.1 Move the device handle to Position 1 until brake pipe pressure has increased 5 to 6 psi, then return handle to Position 3 (Lap). Repeat the operation several times. At least three graduations must be obtained.

4.7 Application Test

4.7.1 Move the device handle to Position No. 1 to fully recharge the brake pipe and reservoirs. Move the device handle to Position 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 5 until a 5 psi brake pipe reduction is obtained, then slowly return the handle to Position 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 psi. The brake must apply. A further drop in brake pipe pressure may be due to brake leakage, failure of the quick service limiting valve to close or leakage from the displacement reservoir system. Observe brake cylinder gage. Allow 20 seconds for the brake cylinder gage to settle, then note that brake cylinder pressure does not increase more than 3 psi in 1 minute.

4.7.1.1 When testing single cars equipped with a continuous type quick service valve, a greater quick service activity will be indicated, and the brake pipe reduction may exceed to 10 psi maximum specified above. If the total brake pipe reduction, however, exceeds 16 psi, 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

4.8 Release Test

4.8.1 Move the device handle to Position 2. The control valve service portion must move to release position within 20 seconds, plus 5 seconds for 1 psi per minute brake pipe leakage.

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

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

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

4.8.5 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 valve has returned to release position. A continuous blow at this exhaust port, however, indicates that the service portion should be removed.

4.8.6 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 rigging is not at fault. Open the brake cylinder cut-out cocks.

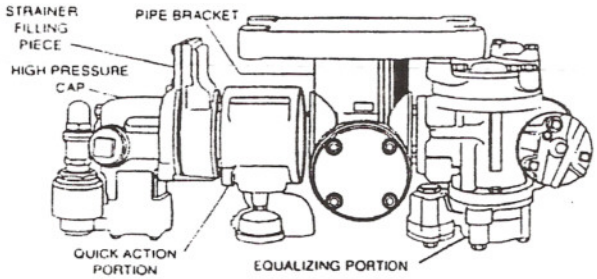
4.8.7 Relay Valve

If the trouble has not been located in the 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 in-shot 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.

4.8.8 Complete tests by continuing with tests 3.8 through 3.11, beginning on page *12*.

4.9 Move device handle to Position 1 to fully recharge brake pipe and reservoirs. Remove air gage from brake cylinder line and apply proper plug for type of test fitting.

5.0 & 6.0, 26-C Test Codes, are now covered by APTA Standard SS-M-005-98 or current issue.



U-12-BD Universal Valve Showing the Different Portions

7.0 U-12-B, U-12-BC and U-12-BD QUICK SERVICE UNIVERSAL VALVES BY MEANS OF STANDARD PASSENGER SINGLE CAR TESTING DEVICE WITH FLOWRATOR

7.1 Preliminary Procedures

7.11 The tests are to be made with the feed valve or reducing valve adjusted for 90 psi. Before the test apparatus is attached to the supply line, the line must be blown out. *Daily Test for Single Car Testing Device as in SECTION 2.3 must be performed at least once a day before testing brake system.*

7.2 Connecting Device to Car

7.2.1 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 the device handle to Position 1 after making sure that the FLOWRATOR by-pass cock is open. With both angle cocks open, note that a
continuous blow of air from the open hose occurs at the end of the car.

7.2.2 When testing a car having 1-1/4" brake pipe, couple on a dummy hose coupling and charge the brake pipe and reservoirs to 90 psi pressure.

7.3 System Leakage Test

7.3.1 Close the FLOWRATOR by-pass cock. If the float is not above the condemning line, open the FLOWRATOR by-pass cock and proceed directly to TEST 7.4. If any part of the float is above the condemning line, make a complete check for leakage (with soap suds when weather conditions permit) of all pipes and pipe connections, including angle cocks, hoses and auxiliary devices. If leakage is found, make the repairs necessary to reduce it to where the float of the FLOWRATOR stays below the condemning line, then open the FLOWRATOR by-pass cock and proceed to TEST 7.4.

NOTE – Excessive brake system leakage may be caused by absorption of air by water raising system or other auxiliary devices.

7.4 Service Stability and Slack Adjuster Tests

If the car is equipped with an automatic slack adjuster, increase the piston travel sufficiently to cause slack adjuster to operate.

