

# UX Series

## Nitrogen Gas Spring Repair Instructions

**CAUTION: Always wear safety goggles when performing any maintenance work.**

### I. Exhausting Pressure

#### Self-Contained Mode



- 1S. When exhausting pressure, position the gas spring with the port up for safety.
- 2S. Remove the Protective Screw, (90.505.110 or 90.607.110). Retain parts for use during reassembly.
- 3S. Keeping face and hands clear of the port, use the Valve Bleed Tool, (90.360.4), or Port Servicing Tool, (90.320.8), to depress the Compact Valve stem, (90.260), or Cartridge Valve, (90.265). Cover the port with a cloth to absorb discharge.
- 4S. 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.

#### Linked Mode



- 1L. Exhaust nitrogen gas by opening the bleed valve on the control panel.
- 2L. Verify that all pressure is relieved by manually retracting the piston rod into the tube. If the rod will not fully retract release the remaining pressure. If still unsuccessful **stop** and contact DADCO.
- 3L. Unthread the service fitting and wipe with a clean cloth. Proceed to 1L. Port Maintenance" *Linked Mode* step 1L.
- 4L. Generally the valve does not need replacing. Only if the valve appears damaged, is leaking pressure or sticking proceed to step 2S, otherwise leave the valve undisturbed and proceed to "III. C-Ring Removal."

### II. Port Maintenance

#### Self-Contained Mode



- 1S. Generally the valve does not need replacing. Only if the valve appears damaged, is leaking pressure or sticking proceed to step 2S, otherwise leave the valve undisturbed and proceed to "III. C-Ring Removal."
- 2S. Remove the Compact Valve, (90.260), or Cartridge Valve, (90.265), by unscrewing it with the Port Servicing Tool, (90.320.8).

### III. C-Ring Removal

#### Linked Mode



1. Stand the gas spring upright. Place a removal sleeve, (90.340.x), longer than the stroke over the rod. Tap the sleeve until the dust cover, (90.246.U.x), is loosened. Remove the Dust Cover and discard.
2. Reposition the DADCO Removal Sleeve and only continue tapping until the rod cartridge assembly is slightly below the retaining ring groove.
3. Remove the C-style Retaining Ring, (90.285.x), using a C-Ring Removal Tool, (90.356 or 90.355). Position the hooked end of the tool below the c-ring. For best results locate the tool near either end of the c-ring.
4. Once the hooked end of the tool is firmly seated below the c-ring, begin pushing it toward the outside of the gas spring can. The handles will close naturally, and the c-ring will be extracted as you complete this motion. For a detailed explanation of c-ring removal see bulletin B15127A.

### IV. Rod & Cartridge Removal



1. To remove the Rod and Cartridge Assembly thread a T-Handle, (90.320.2 or 90.320.10), into the rod end. Pull the entire assembly out of the tube. The spring body can be held in a vise (with soft jaws) while pulling out the assembly.
2. Once the cartridge and rod are removed from the Tube Assembly slide the cartridge off the rod and discard. Retain the rod for inspection and reuse. Based on the model you are repairing proceed to "V. Inspection and Cleaning;" Step 1A, 1B, or 1C.

**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 this precaution is not taken it may lead to contamination and premature gas spring failure.

### VI. Cartridge Replacement and Reassembly



1. Choose the appropriate repair kit. The repair kit number needed is laser marked on the back of the Tube Assembly.
2. Thread Assembly Cone (90.331.x) from Cartridge Starter Kit (90.335.x) onto the rod. Slide Cartridge Assembly over the Assembly Cone, making sure that the wiper end marked "TOP" is facing up. Place Cartridge Starter Kit (90.330.x) from Cartridge Starter Kit (90.335.x) on top of Cartridge Assembly.
- 3A. While holding the cartridge, vertically tap the Assembly Cone to drive the cartridge down the rod. Be careful not to force the cartridge at an angle as the seal could become damaged.
- 3B. The cartridge is now below the Assembly Cone. Remove Assembly Cone from the rod thoroughly.

