



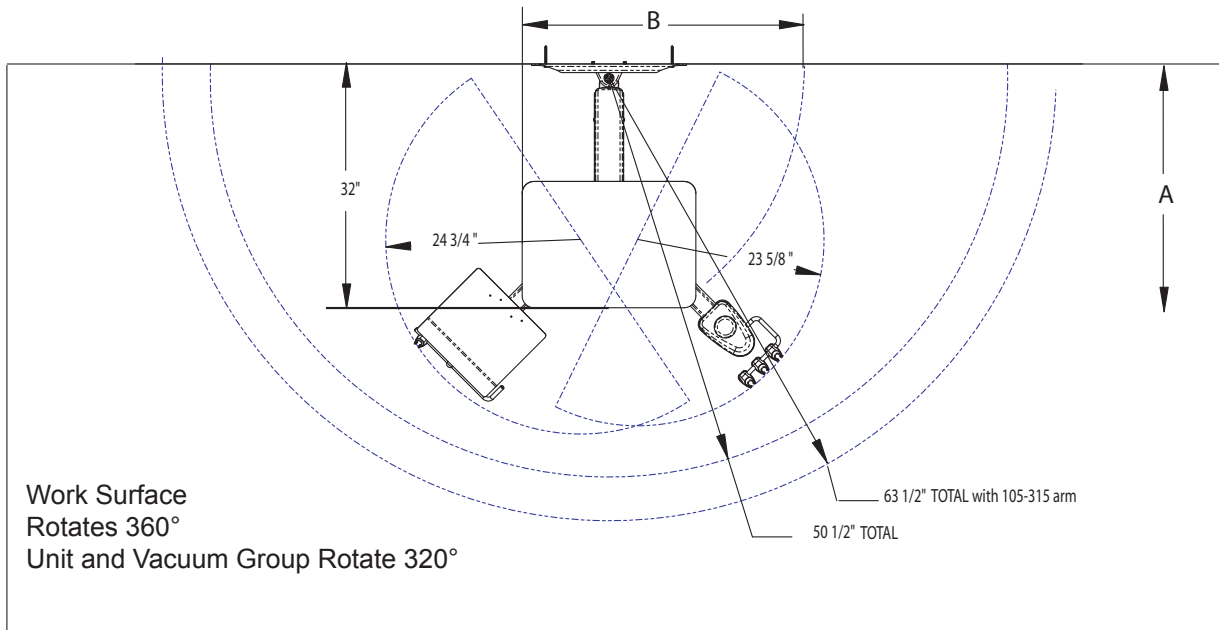
**BEAVERSTATE DENTAL SYSTEMS**

# **Service Manual**

## **RD-4250**

3 HP Automatic Rear Delivery Wall  
Mounted Duo System

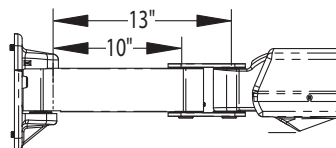
# RD-4250 Dimensions



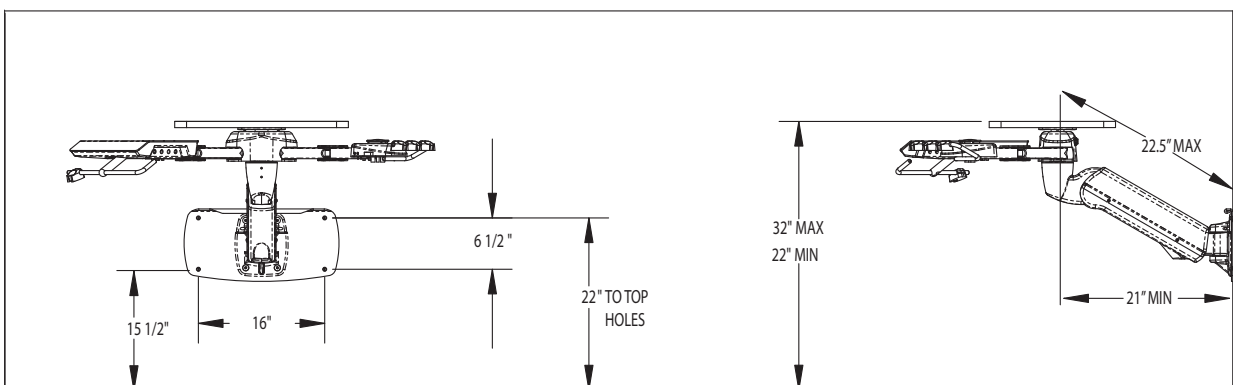
## NOTE

Addition of horizontal extension arm (p/n 105-315) adds 13"

A. Minimum folded distance from the wall without the 105-315 is 22". With the 105-315 it is 25".



B. Minimum folded distance along the wall without the 105-315 is 40". With the 105-315 it is 30".



# Assembly Instructions

Locate and mount the wall plate firmly to the wall using appropriate backing and hardware.

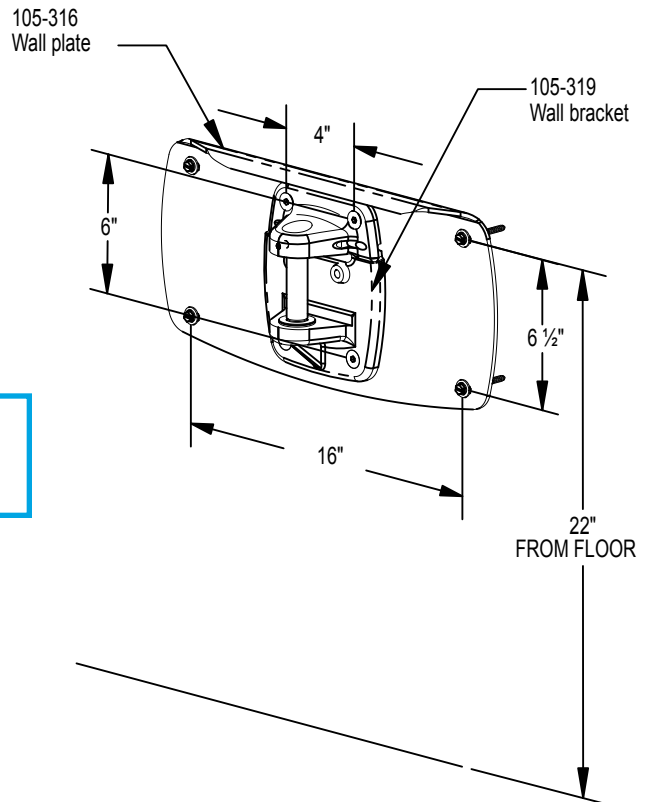
The wall plate can be removed if smaller mounting position is required; such as the side wall of a cabinet.



## Caution

If the 105-316 wall plate is not being used. The mounting surface must be suitably reinforced before the wall bracket can be mounted.

Mount the wall plate 22" from the floor. At this height the work surface in the up position will be 34" and 20" in the down position.

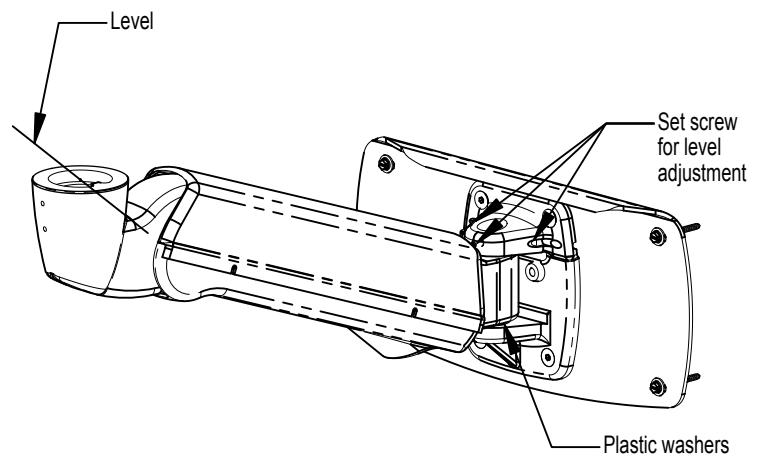


Remove the 1" diameter pivot pin in the wall, place arm in bracket to attach the flex section.

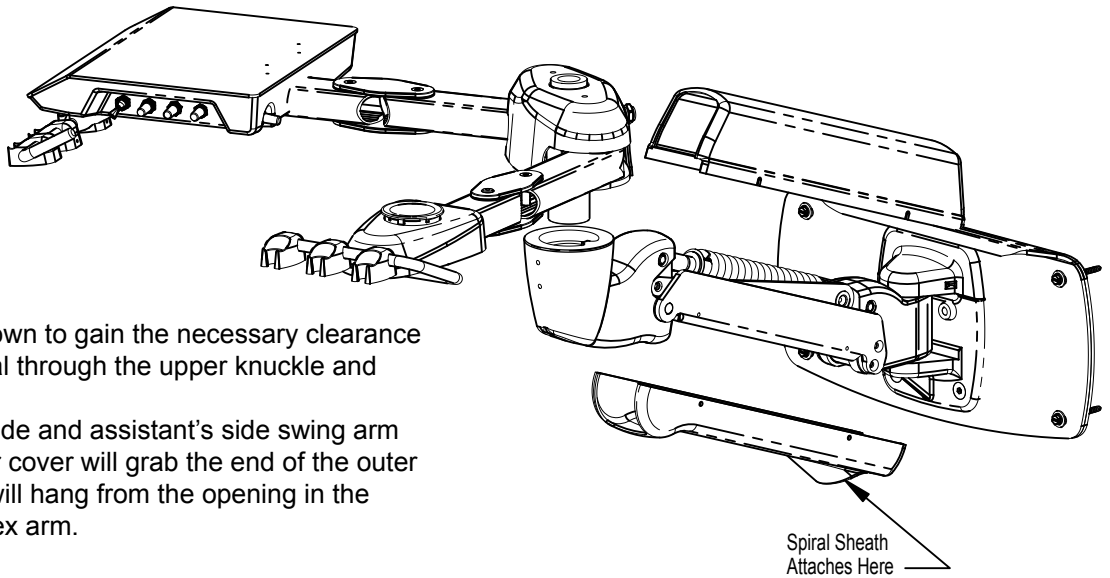
Be sure the plastic washers are still between the flex section and the wall bracket and replace pivot pin.

The arm can be leveled by adjusting the three set screws at the top of the wall bracket.

You can now remove the flex arm covers to string the umbilical.



