

# MERITOR WABCO

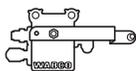
## Technical Bulletin

### Cab Leveling Valve (P/N 464 008 008 0)

### Chassis Leveling Valve (with Suspension Dump) (P/Ns 464 008 007 0, 464 008 010 0, 464 008 011 0)

**Meritor WABCO cab and chassis leveling valves have an exhaust feature that allows air to exhaust for twelve minutes or longer after a load is removed from the suspension — or for as long as it takes the arm to return to the neutral position. You may hear air exhausting from the leveling valve during this time.**

This technical bulletin covers both cab and chassis leveling valves manufactured by Meritor WABCO. While the general installation and maintenance information applies to both valves, there are some differences. A cab or chassis valve icon appears wherever this occurs.



Indicates Information Applies to **Cab** Leveling Valve



Indicates Information Applies to **Chassis** Leveling Valve

**Supply Position:** This refers to the position of the leveling valve when it is supplying air. Usually, the control lever will be in an upward position.



**Exhaust Position:** This refers to the position of the leveling valve when it is exhausting air. Usually the control lever will be in a downward position.



### Control Lever Positions

This technical bulletin refers to various valve positions that are required for correct operation. Before performing any maintenance procedures, make sure you are familiar with these terms.

**The positions illustrated are for chassis leveling valves. In cab leveling valve applications, the UP/DOWN control lever movements for supply/exhaust may be reversed, depending upon the mounting location.**

**Neutral Position:** This refers to the position of the leveling valve when it is neither supplying nor exhausting air. The control lever will be **nearly** horizontal. Neutral position is often referred to as the **Dead Band**. Dead band travel is approximately 3° total.



### How the Cab and Chassis Leveling Valves Work

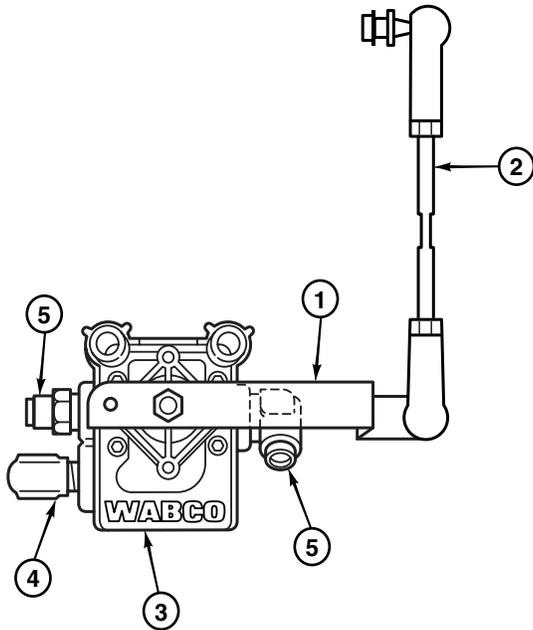
When the Suspension Load Is Increased:

- The control lever shifts to allow air from the reservoir to flow through the supply port and into the air bags from the delivery port.
- Volume in the air bags increases and raises the chassis or cab height. When the operating valve reaches neutral position, the valve closes.

When the Suspension Load Is Decreased:

- The control lever shifts in the opposite direction and allows air to exhaust from the air bags through the valve to the exhaust port.
- Volume in the air bags decreases and lowers the chassis or cab height. When the operating valve reaches the neutral position, the valve closes.

