



# SF - 1 Valve Refurbishment Procedure

Tools Required: Phillips Screwdriver  
Needle-nose Pliers  
Sleeve Puller  
Valve Test Fixture



## 1. PRELIMINARY EXTERNAL INSPECTION OF STANDARD SF-1 DISPENSING VALVE:

- 1.1 Determine generation and condition. Scrap complete valves prior to "X" body; scrap valve bodies only prior to "XII".
  - 1.1.1 Determine generation and condition of SF-1 valve body. If body is second generation of SF-1 XII (date coded [91] – 1st qtr. 1991, and is apparently sound, then it is a candidate of reuse—to be decided later in the manufacturing process. If the body is pre-XII, then it will be discarded AFTER valve disassembly.
- 1.2 Perform functional test
  - 1.2.1 This check enables technician to determine reliability of the 24V electrical system, which includes the switch(29), solenoid(26), and wire harness.

*NOTE: Dispensing valves prior to the X version of the SF-1 valve are questionable for parts value. Some non X style valves should be discarded. Some have been updated while in service; new style nozzle, baffle, lever, etc. Such parts, depending on condition, can be utilized in a rebuilding process. If there has not been updating to these versions, they are not exposed to further changes.*

## 2. TEAR DOWN PROCEDURE AND SEPARATION OF INOPERATIVE AND USABLE PARTS:

- 2.1 Remove valve inlet springs(13).
  - 2.1.1 Using needle nose pliers, carefully remove valve inlet springs.(13) Visually check springs in static position. If any stretch spaces are detected, discard. Springs that are adequate are placed in container to be cleaned.
- 2.2 Remove the micro switch (28).
  - 2.2.1 Remove the small, 2-56, Phillips head screw(28) that holds the micro switch (28). Check the switch operation by actuating switch button. Also check spade terminals for deterioration and cracks. If operation appears normal, place in container to be cleaned and function will be checked later in the process. Place screw with metal parts to be cleaned.
- 2.3 Remove the solenoid coil(26) from the valve.
  - 2.3.1 Remove two pan-head screws(23) that secure solenoid(26) to valve body.(64) XII valve bodies have metal spring retainers (24) that are also secured by the above screw. (Pre XII bodies do not have retainers, the inlet springs were attached to holes in the plastic body). Place screws and spring retainers in container to be cleaned.

*NOTE: New style solenoids have a threaded stud welded to the top of the solenoid and are used for top mount covers. Old style solenoids do not have the stud and were used for front mount covers. (See history of SF-1 Valve for information and part numbers.)*

- 2.4 Remove wire harness from valve.
  - 2.4.1 Disconnect and remove wire harness from valve. Inspect for cuts, breaks, etc. If older style (held together with tape), remove from wires. Place harness in container to be cleaned and reassembled.



- 2.5 Check solenoid plunger for wear and rust.
  - 2.5.1 Further inspect solenoid(26); check solenoid plunger for wear and rust. If adequate, place in container to be cleaned(28).
- 2.6 Remove the four flow control hold–down screws.
  - 2.6.1 Remove four thread–cutting screws(48) from the two flow controls(52). Screws shorter than 5/16” should be discarded. The shorter screws were utilized on early model SF–1 valves. Place in container with other metal parts to be cleaned later.
- 2.7 Remove flow control plates(47).
  - 2.7.1 Remove flow control plates(47) Discard all EXCEPT open slotted type. X and XI plates have a smaller overall diameter than the XII’s. They should be scrapped. Place operative plates in container with other metal parts.
- 2.8 Remove flow control housing tops(52 or 60)
  - 2.8.1 Remove top flow control housings(52 or 60) carefully, preventing damage to adjusting screw(50). Discard any top flow controls(52) that have stainless steel adjusting screws. Discard stainless adjusting screws also. Visually check top flow control housing for ”X” mark on outer cylindrical surface of the housing. Discard all others. Remove plastic adjusting screw(50) from top flow control. Remove o–ring(51) from screw and place in container to be cleaned. Discard o–ring from screw. Remove o–ring(53) from top flow control(52) and inspect the housing for stress cracks. If acceptable, place in container to be cleaned. Discard o–ring from top flow control. Also remove the flow regulator spring(54). Visually check springs. Springs that are adequate are placed in container to be cleaned.
- 2.9 For standard flow valve, remove water flow washer housing(60) from body(64). Discard all rubber parts.
  - 2.9.1 If standard flow valve, remove water flow washer housing(60) from body(64). Remove two (2) o–rings(53) from housing. Remove flow washer retainer cap(58) from housing and place in container to be cleaned. Remove flow washer(59) and discard. Visually check for cracks, especially where hold down plate contacts housing. Discard o–rings.
- 2.10 Remove pistons and sleeves.
  - 2.10.1 Stainless steel pistons(56) and sleeves(57) are matched sets(55) and CANNOT be mixed. To remove pistons and sleeves, submerge back portion of valve in warm water to loosen. Pistons will normally separate from sleeves. Using a rubber, expandable sleeve puller, remove sleeve from body and rematch with piston. Discard o–ring(53) from the sleeve. Check inner piston and the outer sleeve for scoring marks. If either is scored, discard. (Recommend switching to ceramics.) Place piston and sleeve in submergible container, being careful not to allow separation during sanitation. Ceramic pistons and sleeves are removed in the same manner as stainless steel, but are interchangeable and can be mixed.