7.4.1 With the equipment fully charged, move the device handle to Position 5, reducing brake pipe pressure 25 psi, then slowly return the handle to Position 3 (Lap). This test must not produce an emergency application. If an emergency application is obtained, it would indicate that the universal valve must be removed.

7.4.2 If the automatic slack adjuster is of the pneumatic type, soap the slack adjuster and all piping fittings between slack adjuster and brake cylinder with soap suds to detect leakage. No leakage is permitted. If leakage is detected, it must be corrected before proceeding with test.

7.4.3 Move device handle to Position 1 to release the brake and recharge reservoirs to 90 psi, noting that the slack adjuster functions. Make the necessary adjustments of the slack adjuster to set the piston travel to 7" or minimum travel for car or equipment. Check piston travel by repeating the application with a 2 psi reduction.

7.5 Graduated Release Test

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

7.5.2 Move the device handle to Position 1 until brake pipe pressure has increased 5 to 6 psi, then return handle to Position 3 (Lap). Repeat the operation several times. At least three graduations must be obtained.

7.6 Application Test

7.6.1 Move the device handle to Position 1 to recharge the brake system. Move the device handle to Position 4, reducing the brake pipe pressure 10 psi, then return handle to Position 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.

7.7 Release Test

7.7.1 Move the device handle to Position 2.

7.7.2 Brakes must start to release in not more than 90 seconds. Failure to release in the time specified indicates that the valve must be removed.

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

7.7.4 Move device handle to Position 1 to fully recharge brake pipe and reservoirs.

7.8 Emergency Test

7.8.1 Move the device handle to Position 1 to recharge the brake system. Move device handle to Position 6, reducing brake pipe pressure 20 psi. This test must produce an emergency application as indicated by the venting of brake pipe pressure to zero. If an emergency application is not obtained, it indicates that the valve portion must be removed.

7.9 Emergency Brake (Conductor's) Valve Test

7.9.1 Move the device handle to Position 1 to recharge the brake pipe 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 indicated, 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.

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

7.9.3 At completion of this test, move the device handle to Position 6.

7.10 For Brake Cylinder and Retaining Valve Tests, see paragraph 9.0, beginning on page 22.

8.0 TESTS

U-12-B, U-12-BC and U-12-BD QUICK SERVICE UNIVERSAL VALVES by MEANS of ALTERNATE STANDARD PASSENGER SINGLE CAR TESTING DEVICE.

8.1 Preliminary Procedures

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

8.2 Test for Testing Device

8.2.1 Before coupling the device or device outlet hose (if used), move the device handle to Position 3 (Lap) and open the cock in the supply pipe. Leakage from the brake pipe connection or exhaust port of the device when detected with soap suds, must not exceed a 1" bubble in 5 seconds.

8.3 Connecting Device to Car

8.3.1 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 the device handle to Position 1. With both angle cocks open, note that a continuous blow of air from the open hose occurs at the end of the car.

8.3.2 When testing a car having 1-1/4" brake pipe, couple on a dummy hose coupling and charge the brake pipe and reservoirs to 90 psi pressure.

8.4 Brake Pipe Leakage Test

8.4.1 Close the branch pipe cut-out cock to eliminate quick service. Move the device handle to Position 5, reducing brake pipe pressure 20 psi, then return the handle slowly to Position 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.

8.4.2 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 1 psi per minute.

8.5 Auxiliary Reservoir and Graduating Valve Leakage

Move the device handle to Position 1 to recharge the brake pipe, then open branch pipe cut-out cock. Move the device handle to Position 5, reducing the brake pipe pressure 20 psi, then return handle slowly to Position 3 (Lap). If the valve releases the brake in less than 1 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.

8.6 Graduated Release Test

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

8.6.1 Move the device handle to Position 1 until brake pipe pressure has increased 5 to 6 psi, then return handle to Position 3 (Lap). Repeat the operation several times. At least three graduations must be obtained.

8.7 Application Test

8.7.1 Move the device handle to Position 1 to recharge the brake system. Move the device handle to Position 4, reducing the brake pipe pressure 10 psi, then return handle to Position 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.

8.8 Release Test

8.8.1 If the brake applies, and the brake pipe reduction is made as specified in the Application Test, move the device handle to Position 2. The piston and slide valve must move to release position within 1 minute. Failure to release in the time specified indicates that the valve must be removed.

