



# SERVICE BULLETIN No.1174

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<b>COACH MODEL</b>	: T2145 and C2045
<b>BULLETIN TYPE</b>	: Service Information
<b>MANUAL &amp; SECTION</b>	: Maintenance Manual: Chapter 11 – Body and accessories
<b>PARTS BOOK REVISION</b>	: No
<b>DATE</b>	: December 21, 2005
<b>SUBJECT</b>	: <b>Handling gas springs</b>
<b>TERMS &amp; CONDITIONS</b>	: No claims will be accepted with reference to this Bulletin.

## APPLICATION:

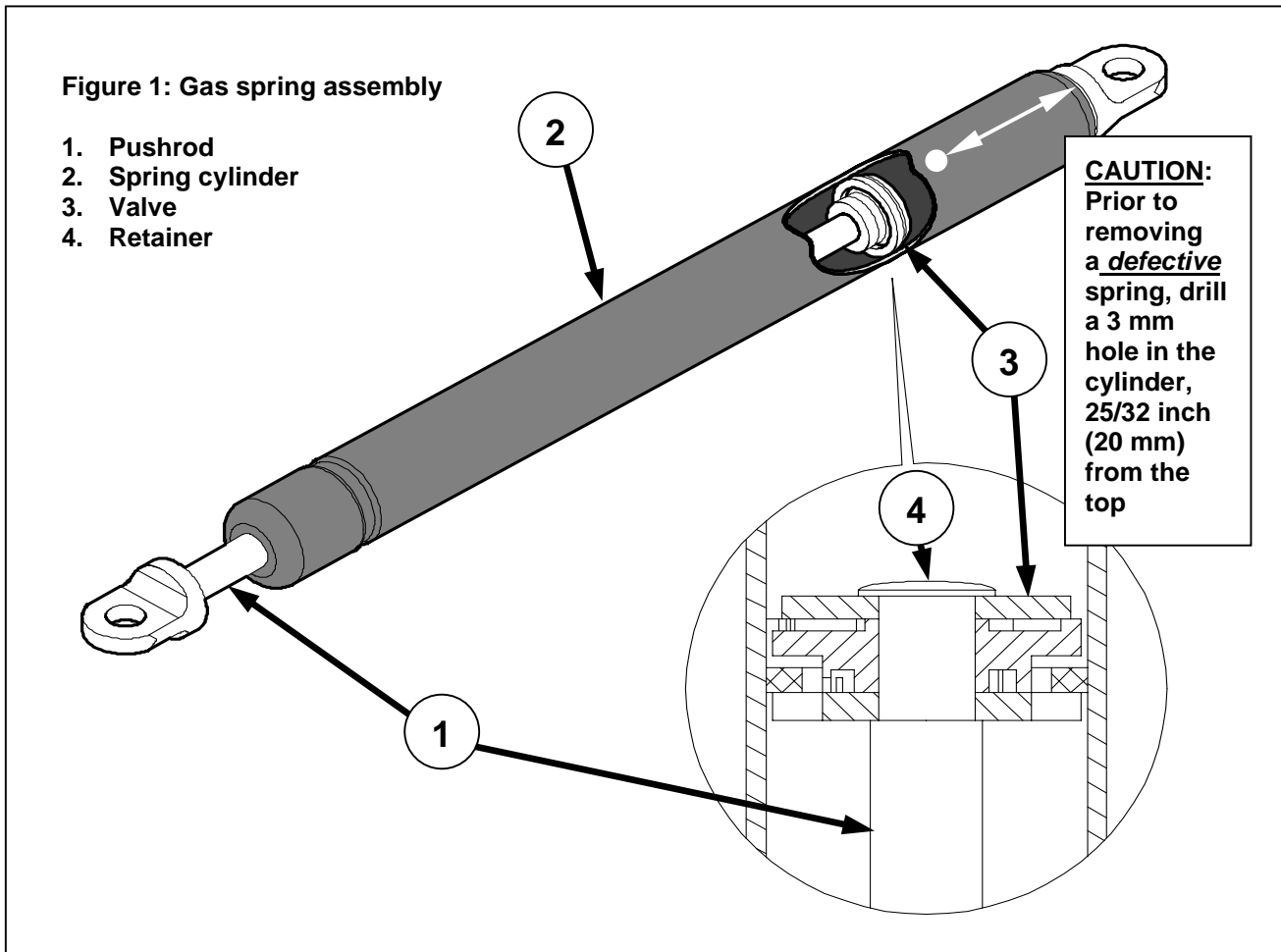
The service information subject of this Bulletin is applicable to all US based T and C coaches.

