Procener Delivery Systems*

* includes International (Whip) Units

Serial Number Prefixes: NV, PN, PZ, RF & V

Theory of Operation & Component Repair Guide

FOR USE BY MIDMARK TRAINED TECHNICIANS ONLY
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General Safety Instructions

Safety First: The primary concern of Midmark Corporation is that this delivery system is maintained with the safety of the patient and staff in mind. To assure that services and repairs are completed safely and correctly, proceed as follows:

1. Read this entire manual before performing any services or repairs on this delivery system.
2. Be sure you understand instructions contained in this manual before attempting to service or repair delivery system.

Safety Alert Symbols

Throughout this manual are safety alert symbols that call attention to particular procedures. These items are used as follows:

**DANGER**
A DANGER is used for an imminently hazardous operating procedure, practice, or condition which, if not correctly followed, will result in loss of life or serious personal injury.

**WARNING**
A WARNING is used for a potentially hazardous operating procedure, practice, or condition which, if not correctly followed, could result in loss of life or serious personal injury.

**CAUTION**
A CAUTION is used for a potentially hazardous operating procedure, practice, or condition which, if not correctly followed, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

**EQUIPMENT ALERT**
An EQUIPMENT ALERT is used for an imminently or potentially hazardous operating procedure, practice, or condition which, if not correctly followed, will or could result in serious, moderate, or minor damage to unit.

NOTE
A NOTE is used to amplify an operating procedure, practice or condition.

Warranty Instructions

Refer to Midmark “Limited Warranty” printed in the Operation Manual for warranty information. Failure to follow guidelines listed below will void the warranty and/or render the delivery system unsafe for operation.

- In event of a malfunction, do not attempt to use delivery system until necessary repairs have been made.
- Do not attempt to disassemble delivery system, replace malfunctioning or damaged components, or perform adjustments unless you are one of Midmark’s authorized service technicians.
- Do not substitute parts of another manufacturer when replacing inoperative or damaged components. Use only Midmark replacement parts.
1.1 **Scope of Manual**

This manual contains detailed troubleshooting, scheduled maintenance, and service instructions for Midmark Delivery System components. This manual is intended to be used by authorized service technicians only.

1.2 **How to Use Manual**

A. **Manual Use When Performing Scheduled Maintenance**

(1) Perform inspections and services listed in Scheduled Maintenance Chart. (Refer to para 3.1).

(2) If a component is discovered to be faulty or out of adjustment, replace or adjust component as necessary. Refer to Section IV for common service procedures.

B. **Manual Use When Delivery System Component Is Malfunctioning And Cause Is Unknown**

(1) Perform troubleshooting procedures listed in Troubleshooting Guide. (Refer to Section II).

(2) If a component is discovered to be faulty or out of adjustment, replace or adjust component as necessary. Refer to Section IV for common service procedures.

C. **Manual Use When Damaged Component Is Known**

(1) Replace or adjust damaged component(s). Refer to Section IV for common service procedures.

1.3 **Description and Theory of Operation**

A. **General Description**

Midmark delivery systems are intended to provide dental professionals with air & water to operate dental handpieces, syringes, and Midmark authorized accessories during dental examinations and procedures.

Systems are available in various styles and configurations [Procenter-style (console, L/R, & 12:00 casework mounted), & Whip-style (console & L/R mounted)].

B. **Basic Theory of Operation:**

**ProCenter-style Delivery Units (Figure 1-1)**

[Refer to Section V for tubing diagrams]

**Master ON/OFF Switch (1, Figure 1-1)**

With the air manual shut-off valve open, unregulated air is supplied to the Master ON/OFF switch on the delivery unit [thru 1/8 in. purple tubing]. When the Master ON/OFF switch is turned ON, air passes thru the ON/OFF switch valve to the pilot air manifold [thru 1/8 in. red tubing]. The pilot air manifold directs the flow of air to the handpiece holder valves, flex arm unlock buttons, and back to the air and water master pilot shut-off valves in the junction box [thru 1/8 in. red tubing].

**Master Pilot Shut-Off Valves**

The air from the Master ON/OFF switch opens the air and water master pilot shut-off valves allowing air/water to pass thru the master pilot shut-off valves to the air/water regulators.

**Air / Water Regulators**

The air regulator w/gauge provides air to the foot control throttle valve [thru 1/4 in. grey ribbed tubing] and air to the syringe and cuspidor [thru 1/8 in. yellow tubing]. This regulator should be set at 80 PSI to optimize performance.

The air regulator w/o gauge provides 30 PSI to pressurize the water bottle [thru 1/8 in. brown tubing]. This regulator is preset at the factory and should not be adjusted.

An updated in-line regulator currently provides 30 PSI to the water bottle replacing above mentioned regulator.

The water regulator provides “city” water to the City/Bottle water selector valve [thru 1/8 in. blue tubing]. This regulator should be set at 30 PSI to optimize performance.

**Water Selector Switch Valve (2, Figure 1-1)**

Distilled water is supplied to the selector valve from the water bottle [thru 1/8 in. blue tubing]. City water is supplied to the selector valve from the water regulator [thru 1/8 in. blue tubing].
**Figure 1-1. Delivery Unit Control Locations**
With the selector valve toggle switch in City or Bottle position, [city water or distilled water] flows thru the selector valve to the water supply manifold [thru 1/8 in. blue tubing]. The water supply manifold directs the flow of water to the syringe adjustment valve and the handpiece adjustment valves [thru 1/8 in. blue tubing].

**NOTE:** The outgoing water line from the selector valve is used for both City and Bottle water.

### Foot Control Assembly

When the foot control pedal is depressed, the throttle valve [in foot control] opens, and supplies drive air and coolant air for the handpieces.

Drive air is supplied to the handpiece supply drive air manifold [thru 1/4 in. clear tubing]. The handpiece supply drive air manifold directs the flow of air to the handpiece drive air adjustment valves [thru 1/4 in. clear tubing]. The drive air is regulated by the adjustment valves then directed to the kink valves [thru 1/8 in. green tubing]. Coolant air is supplied to the handpiece coolant air adjustment valve [thru 1/8 in. green tubing]. The coolant air is regulated by the adjustment valve then directed to the kink valves [thru 1/8 in. green tubing].

When the Wet / Dry toggle valve [on foot control] is switched to the Wet position, pilot air for coolant water is supplied to the kink valve manifolds [thru 1/8 in. orange tubing]. The kink valve manifolds direct the pilot air to the coolant water adjustment valves [thru 1/8 in. white tubing]. The pilot air opens the coolant water adjustment valves, allowing water to flow to the kink valves [thru 1/8 in. blue tubing].

