Service Guide

7716-D1

High-Pressure Measuring Control Valve

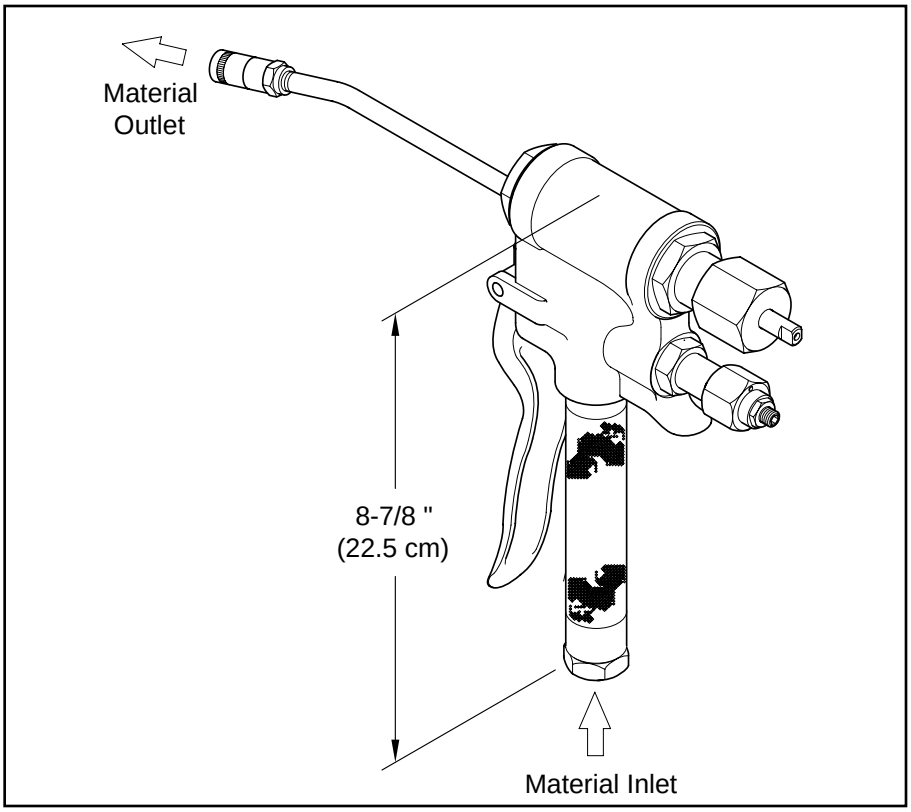

Figure 1 *High-Pressure Measuring Control Valve Model 7716-D1*

Description and Operation

The model 7716-D1 control valve handles fibrous, light, and heavy greases including semifluid and fluid lubricants.

This control valve regulates the amount of product dispensed. It delivers from zero to 1 ounce (28.4 grams) of material per cycle [depress and release the trigger].

When the lever is depressed, it delivers 1/2 of a preset measured amount of product. Release the lever to complete the preset delivery. An adjustment screw is set to obtain the amount required.

Specifications

Material Inlet	Material Outlet (at Body)	Max. Material Pressure		Max. Displacement/Cycle	
		psi	Bars	Ounce	Grams
1/4 " NPTF (f)	1/8 " NPTF (f)	5,000	345	1	28.4

Table 1 *Model 7716-D1 Specifications*

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PO Box 473515, Charlotte, North Carolina 28247-3515