# Assembly Instructions

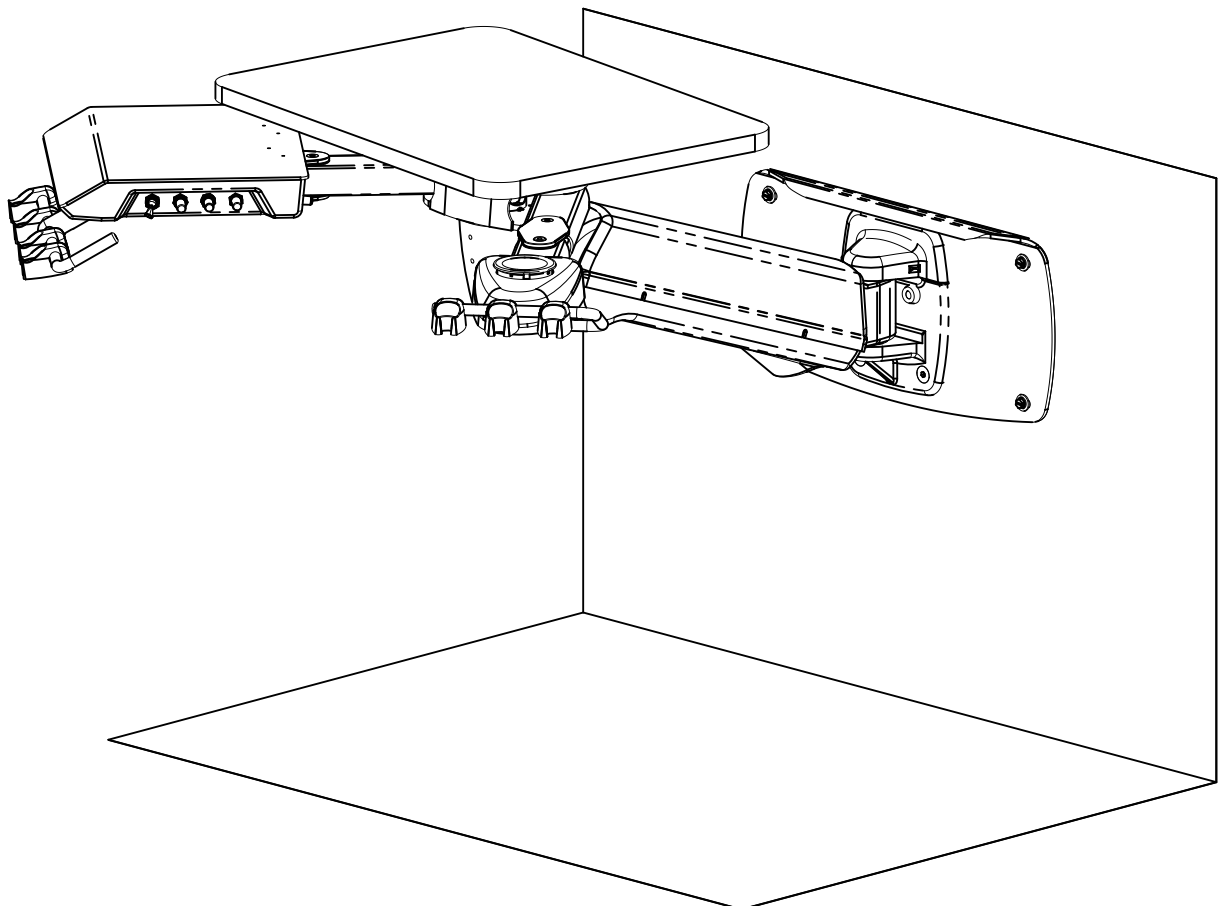


Push the flex arm down to gain the necessary clearance to string the umbilical through the upper knuckle and down the arm.

Install the doctor's side and assistant's side swing arm assembly. The lower cover will grab the end of the outer spiral tubing which will hang from the opening in the lower cover of the flex arm.

Replace flex arm covers. Note: The top cover only fits one way properly. If installed incorrectly there will be a gap between the upper knuckle and edge of the cover.

Install the work surface.



## Final Adjustments

Install master valve assemblies, with filter regulator, onto the manual shut-off valves. (Pressures are preset at the factory: 80 psi air, 40 psi water).

For safety reasons the flex arm is shipped intentionally with a minimum amount of spring tension. It is easily adjusted by removing the top flex arm cover. Loosen the button head screws approximately one turn. The cover will slide off without removing the mounting screws. Push the arm down to turn the hex adjusting nut. Turning clockwise toward the spring will raise the tension.

Adjust to a neutral balance point and replace the cover.

Check air pressure, adjust to 80 psi if necessary.

Check water pressure, adjust to 40 psi if necessary.

Test handpieces for proper function.

Test syringe for proper pressure and function.

Test HVE and Saliva Ejector valve for proper function.

## Operation

1. Turn on the master switch located on the left side of the control head.
2. The handpiece is automatically activated when lifted from the holder.
3. Depress the foot control to activate each handpiece. Pressure is shown on the gauge for the handpiece being used.
4. Individual handpiece pressure adjustments are located on the autoblock inside the control head. To adjust the pressure to each handpiece:
  - a. Turn adjustment screw clockwise to decrease the handpiece pressure.
  - b. Turn adjustment screw counter-clockwise to increase the handpiece pressure.



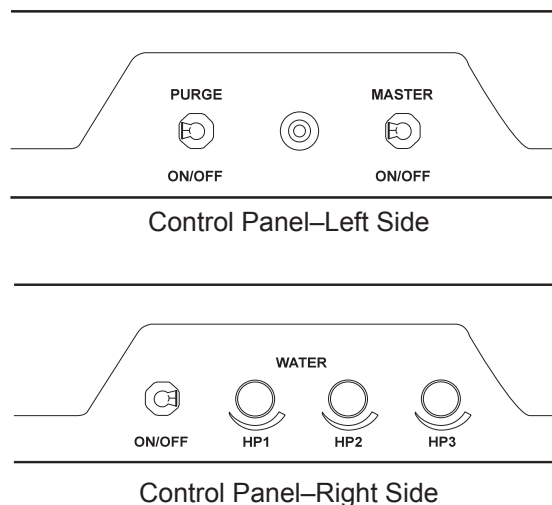
### CAUTION

When adjusting the handpiece pressure, do not over-tighten the screws. Damage may result.

5. Activate the water spray to the handpiece by flipping the toggle for the water located on the right side of the control head.
6. Water coolant flow adjustments are located on the right side of the control head.
7. This system may be positioned in either right or left hand configuration. Pull Dr's control forward, remove Syringe, HVE and Saliva Ejector valves from the assistant's side and pass the assistant's side behind the Dr's control to the opposite side.

## Handpiece Purge

The purge switch, located on the left side of the control head, flushes fresh water through the water coolant system. Guidelines from the Center for Disease Control (CDC) recommends that each handpiece be flushed (purged) 20 to 30 seconds between patients and several minutes at the beginning of each day. Handpieces must be removed from the holder to activate the purge system.



# Troubleshooting

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Symptom Handpiece lacks power.

Possible Causes

- A. Improper supply pressure from compressor (80 psi).
- B. Check handpiece pressure adjustment on unit.
- C. Air filter may be plugged.
- D. Pinched supply tubing.
- E. Defective handpiece gasket at connection with tubing.
- F. Defective handpiece.

Symptom Water coolant does not shut off when foot control is released.

Possible Causes

- A. Adjust air pressure to 80 psi—water pressure to 40 psi.
- B. Foot control is not exhausting.
- C. Defective water relay valve.

Symptom More than one handpiece is operating.

Possible Causes

- A. Handpiece is not all the way in the holder.
- B. Improper adjustment on pilot valve in the handpiece holder.
- C. Defective shuttle valve to gauge.

Symptom Insufficient water coolant.

Possible Causes

- A. Adjust coolant flow valve.
- B. Water filter may be plugged.
- C. Handpiece may be plugged.
- D. Pinched supply tubing.
- E. Improper adjustment of water relay valve.

Symptom Water coolant is running from handpiece while in the holder.

Possible Causes

- A. Water pressure too high.
- B. Air pressure too low.
- C. Handpiece holder out of adjustment.

Symptom Water coolant is running continuously.

Possible Causes

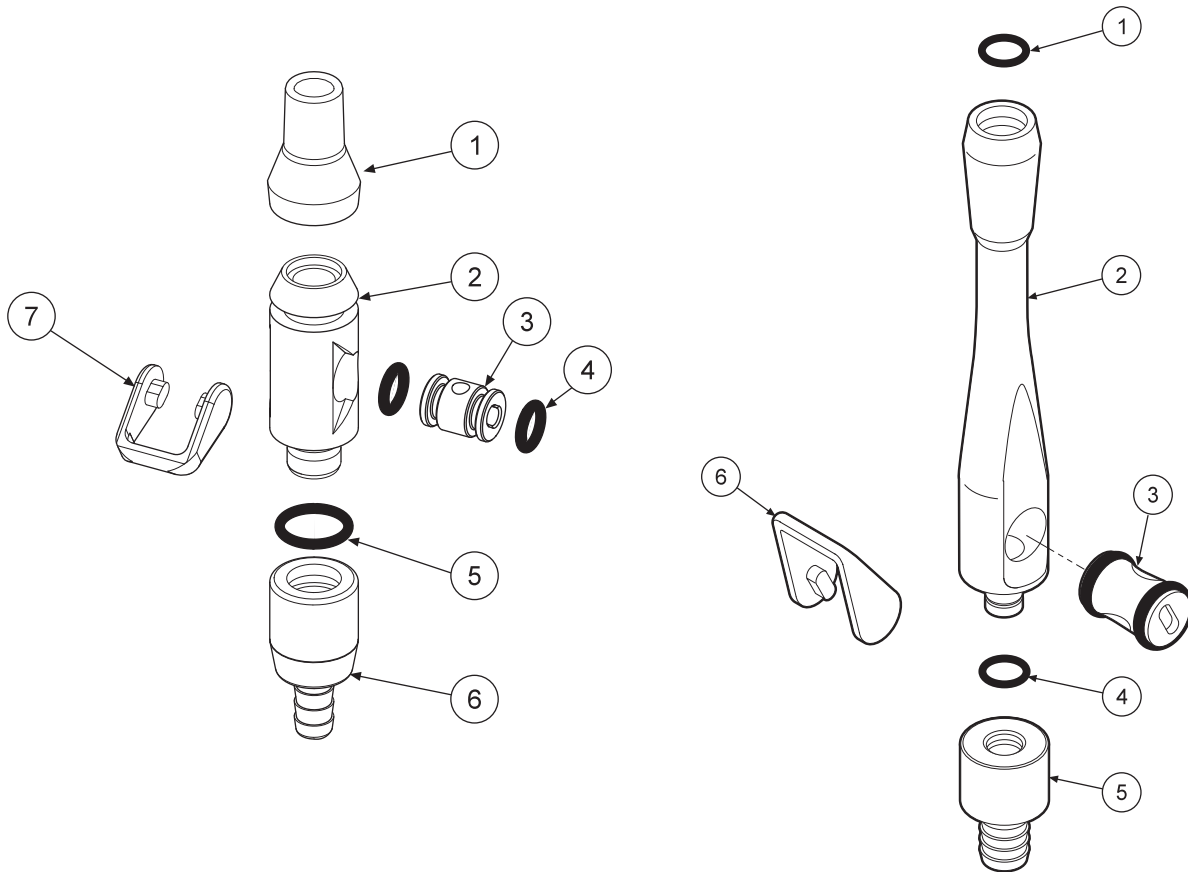
- A. Purge switch is on (on applicable systems).
- B. Water pressure too high.
- C. Handpiece holder out of adjustment.
- D. Defective water relay valve.