**NOTE:** Repair kits are not interchangeable among models.

**NOTE:** For best results, use the DADCO Charging Assembly which has a shut-off valve and Quick Disconnect at the end of the hose.

### VII. Charging

#### Self-Contained Mode



- 1S. Thread the Quick Disconnect Filler Valve, (90.310.143 or 90.310.111), into the port of the gas spring. Connect the female end of the charging assembly to the charging nipple. The DADCO Pressure Analyzer, (90.315.5), can also be used for charging, discharging and gauging pressure in self contained gas springs.
- 1L. Pipe all gas springs back to the control panel, making sure that all connections are tight and that gas spring rods are extended.
- 2L. Attach Charging Assembly (90.310.040) to the quick disconnect filler valve on the control panel.
3. Open the main valve on the nitrogen tank. Set the desired charging pressure on the regulator. Do not exceed the maximum charging pressure of 150 bar (2175 psi).
4. Slowly open the shut-off valve at the end of the charging hose and allow the gas spring to reach the desired charging pressure.

#### Linked Mode



- 1S. Thread the Quick Disconnect Filler Valve, (90.310.143 or 90.310.111), into the port of the gas spring. Connect the female end of the charging assembly to the charging nipple. The DADCO Pressure Analyzer, (90.315.5), can also be used for charging, discharging and gauging pressure in self contained gas springs.
- 1L. Pipe all gas springs back to the control panel, making sure that all connections are tight and that gas spring rods are extended.
- 2L. Attach Charging Assembly (90.310.040) to the quick disconnect filler valve on the control panel.
3. Open the main valve on the nitrogen tank. Set the desired charging pressure on the regulator. Do not exceed the maximum charging pressure of 150 bar (2175 psi).
4. Slowly open the shut-off valve at the end of the charging hose and allow the gas spring to reach the desired charging pressure.

### VIII. Adjusting Gas Spring Pressure

#### Self-Contained or Linked



1. To increase the spring pressure, thread the Quick Disconnect Filler Valve, (90.310.143 or 90.310.111), into the port, set the regulator to the desired pressure and fill. DADCO's Pressure Analyzer, (90.315.5), may also be used to adjust pressure.
2. To decrease the gas spring pressure, depress the valve stem using a DADCO Valve Bleed Tool, (90.360.4), or a DADCO Pressure Analyzer, (90.315.5).

### X. Linked Systems

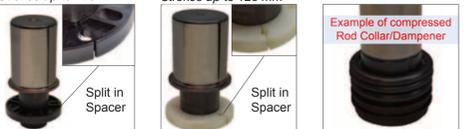
After testing all springs for leaks, the open-flow springs are ready to be re-linked in the system. If possible, once the springs are all linked back to the control panel, leave the system to sit fully charged overnight. If pressure has dropped indicating a leak verify that each connection is tight and test each fitting for a leak.

Contact DADCO for information on converting a self-contained DADCO Nitrogen Gas Spring to a linked system.

**NOTE:** DADCO UUK/UH/UT/UX Series Nitrogen Gas Springs should not be linked with the valve installed.

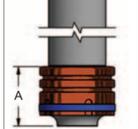
### V. Inspection & Cleaning

UX.0800 – UX.4600  
Strokes up to 125 mm



- 1A. Inspect the Rod and Spacer for wear. UX.0800 – UX.4600 models with stroke lengths up to 125 mm have a black or white spacer. There is a split designed into the spacer. If there are any additional splits, cracks or excessive wear then the spacer needs to be replaced. Contact DADCO for more information.
- 1B. Inspect the Rod and Spacer for wear. UX.6600 – UX.9600 models with stroke lengths up to 125 mm have a black or white spacer. There is a split designed into the spacer. If there are any additional splits, cracks or excessive wear then the spacer needs to be replaced. Contact DADCO for more information.
- 1C. Inspect the Rod and Rod Collar/Dampener for wear. For UX.6600 – UX.9600 models with stroke lengths 150 mm and above, the collar/dampener is black and looks like a series of loops. If there are any splits, cracks or excessive wear then the collar needs to be replaced. To verify the condition, measure the Rod Collar/Dampener height and refer to the chart for the A measurement. If the height is out of tolerance Contact DADCO for repair or replacement. If only the wear band is damaged, it may be replaced. Contact DADCO for replacement part.

