

Standard for Code of Tests for Passenger Car Equipment Using Single Car Testing Device

Approved January 22, 1998
APTA PRESS Task Force

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APTA Commuter Rail Executive Committee

Abstract: The recommended practice for the testing of a single passenger car equipped with 26-C Style brake equipment has been established. The intent of this publication is to provide a standard means by which passenger car brake equipment can be tested before entering into service. The practices outlined herein may be modified by the equipment manufacturer/operating authority as long as the original intent of the publication has been maintained. All modifications to this publication may be subject to inspection to insure that the equipment is tested properly.

Keywords: single car test, single car test device

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Introduction

(This introduction is not a part of APTA SS-M-005-98, Standard for Code of Tests for Passenger Car Equipment Using Single Car Testing Device)

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Contents

APTA SS-M-005-98

Standard for Code of Tests for Passenger Car Equipment Using Single Car Testing Device

1. Overview

1.1 Scope

This code of tests must be used after January 1, 1999 for testing 26-C type brake equipment. The Single Car Test Device may need to be modified to meet these requirements.

The purpose of this standard is to describe the test procedures by which a general check on the condition of passenger brake equipment on cars can be made. It covers cars while in service and cars having undergone "periodic repairs". The Single Car Testing Device enables this testing to be accomplished without removal of any components from the car.

2. References

This standard shall be used in conjunction with the following publications. When the following standards are superseded by an approved revision, the revision shall apply.

AAR Spec M-912 – 1983

AAR Spec M-914 - 1983

ASME B40.1 – 1991

NOTE:

Please refer to the table below to determine which dated publication of Instruction Pamphlet No. 5039-4 is appropriate for the equipment being tested. Copies of these publications may be obtained from the following:

Tourist Railway Association, Inc.
 PO Box 28077
 Denver, CO 80228-0010
 (303) 588-7764

Equipment Type	Last Appeared in 5039-4, Sup. 3	Supplement
D-22 Type Control Valve	April 1, 1991	Sup 3
U-12 Type Control Valve	April 1, 1991	Sup 3
No. 3 Type Control Valve	January 1980	Sup 1

L Type Triple Valve	January 1980	Sup 1
P Type Triple Valve	January 1980	Sup 1
*PS Type Triple Valve	January 1980	Sup 1
*PS does not refer to Electro-Pneumatic overlay type equipment.		

Equipment testing as described above may be done using Standard and Alternate Standard Testing Device

For testing K Type Triple Valve, please refer to the following publication:

Instruction Pamphlet No. 5030 February 1943

For testing Conductor’s Air Signal Equipment, please refer to the following publication:

Conductor’s Air Signal Instruction Leaflet No. 2377-2, July 1942

3. Definitions, abbreviations, and acronyms

4. Single Car Testing Device and Bleed Cock Arrangement

NOTE:

The Single Car Testing Device used must conform to the requirements of this standard. After January 1, 2000 the Device must be equipped with a FLOWRATOR, reducing valve and strainer.

4.1 Description

4.1.1 General

4.1.2

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 devices are identified by nameplates, which are marked "SPFRS" for passenger single car test device or "SFFRS" for freight single car test device. It is important to use the correct Testing Device for the type of cars being tested.

Throughout this standard the Single Car Testing Device shall be referred to as the “Device”. The Device is shown in Figure 1. The Rotary Valve and Rotary Valve Seat are shown in Figure 2.

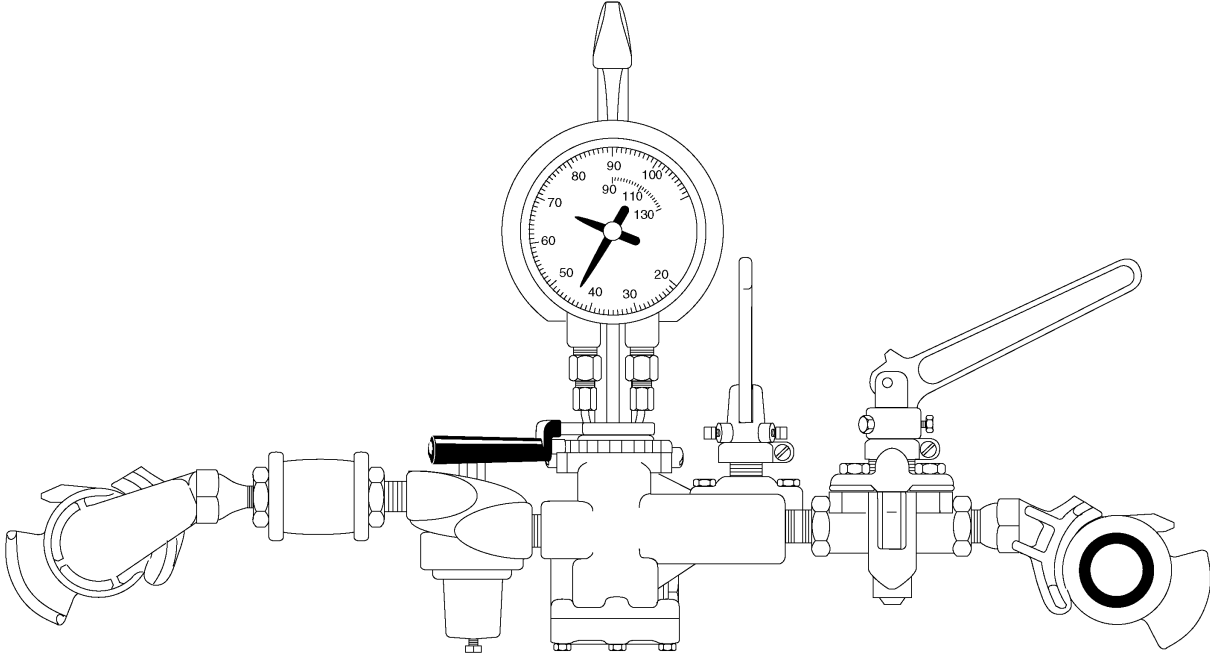


Figure 1 Standard Passenger Single Car Testing Device with FLOWRATOR (SPFRS designation)

POSITIONS OF STANDARD PASSENGER SINGLE CAR TESTING DEVICE

Position No. 1	M.R. charges brake pipe through .250" (1/4" drill) 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 .0465" (No. 56 drill) opening.
Position No. 5	Brake pipe pressure reduces through .09375" (3/32" drill) opening.
Position No. 6	Brake pipe pressure reduces through .1875 (3/16" drill) opening.
3/8" Test Device Cock-	Brake pipe pressure reduces through .375" (3/8" drill) opening.

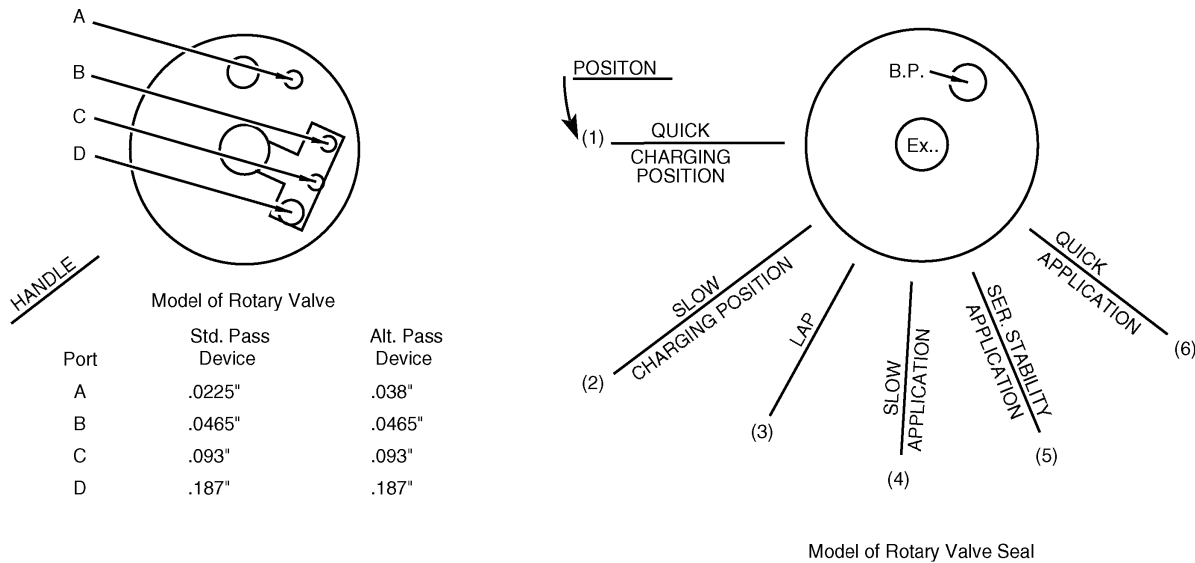


Figure 2 Rotary Valve and the Rotary Valve Seat of the Single Car Testing Device

4.2 Test Gage Arrangement

4.2.1

All gages used during the following tests must be performed using an ASME Grade 2A gage or equivalent as specified by ASME B40.1. The gage must be calibrated as specified by ASME requirements.

