

Integra® Pneumatically Operated Diaphragm Valves Assembly Procedures

½", 2-way and adjustable bypass, normally closed, normally open pneumatic designs

REPAIR INSTRUCTIONS

For models:

Normally closed: 202-57, 202-58, 202-59, 202-60, 202-66, 202-60-SI, 202-60-SO, 202-66-SI, 202-66-SO

Normally open: 202-61, 202-62, 202-63, 202-64, 202-67, 202-64-SI, 202-64-SO, 202-67-SI, 202-67-SO, 202-61-01, 202-62-01, 202-63-01, 202-64-01, 202-67-01, 202-64-SI-01, 202-64-SO-01, 202-67-SI-01, 202-67-SO-01

Normally closed bypass: 202-128, 202-129

REPAIR PROCEDURE – DISASSEMBLY

1. Refer to Figure 4. Hold the inner cap (P8) with an adjustable wrench (S6) while turning the outer cap (P9) counterclockwise with the outer cap wrench (T1).
2. On normally closed valves remove the spring (P7) and discard.
3. Remove red indicator subassembly (P13) and discard.
4. While preventing the diaphragm stem from rotating, remove the nut (P1) with a ⅜" open-end wrench (S13) and discard.
NOTE: To prevent damage to the valve diaphragm, hold the inner cap (P8) so it doesn't rotate.
5. Pry the top piston (P10) loose with the flat blade screwdriver (S4) and remove the piston.
6. Remove the O-ring (P2) and pneumatic diaphragm (P3) and discard both of these parts.
7. Remove the snap-ring (P4) with the snap-ring pliers (S10) and discard.
8. Remove the other O-ring (P2) and discard.
9. On normally closed valves, remove the lower piston (P10) by prying it up with two flat blade screwdrivers (S4). On normally opened valves, remove the lower piston (P10) and the spring (P7) and discard spring.
10. Remove and discard washer (P5).
11. Refer to Figure 1. Make sure the diaphragm preload tool adjusting screw is out 19.1 mm (¾") before placing the diaphragm preload tool (T2) onto the retainer nut (P1).

12. Place the diaphragm preload tool (T2) onto the retainer nut (P1) and screw on the outer cap (P9) to hold it in place (see Figure 3).
13. With the $\frac{1}{4}$ " socket (S8) and torque wrench (S2), turn the external hex on the diaphragm preload tool (T2) counterclockwise to remove the retainer nut (P11).
14. Remove the outer cap (P9) and then the diaphragm preload tool (T2).
15. Hold the stainless steel diaphragm stem with a pliers (S3) and pull out the diaphragm/retainer assembly (P6) and discard.

Diaphragm preload adjusting screw with internal hex

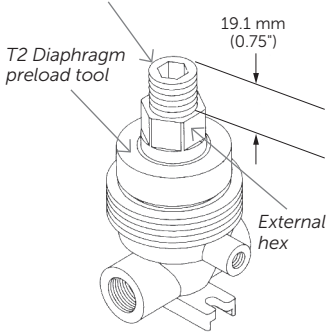


Figure 1.

P6 Diaphragm/retainer assembly

Stem may have slot

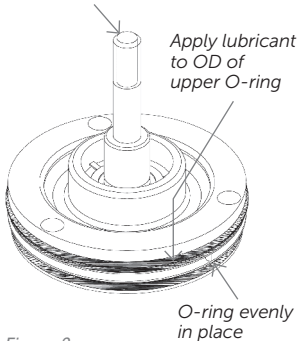


Figure 2.

REPAIR PROCEDURE—ASSEMBLY

1. Before beginning assembly, clean the internal body surfaces and the customer supplied items as listed, with isopropyl alcohol (S9).
2. Begin assembly by applying a light coating of lubricant (S1) to the diaphragm/retainer assembly (P6) O-ring (see Figure 2).
3. Make sure the O-ring between the diaphragm and retainer is evenly in place, (See Figure 2) and then install the diaphragm/retainer assembly (P6) in the valve body and push the retainer all the way down.
4. Thread the retainer nut (P11), by hand, into the valve body until it contacts the diaphragm/retainer assembly (P6).
5. Place the washer (P5) on the diaphragm stem.
6. Make sure the diaphragm preload tool (T2) adjusting screw is out 19.1 mm ($\frac{3}{4}$ ") before placing the diaphragm preload tool (T2) onto the retainer nut (P11).
7. Secure the diaphragm preload tool (T2) in place with the outer cap (P9) (see Figure 3).
8. With an adjustable wrench (S6), hold the diaphragm preload tool (T2) external hex from rotating and turn the internal hex on top of the diaphragm preload tool (T2) with the $\frac{1}{2}$ " allen wrench (S7) clockwise until it is flush with the top surface of the tool (see Figure 3).
9. Torque the external hex on the diaphragm preload tool (T2) to 5.65 N•m (50 in•lbs) with a torque wrench (S2) and a $\frac{1}{4}$ " socket (S8).

