BRAKE LINE ANTIFREEZE ASSEMBLY AND
METHOD OF USING SAME

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ABSTRACT
A de-icing assembly is used for unblocking a trailer brake line. The trailer brake line includes a receiving end that is connected to a truck end of a truck brake line. The de-icing assembly includes a housing including an interior space for storing an alcohol fluid. The housing also defines a top surface and a bottom surface. An inlet extends through the top surface. The inlet is removably connectable to the truck end of the truck brake line. The de-icing outlet also includes an outlet that is removably connectable to the receiving end of the trailer brake line. The outlet includes a fluid tube extending to a distal end disposed adjacent the bottom surface of the housing such that pressurized air received in the housing from the inlet forces the alcohol fluid stored in the housing out the outlet and into the trailer brake line to unblock the trailer brake line.
BRAKE LINE ANTIFREEZE ASSEMBLY AND METHOD OF USING SAME

BACKGROUND ART

[0001] 1. Field of the Invention
[0002] The invention relates to a system and method for unblocking brake lines. More particularly, the invention relates to a de-icing assembly for unblocking a trailer brake line for a trailer connected to a truck.
[0003] 2. Description of the Related Art
[0004] Trucks hauling trailers on highways and roadways is popular means for transporting goods from a point of origin to a destination. In northern regions, where the temperatures typically drop below freezing, trailer brake systems tend to freeze. The brake lines freeze because water manages to enter the brake line system, either through the precipitation in the air pushed through the brake lines or through carelessness in the handling of the brake lines. If the water inside the brake lines freezes, the brakes in the trailer assembly will not work. Currently, the method for de-icing includes disconnecting the trailer brake line from the truck brake line and manually pouring antifreeze into the brake line, reconnecting the truck brake line to the trailer brake line to force the antifreeze through the trailer brake line, disconnecting the trailer brake line from the trailer brake line, applying more antifreeze to the trailer brake line, reconnecting the truck brake line to the trailer brake line to force the antifreeze through the trailer brake line. This process repeats until there is a sufficient amount of antifreeze or alcohol inside the trailer brake line to de-ice the trailer brake line. This process is time consuming and messy. In addition, the mechanic that is de-icing the trailer brake line tends to get very cold when the antifreeze or alcohol (hereinafter alcohol) spills over the mechanic’s hands when the mechanic is out in the cold weather trying to pour the small amounts of alcohol into the trailer brake line.

[0005] U.S. Pat. No. 5,293,904 discloses a de-icing assembly for a train line. In this disclosure, the train line de-icer has a container with two hoses connected between the container and a manifold, which is eventually connected to the brake line for the train car. This system requires a pressurized container to force the alcohol through the brake line. Each brake line in a train car is independent of a complete brake system, thus requiring the container to be pressurized. This is not acceptable in the truck industry. A driver of a truck is not going to drive with a pressurized canister on board or near the truck cabin. Should the truck be involved in an accident, the pressurized container will potentially add to the damage should it be compromised. Therefore, there is a need for a system and method for de-icing a trailer brake line without having a storage container that is required to maintain a pressure at all times for it to be ready to be used in a de-icing situation.

SUMMARY OF THE INVENTION

[0006] A de-icing assembly is used for unblocking a trailer brake line. The trailer brake line includes a receiving end that is connected to a truck end of a truck brake line. The de-icing assembly includes a housing including an interior space for storing an alcohol fluid. The housing also defines a top surface and a bottom surface. An inlet extends through the top surface. The inlet is removably connectable to the truck end of the truck brake line. The de-icing outlet also includes an outlet that is removably connectable to the receiving end of the trailer brake line. The outlet includes a fluid tube extending to a distal end disposed adjacent the bottom surface of the housing such that pressurized air received in the housing from the inlet forces the fluid stored in the housing out the outlet and into the trailer brake line to unblock the trailer brake line.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] Advantages of the invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings, wherein:

[0008] FIG. 1 is a perspective view of a truck with a trailer, partially cutaway, incorporating one embodiment of the invention; and

[0009] FIG. 2 is a cross-sectional side view of one embodiment of the invention connected between a truck and a trailer.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0010] Referring to FIG. 1, a trailer 10 is connected to a truck 12 in a manner well known in the art. The trailer 10 includes a trailer brake line 14 which is operatively connected to the brakes (not shown) of the trailer 10.