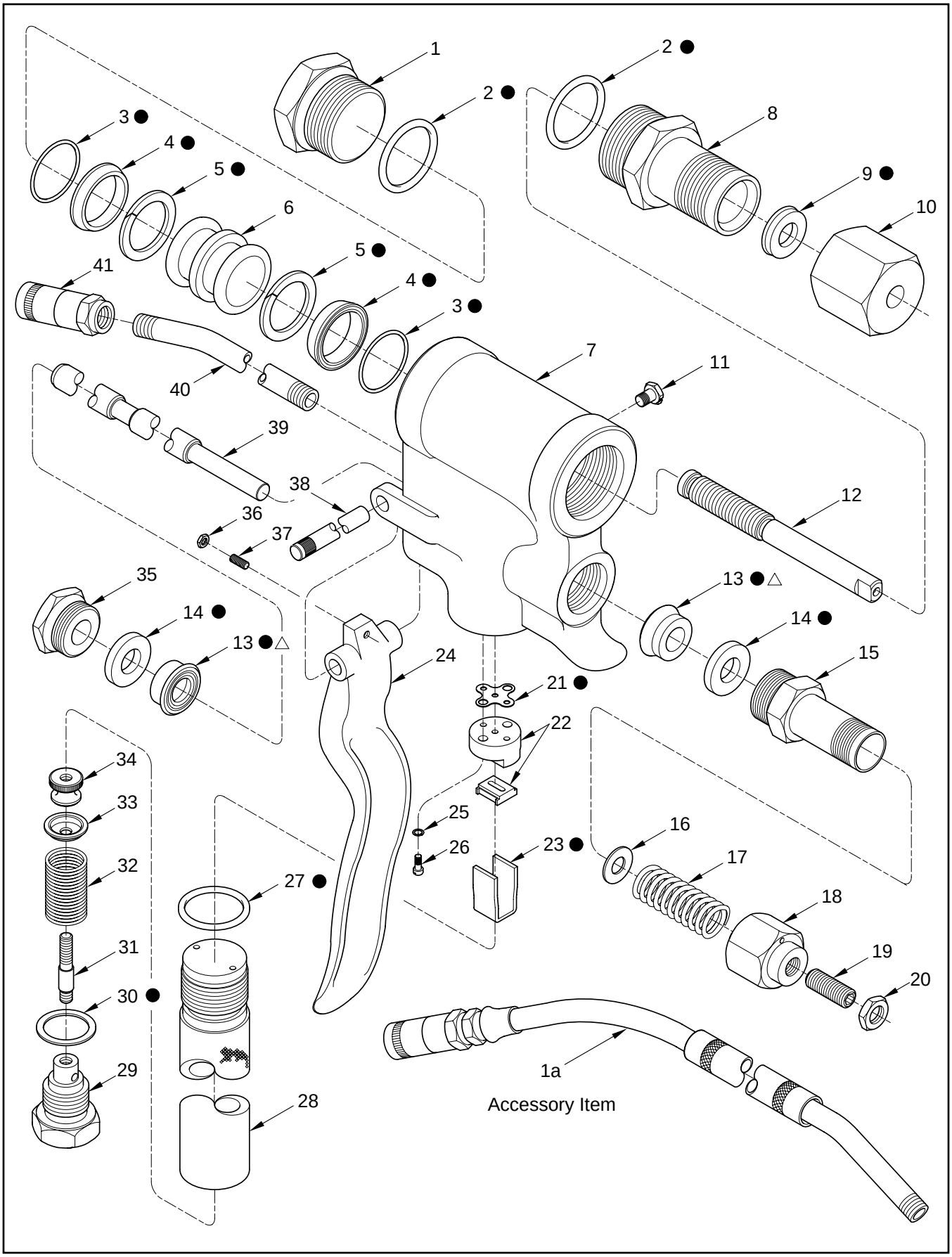


Figure 2 *High-Pressure Measuring Control Valve Model 7716-D1 - Exploded View*

Item No.	Part No.	Description	Qty	Notes	Numeric Order Part #	(Item #)
1		Plug, 1-5/16 " -20	1		6304-B	(41)
2	171001-20	O-Ring, 1-5/16 " OD x 1-1/16 " ID	2	●	45569	(36)
3	171009-9	O-Ring, 1-1/16 " OD x 15/16 " ID	2	●	49136	(40)
4	337044	Packing, V-Block, 1.20 " OD	2	●	*53952*	(9)
5	338971	Ring, Split, Backup (Teflon)	2	●	*76839*	(25)
6	326355	Piston, Measuring	1		*77795*	(20)
7	328499	Body, Valve	1		*77863*	(26)
8	319211	Screw, Packing, 1-5/16 " -20 x 13/16 " -20	1		131132	(32)
9		V-Packing	1	●	131133	(33)
10		Nut, 13/16 " -20	1		*131135*	(34)
11	328224	Plug, 1/4 " -28	1		*131137*	(31)
12	305413	Screw, Adjusting, 1/2 " -20	1		170779	(19)
13		Seal, 3/4 " OD x 3/8 " ID	2	● △	171001-20	(2)
14		Washer, 0.372 " (Brass)	2	●	171009-9	(3)
15		Retainer, 15/16 " -20 x 7/8 " -20	1		171013-17	(27)
16	302678	Washer, 0.265 "	1		*172190-32*	(13)
17	305784	Spring, 2 " Long	1		302678	(16)
18		Cap, 15/16 " -20 x 1/4 " -20	1		*305412*	(10)
19	170779	Setscrew, Hexagon Head Socket, 1/4 " -20 x 5/8 "	1		305413	(12)
20		Nut, 1/4 " -20	1		*305414*	(37)
21		Gasket, Valve Seat	1	●	305415	(24)
22	305780	Valve and Seat Assembly, Slide	1		*305416*	(38)
23	305426	Guide, Valve	1	●	*305418*	(35)
24	305415	Lever	1		*305419*	(21)
25		Washer, Lock, 6	2		305426	(23)
26		Screw, 6 -32 x 3/8 "	2		*305431*	(30)
27	171013-17	O-Ring, 1.00 " OD x 13/16 " ID	1	●	*305432*	(29)
28		Handle, Inlet	1		305780	(22)
29		Bushing, 13/16 " -20	1		305783	(39)
30		Gasket (Aluminum)	1	●	305784	(17)
31		Stud, 8 -32	1		*305785*	(18)
32	131132	Strainer, 1.00 " Long (Compressed)	1		*305786*	(15)
33	131133	Washer, Retaining, 0.172 "	1		*310107*	(14)
34		Nut, Knurled 8 -32	1		319211	(8)
35		Screw, Packing, 7/8 " -20	1		*319212*	(1)
36	45569	Nut, 10 -32	1		326355	(6)
37		Setscrew, 10 -32 x 1.00 "	1		328224	(11)
38		Pin, 1-15/16 " Long	1		*328498*	(28)
39	305783	Stem, Valve Actuation	1		328499	(7)
40	49136	Extension, Rigid	1		337044	(4)
41	6304-B	Coupler, Hydraulic	1		338971	(5)
		Optional Equipment				
1a	6778	Extension, Rigid/Flexible				

