

## Preset Metered Control Valve

### Description

These preset metered valves are designed to dispense preset quantities of fluid lubricants. Each model is equipped with an inlet swivel, a high-volume manual nozzle, and rigid extension.

The models differ in the units of measure that are metered and the face dial range. See **Table 1** for details.

A totalizer keeps a lifetime record of the amount dispensed in a unit of measure labeled on the dial.

These models are also equipped with an internal filter screen to prevent damaging contaminants from entering the meter.

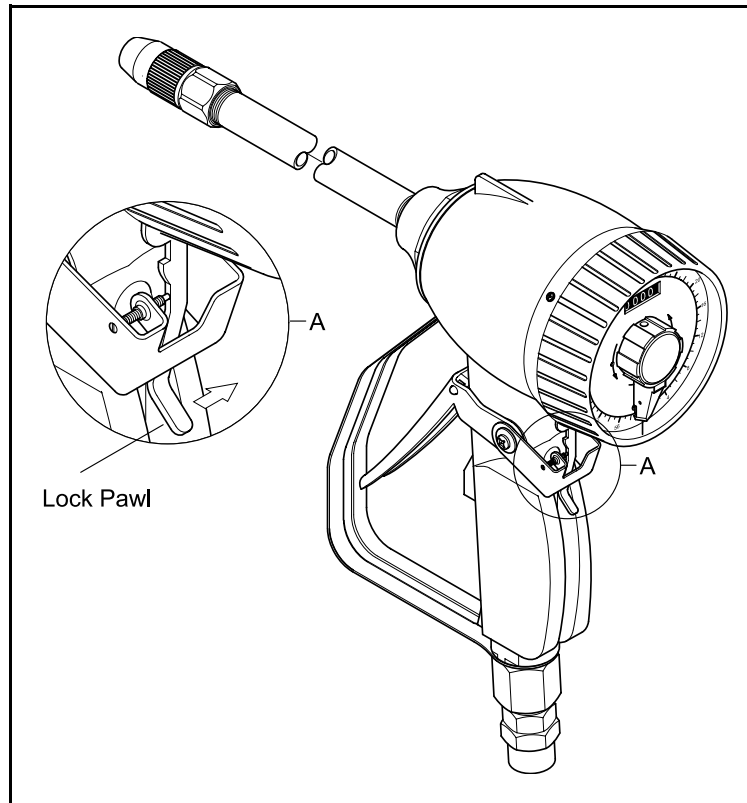
### Operation

Turn the pointer counterclockwise to the required quantity of fluid to be dispensed. To dispense, depress the lever until it locks.

The lever disengages automatically once the preset amount is delivered.

#### Emergency Release Mechanism

To stop a preset delivery before completion, move the lock pawl to the right. See **Figure 1**. This releases the lever and stops delivery.



**Figure 1** Preset Metered Control Valve

### CAUTION

**Do not turn the pointer clockwise. Damage can occur.**

Valve Model	Inlet	Register Units		Accuracy	Maximum Pressure	
		Current (w/ Range)	Totalizer		psi	Bar
3690-C	1/2 " NPTF (f)	Quart (0-60)	Gallon	+ / - 0.65 %	1000	69
3691-C		Gallon (0-15)	Gallon			
3693-C		Liter (0-60)	Liter			
3696-C		Quart (0-16)	Quart			

**Table 1** Preset Metered Control Valve Models 3690-C, 3691-C, 3693-C, and 3696-C

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SER 3690-C  
Revision (10-04)

