L and LJ Series Gas Spring Repair Instructions

I. Exhausting Pressure

1. Exhaust nitrogen gas by opening the bleed valve on the control panel.

2. Remove the Port Plug, (90.310.030), located at the base of the cylinder. Pressure pins for use during reassembly.

3. Keep the face and hand clear of the port. the Valve Bleed Tool, (90.350.3), or Port Servicing Tool, (90.320.5), to depress the valve seat, (90.250) or (90.250). Cover the port with a cloth to absorb discharge.

4. After all of the gas pressure is exhausted, be sure that the piston rod will freely retract into the tube manually. If not, try depressing the valve again. If still unsuccessful stop and contact DADCO.

II. Port Maintenance

1. Determine Valve Style

2. For the U Series use the Compact Valve Port (90.300.0). For the S or LS Series springs, examine the outside of the tube. An additional step in the tube indicates a Compact Valve port, proceed to Compact Valve Port Step 3A. (If no additional step is present proceed to the Valve Tool, Step 3).

3. Unscrew the service fitting and wipe up with a clean cloth. Proceed to “I. Port Maintenance” Open Flow Mode, Step 1.

III. C-Ring Removal

1. Support the gas spring upright. Place a Removal Sleeve (90.310.830), larger than the stroke over the rod. Make sure to use the proper removal sleeve for the cylinder. Tap the sleeve with the DADCO Safety Hammer, (90.246.x.x). Insert the C-Ring Removal Tool, (90.310.130), into the rod end. Remove the Dust Cover and discard. Place the C-Ring Tool in the end of the tube. (Place the tool in the end of the tube to avoid scratching the tube internally).

2. Position the hooked end of the C-Ring Removal Tool, (90.310.130), into the port until it fits snugly on the seat. Avoid over-torquing the valve.

3. Check the port for debris or burrs and clean thoroughly. Inspect the service fitting and replace it if it shows signs of damage. Lubricate threads and seals on the valve and thread the service fitting into the gas springport.

4. Turn the Shutoff Valve until it aligns with the CLOSE AND VENTED position located on the Standard Charging Assembly (90.351.x). (For the U Series springport, all of the nitrogen trapped between the shutoff valve and filler valve will escape as you disconnect from the spring.

5. Check for leaks at the top of the tube around the nut and the base of the valve. For a detailed explanation of “C-Ring Removal” refer to bulletin HDB 0031A.

6. Repeat this procedure on the other side of the valve.

IV. Rod & Cartridge Removal

1. To remove the Rod and Cartridge Assembly, thread a T-Handle, (90.220.1 or 90.302.2), into the rod end. Pull the entire assembly out of the tube. The spring body can be held in a vise (with two inch pads) while pulling out the assembly.

2. Once the cartridge and nut are removed from the T-Ray Assembly, the rod end is slightly past the retaining ring groove. The bore of the tube Assembly is designed to stop two inches past the retaining ring groove in this position. DO NOT force the cartridge assembly further into the tube Assembly.

3. Remove the C-Ring Retaining Ring, (90.250.5) using a C-Ring Removal Tool, (90.310.130). Position the hooked end of the tool in the retaining ring groove. For best results locate the tool near either end of the ring. (Use the Port Servicing Tool to pry out C-Ring Removal Ring found in 10 mm stroke of master model).

4. Once the retaining ring is firmly seated below the ring, begin pushing it toward the outside of the gas spring port. The valve will go slowly, naturally, and it is the ring will be extracted as you complete this motion. For a detailed explanation of “C-Ring Removal” refer to bulletin HDB 0031A.

V. Cleaning & Inspection

1. Lightly polish the internal bore with an emery cloth (600 grit) inspect the finish of the rod for any scratches or gouges. If the finish of the rod is damaged it must be replaced.

2. Inspect the T-Ray Assembly for damage, especially around the mouth of the T-Ray Assembly. Lightly polish out any scratches at the mouth of the T-Ray Assembly to avoid damage during cleaning. Please refer to bulletin HDB 0031A for cleaning and inspection process. If damage to the T-Ray Assembly occurs it must be replaced.

3. Be careful not to force the cartridge on an angle during assembly as the valve may get damaged. Once the Cartridge Assembly is installed, verify that the seal is properly aligned to the rod.

NOTE: If the seal is not aligned or damaged and contact DADCO. DO NOT continue installation.