UX.0800 – UX.9600  
Strokes 150 mm and above



Model	A ±0.5 mm ±0.02"
0800	47.25 1.860
1000	44.4 1.749
1600	39.4 1.551
2600	55.6 2.189
4600	64.8 2.551
6600	78.8 3.102
9600	86.75 3.416
20000	65.0 2.559

## UX Series Parts List

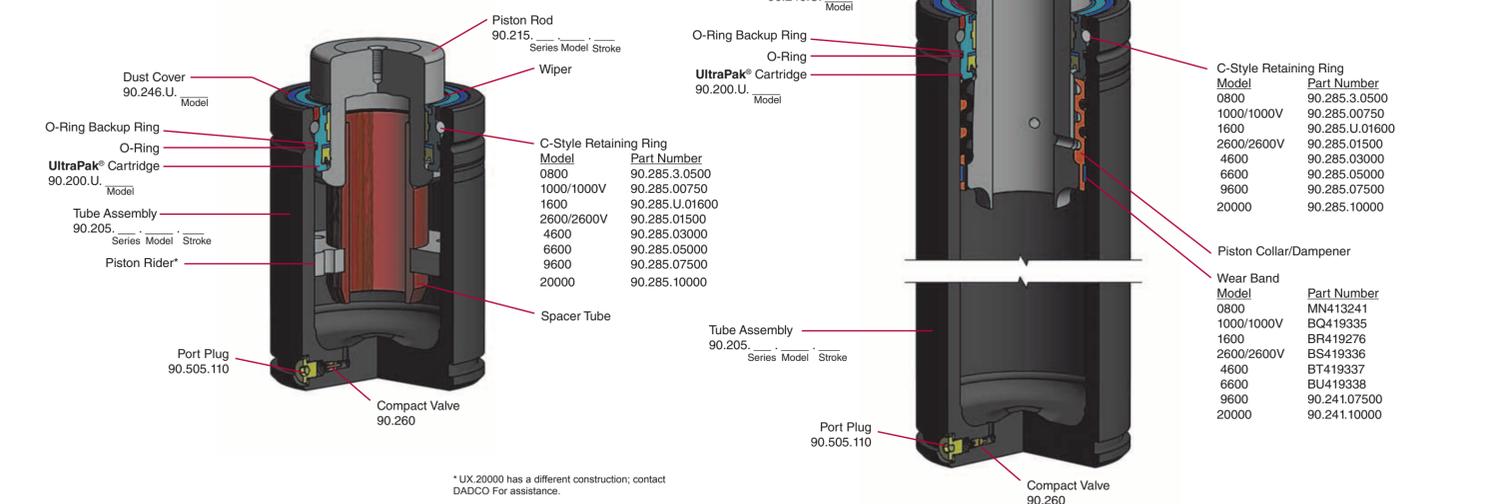
All DADCO gas springs are permanently marked with a model and serial number. Please refer to these numbers for corresponding repair kits when ordering replacement parts.

Construction shown here is for the following UX Series models and stroke sizes:

Strokes	UX Models							
	0800	1000	1600	2600	4600	6600	9600	20000
013	✓	✓	✓	N/A	N/A	N/A	N/A	N/A
025	✓	✓	✓	✓	✓	✓	✓	✓
038	✓	✓	✓	✓	✓	✓	✓	✓
050	✓	✓	✓	✓	✓	✓	✓	✓
063	✓	✓	✓	✓	✓	✓	✓	✓
075	✓	✓	✓	✓	✓	✓	✓	✓
080	✓	✓	✓	✓	✓	✓	✓	✓
100	✓	✓	✓	✓	✓	✓	✓	✓
125	✓	✓	✓	✓	✓	✓	✓	✓

Construction shown here is for the following UX Series models and stroke sizes:

