(57) Abstract: A manual vent (40) and an emergency brake valve (42) are coupled to a pipe bracket (10) such that the manual vent is in flow communication with the emergency brake valve utilizing a passageway between a service side (12) of the pipe bracket and an emergency side (14) of the pipe bracket. When the manual vent is actuated, the passageway is pressurized which resets the emergency brake valve. Once the emergency brake valve is reset, the passageway is opened to atmosphere. Accordingly, a signal is passed through a pipe bracket.
METHODS AND SYSTEM FOR PASSING SIGNALS
THROUGH A PIPE BRACKET

BACKGROUND OF THE INVENTION

This invention relates generally to brake pipes and, more particularly, to passing signals through a pipe bracket.

In a train air brake system, a brake pipe extends from a lead locomotive then to a first rail car then to additional rail cars until ending at the last rail car. The brake pipe typically is used to charge a plurality of compressed air tanks in the rail cars. These tanks provide an energy source utilized for applying a brake application. Typically, when no brake application is needed, and the train is operating normally, a high pressure exists in the brake pipe. Since the air tanks are in flow communication with the brake pipe, the air tanks, accordingly, are charged to the same pressure as the air in the brake pipe during a normal non-braking operation.

Additionally, the brake pipe signals to actuate brakes as explained below. When brakes are to be applied, air is vented from the brake pipe by the lead locomotive, thus causing a reduction in air pressure throughout the brake pipe. When the air pressure in the brake pipe drops, valving in the rail cars utilize the air in the air tanks to supply a plurality of brake cylinders a sufficient air pressure to force a plurality of brake shoes against a plurality of wheels. Typically, the valving includes a pipe bracket including a service side and an emergency side. The service side is used to control an airflow from an auxiliary reservoir to the brake cylinders and a recharging of an emergency reservoir and the auxiliary reservoir after a braking application. The service side is further used to control an exhaust of air from the brake cylinders when the brakes are released and to reinforce the braking application and release signals being pneumatically conveyed by the brake pipe.

The emergency side of the pipe bracket is used to recognize an emergency brake signal and when receiving such a signal, to control an airflow from
both the emergency and auxiliary air tanks to the brake cylinders. The emergency side is further used to rapidly vent brake pipe pressure to atmosphere.

Both the emergency side and the service side have a plurality of openings for airflow. The openings on the emergency side are typically larger than openings on the supply side, and allow for greater airflow on the emergency side. However, an emergency brake valve is located on the emergency side of the pipe bracket while a manual vent is located on the service side. Accordingly, it would be desirable to pass a pneumatic signal through a pipe bracket and control the manual vent and the emergency brake valve from a single side of the pipe bracket.

BRIEF SUMMARY OF THE INVENTION

In an exemplary embodiment, a manual vent and an emergency brake valve are coupled to a pipe bracket such that the manual vent is in flow communication with the emergency brake valve utilizing a passageway between a service side of the pipe bracket and an emergency side of the pipe bracket. When the manual vent is actuated, the passageway is pressurized which resets the emergency brake valve. Once the emergency brake valve is reset, the passageway is opened to atmosphere. Accordingly, a signal is passed through a pipe bracket and both the manual vent and the emergency brake valve are controlled from a single side of the pipe bracket.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is plan view of a pipe bracket;

Figure 2 is a plan view of an emergency side of the pipe bracket shown in Figure 1;

Figure 3 is a plan view of a brake pipe side of the pipe bracket shown in Figure 1; and
Figure 4 is schematic view of a system for passing a signal through the pipe bracket shown in Figure 1.

DETAILED DESCRIPTION OF THE INVENTION

Figure 1 is a plan view of a pipe bracket 10 (e.g., an ADBW control valve available from the Westinghouse Air Brake Company) including a service side 12. Figure 2 is a plan view of an emergency side 14 of pipe bracket 10 and Figure 3 is a plan view of a brake pipe side 16 of pipe bracket 10. In one embodiment, pipe bracket 10 is utilized as a hub for airflow in a pneumatic system for rail cars (not shown). Service side 10 and emergency side 14 have a plurality of openings 18 accessing a plurality of passageways (not shown) interior to pipe bracket 10. Openings 16 include a first opening 20 on service side 10 and a second opening 22 and a third opening 24 on emergency side 14.