# Autoclavable HVE & S/E Valves

**Maintenance** Autoclavable vacuum valves may be autoclaved by steam autoclave or a chemical vapor. Due to the tight clearances and hardness of the anodized surfaces, the valve spool can become jammed or seize in the valve if it is sterilized while contaminated with debris.

Valves can be quickly disassembled for cleaning.

1. Pry one side of the lever and flip it off of the valve. For saliva ejector valves, remove the tip also.
2. Push out the valve spool and clean all the disassembled parts in an ultrasonic cleaner daily. Rinse thoroughly before putting into autoclave.
3. Lubricate the O-Rings on the spool with a silicone based lubricant before reassembly.



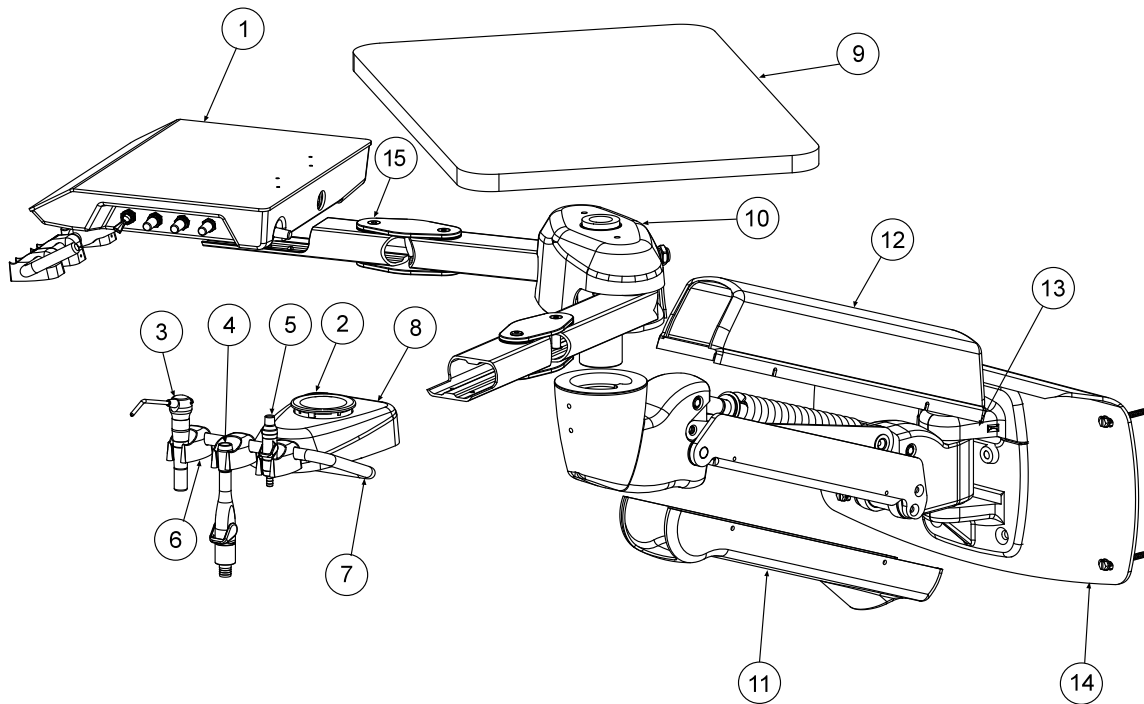
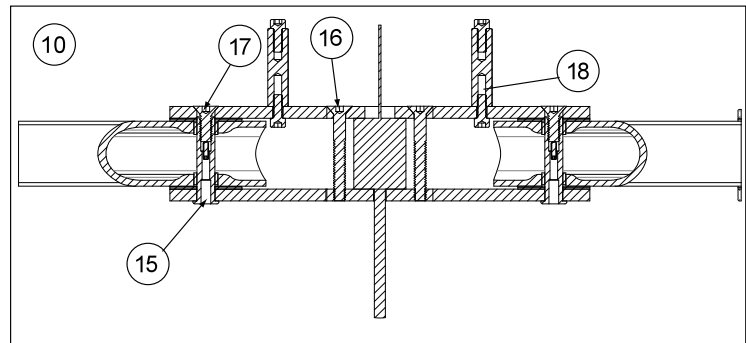
ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	Tip.....	112-174	1
2	Body.....	112-276	1
3	Spool.....	112-278	1
4	O-Ring #10.....	017-110	2
5	O-Ring, #12.....	017-012	1
6	Swivel.....	112-177	1
7	Lever.....	112-181	1

ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	O-Ring, #13.....	017-113	3
2	Body, Chrome.....	112-272	1
3	Spool, Chrome.....	112-268	1
4	O-Ring, #13.....	017-013	1
5	Swivel.....	112-170	1
6	Lever.....	112-169	1

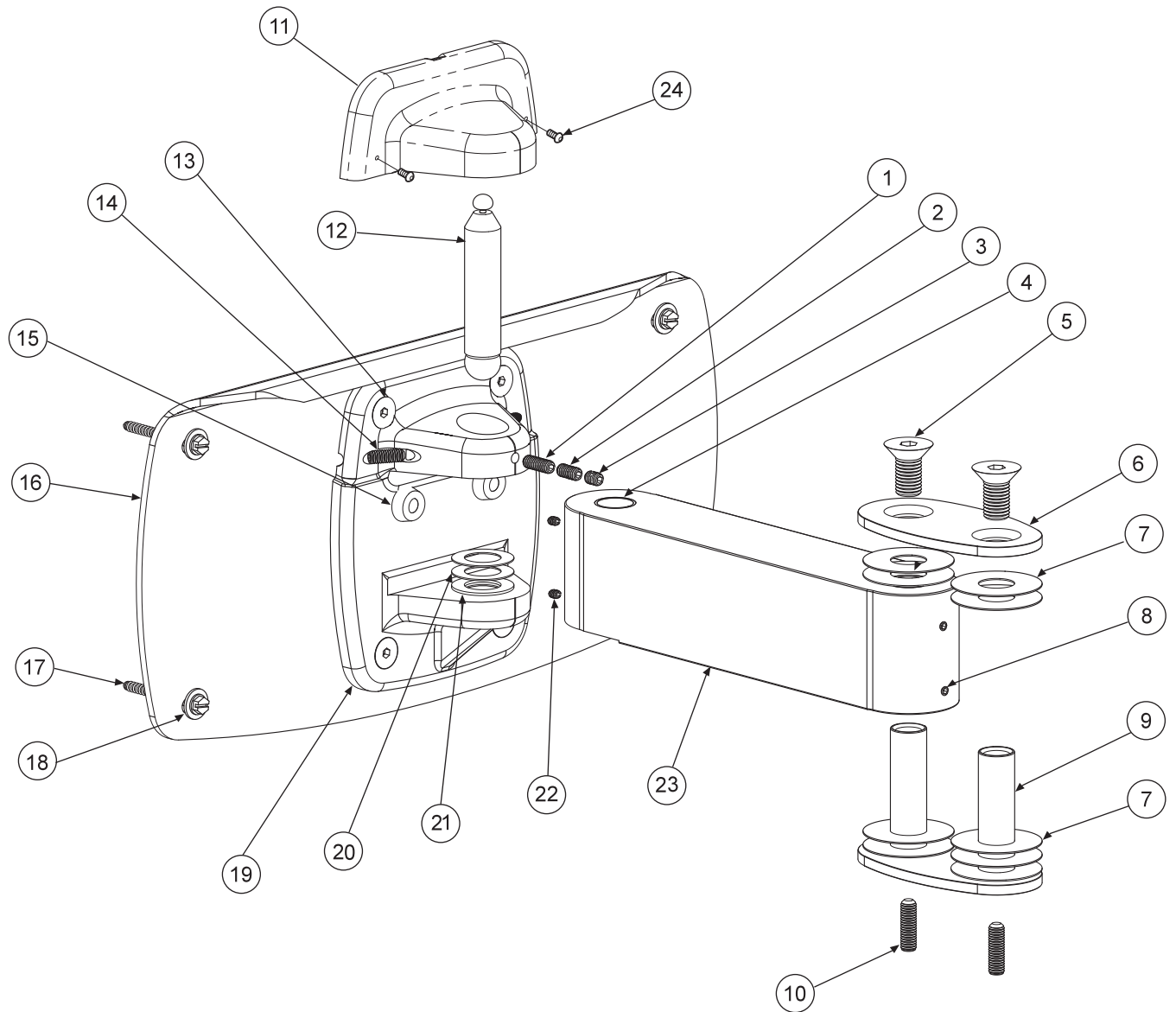
**AUTOCLAVABLE S/E LEVER VALVE**  
112-280