Strokes	UX Models							
	0800	1000	1600	2600	4600	6600	9600	20000
150	✓	✓	✓	✓	✓	✓	✓	✓
160	✓	✓	✓	✓	✓	✓	✓	✓
175	✓	✓	✓	✓	✓	✓	✓	✓
200	✓	✓	✓	✓	✓	✓	✓	✓
225	N/A	✓	✓	✓	✓	✓	✓	✓
250	N/A	✓	✓	✓	✓	✓	✓	✓
275	N/A	✓	✓	✓	✓	✓	✓	✓
300	N/A	✓	✓	✓	✓	✓	✓	✓



## Repair Kits

Select your repair kit from the list below. Please note, repair kits are not interchangeable. Verify that you have the proper repair kit by reviewing the laser mark on the cylinder you are repairing.



Kit Number	Models
90.108.00400	U.0400, UH.0400
90.108.00600	U.0600, UH.0600
90.108.00800	U.0800, UH.0800
90.108V.00800	U.0845, UK.0800, UX.0800
90.108.01000	U.1000, UH.1000, UT.1000, UX.1000
90.108V.01000	UK.1000, UX.1000V
90.108.01200	U.1200
90.108.01600	U.1600, UH.1600, UX.1600
90.108V.01600	UK.1600
90.108.02600	U.2600, UH.2600, UT.2600, UX.2600
90.108V.02600	UK.2600, UX.2600V
90.108.04600	U.4600, UH.4600, UT.4600, UX.4600
90.108.06600	U.6600, UH.6600, UH.6600, UT.6600, UX.6600
90.108.09600	U.9600, UT.9600, UX.9600
90.108.20000	U.20000, UX.20000

A Repair Kit includes a fully assembled UltraPak® cartridge, dust cover, a bottle of assembly oil and a maintenance manual.

## Service Tools

Refer to the opposite side of this bulletin for a comprehensive list of tools used to repair these Nitrogen Gas Springs.

Bulletin No. B18109A

# DADCO

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## Comprehensive Guide

This service manual is a simple step-by-step maintenance guide for DADCO's Ultra Force® and Ultra Force Extended® Nitrogen Gas Springs Series: U, UK, UH, UT, and UX.

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.



# DADCO Nitrogen Gas Spring Maintenance Instructions for Ultra Force® and Ultra Force Extended®

U Series / UK Series / UH Series / UT Series / UX Series

**Note:** 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.

Nitrogen Gas Spring Repair Instructions

**CAUTION: Always wear safety goggles when performing any maintenance work.**

I. Exhausting Pressure

*Self-Contained Mode*



1S. When exhausting pressure, position the gas spring with the port up for safety.



2S. Remove the Protective Screw, (90.505.110 or 90.607.110). Retain parts for use during reassembly.

*Linked Mode*



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



2L. Verify that all pressure is relieved by manually retracting the piston rod into the tube. If the rod will not fully retract proceed to step 1L.

II. Port Maintenance

*Self-Contained Mode*



1S. Generally the valve does not need replacing. Only if the valve appears damaged, is leaking pressure or sticking proceed to step 2S, otherwise leave the valve undisturbed and proceed to "III. C-Ring Removal".



2S. Remove the Compact Valve, (90.260), or Cartridge Valve, (90.265), by unscrewing it with the Port Servicing Tool, (90.320.8).

*Linked Mode*



3S. Thread a new Compact Valve, (90.260), or Cartridge Valve (90.265), into the port until it fits snugly on the seat. Avoid over torquing the valve.

III. C-Ring Removal



1. Stand the gas spring upright. Place a removal sleeve, (90.340.x), longer than the stroke over the rod. Tap the sleeve until the Dust Cover, (90.246.U.x), is loosened. Remove the Dust Cover and discard.

IV. Rod & Cartridge Removal



1. To remove the Rod and Cartridge Assembly thread a T-Handle, (90.320.1, 90.320.2 or 90.320.10), into the rod end. Pull the entire assembly out of the tube. The spring body can be held in a vise (with soft jaws) while pulling out the assembly.

IV. Rod & Cartridge Removal



2. Once the cartridge and rod are removed from the Tube Assembly slide the cartridge off the rod and discard. Retain the rod for inspection and reuse.