[0011] The trailer brake line 14 typically receives pneumatic pressure, i.e., pressurized air from the brake system (not shown) of the truck 12. The pneumatic air received by the trailer brake line 14 is transmitted thereto through a truck brake line 16. Glad hands 17 are connectors that connect the trailer brake line 14 to the truck brake line 16 as is standard in the art. When the trailer brake line 14 freezes, pressure from the truck brake line 16 cannot be used to activate the brake systems for the trailer 10. This is a relatively common occurrence because the trailer brake lines 14 are not near the internal combustion engine of the truck 12 or the passenger compartment of the truck 12. Therefore, the trailer brake lines 14 are not near a source of heat and are more likely to be exposed to the elements which will render them freezeable should water collect in the trailer brake lines 14.

[0012] Referring to FIGS. 1 and 2, a de-icing assembly is generally indicated at 18. The de-icing assembly 18 is secured within the brake system between the trailer brake line 14 and the truck brake line 16 to facilitate the de-icing of the trailer brake line 14.

[0013] Referring specifically to FIG. 2, the trailer brake line 14 includes a receiving end 20. The truck brake line 16 defines a truck end 22 that has a glad hand 17 fixedly secured thereto.

[0014] The de-icing assembly 18 includes a housing 24. The housing 24 defines an interior space 26. The housing 24 includes four side walls 28, 30 (only two shown), a top surface 32 and a bottom surface 34. The surfaces 32, 34 and side walls 28, 30 need not be planar, and may extend through curved planes. The housing 24 is designed to receive a canister of alcohol and still have space therein to receive a fluid in gas form, such as air, such that the housing 24 can be pressurized. In one embodiment, the housing 24 is rated to 120 psi.

[0015] The de-icing assembly 18 includes an inlet, generally shown at 36. The inlet 36 extends through the top surface
32. The inlet 32 includes a pipe threaded portion 38 that sealingly engages the top surface 32 of the housing 24. The inlet 36 is removably connectable to the truck end 22 of the truck brake line 16.

[0016] More specifically, the inlet 36 includes a spout 40 that allows alcohol fluid 42 to be poured into the housing 24 prior to the use of the de-icing assembly 18. A spout valve 44 opens and closes the spout 40 to allow alcohol fluid 42 to flow theretop when it is desired to refill the housing 24. The spout valve 44 is closed during the operation of the de-icing assembly 18 in order to maintain a pressurized interior space 26 when the de-icing assembly 18 is in operation.

[0017] The inlet 36 also includes a line port 46 disposed between the spout 40 and the pipe threaded portion 38. A line port valve 48 is fixedly secured to the line port 46 and opens and closes the line port valve 48 when the de-icing assembly 18 is being used and stored, respectively. More specifically, the line port valve 48 is open when the de-icing assembly 18 is operational and the line port 46 is eventually connectable to the truck brake line 16, whereas the line port valve 48 is closed when the de-icing assembly 18 is not connected to the truck brake line 16 and is in a storage or preparation stage. An inlet line 50 is fixedly secured to the line port 46 and selectively engages the truck end 22 of the truck brake line 16.

[0018] The de-icing assembly 18 also includes an outlet, generally shown at 52. The outlet 52 is removably connectable to the receiving end 20 of the trailer brake line 14. The outlet 52 includes a fluid tube 54 that extends to a distal end 56. The distal end 56 is disposed adjacent to the bottom surface 34 of the interior space 26. This allows for the collection of a large amount of the alcohol fluid 42 therethrough. The outlet 52 is designed that, when the interior space 26 receives pressurized air from the truck brake line 16 through the inlet 36, the fluid tube 54 receives the alcohol fluid 42 and allows it to move through the outlet 52 and into the trailer brake line 14 to unblock the trailer brake line 14 by contacting and melting the frozen precipitate. The outlet 52 includes an outlet valve 58 that selectively opens and closes the outlet 52 depending on when the de-icing assembly is in operation. An outlet line 60 is fixedly secured to the outlet 52 and selectively connected to the receiving end 20 of the trailer brake line 14.

[0019] The housing 24 is designed to represent a structure similar to a brief case. Therefore, the housing 24 includes a handle 62 to facilitate the carrying of the housing 24 when the de-icing assembly 18 is not being used. It should be appreciated that those skilled in the art that the housing 24 may be designed to have any shape desired.

