

**Service Tools**

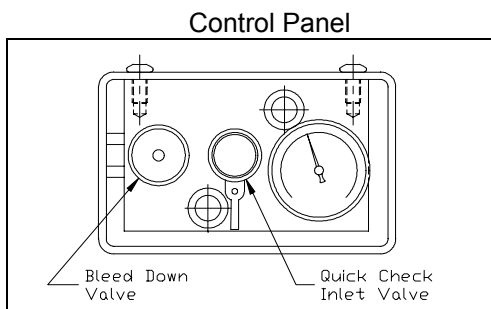
Model	Seal Kit P/N	Hex Wrench
DR 2.5	DR-212-7000	9/64 (3.5mm) 3/8 (9.5mm)

**⚠ Warnings**

- Put on safety glasses and hearing protection before servicing any nitrogen gas spring system.
- Failure to exhaust all gas pressure prior to disassembly could result in serious injury.
- Do not depress piston rods with your hand directly. Place a block of wood between the rod and your hand. The piston rod may pop up after being manually depressed.
- The maximum charging pressure for a standard manifold is 103 bar (1500 psi). Higher pressure manifold systems do exist. Refer to the information tag attached to the manifold plate for maximum charge pressure information.
- Prior to pressurizing any manifold, inspect for proper assembly of cylinders and components. Socket head cap screws are available in both English and metric thread types and may appear to be very similar in size. **Never mix thread types!** Intermixing English and metric thread types could result in serious injury. If there is any doubt about thread type, contact Hyson Products' Customer Service at 1-800-876-4976.

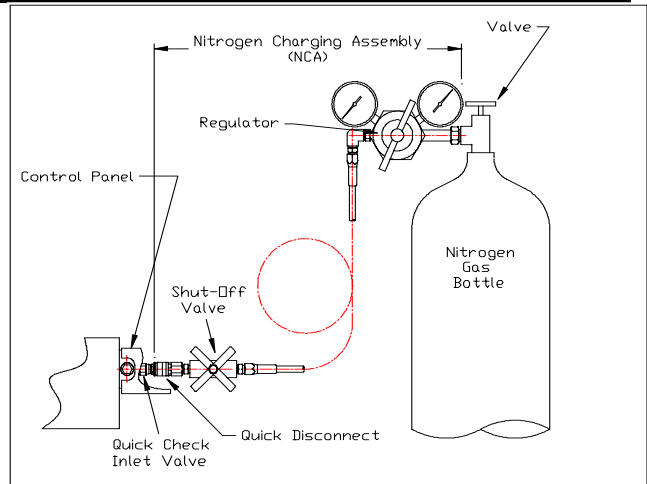
**Discharging delayed return manifold systems**

1. Slowly open bleed down valve on control panel.
2. When gauge reaches zero and the gas flow stops, depress piston rods.
3. Close bleed down valve on control panel.



**Charging delayed return manifold systems**

1. Attach Nitrogen Charging Assembly (NCA) to nitrogen gas bottle.
2. Set NCA regulator to zero pressure.
3. Close the shut-off valve on NCA hose.
4. Close bleed down valve on control panel.
5. Attach NCA quick disconnect to quick check inlet valve on control panel.
6. Open valve on nitrogen gas bottle.
7. Set desired pressure on NCA regulator.
8. Slowly open shut-off valve on NCA hose.
9. When correct pressure is obtained, close valve on NCA hose.
10. Disconnect NCA from control panel.
11. Replace protective cap on quick check inlet valve.
12. Close valve on nitrogen bottle.
13. Open shut-off valve on NCA hose to vent charging assembly.
14. When gas flow stops, close NCA shut-off valve.