VI. Cartridge Replacement and Reassembly

1. Choose the appropriate repair kit. The repair kit number listed is based on the type of Tube Assembly. NOTE: Repair kits are not interchangeable among models.

2. Position the new Cartridge Assembly over the rod, making sure that the upper end marked “TOP” is facing up. While holding the cartridge vertically, slide the cartridge down the rod to the rod retention. For proper installation DADCO recommends using an Allen wrench or screw to secure the housing to the T-Ray Assembly.

3. Secure the cartridge on the rod. If the cartridge is at an angle during assembly as the valve may get damaged. Once the Cartridge Assembly is installed, verify that the seal is properly aligned to the rod.

4. Insert the C-Style Retaining Ring in the retaining ring groove using DADCO C-Ring Installation Tool, (90.351.040 or 90.350.3). Be sure the C-Style ring is seated in the retaining ring groove. For detailed explanation of “C-Ring Removal” refer to bulletin HDB 0031A.

5. Place the rod and cartridge into the Tube Assembly. Depress the end of the rod into the slot in the body of the Tube Assembly. Use the 90.331 C-Ring Installation Tool refer to bulletin HDB 0031A.

6. Thread the Trinaball, (90.310.1) or (90.310.130), into the end of the piston rod. Pull up on the Trinaball until the top of the cartridge is flush with the top of the piston rod. Be sure the cartridge assembly is firmly seated below the retaining ring groove. Make sure the rod is extended to its proper stroke length. (Depress the needle valve to facilitate full rod extension.)

7. Install the new Rod & Cartridge Assembly, (90.310.x), or (90.310.130), into the end of the piston rod. Pull up on the Trinaball until the top of the cartridge is flush with the top of the piston rod. Be sure the cartridge assembly is firmly seated below the retaining ring groove. Make sure the rod is extended to its proper stroke length. (Depress the needle valve to facilitate full rod extension.)

NOTE: Before starting the reassembly process, be sure the repair area is clean. It is imperative that the gas spring be free of all contaminants upon reassembly. If the precaution is not taken it may lead to contamination and premature gas spring failure.

VII. Charging

Quick Disconnect Filling Method

1. To increase the spring pressure, close the valve installed. For information on converting a self-contained DADCO Mini Nitrogen Gas Spring to a high-pressure system refer to bulletin HDB 00012B.

2. To decrease the gas spring pressure, depress the valve stem, (90.320.1), until it aligns with the CLOSE AND VENTED position located on the Standard Charging Assembly (90.351.x). (For the U Series springport, all of the nitrogen trapped between the shutoff valve and filler valve will escape as you disconnect from the spring.

3. Set the desired charging pressure on the regulator. DADCO recommends charging the spring prior to discharging and gauging pressure. A recommended pressure of 120 bar (175 psi)

4. Slowly open the shutoff valve at the end of the charging hose and allow the gas spring to reach the desired pressure. You may also use the gas spring displacement and cartridge is fully seated before charging.

5. Check for leaks at the top of the tube around the nut and the base of the valve. For a detailed explanation of “C-Ring Removal” refer to bulletin HDB 0031A.

6. Install the new Rod & Cartridge Assembly, (90.310.x), or (90.310.130), into the end of the piston rod. Pull up on the Trinaball until the top of the cartridge is flush with the top of the piston rod. Be sure the cartridge assembly is firmly seated below the retaining ring groove. Make sure the rod is extended to its proper stroke length. (Depress the needle valve to facilitate full rod extension.)

VIII. Adjusting Gas Spring Pressure

1. To increase the spring pressure, thread the Quick Disconnect Filler Valve, (90.310.143), into the port and cartridge is fully seated before charging.

2. Open the main valve on the Pressure Analyzer, (90.251), by unthreading the Quick Disconnect Filling Method (90.310.040),  the small amount of nitrogen trapped between the shutoff valve and filler valve will escape as you disconnect from the spring.

3. Check for leaks at the top of the tube around the nut and the base of the valve. For a detailed explanation of “C-Ring Removal” refer to bulletin HDB 0031A.

4. Slowly open the shutoff valve at the end of the charging hose and allow the gas spring to reach the desired pressure. You may also use the gas spring displacement and cartridge is fully seated before charging.

