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VEHICLE BRAKE SYSTEM AND VEHICLE HAVING SAME

Abstract

A vehicle brake system, includes a brake fluid control assembly and a brake master cylinder assembly. The brake fluid control assembly a manifold block, and a pressure buildup device mounted at the manifold block. The brake master cylinder assembly is in communication with the manifold block. The brake master cylinder assembly and the pressure buildup device drive brake fluid to be output via the manifold block. A central axis of the brake master cylinder assembly is non-perpendicular to a first axis along a movement direction of a piston of the pressure buildup device.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS [0001] This application is a continuation application of International Patent Application No. PCT/CN2023/107879, filed on Jul. 18, 2023, which is based on and claims priority and benefits of Chinese Patent Application No. 202222887961.1, filed on Oct. 31, 2022. The entire content of all of the above-referenced applications is incorporated herein by reference.

FIELD

[0002] The present disclosure relates to the technical field of vehicle brakes, and more particularly, to a vehicle brake system and a vehicle having same.

BACKGROUND

[0003] A vehicle brake system in the related art includes a brake master cylinder assembly and a piston pump. Arrangement space is large because the brake master cylinder assembly and the piston pump are generally arranged perpendicular to each other.

SUMMARY

[0004] The present disclosure resolves at least one of the technical problems in the related art. In view of the above, the present disclosure provides a vehicle brake system. The vehicle brake system has advantages such as short pipeline length, low resistance to flow of brake fluid, and small space required by arrangement.

[0005] The present disclosure further provides a vehicle having the above vehicle brake system.

[0006] In a first aspect, a vehicle brake system is provided according to embodiments of the present disclosure. The system includes: a brake fluid control assembly, the brake fluid control assembly including a manifold block and a pressure buildup device, and the pressure buildup device being mounted at the manifold block; and a brake master cylinder assembly, the brake master cylinder assembly being in communication with the manifold block, and both the brake master cylinder assembly and the pressure buildup device driving brake fluid to be output via the manifold block; where a central axis of the brake master cylinder assembly is non-perpendicular to a first axis along a movement direction of a piston of the pressure buildup device.

[0007] The vehicle brake system according to the embodiment of the present disclosure has advantages such as short pipeline length, low resistance to flow of the brake fluid, and small space required by arrangement.

[0008] According to some embodiments of the present disclosure, the central axis of the brake master cylinder assembly is parallel to or coincides with the first axis along the movement direction of the piston of the pressure buildup device.

[0009] According to some embodiments of the present disclosure, the brake master cylinder assembly and the brake fluid control assembly are disposed spaced apart along a first direction, and the first direction is perpendicular to the central axis of the brake master cylinder assembly and the first axis along the movement direction of the piston of the pressure buildup device.

[0010] According to some embodiments of the present disclosure, the first axis along the movement direction of the piston of the pressure buildup device is parallel to a thickness direction of the manifold block.