### Kink Valve Assembly

When a handpiece is removed from holder, the activation lever is released. This causes the (normally closed) handpiece holder valve to stop the airflow to the kink valve manifold [thru 1/8 in. purple tubing] and allows the kink valve to open. When the kink valve opens, coolant air, drive air, and coolant water flow thru the kink valve to the handpiece.

### Adjustment Knobs (See Figure 1-1 for location)

Allow user to adjust air & water flow to instruments.

### C. Basic Theory of Operation

**Whip-style Delivery Units (Figure 1-1)**

[Refer to Section V for diagrams]

**Master ON/OFF Switch (1, Figure 1-1)**

When the Master ON/OFF switch is turned ON, air passes through the ON/OFF switch valve to the pilot valve block.

**Pilot Valve Block**

The pilot valve block directs the flow of air, city water, and self contained water throughout the system.

**Water Selector Valve (2, Figure 1-1)**

Distilled water is supplied to the selector valve from the water bottle [thru 1/8 in. blue tubing]. City water is supplied to the selector valve from the water regulator [thru 1/8 in. blue tubing].

With the selector valve toggle switch in City or Bottle position, [city water or distilled water] flows thru the selector valve to the water supply manifold [thru 1/8 in. blue tubing]. The water supply manifold directs the flow of water to the syringe adjustment valve and the handpiece adjustment valves [thru 1/8 in. blue tubing].

**NOTE:** The outgoing water line from the selector valve is used for both City and Bottle water.

### Foot Control Assembly

The foot control supplies drive air and coolant water to handpieces. When the water ON/OFF switch is turned ON, the coolant water valve opens allowing coolant water to flow to handpieces.

### Handpiece Operation

When a handpiece is lifted, the whip assembly pivots causing a pilot valve to close. This action shuts off the pilot air to the kink valve causing the valve to relax the tubing, allowing air flow thru the kink valve tubing.

### Kink Valve Assembly

When the pilot valve opens, pilot air flow shuts off to the kink valve allowing it to relax. This allows coolant air, drive air, and coolant water to flow through the kink valve tubing to the handpiece.

### Adjustment Knobs (See Figure 1-1 for location)

Allow user to adjust air & water flow to instruments.
SECTION I
GENERAL INFORMATION

D. Basic Theory of Operation
Cuspidor (Figure 1-2)
[Refer to Section V for diagrams]

Supply Water

With the water manual shut-off valve [in junction box] open and the Master ON/OFF switch [on delivery unit] ON, the master pilot shut-off valve supplies regulated water to the cup fill flow control valve and the bowl flush control pinch valve in the cuspidor [thru 1/4 in. blue tubing]. The cup fill flow control valve regulates the supply water, then directs the water to the cup fill water valve [thru 1/4 in. blue tubing]. The bowl flush control pinch valve regulates the supply water, then directs the water to the bowl flush water valve [thru 1/4 in. blue tubing].

Supply Air

With the air manual shut-off valve [in junction box] open and the Master ON/OFF switch [on delivery unit] ON, the air regulator w/gauge supplies 80 PSI to the two manually operated cup filler valves, cup filler primary air valve, bowl flush solenoid, and the manually operated bowl flush valve.

Cup Fill (Earlier Versions)

When one of the manual cup fill valve buttons (1, Figure 1-2) is depressed, air is supplied to the (normally open) cup fill pilot air valve [thru 1/8 in. white tubing]. Air passes thru this valve to the cup fill timing adjustment valve and to the (normally closed) cup fill primary air valve [thru 1/4 in. yellow tubing]. The air opens the normally closed valve and supplies pilot air to the cup fill water valve and back to the (normally open) cup fill pilot air valve [thru 1/8 in. red tubing]. The pilot air to the cup fill water valve opens the valve and allows water to flow to the cup fill faucet. The pilot air to the (normally open) cup fill pilot air valve closes the valve, trapping air in the 1/4 in. yellow tubing between the pilot and primary air valves. This allows the cup fill faucet to run until air pressure in the 1/4 in yellow tubing is “bled off” thru the cup fill timing adjustment valve.

NOTE: The cup fill timing adjustment valve may be adjusted to shorten/lengthen the amount of time it takes to bleed off air pressure.

Cup Fill (Current Versions)

When the manual cup fill valve button is depressed, pilot air is supplied to the shuttle valve. The shuttle valve blocks off the air line going to the opposite cup fill valve, and supplies pilot air to the cup fill water valve as well as the cup fill timing adjustment valve [thru 1/8” red tubing]. The pilot air opens the cup fill water valve allowing water to flow to the cup fill faucet.

The cup fill timing adjustment valve gradually bleeds off air pressure from the cup fill water valve. When air pressure is removed from the cup fill water valve, the valve closes and water flow to the cup fill faucet is stopped.

NOTE: The cup fill timing adjustment valve may be adjusted to shorten/lengthen the amount of time it takes to bleed off air pressure.
Bowl Flush

Manual Push Button Operation
When the manual bowl flush valve button (2, Figure 1-2) is depressed, pilot air is supplied to the bowl flush water valve as well as the bowl flush timing adjustment valve [thru 1/8 in. red tubing]. The pilot air opens the bowl flush water valve allowing water to flow to the bowl flush faucet. The bowl flush timing adjustment valve gradually bleeds off air pressure from the bowl flush water valve. When air pressure is removed from the bowl flush water valve, the valve closes and water flow to the bowl flush faucet is stopped.

NOTE: The bowl flush timing adjustment valve may be adjusted to shorten/lengthen the amount of time it takes to bleed off air pressure.

Automatic Bowl Flush Function
When using the cuspidor with a Midmark dental chair, the operator may program a “Patient Cuspidor Position” on program button 4. This moves the chair to a desired position, and electrically activates the cuspidor bowl flush solenoid.

With the chair PC board in Cuspidor Position Return Mode, pressing program button 4 begins to move the chair to the programmed position and the PC board supplies voltage to the bowl flush solenoid (until chair reaches the programmed position). This voltage causes the solenoid to open, allowing pilot air to flow to the bowl flush water valve as well as the bowl flush timing adjustment valve [thru 1/8 in. red tubing]. The pilot air opens the bowl flush water valve allowing water to flow to the bowl flush faucet. The bowl flush timing adjustment valve gradually bleeds off air pressure from the bowl flush water valve. When air pressure is removed from the bowl flush water valve, the valve closes and water flow to the bowl flush faucet is stopped.

NOTE: The bowl flush timing adjustment valve may be adjusted to shorten/lengthen the amount of time it takes to bleed off air pressure.

For Procenter Cuspidor Mounted on Elevance Chair ONLY

Cuspidor Position Mode Setting
Press button 4 to raise chair (patient) to the cuspidor position, a position convenient for cuspidor use. The cuspidor solenoid output also activates on the PC board. The cuspidor solenoid output (J5) can be connected to an optional automatic bowl flush solenoid, initiating an automatic bowl flush function as the chair raises to the cuspidor position. Press button 4 again to return chair to last position used before the cuspidor position.