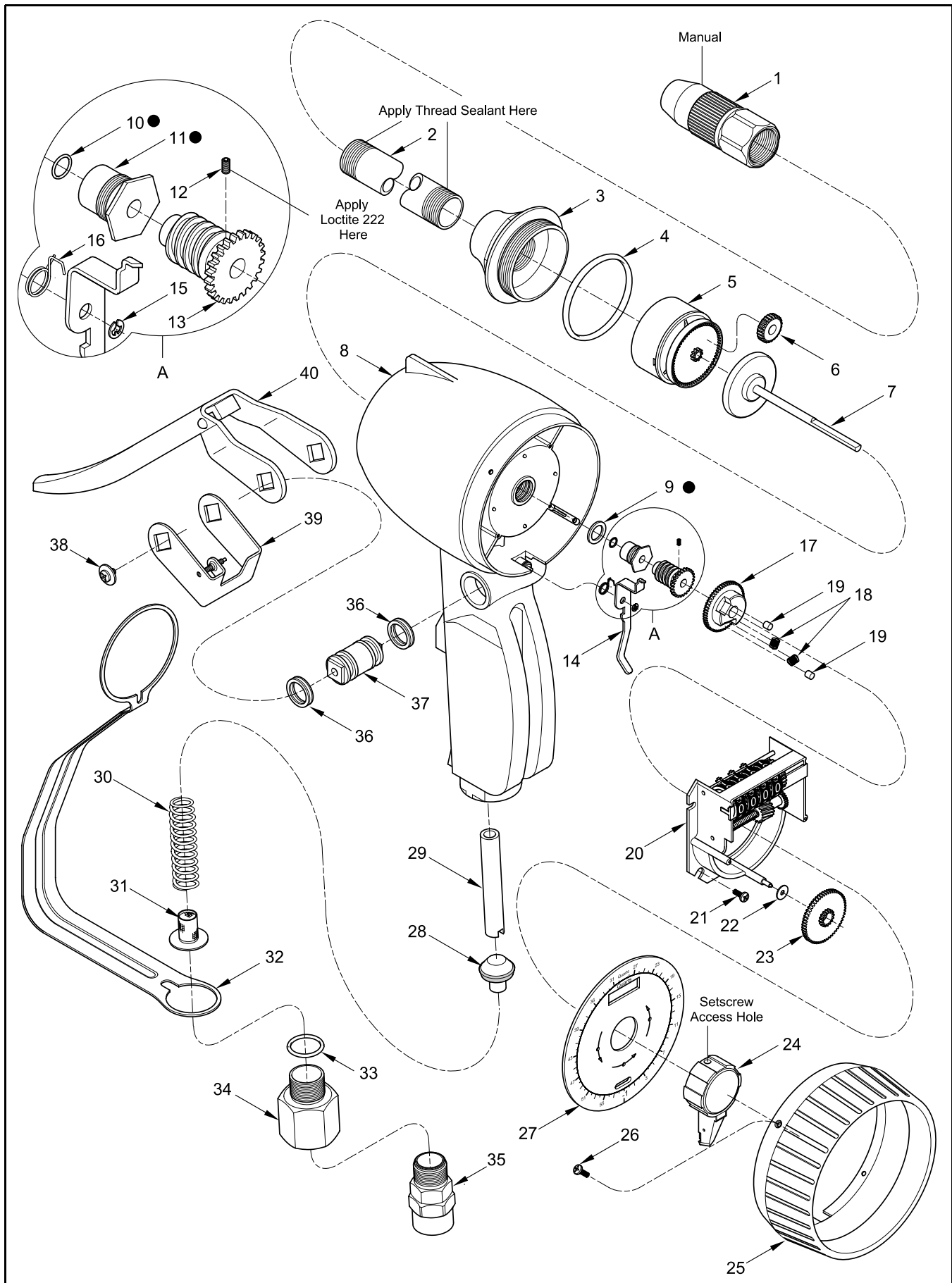


Figure 2 Preset Metered Control Valve Models 3690-C, 3691-C, 3693-C, and 3696-C

Item No.	Part No.	Description	Qty	Notes	Numeric Order Part # (Item #)
1	340084	Non-Drip Nozzle, High-Volume Manual	1		(6)
2	332891	Extension	1		(8)
3		Cap	1		(23)
4	393307-60	O-Ring (Buna-N)	1		332891 (2)
5	393307-55	Chamber and Pinion Assembly	1	3690-C, 3691-C, 3696-C	339651 (35)
		Chamber and Pinion Assembly (Liters)	1	3693-C	340084 (1)
6		Gear, Planetary	1	Included w/ item 5	393307-9 (27)
7	393307-141	Spindle and Gear Assembly	1	3690-C, 3691-C, 3696-C	393307-11 (27)
		Spindle and Gear Assembly (Liters)	1	3693-C	393307-12 (27)
8		Housing	1		393307-14 (18)
9	393307-128	Washer (Buna-N)	1	●	393307-15 (19)
10	393307-130	O-Ring (Buna-N)	1	●	393307-19 (22)
11		Nut, Gland	1	●	393307-21 (17)
12		Setscrew	1		393307-23 (13)
13	393307-23	Gear, Worm	1	3690-C, 3691-C	393307-24 (13)
		Gear, Worm	1	3693-C	393307-39 (40)
		Gear, Worm	1	3696-C	393307-40 (37)
14	393307-50	Pawl, Lock	1	Includes item 15	393307-41 (36)
15	393307-139	Ring, Retaining	1		393307-42 (29)
16	393307-47	Spring, Lock Pawl	1		393307-45 (30)
17	393307-21	Cam	1	3690-C, 3691-C, 3693-C	393307-47 (16)
		Cam	1	3696-C	393307-50 (14)
18	393307-14	Spring	2		393307-55 (5)
19	393307-15	Roller	2		393307-56 (5)
20	393307-159	Register Assembly	1	3690-C, 3691-C	393307-60 (4)
	393307-160	Register Assembly	1	3693-C, 3696-C	393307-62 (3)
21	393307-164	Screw	4		393307-108 (13)
22		Washer	1		393307-125 (28)
23		Gear, Pointer	1	3690-C, 3691-C, 3693-C	393307-126 (31)
		Gear, Pointer	1	3696-C	393307-128 (9)
24	393307-156	Pointer, (w/ Setscrew)	1		393307-129 (26)
25	393307-163	Shroud	1		393307-130 (10)
26		Screw	4		393307-132 (38)
27	393307-11	Dial (Quart w/Gallon Totalizer)	1	3690-C	393307-133 (11)
		Dial (Gallon w/ Gallon Totalizer)	1	3691-C	393307-139 (15)
		Dial (Liter w/ Liter Totalizer, 0-60 Range)	1	3693-C	393307-141 (7)
	393307-151	Dial (Quart w/ Quart Totalizer)	1	3696-C	393307-142 (7)
28	393307-125	Valve Assembly (Buna-N)	1	Includes item 29	393307-149 (23)
29	393307-42	Sleeve, Valve	1		393307-151 (27)
30	393307-45	Spring	1		393307-152 (17)
31	393307-126	Screen, Filter	1		393307-156 (24)
32	393307-171	Guard, Hand	1		393307-158 (12)
33	393307-168	O-Ring	1		393307-159 (20)
34	393307-170	Adapter, 1/2 " NPTF (f)	1		393307-160 (20)
35	339651	Swivel, 1/2 " NPTF (m) x 1/2 " NPTF (f)	1		393307-163 (25)
36	393307-41	Quad-Ring (Buna-N)	2		393307-164 (21)
37	393307-40	Cam	1		393307-168 (33)
38	393307-132	Screw	2		393307-170 (34)
39	393307-172	Lock Bar and Screw Assembly	1		393307-171 (32)