4.2.2

The typical gage arrangements consist of either a gage or gage with bleed cock, connected to short length of hose and the appropriate equipment interface fitting (flange, test point, pipe tap, etc). The equipment interface fittings must provide an airtight seal and should be checked whenever leakage is detected during the test. Use the correct interface fitting for each test gage connection as determined by the equipment manufacturer / operating authority. Figure 3 shows a typical test gage with bleed cock and pipe thread / flange fitting.

4.3 Dummy Couplings

4.3.1

One “F” type non-vented dummy coupling (Brake Pipe) and one “L” type non-vented dummy coupling (Main Reservoir) are required.

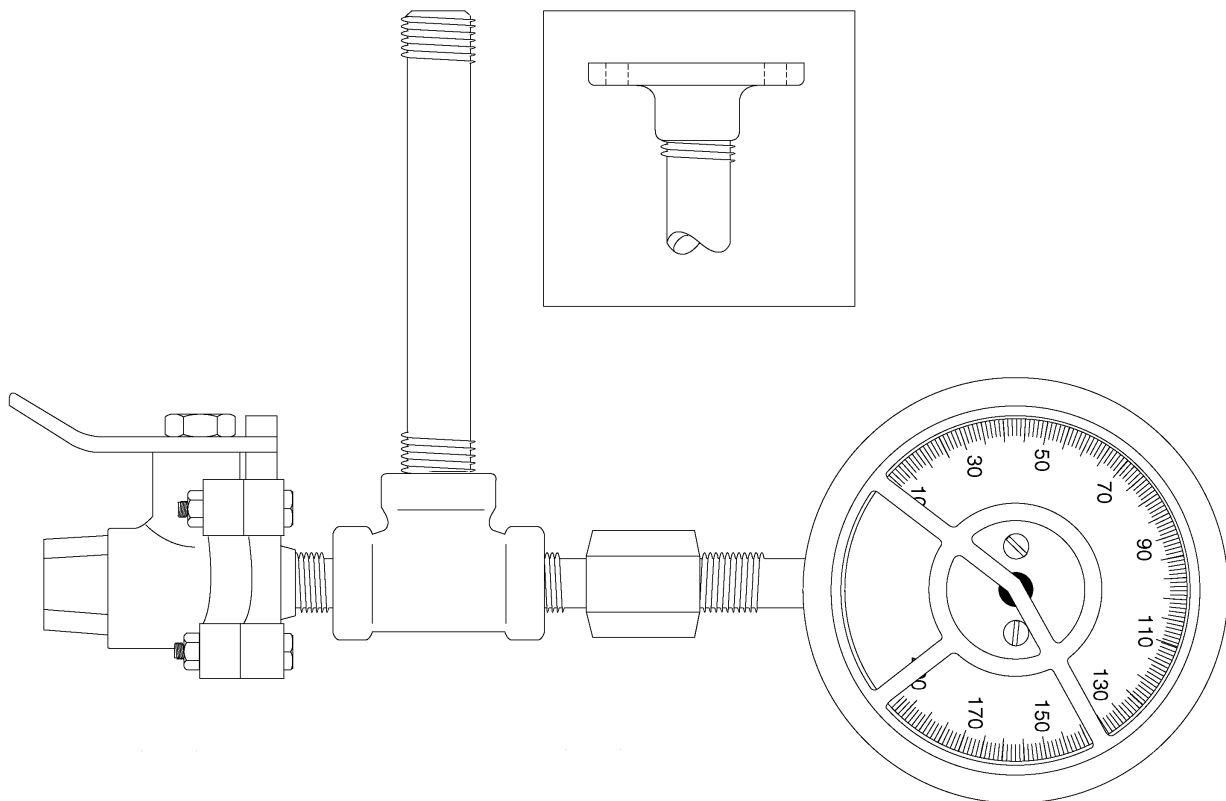


Figure 3 Test Gage: Bleed Cock Arrangement

5. General Test Procedures

5.1 Testing Device Preparation

5.1.1

The Single Car Testing Device must be maintained in accordance with SECTION 14.0.

5.1.2

The Daily Test as specified in SECTION 14.1 must be performed prior to using the Device on that day.

5.1.2.1

A source of clean, dry air shall be maintained at 100 psi minimum to the Device during test for proper operation and results. An efficient air filter in the supply line ahead of the regulating valve must be installed. **Before the Device is attached to the supply line, the line must be blown out.**

5.1.2.2

Between the 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 3/4" size with 1/2" connecting nipples and not greater than 8 feet in length. A flat (roll-up) hose may be used to connect the Device to the car being tested, however no kinks are allowed in the hose at any time during the test.

5.1.2.3

FLOWRATOR shall be within **15 degrees** of vertical.

5.1.2.4

The Device ends, Device exhausts and test coupling must be protected from contamination (entry of dirt).

5.1.2.5

The tests are to be made with the Device reducing valve adjusted for 90 psi

5.1.3

Care should be exercised in moving the Device handle back to Position No. 3 (Lap) after making brake pipe reductions of 15 psi or more in Position No. 5 and Position No. 6. When the handle is snapped back, the temperature effect may cause the brake pipe pressure to rise 1-1/2 and 2 psi and may be the cause of an undesired release. The Device handle should be moved slowly toward Lap position.

5.1.4

When making tests of cars having two sets of brake equipment, each set must be tested separately, with the branch pipe Cut-Out Cock closed to one set while the other set is being tested.

5.1.5

In the event of the valve failing to pass the specified test, it must be ascertained that the Device and any test gage attachments are not at fault.

5.1.6

To determine a “fully charged system” utilizing the FLOWRATOR, place the Device handle in Position No. 1 and close the FLOWRATOR by-pass cock. If ball remains below the condemning line of the FLOWRATOR tube the system is fully charged, open the FLOWRATOR by-pass cock. If the ball rises above the condemning line of the FLOWRATOR tube the system is not fully charged or the system has excess leakage, open the FLOWRATOR by-pass cock and allow the system to continue charging.

5.1.6.1

For equipment which utilizes equalization of the brake cylinder supply reservoir to the brake cylinders, a longer time period may be required to properly charge the control reservoir even if the FLOWRATOR ball is below the condemning line.

5.1.7

If using a Device when the FLOWRATOR has been disqualified by the daily test in SECTION 14.1 or if not equipped with a FLOWRATOR, the determination of a “fully charged system” may be done as follows:

5.1.7.1

Move the Device handle to Position No. 3 (Lap) for 5 seconds. If the brake pipe pressure decreases, the system has not reached fully charged or the system has excess leakage. Place the Device handle Position No. 1 and continue charging.

5.2 General Information

5.2.1

As used in this specification, pounds per square inch (psi) shall indicate pressure as pounds per square inch gage (psig) unless otherwise specified. The pressure measured is greater than ambient using ambient pressure as the reference.

