DADCO has established operating specifications and installation requirements for its Mini (L, LJ), Ultra Force (U.0400 – U.20000), UH, SCR and Large (90.8, 90.5B2, 90.10, UX and SC) Series Nitrogen Gas Springs to help ensure customer safety and optimize product performance. Review the guidelines in this bulletin carefully. For information on installation and operation practices for DADCO’s Micro (C) Series and U.0175 – U.0325 Gas Springs, refer to bulletin B131029.

**Operating Specifications**

<table>
<thead>
<tr>
<th>Charging Medium</th>
<th>Nitrogen Gas</th>
<th>Nitrogen is an abundant gas that does not react easily with other elements. These properties make it the ideal charging medium for gas springs. No other gas should be used.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charging Pressure Range</td>
<td>15 – 150 bar (220 – 2175 psi)</td>
<td>The maximum charging pressure for self-contained and linked nitrogen gas springs is indicated at the left. Do not exceed maximum charging pressure.</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>4°C – 71°C (40°F – 160°F)</td>
<td>Operating the gas spring within the specified temperature range is important to extend gas spring life. For high-temperature operations, contact DADCO for assistance. After prolonged operation, the outside of the gas spring may be hot to touch, handle with care.</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>1.6 m/s (63 in/s)</td>
<td>Operating the gas spring within speed limits is required for safe operation. For estimating operation rate/temperature, please refer to the web-based calculator at <a href="http://www.dadco.net">www.dadco.net</a>.</td>
</tr>
</tbody>
</table>

**Charging Nitrogen Gas Springs**

1.) Before charging either a Self-Contained or Linked System, verify the rod is fully extended to its proper stroke length, ensuring that the housing is seated properly against the c-style retaining ring. Use a DADCO T-Handle to extend the rod.

2a.) To prepare the Filling Port in a Self-Contained Operation, remove the protective screw/flush plug. Then, thread the appropriate DADCO Filler Valve into the port. Finally, connect the female quick disconnect adapter on the charging rod to the filler valve.

2b.) In a Linked System Operation, pipe all gas springs to the control panel or multi panel following proper assembly guidelines. Make sure all hoses and fittings are tight. Attach the charging assembly to the filler valve on the control panel or multi panel.

3.) Open the main valve on the nitrogen tank. Set the desired charging pressure on the regulator. Slowly open the shut-off valve and allow the gas spring or system to reach the desired charging pressure. After each spring has been charged to the desired pressure, CLOSE THE HOSE SHUT-OFF VALVE. Disconnect the charging assembly from the filler valve. The small amount of nitrogen trapped between the shut-off valve and filler valve will bleed off as you disconnect the fitting. If you’re using the 90.310.340 filling assembly with the 90.310.044 charging assembly, the gas will vent when the valve closes.

4.) For self-contained units, verify the internal pressure using a DADCO Load Cell or Pressure Analyzer, contact DADCO for load cell instructions and additional information. DO NOT test the pressure using a hammer. DADCO recommends periodic checking of internal gas spring pressure as a preventive maintenance measure.

5.) CLOSE the tank shut-off valve when not charging gas springs. NOTE: If you’re not using a DADCO Charging Assembly, make sure your charging assembly consists of a high pressure thermoplastic hose, o-ring face seal fittings and a high pressure valve.

**Discharging**

CAUTION: Before disposing of damaged or worn out gas springs, be sure to discharge all pressure. Contact DADCO for additional information.

1.) When discharging a DADCO Nitrogen Gas Spring, position the gas spring horizontally with the port up for safety. Remove the port plug.

2.) Keep hands and face clear of the port, use the Valve Bleed Tool (90.360.4) or Port Servicing Tool (90.320.8) to depress the valve. Cover the port with a cloth to absorb discharge. After all of the gas pressure is exhausted, be sure that the piston rod will freely compress into the tube manually. If not, try depressing the valve again. If still unsuccessful, STOP and contact DADCO.

3.) Exhaust the nitrogen gas by opening the bleed valve on the control panel. Verify that all pressure is relieved by manually compressing the piston rod into the tube. If the rod will not fully retract release the remaining pressure. If still unsuccessful, STOP and contact DADCO.

**Tools for Charging and Discharging**

Pressure Analyzer 90.315.5
T-Handle 90.320.1 • 90.320.2 • 90.320.10
Port Servicing Tool 90.320.8
Quick Disconnect Charging Assembly Standard 90.310.040 • High Pressure 90.310.041/44 • European 90.310.045
Self-Venting Quick Disconnect Filling Assembly 90.310.338 • 90.310.339 • 90.310.340
Valve Bleed Tool 90.360.4
M6 Charging Nipple 90.310.143
G1/8 Charging Nipple 90.310.111

CAUTION: Use safety glasses when performing maintenance on nitrogen gas springs.

**Transport Thread**

<table>
<thead>
<tr>
<th>Gas Spring Models</th>
<th>Rod End Thread</th>
<th>Required Thread Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>90.10.03000, 90.10.05000, 90.10.075000</td>
<td>M8</td>
<td>12 mm</td>
</tr>
<tr>
<td>90.10.10000</td>
<td>M10</td>
<td>15 mm</td>
</tr>
<tr>
<td>U.9600, UX.6600, UX.9600</td>
<td>M8</td>
<td>12 mm</td>
</tr>
<tr>
<td>U.20000, UX.20000</td>
<td>M10</td>
<td>15 mm</td>
</tr>
</tbody>
</table>

DADCO recommends using the rod and thread to transport selected springs. Use an eye bolt or the appropriate T-handle for transportation. Verify that the proper thread engagement is achieved prior to transportation.

**Service**

DADCO’s Mini (L, LJ), Ultra Force (U.0400 – U.20000), UH, SCR and Large (90.8, 90.5B2, 90.10, UX and SC) Series Nitrogen Gas Springs are repairable. DADCO supplies detailed repair instructions with its repair and seal kits. After reviewing the maintenance guides, if you require additional training or have any questions, please contact DADCO. Contact DADCO for SCR Series gas spring repair.

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Gas Spring Installation Design and Operation

Mounting

DADCO offers a wide selection of mounts to meet specific customer applications. As a general rule, installation and fastening of the gas spring should take into consideration load support, fasterener selection and torque values. DADCO recommends using medium strength serviceable thread locking compound on mounting screws. Refer to DADCO’s product catalogs for mount compatibility with each series and model of nitrogen gas spring.

CAUTION
• Do not weld
• Do not machine or modify
• Protect from damage

Improper Installation

Avoid large gaps in upper. Use tapped holes in base to secure, pre-load if possible.

Safe Removal of Damaged Nitrogen Gas Springs

• Discharge gas spring before removal.
• Do not use a slide hammer or similar method to remove a gas spring. Slide hammer forces exceed design limits and will damage internal components.

Standard Installation Principles

OVERSTROKE PREVENTION

Avoid side loading when possible. Side loading resulting from press action or worn guide components causes increased wear on the bearing, seal, and piston rod. Rod end may wear soft die materials, use hardened contact surface (RC 25-40). The end of the piston rod has a construction thread intended for assembly and disassembly purposes only, and should never be used to mount or secure the gas spring. Die vibration and/or misalignment will damage the spring.

SIDE LOAD PREVENTION

Avoid large gaps in upper. Use tapped holes in base to secure, pre-load if possible.

OVERSPEED PREVENTION

If the port is not accessible, drill through the body of the gas spring to safely discharge. It may be necessary to drill through die components. Disassembly may also be required.