**AUTOCLAVABLE UNIVERSAL HVE VALVE**  
112-263

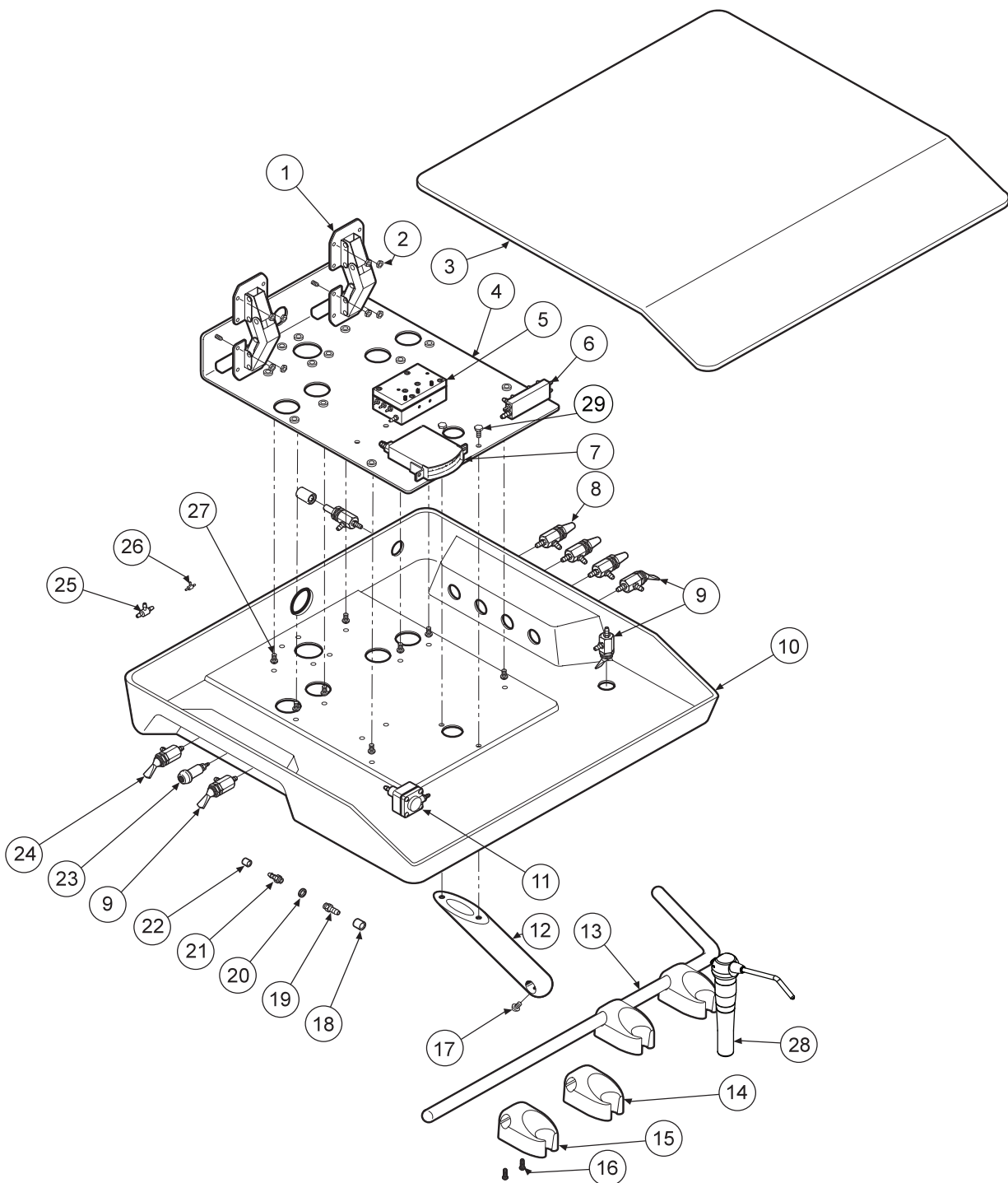




ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	Head, RD-4250, .....	330-RD-4250	1
2	CV Cannister w/Bayonet Lid.....	131-036	2
3	Syringe.....	113-400	1
4	HVE Valve, Autoclavable.....	112-263	4
5	S/E Valve, Autoclavable.....	112-280	2
6	Universal Holder.....	141-200	1
7	Holder Bar.....	105-114	1
8	Cover.....	131-057	1
9	Cart Work Surface.....	101-113	3
10	Swing Arm Sub Assembly.....	105-340	1
11	Cover, Arm, Bottom.....	105-327	1
12	Cover, Arm Top.....	105-328	2
13	Cover.....	105-318	1
14	Wall Mounting Plate.....	105-316	1
15	Screw, 1/4-28 x 3/4".....	001-180	6
16	Screw, 1/4-20 x 3/4".....	001-181	3
17	Set Screw, 10-32 x 1".....	005-029	6
18	Screw, 10-32 x 1/2".....	001-166	4

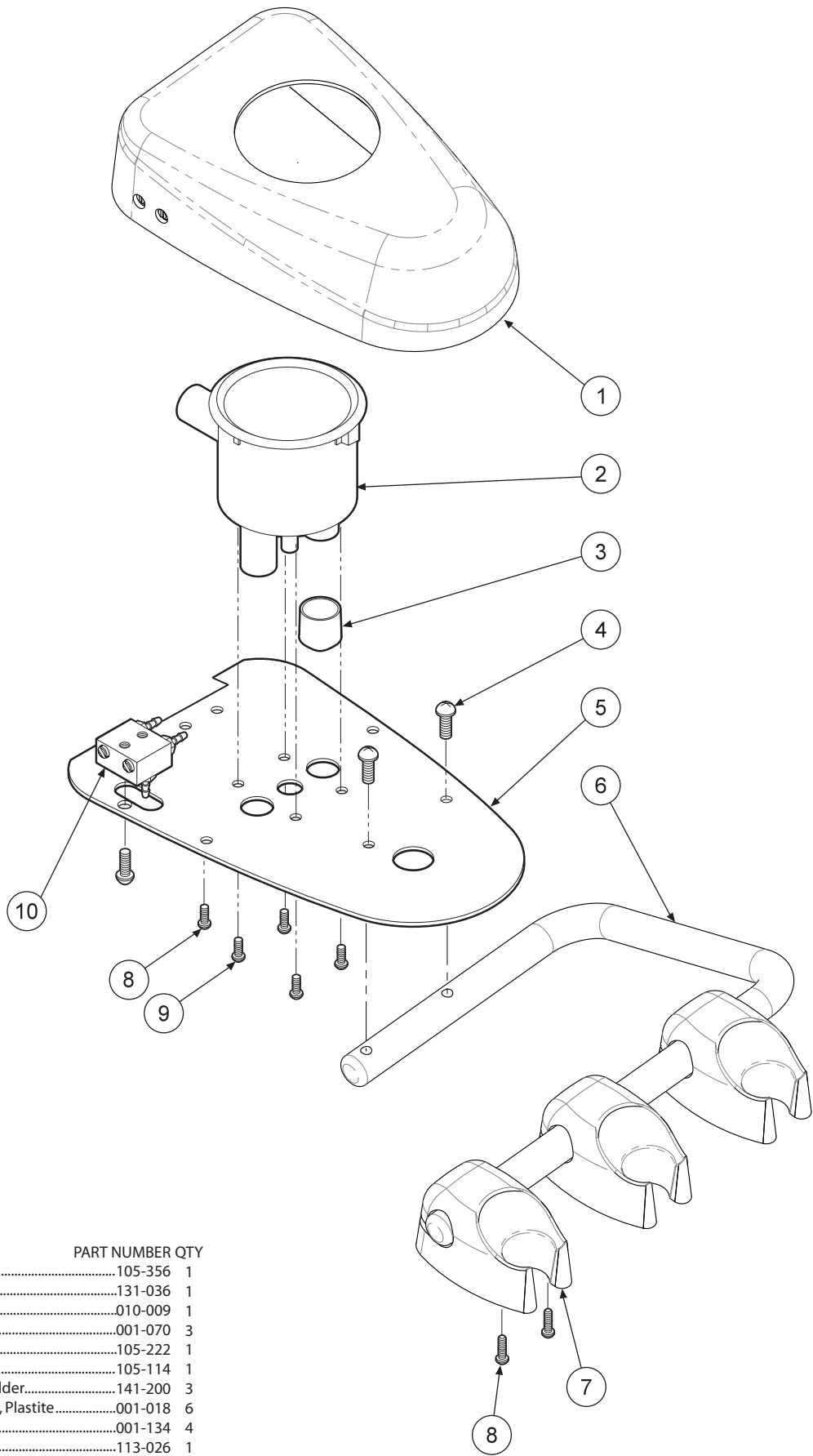


ITEM	PART DESCRIPTION	PART NUMBER	QTY	ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	Set Screw, 5/16-18 x 7/8"	005-042	1	13	Screw, 3/8"-24 x 3/4"	001-199	4
2	Set Screw, 5/16-18 x 3/4"	005-041	1	14	Set Screw, 5/16"-18 x 1"	005-043	2
3	Set Screw, 5/16-18 x 1/2"	005-040	1	15	Bumper	010-010	2
4	Bushing, 1-1/8" x 7/8" x 1"	013-002	2	16	Wall Mounting Plate	105-316	1
5	Screw, 5/8"- 11 x 1 1/4"	001-196	2	17	Screw, #14 x 2-1/2"	001-069	4
6	Plate, Chamfer, Extension Arm	105-363	2	18	Washer, Flat, 1/4"	003-033	4
7	Washer	003-056	8	19	Wall Bracket	105-314	1
8	Socket Set Screw, 1/4-20 x 5/8"	005-025	2	20	Washer .89 x 1.505 x .031 Teflon	003-042	2
9	Plate/Pin	105-366	2	21	Washer .89 x 1.505 x .062 Neoprene	003-041	1
10	Set Screw, 3/8-16 x 1 3/4"	005-045	2	22	Set Screw, 1/4-20 x 1/4"	005-038	2
11	Cover, Wall Bracket	105-318	1	23	Arm Extension	105-361	1
12	Hinge Pin	105-317	1	24	Screw, 10-32 x 1/4"	001-032	2