**Figure 1 — Cab Leveling Valve**



- |                    |                     |
|--------------------|---------------------|
| 1 CONTROL LEVER    | 4 SUPPLY PORT       |
| 2 VERTICAL LINKAGE | 5 DELIVERY PORT (2) |
| 3 EXHAUST AREA     |                     |

## Maintenance

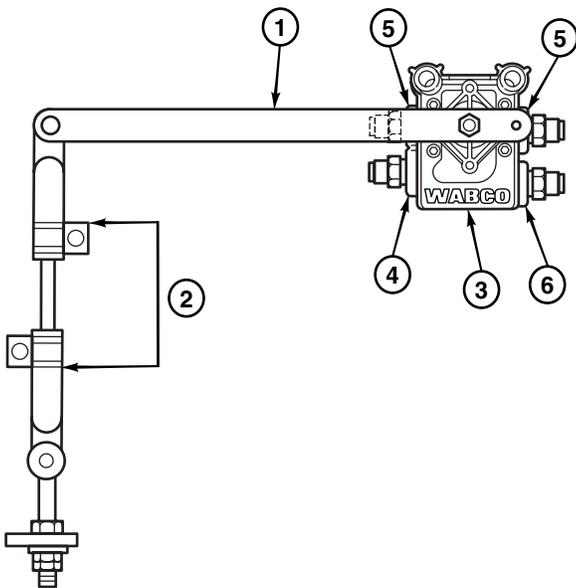
Valve mounting locations, measurement ranges, etc., will vary by vehicle manufacturer. For this reason, it is important that a copy of the vehicle OEM specifications and/or operating manual be available.

Refer to the Diagnostic Table on page 3 for maintenance information.

Conditions that indicate maintenance may be required include:

- Air leaks from the leveling valve AFTER the lever has returned to the neutral position
- High air consumption, e.g., air exhausts excessively (compressor duty cycles increase)
- Rough ride, bottoming out, excessive road vibration
- Vehicle chassis or cab sits high or low

**Figure 2 — Chassis Leveling Valve**



- |                    |                     |
|--------------------|---------------------|
| 1 CONTROL LEVER    | 4 SUPPLY PORT       |
| 2 VERTICAL LINKAGE | 5 DELIVERY PORT (2) |
| 3 EXHAUST AREA     | 6 PILOT PORT        |

# Troubleshooting



**For suspected air leakage:** Fully dump the suspension. Return to ride height and allow five minutes for the system to stabilize prior to checking for leakage at the chassis leveling valve.

Use the following Diagnostic Table to identify and correct leveling valve problems.

## Diagnostic Table

Condition	Possible Cause	Corrective Action
<b>No air to the valve</b>	<ul style="list-style-type: none"> <li>• Air system not working correctly</li> <li>• Clogged air supply lines</li> </ul>	Inspect air lines for pinching. Inspect pressure protection valve for correct operation. Verify system pressure by removing the supply line at the valve. Refer to the OEM operating instructions for pressure protection valve information.
<b>Exhausting of air after control lever reverts to neutral position</b>	• Contaminants in the air system	Inspect the air supply system for oil, moisture or foreign materials. If contamination is suspected, evacuate and clean the system. Reassemble and test the leveling valve for correct operation. Replace <b>only</b> if the valve testing procedures fail.
	• Incorrect tubing installation	Inspect tubing cuts and connections. Re-cut and reassemble as necessary. Make sure cuts are straight and smooth. Use the correct tube cutting tool.
	• Incorrect plumbing	Inspect installation of the inlet and output ports. Reassemble as instructed in the vehicle OEM manual.
	• Internal problem with leveling valve	If all of the above causes have been eliminated and the problem still persists, contact the Meritor Customer Service Center at 800-535-5560.
<b>High air consumption</b>	• Air leakage	Check all air lines and connections for leaks. Make necessary repairs.
	• Worn shock absorbers on either the cab or chassis	Check shocks for oil leakage. Replace as necessary. <b>NOTE:</b> Worn shocks result in excess cab or chassis movement.
	• Linkage length is incorrect	Follow the linkage adjustment procedures on page 6 ("Adjusting the Leveling Valve") to adjust linkage to OEM specifications.
	• Incorrect valve installation	Follow the linkage adjustment procedures on page 6 ("Adjusting the Leveling Valve"). Check for correct valve installation and orientation of plumbing to the air supply and delivery ports.
<b>Rough ride</b>	• Incorrect ride height	Check the height at the correct measuring points (refer to "Adjusting the Leveling Valve" on page 6). Adjust linkage as necessary.
	• Worn shock absorbers	Check shocks for oil leakage. Replace as necessary. <b>NOTE:</b> Worn shocks result in excess cab or chassis movement.
	• Valve will not exhaust	Check for crimped air delivery line or incorrect installation. Make necessary repairs.
	• Valve will not deliver air	Check for crimped air supply and/or delivery lines. Verify system pressure at the valve. Check for correct valve installation.