40	393307-39	Lever Assembly	1		393307-172 (39)

**Legend:**

Part numbers left blank (or in *italics*) are not available separately

● designates a repair kit item

**Repair Kit**

Part No.	Kit Symbol	Description
393307-134	●	Kit, Packing Gland

## Overhaul

Prior to performing any maintenance procedure, the following safety precautions must be observed. Personal injury may occur.



### WARNING

**Do not use halogenated hydrocarbon solvents such as methylene chloride or 1,1,1-trichloroethane in this valve. An explosion can result when aluminum and/or zinc-plated parts in the valve come in contact with halogenated hydrocarbon solvents.**

**Release all pressure within the system prior to performing any overhaul procedure.**

- **Disconnect the air supply line from the pump motor.**
- **Into an appropriate container, operate the control valve to discharge remaining pressure within the system.**

**Never point a control valve at any portion of your body or another person. Accidental discharge of pressure and/or material can result in injury. Read each step of the instructions carefully. Make sure a proper understanding is achieved before proceeding.**

## Disassembly

**NOTE:** Refer to **Figure 2** for component identification on all overhaul procedures.

### Metered Control Valve

**NOTE:** The following procedures pertain to all models of metered control valves.

1. Unscrew Extension (2) from the Cap (3).
2. Unscrew Nozzle Assembly (1) from the Extension.

### Shroud, Pawl, and Register Assembly

3. Unscrew Screws (26) that secure Shroud (25) to Housing (8)
  - Remove the Shroud from the Housing.
4. Turn Pointer (24) counterclockwise until the access hole in the Pointer lines up with the setscrew.
  - See **Figure 2**.

5. Loosen the setscrew that secures the Pointer to Spindle and Gear Assembly (7).
6. Remove Dial (27) Cam (17), and Pointer (24) as an assembly from the Spindle and Gear Assembly.
7. Carefully pry the Pointer from the Cam Assembly and Dial to separate components.
8. Remove Springs (18) and Rollers (19) from the Cam.
9. Remove Retaining Ring (15) that secures Lock Pawl (14) to the Housing.
  - Remove the Lock Pawl and Spring (16) from the Housing.
10. Remove Pointer Gear (23) and Washer (22) from Register Assembly (20).
11. Loosen Setscrew (12) that secures Worm Gear (13) to the Spindle and Gear Assembly.
  - Remove the Worm Gear from the Spindle and Gear Assembly.
12. Remove Screws (21) that secure the Register Assembly to the Housing.
  - Remove the Register Assembly from the Housing.