## DESCRIPTION:

- On the above-mentioned units, many doors have been equipped with gas-charged springs to:
  - assist opening them,
  - hold them in the fully open position if so required,
  - assist closing them.
- The gas springs used may exert forces up to 180 lbf (800 N). A possibility of damage may therefore exist during removal of worn or defective gas spring from door mechanisms. Cases have been reported where the pushrod had separated from the valve inside the spring cylinder (see Figure 1, overleaf), thus leaving the rod without a positive stop. Upon removal, the residual gas pressure pushed the rod out of the spring cylinder with great force.
- The purpose of this Bulletin is therefore to warn service technicians and maintenance personnel that great caution should be observed when disassembling doors and door linkages.
- Taking as an example a luggage door and a service door, which have been equipped with the strongest gas springs, sections 4 through 6 of the procedure in this Bulletin show a generic method to identify and safely remove defective gas springs from coach doors.

*Service personnel: please read, initial and circulate.*

Service Manager	Parts Manager	Warranty Administrator	Workshop Foreman	Service Technician



**PARTS AND PRODUCTS:**

- Refer to the coach parts manual for specific applications.
- Parts and products disposition: discard according to applicable environmental regulations.

**PROCEDURE:**

**1. General:**

- A technician experienced in body repair and an assistant should execute this job.

**2. Special tools, equipment or services:**

- No special tools, equipment or services are required.

**3. Preparations:**

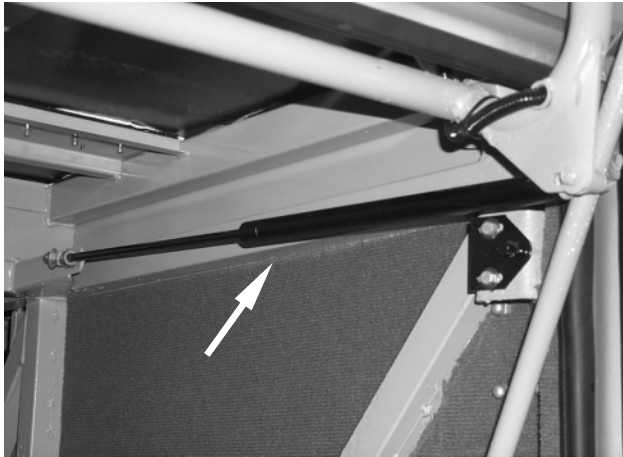
- Park the coach on a level surface with the front wheels straight. Apply the parking brake and shut down the engine.
- Switch off all systems and turn off the battery master switch.
- Put a “DO NOT OPERATE” tag on the instrument panel.
- Read the entire procedure before beginning to work.

**CAUTION: Observe safe shop practices at all times.**

#### 4. To identify and test a defective gas spring (typical):

##### Door operation

Luggage and service doors can be opened by lifting the centrally mounted handle to unlatch the door and lifting it all the way up. The doors are kept in the open position by the gas springs (see Figure 2).



**Figure 2: Fully extended gas spring keeps door open**

##### Indications

Following telltale signs indicate that one (or both) gas springs supporting a door are defective:

- If undue effort is required to open the door or if the door does not remain in the fully open position, one or both gas struts on that door may be defective. Do keep in mind that the performance of gas springs is temperature related. Spring performance is less at freezing temperatures.
- Oil seepage at the pushrod.
- Bend or damaged pushrod.

##### Testing

Testing the gas springs can only be done after removing them following the procedures further in this Bulletin.

**CAUTION: Defective gas springs with a separated valve should be drilled before being removed from the coach and scrapped.**

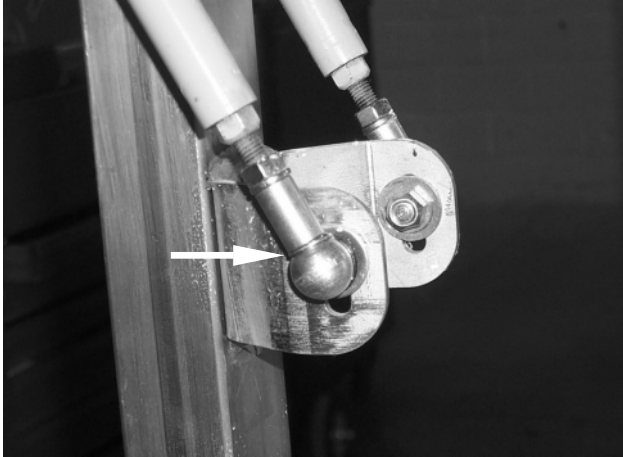
With the springs removed from the coach try to retract the rod.

