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MERITOR WABCO

Technical Bulletin

Dual System Foot Brake Valve

Hazard Alert Messages

Read and observe all Warning and Caution hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.

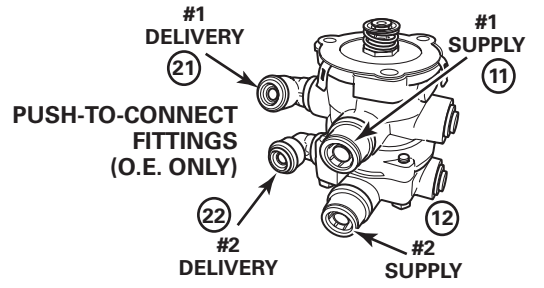
How to Obtain Additional Maintenance and Service Information

If you have any questions about the material covered in this publication, or for more information about the Meritor WABCO product line, please contact the ArvinMeritor Customer Service Center at 800-535-5560 or visit our website, meritorwabco.com.

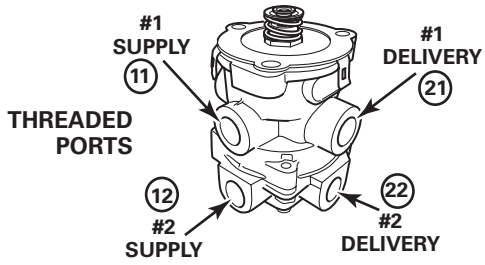
Description

The Meritor WABCO dual system foot brake valve provides graduated control for applying and releasing the brakes. The valve is mounted on the floor or on the firewall of commercial vehicles equipped with air brakes. Ports on the top portion of the valve, closest to the mounting face, are identified by a two-digit number ending in 1; port identification on the bottom portion of the valve has a two-digit number ending in 2. Figure 1.

NOTE: Service units are available with threaded ports only. Fittings must be added.



OEM ASSEMBLY (INCLUDES FITTINGS)



SERVICE UNIT (DOES NOT INCLUDE FITTINGS)

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Figure 1

Function

Force is applied by the driver's foot, which results in pressurized air being delivered from the air tanks to the front and rear axle control valves in order to apply the brakes. By controlling the force applied by the driver, the air pressure — and subsequent stopping power — can be graduated. The valve incorporates two separate supply and delivery circuits for primary and secondary service braking. Ports 11 and 21 are connected to the primary or rear brake circuit. Ports 12 and 22 are connected to the secondary or front brake circuit. Figure 2.

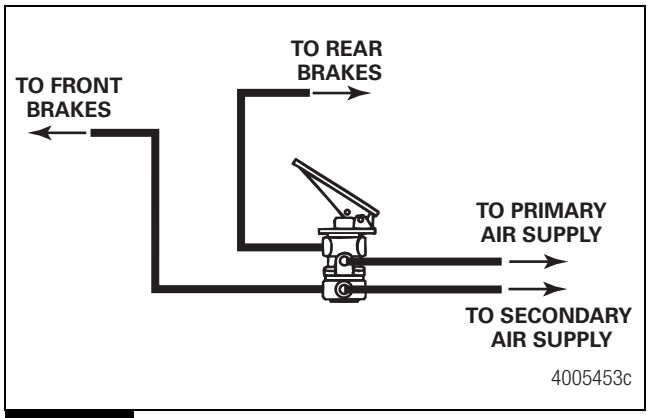

Figure 2

Service Procedures

Before servicing the Meritor WABCO Dual System Brake Valve, carefully read and follow all outlined procedures.

⚠ WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Open drain valves on all reservoirs to remove all pressure from the air system before you disconnect any component. Pressurized air can cause serious personal injury.

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a vehicle supported only by jacks. Jacks can slip and fall over. Serious personal injury and damage to components can result.

Do not spray the foot brake valve with a power washer. Internally frozen water may cause a loss of braking resulting in loss of vehicle control.

Do not paint the foot brake valve. Paint may impair valve function and could cause a loss of braking resulting in loss of vehicle control.

Inspect the pedals or treadles for binding on a regular basis. Binding can cause a loss of braking resulting in loss of vehicle control.

⚠ CAUTION

Do not use alcohol evaporators with this valve. Excessive alcohol may damage the valve and void the warranty.

Removal

1. Wear safe eye protection.
2. Place blocks under the tires to prevent the vehicle from moving.
3. Drain the air brake system. Open all of the drain valves on all of the reservoirs.
4. Identify the ports, tubes and radial orientation of the valve to ensure that the replacement valve is connected correctly. Color coded tubing is recommended for new installations. Mark and disconnect all air lines from the valve.
5. Remove the capscrews from the brake valve and treadle or pedal assembly.
6. Remove the brake valve and treadle or pedal assembly.

New Installation or Valve Replacement

1. Cover valve ports and existing tubes to protect them against contamination during installation.
2. Ensure the correct fittings are used with the foot brake valve. Several vehicle manufacturer customers mount various combinations of pressed-in push-to-connect fittings. Service units are offered with threaded ports only and fittings must be added.