1.) Position (1) on dipswitch - Position (4) on remote
2.) Chairboard sends signal to cuspidor board
3.) Rinse solenoid turns on
4.) Deposit in bowl
5.) Position (4) - chair back to previous position

• No chair base movement
E. Basic Theory of Operation  
Assistant’s Instrument Unit (Figure 1-3)  
[Refer to Section V for diagrams]

**Syringe Air**

With the air manual shut-off valve [in junction box] open and Master ON/OFF switch [on delivery unit] ON, the air regulator w/gauge supplies 80 PSI to the syringe [thru 1/8 in yellow tubing].

**Supply Water**

The City / Bottle water selector valve supplies water to the syringe and water quick connect valve [thru 1/8 in blue tubing].

**City / Bottle Water Selector Valve**

Distilled water is supplied to the selector valve from the delivery system water bottle [thru 1/8 in. blue tubing].

City water is supplied to the selector valve from the water regulator [thru 1/8 in. blue tubing].

With the selector valve toggle switch in City or Bottle position, [city water or distilled water] flows thru the selector valve to the syringe [thru 1/8 in. blue tubing].

**NOTE:** The outgoing water line from the selector valve is used for both City and Bottle water.

**Vacuum**

The central vacuum unit (not provided w/delivery system) provides suction for the HVE and saliva ejector. Vacuum tubing connects to the central vacuum unit in the junction box, runs thru the umbilical, and connects to the solids collector housing (1, Figure 1-3) [inside of the assistant’s unit]. The HVE and saliva ejector hoses connect to the solids collector housing under the assistant’s unit.

**NOTE:** Any unused, ejector hose connection holes under the solids collector must be capped for proper operation.

With the central vacuum unit turned on, and the lever of the desired ejector opened, there is suction present at the ejector. Any solids taken in by the ejector are caught in the solids collector basket (2, Figure 1-3).

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**Figure 1-3. Assistant’s Instrument Unit**

**Solids Collector**

1. City / Bottle water selector valve
2. Solids collector basket

**Ortho / Pedo Cabinets**

KA946701
Figure 1-5 shows model / serial number location for delivery system components.

Figures 1-6 thru 1-10 show dimensional information.
Figure 1-6. Console Mounted Delivery System
Range of Motion / Dimensions
Figure 1-7. LR Mounted Delivery System
Range of Motion / Dimensions
Figure 1-8. Cuspidor (Console & LR versions shown)
Dimensions / Range of Motion
Figure 1-9. Assistant’s Instrument Unit (Rear Mounted shown)
Range of Motion / Dimensions
Figure 10. 12:00 Free-Standing Casework (w/Delivery System) Dimensions
Figure 1-1. Side Delivery Unit Dimensions / Range of Motion / Recommended Mounting Location / Cabinet size Requirements

NOTE: Product can be configured to use either fixed arm with either flex arm.

* Measurement w/long fixed arm & long flex arm (Standard w/wall mtd. unit)
** Measurement w/short fixed arm & short flex arm (Standard w/cabinet mtd. unit)
1.7 Special Tools

Table 1-3 lists all of the special tools needed to repair the delivery system, how to obtain the special tools, and the purpose of each special tool.

Table 1-3. Special Tool List

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<tr>
<th>Description of Special Tool</th>
<th>Manufacturer’s Name / Address / Phone</th>
<th>Manufacturer’s Part Number</th>
<th>Purpose of Special Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multimeter</td>
<td>Commercially Available</td>
<td>Any Type</td>
<td>Used to perform continuity and voltage checks.</td>
</tr>
<tr>
<td>Torque Wrench</td>
<td>Commercially Available</td>
<td>Any Type</td>
<td>Used to tighten nuts or screws to specified values.</td>
</tr>
</tbody>
</table>
2.1 Operational Test

To effectively diagnose a delivery system malfunction, it may be necessary to perform the following operational test.

**NOTE**
The Operational Test describes what should happen during basic operation of delivery / whip system components. If a malfunction is discovered, refer to the appropriate troubleshooting guide to determine the cause of the problem and corrective procedures.

1. Turn air and water manual shut-off valves [in junction box] ON.
2. Turn delivery unit master switch ON.
3. Depress air and water buttons of syringe(s).
   - **Observe.** When air button is depressed, syringe should release air pressure from tip. When water button is depressed, syringe should release water stream from tip.
4. Move delivery unit foot control toggle switch to DRY position.
5. Remove one handpiece from holder; then depress foot control pedal for several seconds, then release pedal.
   - **Observe.** When foot control pedal is depressed, the handpiece that is removed from its holder should run and have a fine mist of water until the foot pedal is released.
6. Repeat this step for each handpiece.
7. Move delivery unit foot control toggle switch to WET position.
8. Remove one handpiece from holder and depress foot control pedal for several seconds; then release pedal.
9. Repeat this step for each handpiece.
10. Place cup under fill spout and depress cup fill button.
    - **Observe.** Water should run until cup is filled to desired level.
11. Depress bowl flush button.
    - **Observe.** Water should run for desired time to sufficiently rinse bowl.
12. Move lever of ejector to the OPEN position.
    - **Observe.** Suction should be present at the ejector.
13. Repeat this step for each ejector.
14. Depress air and water buttons of syringe(s).
    - **Observe.** When air button is depressed, syringe should release air pressure from tip. When water button is depressed, syringe should release water stream from tip.
15. Move flex arm upward, and release; then attempt to move flex arm downward.
    - **Observe.** Flex arm should move upward freely and stay in position when released. It should not move downward.
16. Depress flex arm unlock button(s) on delivery unit and move flex arm downward; then release unlock button(s).
    - **Observe.** Flex arm should move downward freely with unlock buttons depressed, and lock in place when unlock buttons are released.
4.1 Typical Regulator Adjustment

A. Adjustment

1. Pull adjustment knob (Figure 4-1) outward to unlock.
2. Rotate adjustment knob: clockwise to increase pressure, counterclockwise to decrease pressure.
3. Push adjustment knob inward to lock.

**EQUIPMENT ALERT**
The operatory equipment has been designed to operate at the recommended settings. Adjusting the pressure higher or lower can damage the equipment and/or result in decreased operating efficiency.

4.2 Typical Regulator Removal / Installation

A. Removal

1. Turn air and water manual shut-off valves (1, Figure 4-2) OFF.
2. Tag and disconnect any tubing connected to fittings of regulator (2).
3. Remove locking ring (3) from regulator (2) then, if needed, remove from mounting plate (4).
4. Unscrew regulator (2) from master pilot shut-off valve (5).
5. Remove gauge (6), and any fittings (7) or plugs (8) from regulator (2).