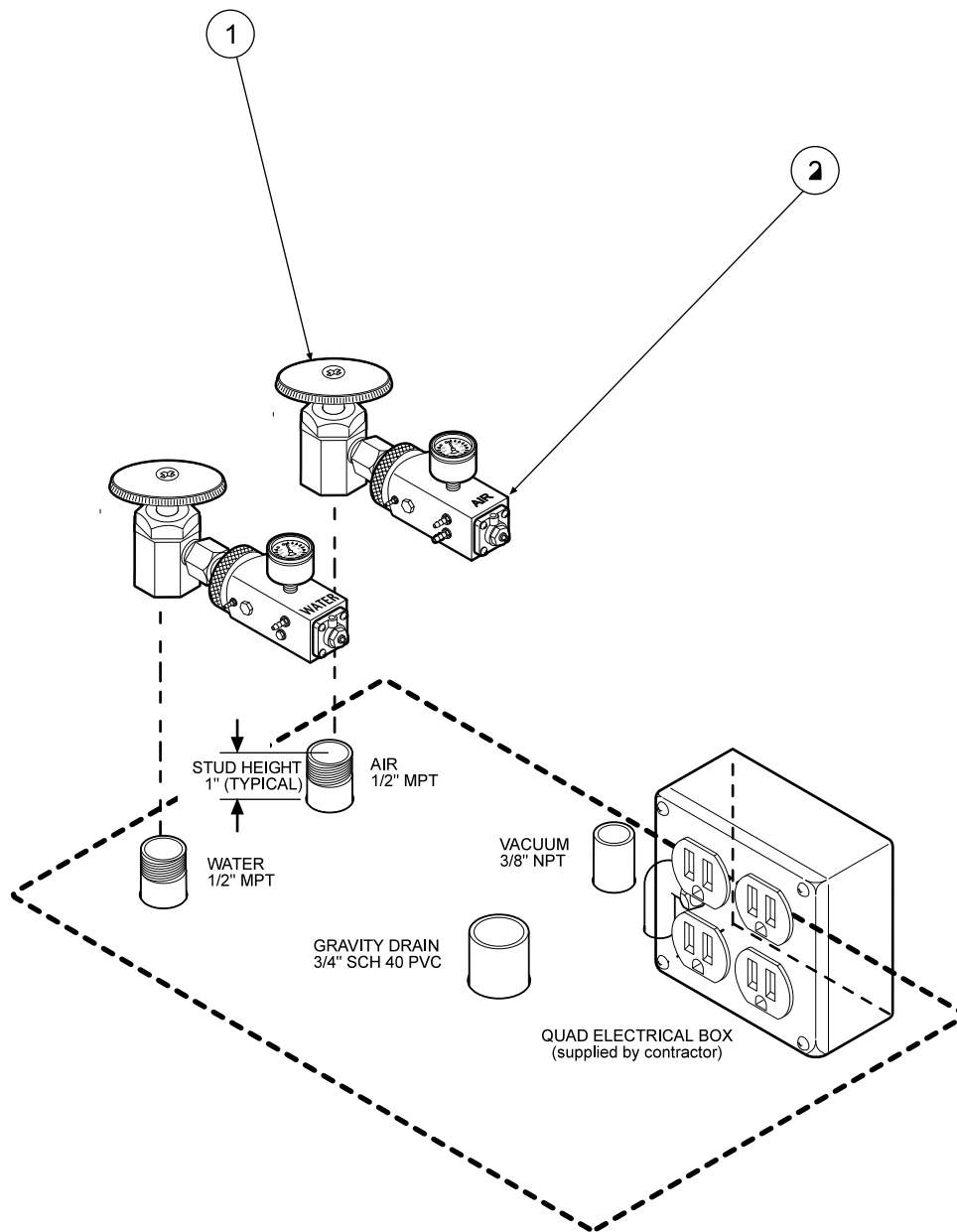


ITEM	PART DESCRIPTION	PART NUMBER	QTY	ITEM	PART DESCRIPTION	PART NUMBER	QTY	ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	Hinge.....	107-083	2	11	Water Relay Valve.....	123-000	1	21	Barb, 10-32 x 1/16".....	022-009	9
2	Hex Nut 6-32.....	002-004	8	12	Holder Bar Mount.....	107-007	1	22	Ferrule, 1/8".....	117-007	32
3	Cover.....	107-112	1	13	Holder Bar.....	107-006	1	23	Indicator.....	026-020	1
4	Chassis.....	107-110	1	14	Automatic Holder.....	122-200	3	24	Momentary Valve.....	120-005	1
5	Automatic Handpiece Block.....	125-030	1	15	Syringe Holder.....	141-200	1	25	Shuttle Valve.....	014-012	1
6	Handpiece Manifold.....	023-001	1	16	Screw, 8 x 1/2".....	001-018	8	26	Plastic Tee, 1/16".....	022-033	1
7	Gauge.....	026-003	1	17	Screw, 10-32 x 3/8".....	001-070	1	27	Screw, 8-32 x 3/8".....	001-151	4
8	Needle Flow Valve.....	121-000	4	18	Ferrule, 1/4".....	117-008	2	28	Syringe.....	113-400	1
9	3-way Toggle Valve.....	120-000	3	19	Barb, 10-32 x 1/8".....	022-010	4	29	Screw 10-32 x 1/2".....	001-166	2
10	Base.....	107-111	1	20	Plastic Washer, 1/4".....	003-001	13				

**AUTOMATIC HANDPIECE CONTROL  
330-RD-4250**

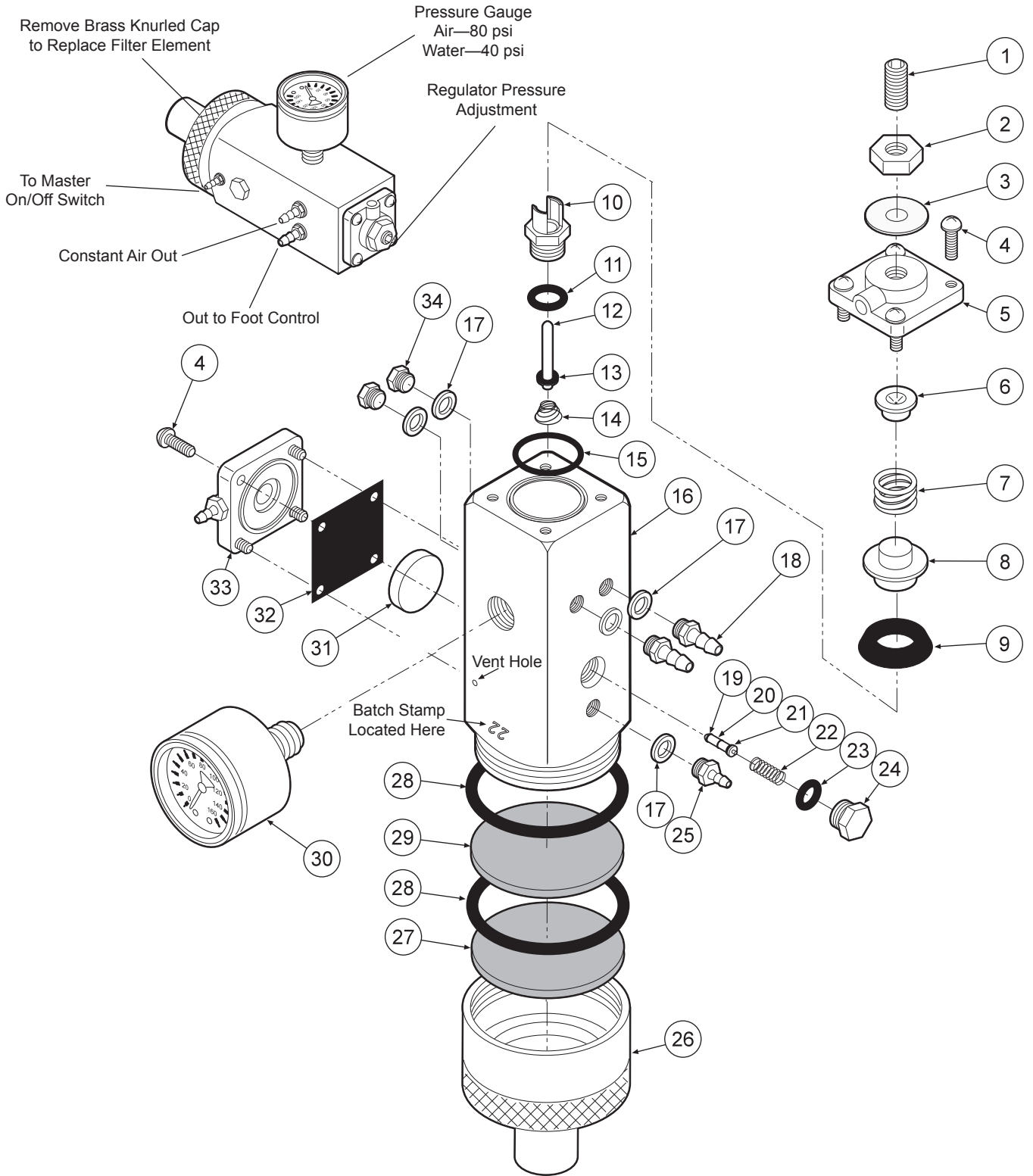


ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	Cover.....	105-356	1
2	Cannister.....	131-036	1
3	HVE Port Plug.....	010-009	1
4	Screw, #10-32 x 3/8".....	001-070	3
5	Mounting Plate.....	105-222	1
6	Holder Bar.....	105-114	1
7	Vacuum Handpiece Holder.....	141-200	3
8	Screw, #8 x 1/2" Phillips, Plastite.....	001-018	6
9	Screw, #6-32 x 3/8".....	001-134	4
10	Syringe Block.....	113-026	1



ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	Manual Shut-off Valves.....	020-022	2
2	Master Shut-off Valve Kit.....	127-012	1