5.2.2

Throughout this standard the term “Cut-In” (OPEN) will be used to designate a cut-out cock that will allow the passage of air between equipment components. The Term “Cut-Out” (CLOSED) will be used to designate a cut-out cock that will prevent the flow of air between equipment components.

5.2.3

Any ancillary equipment not tested by this standard shall be tested in accordance with equipment manufacturer / operating authority instructions.

5.2.4

Passenger cars equipped with freight brake systems must be tested in accordance with equipment manufacturer / operating authority instructions based upon current Federal Regulations.

5.2.5

When a car is equipped with a main reservoir pipe, air pressure of 100 psi minimum should be connected to the main reservoir trainline as instructed in the procedure. The dual air source arrangement (brake pipe and main reservoir) will aid in reducing the test time and will not compromise test results.

5.2.6

The following *Nominal values need to be obtained from the operating authority for use in testing.

Required ¹Nominal Values			
	Air Spring Pressure	Brake Cylinder Pressure	
		Service	Emergency
Non Load Weigh	³ 0	² X	² X
Empty (Light)			
Loaded(Heavy)⁴			
1. Nominal values represent the normal values that are obtainable on an “in-date” car. These values should be obtained from the equipment manufacturer / operating authority.			
2. Only these pressures are required for cars not equipped with a load weigh system			
3. Zero (0) Air Spring Pressure is used for cars not equipped with a load weigh system or the brake cylinder pressure when load weigh is cut-out (Not Operating).			

<p>4. Loaded (Heavy) car air spring pressure must be higher than the Empty (Light) car pressure such that the Loaded car brake cylinder pressure plus tolerance does not overlap the Empty car brake cylinder pressure plus tolerance. Heavy car air spring pressure does not have to be equivalent to maximum loaded pressure of the car</p>
<p>.5. For equipment which utilizes equalization, the brake cylinder pressure tolerance shall be ± 5 psi. This tolerance is based on volume variations in car piping.</p>

6. Car Preparation

6.1 Safety

6.1.1 Chock wheels to prevent car motion during tests.

6.1.2 Follow car testing safety regulation of the operating authority.

6.2 Car Setup

6.2.1

Open cut-out cock between the Main Reservoir and Air Spring system if equipped.

6.2.2

Insure that the hand brake / parking brakes are released where applicable.

6.2.3

Water raising equipment should be Cut-Out at the water filling valves.

6.2.4

Other ancillary equipment must be Cut-Out.

6.2.5

The brake system cocks must be placed in the appropriate positions before testing begins as follows:

BRAKE SYSTEM COCKS	POSITION
Brake Pipe and Main Reservoir (If equipped) trainline cocks	OPEN
Brake Pipe Branch Pipe Cut-Out Cock	Cut-In

All device cocks attached to Brake Pipe	Cut-In
Brake Cylinder (Truck Cut-Out)	Cut-In

WARNING: INSURE THAT NO AIR IS ON THE CAR BEFORE MAKING ANY OF THE FOLLOWING GAGE CONNECTIONS. PLUGS OR BLANKING PLATES MUST BE CAREFULLY LOOSENED BEFORE THEY ARE REMOVED IN ORDER TO MINIMIZE THE POSSIBILITY OF PERSONAL INJURY FROM THE EFFECTS OF RESIDUAL, PRESSURIZED AIR THAT MAY BE IN THE EQUIPMENT COMPONENTS.

6.2.6

Connect ASME Grade 2A gage to the test points of the following: main reservoir trainline (if equipped), brake cylinder, *control valve exhaust (10 port), *relay valve exhaust, and load weigh (air spring) system (if equipped). A single gage may be used but must be moved between each test point during the testing procedures as required. The bleed cocks must be open on the control valve and relay valve exhausts before beginning procedures outlined in this standard.

*Test gage must include a bleed cock to properly perform tests.

6.2.7

An ASME Grade 2A gage may be connected to 16 pipe, if desired by the operating authority to aid in testing.

7. Test Equipment Installation

7.1 Connecting The Device to Car

WARNING: CARE SHOULD BE TAKEN THAT ALL SUPPLY AIR IS CUT-OUT TO PREVENT ANY WHIPPING OR LASHING HOSES AND COUPLINGS. MAKE CERTAIN THAT ALL TEST GAGES AND THE DEVICE FASTENED AND/OR CONNECTED SECURELY TO MINIMIZE THE POSSIBILITY OF PERSONAL INJURY FROM PARTS THAT MAY BE “BLOWN” FROM THE TEST ARRANGEMENT WHEN AIR IS ADMITTED TO THE TEST RACK.

7.1.1

Connect the Device end marked B.P. to the brake pipe hose at one end of the car (preferably at "B", hand brake, end of car). Move the Device handle to Position No. 1 after making sure that the FLOWRATOR by-pass cock is open. With both angle cocks open, note a continuous blow of air from the open hose occurs at the other end of the car. Close the Brake Pipe angle / end cock at the end opposite the Device, and couple on a non-vented “F” type dummy hose coupling. Open the Brake Pipe angle / end cock at the end opposite the Device. Continue charging the brake pipe and reservoirs to 90 psi. If the car is equipped with main reservoir trainline, close the cut-out cock on opposite end of car from the Device.

8. Leakage Tests

8.1 System Leakage Test

8.1.1

Close the FLOWRATOR by-pass cock. If the ball is not above the condemning line, open the FLOWRATOR by-pass cock and proceed directly to SECTION 6.2 Main Reservoir Leakage (if equipped). If any part of the ball 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, check valves and auxiliary devices.

8.1.2

If leakage is found, make repairs necessary to reduce it to where the ball of the FLOWRATOR stays below the condemning line, then open the FLOWRATOR by-pass cock and proceed to SECTION 6.2 Main Reservoir Leakage (if equipped).

8.1.2.1

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

8.1.2.2

If air is detected exhausting from the main reservoir trainline at the Device end of car, the main reservoir check valve(s) must be corrected/replaced.

8.2 Main Reservoir Leakage(if equipped)

8.2.1

Before making any hose connection the supply line must be blown out.

8.2.2

Make a connection of a 100 psi minimum supply air (air must be from a clean, dry source) to the main reservoir pipe hose at one end of the car. Note: The air supplied to the main reservoir pipe must be taken from the supply side of the Device or an alternate air supply line.

8.2.3

With the 100 psi test air supply cut-out cock closed, open the main reservoir cut-out cock at the end of the car opposite the supply air connection.

8.2.4

Partially open the 100 psi test air line supply Cut-Out Cock. Note the continuous blow of air from the main reservoir hose opening at the opposite end of the car.

8.2.5

Close the main reservoir cut-out cock. Connect a non vented “L” type dummy hose coupling to the main reservoir pipe hose coupling at the end of the car opposite the 100 psi test supply air connection. Open the main reservoir cut-out cock.

8.2.6

Confirm installation of an air gage to the main reservoir trainline.

8.2.7

Move the Device handle to Position No. 3 (Lap).

8.2.8

Open the main reservoir test air supply cock and fully charge the main reservoir system.

8.2.9

Move the Device handle to Position No. 5, and make a 10 psi reduction in brake pipe. Place the Device handle in Position No. 3 (Lap).

8.2.10

After 30 seconds, observe the Device gage, pressure increase must not exceed 3 psi in 1 minute and must stabilize.

8.2.11

Close the main reservoir test air supply cock.

8.2.12

Observe the main reservoir gage, pressure decrease must not exceed 5 psi in 1 minute.

8.2.13

Open the main reservoir test air supply cock. Move the Device handle to Position No. 1 and fully charge the brake equipment.

9. Functionality Testing**9.1 Preparation****9.1.1**

Cars equipped with load weigh systems must either temporarily disable the variable load valve or inhibit its operation by reduction of the air spring pressure to the variable load valve a minimum

of 10 psi below the Light (Empty Car) air spring pressure.