[0011] According to some embodiments of the present disclosure, the brake master cylinder assembly and the brake fluid control assembly are spaced apart.
[0012] According to some embodiments of the present disclosure, the vehicle brake system further includes: a brake pedal, the brake pedal being in transmission connection to the brake master cylinder assembly; a sensor, the sensor being electrically connected to the pressure buildup device, and the sensor being configured to detect a movement change of the brake pedal; and a brake wheel cylinder, the brake wheel cylinder being in communication with the manifold block, and the brake wheel cylinder being configured to receive the brake fluid output by the manifold block.
[0013] According to some embodiments of the present disclosure, the brake fluid control assembly further includes: an electric control device. The electric control device is mounted at the manifold block. The electric control device includes a control valve, and the sensor is electrically connected to the pressure buildup device through the control valve. The control valve determines whether the pressure buildup device drives the brake fluid to be output via the manifold block according to a detection signal of the sensor.
[0014] According to some embodiments of the present disclosure, the brake fluid control assembly further includes: an oil supply device. The oil supply device is mounted on a top surface of the manifold block and configured to supply the brake fluid to the pressure buildup device. A bottom surface of the manifold block is configured to be connected to a vehicle body of a vehicle.
[0015] According to some embodiments of the present disclosure, the vehicle brake system further includes: a connection oil pipe. The manifold block includes a fluid inlet. The brake master cylinder assembly includes a first fluid outlet. The connection oil pipe is in communication with the fluid inlet and the first fluid outlet. The fluid inlet is constructed on a side surface of the manifold block.
[0016] According to some embodiments of the present disclosure, the first fluid outlet is disposed on a circumferential surface of the brake master cylinder assembly, and the first fluid outlet is located on a side of the brake master cylinder assembly facing the brake fluid control assembly.
[0017] According to some embodiments of the present disclosure, both the central axis of the brake master cylinder assembly and the first axis along the movement direction of the piston of the pressure buildup device extend along a length direction of the vehicle body of the vehicle; the brake master cylinder assembly and the brake fluid control assembly are disposed along a width direction of the vehicle body; or, the brake master cylinder assembly and the brake fluid control assembly are disposed along a height direction of the vehicle body, and the brake master cylinder assembly is located above the brake fluid control assembly.
[0018] According to some embodiments of the present disclosure, the manifold block includes a second fluid outlet, and the second fluid outlet is in communication with the fluid inlet. A central axis of the second fluid outlet is parallel to the first axis along the movement direction of the piston of the pressure buildup device.
[0019] According to some embodiments of the present disclosure, the pressure buildup device is a piston pump. The piston pump includes a motor, and the motor is mounted at the manifold block. The motor and the second fluid outlet are located on a same side surface of the manifold block.
[0020] According to some embodiments of the present disclosure, the brake fluid control assembly further includes: the electric control device, the electric control device being mounted at the manifold block, the electric control device and the motor being disposed on two opposite sides of the manifold block respectively, and the electric control device being connected to the piston pump.
[0021] In a second aspect, a vehicle is provided according to the embodiments of the present disclosure. The vehicle includes the vehicle brake system according to the embodiments in the first aspect of the present disclosure.
[0022] The vehicle according to the embodiments in the second aspect of the present disclosure uses the vehicle brake system according to the embodiments in the first aspect of the present disclosure, and thus has advantages such as short pipeline length, low resistance to flow of brake

fluid, and small space required by arrangement.
[0023] Additional aspects and advantages of the present disclosure will be set forth in part in the following description, and in part will become apparent from the following description, or will be learned by practice of the present disclosure.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
[0024] The above and/or additional aspects and advantages of the present disclosure will become apparent and comprehensible in the description of embodiments made with reference to the following accompanying drawings.
[0025] FIG. **1** is a schematic structural diagram of a vehicle brake system according to an embodiment of the present disclosure;
[0026] FIG. **2** is a schematic structural diagram of a vehicle brake system in another view according to an embodiment of the present disclosure;
[0027] FIG. **3** is a schematic structural diagram of a vehicle brake system in yet another view according to an embodiment of the present disclosure;
[0028] FIG. **4** is a schematic block diagram of a vehicle brake system according to an embodiment of the present disclosure; and
[0029] FIG. **5** is a schematic block diagram of a vehicle according to an embodiment of the present disclosure.
DETAILED DESCRIPTION
[0030] Embodiments described with reference to the accompanying drawings are illustrative, and the embodiments of the present disclosure are described in detail below.
[0031] In the description of the present disclosure, it should be understood that orientation or position relations indicated by the terms such as “center”, “longitudinal”, “transverse”, “length”, “width”, “thickness”, “on”, “below”, “front”, “back”, “left”, “right”, “vertical”, “horizontal”, “top”, “bottom”, “inside”, “outside”, “clockwise”, “anticlockwise”, “axial direction”, “radial direction”, and “circumferential direction” are based on orientation or position relations shown in the accompanying drawings, and are used only for ease and brevity of the description of the present disclosure, rather than indicating or implying that the mentioned device or component must have a particular orientation or must be constructed and operated in a particular orientation. Thus, such terms should not be interpreted as limiting the present disclosure.
[0032] In the description of the present disclosure, “a plurality of” means two or more.
[0033] A vehicle brake system **1** according to the embodiments of the present disclosure is described below with reference to the accompanying drawings.
[0034] As shown in FIG. **1** to FIG. **4**, the vehicle brake system **1** according to the embodiments of the present disclosure includes a brake fluid control assembly **100** and a brake master cylinder assembly **200**.
[0035] The brake fluid control assembly **100** includes a manifold block **110** and a pressure buildup device **120**. The pressure buildup device **120** is mounted at the manifold block **110**, the brake master cylinder assembly **200** is in communication with the manifold block **110**, and both the brake master cylinder assembly **200** and the pressure buildup device **120** can drive brake fluid to be output via the manifold block **110**. A central axis L**1** of the brake master cylinder assembly **200** is arranged/disposed non-perpendicular to an axis L**2** along a movement direction of a piston of the pressure buildup device **120**.
[0036] For example, the vehicle brake system **1** may include a brake pedal **500**, a sensor **600**, and a brake wheel cylinder **700**. The brake pedal **500** is in transmission connection to the brake master cylinder assembly **200**. The sensor **600** is electrically connected to the pressure buildup device **120**.