**UTILITY CENTER LESS HOUSING AND COVER**  
144-027



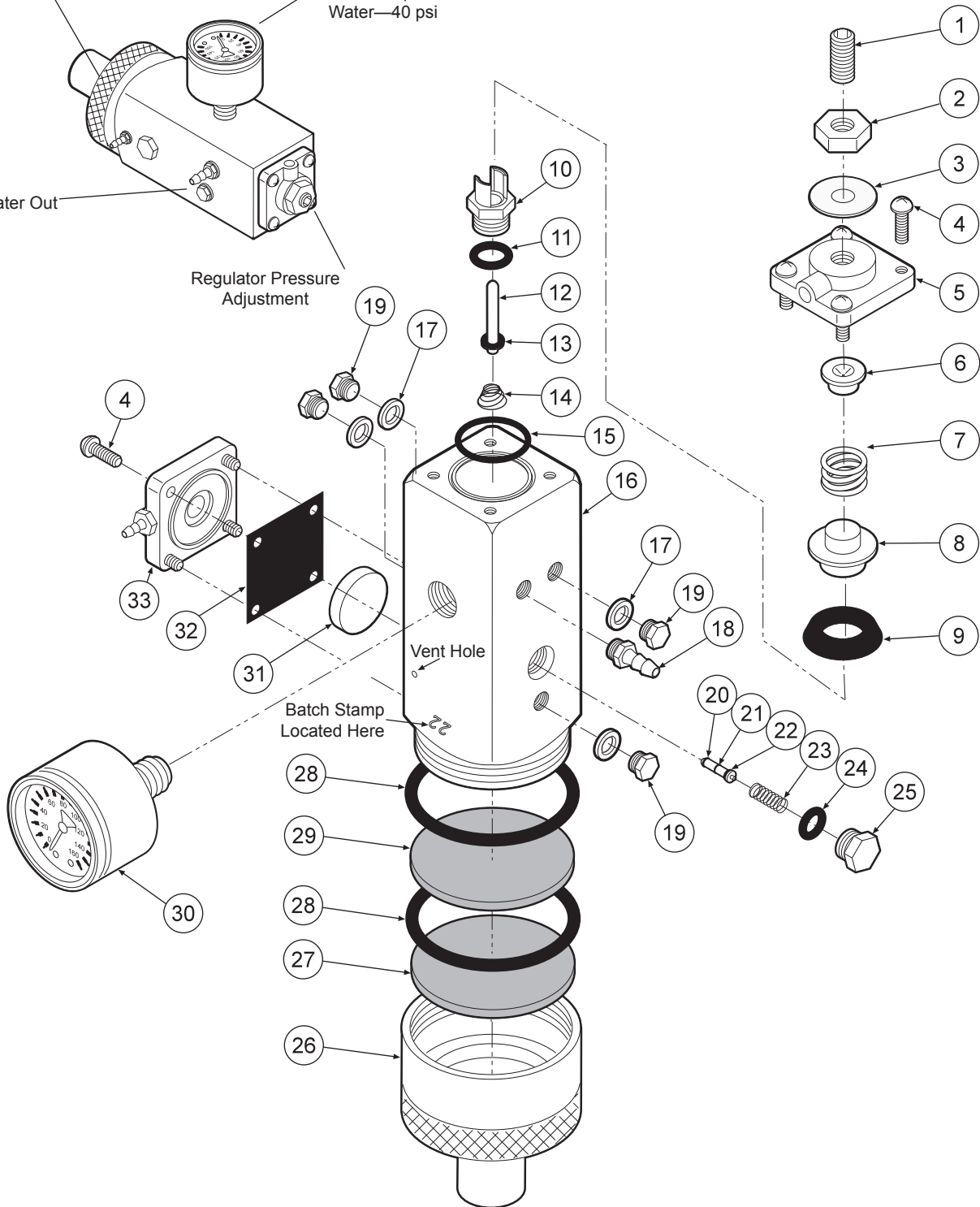
ITEM	PART DESCRIPTION	PART NUMBER	QTY	ITEM	PART DESCRIPTION	PART NUMBER	QTY	ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	Set Screw, 1/4-20 x 5/8"	005-024	1	13	O-Ring, 004	017-104	1	24	Plug	020-026	1
2	Jam Nut, 1/4-20	002-006	1	14	Spring	008-028	1	25	Barb, 10-32 x 1/16"	022-009	1
3	Washer	003-015	1	15	O-Ring	017-018	1	26	Cap Inlet	127-041	1
4	Screw, 6-32 x 3/8"	001-041	8	16	Body	127-040	1	27	Filter Element, 100 Micron	119-005	1
5	Cap	127-033	1	17	Plastic Washer, 1/4"	003-001	5	28	O-Ring, 018	017-022	2
6	Spring Seat	127-043	1	18	Barb, 10-32 x 1/8"	022-010	2	29	Filter Element, 35 Micron	119-004	1
7	Spring	008-008	2	19	O-Ring, 001	017-501	2	30	Gauge	026-001	1
8	Cup Seat	127-044	1	20	Stem	127-045	1	31	Piston	123-014	1
9	Cup Seal	017-200	4	21	O-Ring, 003	017-103	1	32	Gasket	127-031	1
10	Seat	127-026	3	22	Spring	008-040	1	33	Cap	123-030	1
11	O-Ring, 008	017-008	2	23	O-Ring, 007	017-007	1	34	Plug	001-001	2
12	Stem	127-024	1								

Remove Brass Knurled Cap to Replace Filter Element

Pressure Gauge  
Air—80 psi  
Water—40 psi

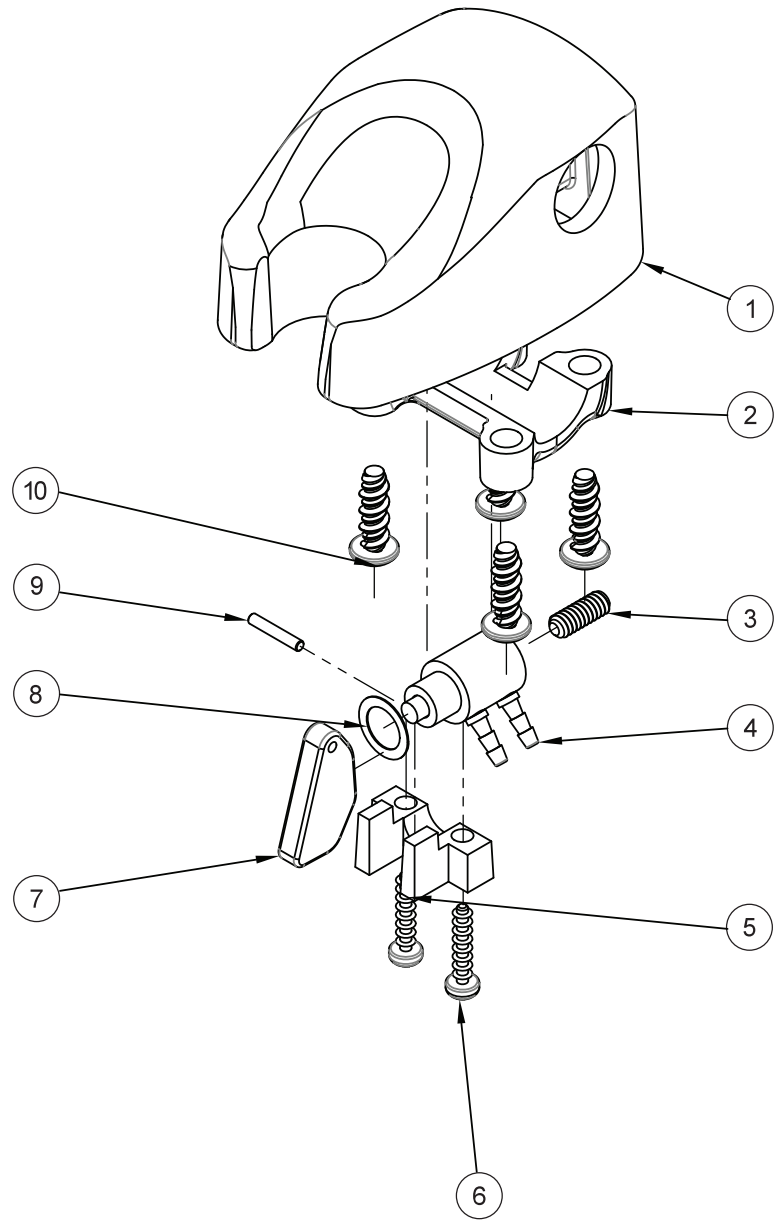
Water Out

Regulator Pressure Adjustment



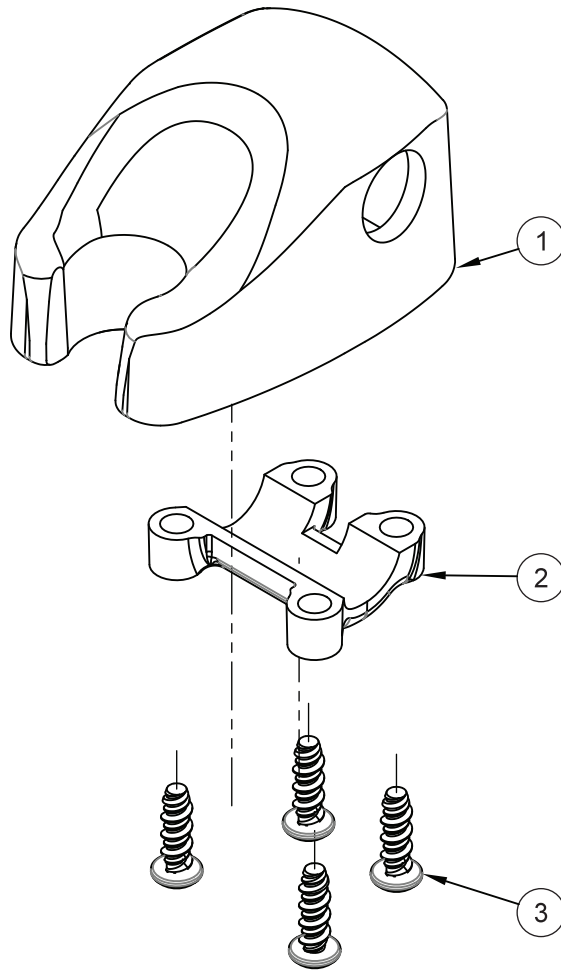
ITEM	PART DESCRIPTION	PART NUMBER	QTY	ITEM	PART DESCRIPTION	PART NUMBER	QTY	ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	Set Screw, 1/4"-20 x 5/8"	005-024	1	12	Stem	127-024	1	23	Spring	008-040	1
2	Jam Nut, 1/4"-20	002-006	1	13	O-Ring, 004	017-104	1	24	O-Ring, 007	017-007	1
3	Washer	003-015	1	14	Spring	008-028	1	25	Plug	020-026	1
4	Screw, 6-32 x 3/8"	001-041	8	15	O-Ring	017-018	1	26	Cap Inlet	127-041	1
5	Cap	127-023	1	16	Body	127-040	1	27	Filter Element, 100 Micron	119-005	1
6	Spring Seat	127-043	1	17	Plastic Washer, 1/4"	003-001	1	28	O-Ring, 018	017-022	2
7	Spring	008-008	1	18	Barb, 10-32 x 1/8"	022-010	1	29	Filter Element, 35 Micron	119-004	1
8	Cup Seat	127-044	1	19	Plug	001-001	4	30	Gauge	126-001	1
9	Cup Seal	017-200	1	20	O-Ring, 001	017-501	2	31	Piston	123-014	1
10	Seat	127-026	1	21	Stem	127-045	1	32	Gasket	127-031	1
11	O-Ring, 008	017-008	1	22	O-Ring, 003	017-103	1	33	Cap	123-012	1

**MASTER VALVE  
127-010 WATER**

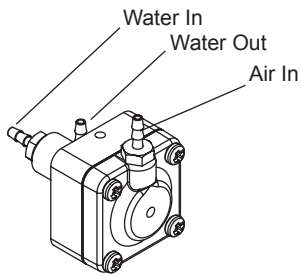
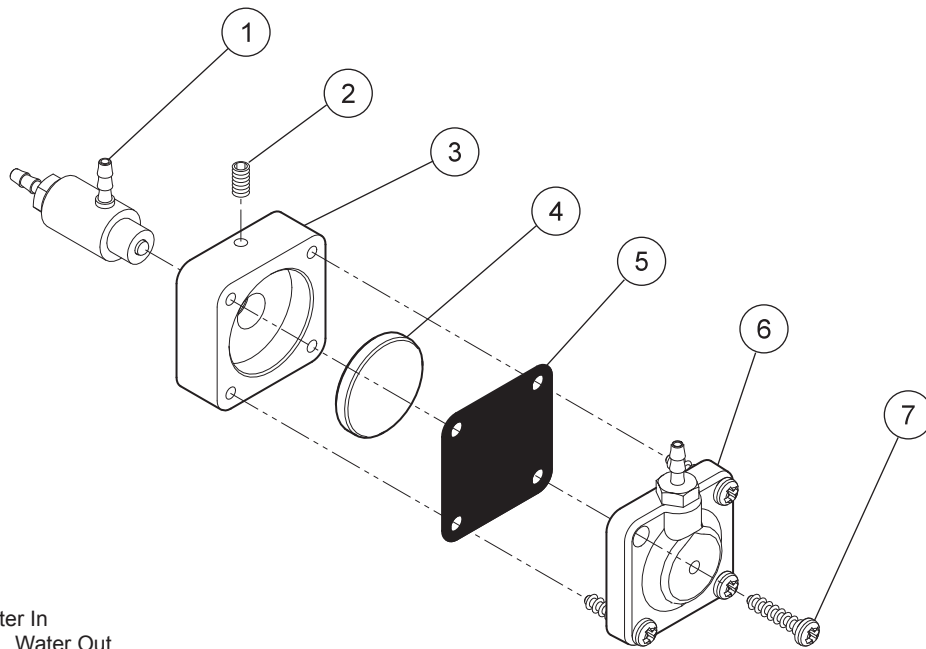
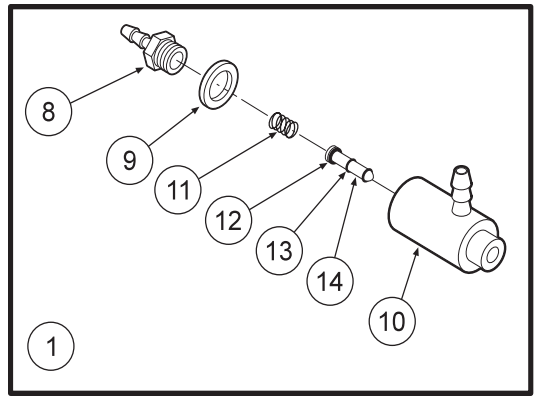


ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	Molded Body.....	122-201	1
2	Clamp .....	122-104	1
3	Set Screw, 6-32 x 3/8".....	005-012	1
4	Valve Cartridge.....	122-031	1
5	Molded Clip.....	122-102	1
6	Screw, 4 x 1/2".....	001-019	2
7	Handpiece Actuator Lever.....	122-103	1
8	Washer.....	003-004	1
9	Pin, 1/16"x3/8" Dowel.....	009-010	1
10	Screw, 8-18 x 1/2".....	001-267	4



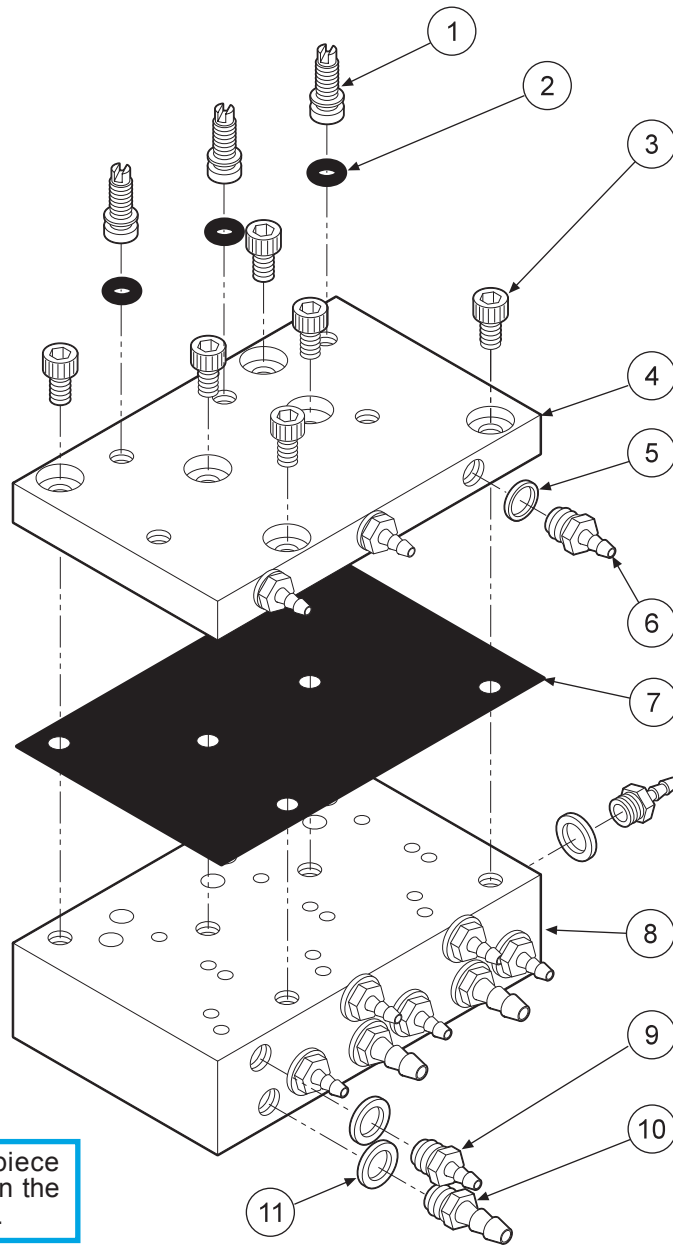


ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	Molded Body.....	141-201	1
2	Clamp .....	122-204	1
3	Screw, 8-32 x 1/2".....	001-267	4



Water Relay Valve 123-000

ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	Cartridge Body Assembly.....	123-018	1
2	Set Screw, 4-40 x 5/8".....	005-028	1
3	Body.....	123-013	1
4	Piston.....	123-014	1
5	Diaphragm.....	127-031	1
6	Cap.....	123-012	1
7	Screw, #6 x 1/2".....	001-267	4
8	Barb, 10-32 x 1/16".....	022-009	1
9	Plastic Washer, 1/4".....	003-001	1
10	Valve Body.....	123-017	1
11	Spring.....	008-011	1
12	O-Ring, 002.....	017-502	1
13	O-Ring, 001.....	017-501	2
14	Stem.....	123-015	1



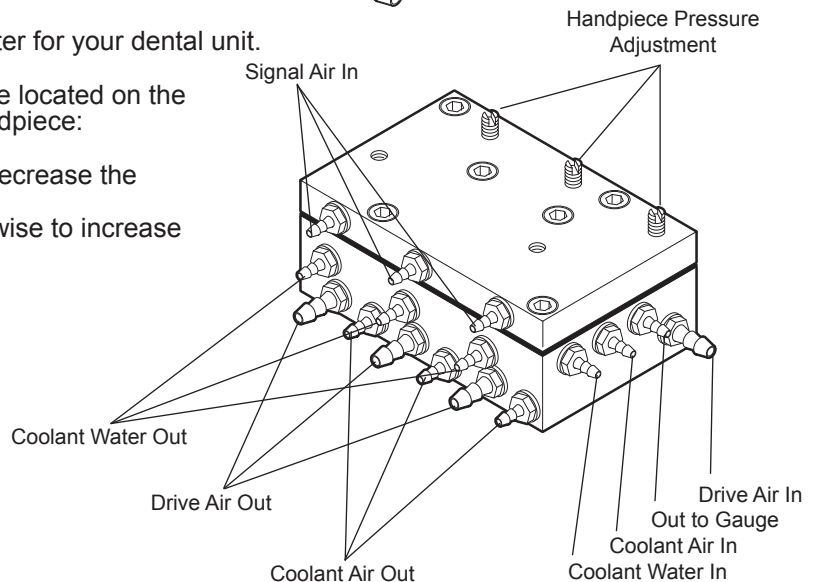
**CAUTION**  
When adjusting the handpiece pressure, do not over-tighten the screws. Damage may result.

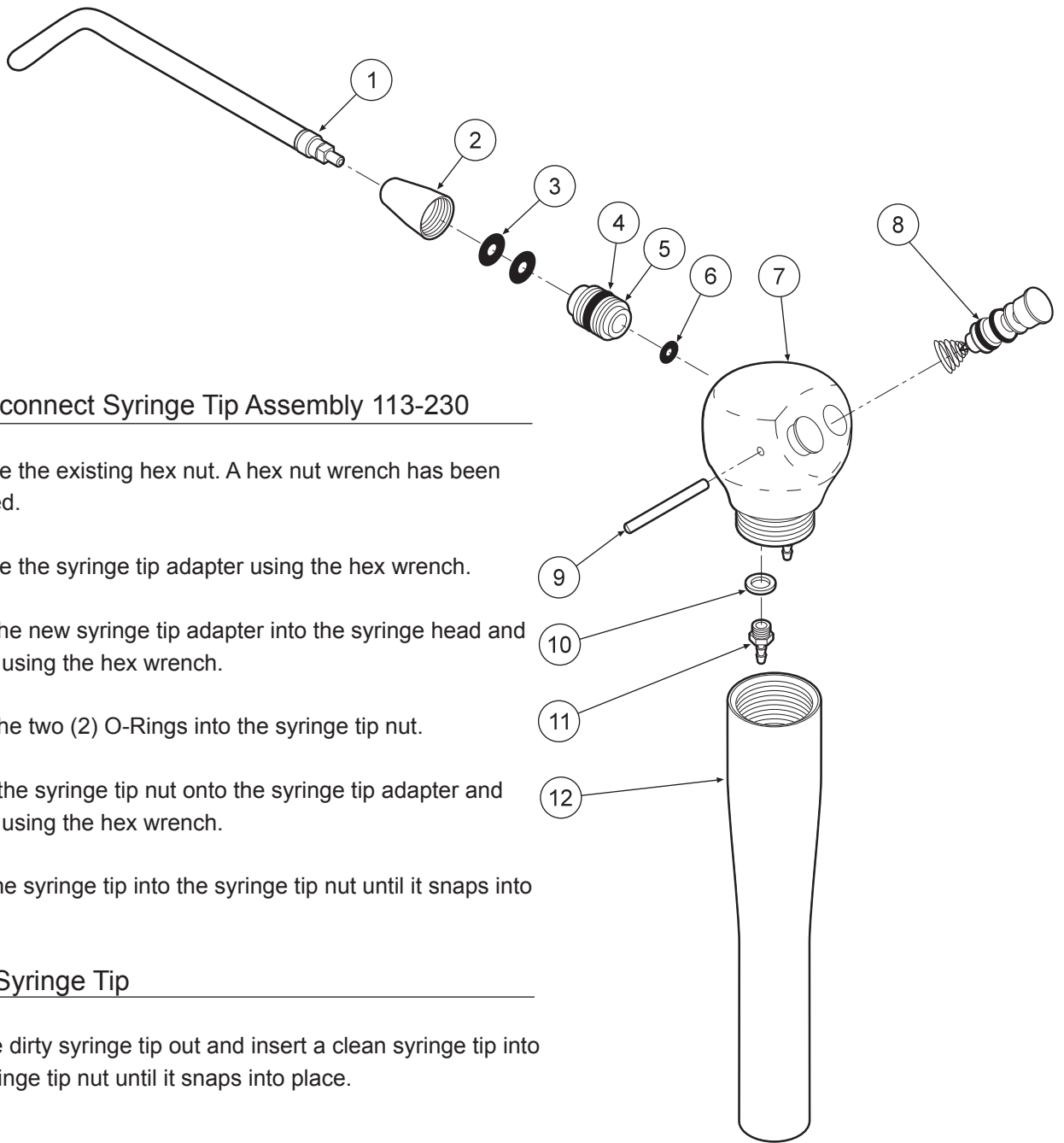
The automatic control block is the control center for your dental unit.