9.2 Service Stability Test

9.2.1

Confirm installation of an air gage in the brake cylinder line. With the equipment fully charged, move the Device handle to Position No. 5, reducing brake pipe pressure 25 psi, then slowly return handle to Position No. 3 (Lap). This test must not produce an emergency application. Observe brake cylinder gage, and verify that the non-load weigh service brake cylinder pressure ± 3 psi as specified is correct.

9.2.2

Allow 20 seconds settling time for brake cylinder then note that brake cylinder pressure increases no more than 3 psi in 1 minute. An increase in brake cylinder pressure during this 1 minute period indicates a faulty relay valve portion, control valve service portion, or variable load valve, if equipped.

9.3 Graduated / Direct Release Testing

NOTE:

Cars shall be tested for direct or graduated release based on the type of service the car is used in. If the Graduated/Direct Release Cap on the 26C Service Portion is set to Graduated, proceed to SECTION 7.3.1. If the Graduated/Direct Release Cap is set to Direct Release, proceed to SECTION 7.3.2. If a car is used in both Graduated and Direct service then the system must be tested in graduated and direct release operation with the Graduated/Direct Release Cap set to the mode of operation being tested.

CAUTION - When changing the Graduated/Direct Release Cap or other related covers, refer to the operating authority / manufacturer instructions.

9.3.1 Graduated Release Test

9.3.1.1

With a 25 psi brake pipe reduction in effect, move the Device handle to Position No. 1 until brake pipe pressure has increased 5 to 6 psi, then return handle to Position No. 3 (Lap). Brake cylinder control (port 10 exhaust) pressure must exhaust. Repeat the operation several times. At least three separate brake cylinder control pressure exhausts (graduations) must be obtained.

9.3.1.2

Move the Device handle to Position No. 1 to fully recharge the brake pipe and reservoirs. Check that the equipment is fully charged.

9.3.1.3

Proceed to Application Test SECTION 7.4, unless the equipment requires the Direct Release Test then proceed to Direct Release Test SECTION 7.3.2.

9.3.2 Direct Release Test

9.3.2.1

With a 25 psi brake pipe reduction in effect, move the Device handle to Position No. 1 until brake pipe pressure has increased 10 to 11 psi, then return handle to Position No. 3 (lap). Brake cylinder control (port 10 exhaust) pressure must fully exhaust.

9.3.2.2

Move the Device handle to Position No. 1 to fully recharge the brake pipe and reservoirs. Check that the equipment is fully charged.

9.4 Application Test

9.4.1

With the equipment fully charged, move the Device handle to Position No. 5 until a 5 psi brake pipe reduction is obtained, then slowly return the handle to Position No. 3 (Lap). The brake pipe pressure must continue to drop to within an 84 psi maximum and 80 psi minimum allowable pressure range. The brake pipe pressure must remain between 80 and 84 psi, then proceed to SECTION 7.4.2. NOTE: For PS-68 Type brake equipment, a 10 psi reduction is required.

9.4.1.1

If brake pipe pressure continues to decrease and the car is equipped with an accelerated / continuous service application feature (B-1 Quick Service Valve or Accelerated Application Valve), a greater quick service activity may be indicated by the continual decrease in brake pipe pressure. 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 control valve service portion or the portion with the accelerated / continuous service application feature is defective and must be replaced.

9.4.2

Allow 20 seconds for the brake cylinder gage to stabilize. The brake cylinder pressure must not increase / decrease more than 3 psi in 1 minute. If the pressure requirement is not met, the relay valve portion, the control valve service portion, or the variable load valve portion, if so equipped, is defective and the appropriate valve portion must be removed and replaced. With this application, the brake shoes/pads must be in firm contact with the braking surfaces.

9.5 Release Sensitivity Test

9.5.1

Move the Device handle to Position No. 2. NOTE: During the release test, the feed or reducing valve pressure must not decrease more than 2 psi.

9.5.2

Brake cylinder pressure must begin to decrease within 90 seconds as indicated by an exhaust of air from the control valve exhaust. Failure to release in the time specified indicates a faulty control valve service portion.

9.5.3

Continue the test until brake cylinder pressure is zero (0) psi and brake shoes/pads are fully released from the brake surfaces as defined by the equipment manufacturer / operating authority.

9.5.4

Failure to obtain the proper brake release 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. If the test performed in SECTIONS 7.5.2 and 7.5.3 are passed then proceed to Emergency Brake Application Tests SECTION 8.0.

9.5.4.1 Control Valve

During the release test, an exhaust of air should occur at the exhaust port. A continuous blow at this exhaust port, however, indicates that the control service portion is defective.

9.5.4.2 Brake Cylinders

Close the brake cylinder cut-out cocks, and vent brake cylinder air to atmosphere. If the brake shoes/pads return to release position, the rigging is not at fault. Return the brake cylinder cut-out cocks to their normal operating position.

9.5.4.3 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 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 is defective.

9.5.5

Place the Device handle in Position No. 1 and fully recharge the brake system.

10. Emergency Brake Application Tests

10.1 Pre-Test Instruction

10.1.1

If the car is equipped with a Branch Pipe Cut-Out Cock capable of cutting out an emergency venting function, then proceed to Emergency Test (Control Valve / Operating Unit Cut-Out) SECTION 8.2. If the car is not equipped with a Branch Pipe Cut-Out Cock capable of cutting out an emergency venting function, then proceed to Emergency Test (Venting Device Plugged) SECTION 8.3.

10.2 Emergency Test (Control Valve / Operating Unit Cut-Out)

NOTE:

The following test must be individually performed for each auxiliary venting device on the car. Devices not being tested must be cut-out / plugged.

10.2.1

Verify that the system is fully charged. Move the Device handle to Position No. 5 and make a reduction of brake pipe pressure to 60 psi. Move the Device handle to Position No. 3 (Lap).

10.2.2

Cut-Out the control service portion at the Brake Pipe Branch Pipe Cut-Out Cock.

10.2.3

With the Device handle in Position No. 3 (Lap), open the Device 3/8" cock. This test must produce an emergency application as indicated by the opening of the auxiliary venting device(s) and the sudden decrease in brake pipe pressure.

10.2.3.1

Failure to obtain an emergency may be caused by a decrease in the venting device volume, due to the accumulation of excessive moisture or, by a restricted orifice.

10.2.4

Place the Device handle in Position No. 1 to fully recharge brake pipe and reservoirs. While system is charging, Cut-In the control service portion that was Cut-Out at the Brake Pipe Branch Pipe Cut-Out Cock.

10.3 Emergency Test (Venting Device Plugged)

NOTE:

The following test must be individually performed for each venting device on the car. Devices not being tested must be cut-out / plugged.

10.3.1

Plug all auxiliary brake pipe emergency venting device(s) except the one being tested.

10.3.2

With the equipment fully charged. Move the Device handle to Position No. 5 and make a reduction of brake pipe pressure to 60 psi. Place the Device handle in Position No. 3 (Lap).

10.3.3

Open the Device 3/8" cock. This test must produce an emergency application as indicated by opening of the emergency venting device and the sudden decrease in brake pipe pressure.

10.3.3.1

Observe brake cylinder gage, and verify that the non-load weigh emergency brake cylinder pressure ± 3 psi (or equalization pressure) as specified is correct. The non-load weigh brake cylinder pressure generated by this test need only be verified when the first venting device is plugged. An emergency application as indicated by the opening of the emergency venting device and the sudden decrease in brake pipe pressure is required during all subsequent tests of emergency venting devices.

10.3.4

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.

10.3.5

Remove plugs from all emergency venting devices and install all vent protectors.

10.4 Release Test After Emergency

10.4.1

At the completion of the Emergency Test, close the Device 3/8" cock. Wait 2 minutes. After 2 minutes, if brake pipe pressure rises on the Device gage the control valve service portion is defective.

10.4.2

Move the Device handle to Position No. 1 and recharge the equipment.

11. Leakage Tests – Control and Brake Cylinder

11.1 Control Valve

11.1.1

Verify connection of the gage to the control valve exhaust (10 port) and close the bleed cock.