The sensor **600** is configured to detect a movement change of the brake pedal **500**. The brake wheel cylinder **700** is in communication with the manifold block **110**. The brake wheel cylinder **700** is configured to receive the brake fluid output by the manifold block **110**.

[0037] When the brake pedal **500** is pressed down, the sensor **600** may detect a displacement change or an angle change of the brake pedal **500**. For example, the sensor **600** may be a displacement sensor or an angle sensor. Then, the sensor **600** transmits an electrical signal to the pressure buildup device **120**, so as to control the pressure buildup device **120** to build up pressure. Thus, the brake fluid is pressed into the brake wheel cylinder **700**, so that the brake wheel cylinder **700** brakes wheels.

[0038] When the brake pedal **500** is pressed down, if the vehicle brake system **1** is not powered, the sensor **600** is damaged, the pressure buildup device **120** is damaged, or the pressure buildup device **120** cannot build up the pressure, a piston of the brake master cylinder assembly **200** is pushed by the brake pedal **500**. The brake master cylinder assembly **200** presses the brake fluid into the brake wheel cylinder **700**, so that the brake wheel cylinder **700** brakes the wheels.

[0039] In this way, the vehicle brake system **1** may have two brake manners. In one manner, a brake is performed in a manner of pure mechanical control through the brake master cylinder assembly **200**. In another manner, a brake is performed in a manner of combining mechanical control and electric control through the cooperation between the pressure buildup device **120** and the sensor **600**. Thus, brake accuracy and reliability of the vehicle brake system **1** can be ensured.

[0040] In the vehicle brake system **1** according to the embodiments of the present disclosure, the brake fluid control assembly **100** is configured to include the manifold block **110** and the pressure buildup device **120**. The pressure buildup device **120** is mounted at the manifold block **110**, the brake master cylinder assembly **200** is in communication with the manifold block **110**, and both the brake master cylinder assembly **200** and the pressure buildup device **120** can drive the brake fluid to be output via the manifold block **110**. In other words, the brake master cylinder assembly **200** can independently drive the brake fluid to be output via the manifold block **110**. The pressure buildup device **120** can independently drive the brake fluid to be output via the manifold block **110**. In an embodiment, the brake master cylinder assembly **200** and the pressure buildup device **120** can independently drive the brake fluid to be output via the manifold block **110**.

[0041] An oil path may be arranged in the manifold block **110**, and the oil path is in communication with the pressure buildup device **120**, the brake master cylinder assembly **200**, and the brake wheel cylinder **700** separately. Thus, both the pressure buildup device **120** and the brake master cylinder assembly **200** can output the brake fluid to the brake wheel cylinder **700** via the manifold block **110**. Both the pressure buildup device **120** and the brake master cylinder assembly **200** use the oil path in the manifold block **110**. Thus, an integration degree of the oil path of the vehicle brake system **1** can be improved, and space occupation and processing complexity of the vehicle brake system **1** can be reduced.

