

# WABCO

## Technical Bulletin

### Hydraulic Compact Unit (HCU) Relay Valve Replacement Procedure

#### 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

Refer to Maintenance Manual MM-0401, WABCO Hydraulic Power Brake (HPB) System. To obtain this publication, call WABCO North America Customer Care at 855-228-3203. WABCO publications are also available on our website:

[www.wabco-na.com](http://www.wabco-na.com)

For dealer support, call WABCO North America Customer Care at 855-228-3203.

#### HCU Relay Valve Replacement Procedures

This publication provides instructions for the removal and installation of HCU relay valves. Please read these instructions completely before attempting to service the system and carefully follow all outlined procedures.

#### Required Equipment

- Denatured alcohol
- Lint-free tissues or rags
- Torque wrench, capable of 35-71 in-lb (4-8 N•m)
- 4 mm hex-head socket
- Drive ratchet
- Hose clamp pliers for 3/4-inch (19.5 mm) rubber hose

#### Before Performing Service Procedures

Before working on the HPB braking system, you must depressurize the system. Failure to depressurize the system may result in serious personal injury. Depressurization instructions are outlined under Step 4 of Removal on page 2 of this bulletin.

#### WARNING

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

**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.**

**Release all air from the air systems before you remove any components. Failure to depressurize the system may result in serious personal injury.**

**The full power brake system is a pressurized system that achieves pressures up to 2320 psi (160 bar). This pressure is not reduced by switching the ignition off or removing battery power. Prior to servicing this system, the depressurization procedures must be performed exactly as presented. Failure to depressurize the system may result in personal injury or death.**

#### CAUTION

**The HPB system is a complex device that provides optimum efficiency and operation. If the system sustains damage, or a component malfunctions and requires replacement, the replacement procedures provided by WABCO must be followed exactly with the associated steps performed in the order presented.**

**Hydraulic brake fluid is a caustic substance. Contact with the hydraulic brake fluid can cause skin irritation. Do not let hydraulic brake fluid touch any painted surfaces, as it will remove the paint. Hydraulic brake fluid may also damage certain non-metal surfaces. Do not let fluid contact brake pads, shoes, rotors or discs.**

**Before disposing of used components, verify the warranty status. Contact WABCO North America Customer Care at 855-228-3203 for instructions.**

## Removal

1. Wear safe eye protection.
2. Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving.
3. Disconnect the battery.
4. Apply the brake pedal a **minimum** of 30 times to decrease pressure in the system. To ensure the system is depressurized, perform the following check on both the front and rear axles.
  - A. Remove the protective cover from the end of the bleeder fitting on one brake caliper.
  - B. Attach a bleeder bottle hose to the bleeder fitting at the wheel end. Submerge the free end of the bleeder hose into the bleeder bottle. Both the tubing and container must be able to withstand the chemical effects of hydraulic brake fluid.
  - C. Use a wrench to open the bleeder fitting screw.
  - D. Apply and hold the brake pedal down until no more brake fluid runs out. Do not release the brake pedal.
  - E. With the brake pedal still applied, use a torque wrench to close the bleeder fitting screw.
5. Use a torque wrench to tighten the bleeder fitting screw to 35-39 in-lb (4-4.5 N•m). 
6. Repeat Step 4 and Step 5 for the other axle.
7. Use hose clamp pliers to clamp the rubber hose at least three-inches (76 mm) away from the entrance to the HCU reservoir. Use care to avoid damage to the plastic reservoir nipple inside the hose. Figure 1.

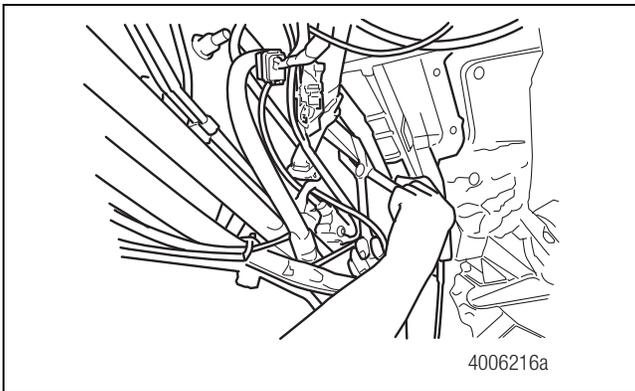


Figure 1

**NOTE:** Avoid bending or kinking the brake lines while disconnecting and handling other components.

8. Disconnect the two master cylinder brake lines from the relay valve. Plug the two lines to prevent contamination.

9. Use a 4 mm socket wrench to loosen and remove the five Allen-head screws that secure the relay valve to the hydraulic compact unit (HCU). Figure 2.