⚠ WARNING

When installing fittings, ensure that clamping force on the valve does not exceed 500 lb (2224.11 N). Excessive force on the valve may cause binding and could cause loss of braking resulting in loss of vehicle control.

3. Mount the dual circuit foot valve so that the exhaust port is no more than 90 degrees from the down position. The valve is mounted using three 5/16 or M8 threaded holes or studs. The part may be attached directly to the floor of the firewall or it may be attached to an adapter. Install the capscrews that retain the brake valve to the treadle or pedal assembly. The assembly torque is 200 ±10 lb-in (22.6 ±1.13 N•m).
4. Install the brake valve and treadle or pedal assembly.
5. Connect all air lines to the valve as previously identified.

⚠ CAUTION

Tubes for push-to-connect fittings must be cut cleanly and end cuts must be perpendicular within seven degrees. Angles and sharp edges can damage the seal in the fitting.

⚠ WARNING

Follow the manufacturer's recommendation for the installation radius of the tubes. Kinked tubes can block the flow of air and cause a loss of braking resulting in loss of vehicle control.

6. When installing the tubes into the push-to-connect fittings, insert the tubing until it hits a stop in the fitting.
7. Follow the manufacturer's recommendation for adjusting pedals or treadles.
8. After installation, perform both the operation and leakage tests. Refer to the test instructions in this bulletin.
9. Remove the blocks from the tires.

Testing

Operation Test

Use a test gauge to check the delivery pressure of both the number 1 and number 2 circuits. Depress the treadle to several positions between fully released and fully applied. Check that the delivered pressure on the gauge varies equally and proportionately with the movement of the brake pedal. The gauge should fall promptly to ZERO after a full application is released.

The secondary delivery pressure is designed to be slightly lower than the primary pressure. The differential is indicated on the valve name tag. A designation of BV 550-030 describes a valve with a 55 lb (244.65 N) primary crack force and a 3 psi (0.2 bar) secondary crack pressure. A designation of BV 550-060 describes a valve with a 55 lb (244.65 N) primary crack force and a 6 psi (0.4 bar) secondary crack pressure.

If the valve does not function as described, replace the valve.

Leakage Test

1. Apply and hold a high pressure application.
2. Apply a soap solution to the exhaust port and body of the brake valve.
   - Leakage of a one-inch (25.4 mm) bubble in three seconds is acceptable.
   - Leakage at the tube fittings should not exceed a 1/4-inch (6.35 mm) bubble in three seconds.

   NOTE: Leakage may be caused by contaminants entering the valve and lodging in the seal surface. Several full, rapid pedal applications may clear the valve.
3. If the valve does not function as described or if leakage is excessive, replace the valve.

Troubleshooting the Dual System Foot Brake Valve

⚠ WARNING

The foot valve is a critical part of the air brake system. Never ignore any symptom such as leakage or a change in pedal force. Loss of braking may result.

Open the drain valves on all reservoirs to remove all pressure from the air system before you disconnect any component. Pressurized air can cause serious personal injury.

Pedal Force and Travel

- Inspect the pedals or treadles for binding on a regular basis. Binding can cause a loss of braking.
- Check pedals or treadles for excessive pre-travel. Follow the manufacturer's recommendation for adjusting pedals or treadles.
- **Check pedal force.** If a change in pedal force is detected, examine the valve and the pedals carefully.
  - — The pedal arrangement and valve must be free of corrosion, debris or contamination.
  - — Force to start pressure application of the valve without the pedal advantage will be 55 ±10 lb (244.65 ±44.8 N)
  - — Replace the valve if necessary.

Pressure Values

- The secondary delivery pressure is designed to be slightly lower than the primary pressure. The differential is indicated on the valve name tag. A designation of BV 550-030 describes a valve with a 55 lb (244.65 N) primary crack force and a 3.0 psi (0.2 bar) secondary crack pressure. The most common secondary crack pressure will be 3.0 psi (0.2 bar).

Air Leakage

- Inspect the valve and fittings for **air leakage** on a regular basis.
  - — Internal leaks will generally exit the valve through the exhaust port on the bottom of the valve. This may be due to contamination entering the valve and lodging in the seal surfaces. Make several full, rapid pedal applications. Debris may be blown out of the valve. If the leak persists, replace the valve.
  - — Some push-to-connect fittings can be repaired by replacing the internal O-ring. Contact the truck manufacturer for fitting repair instructions and components.
- **Valve leaks at the exhaust port with all brakes released:**
  - — Examine the two-way check valves to ensure there is no air entering the system from another source.
  - — Examine the inversion valve to ensure there is no back flow into the service control line.
  - — Check the seal in the spring brake for back flow of spring “hold-off” pressure through the service port to open the exhaust on the valve.
- **Valve leaks at exhaust with foot brake applied:**
  - — Replace the valve.
- **Valve leaks at exhaust with all park brakes set in the park position and foot brake released:**
  - — Replace the valve.

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