[0042] Also, the central axis L**1** of the brake master cylinder assembly **200** is arranged non-perpendicular to the axis L**2** along the movement direction of the pressure buildup device **120**. In this way, compared with a vehicle brake system **1** in the related art that a central axis of a brake master cylinder assembly is arranged perpendicular to an axis (e.g., a first axis) along a movement direction of the pressure buildup device, the brake master cylinder assembly **200** and the brake fluid control assembly **100** in the embodiments of the present disclosure can be closer to each other. Thus, length of a pipeline between the brake master cylinder assembly **200** and the brake fluid control assembly **100** is reduced, and entire space occupation by the brake master cylinder assembly **200** and the brake fluid control assembly **100** is reduced accordingly, so that space utilization of the vehicle is improved.

[0043] In an embodiment, when a brake is performed by the brake master cylinder assembly **200**, since the length of the pipeline between the brake master cylinder assembly **200** and the brake fluid control assembly **100** is reduced, resistance to flow of the brake fluid between the brake master

cylinder assembly **200** and the brake fluid control assembly **100** is reduced, a brake is correspondingly faster, and a brake effect is better.

[0044] Thus, the vehicle brake system **1** according to the embodiments of the present disclosure has advantages such as a short pipeline length, low resistance to the flow of the brake fluid, and small space required by arrangement.

[0045] According to some embodiments of the present disclosure, as shown in FIG. **1** to FIG. **3**, the central axis L**1** of the brake master cylinder assembly **200** is parallel to or coincides with the axis L**2** along the movement direction of the piston of the pressure buildup device **120**.

[0046] In this way, the brake master cylinder assembly **200** may be further close to the brake fluid control assembly **100**. Thus, the length of the pipeline between the brake master cylinder assembly **200** and the brake fluid control assembly **100** is further reduced, the entire space occupation by the brake master cylinder assembly **200** and the brake fluid control assembly **100** is further reduced, and the space utilization of the vehicle is further improved.

[0047] In an embodiment, when a brake is performed by the brake master cylinder assembly **200**, since the length of the pipeline between the brake master cylinder assembly **200** and the brake fluid control assembly **100** is further reduced, the resistance to flow of the brake fluid between the brake master cylinder assembly **200** and the brake fluid control assembly **100** is further reduced, the brake speed is further increased, and the brake effect is better.

[0048] According to some embodiments of the present disclosure, as shown in FIG. **1** to FIG. **3**, the brake master cylinder assembly **200** and the brake fluid control assembly **100** are arranged spaced apart along a predetermined direction (e.g., a first direction). The predetermined direction is perpendicular to the central axis L**1** of the brake master cylinder assembly **200** and the axis L**2** along the movement direction of the piston of the pressure buildup device **120**.

[0049] In this way, the brake master cylinder assembly **200** and the brake fluid control assembly **100** are arranged along a radial direction of the central axis L**1** of the brake master cylinder assembly **200** (i.e. a radial direction of the axis L**2** along the movement direction of the piston of the pressure buildup device **120**). In other words, the brake master cylinder assembly **200** and the brake fluid control assembly **100** can be prevented from being arranged along an axial direction of the central axis L**1** of the brake master cylinder assembly **200** (i.e. an axial direction of the axis L**2** along the movement direction of the piston of the pressure buildup device **120**). Thus, an objective of reducing a distance between the brake master cylinder assembly **200** and the brake fluid control assembly **100** can be achieved, and an increase in a size of the vehicle brake system **1** along the axial direction of the central axis L**1** of the brake master cylinder assembly **200** can be avoided. Further, space occupation by the vehicle brake system **1** in the axial direction of the central axis L**1** of the brake master cylinder assembly **200** can be reduced.

[0050] According to some embodiments of the present disclosure, as shown in FIG. **1** to FIG. **3**, the axis L**2** along the movement direction of the piston of the pressure buildup device **120** is arranged parallel to a thickness direction of the manifold block **110**. In this way, a size of the brake fluid control assembly **100** along the axial direction of the central axis L**2** of the pressure buildup device **120** is reduced, and space occupation by the brake fluid control assembly **100** along the axial direction of the axis L**2** along the movement direction of the piston of the pressure buildup device **120** is also reduced. Thus, the vehicle brake system **1** is miniaturized.