- 2.11 Remove the guide pin(30), if slotted
  - 2.11.1 Remove the guide pin(30), except for the current XII, which is electronically welded into the body. Check pins to make sure shaft is not bent by rolling on a flat surface. If it wobbles, discard. Place good pins in container with metal parts.
- 2.12 Remove nozzle(8) and syrup baffle(10).
  - 2.12.1 Remove nozzle(8) and syrup baffle(10). If the nozzle is the ribbed type, and appearance is acceptable, place in container to be sanitized. If the nozzle is older style with smooth cylinder, discard. Baffles without a groove for o–ring are not reusable. Inspect reusable baffles for cracks. Place usable baffles in container to be sanitized. Discard baffle o–ring(9).
- 2.13 Remove four 3/4” screws(6) from bottom cover(7) and place in container with other metal parts.
- 2.14 Remove bottom cover(7).
  - 2.14.1 Remove bottom cover(7). Reusable covers are open slotted from lever area into the nozzle area. Discard exceptions. Inspect covers for cracks and cuts. If reusable, place in container with nozzles.
- 2.15 Remove valve block(15) and inspect.
  - 2.15.1 Remove valve block(15) and inspect for cracks. If body is amber or if the body has amber plugs inside, discard. Acceptable blocks are containerized to be sanitized. Discard block o–ring(11). Please take notice of the raised letters on the sides of the block, identifying WATER and SYRUP. The water side of the block is always on the left side and the syrup is on the right side where the micro switch(29) is mounted to the body(64). The block can be mounted either way. To re–emphasize: make sure the water side of valve block is mounted to the left side.
- 2.16 Remove the stainless steel lever pin(19) from the lever(21) and place with other metal parts.
- 2.17 Inspect the lever(21) for cracks, breaks.
  - 2.17.1 Inspect the lever(21) for cracks, breaks, etc. See Figure 3. The current style lever is formed with three flat surfaces on the front with a reinforced rib on the back. Out–dated levers are straight levers with basically one flat surface on the front—discard.
- 2.18 Remove nibs(12) from the two inlet valves(14) and discard inlet valves. Majority of nibs are reusable after cleaning. During reassembly be sure that the inlet valve (Banjo) is installed with the flat side down toward the valve outlet block (15). The curved side is to be up toward the valve body.
- 2.19 Remove pivot pin from solenoid arm.
  - 2.19.1 Observe each side of valve where pin(17) holds the solenoid arm(18) in place. Newer type pins are grooved. Drive pin out from opposite side utilizing a “like” size pin. Older style valves incorporated a smooth pin without grooves—discard. Place usable pins with other metal parts.
- 2.20 Remove adjustment screws(16) from the solenoid arm(18).



- 2.20.1 Remove adjustment screws(16) from the solenoid arm(18). Place screws (allen or phillips head) in with other metal parts for cleaning. (Note: as an option you may want to discard the old style allen type screws used on pre–XII’s and replace with new style phillips head screws.) Inspect solenoid arm for cracks. If arm is amber, discard. If reusable, place with other plastic parts.

### 3. ACCUFILL, PORTION CONTROL, AND PUSH–TO–SERVE SF–1 VALVES:

- 3.1 Follow steps 1.1 through 2.20 above.
- 3.2 Inspect the back plate of the circuit boards for manufacturing date code.
  - 3.2.1 Practice same procedures as in standard SF–1 disassemble with the exception of electronic controls. Inspect the back plate of the circuit boards for manufacturing date code. These devices are covered with a one year warranty. Discard any defective boards that are out of warranty.
- 3.3 Scrap Accuill levers without conductive strip. Inspect the flow control tops.
  - 3.3.1 The ACCUFILL lever and top flow control are manufactured with a special carbon impregnated material, unlike the material used in standard valves. Replace any levers without a S/S conductive strip.