**NOTE**
If removing water bottle air regulator (w/o gauge), the following step is not necessary. Go to step 5.

Figure 4-1. Typical Regulator Adjustment

Figure 4-2. Typical Regulator Removal / Installation
B. Installation

(1) Install gauge (6), and any fittings (7) or plugs (8) [removed in step 5] into regulator (2).

(2) Apply removable loctite, then screw regulator (2) onto fitting of master pilot shut-off valve (5).

(3) Secure regulator (2) with locking ring (3).

(4) Connect tubing to proper fittings of regulator.

(5) Turn air and water manual shut-off valves (1) ON and check for proper operation.

4.3 Typical Master Pilot Shut-Off Valve Removal / Installation

A. Removal

(1) Turn air and water manual shut-off valves (1, Figure 4-3) OFF.

(2) Tag and disconnect all tubing connected to master pilot shut-off valve (2).

(3) Remove locking ring (3) from regulator (4); then remove mounting plate (5) from regulator.

(4) Loosen compression nut (6) and remove master pilot shut-off valve (2) from manual shut-off valve (1).

(5) Unscrew master pilot shut-off valve (2) from regulator (4).

(6) Remove any fittings/plugs/gaskets (7) from master pilot shut-off valve (2).

B. Installation

(1) Install any fittings/plugs/gaskets (7) [removed in step 6] into master pilot shut-off valve (2).

(2) Apply removable loctite, then screw master pilot shut-off valve (2) onto fitting of regulator (4).

**EQUIPMENT ALERT**

When performing the following step, it may be necessary to replace the compression sleeve. Failure to do so could cause connection to leak.

(3) Insert master pilot shut-off valve (2) into manual shut-off valve (1); then tighten compression nut (6).

(4) Place mounting plate (5) over regulator (4); then secure regulator with locking ring (3).

(5) Connect tubing to proper fittings of master pilot shut-off valve (2).

(6) Turn air and water manual shut-off valves (1) ON and check for proper operation.
4.4 Whip-style Delivery Unit Cover Removal

A. Removal

(1) Turn master ON/OFF switch OFF.

(2) Remove instrument pad (1, Figure 4-4). *(The instrument pad is pressure fit onto two studs; no tools are required).*

(3) Remove four screws (2) and delivery unit cover (3).

4.5 Kink Valve Removal / Installation

A. Removal

NOTE
The ProCenter® Delivery Unit is shown in Figure 4-5. The procedure for the Whip & casework mounted units is similar.

(1) Turn master ON/OFF switch (1, Fig. 4-5) OFF.

(2) Depress Panel Unlock button (2) to access internal components.

(3) Tag and disconnect tubing from six kink valve fittings (3), and three kink valve manifold fittings (4).

(EQUIPMENT ALERT)
On Whip Units, the kink valves are mounted to spacer blocks instead of the lower housing. Do not remove the spacer block when replacing the kink valve. Removing the spacer block will release the whip spring.

(4) Remove screw (5) and kink valve assembly (6).
SECTION IV  
MAINTENANCE / SERVICE

B. Installation

1. Connect tubing to proper kink valve fittings (3), and proper kink valve manifold fittings (4).
2. Position kink valve (6) and secure with screw (5).
3. Turn master ON/OFF switch (1) ON, and check for proper operation.

C. Adjustment (Whip Units Only)

NOTE
Whip-style delivery units use an actuator assembly (1, Figure 4-6) attached to the kink valve (2). The actuator contains a normally closed On/Off Valve (3) that opens, supplying pilot air to the kink valve, when the instrument is lifted from the instrument pad. The actuator can be adjusted.

1. Remove delivery unit cover. Refer to para 4.4.
2. To adjust the actuator (1, Figure 4-6), loosen the jam nut (4) and turn the adjustment screw (5) inward to open the valve or outward to close the valve.
3. Check operation.

Figure 4-6. Adjustment (Whip Units only)

4.6 Foot Control Removal / Installation

A. Removal

1. Access air / water regulators.

In Junction Box / Cabinet Base:
2. Disconnect tubing (1, Figure 4-7) from fitting (A) of air regulator (2).
3. Disconnect tubing (3) from tubing (4).
4. Disconnect tubing (5) from tubing (6).
5. Disconnect tubing (7) from tubing (8).
6. Remove foot control.

B. Installation

Air to Foot Control
1. Connect tubing (1) [from foot control] to fitting (A) of air regulator (2). Secure with sleeve.

Handpiece Drive Air
2. Connect tubing (plain) (3) [from foot control] to tubing (4) [from umbilical]. Secure with sleeve.

Handpiece Coolant Water Pilot Air
3. Connect tubing (5) [from foot control] to tubing (6) [from umbilical]. Secure with uni-clamp.

Handpiece Coolant Air
4. Connect tubing (7) [from foot control] to tubing (8) [from umbilical]. Secure with uni-clamp.
4.7 Water Bottle Gasket Replacement

A. Removal

(1) Unscrew water bottle (1, Figure 4-8) and set aside.

B. Installation

(2) Remove damaged gasket (2) from bottle mounting cap (3).

---

**NOTE**

Figure 4-8 shows a console mounted water bottle. The procedure for LR, & casework mounted systems is the same.

(1) Unscrew water bottle (1, Figure 4-8) and set aside.

---

**EQUIPMENT ALERT**

When performing the following step, be sure gasket is properly aligned with top of water bottle. Failure to comply could result in damage to gasket.

(1) Align new gasket (2) on top of water bottle (1).
(2) Route tubing into water bottle (1); then screw bottle into bottle mounting cap (3).

4.8 Flex Arm Unlock Button Valve
Removal / Installation / Adjustment

A. Removal

(1) Turn master ON/OFF switch [on delivery unit] OFF.

(2) Remove three screws (1, Figure 4-9), lower handle cover (2), and switch lever (3).

(3) Tag and disconnect 1/8 in. brown tubing (4) and 1/8 in. red tubing (5) from valve (6); then remove valve.

B. Installation

(1) Connect 1/8 in. brown tubing (4) and 1/8 in. red tubing (5) to proper fittings of valve (6).

(2) Install switch lever (3) in slot of lower handle cover (2); then position valve (6) in switch lever (3).

(3) Install lower handle cover (2) and secure with three screws (1).

C. Adjustment

(1) If necessary, adjust position of valve (6) by loosening/tightening set screw (7).

4.9 Handpiece Holder Valve
Removal / Installation / Adjustment
(ProCenter-style Units only)

NOTE
Figure 4-10 shows the chair mounted version of the delivery unit. The procedure for casework mounted units is similar.

A. Removal

(1) Remove two screws (1, Figure 4-10) and cover (2).

(2) Remove two screws (3), actuator block (4), lever (5), and valve (6).