### Metering Mechanism Assembly

13. Unscrew Cap (3) from the Housing.
  - Remove O-Ring (4) from the Cap.
14. Remove Chamber and Pinion Assembly (5), Planetary Gear (6), and the Spindle and Gear Assembly from the Housing.
15. Remove Gland Nut (11) from the Housing.
  - Remove O-Ring (10) from the Gland Nut.
16. Remove Washer (9) from the Housing.

### Inlet Swivel, Valve, Guard, and Lever Assembly

17. Unscrew Swivel Assembly (35) from Adapter (34).
18. Unscrew the Adapter from the Housing.
  - Remove Hand Guard (32) and O-Ring (33) from the Adapter.
19. Remove Screen (31), Spring (30), Valve Assembly (28), and Valve Sleeve (29) from the Housing.
20. Remove Screws (38) that secure Lever Assembly (40) and Lock Bar and Screw Assembly (39) to Cam (37).
  - Remove the Lever Assembly and Lock Bar and Screw Assembly from the Cam.
21. Push the Cam from the Housing.
  - Remove Quad Rings (36) from the Cam.

## Clean and Inspect

1. Clean all metal parts in cleaning solvent. The solvent should be environmentally safe.
2. Inspect all parts for wear and/or damage.
  - Replace as necessary.
3. Closely inspect the mating surfaces of all components for any imperfections. Ensure a smooth and clean contact is obtained when assembled.

## Assembly

**NOTE:** Prior to assembly, certain components require lubrication. Refer to **Table 2** for details.

### Metered Control Valve

**NOTE:** Refer to **Figure 3** for component identification.

#### Metering Mechanism Assembly

1. Install and seat Washer (9) into the head of Housing (8).
2. Install O-Ring (10) into Gland Nut (11).
3. Screw the Gland Nut into the Housing.
  - Tighten the Gland Nut securely.
4. Position Chamber and Pinion Assembly (5) gear end upward.
5. Install Planetary Gear (6) into the Chamber and Pinion Assembly.
6. Position Spindle and Gear Assembly (7) onto the Chamber and Pinion Assembly.
7. With the Spindle and Gear Assembly pointed upward, install the entire subassembly into the Housing.
  - Use care passing the O-Ring.

**HINT:** Rotate the Spindle and Gear Assembly so the flat of the shaft points between the posts of the Register Assembly. This aids in the installation of the Worm Gear.

### CAUTION

**Make sure the subassembly does not shift during installation or once installed. Damage to the Gears can occur.**

8. Install O-Ring (4) onto Cap (3).

9. Install Hand Guard (32) onto the Housing.

10. Screw the Cap into the Housing.
  - Tighten the Cap to 35 ft. lbs. (47 Nm).

#### Register Assembly

11. Install Register Assembly (20) onto the Housing
  - Make sure the Register seats on the four pins.
12. Install Screws (21) that secure the Register Assembly to the Housing.
  - Tighten the Screws securely.
13. Install Setscrew (12) [with Loctite 222] into the Worm Gear.
14. Install Worm Gear (13) [spur gear upward] onto the shaft of the Spindle and Gear Assembly.
  - Make sure the Worm Gear's setscrew points toward the flat on the Spindle and Gear Assembly.
  - Check to ensure the gear meshes properly with the Register's gear.
15. Install Washer (22) onto the bottom post of the Register Assembly.
16. Install Pointer Gear (23) [flat surface downward] onto the Washer.

*IMPORTANT: Make sure the Gears mesh evenly.*

17. Move the Worm Gear [straight upward or downward] as required so its gear wheel meshes evenly with the Pointer Gear.
  - Tighten the Setscrew securely.

#### Lock Pawl

18. Install and seat Spring (16) [flat portion first] onto the the post on the Housing.
  - Make sure the Spring seats in the notch.
19. Install Lock Pawl (14) onto the Housing's post.
  - Make sure the Lock Pawl properly engages the Spring.
20. Install Retaining Ring (15) that secures the Lock Pawl to the post.

Item No.	Description
4	O-Ring
9	Washer
10	O-Ring
33	O-Ring
36	Quad-Ring

**Table 2** Components Lubricated in Clean Oil

**Pointer-Cam-Dial Assembly**

21. Install Dial (27) onto Cam (17).
22. Install Rollers (19) into the Cam.
 

*IMPORTANT: Make sure Spring (18) is against right-angled end of notch in Cam.*

  - See **Figure 2**.
23. Install Springs (18) into the Cam.
24. Install and seat Pointer (24) onto the Cam.
 