- If strong resistance is felt, the strut is in good condition and can be reinstalled.
- If the pushrod retracts with little effort, the strut is defective and should be replaced without delay.
- Always test both springs.

*NOTE: When a door gas spring is found faulty, as a preventive measure, it is recommended to replace both springs supporting that door to ensure lasting and trouble free operation.*

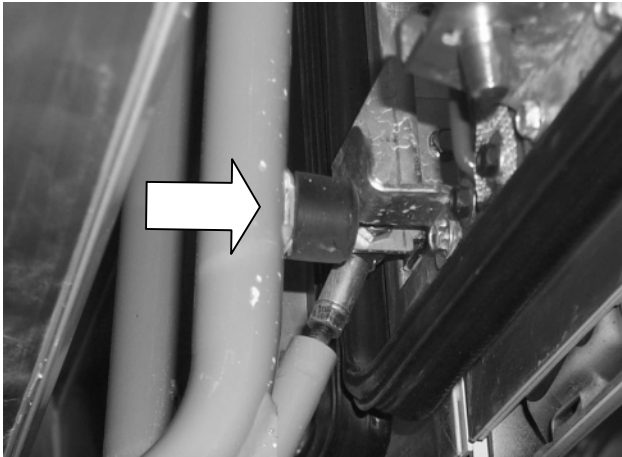
#### 5. To remove a defective luggage door gas spring:

- 1) Open the luggage door.  
Undo and remove the lower radius rod ball joint retaining spring (see Figure 3).  
Withdraw the ball joint from its mounting bracket.



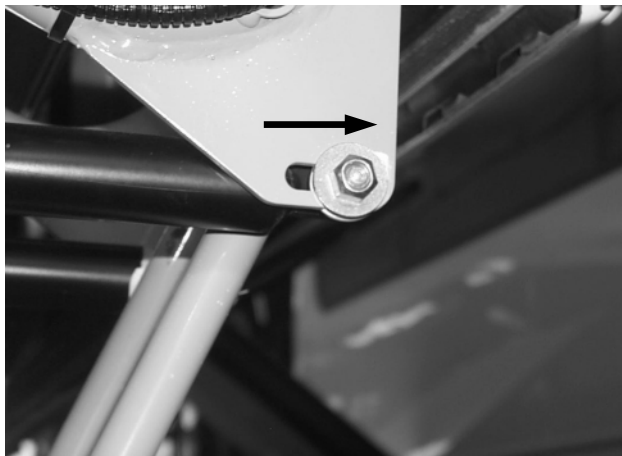
**Figure 3: Radius rod lower ball joint retaining spring**

- 2) Lower the door until there is sufficient room to remove the J-link to door stops (refer to Figure 4).  
Unscrew and remove the LH and RH stops.  
Raise the door to its upper most position and support it with a suitable stand.



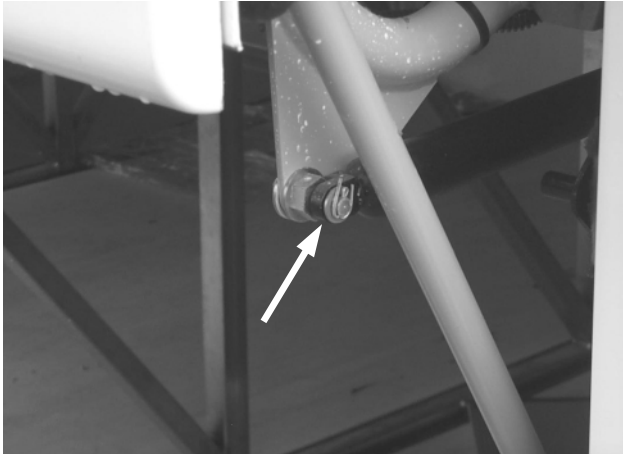
**Figure 4: Door stop**

- 3) Undo but do not remove the nut securing the spring pivot to the J-link bracket (see Figure 5), while carefully watching the mounting pivot in the bracket slot for outward movement. With the spring at the end of its stroke, there shouldn't be any outward movement of the pivot.  
If the pivot remains steady (no movement), extract the cotter pin and washer and withdraw the strut from the pivot (see Figure 6).