**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 this precaution is not taken it may lead to contamination and premature gas spring failure.

V. Cleaning & Inspection



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

VI. Cartridge Replacement and Reassembly



1. Choose the appropriate repair kit. The repair kit number needed is laser marked on the back of the Tube Assembly. Lightly polish out any scratches at the mouth of the Tube Assembly to avoid damaging seals during the reassembly process. If damage to the Tube Assembly is severe it must be replaced. Wash, clean and dry the inside thoroughly.



2. For applicable sizes, thread Assembly Cone (90.331.x) from Cartridge Starter Kit (90.335.x) onto rod. Be careful not to force the cartridge at an angle as the seal could become damaged.



3A. While holding the cartridge, vertically lap the Assembly Cap to drive the cartridge down the rod. Be careful not to force the cartridge at an angle as the seal could become damaged.



3B. The cartridge is now below the Assembly Cone. Remove Assembly Cone from the rod.

**NOTE:** For best results, use the DADCO Charging Assembly which has a shut-off valve and Quick Disconnect at the end of the hose.

VII. Charging

*Self-Contained Mode*



1S. Thread the Quick Disconnect Filler Valve, (90.310.143 or 90.310.111), into the port of the gas spring. Connect the female end of the charging assembly to the charging nipple. The DADCO Pressure Analyzer, (90.315.5), can also be used for charging, discharging and gauging pressure in self contained gas springs.

*Linked Mode*



1L. Pipe all gas springs back to the control panel, making sure that all connections are tight and that gas spring rods are extended.

*Self-Contained or Linked Mode*



2L. Attach Charging Assembly (90.310.040) to the quick disconnect filler valve on the control panel.

*Self-Contained Mode*



3. Open the main valve on the nitrogen tank. Set the desired charging pressure on the regulator. Do not exceed the maximum charging pressure of 150 bar (2175 psi).

*Self-Contained Mode*



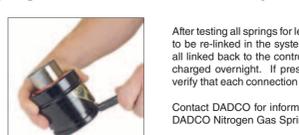
4. Slowly open the shut-off valve at the end of the charging hose and allow the gas spring to reach the desired charging pressure.

VIII. Adjusting Gas Spring Pressure



9. Install the new Dust Cover, (90.246.U.x). Tap with a soft mallet until the top of the Dust Cover rests flush with the top of the can. The rod wiper should be visible.

IX. Linked Systems



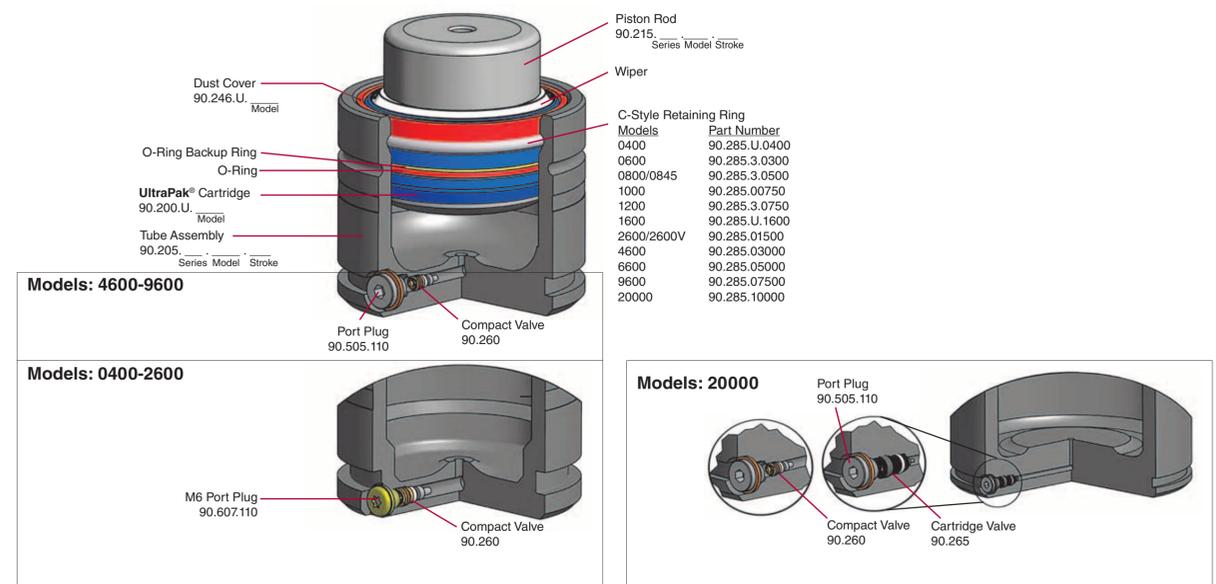
1. To increase the spring pressure, thread the Quick Disconnect Filler Valve, (90.310.143 or 90.310.111), into the port, set the regulator to the desired pressure and fill. DADCO's Pressure Analyzer, (90.315.5), may also be used to adjust pressure.