(3) Tag and disconnect 1/8 in. purple tubing and 1/8 in. red tubing from valve (6).
B. Installation

(1) Connect 1/8 in. purple tubing and 1/8 in. red tubing to proper fittings of valve (6).

(2) Position valve (6) in actuator block (4); then while holding lever (5) in position, secure actuator block with two screws (3).

(3) Install cover (2) and secure with two screws (1).

C. Adjustment

(1) If kink valve does not open completely when handpiece is removed from holder, **loosen** set screw (7).

(2) If kink valve does not close completely when handpiece is properly stowed in holder, **tighten** set screw (7).

---

Figure 4-10. ProCenter Handpiece Holder Valve Removal / Installation / Adjustment
*(Chair / Console Mounted Version shown)*
4.10 Typical Adjustment Valve 
Removal / Installation

A. Removal

(1) Turn master ON/OFF switch (1, Figure 4-11) OFF.

(2) Push panel unlock button (2) to access internal components.

(3) Remove three screws (3); then lower lid cover (4) to access adjustment valve (5).

(4) Tag and disconnect all tubing connected to adjustment valve (5).

(5) Loosen set screw (6) and remove adjustment knob (7).

(6) Hold trim ring (8) in place, then unscrew adjustment valve (5).

(7) Remove adjustment valve (5), nut (9), washer (10), and trim ring (8) from lid cover (4).

B. Installation

(1) Insert adjustment valve (5) thru nut (9), washer (10), and lid cover (4).

(2) Secure adjustment valve (5) with trim ring (8).

(3) Turn valve stem clockwise as far as it will go; then install adjustment knob (7) and tighten set screw (6).

(4) Connect all tubing to proper fittings of adjustment valve (5).

(5) Raise lid cover (4); then secure to upper housing (11) with three screws (3).

(6) Close upper housing; then turn master ON/OFF switch (1) ON and check for proper operation.

NOTE
Steps 2 & 3 do not apply to casework mounted delivery systems. Go to step 4.
4.11 Master ON/OFF Switch Valve
(Chair Mounted ProCenter®-style units)

A. Removal

(1) Turn air manual shut-off valve [in junction box] OFF.

(2) Press air button of syringe(s) until all residual air pressure is removed from the system.

EQUIPMENT ALERT
Residual air pressure will eject the plunger from the master ON/OFF switch valve. Be sure all air pressure is removed from the system before performing the following step.

(3) Remove six screws (1, Figure 4-12) and two screws (2); then partially separate front cover (3) and remove master switch (4).

(4) Remove plunger (5) from valve (6).

(5) Remove two screws (7) and partially separate instrument holder (8) from bottom housing (9); then slide valve (6) out of instrument holder.

(6) Tag and disconnect 1/8 in. purple tubing and 1/8 in. red tubing from valve (6).

B. Installation

(1) Connect 1/8 in. purple tubing and 1/8 in. red tubing to proper fittings of valve (6).

(2) Slide valve (6) into instrument holder (8).

(3) Secure instrument holder (8) to bottom housing (9) with two screws (7).

(4) Install plunger (5) into valve (6).

(5) Position master switch (4) and front cover (3) on bottom housing (9); then secure with two screws (2) and six screws (1).
4.12 Master ON/OFF Switch Valve
(12:00 Casework Mounted ProCenter®-style units)

A. Removal

(1) Turn air manual shut-off valve [in cabinet base] OFF.

(2) Tag and disconnect tubing from toggle valve (1, Figure 13).

(3) Hold toggle valve (1) in place and remove trim ring (2); then remove toggle valve (1) from water bottle bracket (3).

B. Installation

(1) Insert toggle valve (1) thru water bottle bracket (3) and secure with trim ring (2).

(2) Connect tubing to proper fittings of toggle valve (1).

4.13 Master ON/OFF Switch Valve
(Whip-style Units)

A. Removal

(1) Turn air manual shut-off valve [in junction box] OFF.

(2) Press air button of syringe(s) until all residual air pressure is removed from the system.

(3) Remove the top cover. Refer to para 4.4.

(4) Disconnect the tubing (1, Fig. 4-14) from the Master On / Off toggle valve (2).

(5) While holding the threaded ring (3) that secures the On / Off Toggle Valve (2) to the case, loosen the jam nut (4).

(6) Remove the threaded ring (3), then remove the Master On / Off Valve (2), jam nut (4) and lock-washer (5).

Figure 4-13. Master ON/OFF Switch Valve (12:00 Casework Mtd. ProCenter-style Units)

Figure 4-14. Master On/Off Switch (Whip-style Units)
**B. Installation**

1. Place the jam nut (4) and lockwasher (5) on to the On / Off Toggle Valve (2) and place it in position in the bottom cover.

   ![](image)
   **EQUIPMENT ALERT**
   Position the outlet (top fitting) on the valve upward to assure the toggle works in conjunction with the On / Off symbols on the cover.

2. Place the threaded ring (3) onto the end of the On / Off Toggle valve and tighten.

3. Connect the 1/8" red tubing to the top (outlet) fitting and the 1/8" purple tubing to the end (inlet) fitting.

### 4.14 Coolant Water Flush Valve

**Removal / Installation**

*(Chair Mtd. ProCenter Units & Whip-style Units)*

**A. Removal**

1. Turn master ON/OFF switch (1, Figure 4-14) OFF.

   ![](image)
   **NOTE**
   Remove the top cover on the Whip. Refer to para 4.4.

2. Push panel unlock button (2) to access internal components; use a prop to hold up lid if necessary.

3. Tag and disconnect tubing from flush valve (3).

4. Loosen set screw (4) and remove adjustment knob (5).

5. Unscrew flush valve (3); remove valve, nut (6), washer (7), and trim ring (8) from housing.

**B. Installation**

1. Insert flush valve (3) thru washer (7) and nut (6); then insert valve thru hole in housing and secure to with trim ring (8).

2. Secure flush valve (3) with trim ring (8).

3. Install adjustment knob (5); then tighten set screw (4).

4. Connect 1/8 in. yellow (blue) inlet tubing and 1/8 in. orange (white) outlet tubing to proper fittings of flush valve (3).

5. Close upper housing, or install cover on Whip unit; then turn master ON/OFF switch (1) ON and check for proper operation.
4.15 Coolant Water Flush Valve Removal / Installation
(12:00 Casework Mtd. ProCenter Units)

A. Removal

(1) Turn Master ON/OFF switch OFF.
(2) Tag and disconnect tubing from flush valve (1, Figure 15).
(3) Loosen set screw (2) and remove adjustment knob (3).
(4) Hold flush valve (1) in place and remove trim ring (4); then remove flush valve (1) from water bottle bracket (5).

B. Installation

(1) Insert flush valve (1) thru water bottle bracket (5) and secure with trim ring (4).
(2) Connect tubing to proper fittings of flush valve (1).
(3) Install adjustment knob (3) and tighten set screw (2).

