

Examination Questions
On the Subject of Air Brakes; And
Instructions for Trainmen



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Examination Questions

On the Subject of Air Brakes; And

Instructions for Trainmen

GENERAL QUESTIONS AND ANSWERS ON THE AIR BRAKE SUBJECT

1—What do you understand by the term automatic air brake?

One whose operative power is compressed air.

2—What are the essential working parts of the automatic brake as applied to a car?

Triple valve, brake cylinder, brake rigging, auxiliary reservoir, brake pipe, hose and couplings.

3—Name the different air pressures necessary to maintain and operate the automatic brake?

Atmosphere, main reservoir, brake pipe, auxiliary reservoir, and brake cylinder.

4—What is used to compress the air?

Air pump.

5—Where is the compressed air first stored?

Main reservoir.

6—How many pounds pressure is stored in main reservoir, passenger and freight?

Passenger 140, main reservoir; Freight 100, main reservoir.

- 7—Where does brake pipe pressure begin and end?
At engineer's brake valve and ends at front of triple piston.
- 8—What is brake pipe pressure used for?
For charging auxiliary reservoir and operating triple valve.
- 9—How many pounds pressure is carried in brake pipe, passenger? Freight?
Passenger 110; Freight 70.
- 10—From the brake pipe, where does the air go?
To auxiliary reservoir.
- 11—What pressure is it then called?
Auxiliary reservoir pressure.
- 12—How many pounds pressure is carried in the auxiliary reservoir, passenger? Freight?
Passenger, 110; Freight, 70.
- 13—What is the auxiliary reservoir pressure used for?
To supply the brake cylinder with air to apply brake.
- 14—When air leaves the auxiliary reservoir, where does it go?
To the brake cylinder.
- 15—After the air leaves the brake cylinder, where does it go?
Back to the atmosphere.
- 16—What valve is used to control the passage of air from auxiliary reservoir to brake cylinder?
Triple valve.

17—To what pressure is the retaining valve connected?

Brake cylinder pressure.

18—How is the automatic brake applied and released?

Applied by reducing train line pressure; released by increasing train line pressure.

19—How is the service application obtained? Emergency?

Slow and gradual for service; sudden for emergency.

5 lb reduction in Brake

20—How many different ways can the automatic brake be applied from the train?

Conductor's valve, opening angle cock on rear of train and uncoupling hose between cars.

21—How should the release valve on auxiliary reservoir be operated to release the brake?

Opening and closing of release cock until brake is released.

22—After stopping a train on a descending grade, should the air or hand brakes be used to hold the train for an indefinite period?

Hand brakes.

23—Explain in detail how the train should be secured with hand brakes?

Release air brakes and apply hand brakes.

BRAKE PIPE AND CONNECTIONS

24—What is the line of pipe called that extends from one end of the car to the other?

Brake pipe.

25—What cocks are found in this pipe?

Angle cocks.

26—How many different kinds of handles do angle cocks have?

Two different styels.

27—How does the handle of angle cock stand when open? When closed?

In line with the pipe to be open; cross-wise with the pipe to be closed.

28—How could the position of angle cock be known if handle was missing?

By the groove mark which should always be in line with the pipe when open.

✓ 29—How many branch pipes lead away from brake pipe on freight cars?

One.

✓ 30—Where does it lead to?

From brake pipe to triple valve.

✓ 31—Is there a cock in this branch pipe?

There is.

✓ 32—Why is a cut-out cock placed there?

To cut the brake out.

✓ 33—In what position should handle of this cock stand to cut out the brake?

In line with pipe.

✓ 34—What else should be done after cutting the brake?

The auxiliary reservoir should be drained.

35—Why drain auxiliary reservoir?

So that brake could not leak on.

36—Under what conditions would you apply cut-out card M. P. 276?

Apply M. P. 276 card on freight for the following defects: Cut-out cock, angle cock, branch pipe, between brake pipe and cut-out cock, brake pipe, hose and couplings, place card as close to the triple valve as possible.

37—Where should cut-out card always be placed?

On branch pipe close to the triple valve.

38—On passenger equipment cars, how many branch pipes lead from main brake pipe?