## Diagnostic Table

Condition	Possible Cause	Corrective Action
<b>Bottoming out</b>	• Incorrect chassis height	Check the ride height at the correct measuring points (refer to "Adjusting the Leveling Valve" on page 6). Adjust the leveling valve linkage as necessary.
	• Worn shock absorbers	Check shocks for oil leakage. Replace as necessary. <b>NOTE:</b> Worn shocks result in excess cab or chassis movement.
<b>Vibration (chassis valve only)</b>	• Incorrect drive line angles	Follow the linkage adjustment procedures on page 6 ("Adjusting the Leveling Valve") to adjust linkage to OEM specifications.
<b>No dump valve function (chassis valve only)</b>	• No air signal to Pilot Port (Port 4)	Check air feed to pilot port. Check air lines to and from the cab switch. Make necessary repairs. If air feed is OK but problem persists, contact ArvinMeritor's Customer Service Center at 800-535-5560.
<b>After dump function, air bags do not inflate</b>	• Air lines blocked	Check air lines to delivery and supply ports for clogging or crimping. Make necessary repairs. Check the supply function (refer to "Checking the Supply and Exhaust Functions" on page 4).
	• Incorrect linkage or valve installation	Adjust linkage (Refer to "Adjusting the Leveling Valve" on page 6). Verify correct valve installation. Check the exhaust function (refer to "Checking the Supply and Exhaust Functions" on page 4). If condition persists, contact ArvinMeritor's Customer Service Center at 800-535-5560.

## Cab and Chassis Leveling Valve Test Procedures



### 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.

Verify that all personnel are clear of the vehicle before you inflate or deflate the air bags. The air suspension has various pinch points that can cause serious personal injury.

## Checking the Supply and Exhaust Functions

1. Unhitch the trailer from the tractor.
2. Put blocks under the front and rear tires to keep the vehicle from moving.

3. Run the engine to build up vehicle air pressure to at least 100 psi (690 kPa) to ensure the pressure protection valve does not block supply to the leveling valve.
4. Turn engine OFF. Set parking brakes.
5. Disconnect the linkage from the control lever.
6. Check the supply and exhaust functions.

### Cab Leveling Valve

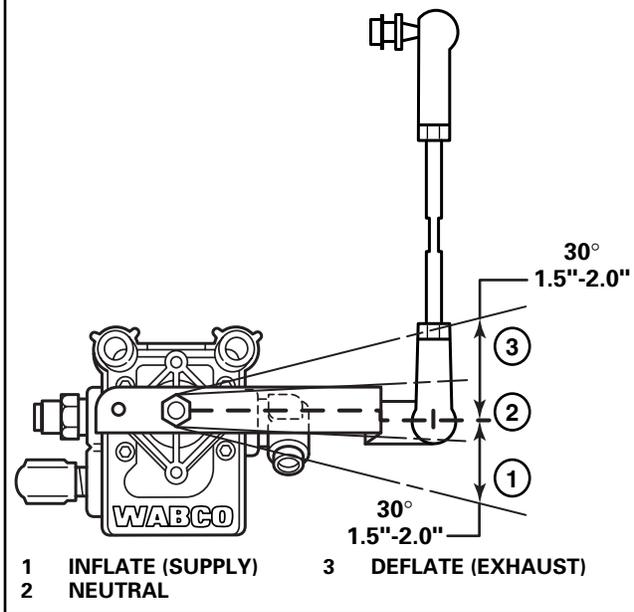
Supply Function:



**NOTE:** In some applications, the UP/DOWN control lever movements for supply/exhaust may be reversed.

Push the control lever DOWN (or toward the supply position) at a 30° angle (1.5 to 2.0-inches/38 to 51 mm). If air passes through the valve, the intake section of the valve works correctly. The cab will rise and the flow of air will be audible. Return to the neutral position.  
**Figure 3.** If you do not detect any air flow, refer to the Diagnostic Table on page 3.