4.16 Typical Supply Manifold Removal / Installation
(ProCenter-style Units)

A. Removal

(1) Turn master ON/OFF switch(1, Figure 4-16) OFF.

NOTE
Steps 2 & 3 do not apply to casework mounted delivery systems. Go to step 4.

(2) Push panel unlock button (2) to access internal components.

NOTE
If replacing pilot air manifold [mounted in lower housing], the following step is not necessary.

(3) Remove three screws (3); then lower lid cover (4) to access manifold (5).
(4) Tag and disconnect all tubing connected to manifold (5).

NOTE
All manifolds are held in place with double sided foam tape. There is no hardware to remove.

(5) Remove manifold (5).

B. Installation

(1) Peel backing from double sided tape [applied to back of manifold]; then position manifold (5) and apply pressure to secure.
(2) Connect all tubing to proper fittings of manifold (5).
(3) Raise lid cover (4); then secure to upper housing (6) with three screws (3).
(4) Close upper housing; then turn master ON/OFF switch (1) ON and check for proper operation.

Figure 4-15. Coolant Water Flush Valve Removal / Installation
(12:00 Mounted ProCenter-style Units)
4.17 ProCenter Delivery Unit Leveling Adjustment *Chair Mtd Units only*

A. Adjustment

1. Remove four screws (1, Figure 4-17) and bottom cover (2).

2. Loosen three button-head screws (3) slightly.

3. Place a level on top of delivery unit; then adjust three leveling screws (4) until unit is level.

4. Tighten three button-head screws (3).

5. Replace bottom cover (2) and secure with four screws (1).
### 4.18 LR Delivery Arm Leveling Adjustment

**A. Adjustment**

1. Remove seat upholstery; then lift seat frame to access connection box.
2. Remove four screws (1, Figure 4-18) and connection box cover (2).
3. Position delivery arm (3) straight out from casting (4) as shown; then adjust three leveling screws (5) until delivery arm is level.
4. Install connection box cover (2) and secure with four screws (1).
5. Lower seat frame and replace seat upholstery.

### 4.19 Water Selector Valve Removal / Installation (Console Mounted Units)

**A. Removal**

1. Remove console side cover.

---

**EQUIPMENT ALERT**

The three pieces of 1/8 in. blue tubing (1, Figure 4-19) must be connected to the same fittings of valve (2) during installation. Tag tubing before disconnecting to ensure proper installation.

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![Figure 4-18. LR Delivery Arm Adjustment](image1)

![Figure 4-19. Water Selector Valve (Console)](image2)
(2) Tag and disconnect three pieces of 1/8 in. blue tubing (1, Figure 4-19) from valve (2).

(3) Hold trim ring (3) in place and unscrew valve (2); remove trim ring, valve, washer (4), and nut (5) from console (6).

B. Installation

(1) Install washer (4) and nut (5) onto valve (2).

(2) Insert valve (2) thru hole in console (6); then secure with trim ring (3).

(3) Connect three pieces of 1/8 in. blue tubing to proper fittings of valve (2).

(4) Install console side cover.

4.20 Water Selector Valve Removal / Installation (LR Units)

A. Removal

(1) Turn master ON/OFF switch [on delivery unit] OFF.

(2) Remove water bottle (1, Figure 4-20).

(3) Lift cover (2); then remove two screws (3) and separate bottle cap (4) from bracket (5).

(4) Tag and disconnect 1/8 in. blue tubing (6), 1/8 in. grey tubing w/o rib (7), and 1/8 in. grey tubing w/rib (8) from valve (9).

(5) Remove nut (10), washer (11), valve (9) and jam nut (12) from bracket (5).

B. Installation

(1) Install jam nut (12) onto valve (9); then position valve in bracket (5).

(2) Connect 1/8 in. grey tubing w/rib (8), 1/8 in. grey tubing w/o rib (7), and 1/8 in. blue tubing (6) to proper fittings of valve (9).

(3) Secure valve (9) to bracket (5) with washer (11) and nut (10).

(4) Secure bottle cap (4) to bracket (5) with two screws (3).

(5) Install water bottle (1); then lower cover (2).

---

EQUIPMENT ALERT
Residual water pressure in tubing will result in leaks when tubing is removed in the following step. With the toggle switch in "City" position, depress the water button of syringe(s) until all water pressure is removed from the system.
4.21 Water Selector Valve
Removal / Installation
(12:00 Mtd. ProCenter Units)

A. Removal

1. Turn master ON/OFF switch OFF.
2. Tag and disconnect tubing from toggle valve (1, Figure 21).
3. Hold toggle valve (1) in place and remove trim ring (2) and washer (3); then remove toggle valve (1) from water bottle bracket (4).

B. Installation

1. Insert toggle valve (1) thru water bottle bracket (4); then install washer (3) and secure with trim ring (2).
2. Connect tubing to proper fittings of toggle valve (1).

4.22 Chair Control Touch Pad
Removal / Installation
(Chair Mtd ProCenter Units only)

A. Removal

1. Disconnect all electrical power to operatory.
2. Turn air manual shut-off valve [in junction box] OFF.
3. Press air button of syringe(s) until all residual air pressure is removed from the system.

- **EQUIPMENT ALERT**
  Residual air pressure will eject plunger (A) from the master ON/OFF switch valve. Be sure all air pressure is removed from the system before performing the following step.

4. Remove six screws (1, Figure 4-22) and two screws (2); then partially separate front cover (3) and remove master switch (4).
5. Disconnect wire harness (5) from bevel/touch pad (6).
6. Remove screw (7), bracket (8), and bevel/touch pad (6) from front cover (3).

B. Installation

1. Secure bevel/touch pad (6) to front cover (3) with bracket (8), and screw (7).
2. Connect wire harness (5) to bevel/touch pad (6).

- **EQUIPMENT ALERT**
  Ensure that switch valve plunger (A) is in place before performing the following step.

3. Install master switch (4); then position front cover (3) and secure with six screws (1) and two screws (2).
4. Turn air manual shut-off valve [in junction box] ON, connect electrical power to operatory, and check for proper operation.
4.23 Chair Control Touch Pad
Removal / Installation
(12:00 Casework Mtd ProCenter Units)

A. Removal

(1) Disconnect all electrical power to unit.

(2) Remove four screws (1, Figure 23) and bottom cover (2).

(3) Disconnect wire harness (3) from touch pad (4).

(4) Remove screw (5), bracket (6), and touch pad (4).

B. Installation

(1) Install touch pad (4) and secure with bracket (6) and screw (5).

(2) Connect wire harness (3) to touch pad (4).

(3) Install bottom cover (2) and secure with four screws (1).
Cuspidor

4.24 Cuspidor Bowl

(4) Turn master ON/OFF switch [on delivery unit] to OFF position.