Two.

39—Where do they lead to?

One from brake pipe to triple valve and one from brake pipe to conductor's valve.

40—Is there a cock in branch pipe leading to conductor's valve?

There is not.

41—Is there more than one conductor's valve on Pullman or private cars?

Yes, two.

42—Where are they located?

At each end of car.

43—In case of a broken branch pipe between main brake pipe and cut-out cock, how could it be repaired?

Take broken pieces of pipe out of brake pipe, screw the pipe with cut-out cock on it out of triple valve, reverse it and screw it back into brake pipe, turn cut-out cock in line with the pipe, then

you can pass air through the line and use car among other air brake cars.

- 44—If main brake pipe was broken so it could not be used on a passenger equipment car, what could be done?

We could couple up air hose and signal line hose together.

- 45—If necessary to drill a car to rear end of train, what should be examined before placing it there?

Would see if it had good hand brake.

- 46—A car having a defective air and hand brake, in what part of the train can it be safely moved to the nearest terminal.

Drill a car behind it that had good hand brake on.

- 47—When necessary to drill a car to rear of train on account of broken brake pipe, how should the hose couplings and angle cocks be arranged between the two rear cars?

Would couple up brake pipe and signal pipe hose, turn angle cock on defective car crosswise with pipe, and one on train in line with pipe.

- 48—In case of a bad leak at coupling gaskets, what can be done to stop same?

By placing wooden wedge between couplings.

TRIPLE VALVE, AUXILIARY RESERVOIR AND BRAKE CYLINDER

- 49—How many kinds of quick-action triple valves? Name them.

Two. Plain and quick-acting.

50—What function does the “K” triple valve possess in addition to the old style quick-action triple valve?

Quick service, uniform release and uniform recharge.

51—How many working parts in the quick-action triple valve? Can you name them?

Three. Triple piston, graduating valve and slide valve.

52—What is the duty of the triple valve?

It applies and releases brakes and charges the auxiliary.

53—Name the different operating positions of the quick-action triple valve?

Release, service, lap and emergency.

54—What are the duties of the triple piston?

It opens and closes the brake pipe feed port, opens and closes the graduating valve, and moves the slide valve in position to apply and release the brakes.

55—What are the duties of the slide valve?

The slide valve brings in register the ports between auxiliary reservoir and brake cylinder to apply the brakes, and between brake cylinder and atmosphere to release the brakes.

56—What are the duties of the graduating valve?

It automatically graduates or measures the air from the auxiliary reservoir to brake cylinder in making a service application.

57—What are the duties of the emergency piston?

Opens the emergency valve.

58—What are the duties of the emergency valve?

To admit brake pipe pressure to brake cylinder when we want it there, and keep it out when we do not want it there.

59—What are the duties of the brake pipe check valve?

To prevent brake cylinder pressure from re-entering the brake pipe after an emergency application.

60—Name the different operating positions of the "K" triple valve?

Retarded release, full release, quick service, full service lap and emergency.

61—With triple valve in release position and a constant pressure of 70 pounds in the brake pipe, how long will it take to charge an auxiliary reservoir to 70 pounds?

One minute and a half to two minutes.

62—Through what portion or groove does the air pass from brake pipe to auxiliary reservoir?

Feed groove.

63—Why does it take so long to charge the auxiliary reservoir?

On account of feed groove being small.

64—Could the auxiliary reservoir on four or five cars be charged as quickly as one?

Yes.

65—Can 50 cars be charged with air as quickly as four or five?

No.

66—Who is held responsible for leaks in brake pipes?

Terminal car inspectors, on road the trainmen.

67—Give some of the causes for undesired quick action of the air brakes?

Dirty triple, defective graduating valve, defective graduating steamer spring, ports in slide valve clogged with dirt, wrong triple, leak through check valve or cylinder cap gasket.

68—Name the operating parts of the brake cylinder?

Piston, release spring, leakage groove, leather packing.

69—Why is the leakage groove placed in the brake cylinder?

To take care of light reductions in brake pipe.

70—What causes the brake cylinder piston to return to release position?

Release spring.