Individual handpiece pressure adjustments are located on the autoblock. To adjust the pressure to each handpiece:

- a. Turn adjustment screw clockwise to decrease the handpiece pressure.
- b. Turn adjustment screw counter-clockwise to increase the handpiece pressure.

ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	Adjusting Stem.....	125-023	3
2	O-Ring, 021.....	017-021	3
3	Screw, 6-32 x 1/4".....	001-131	7
4	Cap.....	125-032	1
5	Plastic Washer, 8-32 x 1/16".....	003-030	3
6	Barb, 8-32 x 1/16".....	022-040	3
7	Diaphragm.....	125-016	1
8	Body.....	125-031	1
9	Barb, 10-32 x 1/16".....	022-009	9
10	Barb, 10-32 x 1/8".....	022-010	4
11	Plastic Washer, 1/4".....	003-001	13





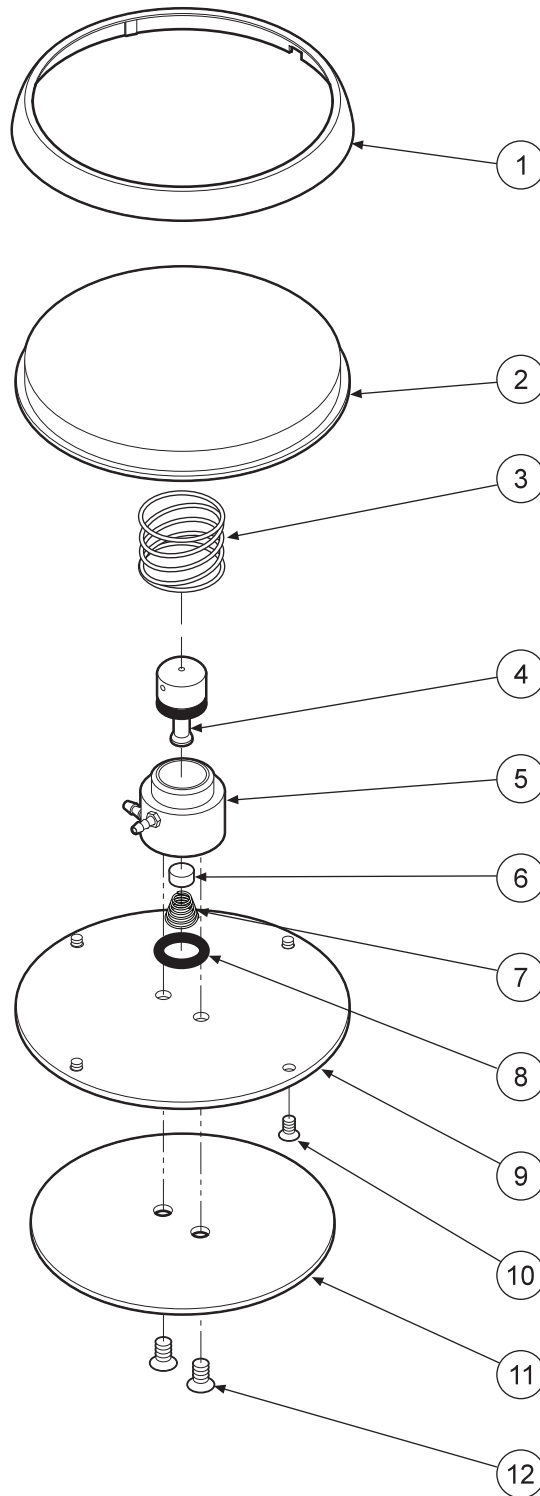
### Quick-disconnect Syringe Tip Assembly 113-230

1. Remove the existing hex nut. A hex nut wrench has been provided.
2. Remove the syringe tip adapter using the hex wrench.
3. Insert the new syringe tip adapter into the syringe head and tighten using the hex wrench.
4. Place the two (2) O-Rings into the syringe tip nut.
5. Screw the syringe tip nut onto the syringe tip adapter and tighten using the hex wrench.
6. Push the syringe tip into the syringe tip nut until it snaps into place.

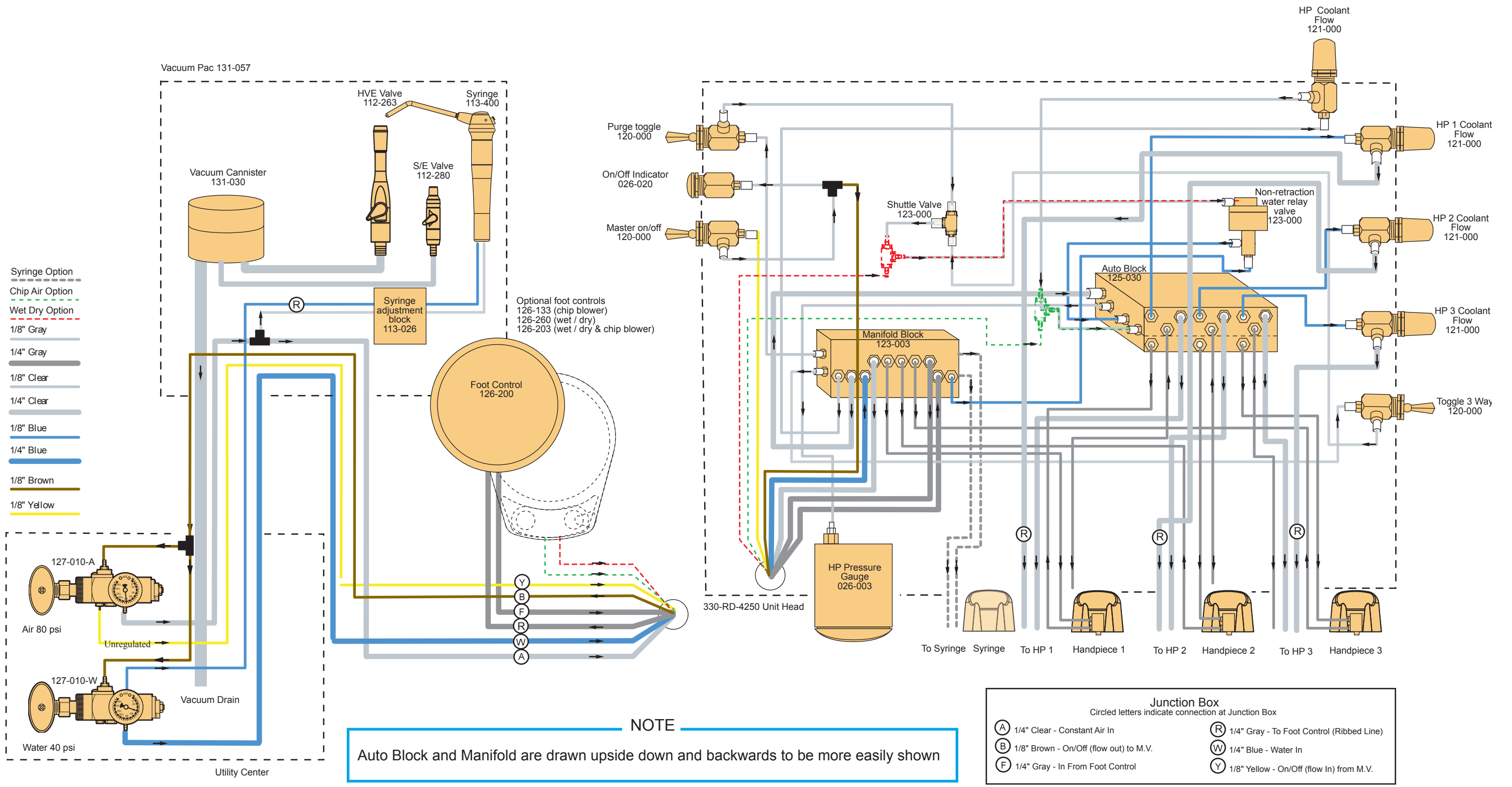
### Replace Syringe Tip

1. Pull the dirty syringe tip out and insert a clean syringe tip into the syringe tip nut until it snaps into place.

ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	Syringe Tip .....	113-030	1
2	Syringe Tip Nut.....	113-402	1
3	O-Ring, 006 .....	017-006	2
4	O-Ring, 228-040 .....	017-023	1
5	Syringe Tip Adapter.....	113-227	1
6	O-Ring, 003 .....	017-003	1
7	Syringe Head.....	113-405	1
8	Syringe Button Repair Kit .....	113-403	2
9	Pin, Syringe Cartridge .....	113-008	1
10	Plastic Washer, 8-32.....	003-030	2
11	Barb, 8-32 x 1/16" .....	022-040	2
12	Syringe Handle.....	113-236	1



ITEM	PART DESCRIPTION	PART NUMBER	QTY
1	Ring.....	126-202	1
2	Cover.....	126-201	1
3	Spring.....	008-005	1
4	Stem (Includes 017-012 o-ring).....	126-005	1
5	Body.....	126-004	1
6	Poppet.....	126-006	1
7	Spring.....	008-006	1
8	O-Ring, 013.....	017-013	1
9	Baseplate.....	126-003	1
10	Screw, 4-40 x 1/4".....	001-005	4
11	Rubber Pad.....	126-007	1
12	Screw, 6-32 x 1/4".....	001-004	2



## WARRANTY

Beaverstate Dental warrants its product to be free of defects in material and workmanship for FIVE FULL YEARS from the date of purchase on all units. Auto-blocks and standard foot control (126-000) are covered by a LIFETIME warranty when factory installed as part of a complete dental system. Warranty is limited to repair or replacement by Beaverstate Dental. Products returned to the factory and determined to be defective will be repaired or replaced free of charge. The warranty does not cover light bulbs. Beaverstate Dental reserves the right to void all warranties if any product is installed by other than an authorized technician. Beaverstate's warranty does not cover damage to any surface finish, including but not limited to, discoloration or abrasion from cleaners, disinfectants or light sources. No claim for labor or consequential damages will be allowed. Return items must include a copy of the invoice or packing slip as proof of purchase.

**Beaverstate Dental Inc.  
115 S. Elliott Rd.  
Newberg, OR 97132  
800-237-2303  
503-538-8756  
503-538-2845 Fax  
[www.beaverstatedental.com](http://www.beaverstatedental.com)**

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