[0051] According to some embodiments of the present disclosure, as shown in FIG. **1** to FIG. **3**, the brake master cylinder assembly **200** and the brake fluid control assembly **100** are arranged in a spit manner, such that they are spaced apart. In the embodiment, in a case that the brake master cylinder assembly **200** and the brake fluid control assembly **100** are arranged in a split manner, the brake master cylinder assembly **200** and the brake fluid control assembly **100** are separated and mounted independently. In an embodiment, in a case that the brake master cylinder assembly **200** and the brake fluid control assembly **100** are arranged in a split manner, a cylinder body of the brake master cylinder assembly **200** and a body of the manifold block **110** are not connected integrally. In

this case, the brake master cylinder assembly **200** is detachably mounted at the brake fluid control assembly **100** through threaded connection, etc. The brake master cylinder assembly **200** includes the cylinder body and the piston located in the cylinder body. Movement of the piston in the cylinder body drives the brake fluid to flow.

[0052] In this way, compared with the vehicle brake system in the related art that the brake master cylinder assembly and the brake fluid control assembly are mounted integrally, the brake master cylinder assembly **200** and the brake fluid control assembly **100** of the vehicle brake system **1** in the embodiments of the present disclosure are separately arranged. Thus, arrangement positions and mounting methods can be more flexible, and the space utilization can be improved. In an embodiment, disassembly and assembly are convenient, and the brake master cylinder assembly **200** and the brake fluid control assembly **100** do not need to separately occupy large space.

[0053] According to some embodiments of the present disclosure, as shown in FIG. **1** to FIG. **3**, the brake fluid control assembly **100** further includes an electric control device **130**.

[0054] The electric control device **130** is mounted at the manifold block **110**. The electric control device **130** is provided with a control valve **1301**. The sensor **600** is electrically connected to the pressure buildup device **120** through the control valve **1301**. The control valve **1301** controls whether the pressure buildup device **120** drives the brake fluid to be output via the manifold block **110** according to a detection signal of the sensor **600**. The control valve **1301** may be a solenoid valve.

[0055] By arranging the electric control device **130**, the electric control device **130** may be connected to the sensor **600**, so as to obtain an electrical signal fed back by the sensor **600**. The electric control device **130** may calculate a displacement distance or a rotation angle of the brake pedal **500** according to the electrical signal fed back by the sensor **600**. Thus, pressure of the pressure buildup device **120** can be accurately controlled, so that a brake force of the vehicle is matched with a brake force required by a driver, and brake experience is improved.

[0056] According to some embodiments of the present disclosure, as shown in FIG. **1** to FIG. **3**, the vehicle brake system **1** further includes an oil supply device **140**. The oil supply device **140** is a device that can supply the brake fluid. In the embodiment, the oil supply device **140** is an oil storage device (for example, an oil kettle). Flow power of the brake fluid is sourced from an action of the piston of the brake master cylinder assembly **200**, or an action of piston of the pressure buildup device **120**. In an embodiment, the oil supply device **140** may include an oil storage device (for example, an oil kettle) and a power device that assists in supplying fluid power to the oil storage device. The oil supply device **140** is mounted on a top surface of the manifold block **110**, and is configured to supply the brake fluid to the pressure buildup device **120**. A bottom surface of the manifold block **110** is suitable/configured for being connected to a vehicle body. The bottom surface of the manifold block **110** may be mounted at a transverse beam **400** of a front cabin.

[0057] In this way, the transverse beam **400** of the front cabin may support the manifold block **110**. The manifold block **110** does not need to be suspended in the front cabin. In an embodiment, it does not need to additionally arrange a bracket for supporting the manifold block **110**. The manifold block **110** is mounted stably, and the space occupation is reduced. By arranging the oil supply device **140**, the brake fluid can be supplied to the pressure buildup device **120**, so as to facilitate repeated use of the pressure buildup device **120** and prepare for next pressure buildup for a brake of the pressure buildup device **120**. The oil supply device **140** and the brake master cylinder assembly **200** may be connected to a same oil kettle. In an embodiment, the oil supply device **140** and the brake master cylinder assembly **200** may be connected to different oil kettles. In an embodiment, the oil supply device **140** is the oil kettle, and directly supplies the brake fluid to the brake master cylinder assembly **200** and the pressure buildup device **120**. In an embodiment, the oil supply device **140** is mounted on the top surface of the manifold block **110**. The manifold block **110** can support the oil supply device **140**. Also, the oil supply device **140** does not interfere with the transverse beam of the front cabin and the pressure buildup device **120**. Thus, the brake fluid

control assembly **100** is more convenient to arrange, and the brake fluid in the oil supply device **140** can more easily flow into the pressure buildup device **120** under the effect of gravity.