11.1.2

With the equipment fully charged reduce brake pipe pressure 26 psi in Position No. 5 then return the Device handle back to Position No. 1. If test gage indicates a pressure in excess of 50 psi, the pressure must be reduced to 50 psi through the bleed cock.

11.1.3

Observe the test gage for leakage from the combined volumes of the relay valve diaphragm chamber, 16 pipe/10 port (if used) and their related piping, which must not exceed 2 psi in 1 minute.

11.1.4

If the drop in pressure exceeds 2 psi in 1 minute, inspect the 16 pipe/10 port and 16 pipe/10 port pipe as well as all other related piping, and eliminate any leakage. Initially check the gage installed for the leakage test in the 16 pipe/10 port for leakage before checking the remainder of the system. 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, control valve, or a combination of related devices, in which case the defective conditions must be corrected. If the drop in pressure does not exceed the above specified limit, proceed to Brake Cylinder Leakage SECTION 9.2.

11.2 Brake Cylinder Leakage

NOTE:

If the car is not equipped with a brake cylinder relay valve then proceed to Emergency Brake (Conductor's Valve Test) SECTION 10.0.

11.2.1

With the equipment fully charged, open the bleed cock on 10 port. Close the bleed cock on Relay Valve exhaust.

11.2.2

Reduce brake pipe pressure 26 psi in Position No. 5 then return the Device handle back to Position No. 1. Leave the handle of the Device in Position No. 1. The pressure obtained by the reduction should be a full service brake pressure. If the pressure on the test gage is in excess of 50 psi, the pressure must be reduced to 50 psi through the bleed cock.

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 must not exceed 3 psi in 1 minute.

11.2.3.1

If the drop in pressure exceeds the amount specified, inspect the brake cylinder 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 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.

12. Emergency Brake (Conductor's) Valve Test

12.1 Valve Test

NOTE:

The following test must be performed for the first Emergency Brake Valve handle tested on the car. The remaining Emergency Brake Valve handles must be tested in accordance with Remaining Valves SECTION 10.2.

12.1.1

With the equipment fully charged, and the 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 application is not obtained, a restriction to air flow in the 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 the application valve.

12.2 Remaining Valves

12.2.1

Repeat the above operation for each emergency brake (conductor's) valve handle if car is equipped with more than one valve handle, allow 1 minute between testing of each valve so that the system may reset and begin to charge. A full charge of the brake system is not required to test the function of the remaining Emergency Brake (Conductor's) Valve handles and application valves.

13. Variable Load Control (If Applicable)

NOTE:

The following section provides a guide to testing variable load control systems. The test may be performed as described below or the test may be modified or performed in any sequence to meet the specific operation of a particular variable load control system. This procedure must agree with the original equipment manufacturer specification.

13.1 Empty (light car)

13.1.1

Observe the air spring gage and verify that the Empty (light) Car air spring pressure is within ± 1 psi as specified is correct.

13.1.2

With the equipment fully charged, move the device handle to Position No. 5 until a 30 psi brake pipe reduction is obtained, then slowly return the handle to Position No. 3 (Lap). When testing cars equipped with an accelerated, continuous service application feature (B-1 Quick Service Valve or Accelerated Application Valve), a greater quick service activity will be indicated by the continual decrease in brake pipe pressure. If brake pipe pressure has not stopped dropping before it reaches 55 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.

13.1.3

Allow 20 seconds for the system to stabilize. Observe that the brake cylinder gage pressure is within ± 3 psi of the Empty (light) Car full service brake cylinder pressure as specified is correct.

13.1.3.1

If the brake cylinder pressure is higher / lower than the Empty (light) Car pressure, the variable load valve portion must be corrected or replaced.

13.1.4

Move device handle to Position No. 1 to release the brake and fully recharge the system, then place the device handle in Position No. 3 "Lap".

13.1.5

Open the Device 3/8" cock. The test must produce an emergency brake application.

13.1.6

Allow 20 seconds for the system to stabilize. Observe that the brake cylinder gage for pressure is within ± 3 psi of the Empty (light) Car emergency brake cylinder pressure as specified is correct.

13.1.7

Close the Device 3/8" cock. Move the device handle to Position No. 1.

13.2 Loaded (heavy car)

13.2.1

Increase air pressure in the Air Springs to the pressure is within ± 1 psi of the Loaded (heavy) Car as specified is correct(See SECTION 3.2.6, NOTE 4).

13.2.2

With the equipment fully charged, move the device handle to Position No. 5 until a 30 psi brake pipe reduction is obtained, then slowly return the handle to Position No. 3 (Lap). When testing cars equipped with an accelerated, continuous service application feature (B-1 Quick Service Valve or Accelerated Application Valve), a greater quick service activity will be indicated by the continual decrease in brake pipe pressure. If brake pipe pressure has not stopped dropping before it reaches 55 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.

13.2.3

Allow 20 seconds for the system to stabilize. Observe that the brake cylinder gage pressure is within ± 3 psi of the Loaded (heavy) car full service brake cylinder pressure as specified is correct.

13.2.3.1

If the brake cylinder pressure is higher / lower than the Loaded (heavy) Car full service brake cylinder pressure, the variable load valve portion must be corrected or replaced.

13.2.4

Move device handle to Position No. 1 to release the brake and fully recharge the system, then place the device handle in Position No. 3 "Lap".

13.2.5

Open the Device 3/8" cock. The test must produce an emergency brake application.

13.2.6

Observe that the brake cylinder gage pressure is within ± 3 psi of the Loaded (heavy) car emergency brake cylinder pressure as specified is correct.

14. Miscellaneous Devices

If the car is equipped with any of the equipment listed below, it must also be tested as part of the Single Car Test.

14.1 Hand Brake / Parking Brake

14.1.1

Hand brake / parking brake unit must be tested in accordance with manufacturer's instructions.

14.2 Wheel Slide Protection Equipment

14.2.1

Wheel Slide equipment must be tested in accordance with manufacturer's instructions.

14.3 Conductor's Signal System

14.3.1

Conductors signal systems must be tested in accordance with manufacturer's instructions. If car is equipped with air signal equipment, it must be tested in accordance with Instruction Leaflet No. 2377-2, July 1942.

14.4 Electro-Pneumatic Operation

14.4.1

Cars with Electro-Pneumatic operation capabilities should be tested in accordance with manufacturer's instructions.

14.5 Ancillary Equipment

14.5.1

Any ancillary equipment not described by this standard must be tested in accordance with manufacturer's instructions.

15. Completion of Testing

15.1 Test Equipment

15.1.1

Safely remove all gages from their respective test points where applicable.

15.1.2

If the gages were connected by the removal of pipe plugs, leakage must be tested. No pipe plug leakage is allowed.

15.1.3

Disconnect single car test device from car. Connect a dummy coupling to all hose connections and the single car test device to prevent contamination from dust or dirt.

15.2 Final Car Preparation

15.2.1

Insure hand brake / parking brake is applied.

15.2.2

Record car and test information as specified by the operating authority and federal regulation.

16. Single Car Test Device - Testing

16.1 Daily Test for Single Car Testing Device

Note:

Single Car Test Devices without FLOWRATOR must be tested in accordance with SECTION 14.1.1. Single Car Test Devices with FLOWRATOR must be tested in accordance with SECTION 14.1.1 and SECTION 14.1.2.

16.1.1

Daily Test for All Single Car Testing Devices

16.1.1.1

Connect the Device to a source of clean, dry air as specified in SECTION 3.1.2.1. A source of clean, dry air shall be maintained at 100 psi minimum to the Device during test for proper operation and results. An efficient air filter in the supply line ahead of the regulating (feed) valve must be installed. **Before the Device is connected to the supply line, the supply line must be blown out.** Open the FLOWRATOR by-pass cock, if equipped.

16.1.1.2

Move the Device handle to Position No. 2 and note a flow of air at the Device brake pipe hose coupling.

16.1.1.3

Move the Device handle to Position No. 3 (Lap). Test for leakage at brake pipe connection and rotary valve exhaust. This leakage when detected with soap suds, must not exceed a 1" bubble in 5 seconds.