### 4. CLEANING, SANITIZING, AND INOPERATIVE PART ELIMINATION:

- 4.1 Clean and sanitize all parts. NOTE: Do not use any alcohol based cleaners.
  - 4.1.1 Plastic parts are soaked for a period of not less than two hours in a 1:1 solution of warm water and hydrogen peroxide. After the soaking process is complete, parts are individually washed, utilizing a medium stiff brush. After each individual part is washed it is inspected for any apparent damage, such as cracks, scratches, etc. The acceptable parts are re–washed in sanitizing solution, rinsed with warm water, and placed on drainer to dry. Before parts are put into stock, they are screened again by examining them with a lighted magnifier. Install new o–rings and set aside for reuse.
- 4.2 Clean and Inspect S.S. Pistons and Sleeves
  - 4.2.1 Pistons and sleeves are processed in the same manner as plastic parts. Stainless steel pistons and sleeves are continually checked during the cleaning process for smooth action of the piston inside the sleeve. If any visible sign of rust, scratches, or resistance is detected, discard BOTH the piston and sleeve. Ceramic is cleaned and function checked in the same manner. In case of stained ceramic piston and sleeve, soak in warm water and hydrogen peroxide solution. Install new o–rings and set aside for reuse.
- 4.3 Clean and inspect all metal parts.
  - 4.3.1 Wash Metal parts. After parts are dry, place flow control bracket screws, bottom cover screws, guide pins, switch mounting screws, and solenoid mounting screws in a glass container. Thoroughly cover all exposed surfaces with a "rust remover" such as Naval Jelly. Let stand approximately thirty minutes. Wash thoroughly with warm water. Drain. When completely dry, spray with a petroleum distillate. Separate metal parts and place in containers to be used in the rebuilding process.



- 4.4 Clean and inspect the Solenoids.
  - 4.4.1 Clean terminals. Remove tape residue with a small amount of naphtha. Visually check the plunger cavity for rust, etc. Manually insert a plunger into the solenoid and check for free, no binding action. If acceptable, clean solenoid metal bracket assembly with soft steel power brush.
- 4.5 Clean and test the switch.
  - 4.5.1 Switches are cleaned with a soft, naphtha dampened cloth. Be careful not to over-wet or allow moisture to enter switch around button. Actuate switch and check for function.
- 4.6 Clean and test the wiring harness.
  - 4.6.1 Wiring harnesses are cleaned with a small amount of naphtha on a soft cloth to remove tape residue.

## 5. RE-ASSEMBLY

- 5.1 Assembly procedures are basically reverse of the tear-down process. Consider the assemble process as another check point of all items being applied—new or used.
- 5.2 It is helpful to wet assemblies that have o-rings before inserting into a valve body.
- 5.3 Route and form wiring harness, especially on ACCUFILL and Portion Control to allow cover assembly.

## 6. TESTING RE-MANUFACTURED DISPENSING VALVE:

- 6.1 The testing process is a simulated version of a dispenser on location with the exception of pressure used. Higher than normal pressures are used to accelerate and expose a possible leaking problem in the valve.
  - 6.1.1 Testing fixture is supplied with 90 – 100 psi potable water. Evacuation of water is performed with 90 – 100 psi filtered air or CO<sub>2</sub>.
- 6.2 Apply valve to be tested to a test panel.
- 6.3 Set adjustable flow regulators to minimum flow position.
- 6.4 Adjust the screws on the solenoid arm.
  - 6.4.1 Adjust the screws clockwise until product begins to drip from the nozzle. Turn the screw 360 degrees counterclockwise to stop the flow. Adjust the water and syrup sides in same manner. If everything is correct, set fixture switch to evacuate position and evacuate water from valve.
- 6.5 Actuate valve to test function.
  - 6.5.1 Push valve lever to electrically activate the valve. Dispense approximately six ounces of water from valve. Let valve set idle for approximately fifteen seconds while observing entire valve.
- 6.6 Blow water from the valve.
  - 6.6.1 Press valve lever to evacuate water from valve, pulsate lever several times during this process.



6.7 Remove the valve from fixture and visually check.

6.7.1 Remove the valve from fixture and visually recheck adjustments of the actuator arm screws and overall appearance. Dry excess water from valve and place in staging area to be date coded, marked with operator number and packaged.

NOTE: The test function is one of the most critical steps in valve rebuilding and should always be performed by a knowledgeable person who understands the correct function of the valve. Even though many items of the valve is checked several times during the process, the final product is observed by the test fixture operator. All components used in refurbishment must meet IMI Cornelius' design specifications.

## **SF-1 MOUNTING BLOCK INSTRUCTIONS**

### 1. TEAR-DOWN PROCEDURE

- 1.1 Remove and discard O-Rings (#43)
- 1.2 Remove the three screws (#32), from the rear of the block
- 1.3 Remove the two retainers (#37)
- 1.4 Remove the O-Rings (#38) from the buttons
- 1.5 Remove the Springs (#39), the Caps (#40), the Black Seal Washers (#41) and the stems (#42)
- 1.6 Discard the Black Seal Washers (#41), reserve all other components

### 2. PRELIMINARY INSPECTION AND EVALUATION

- 2.1 Inspect the block for cracks or other defects
- 2.2 Discard any cracked blocks
- 2.3 Test the lever for freedom of movement
- 2.4 Clean and lubricate levers that are sticky

### 3. CLEANING, SANITIZING

- 3.1 Completely clean and sanitize the block and other reserved components

### 4. REASSEMBLY

- 4.1 Reassemble Stem (#42), new Seal Washers (#41), Caps (#40), Springs (#39), Retainers (#37) with new O-Rings (#38)
- 4.2 Replace any other items that were removed or missing

### 5. FINAL TEST AND INSPECTION

- 5.1 Assemble block to test fixture and apply water pressure to the syrup and water sides
- 5.2 Observe the block for leaks