**Figure 3 — Cab Leveling Valve**



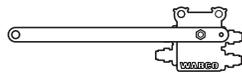
**Exhaust Function:**

Pull the control lever UP (or toward the exhaust position) at a 30° angle (1.5 to 2.0-inches/38 to 51 mm). If air exhausts through the valve, the exhaust section of the valve is operating correctly. The cab will lower and the flow of air will be audible.

If the leveling valve does not supply or exhaust air, or there is no neutral position, refer to the Diagnostic Table on page 3.

**Chassis Leveling Valve**

**Supply Function:**



Pull the control lever UP at a 30° angle (3.5 to 4.0-inches/89 to 102 mm). If air passes through the valve, the intake section of the valve works correctly.

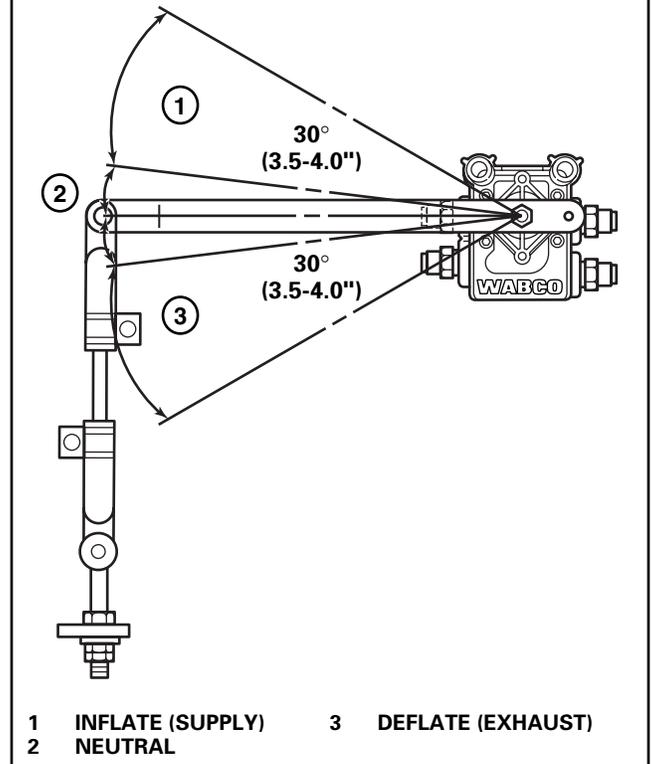
The chassis will rise and there will be an audible flow of air. Return to neutral position. **Figure 4.**

**Exhaust Function:**

Push the control lever DOWN at a 30° angle (3.5 to 4.0-inches/89 to 102 mm). If air exhausts through the valve, the exhaust section of the valve is operating correctly. The chassis will lower and the flow of air will be audible.

If the leveling valve does not supply or exhaust air, or there is no neutral position, refer to the Diagnostic Table on page 3.

**Figure 4 — Chassis Leveling Valve**



7. Return the control lever to the neutral position. After a short period of time, the air should stop flowing.
8. If the cab or chassis leveling valve exhaust and supply functions operate correctly, no further checking of the valve is necessary. However, there could be another problem, such as valve linkage adjustment, that needs to be repaired. Do not replace the leveling valve before performing all possible checks referenced in the diagnostic table.

**Chassis Leveling Valve:**

If the valve has an integrated dump function, test it to make sure it is functioning correctly. To test this function, refer to "Testing the Suspension Dump Function (On chassis leveling valves equipped with an integrated suspension dump function)" on page 6.