16.1.2 Daily Test for Single Car Testing Device with FLOWRATOR

16.1.2.1

Move the Device handle to Position No. 2. Close and open FLOWRATOR by-pass cock. Observe that ball does not stay at top of tube.

16.1.2.2

Move the Device handle to Position No. 3 (Lap). Couple the test coupling with orifice to the

brake pipe coupling end (BP) of the Device. Move the Device handle to Position No 1. Close the FLOWRATOR by-pass cock. Note that the FLOWRATOR ball rises and floats in the tube in the zone between the condemning line and the top of tube. NOTE: the test coupling may be connected to the end of a hose connected to the Device as described in SECTION 3.1.2.2. However a greater time must be given before condemning the FLOWRATOR due to the increased volume of the hose.

If the Device fails, check coupling and gaskets for leakage (none allowed). Inspect the exhaust end of test coupling to insure that it is clean and free of obstructions. If this does not correct the failure, the FLOWRATOR shall not be used to qualify leakage or fully charged system until the Device and test coupling are returned for maintenance to re-qualify the test coupling and FLOWRATOR.

16.1.2.3

Open the FLOWRATOR by-pass cock and move the Device handle to Position No. 3 (Lap).

16.1.2.4

Remove and properly store the test coupling.

16.2 92 Day Test for the Single Car Testing Device [31 Day Test, if applicable]

The Device must be tested and pass the procedure as defined below:

Single Car Testing Device	Test Rack	
	Standard	Alternate
With FLOWRATOR	14.2.1	14.2.2
WITHOUT FLOWRATOR	14.2.3	14.2.4

Note:

If the Device is not equipped with a strainer, the test must be performed on a 31 day basis.

To secure reliable and uniform results with the Single Car Testing Device, it must be kept free from leakage and must be tested as often as necessary but not less frequently than once every 92 days after being placed into service.

The test coupling is part of the Device and must be returned for re-qualification with the Device.

As often as service conditions require, the rotary valve must be lubricated with a suitable grease or lubricating oil (AAR Spec M-912). Lubricate the standard quick opening diaphragm cock cam with a small amount of grease (AAR Spec M-914).

The test gage must be compared with a master gage for accuracy as often as the Device itself is

being tested. The master gage is to be calibrated according to ASME standards. The calibration of the master gage must be performed annually or as required by ASME standards.

The strainer filter, if equipped, must be replaced annually unless service conditions warrant a more frequent replacement.

16.2.1 Test Procedure for Single Car Testing Device with FLOWRATOR on Standard Test Rack (Figure 4)

16.2.1.1

Attach the Device to rack as illustrated by Figure 4. Open the supply cock, cock 1, cock 2 and FLOWRATOR by-pass cock. Place the Device handle in Position No. 1. Adjust the test rack regulating valve until the test rack supply reservoir gage indicates as follows:

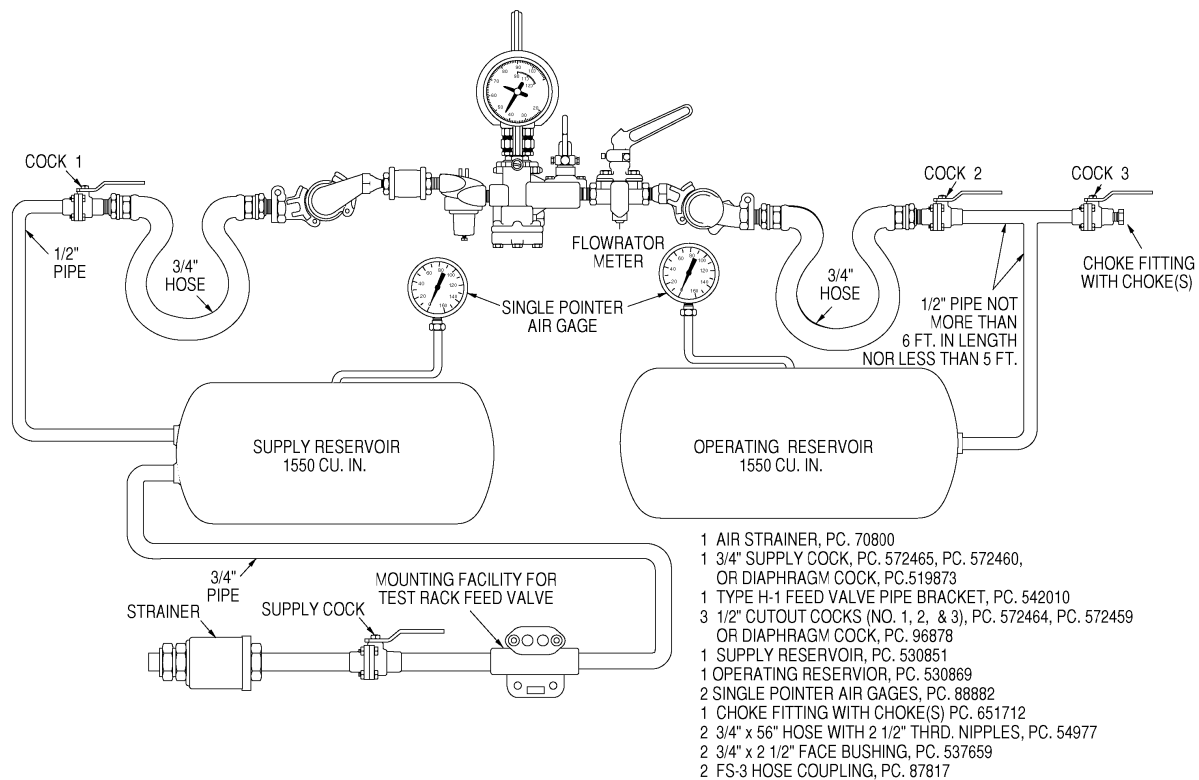


Figure 4 Standard Rack for Testing the Passenger Single Car Testing Device

NOTE:

If the pressure indicated on the test rack supply reservoir gage should rise above the values indicated below then the Device 3/8" cock should be opened to release air currently trapped in the system. While the Device 3/8" cock is open, the reducing or feed valve should be turned down below the set pressure. Once the test rack feed valve or the Device reducing valve set point has been turned back down, close the Device 3/8" cock, and readjust the feed or reducing valve. The pressure setting of either the Device reducing valve or the test rack feed valve must be set by increasing to the set pressure and never by decreasing to the set pressure.

If testing a Device with reducing valve, the test rack regulating valve must be set to close at 90 psi.

If testing a Device without a reducing valve, the test rack regulating valve must be set to close at 70 psi.

16.2.1.2

Adjust the Device reducing valve, if so equipped, to close at 70 psi as indicated by the operating reservoir gage.

NOTE:

If the pressure indicated on the test rack operating reservoir gage should rise above 70 psi, the Device 3/8" cock should be opened to release air currently trapped in the system. While the Device 3/8" cock is open, the reducing valve should be turned down below the set pressure. Once the reducing valve set point has been turned back down, close the Device 3/8" cock, and readjust the reducing valve. The pressure setting of the Device reducing valve must be set by increasing to the set pressure and never by decreasing to the set pressure.

16.2.1.3

Operate the Device several times by moving the Device handle from Position No. 1 to Position No. 6, finally leaving the handle in Position No. 3.

16.2.1.4

Close Cock 1, and open the Device 3/8" cock until the operating reservoir gage indicates zero psi. Close the Device 3/8" cock.

16.2.1.5

Commence test with all numbered cocks closed and the Device handle in Position No. 3. Open Cock 1 and the Device 3/8" cock. Coat the opening of the 3/8" cock with soap suds in order to detect rotary valve leakage to brake pipe. A 1" bubble in not less than 5 seconds is permitted.

16.2.1.6

Close the 3/8" cock and move the Device handle to Position No. 6, then coat the Device exhaust port with soap suds in Position No.'s 6, 5, 4, 3, 2 and 1 consecutively. A 1" bubble in not less than 5 seconds is permitted.