NOTE
To prevent residual water spilling, place finger over end of spouts when removing.

(5) Remove cup fill spout (1, Figure 4-24), cup fill gasket (2), bowl flush spout (3), bowl flush gasket (4), and gold trap (5).

NOTE
Cuspidor bowl is pressure-fit. There is no hardware to remove.

4.25 Typical Push Button Valve

A. Removal

(1) Remove cuspidor bowl. Refer to para 4.24.

(2) Tag and disconnect all tubing connected to push button valve (1, Figure 4-25).

(3) Remove barbed fitting (2) and gasket (3) from push button valve (1).

(4) Loosen set screw (4) and remove knob (5).

(5) Unscrew push button valve (1); then remove valve, washer (6), and trim ring (7) from bottom housing (8).

B. Installation

(1) Insert push button valve (1) thru washer (6), and bottom housing (8).

(2) Secure push button valve (1) with trim ring (7).

(3) Install knob (5) and tighten set screw (4).

(4) Install gasket (3) and barbed fitting (2) onto push button valve (1).
(5) Connect all tubing to proper fittings of push button valve (1).

(6) Install cuspidor bowl. Refer to para 4.24.

4.26 Cup Fill Water Valve

A. Removal

(1) Remove cuspidor bowl. Refer to para 4.24.

(2) Tag and disconnect 1/4 in. blue tubing and 1/8 in. red tubing from cup fill water valve (1, Figure 4-26).

(3) Remove two screws (2) and valve bracket (3).

(4) Remove screw (4), washer (5), and cup fill water valve (1) from valve bracket (3).

B. Installation

(1) Secure cup fill water valve (1) to valve bracket (3) with screw (4) and washer (5).

(2) Install valve bracket (3) into bottom housing (6) and secure with two screws (2).

(3) Connect 1/4 in. blue tubing and 1/8 in. red tubing to proper fittings of cup fill water valve (1).

(4) Install cuspidor bowl. Refer to para 4.24.

4.27 Bowl Flush Water Valve

A. Removal

(1) Remove cuspidor bowl. Refer to para 4.24.

(2) Tag and disconnect 1/4 in. blue tubing and 1/8 in. red tubing from bowl flush water valve (1, Figure 4-27).
(3) Remove screw (2) and bowl flush water valve (1).

B. Installation

(1) Secure bowl flush water valve (1) to bottom housing (3) with screw (2).

(2) Connect 1/4 in. blue tubing and 1/8 in. red tubing to proper fittings of bowl flush water valve (1).

(3) Install cuspidor bowl. Refer to para 4.24.

4.28 Bowl Flush Solenoid

A. Removal

(1) Remove cuspidor bowl. Refer to para 4.24.

(2) Remove two screws (1, Figure 4-28).

(3) Disconnect electrical lead (2) from solenoid (3).

(4) Tag and disconnect 1/8 in. yellow tubing and 1/8 in. red tubing from solenoid (3); then remove solenoid.

B. Installation

(1) Connect 1/8 in. yellow tubing and 1/8 in. red tubing proper fittings of solenoid (3).

(2) Connect electrical lead (2) to solenoid (3).

(3) Install solenoid (3) and secure to bottom housing (4) with two screws (1).

(4) Install cuspidor bowl. Refer to para 4.24.

4.29 Cup Fill / Bowl Flush Timing Valve

A. Adjustment (Refer to Figure 4-29)

(1) To increase the length of time the bowl flush/cup fill water runs, insert a screwdriver thru proper hole in bottom housing; then turn valve adjuster counterclockwise.

(2) To decrease the length of time the bowl flush/cup fill water runs, insert a screwdriver thru proper hole in bottom housing; then turn valve adjuster clockwise.

B. Removal (Earlier Units)

(1) Remove cuspidor bowl. Refer to para 4.24.
SECTION IV
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(2) Remove four screws (1, Figure 4-30); then partially separate mounting plate (2) from bottom housing (3).

(3) Tag and disconnect tubing connected to timing adjustment valve (4).

(4) Unscrew timing adjustment valve (4); then remove valve, nut (5), washer (6), and trim ring (7) from mounting plate (2).

(5) Remove set screw (8) and valve adjuster (9) from timing adjustment valve (4).

C. Installation (Earlier Units)

(1) Install valve adjuster (9) onto timing adjustment valve (4) and secure with set screw (8).

(2) Secure timing adjustment valve (4) to mounting plate (2) with nut (5), washer (6), and trim ring (7).

(3) Connect tubing to proper fitting of timing adjustment valve (4).

D. Removal (Present Units)

(1) Remove cuspidor bowl. Refer to para 4.24.
(2) Remove four screws (1, Figure 4-31); then partially separate mounting plate (2) from bottom housing (3).

(3) Tag and disconnect tubing connected to timing adjustment valve(s) (4).

(4) Remove mounting screws (5) and timing adjusting valve(s) (4).

E. Installation *(Present Units)*

(1) Place timing adjusting valve(s) (4) in position and secure with mounting screws (5).

(2) Connect tubing to proper fitting(s) of timing adjustment valve (4).

(3) Position mounting plate (2) and secure to bottom housing (3) with four screws (1).

(4) Install cuspidor bowl. Refer to para 4.24.

**4.30 Cup Fill (Primary / Pilot) Air Valve**

A. Removal

NOTE

The **pilot** air valve has 2-Way sticker on valve. The **primary** air valve has 3-Way sticker on valve.

(1) Remove cuspidor bowl. Refer to para 4.24.

(2) Tag and disconnect all tubing from valve assembly (1, Figure 4-32).

(3) Remove valve cap (A) from valve body (B); then remove valve body from mounting plate (2).

B. Installation

(1) Insert valve body (B) thru mounting plate (2); then install valve cap (A) to secure in place.

(2) Connect all tubing to proper fittings of valve assembly (1).

(3) Install cuspidor bowl. Refer to para 4.24.

**4.31 Cuspidor Limit Switch**

A. Removal

(1) Remove cuspidor bowl. Refer to para 4.24.

(2) Remove four screws (1, Figure 4-33); then partially separate mounting plate (2) from bottom housing (3).

(3) Remove two screws (4) and switch bracket (5).

(4) Disconnect wiring harness (6) from limit switch (7).

(5) Remove two screws (8), two nuts (9), and limit switch (7).
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B. Installation

1. Secure limit switch (7) to switch bracket (5) with two screws (8) and two nuts (9).
2. Connect wiring harness (6) to terminals of limit switch (7).
   **Note:** The black wire must connect to the terminal marked COM, and the red wire must connect to the terminal marked NO.
3. Secure switch bracket (5) to bottom housing (3) with two screws (4).
4. Position mounting plate (2) and secure to bottom housing (3) with four screws (1).
5. Install cuspidor bowl. Refer to para 4.24.