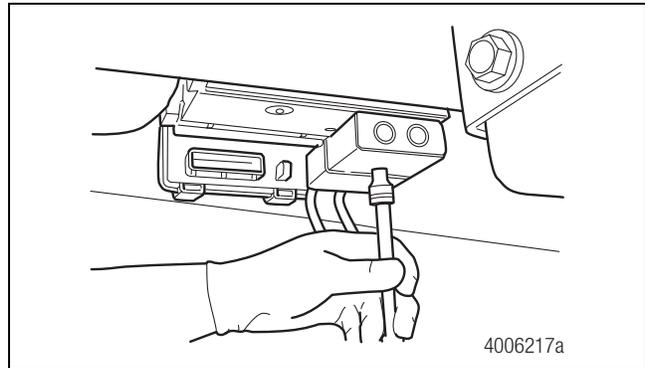


Figure 2

10. Carefully lower and remove the relay valve.
11. Remove and discard the rubber-coated seal plate. **Do not reuse this plate.** During installation, use the new seal plate included with the relay valve replacement kit. Figure 3.

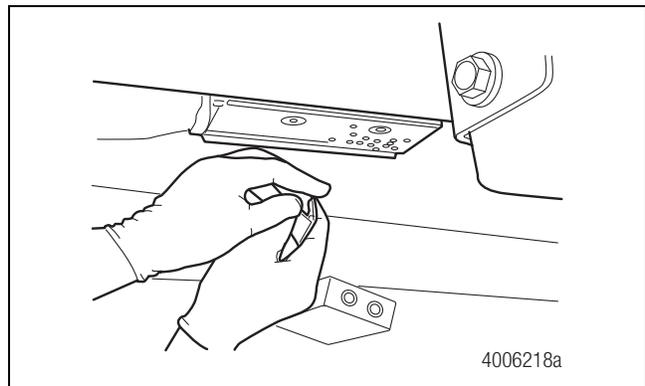


Figure 3

12. Use denatured alcohol and lint-free rags to clean the valve mounting surface. Ensure there is no rubber sticking to the HCU. Do not allow rubber or other debris to fall into the HPB bore holes. Figure 4.

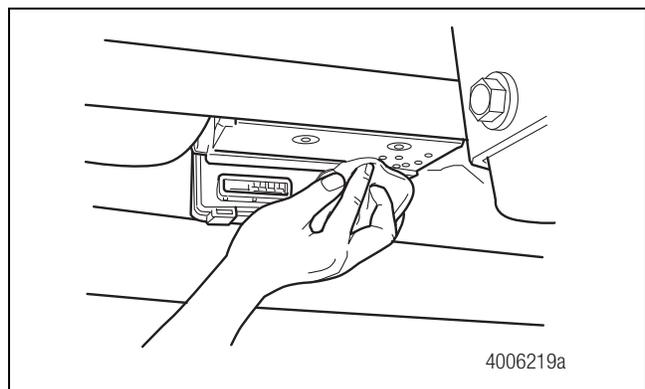


Figure 4

## Installation

- Place a screw into the center mounting hole of the relay valve. Use a hex-head socket tool for positioning. Place the new relay valve seal onto the relay valve using the screw to align the seal. The orientation should match Figure 5. Position the relay valve against the HCU. Thread the screw into the HCU.