16.2.1.7

Open cock 2, and when operating reservoir pressure reaches 38 psi, move the Device handle to Position No. 2. Note that the operating reservoir charges from 40 to 45 psi in 35 to 40 seconds.

16.2.1.8

Close FLOWRATOR by-pass cock and move the Device handle to Position No. 1. Note that operating reservoir charges from 50 to 55 psi in 18 to 21 seconds.

16.2.1.9

Open the FLOWRATOR by-pass cock. After the operating reservoir is charged to 70 psi, compare gages and note that the gage hands must register within ½ psi.

16.2.1.10

Close the FLOWRATOR by-pass cock. There should be no indication of air flow. Open the FLOWRATOR by-pass cock and open Cock 3, allowing air to vent through the choke fitting (or chokes) of the test rack. Then close the by-pass cock. The ball should rise and float in the tube in the zone between the condemning line and the top of the tube. If the FLOWRATOR fails to pass this test, the ball and glass tube of the FLOWRATOR should be cleaned, using a non residue producing solution to remove any oil or foreign matter which may be carried into the Device. When tube is properly installed in FLOWRATOR cock, the dot on the tube should be below the condemning line.

16.2.1.11

Close Cock 3 and open the FLOWRATOR by-pass cock.

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 psi in 10 to 13 seconds. At the completion of test, move the Device handle to Position 1 and recharge to 70 psi.

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

Move the Device handle to Position No. 6. The operating reservoir pressure must reduce from 70 to 30 psi in 3-1/2 to 5 seconds. At the completion of test, move the Device handle to Position No. 1 and recharge to 70 psi.

Move the Device handle to Position No. 3 (Lap). Open the Device 3/8" cock and observe on the operating reservoir gage that the operating reservoir pressure reduces from 70 to 10 psi in 3 to 3-1/2 seconds.

Set the Device reducing valve to 90 psi.

At the completion of test, close Cock 1, open the Device 3/8" cock and allow the Device Gage to decrease to zero psi. Close the Device 3/8" cock and close the remaining test rack cocks. Remove the Device from the test rack.

16.2.2 Test Procedure for Standard Single Car Test Device with FLOWRATOR on Alternate Test Rack (Figure 5)

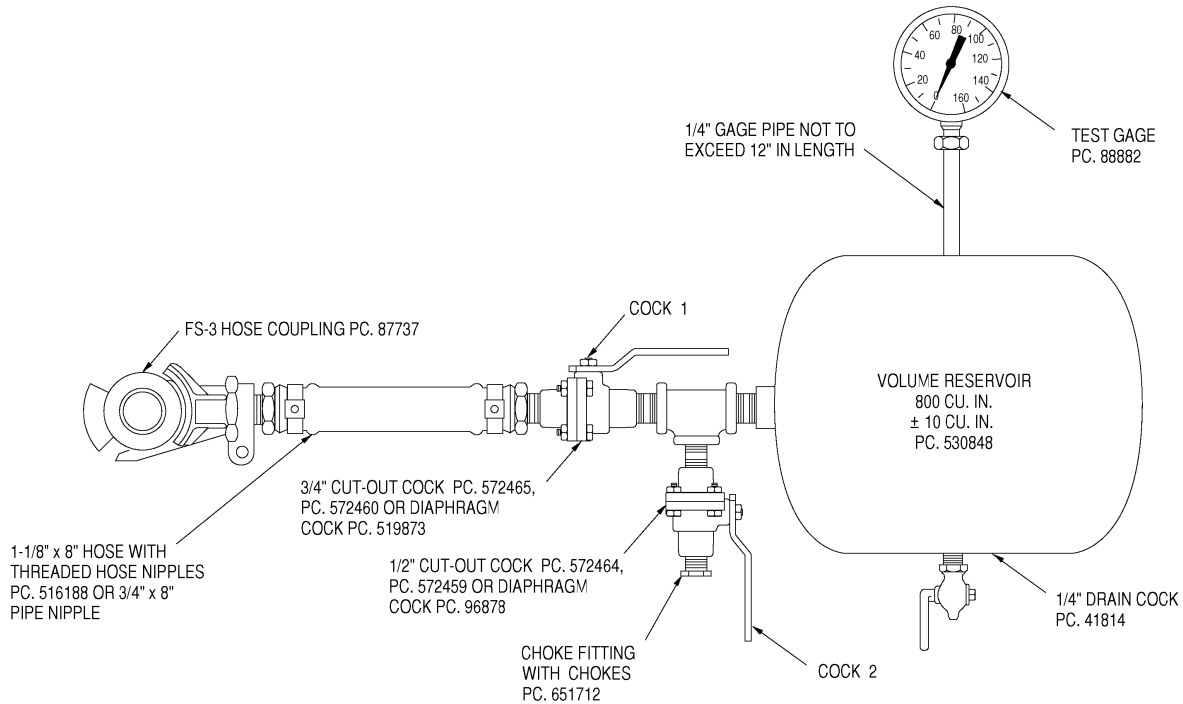


Figure 5 Alternate Rack for Testing the Passenger Single Car Testing Device

16.2.2.1

Attach the end of the Device marked BP to the volume reservoir coupling of the test rack (Figure 5) then couple the supply line to the test device end marked MR. The air supply must meet the requirements as specified in SECTION 3.1.2.1.

16.2.2.2

Open the supply cock, cock 1 and FLOWRATOR by-pass cock. Move the Device handle to Position No. 1. Adjust the supply regulating valve as follows:

If testing a Device with reducing valve, the test supply regulating valve must be set to close at 90 psi.

If testing a Device without a reducing valve, the test rack regulating valve must be set to close at 70 psi.

16.2.2.3

Adjust the Device reducing valve, if so equipped, to close at 70 psi as indicated by the operating reservoir gage.

NOTE:

If the pressure indicated on the test rack operating reservoir gage should rise above 70 psi, the Device 3/8" cock should be opened to release air currently trapped in the system. While the Device 3/8" cock is open, the reducing should be turned down below the set pressure. Once the reducing valve set point has been turned back down, close the Device 3/8" cock, and readjust the reducing valve. The pressure setting of the Device reducing valve must be set by increasing to the set pressure and never by decreasing to the set pressure.

16.2.2.4

With the Device handle in Position No. 3 (Lap) and Cocks 1 and 2 closed, open the 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 5 seconds is permitted.

16.2.2.5

Close the 3/8" cock and move the Device handle to Position No. 6, then coat the Device exhaust port with soap suds in Position No.'s 6, 5, 4, 3, 2 and 1 consecutively. A 1" bubble in not less than 5 seconds is permitted.

16.2.2.6

With the Device handle in Position No. 1, open Cock 1. After reservoir is charged to 70 psi, compare gages and note that gage hands register within ½ psi.

16.2.2.7

Close the FLOWRATOR by-pass cock. There should be no indication of air flow. Open the FLOWRATOR by-pass cock and open Cock 2, allowing air to vent through the choke fitting (or chokes) of the test rack. Then close the by-pass cock. The ball should rise and float in the tube in the zone between the condemning line and the top of the tube. If the FLOWRATOR fails to pass this test, the ball and glass tube of the FLOWRATOR should be cleaned, using a non residue producing solution to remove any oil or foreign matter which may be carried into the Device. When tube is properly installed in FLOWRATOR cock, the dot on the tube should be below the condemning line.

16.2.2.8

Close cock 2 and open FLOWRATOR by-pass cock.

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

16.2.2.9

Move the Device handle to Position No. 4 and reduce the volume reservoir pressure to approximately 30 psi. Move the Device handle to Position 2. Note that the operating reservoir charges from 40 to 50 psi in 38 to 43 seconds. At the completion of test, move the Device handle to Position No. 1 and charge the reservoir to 70 psi.

Move the Device handle to Position No. 4. The volume reservoir pressure must reduce from 70 to 50 psi in 15 to 17 seconds. At the completion of test, move the device handle to Position No. 1 and recharge to 70 psi.