First, second, and third openings 20, 22, and 24 are in flow communication with each other via a first passageway 25 extending between service side 12 and emergency side 14. In one embodiment, openings 20, 22, and 24 are not in flow communication with other openings 18 or with other passageways of pipe bracket 10. Pipe bracket 10 is also connected to a brake pipe (not shown in Figures 1, 2 and 3), which supplies air to pipe bracket 10. Pipe bracket 10 further includes a plurality of bolt holes 26, an exhaust port 28, an auxiliary reservoir port 30, an emergency reservoir port 32, a brake cylinder port 34, and a brake pipe port 36.

Figure 4 is a schematic view of a signal passing system 38 configured such that a signal is passed through a pipe bracket, such as pipe bracket 10 shown in Figure 1, and both a manual vent 40 and an emergency brake valve 42 are controlled from a single side of pipe bracket 10. Emergency brake valve 42 is in flow communication with manual vent 40 through pipe bracket 10. System 38 further includes an auxiliary reservoir 44, an emergency reservoir 46, an exhaust 48, a brake pipe 50, a brake pipe filter 52, a check valve 54, and a brake cylinder 56. Exhaust 48 and brake cylinder 56 are in flow communication with emergency brake valve 42 such that exhaust 48 is between brake cylinder 56 and emergency brake valve 42.
Auxiliary reservoir 46 and emergency reservoir 46 are in flow communication with emergency brake valve 42 opposite brake cylinder 56. Check valve 54 is in flow communication with emergency brake valve 42 and pipe bracket 10. Brake pipe 50 is in flow communication with auxiliary reservoir 46 and emergency reservoir 46. Brake pipe filter 52 is in flow communication with brake pipe 50. Manual vent 40 includes an exhaust path 58.

In one embodiment, all valves of system 38 except manual vent 40 are located on emergency side 14 of pipe bracket 10 and manual vent 40 is located on service side 12. Emergency brake valve 42 includes a pilot 60 configured to reset emergency brake valve 42. In an exemplary embodiment, manual vent 40 is coupled to pipe bracket service side 12 (shown in Figure 1) at first opening 20 (shown in Figure 1), and emergency brake valve 42 is coupled to emergency side 14 (shown in Figure 2) at second and third openings 22 and 24 (shown in Figure 2). In an alternative embodiment, emergency brake valve 42 is coupled to at least one of second opening 22 and third opening 24. In a further alternative embodiment, emergency brake valve 42 is coupled to at least one opening 18 on emergency side 14 and manual vent 40 is coupled to at least one opening 18 on service side 12 and a passageway other than first passageway 25 is utilized such that a signal is passed through pipe bracket 10 and both manual vent 40 and emergency brake valve 42 are controlled from a single side of pipe bracket 10.

During operation of system 38, manual vent 40 is actuated which results in a passageway being pressurized. Emergency brake valve 42 is in flow communication with the passageway and when the passageway is pressurized, pilot 60 is pressurized and, accordingly, emergency brake valve 42 is reset allowing the passageway to open to atmosphere. When the passageway is open to atmosphere, stored pressurized air (not shown) from both sides of pipe bracket 10 vents to atmosphere. Accordingly, a pneumatic signal is passed through a pipe bracket such that actuating manual vent 40 resets emergency brake valve 42.

In an exemplary embodiment, the passageway is first passageway 25, which is defined by first opening 20, second opening 22, and third opening 24. In a
further embodiment, system 10 is attached under a rail car. In an alternative embodiment, system 10 is utilized in pneumatic systems for tractor-trailers and aircraft. It is contemplated that the benefits of system 10 accrue to all applications that employ pneumatic systems.

While the invention has been described in terms of various specific embodiments, those skilled in the art will recognize that the invention can be practiced with modification within the spirit and scope of the claims.
WHAT IS CLAIMED IS:

1. A method for passing a signal through a pipe bracket (10), said method comprising the steps of:

   coupling a manual vent valve (40) in flow communication with an emergency side (14) of the pipe bracket; and

   actuating the manual vent valve.

2. A method according to Claim 1 wherein said step of coupling a manual vent valve (40) further comprises the step of coupling a manual vent valve in flow communication with a passageway of the pipe bracket (10).

3. A method according to Claim 1 further comprising the step of coupling an emergency brake valve (42) in flow communication with an emergency side (14) of the pipe bracket (10) such that actuating the manual vent valve (40) resets the emergency brake valve.

4. A method according to Claim 3 wherein said step of coupling an emergency brake valve (42) further comprises the step of coupling an emergency brake valve in flow communication with a passageway.

5. A method according to Claim 1 wherein said step of actuating the manual vent valve (40) further comprises the step of actuating the manual vent valve such that a first passageway (25) is pressurized.