[0058] According to some embodiments of the present disclosure, as shown in FIG. **1** to FIG. **3**, a vehicle brake system **1** further includes a connection oil pipe **300**. The manifold block **110** is provided with a fluid inlet **111**, the brake master cylinder assembly **200** is provided with a first fluid outlet **210**, and the connection oil pipe **300** is in communication with the fluid inlet **111** and the first fluid outlet **210** separately. The fluid inlet **111** is constructed/disposed on a side surface of the manifold block **110**.

[0059] For example, a plurality of connection oil pipes **300** may be provided. The plurality of connection oil pipes **300** may be connected to different side surfaces of the manifold block **110**. The plurality of connection oil pipes **300** or may be connected to a same side surface of the manifold block **110**. The oil supply device **140** is arranged on the top surface of the manifold block **110**, and the bottom surface of the manifold block **110** is connected to the vehicle body. Thus, length of the connection oil pipe **300** can be reduced by connecting the connection oil pipe **300** to the side surface of the manifold block **110**, and an entire size of the vehicle brake system **1** can be reduced. In an embodiment, the connection oil pipe **300** is less likely to interfere with the vehicle body.

[0060] According to some embodiments of the present disclosure, as shown in FIG. **1** to FIG. **3**, the first fluid outlet **210** is constructed on a circumferential surface of the brake master cylinder assembly **200**, and the first fluid outlet **210** is located on one side of the brake master cylinder assembly **200** that faces the brake fluid control assembly **100**.

[0061] In this way, a distance between the first fluid outlet **210** and the manifold block **110** is smaller, so that the length of the connection oil pipe **300** can be reduced. In an embodiment, since the length of the connection oil pipe **300** is reduced, resistance to flow of the brake fluid in the connection oil pipe **300** can be correspondingly reduced.

[0062] According to some embodiments of the present disclosure, as shown in FIG. **1** to FIG. **3**, both the central axis L**1** of the brake master cylinder assembly **200** and the axis L**2** along the movement direction of the piston of the pressure buildup device **120** extend along a length direction (i.e. a front-rear direction) of the vehicle body of the vehicle. The vehicle body has the largest spatial size along the length direction. Thus, space of the vehicle body along the length direction can be more fully used, and space utilization can be improved after both the central axis L**1** of the brake master cylinder assembly **200** and the axis L**2** along the movement direction of the piston of the pressure buildup device **120** extend along the length direction of the vehicle body.

[0063] In an embodiment, the brake master cylinder assembly **200** and the brake fluid control assembly **100** are distributed/disposed along a width direction (i.e. a left-right direction) of the vehicle body. In an embodiment, the brake master cylinder assembly **200** and the brake fluid control assembly **100** are distributed along a height direction (i.e. an up-down direction) of the vehicle body, and the brake master cylinder assembly **200** is located exactly above the brake fluid control assembly **100**.

[0064] In this way, arrangement methods are more diversified, so that the present disclosure can adapt to different shapes in front cabins of vehicles better, and can be applied to a wider range.

[0065] According to some embodiments of the present disclosure, as shown in FIG. **1** to FIG. **3**, the manifold block **110** is provided with a second fluid outlet **112**, and the second fluid outlet **112** is in communication with the fluid inlet **111**. A central axis of the second fluid outlet **112** is arranged parallel to the axis L**2** along the movement direction of the piston of the pressure buildup device **120**, where the manifold block **110** is in communication with the brake wheel cylinder **700** through the second fluid outlet **112**.

[0066] In this way, when performed by the brake master cylinder assembly **200**, a brake response is faster, a brake response speed is increased, and drive safety of the vehicle is higher.