[0020] In operation, the de-icing assembly 18 may be stored in a ready-to-use format, having alcohol fluid 42 already disposed inside the interior space 26, or in a non-ready format wherein the alcohol fluid 42 is not stored within the interior space 26. Regardless, to minimize leaks and/or spills, the de-icing assembly 18 is stored with the line port valve 48, the spout valve 44 and the outlet valve 58 all closed preventing alcohol fluid 42, or remnants thereof, from pouring out of the interior space 26. The de-icing assembly 18 is stored in a non-pressurized manner so that it does not pose a hazard during non-operational periods.

[0021] When it is determined that the trailer brake line 14 is frozen or blocked, it is determined whether alcohol fluid 42 is stored within the housing 24. If not, the spout valve 44 is opened and alcohol fluid 42 is poured through the spout 40 to fill the interior space 26 with a sufficient amount of alcohol fluid 42 to complete the de-icing of the trailer brake line 14. When the alcohol fluid 42 is inside the interior space, the spout valve 44 is closed.

[0022] The trailer brake line 14 is disconnected from the truck brake line 16. The truck end 22 of the truck brake line 16 is then connected to the inlet line 50 of the de-icing assembly 18. Likewise, the receiving end 20 of the trailer brake line 14 is connected to the outlet line 60 of the de-icing assembly 18. Once the lines are connected, the line port valve 48 and the outlet valve 58 are opened allowing the pneumatic pressure from the truck brake line 16 to pass through the de-icing assembly 18. When this occurs, the pressure from the truck brake line 16 forces the alcohol fluid 42 down and through the fluid tube 54 and out through the outlet 52 and to the trailer brake line 14. The alcohol fluid 42 then melts the ice within the trailer brake line allowing the trailer brakes to operate as designed. The alcohol fluid 42 and water, which was melted from the ice blockage, are eventually flushed out of the trailer brake lines through normal exhaust of the pneumatic pressure in the trailer brakes as is typical of trailer brake systems.

[0024] The invention has been described in an illustrative manner. It is to be understood that the terminology, which has been used, is intended to be in the nature of words of description rather than of limitation.

[0025] Many modifications and variations of the invention are possible in light of the above teachings. Therefore, within the scope of the appended claims, the invention may be practiced other than as specifically described.

1. A de-icing assembly for unblocking a trailer brake line having a receiving end that is connected to a truck end of a truck brake line, said de-icing assembly comprising:

a. a housing defining an interior space for storing an alcohol fluid, a top surface and a bottom surface;

b. an inlet extending through said housing, said inlet removably connectable to the truck end of the truck brake line;

c. an outlet removably connectable to the receiving end of the trailer brake line, said outlet including a fluid tube extending to a distal end disposed adjacent said bottom surface such that pressurized air received in said housing from said inlet forces the alcohol fluid stored in said housing out said outlet and into the trailer brake line to unblock the trailer brake line.

2. A de-icing assembly as set forth in claim 1 wherein said inlet includes a spout for pouring the alcohol fluid into said housing prior to use of said de-icing assembly.

3. A de-icing assembly as set forth in claim 2 wherein said inlet includes a line port for having an inlet line fixedly secured thereto.

4. A de-icing assembly as set forth in claim 3 including a spout valve for selectively opening and closing said spout.

5. A de-icing assembly as set forth in claim 4 including a line port valve for selectively opening and closing said line port.

6. A de-icing assembly as set forth in claim 5 including an outlet valve for selectively opening and closing said outlet.

7. A de-icing assembly as set forth in claim 6 wherein said interior space is greater than a space required to hold one fluid quart.
8. A de-icing assembly as set forth in claim 7 wherein said housing is rated to be pressurized to 120 psi.

9. A method for unblocking a trailer brake line having a receiving end with a de-icing assembly and a truck brake line connected to a truck brake system, the method including the steps of:

- securing the truck brake line to the de-icing assembly;
- securing the trailer brake line to the de-icing assembly;
- activating the truck brake system to force air through the truck brake line; and
- forcing alcohol fluid through the trailer brake line to de-ice the trailer brake line and unblock the trailer brake line.

10. A method as set forth in claim 9 including the step of filling the de-icing assembly with the alcohol fluid prior to the step of securing the truck brake line to the de-icing assembly.

11. A method as set forth in claim 10 including the step of closing valves to an inlet and an outlet after the step of forcing alcohol through the trailer brake line.