Move the Device handle to Position No. 5. The volume reservoir pressure must reduce from 70 to 40 psi in 6 to 7 seconds. At the completion of test, move the Device handle to Position No. 1 and recharge to 70 psi.

Move the Device handle to Position No. 6. The volume reservoir pressure must reduce from 70 to 20 psi in 3-1/2 to 4-1/2 seconds. At the completion of test, move the Device handle to Position No. 1 and recharge to 70 psi.

Move the Device handle to Position No. 3. Open the test device 3/8" cock and observe on the operating reservoir gage that the operating reservoir pressure reduces from 70 to 10 psi in 1-1/2 to 2 seconds.

Set the Device reducing vale to 90 psi.

At the completion of test, close the supply cock. Open the Device 3/8" cock, allow the Gage to decrease to zero psi and close the Device 3/8" cock. Remove the Device from the test rack.

16.2.3 Test Procedure for Single Car Testing Device without FLOWRATOR on Standard Test Rack (Figure 4)

16.2.3.1

Attach the Device to rack as illustrated by Figure 4. Open the supply cock, Cock 1 and Cock 2. Place the Device handle in Position No. 1. Adjust the test rack regulating valve as follows:

NOTE:

If the pressure indicated on the test rack supply reservoir gage should rise above the values indicated below then the Device 3/8" test cock should be opened to release air currently trapped in the system. While the Device 3/8" cock is open the reducing or feed valve should be turned down below the set pressure. Once the test rack feed valve or the device reducing valve set point has been turned back down, close the Device 3/8" cock, and readjust the feed or reducing valve. The pressure setting of either the Device reducing valve or the test rack feed valve must be set by increasing the set pressure and never by decreasing the set pressure.

If testing a Device with reducing valve, the test rack regulating valve must be set to close at 90 psi.

If testing a Device without a reducing valve, the test rack regulating valve must be set to close at 70 psi.

16.2.3.2

Adjust the Device reducing valve, if so equipped, to close at 70 psi as indicated by the operating

reservoir gage.

NOTE:

If the pressure indicated on the test rack operating reservoir gage should rise above 70 psi the Device 3/8" test cock should be opened to release air currently trapped in the system. While the Device 3/8" cock is open, the reducing should be turned down below the set pressure. Once the reducing valve set point has been turned back down, close the Device 3/8" cock, and readjust the reducing valve. The pressure setting of the Device reducing valve must be set by increasing the to the set pressure and never by decreasing the set pressure.

16.2.3.3

Operate the Device several times by moving the device handle from Position No. 1 to Position No. 6, finally leaving the handle in Position No. 3.

16.2.3.4

Close Cock 1, and open the Device 3/8" cock until the operating reservoir gage indicates zero psi. Close the Device 3/8" cock.

16.2.3.5

Commence test with all numbered cocks closed and the Device handle in Position No. 3. Open cock 1 and the Device 3/8" cock. Coat the opening of the 3/8" cock with soap suds in order to detect rotary valve leakage to brake pipe. A 1" bubble in not less than 5 seconds is permitted.

16.2.3.6

Close the 3/8" cock and move the Device handle to Position No. 6, then coat the Device exhaust port with soap suds in Position No.'s 6, 5, 4, 3, 2 and 1 consecutively. A 1" bubble in not less than 5 seconds is permitted.

16.2.3.7

Move the Device handle to Position No. 2. Open cock 2 and note that the operating reservoir charges from 5 to 20 psi in 29 to 36 seconds, then move the Device handle to Position No. 1 and charge the reservoir to 70 psi.

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 psi in 10 to 13 seconds. At the completion of test, move the Device handle to Position 1 and recharge to 70 psi.

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

Move the Device handle to Position No. 6. The operating reservoir pressure must reduce from 70 to 30 psi in 3-1/2 to 5 seconds. At the completion of test, move the Device handle to Position No. 1 and recharge to 70 psi.

Move the Device handle to Position No. 3 (Lap). Open the Device 3/8" cock and observe on the operating reservoir gage that the operating reservoir pressure reduces from 70 to 10 psi in 3 to 3-1/2 seconds.

Set the Device reducing valve to 90 psi.

At the completion of test, close Cock 1, open the Device 3/8" cock and allow the GAGE to decrease to zero psi. Close the Device 3/8" cock and close the remaining test rack cocks. Remove the Device from the test rack.

16.2.4 Test Procedure for Standard Single Car Testing Device without FLOWRATOR on Alternate Test Rack (Figure 5)

16.2.4.1

Attach the end of the Device marked BP to the volume reservoir coupling of the test rack (Figure 5) then couple the supply line to the Device end marked MR. The air supply must meet the requirements as specified in SECTION 3.1.2.1.

16.2.4.2

Open the supply cock. Adjust the supply regulating valve as follows:

NOTE:

If the pressure indicated on the test rack supply reservoir gage should rise above the values indicated below then the Device 3/8" test cock should be opened to release air currently trapped in the system. While the Device 3/8" cock is open the reducing or feed valve should be turned down below the set pressure. Once the test rack feed valve or the device reducing valve set point has been turned back down, close the Device 3/8" cock, and readjust the feed or reducing valve. The pressure setting of either the Device reducing valve or the test rack feed valve must be set by increasing the set pressure and never by decreasing the set pressure.

If testing a Device with reducing valve, the test rack regulating valve must be set to close at 90 psi.

If testing a Device without a reducing valve, the test rack regulating valve must be set to close at 70 psi.

16.2.4.3

Adjust the Device reducing valve, if so equipped, to close at 70 psi as indicated by the operating reservoir gage.

NOTE:

If the pressure indicated on the test rack operating reservoir gage should rise above 70 psi the Device 3/8" test cock should be opened to release air currently trapped in the system. While the Device 3/8" cock is open, the reducing should be turned down below the set pressure. Once the reducing valve set point has been turned back down, close the Device 3/8" cock, and readjust the reducing valve. The pressure setting of the Device reducing valve must be set by increasing the to the set pressure and never by decreasing the set pressure.

16.2.4.4

With the Device handle in Position No. 3 (Lap) and Cocks 1 and 2 closed, open the supply cock and the 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 5 seconds is permitted.

16.2.4.5

Close the 3/8" cock and move the Device handle to Position No. 6, then coat the Device exhaust port with soap suds in Position No.'s 6, 5, 4, 3, 2 and 1 consecutively. A 1" bubble in not less than 5 seconds is permitted.

16.2.4.6

With the Device handle in Position No. 1, open cock 1. After reservoir is charged to 70 psi, compare gages and note that gage hands register within 1/2 psi.

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

16.2.4.7

Move the Device handle to Position No. 2 and reduce the volume reservoir pressure to approximately 30 psi. Move the Device handle to Position No. 2. Note that the operating reservoir charges from 40 to 60 psi in 26 to 29 seconds. At the completion of test, move the Device handle to Position No. 1 and charge the reservoir to 70 psi.

Move the Device handle to Position No. 4. The volume reservoir pressure must reduce from 70 to 50 psi in 15 to 17 seconds. At the completion of test, move the Device handle to Position No. 1 and recharge to 70 psi.

Move the Device handle to Position No. 5. The volume reservoir pressure must reduce from 70 to 40 psi in 5 to 7 seconds. At the completion of test, move the Device handle to Position No. 1 and recharge to 70 psi.

Move the Device handle to Position No. 6. The volume reservoir pressure must reduce from 70 to 20 psi in 3-1/2 to 4-1/2 seconds. At the completion of test, move the Device handle to Position No. 1 and recharge to 70 psi.

Move the Device handle to Position No. 3. Open the test device 3/8" cock and observe on the operating reservoir gage that the operating reservoir pressure reduces from 70 to 10 psi in 1-1/2

to 2 seconds.

Set the Device reducing valve to 90 psi.

At the completion of test, close the supply cock. Open the Device 3/8" cock, allow the Gage to decrease to zero psi and close the Device 3/8" cock. Remove the Device form the test rack.