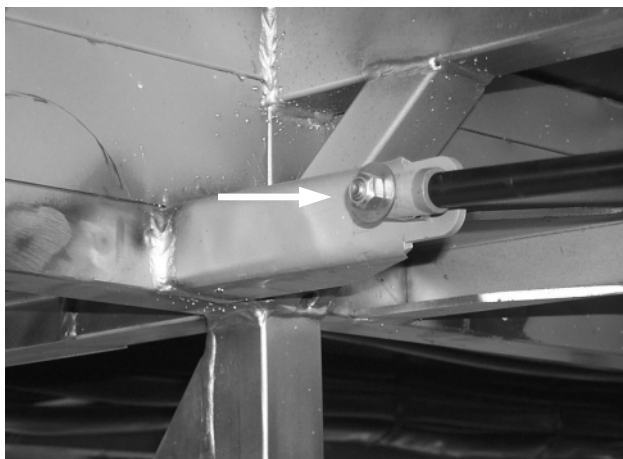
**Figure 5: Outward pivot movement in J-link bracket slot**

- 4) If the pivot has moved, this means that there is still pressure on the pushrod and that the valve no longer acts as a positive stop. Wearing safety glasses, proceed as follows:
  - At approximately 25/32 inch (20 mm) from the bottom of the spring cylinder, drill a 1/8 inch (3 mm) diameter and 25/64 inch (10 mm) deep hole in the cylinder wall (refer to Figure 1).
  - Allow gas and oil to escape.
- 5) With the residual gas pressure vented from the spring, extract the cotter pin and washer and withdraw the spring from the pivot (see Figure 6).



**Figure 6: Cotter pin**

- 6) At the chassis bracket, undo and remove the nut and washer securing the spring to the coach frame (see Figure 7). Remove the spring from the coach.



**Figure 7: Spring to chassis bracket installation**

#### **6. To remove a worn access door gas spring:**

- 1) Open the access door.
- 2) With the spring(s) fully extended gently push the door further upward to check that the valve(s) butt(s) against the top of the cylinder.
- 3) Undo but do not remove the nut securing the spring pivot to the door mounting bracket while carefully watching the pivot in the bracket slot for upward movement (see Figure 8). With the spring at the end of its stroke, there shouldn't be any upward movement of the pivot.

If the pivot remains steady (no movement), extract the cotter pin and washer and withdraw the strut from the pivot (see Figure 8).



**Figure 8: Upward pivot movement in door bracket slot**

- 4) If the spring pivot has moved, this means that there is still pressure on the pushrod and that the valve no longer acts as a positive stop. Wearing safety glasses, proceed as follows:
  - At approximately 25/32 inch (20 mm) from the bottom of the strut cylinder, drill a 1/8 inch (3 mm) diameter and 25/64 inch (10 mm) deep hole in the cylinder wall (see Figure 1).
  - Allow gas and oil to escape.
- 5) With the residual gas pressure vented from the spring, remove the cotter pin and washer(s) and withdraw the spring from the pivot.
- 6) At the chassis bracket, undo and remove the nut, bolt and washer(s) securing the spring (see Figure 9).  
Remove the spring from the coach.



**Figure 9: Gas spring to chassis pivot and fasteners**

*Procedure complete.*

**DISCLAIMER:**

The procedures contained herein are not exclusive. Van Hool cannot possibly know, evaluate, or advise the transportation industry of all conceivable ways in which a procedure may be undertaken or of the possible consequences of each such procedure. Other procedures may be as good, or better, depending upon the particular circumstances involved.

Each carrier who uses the procedures herein must first satisfy itself thoroughly that neither the safety of its employees or agents, nor the safety or usefulness of any products, will be jeopardized by any procedure selected.

**SERVICE INFORMATION:**

Service Bulletins are issued to supplement or supersede information in the Van Hool manuals. Note Service Bulletin number, date and subject on the register at the end of the relevant chapter(s). File Service Bulletin separately for future reference.

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