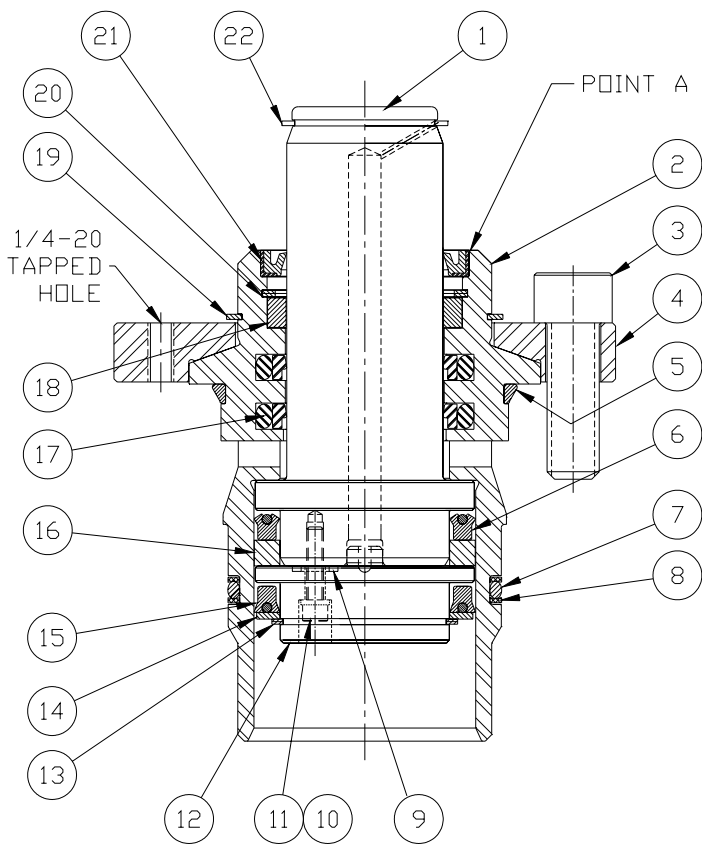
**Verification of assembly (Leak test)**

1. Charge the manifold to at least 69 bar (1000 psi) with a maximum of 83 bar (1200 psi). Refer to charging instructions.
2. Pour lightweight oil in the gap between the piston (1) and the cylinder body (2). If bubbles appear, nitrogen is leaking past the piston seal (9). **Note:** It may take several minutes for a small leak to be seen. If a leak is found, the cylinder needs to be discharged, disassembled, and inspected. A scratch on the cylinder body bore, rod or seal could be the cause.

**Delayed return manifold inspection & cleaning**

1. Before installing new or rebuilt cylinders into a delayed return manifold, the manifold and control module(s) must be disassembled, inspected and thoroughly cleaned.
2. Inspect all manifold seal surfaces. Seal surfaces to be inspected are cylinder ports where the cylinder seals slide over and rest, port plug seal surfaces and module o-ring groove surfaces.

SEAL KIT PARTS LIST			
ITEM	HYSON P/N	DESCRIPTION	QTY.
5	DR-212-4010	O-RING	1
6	DR-212-3025	UPPER PISTON SEAL	1
7	DR-212-0000	O-RING	1
8	DR-212-0001	BACK-UP RING	2
9	DR-212-0045	O-RING	3
10	CS #8-32X.75	SOC. HD. CAP SCREW	3
11	DR-212-0040	LOCK WASHER	3
13	DR-212-5300	RETAINING RING	1
14	DR-212-5301	WASHER	1
15	DR-212-3000	LOWER PISTON SEAL	1
16	DR-212-8000	BEARING, PISTON	1
17	DR-212-0026	STEPSEAL, ROD	2
18	DR-212-0020	BEARING, ROD	1
19	11-319-5300	RETAINING RING	1
20	DR-212-0015	RETAINING RING	1
21	DR-212-6000	WIPER, CANNED	1
22	DRAC-209-5200	RETAINING RING	1
	XP-206	XP LUBE	1