5. Install the new Rod & Cartridge Assembly, (90.310.x), or (90.310.130), into the end of the piston rod. Pull up on the Trinaball until the top of the cartridge is flush with the top of the piston rod. Be sure the cartridge assembly is firmly seated below the retaining ring groove. Make sure the rod is extended to its proper stroke length. (Depress the needle valve to facilitate full rod extension.)

IX. Linked Systems

After testing all springs for leaks, the open-line springs are ready to be linked in the system. It is possible, once the springs are all linked back to the control panel, for a leak to be found and repaired. The following procedure is recommended in the event of a leak while testing the system. A leak will be found in the system. Always check the connections thoroughly and seal each fitting for a leak. For information on converting a self-contained DADCO Mini Nitrogen Gas Spring to a high-pressure system please contact DADCO.

CAUTION: DADCO Mini Nitrogen Gas Springs should not be linked with the value installed.
**LJ Series Parts List**

<table>
<thead>
<tr>
<th>Part Description</th>
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<tbody>
<tr>
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<tr>
<td>C-Style Retaining Ring</td>
<td>90.246.2</td>
</tr>
<tr>
<td>Compact Valve</td>
<td>90.260</td>
</tr>
<tr>
<td>Tire Valve Port</td>
<td></td>
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<tr>
<td>Valve Retaining Screw</td>
<td>90.250</td>
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<tr>
<td>Needle Valve</td>
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<td>Compact Valve Port</td>
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<tr>
<td>Port Plug</td>
<td>90.607.110</td>
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<td>Tube Assembly</td>
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**Repair Tools**

- **C-Ring Removal Tool** 90.355
  - To remove the C-style retaining ring safely in a single controlled motion.

- **C-Ring Installation Tool** 90.351.00500
  - For use with LJ/LJ.0500
  - For use with LJ/LJ.0300
  - To insert the C-style retaining ring into the retaining ring groove.

- **Removal Sleeve** 90.340.00300
  - For use with LJ/LJ.0300
  - For use with LJ/LJ.0500
  - For use with LJ/LJ.0750
  - To position the cartridge assembly below the C-ring groove when assembling or disassembling a gas spring.

- **Port Servicing Tool** 90.320.8
  - To perform all necessary servicing to the valve compartment.

- **Standard Load Cell** 90.300.0300
  - For use with LJ/LJ.0300
  - For use with LJ/LJ.0500
  - For use with LJ/LJ.0750
  - When used with a Portable Test Stand, the Standard Load Cell gives precise measurement of gas spring charging pressure. For more information contact DADCO.

- **Mini Test Stand** 90.305.2
  - Use the Portable Test Stand in conjunction with a Standard Load Cell for precise measurement of gas spring force on contact. For more information request bulletin B01133F.

- **DADCO Pressure Analyzer** 90.315.5
  - Use the DADCO Pressure Analyzer to easily charge, discharge, and gauge the pressure in DADCO Gas Springs. This tool can take the place of the Valve Bleded Tool. Standard Load Cell, Quick Disconnect Filler Valve, and Portable Test Stand. For more information request bulletin B01133F.

**Comprehensive Guide**

This service manual is a simple step-by-step maintenance guide for DADCO Nitrogen Gas Spring models including L and LJ. Proper repair requires careful examination of all component parts and replacement of any that are worn or damaged. All DADCO replacement parts are available from factory stock.

Typically, DADCO Nitrogen Gas Springs can be rebuilt in less than ten minutes by replacing only one part, the factory pre-assembled cartridge assembly.

After reviewing this maintenance guide, if you require any additional training or have any questions please contact DADCO for assistance.

**Nitrogen Gas Spring Repair**

The additional step in the tube indicates a compact valve.

- **Dadco**
  - Plymouth, Michigan USA 48170
  - 43850 Plymouth Oaks Blvd.
  - Phone: 1.734.207.1100
  - Toll Free: 800.DADCO.USA
  - Fax: 1.734.207.2222

Note: Nitrogen Gas Spring repair varies slightly from model to model, and by mode of operation (self-contained or open-Rose). As you proceed through the basic steps outlined in this bulletin, take care to follow the instructions pertaining to your model. All DADCO gas springs are permanently marked with model and serial number. Please refer to these numbers for corresponding repair kits and when ordering replacement parts.

All DADCO bulletins and catalogs are available for download from our web site, www.dadco.net.

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