71—What other air reservoir do we charge on some passenger equipment cars besides auxiliary reservoirs?

Carburetor and water raising system.

72—From where does the carburetor and water raising system receive its air?

From the auxiliary reservoir.

73—How much pressure do we carry in the carburetor tank?

Sixty-five pounds.

74—How much pressure do we carry in the water-raising system storage tank?

Twenty pounds.

75—With broken brake rigging on car equipped with carburetor or water raising system, how would you get air to operate these systems?

By removing plug from the high-speed reducing valve.

76—How long does it take to charge the reservoirs on a passenger car with the carburetor system?

Seven to ten minutes.

TRAIN AIR SIGNAL AND HIGH SPEED BRAKE

77—What other line of pipe is found on passenger equipment cars that is not on freight cars?

Air signal.

78—What pressure is carried in the signal pipe?

Forty-five pounds.

79—From where is this pressure obtained?

Main reservoir.

80—Has the signal line any connection with the brake pipe?

No.

81—What kind of stop cocks do we find on the main signal pipe, and where located?

Straight cocks at each end of car.

35—How and when should a road test be
82—In what position do the handles stand

when these cocks are open? Closed?

Crosswise with pipe when open; in line
with pipe when closed.

83—How many branch pipes lead off from
the main signal pipe?

Two.

84—To what are these branch pipes con-
nected?

Car discharge valve.

85—Is there a cut-out cock in this pipe?
Where located?

In the toilet.

86—How must the car discharge valve be
operated to make a reduction in the
signal pipe?

Valve must be held open.

87—How long should the car discharge valve
be held open to give the proper blast
of the signal whistle on the engine?

Open one second.

88—What period should intervene between
each blast?

Closed two seconds.

89—If the car discharge valve is opened and
a very weak blast of air comes from
the valve and the engineman does not
answer the signal, what could be
wrong if the car discharge valve op-
erates properly on other cars in the
train?

Car discharge valve may be dirty.

90—If no air comes out of the car discharge
valve on one car and operates on cars

ahead of or in the rear of this car,
what could be wrong?

Cock is closed.

91—What additional equipment is necessary
on passenger equipment cars when
using the high speed brake?

High speed reducing valve.

92—To what pressure is the high speed re-
ducing valve connected?

Brake cylinder pressure

93—To what pressure is this valve adjusted?

Sixty pounds.

94—What pressure is carried in the brake
pipe and auxiliary reservoir, when
using the high speed brake?

One hundred and ten pounds.

95—Is a higher brake cylinder pressure ob-
tained when an emergency application
is made than when the brake is applied
with a full service application?

Yes.

96—Does the high pressure obtained in the
brake cylinder in emergency applica-
tion remain constant until completion
of the stop?

Yes.

97—About how long will it take to reduce
this high pressure to 60 pounds?

From 18 to 26 seconds.

98—Would it be advisable to use the emer-
gency application at low speed?

No.

99—If we were to attach a car after leaving
terminal not equipped with high speed

reducing valve or safety valve to a train using the high speed brake, what should be done?

The engineer must be notified.

100—Give the standard code of communicating air whistle signals?

Sound. Indication.

- (a) Two .. When train is standing, start.
- (b) Two .. When train is running, stop at once.
- (c) Three. When train is standing, back.
- (d) Three. When train is running, stop at next station.
- (e) Four. . . When train is standing, apply or release air brakes.
- (f) Four. . . When train is running, reduce speed.
- (g) Five. . . When train is standing, call in flagman.
- (h) Five. . . When train is running, increase speed.

RETAINING VALVES

101—What are retaining valves used for?

To retain a limited amount of pressure in the brake cylinder in heavy grades while charging auxiliary reservoir.

102—To what are they piped?

Exhaust port of triple.

103—How many kinds of retaining valves in use?

Two.

104—How many positions do the old style retaining valves have?

Two.

105—What pressure do they retain?

Fifteen pounds.

106—How should retaining valves be tested?

After a full application of the brakes, turn handle of pressure retaining valve crosswise of pipe, then release brake, note if vent port is open, and after interval of one minute, turn handle of retaining valve to vertical position. If no air, or air at very light pressure, escapes, examination must be made to locate defects.