### Disassembly

1. Verify all pressure has been exhausted from the system by following the discharging instructions.
2. Remove the cylinder from the manifold by untorquing the mounting screws (3). The cylinder can then be jacked out of the plate using two socket head cap screws and the 1/4-20 tapped holes provided in the mounting flange (4). Once the cylinder is removed from the manifold, cover the cylinder port to prevent dirt from falling into the manifold.
3. Remove the retaining ring (19) from the cylinder body (2) and then remove the mounting flange (4).
4. Remove the piston rod assembly (1) from the cylinder body (2).
5. Remove the socket head cap screws (10) and lock washers (11). The lower piston (12) can now be removed.
6. Remove the retaining ring (13) from the lower piston. The lower piston seal (15) and washer (14) can now be removed. **Note:** If using a screwdriver to pry the seal off the lower piston, be careful not to scratch the piston.
7. Remove the o-rings (9) from the lower piston (12). **Note:** Be careful not to scratch the o-ring seal surfaces.
8. Remove the bearing (16) and upper piston seal (6) from the piston rod (1). **Note:** If using a screwdriver to pry the seal off the piston rod, be careful not to scratch the piston.
9. Remove o-ring (5) from the cylinder body. **Note:** Be careful not to scratch the cylinder body seal surfaces.
10. Remove the o-ring (7) and backup rings (8) from the cylinder body. **Note:** Be careful not to scratch the cylinder body seal surfaces.
11. Insert the end of a flat blade screwdriver between the rod scraper (21) and cylinder body (2) at POINT A. Strike the screwdriver towards the center of the cylinder to deform the scraper. The scraper can then be pried out. Remove the retaining ring (20) and bearing (18).
12. Carefully remove the 2 part rod seals (17). **Note:** Be careful not to scratch the cylinder body seal surfaces.

13. Save the cylinder body (2), mounting flange (4) piston rod (1), lower piston (12) and mounting screws (3). All other parts are included in the seal kit and can be discarded.

### Inspection

14. Visually inspect all components. The inner bore diameter, the rod seal grooves and outer diameter o-ring grooves of the cylinder body as well as the surface of the piston rod and lower piston where the seals rest are critical. Any scratches or dents will lead to premature leakage. If defects exist, replace the parts.
15. Clean the cylinder body (2), piston (1) lower piston (14), mounting flange (4) and mounting bolts (18).

### Assembly

16. Unpack the seal kit. The seal kit contains Nitro-Dyne® Lube XP-206. This is used as assembly oil only.
17. Liberally lubricate the piston rod (1), piston seal (6) and bearing (16) and then assemble. **Note:** Make sure the piston seal lip faces the flange of the piston rod as shown.
18. Liberally lubricate the lower piston (12) and piston seal (15). Install the piston seal, washer (14) and retaining ring (13) on the lower piston.
19. Liberally lubricate the o-rings (9) and place them in the counterbores of the lower piston (12).
20. Install the lower piston assembly (12) into the piston rod (1) using the lower piston guide. **Note:** Make sure the o-rings (9) remain in their counterbores. Install the socket head cap screws (10) and lock washers (11) and torque to 35-45 pounds-inch (4-5 N-m).
21. Liberally lubricate the two-part rod seals (17) and *using great care*, install them into the cylinder body (2). **Note:** Be careful not to scratch the cylinder body seal grooves or seals..
22. Install the bearing (18) and retaining ring (20) into the cylinder body.
23. Press the rod scraper (21) into the cylinder body (2).
24. Liberally lubricate the inner diameter of the cylinder body (2). Carefully insert the piston rod assembly (1) into the cylinder body (2) and push to the fully extended position. **Note:** Be careful when inserting the piston rod assembly to make sure the upper piston seal lip (6) is not damaged.
25. Liberally lubricate the o-rings (5 & 7), backup rings (8) and install in the OD grooves of the cylinder body (2).
26. Place the mounting flange (4) on the cylinder body (2) and install the retaining ring (19).
27. Install cylinder into test fixture, then install mounting screws (3) hand tight and test for leakage. (See Verification of Assembly section on previous page).
28. When installing the cylinder into the manifold, torque the mounting screws to 45-50 lb-ft (60-67 N-m).