[0067] According to some embodiments of the present disclosure, as shown in FIG. **1** to FIG. **3**, the

pressure buildup device **120** is a piston pump. The piston pump is provided with a motor **121**, the motor **121** is mounted at the manifold block **110**, and the motor **121** and the second fluid outlet **112** are located on a same side surface of the manifold block **110**.

[0068] The movement direction of the piston of the pressure buildup device **120** is identical to the thickness direction of the manifold block **110**. Thus, the motor **121** is mounted on one side surface, along the thickness direction, of the manifold block **110**. A surface area of the side surface of the manifold block **110** is larger for mounting the motor **121**. By locating the motor **121** and the second fluid outlet **112** on the same side surface of the manifold block **110**, the side surface of the manifold block **110** can be better utilized for mounting the motor **121**. In an embodiment, it can be ensured that the central axis of the second fluid outlet **112** is arranged parallel to the axis L**2** along the movement direction of the piston of the pressure buildup device **120**.

[0069] According to some embodiments of the present disclosure, as shown in FIG. **1** to FIG. **3**, the brake fluid control assembly **100** further includes the electric control device **130**. The electric control device **130** is mounted at the manifold block **110**. The electric control device and the motor **121** are arranged on two opposite sides of the manifold block **110** respectively. The electric control device **130** is connected to the piston pump.

[0070] In this way, the electric control device **130** and the motor **121** are arranged on the two opposite sides of the manifold block **110**. Thus, the side surface area of the manifold block **110** can be fully used. In an embodiment, the connection oil pipe **300** does not need to bypass the electric control device **130**, so that the connection oil pipe **300** is less likely to interfere with the electric control device **130**. Thus, the length of the connection oil pipe **300** can be reduced, and the entire size of the vehicle brake system **1** can be reduced.

[0071] A vehicle **1000** according to the embodiments of the present disclosure is described below with reference to FIG. **5**. The vehicle **1000** includes the vehicle brake system **1** according to any embodiment above of the present disclosure.

[0072] The vehicle **1000** according to the embodiments of the present disclosure uses the vehicle brake system **1** according to the above embodiment of the present disclosure, and thus has advantages such as short pipeline length, low resistance to flow of the brake fluid, and small space required by arrangement.

[0073] Other configurations and operations of the vehicle brake system **1** and the vehicle having same according to the embodiments of the present disclosure are known to those of ordinary skill in the art, and are not described in detail herein.

[0074] In the descriptions of the description, the descriptions with reference to the terms “an embodiment”, “some embodiments”, “an illustrative embodiment”, “an example”, “a specific example”, “some examples”, etc. indicate that characteristics, structures, materials, features, etc. described with reference to the embodiment or example are included in at least one embodiment or example of the present disclosure. In the description, exemplary descriptions of the above terms do not necessarily refer to a same embodiment or example.

[0075] Although the embodiments of the present disclosure have been shown and described, those of ordinary skill in the art can understand that various changes, modifications, replacements, and variations can be made to the embodiments without departing from the principles and spirit of the present disclosure, and the scope of the present disclosure is defined by the claims and their equivalents.

REFERENCE NUMERALS

[0076] vehicle brake system **1**, vehicle **1000**, [0077] brake fluid control assembly **100**, manifold block **110**, fluid inlet **111**, second fluid outlet **112**, pressure buildup device **120**, motor **121**, electric control device **130**, oil supply device **140**, [0078] brake master cylinder assembly **200**, first fluid outlet **210**, [0079] connection oil pipe **300**, and transverse beam **400**.