After testing all springs for leaks, the open-flow springs are ready to be re-linked in the system. If possible, once the springs are all linked back to the control panel, leave the system to sit fully charged overnight. If pressure has dropped indicating a leak verify that each connection is tight and test each fitting for a leak.

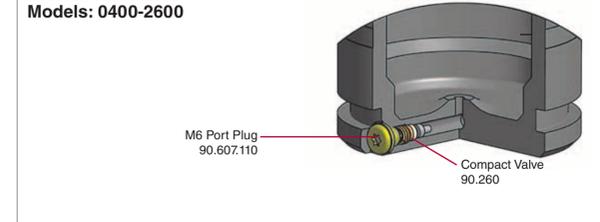
Contact DADCO for information on converting a self-contained DADCO Nitrogen Gas Spring to a linked system.

**NOTE:** DADCO U/UUK/UH/UT/UJ Series Nitrogen Gas Springs should not be linked with the valve installed.

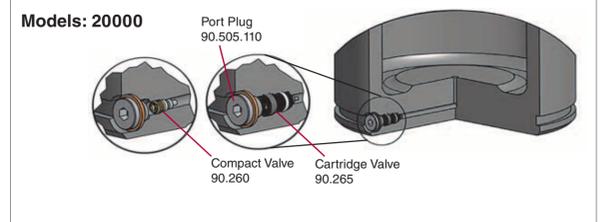
All DADCO gas springs are permanently marked with model and serial number. Please refer to these numbers for corresponding repair kits when ordering replacement parts.



Models	Part Number
4600	90.285.U.0400
6600	90.285.3.0300
0800/0845	90.285.3.0500
1000	90.285.00750
1200	90.285.3.0750
1600	90.285.U.1600
2600/2600V	90.285.01500
4600	90.285.03000
6600	90.285.05000
9600	90.285.07500
20000	90.285.10000



Models: 0400-2600



Models: 20000

Service Tools

Gas Spring Model	Port Size*	Charging				Standard Repair				
		Charging Nipple	Charging Assembly	Analog Load Cell	Digital Load Cell	Removal Sleeve	C-Ring Removal Tool	T-Handle	Cartridge Starter Kit	C-Ring Installation Tool
U.0400 / UH.0400	M6 / G 1/8	90.310.143 / 90.310.111	90.310.041	90.300.0300	90.305.LC.05A	90.340.00400	90.320.1	N/A	90.351.00400	
90.300.0500				90.340.00600		90.351.00300				
90.300.0750				90.340.00750		90.351.00500				
90.300.1000				90.340.01200		90.356				
U.0600 / UH.0600 / UK.0800 / UH.0800 / UJ.0800	M6	90.310.143	90.310.340	90.300.1200	90.305.LC.50A	90.340.01200	90.355	N/A	90.351.00750	
90.300.1500				90.340.01500		90.356				
90.300.2600				90.340.01600		90.355				
90.300.2600				90.340.01600		90.355				
U.1600 / UK.1600 / UH.1600 / UJ.1600 / UJ.1600 / UT.1600 / UX.1000 / UX.1000V	M6 / G 1/8	90.310.143 / 90.310.111	90.310.340	90.300.1500	90.305.LC.50A	90.340.01500	90.320.2	U.R	90.351.00750	
90.300.2600				90.340.01500		90.356				
90.300.2600				90.340.01500		90.356				
90.300.2600				90.340.01500		90.356				
U.4600 / UH.4600 / UT.4600 / UX.4600	G 1/8	90.310.111	90.310.111	90.300.6600	90.305.LC.50A	90.340.05000	90.355.9600	U.R	90.352	
90.300.6600				90.340.05000		90.355.9600				
90.300.9600				90.340.07500		90.355.20000				
90.300.20000				N/A		90.355.20000				