10. While holding the external hex to keep it from rotating, turn the internal hex on top of the diaphragm preload tool (T2) counterclockwise until it is 19.1 mm (¾") above the top surface of the diaphragm preload tool (T2). Remove the outer cap (P9) and then the diaphragm preload tool (T2).
11. On normally opened valves, place the spring (P7) inside the retainer nut (P11).
12. Put lower piston (P10) in place on the pneumatic diaphragm stem. Orient the ribs facing away from the pneumatic diaphragm (P3) as shown in Figure 4.
13. Lubricate O-ring (P2) with lubricant (S1) and install.
14. Install snap-ring (P4) with snap-ring pliers (S10) being careful to just spread the snap-ring enough to install over the stem. The snap-ring does not fit in a groove. Make sure the lower piston (P10) is pushed all the way down. On normally open valves the spring (P7) has to be compressed to get the lower piston (P10) in place.
15. On normally closed valves, place the pneumatic diaphragm (P3) onto the diaphragm stem with the concave side facing up. (See Figure 4.) On normally open valves, place the pneumatic diaphragm (P3) onto the diaphragm stem with the concave side facing down. (See Figure 4.) Make sure the bead on the outside of the pneumatic diaphragm (P3) fits evenly within the groove on the body.
16. Lubricate O-ring (P2) with lubricant (S1) and install.
17. Put upper piston (P10) in place. Orient the ribs facing away from the pneumatic diaphragm (P3) as shown in Figure 4.
18. While making sure the diaphragm stem does not rotate, torque the nut (P1) to 2.3 N•m (20 in•lbs) with a ⅜" open-end wrench (S13).
19. On normally closed valves, put a drop of Loctite® (S11) in coupling of indicator subassembly (P13) and tighten with open-end wrench (S13) until it touches nut.
20. On normally closed valves, place the spring (P7) on the upper piston (P10).
21. On normally closed valves, place the inner cap (P8) on the spring (P7). On normally open valves, place the inner cap (P8) on the pneumatic diaphragm (P3). In either case, make sure the bead on the outside of the pneumatic diaphragm (P3) fits evenly within the groove on the body.
22. Place the outer cap (P9) on the inner cap (P8).
23. Push down on the inner cap (P8) and prevent it from rotating while threading the outer cap (P9) onto the body.

NOTE: To prevent damage to the valve diaphragm, hold the inner cap (P8) so it doesn't rotate.

24. Hold the inner cap (P8) from rotating and torque the outer cap (P9) to 200 in•lbs (22.6N•m) with the outer cap wrench (T1) and torque wrench (S2).
25. With valve in the closed position, use a blade (S12) to trim off the red indicator (P13) so it is flush with the top of inner cap (P8).
26. Assembly is now complete. See testing procedures.

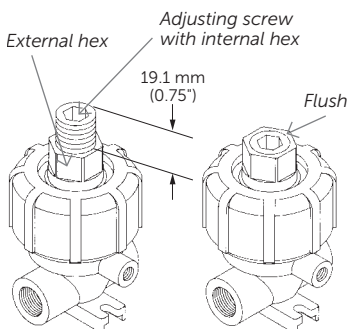


Figure 3.