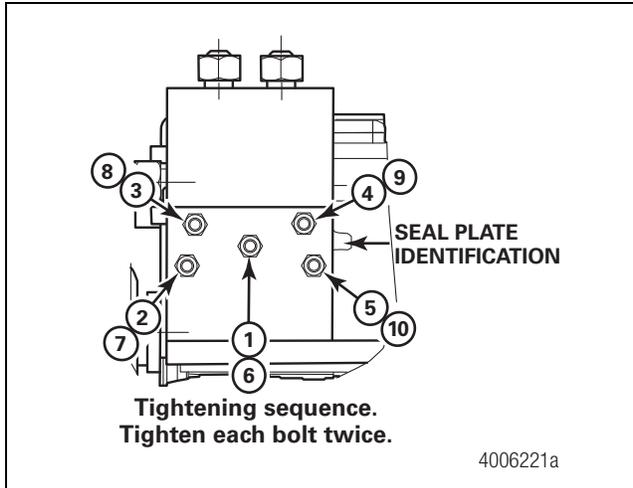


Figure 5

- Place the remaining four screws into the mounting holes on the relay valve. Hand tighten all five screws.
- Use a torque wrench to tighten all five screws to 71 in-lb (8 N•m) following the numbered sequence illustrated in Figure 5.
- Attach the master cylinder brake lines. Remove the hose clamp from the low pressure hose.
- Refill the master cylinder reservoir. The HCU reservoir will require some filling, and some fluid will gravity feed down the low pressure hose.
- Verify the master cylinder is filled to the "MAX" fill line or above.
- Install a bleeder adapter cap, and apply pressure to the master cylinder reservoir. Use filtered and regulated air and regulate the air to 35 psi (2.4 bar). The fluid level may drop significantly after applying pressure, as the HCU reservoir fills. If this occurs, pressure must be removed and fluid must be added to the maximum level again.
- Bleed the relay valve circuit. If all of the fluid was drained from the HCU reservoir during the replacement procedure, air was able to enter the system. If this is the case, bleed the axle circuits. Refer to WABCO maintenance manual MM-0401 for bleed instructions.

**NOTE:** The following steps require TOOLBOX™ Software. Refer to the TOOLBOX™ user's manual, TP-99102, for complete operating instructions. A copy of this manual is available on the web (wabco-na.com).

- With pressure on the system, reconnect the batteries. After reconnecting the batteries, turn the ignition on. Connect TOOLBOX™ Software to the vehicle. Use this software to verify pressure is building correctly. Figure 6.

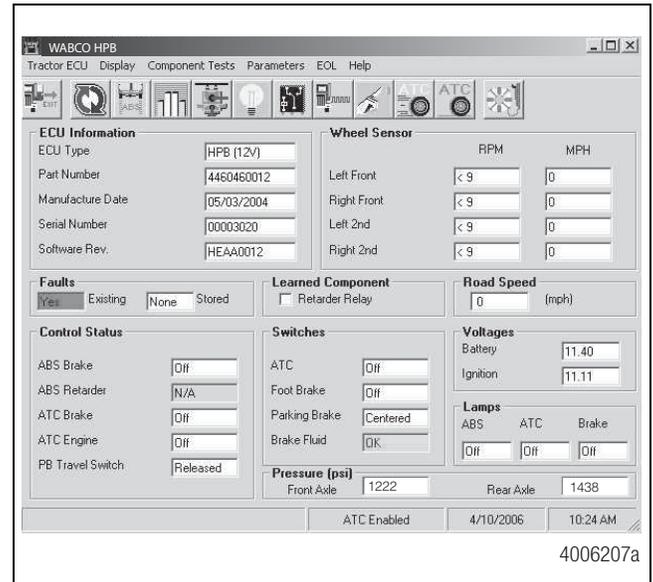


Figure 6

- Remove pressure from the master cylinder reservoir and remove the adapter cap.
- After the accumulators have fully charged, approximately 2100 psi (145 bar), deplete the system pressure. Under the **EOL** menu on the HPB screen, select **Deplete Accumulators**. Figure 7 and Figure 8.

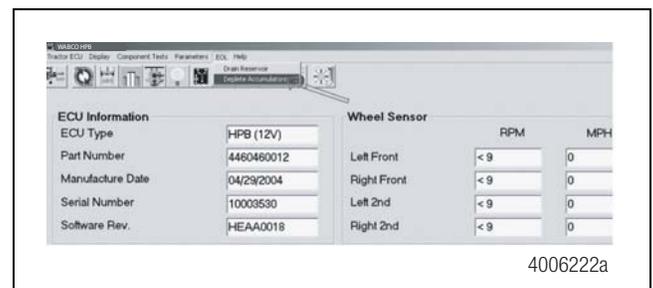


Figure 7



**Figure 8**

12. Verify fluid is at the maximum level.
13. Use TOOLBOX™ Software to verify correct system function.  
Check for:
  - System Pressure (Main Screen)
  - System Faults (Fault Information Screen)
14. Record, then repair, any new fault occurrences. Clear the system faults.

## **WABCO**

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