## Testing the Suspension Dump Function (On chassis leveling valves equipped with an integrated suspension dump function)

### **WARNING**

*Verify that all personnel are clear of the vehicle before you inflate or deflate the air bags. The air suspension has various pinch points that can cause serious personal injury.*

Some chassis leveling valves may be equipped with an integrated suspension dump function. If this is the case, the valve will have a pilot port. Refer to **Figure 2**. To test the dump function:

1. Charge the air system (100 psi minimum).
2. Activate the dump switch located on the dash. The air bags will deflate. (Refer to the vehicle OEM manual for a description of the dump switch.)
3. Deactivate the dump switch to refill the air bags. If the bags do not refill, maintenance procedures may be required. Refer to the Diagnostic Table on page 3 for additional information.

## Adjusting the Leveling Valve

### **WARNING**

*Pressurized air can cause serious personal injury.*

1. Park vehicle on a level surface. Unhitch the trailer from the tractor.
2. Put blocks under the front and rear wheels to keep the vehicle from moving.
3. Run the engine to charge the air system (100 psi minimum).
4. Turn the engine off. **Do not** set the parking brakes.
5. Measure the ride height of the leveling valve. Refer to the vehicle OEM specifications for recommended distance and measurement instructions.

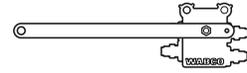
**NOTE:** If ride height measurement is within the OEM-recommended distance, no further action is required.

6. If the ride height measurement is NOT within the OEM-recommended distance, make the necessary adjustments:
  - Loosen the fastener(s) on the leveling valve linkage.

- Adjust the linkage rod to shorten or lengthen the rod linkage until the appropriate height is obtained. Wait a sufficient length for the control to stop.
- Tighten the fastener(s). Refer to the vehicle OEM specifications for the correct torque specification. 

7. Make sure the control lever is in the neutral position.

### **Chassis Leveling Valve with Suspension Dump Only:**



Lower the chassis with the dump feature. The lever should be in the supply position. Move the switch to the OFF position to deactivate the dump function. The chassis will return to the correct ride height. If adjustment is necessary, follow the procedure given above.

8. Drive the vehicle to test for correct adjustment. If further adjustment is necessary, repeat the above steps until ride height is within the OEM-recommended distance.