KEY: N/A = Not Available; U.R. = Upon Request \*Note: DADCO's U Series models U.0400 - U.2600 have an M6 port size and use Charging Nipple 90.310.143

**Port Servicing Tool 90.320.8**

To perform all necessary servicing to the valve compartment.

**Valve Bleed Tool 90.360.4**

Use the DADCO Valve Bleed Tool to slowly discharge a spring to the desired pressure.

**T-Handle 90.320.1**

To remove the piston rod when disassembling and position correctly when reassembling.

**Removal Sleeve 90.340.0**

To position the cartridge assembly below the C-ring groove when assembling or disassembling a gas spring. Each model requires its specified removal sleeve.

**C-Ring Removal Tool 90.355**

To remove the C-style retaining ring safely in a single controlled motion.

**C-Ring Removal Tool 90.356**

To remove the C-style retaining ring safely in a single controlled motion.

**C-Ring Installation Tool 90.350.0**

To insert the C-style retaining ring into the retaining ring groove.

**Cartridge Starter Kit 90.335**

(2600, 4600, 6600, 9600, 20000)

The Cartridge Starter Kit includes an Assembly Cap (90.330.0) and an Assembly Cone (90.331.0). The Assembly Cone is used to start the cartridge assembly onto the rod without damaging the seal, the Assembly Cap is used to set the cartridge at a proper depth for C-Ring installation.

90.330.0

90.331.0

**C-Ring Installation Tool 90.352**

To insert the C-style retaining ring into the retaining ring groove.

**Quick Disconnect Charging Nipple: Self-Contained 90.310.143 (M6 Port) 90.310.111 (G 1/8 Port)**

Use the DADCO Quick Disconnect Charging Nipple to charge DADCO Nitrogen Gas Springs.

**DADCO Pressure Analyzer 90.315.5**

Use the DADCO Pressure Analyzer to easily charge, discharge, and gauge the pressure in DADCO's gas springs. This tool can take the place of the Valve Bleed Tool, Standard Load Cell, Quick Disconnect Filler Valve, and Portable Test Stand. For more information request bulletin B01133F.

**Quick Disconnect Charging Assembly 90.310.040 - Standard Option 90.310.044 - Self-Venting Capable**

Use the DADCO Quick Disconnect Charging Assembly with the Filler Valve or Pressure Analyzer to charge self-contained gas springs, or with a DADCO Control Panel for charging linked systems. For more information contact DADCO.

DADCO recommends using the 90.310.044 Charging Assembly to charge the U.0400 nitrogen gas spring to maximum pressure.

**Standard Load Cell 90.300.0**

When used with a Portable Test Stand, the Standard Load Cell gives precise measurement of gas spring charging pressure. Each model requires its specified load cell. For more information request bulletin B16119A.

**Digital Load Cell 90.305.BGA (Meter), 90.305.LC.50A (222 kN Load Cell)**

The DADCO Digital Load Cell Meter can display force in Newtons, Kg or lbs. The 90.305.LC.50A (supplied with the connector) may be used to measure gas spring force up to 50,000 lbs. Other digital load cell units are available, for more information request bulletin B04106E.

**Mini Test Stand 90.305.2 90.305.2D**

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 B08108B.

**Portable Test Stand 90.305.3**

Use the Portable Test Stand in conjunction with a Standard Load Cell for precise measurement of gas spring force on contact. Excludes use with the U.9600 and U.20000. For more information contact DADCO.