107—What is the rule in regard to the use of the pressure retaining valve?

This valve must be used on grades where it is necessary to hold the brakes applied while recharging auxiliary reservoir or to hold the slack of train when approaching points where stops are likely to be made.

108—When, where and how should retaining valves be used?

The trainmen will set these valves for use when necessary and must change them to a vertical position as soon as their use is no longer required; neglect of the latter will cause the brakes to drag and may cause damage to the wheels.

109—What pressure does the three-position retaining valve hold in brake cylinder when the handle is at an angle of 45 degrees? At right angle to the pipe?

Fifty pounds, twenty-five pounds.

INSTRUCTIONS—MAKING UP TRAINS AND TESTING BRAKES

110—In making up trains, how many cars in consecutive order may have the brake cut out?

One.

111—If the brake on a car is cut out, with no cut-out card on it, and no visible defect found, what should be done?

Cut air in car.

112—In making up trains, should all air hose be coupled before turning in the air pressure from the locomotive or air plant?

Yes.

113—Why should this be done?

Gives each car time to charge.

114—When train is all coupled up, and before turning in the air pressure, what should be done?

See that hand brakes are off.

115—In turning in the air pressure, how should angle cock be opened?

Gradually.

116—Which one should be opened first?

The one nearest to engine.

117—After air has been turned into the brake pipe, what should trainmen look for?

Leaks.

118—When train is ready for terminal or road test, how should the engineman be notified in freight service? In passenger service?

Hand or flag crosswise; four blasts of signal whistle.

119—How much brake pipe reduction should engineman make in testing brakes?

Twenty-five pounds.

120—What is the duty of trainmen or car inspectors after brakes are applied for test?

No leaks, piston out, shoes up against the wheels.

121—After having passed over the train and noted its condition, what signal should be given to release the brakes in freight service? In passenger service?

Hand or lamp held above head; four blasts of signal.

122—After brakes are examined and signal given to release, what is required of trainmen or inspectors before a test of the brakes is complete?

Notify the engineer the brakes are all right.

123—If additional applications of the brakes are required, what signal should be given in freight service? In passenger service?

Freight—A hand, flag or lamp held at arm's length above the head when train is standing; Passenger—Four blasts of the air signal whistle.

124—What is the required percentage of brakes in operative condition to comply with the instructions now in force?

Eighty-five per cent.

125—If you have less than the required number of air brakes in the train in an operative condition, what action must be taken?

Notify the Superintendent.

126—What kind of a test must be made when the make-up of a train has been has been changed or engine cut loose after leaving a terminal?

Road test.

127—In case of train parting, what is the duty of the trainmen?

Turn on the Cap. Protect all tracks in case of parting. Signal Eng. to Release Brake

128—Under what conditions should the angle cock be used to stop a train?

Case of emergency.

129—Should hand brakes be applied when the air is being used?

No.

130—With self-closing conductor's emergency valve, how should the valve be opened for an emergency application?

Quickly.

131—What is the proper piston travel on a freight car?

Six inches.

132—What is the proper piston travel on a passenger equipment car?

Six inches, not over nine inches for steel wheels; seven inches, not over nine inches for cast wheels.

133—What is the objection to a three-inch piston travel?

No. The leakage groove would not be covered; the air would pass out of the atmosphere.

134—What would be the objection to a brake having twelve-inch piston travel?

No braking power.

135—How and when should a road test be made?

When you add a car.

136—When brakes are applied for test, and you find a brake that did not apply, what should be done with the brake? If defective, how should it be carded?

Try the brake the second time, and if they do not apply, cut the air out.

137—In going over a train after brakes are released, and you find a brake that did not release, what should be done to determine the cause? If defective, how carded?

The hand brake may be on or the retaining valve reversed.

138—What should be done with defective air brake hose after removing from car; also, new hose before applying to car?

Cut out badge plate in both cases.

139—When necessary to secure a new hose from the locomotive for application to a car, what information should be given the engineman?

Give H. P. 217.

HARRY KNISELY

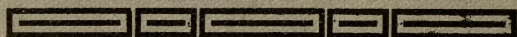


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