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

8.9 Service Stability and Slack Adjuster Tests

If the car is equipped with an automatic slack adjuster, increase the piston travel sufficiently to cause slack adjuster to operate.

8.9.1 Move the device handle to Position 1 to recharge the brake system. Move device handle to Position 5, reducing brake pipe pressure 25 psi, then slowly return the handle to Position 3 (Lap). This must not produce an emergency. If an emergency application is obtained, it would indicate that the universal valve must be removed.

8.9.2* If the automatic slack adjuster is of the pneumatic type, soap the slack adjuster and all piping and fittings between slack adjuster and brake cylinder with soap suds to detect leakage. No leakage is permitted. If leakage is detected, it must be corrected before proceeding with test.

8.9.3* Move device handle to Position 1 to release the brake and recharge reservoirs to 90 psi, noting that the slack adjuster functions. Make the necessary adjustments of the slack adjuster to set the piston travel to 7", or minimum travel for car or equipment. Check piston travel by repeating the application with a 20 psi reduction.

8.9.4 Move device handle to Position 1 to fully recharge brake pipe and reservoirs.

8.10 Complete Tests by continuing with Tests 7.8, 7.9 and 7.10, beginning on page *19*.

* To be performed if car is equipped with slack adjuster.

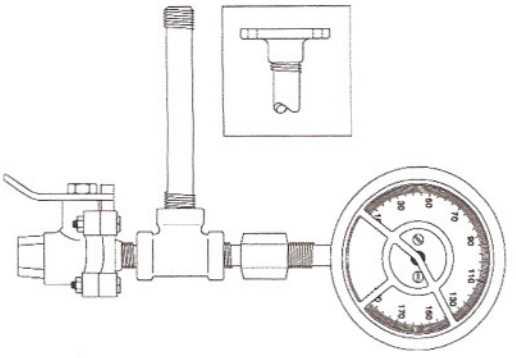


Figure 10 Exhaust Gage Fitting. Pc. No. 522598

9.0 TESTS – BRAKE CYLINDER AND RETAINING VALVE

9.1 Preliminary Procedures

9.1.1 The following repair track test code, which covers the necessary tests for retaining valve, and for brake cylinder leakage and piston travel on passenger cars, supplements (where called for) the tests prescribed on the preceding pages of this Instruction Pamphlet for other brake devices.

9.1.2 When testing cars equipped with a two or three position retaining valve, an Exhaust Gage Fitting as shown by Figure 10 must be available. This fitting must be inserted into the tapped retainer exhaust port after the wasp excluder, if equipped with such, has been removed.

9.2 Leakage

9.2.1 With the exhaust gage fitting attached, the bleed cock closed and the retainer handle turned down to "Direct Exhaust" position, make applications and releases of the brake noting that the brake cylinder piston moves to applied position, until 50 psi or more brake cylinder pressure is indicated on the exhaust fitting air gage when the handle of the single car testing device is in Position 1. If in Excess of 50 psi, the pressure must be reduced to 50 psi through the bleed cock.

9.2.2 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.

3psi in 1 minute (from 50 psi) when testing a car on which the brake equipment has been given COT&S.

5 psi in 1 minute (from 50 psi) when testing an "In-Date" car.

9.2.3 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 in which case the defective conditions must be corrected. If the drop in pressure does not exceed above specified limits, proceed, as follows:

9.3 Retaining Valve Test

9.3.1 Cars Equipped with "Two Position" Retaining Valve

9.3.1.1 Move the retaining valve handle up to "Retaining" (horizontal) position and immediately open the bleed cock, leaving handle in this position for 40 seconds. Note that a continuous exhaust of air through the choked exhaust port in the retaining valve cap is obtained.

9.3.1.2 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.

9.3.2 Cars Equipped with "Three Position" Retaining Valve

9.3.2.1 Move the retaining valve handle up to "High Pressure" position and immediately open the bleed cock, leaving handle in this position for 15 seconds, noting that a continuous exhaust of air through the choke exhaust port in the retaining valve cap is obtained.

9.3.2.2 Move retaining valve handle to "Low Pressure" position, leaving handle in this position for 2 minutes and 45 seconds, noting that air continues to exhaust through the choked exhaust port.

9.3.2.3 Move retaining valve handle to "Direct Exhaust" position and note that a sufficient flow is obtained to indicate that effective brake cylinder pressure has been retained.

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

9.3.3 If during the above tests of the 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.