**Assistant’s Instrument Unit**

4.32 Syringe Button Valve

A. Removal

1. Turn master ON/OFF switch [on delivery unit] to OFF position.
2. Gently tap roll pin (1, Figure 4-34) out of syringe body (2) until malfunctioning button valve (3) is released.
3. Remove button valve (3) and spring (4).

B. Installation

**NOTE**
Align hole in button valve with roll pin when installing.

1. Install spring (4) and button valve (3) into syringe body (2); then gently tap roll pin (1) thru button valve.
2. Turn master ON/OFF switch ON and check for proper operation.

4.33 Chair Control Touch Pad

A. Removal

1. Disconnect all electrical power to operatory.
2. Turn master ON/OFF switch [on delivery unit] to OFF position.
3. Remove solids collector cover (1, Figure 4-35) and screw (2).
4.34 Water Quick Connect Valve

A. Removal

(1) Turn master ON/OFF switch [on delivery unit] to OFF position.

(2) Remove solids collector cover (1, Figure 4-36) and screw (2).

(3) Remove four screws (3) and top cover (4) from bottom housing (5).

(4) Unscrew compression nut (6) and disconnect 1/4 in. blue tubing (7) from valve (8); then remove coupler (9) from tubing.

(5) Remove nut (10) and valve (8) from bottom housing (5).

B. Installation

(1) Secure bevel/touch pad (7) to top cover (4) with bracket (9), and screw (8).

(2) Connect wire harness (6) to bevel/touch pad (7).

(3) Install top cover (4) and secure to bottom housing (5) with four screws (3).

(4) Install screw (2) and solids collector cover (1).

(5) Turn master ON/OFF switch [on delivery unit] ON, connect electrical power to operatory, and check for proper operation.
**B. Installation**

1. Insert valve (8) thru hole in bottom housing (5); then secure with nut (10).
2. Install compression nut (6) and coupler (9) onto 1/4 in. blue tubing (7); then connect tubing to valve (8).
3. Tighten compression nut (6).
4. Install top cover (4) and secure to bottom housing (5) with four screws (3).
5. Install screw (2) and solids collector cover (1).
6. Turn master ON/OFF switch [on delivery unit] ON and check for proper operation.

**Flex Arm**

**4.35 Flex Arm Cover**

**A. Removal**

1. Remove two screws (1, Figure 4-37) and two end caps (2).
2. Remove flex arm cover (3) and bottom cover (4) from flex arm (5).

**B. Installation**

1. Hold bottom cover (4) in place, then slide flex arm cover (3) over flex arm (5).
2. Install two end caps (2) and secure with two screws (1).

---

**Figure 4-37. Flex Arm Cover**

KA9734001
4.36 Flex Arm Spring Tension Adjustment

A. Adjustment

1. Remove flex arm cover. Refer to para 4.35.
2. Adjust tension nut (1, Figure 4-38) to increase or decrease spring tension.
3. Raise and lower flex arm; then move flex arm to horizontal position and observe. Flex arm should be easy to move, yet not drift downward when released. Repeat step 2 as necessary.
4. Install flex arm cover. Refer to para 4.35.

4.37 Lock Pawl

A. Removal

1. Remove flex arm cover. Refer to para 4.35.

(2) Remove retaining ring (1, Figure 4-39); then (while supporting delivery unit) remove clevis pin (2) and two lock pawls (3) from cylinder block assembly (4).

(3) Remove two screws (5), two washers (6), and pivot bracket (7) from damaged lock pawl (3).

B. Installation

1. Secure pivot bracket (7) to lock pawl (3) with two washers (6) and two screws (5).

CAUTION

The delivery unit will drop when clevis pin is removed in the following step. Use an assistant to hold the delivery unit, or place support under delivery unit prior to removing clevis pin. Failure to do so could result in personal injury or damage to delivery unit.

NOTE

Be sure slotted holes in pivot brackets (7) are positioned over the ends of cylinder pin.

(2) Insert clevis pin (2) thru one lock pawl (3), cylinder block (4), and other lock pawl (3); then secure clevis pin with retaining ring (1).

(3) Install flex arm cover. Refer to para 4.35.
4.38 Lock Cylinder

A. Removal

1. Remove flex arm cover. Refer to para 4.35.

2. Remove lock pawls. Refer to para 4.37.

3. Disconnect 1/8 in. brown tubing from fitting (1, Figure 4-40).

4. Remove fitting (1) and gasket (2) from cylinder block assembly (3).

5. Loosen set screw (4); then remove lock cylinder (5) from cylinder block assembly (3).

6. Remove cylinder pin (6) from lock cylinder (5).

B. Installation

1. Install cylinder pin (6) onto lock cylinder (5).

2. Insert lock cylinder (5) into cylinder block assembly (3) until end of cylinder is flush with block; then tighten set screw (4).

3. Install fitting (1) and gasket (2) into lock cylinder (4).

4. Connect 1/8 in. brown tubing to fitting (1).

5. Install lock pawls. Refer to para 4.37.

6. Install flex arm cover. Refer to para 4.35.

EQUIPMENT ALERT

The 1/8 in. brown tubing has a short section of wire inserted to prevent kinking. Retain wire for installation.

EQUIPMENT ALERT

Thread cylinder pin onto lock cylinder so that only 1-2 threads are exposed at the end of the plunger.

EQUIPMENT ALERT

Be sure the short section of wire is installed in 1/8 in. brown tubing before connecting to fitting (1). Failure to do so could allow tubing to kink, preventing proper operation.
Alternative Handpiece Installation

4.39 Lares® Handpiece Tubing Installation

A. Removal of Existing Handpiece Tubing

1. Disconnect three handpiece tubes (1, Figure 4-41) from kink valve (2).
2. Disconnect 1/8" green tube (3) from kink valve (2).
3. Disconnect two pieces of 1/8" green tubing (4) from 1/8" green tube (3); then insert straight barb fitting (5).
4. Disconnect two pieces of 1/8" clear tubing (6) from 1/8" clear tube (7); then insert straight barb fitting (8).
5. Disconnect handpiece tube (9) from 1/4" clear exhaust tube (10).

NOTE
If removing 3-port tubing, the following Removal step is not necessary. Go to Installation procedure.
B. Installation of Lares® Handpiece Tubing

(1) Route Lares® tubing (1, Figure 4-42) up thru hole in delivery unit; then connect 1/4” clear tube (2) to kink valve (3) as shown.

(2) Install uni-clamp (4) onto 1/8” blue tube (5) and connect to kink valve (3) as shown.

(3) Install a 1/8” to 1/4” barb fitting (6) into 1/8” clear tube (7); then connect to 1/4” clear exhaust tube (8).

Figure 4-42. Lares® Handpiece Tubing Installation