*IMPORTANT: Make sure the three holes on the Dial engage with the Register's posts.*
25. Install and seat the Pointer, Cam, and Dial assembly onto the shaft of the Spindle and Gear Assembly.
  - Make sure the Lock Pawl fits properly into the hole of the Dial.

**NOTE:** The Pointer's setscrew must point toward the flat on the Spindle and Gear Assembly.
26. Tighten the Pointer setscrew onto the shaft of the Spindle and Gear Assembly.
27. Turn the Pointer counterclockwise.
  - Set the Pointer to zero.
28. Install Shroud (25) [notch downward] onto the Housing.
29. Install Screws (26) that secure the Shroud to the Housing.
  - Tighten each Screw securely.

**Lever Assembly**

30. Install Quad Rings (36) onto each end of Cam (37).
31. Install the Cam into the Housing.
  - Use care passing the Quad Rings.
32. Install Lever Assembly (40) onto the Cam.
  - Reposition the Cam as required to ensure the Lever Assembly properly meshes.
33. Install Lock Bar and Screw Assembly (39) onto the Cam.
  - Make sure the screw in the Lock Bar and Screw Assembly meshes properly with the Lock Pawl.
34. Install Screws (38) that secure the Lever Assembly and Lock Bar and Screw Assembly to the Cam.
  - Tighten the Screws securely.

**Valve and Inlet Swivel Assembly**

35. Install Valve Sleeve (29) [unslotted end first] into the Housing.
36. Install Valve Assembly (28) [stem first] into the small end of Spring (30).
37. Install the Valve Assembly and Spring horizontally into the Housing.
  - Make sure the Valve Assembly does not shift.
38. Install Screen (31) into the Spring.
39. Install O-Ring (33) onto the Adapter (34).
40. Screw the Adapter into the Housing.
  - Tighten the Adapter to 20 ft. lbs. (26 Nm).
41. Screw Swivel Assembly (35) [with thread sealant] into the Adapter.
  - Tighten the Swivel Assembly securely.

**Extension**

- IMPORTANT: Apply thread sealant to all pipe thread connections prior to assembly.*
42. Screw Extension (2) into Cap (3).
    - Tighten the Extension securely.
  43. Screw Nozzle Assembly (1) onto the Extension.
    - Tighten the Nozzle Assembly securely.

## Troubleshooting Chart

Control Valve Indications	Possible Problems	Solutions
Reduced or zero flow	<ol style="list-style-type: none"> <li>1. Filter Screen (31) clogged</li> <li>2. Clogged system</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove Filter Screen (31) and clean or replace</li> <li>2. Clean or replace system filter</li> </ol>
No product flow	Nozzle (1) not open	Open Nozzle (1)
Continuous product flow	<ol style="list-style-type: none"> <li>1. Foreign material on Valve Assembly (28)</li> <li>2. Valve Assembly (28) worn or damaged</li> </ol>	<ol style="list-style-type: none"> <li>1. Disassemble, clean, and inspect seat area. Check mating surfaces and replace Valve Assembly (28) as necessary. Locate and eliminate source of foreign material.</li> <li>2. Replace Valve Assembly (28)</li> </ol>
Leakage at Swivel Assembly (35)	<ol style="list-style-type: none"> <li>1. Initial tightening of Swivel Assembly (35) not sufficient</li> <li>2. Seal worn or damaged</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten Swivel Assembly (35)</li> <li>2. Replace Swivel Assembly (35)</li> </ol>
Leakage at Cam (37)	Quad-Rings (36) worn or damaged.	Replace Quad-Rings (36)
Leakage at front end of Nozzle	Nozzle damaged	Replace Nozzle
Leakage at Extension Assembly	<ol style="list-style-type: none"> <li>1. Initial tightening not sufficient</li> <li>2. Thread sealant missing or inadequate</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten leaking connection</li> <li>2. Apply thread sealant* to male pipe threads</li> </ol>
Lock Pawl (14) does not engage with the screw on Lock Bar and Screw Assembly (39)	Screw out of adjustment	Adjust the screw so it fully engages Lock Pawl (14) in an upright position when Lever (40) is pulled
* Do not apply thread sealant to the first two (2) threads. Contamination can occur.		

**Changes Since Last Printing**

Initial Release