## Measuring the Dead Band

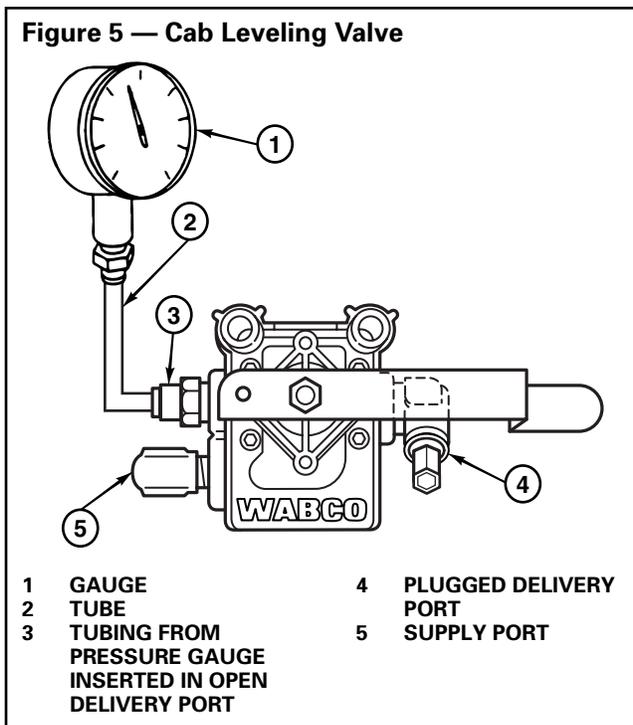
### **WARNING**

*Pressurized air can cause serious personal injury.*

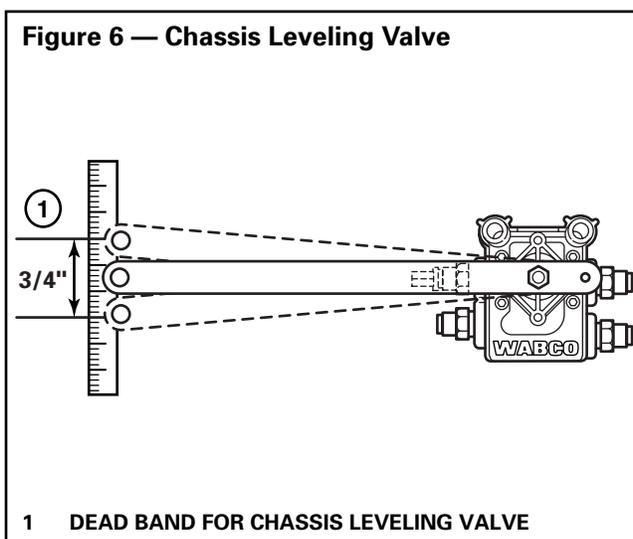
**NOTE:** Use a pressure gauge capable of measuring at least 0–150 psi along with a piece of tubing to measure the dead band. If this equipment is not available, contact Meritor WABCO at 800-535-5560.

1. Park vehicle on a level surface. Unhitch the trailer from the tractor.
2. Run the engine to charge the air system (100 psi minimum).
3. Turn the engine off. Set the parking brakes.
4. Put blocks under the front and rear wheels to keep the vehicle from moving.
5. Make sure the control lever is in the neutral position.
6. Remove the linkage from the leveling valve arm.
7. Clean the area around the delivery ports.
8. Move the lever toward the exhaust position until all air is exhausted from the air bellows.
9. Remove the tubing from both delivery ports on the leveling valve.
10. Plug either one of the delivery ports.
11. Attach the correct size tubing to the pressure gauge.

12. Insert tubing from the pressure gauge into the open delivery port (second delivery port remains plugged). **Figure 5.**



13. Move the control lever toward the supply position until the gauge reaches system pressure.
14. With one hand, hold a tape measure or ruler against a stationary object. With the other hand, move the control lever toward the exhaust position until the pressure starts to drop. Mark the location. **Figure 6.**



15. While holding the tape measure or ruler, move the control lever toward the supply position until the pressure starts to increase. Mark the location.
16. Return the lever to the neutral position.
17. Subtract the lower readings from the higher readings to determine the dead band range.
18. Verify dead band for the leveling valve is within the acceptable range:
  - Acceptable dead band for the cab leveling valve as measured from the linkage connection point is 3/8-inch maximum.
  - Acceptable dead band range for the chassis leveling valve as measured from the linkage connection point is 3/4-inch maximum.

If the dead band is not within the acceptable range, repeat the above procedure to check your measurement. If the measurement is still not within the acceptable range, contact Meritor WABCO at 800-535-5560.
19. Exhaust all air from the bellows and remove the pressure gauge tubing and plug from the delivery ports.
20. Reconnect the air lines to both delivery ports.
21. Reconnect the linkage to the control lever. Refer to the vehicle OEM specifications for the correct torque specification. **T**

## Removal and Installation of Leveling Valve

**NOTE:** Valve positions, torque specifications, etc., will vary by vehicle manufacturer; therefore, you must consult the vehicle manufacturer's service manual for specific installation and removal information of the leveling valve.

General removal and replacement instructions for the Meritor WABCO leveling valves are as follows:

### Leveling Valve Removal Instructions

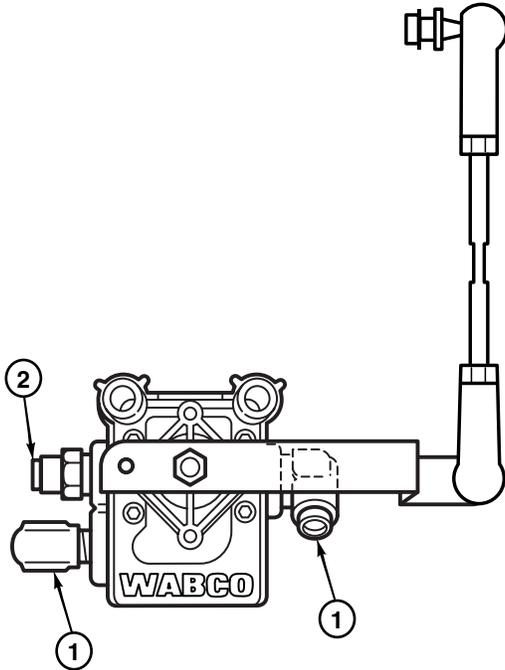
**WARNING**  
*Pressurized air can cause serious personal injury.*

1. Park the vehicle on a level surface. Turn the engine off and set the parking brakes.
2. Unhitch the trailer from the tractor.
3. Put blocks under the front and rear wheels to keep the vehicle from moving.
4. Drain all air from the air system.

- Remove the fittings from the valve.

If fittings are in good condition, retain for reassembly. Discard worn or damaged fittings. Port fittings are illustrated in **Figure 7** and **Figure 8**. All fittings are push-to-connect style.

**Figure 7**



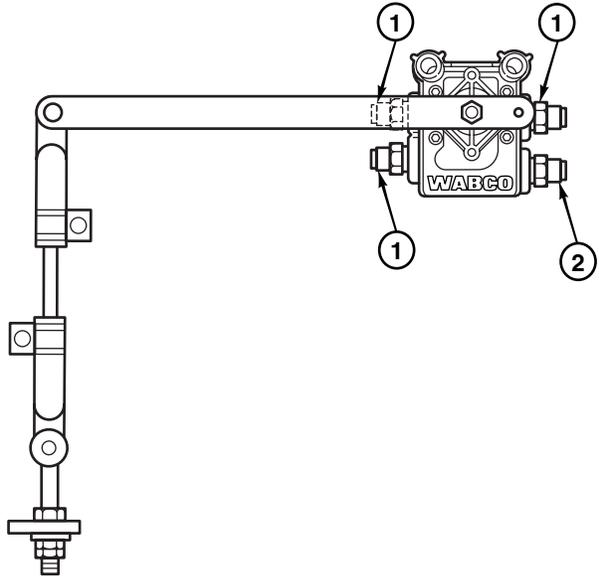
- ONE 90° 1/4" TUBE FITTING (SUPPLY PORT) AND ONE 90° 1/4" TUBE FITTING (DELIVERY PORT)
  - ONE STRAIGHT 1/4" TUBE FITTING (DELIVERY PORT)
- ALL FITTINGS ARE PUSH TO CONNECT

- Remove the linkage from the body of the leveling valve.
- Remove the two mounting bolts that hold the leveling valve to cab or chassis. Remove the leveling valve assembly from the vehicle.

## Leveling Valve Installation Instructions

- Position the leveling valve and control lever assembly on the cab or chassis.
- Mount the valve in the same location as the old one. Tighten the mounting bolts. Tighten to 178-249 lb-in (20-28 N•m). **T**
- Attach the linkage to the control lever of the leveling valve. Cab valve linkage is snap on; for chassis valve linkage, refer to the vehicle OEM specifications for the correct torque spec. **T**
- Attach the fittings to the cab or chassis leveling valve ports. Use a liquid teflon to seal the connection. Do not use teflon tape. Tighten to seal, maximum torque is 125 lb-in (14 N•m). **DO NOT OVERTORQUE OR VALVE MAY BE DAMAGED.** **T**
- Check the installation to ensure correct adjustment of the valve. To do this, follow Steps 1 through 7 listed in "Adjusting the Leveling Valve." This procedure appears on page 6.

**Figure 8**



- THREE STRAIGHT 3/8" TUBE FITTINGS
  - ONE STRAIGHT 1/4" TUBE FITTING
- ALL FITTINGS ARE PUSH TO CONNECT

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