Claims

1. A vehicle brake system, comprising: a brake fluid control assembly, comprising: a manifold block; and a pressure buildup device mounted at the manifold block; and a brake master cylinder assembly being in communication with the manifold block, and the brake master cylinder assembly and the pressure buildup device driving brake fluid to be output via the manifold block, wherein a central axis of the brake master cylinder assembly is non-perpendicular to a first axis along a movement direction of a piston of the pressure buildup device.
2. The vehicle brake system according to claim 1, wherein the central axis of the brake master cylinder assembly is parallel to or coincides with the first axis.
3. The vehicle brake system according to claim 2, wherein the brake master cylinder assembly and the brake fluid control assembly are disposed spaced apart along a first direction, and the first direction is perpendicular to the central axis of the brake master cylinder assembly and the first axis.
4. The vehicle brake system according to claim 2, wherein the first axis is parallel to a thickness direction of the manifold block.
5. The vehicle brake system according to claim 1, wherein the brake master cylinder assembly and the brake fluid control assembly are spaced apart.
6. The vehicle brake system according to claim 1, further comprising: a brake pedal being in transmission connection to the brake master cylinder assembly; a sensor electrically connected to the pressure buildup device, and configured to detect a movement change of the brake pedal; and a brake wheel cylinder being in communication with the manifold block, and configured to receive the brake fluid output by the manifold block.
7. The vehicle brake system according to claim 6, wherein the brake fluid control assembly further comprises: an electric control device mounted at the manifold block and comprising a control valve, the sensor electrically connected to the pressure buildup device through the control valve, and the control valve determining whether the pressure buildup device drives the brake fluid to be output via the manifold block according to a detection signal of the sensor.
8. The vehicle brake system according to claim 1, further comprising: an oil supply device mounted on a top surface of the manifold block and configured to supply the brake fluid to the pressure buildup device, and a bottom surface of the manifold block configured to be connected to a vehicle body of a vehicle.
9. The vehicle brake system according to claim 1, further comprising: a connection oil pipe, the manifold block comprising a fluid inlet disposed on a side surface of the manifold block, the brake master cylinder assembly comprising a first fluid outlet, and the connection oil pipe being in communication with the fluid inlet and the first fluid outlet.
10. The vehicle brake system according to claim 9, wherein the first fluid outlet is disposed on a circumferential surface of the brake master cylinder assembly, and the first fluid outlet is located on a side of the brake master cylinder assembly facing the brake fluid control assembly.
11. The vehicle brake system according to claim 10, wherein: the central axis of the brake master cylinder assembly and the first axis extend along a length direction of a vehicle body of a vehicle; and the brake master cylinder assembly and the brake fluid control assembly are disposed along a width direction of the vehicle body; or the brake master cylinder assembly and the brake fluid control assembly are disposed along a height direction of the vehicle body, and the brake master cylinder assembly is located above the brake fluid control assembly.
12. The vehicle brake system according to claim 9, wherein the manifold block comprises a second fluid outlet, the second fluid outlet is in communication with the fluid inlet, and a central axis of the second fluid outlet is parallel to the first axis.
13. The vehicle brake system according to claim 12, wherein the pressure buildup device is a piston

pump, the piston pump comprises a motor, the motor is mounted at the manifold block, and the motor and the second fluid outlet are located on a same side surface of the manifold block.

14. The vehicle brake system according to claim 13, wherein the brake fluid control assembly further comprises: an electric control device mounted at the manifold block, the electric control device and the motor disposed on two opposite sides of the manifold block respectively, and the electric control device connected to the piston pump.

15. A vehicle, comprising a vehicle brake system, comprising: a brake fluid control assembly, comprising: a manifold block; and a pressure buildup device mounted at the manifold block; and a brake master cylinder assembly being in communication with the manifold block, and the brake master cylinder assembly and the pressure buildup device driving brake fluid to be output via the manifold block, wherein a central axis of the brake master cylinder assembly is non-perpendicular to a first axis along a movement direction of a piston of the pressure buildup device.

16. The vehicle according to claim 15, wherein the central axis of the brake master cylinder assembly is parallel to or coincides with the first axis.

17. The vehicle according to claim 16, wherein the brake master cylinder assembly and the brake fluid control assembly are disposed spaced apart along a first direction, and the first direction is perpendicular to the central axis of the brake master cylinder assembly and the first axis.

18. The vehicle according to claim 16, wherein the first axis is parallel to a thickness direction of the manifold block.

19. The vehicle according to claim 15, wherein the brake master cylinder assembly and the brake fluid control assembly are spaced apart.

20. The vehicle according to claim 15, wherein the vehicle brake system further comprises: a brake pedal being in transmission connection to the brake master cylinder assembly; a sensor electrically connected to the pressure buildup device, and configured to detect a movement change of the brake pedal; and a brake wheel cylinder being in communication with the manifold block, and configured to receive the brake fluid output by the manifold block.