INTEGRA PNEUMATICALLY OPERATED DIAPHRAGM VALVES

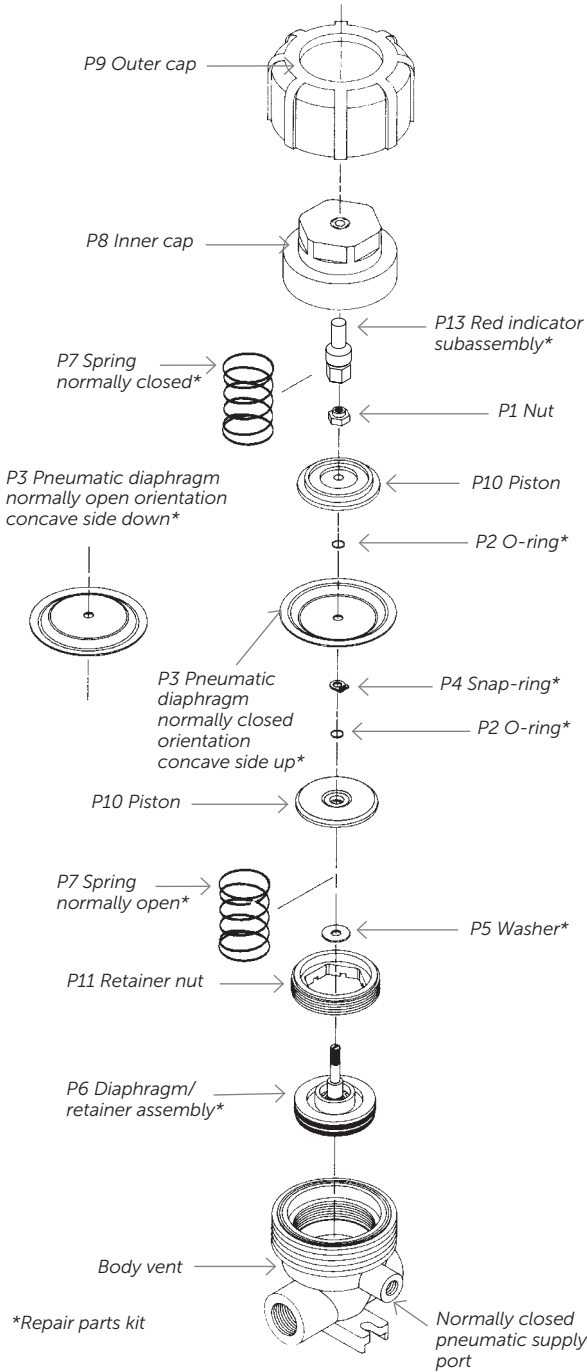


Figure 4.

TESTING PROCEDURES

The valve must be tested in the following ways:

External Operator Leakage

Apply 483 kPa (70 psig) air pressure to the pneumatic supply port. No air from the body vent hole or from the top of the operator should be seen when the valve is submerged in water.

Inlet to Outlet Leakage

For normally closed valves, apply 552 kPa (80 psig) air pressure to the inlet. No leakage at the outlet should be seen when the outlet port is submerged in water. On normally open valves, apply 276 kPa (40 psig) pneumatic pressure to the pilot port and then apply 552 kPa (80 psig) pressure to the inlet. No leakage at the outlet should be seen when the outlet port is submerged in water.

External Media Leakage

Plug the inlet with a taped pipe plug or Flaretek® fitting cap and apply 552 kPa (80 psig) air pressure to the outlet. No leakage at the body vent port should be observed.

ORDERING INFORMATION

Repair parts kit*

ITEM	DESCRIPTION	QUANTITY
P1	Nut	1
P2	O-ring (pistons)	2
P3	Pneumatic diaphragm	1
P4	Snap-ring	1
P5	Washer	1
P6	Diaphragm/retainer assembly	1
P7	Spring	1
P13	Red indicator subassembly	1

*See ordering numbers listed below.

Repair parts kit

REPAIR PARTS KIT PART NUMBER	VALVE PART NUMBERS
202-115	202-57, 202-58, 202-59, 202-60, 202-66, 202-60-SI, 202-60-SO, 202-66-SI, 202-66-SO, 202-128, 202-129
202-116	202-64-SI, 202-64-SO, 202-67-SI, 202-67-SO, 202-64-SI-01, 202-64-SO-01, 202-67-SI-01, 202-67-SO-01, 202-61-01, 202-62-01, 202-63-01, 202-64-01, 202-67-01, 202-61, 202-62, 202-63, 202-64, 202-67

Repair tool kit (part number 213-103)

ITEM	DESCRIPTION
T1	Outer cap wrench
T2	Diaphragm preload tool

Customer supplied items

ITEM	DESCRIPTION
S1	Lubricant (Nye Fluorocarbon Gel 807 or equivalent) and brush for applying
S2	Torque wrench, 1/2" drive, 6" extension, 34 N•m (300 in•lbs) scale
S3	Pliers
S4	(2) Screwdrivers, flat blade style, one must have a blade that is less than 0.73 mm (0.029") thick and 3.6 mm (0.145") wide
S5	Socket (3/8")
S6	Adjustable wrench adjustable to 39 mm (1 1/2") or larger
S7	Allen wrench (1/2")
S8	Socket (1 1/16") 1/2" drive
S9	Isopropyl alcohol
S10	Snap-ring pliers
S11	Loctite® 430
S12	Blade for trimming
S13	3/8" open-end wrench

FOR MORE INFORMATION

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