6. A method according to Claim 1 wherein said step of coupling further comprises the step of coupling an emergency brake valve (42) in flow communication with an emergency side (14) of the pipe bracket (10) such that actuating the manual vent valve (40) resets an emergency brake valve allowing a first passageway (25) to open to atmosphere.

7. A method according to Claim 6 wherein said step of coupling an emergency brake valve (42) further comprises the step of coupling an emergency
brake valve in flow communication with the manual vent valve (40) utilizing the first passageway (25) through the pipe bracket (10).

8. A method according to Claim 2 wherein said step of coupling a manual vent (40) further comprises the step of coupling a manual vent valve in flow communication with a first passageway (25) of the pipe bracket (10).

9. A method according to Claim 4 wherein said step of coupling an emergency brake valve (42) further comprises the step of coupling an emergency brake valve in flow communication with a first passageway (25).

10. A method according to Claim 6 wherein said step of coupling an emergency brake valve (42) further comprises the step of coupling an emergency brake valve for a rail car in flow communication with the manual vent valve (40) utilizing the first passageway (25) through the pipe bracket (10).

11. A method for actuating a pneumatic brake system, said method comprising the steps of:

-decreasing air pressure in a service side (12) of a brake pipe (50); and
-passing a signal through a pipe bracket (10).

12. A method according to Claim 11 wherein said step of decreasing air pressure further comprises the step of actuating a manual vent valve (40).

13. A method according to Claim 11 wherein said step of passing a signal further comprises the step of passing a signal through the pipe bracket (10) utilizing a passageway.

14. A method according to Claim 11 wherein said step of passing a signal through a pipe bracket (10) further comprises the step of sending a reset signal to an emergency brake valve (42) through the pipe bracket (10).
15. A method according to Claim 14 wherein said step of sending a reset signal further comprises the step of sending a reset signal to an emergency brake valve (42) through the pipe bracket (10) utilizing a passageway therein.

16. A method according to Claim 11 wherein said step of passing a signal further comprises the step of passing a signal through the pipe bracket (10) utilizing a first passageway (25).

17. A method according to Claim 14 wherein said step of sending a reset signal further comprises the step of sending a reset signal to an emergency brake valve (42) through the pipe bracket (10) utilizing a first passageway (25) therein.

18. A method according to Claim 11 wherein said step of decreasing air pressure further comprises the step of actuating a manual vent valve (40) for a rail car.

19. A method according to Claim 14 wherein said step of sending a reset signal further comprises the step of sending a reset signal to an emergency brake valve (42) for a rail car through the pipe bracket (10) utilizing a first passageway (25) therein.

20. A system (38) for passing a pneumatic signal, said system comprising:

   a control valve (10) comprising a first passageway (25) extending from a service side (12) of said valve to an emergency side (14) of said valve;

   a manual vent valve (40) in flow communication with said first passageway; and

   an emergency brake valve (42) in flow communication with said first passageway.
21. A system (38) in accordance with Claim 20 wherein said emergency brake valve (42) configured to be reset when said manual vent valve (40) is actuated.

22. A system (38) in accordance with Claim 21 wherein said manual vent (40) in flow communication with said first passageway (25) at said service side (12).

23. A system (38) in accordance with Claim 21 wherein said emergency brake valve (42) in flow communication with said first passageway (25) at said emergency side (14).

24. A system (38) in accordance with Claim 21 wherein said emergency brake valve (42) in flow communication with said first passageway (25) at said emergency side (14), said manual vent (40) in flow communication with said first passageway (25) at said service side (12).

25. A system (38) in accordance with Claim 21 wherein said first passageway (25) configured to open to atmosphere when said emergency brake valve (42) is reset.

26. A system (38) in accordance with Claim 21 wherein said first passageway (25) configured to open to atmosphere when said emergency brake valve (42) is reset, said emergency brake valve in flow communication with said first passageway at said emergency side (14), said manual vent (40) in flow communication with said first passageway at said service side (12).

27. A system (38) in accordance with Claim 20 wherein said first passageway (25) configured to open to atmosphere when said emergency brake valve (42) is reset, said emergency brake valve in flow communication with said first passageway at said emergency side (14), said manual vent (40) in flow communication with said first passageway at said service side (12).
28. A system (38) in accordance with Claim 20 wherein said first passageway (25) configured to open to atmosphere when said emergency brake valve (42) is reset.

29. A system (38) in accordance with Claim 20 wherein said control valve (10) comprises an ABDW control valve.

30. A system (38) in accordance with Claim 26 wherein said emergency brake valve (42) comprises an emergency brake valve for a rail car.