Legend:
Part numbers left blank (or in *italics*) are not available separately
● △ designates a repair kit item

Repair Kits

Part No.	Kit Symbol	Description
398971-2	●	Kit, Major Repair
393530-32	△	Kit, Minor Repair [includes five (5) of item number **13**]

Accessories

WARNING

Altering the control valve with the addition of a flexible hose extension is not recommended. Personal injury may occur. If a flexible extension is mandatory, use only Alemite Corporation extension hose number 6778.

Part Number	Description
6778	Rigid/Flexible Extension

Table 2 *High-Pressure Measuring Control Valve Model 7716-D1 Accessory*

Preventive Maintenance

Refer to section entitled **Overhaul** for details on the procedures necessary to perform maintenance.

Daily	Weekly	Monthly	Quarterly
Wipe Exterior with Clean Cloth	Inspect for Leakage		1. Clean Strainer (**32**) * 2. Inspect Valve Guide (**23**) *
* Refer to **Figure 2** Parts List for Parts Identification			

Table 3 *High-Pressure Measuring Control Valve Model 7716-D1 Preventive Maintenance Schedule*

Overhaul

NOTE: Refer to **Figure 2** and/or **Figure 3** for component identification on all overhaul procedures.

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-trichlorethane in this valve. An explosion can result when aluminum and/or zinc-plated parts 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 personal injury.

Read each step of the instructions carefully. Make sure a proper understanding is achieved before proceeding.

Removal

Remove the control valve from its delivery line.

Disassembly

1. Clamp Valve Body (**7**) vertically in a soft-jaw vise with the Inlet Handle facing upward.
2. Unscrew Extension (**40**) and Coupler (**41**) from the Valve Body.

Inlet Handle

3. Unscrew Bushing (**29**) from Inlet Handle (**28**).
   - Remove Gasket (**30**) from Bushing.
4. Unscrew Knurled Nut (**34**) from Stud (**31**).
5. Remove Retaining Washer (**33**), Strainer (**32**), and the Stud from the Bushing.
6. Unscrew the Inlet Handle from the Valve Body.
   - Use a strap wrench or other suitable tool that will not mar the surface of the Inlet Handle.
7. Remove O-Ring (**27**) from the Inlet Handle.

Valve Body

Lever and Valve Actuation Stem Travel Assembly

8. Remove Valve Guide (**23**) from the Valve Body.
   - Use needle-nose pliers.
9. Remove Pin (**38**) from the Valve Body.
   - Drive the Pin from the opposite of the knurled end with a punch and hammer.
10. Remove Lever (**24**) from the Valve Body.
11. Remove Nut (**36**) and Setscrew (**37**) from the Lever as required.
12. Unscrew Packing Screw (**35**) from the Valve Body.
13. Remove Valve Actuation Stem (**39**), Washer (**14**), and Seal (**13**) from the Valve Body.

    NOTE: The earlier units contain a leather washer (not illustrated) that is no longer required.

14. Unscrew Cap (**18**) from Retainer (**15**).
15. Remove Spring (**17**) and Washer (**16**) from the Retainer.
16. Unscrew Nut (**20**) and Setscrew (**19**) from the Cap if necessary.
17. Unscrew the Retainer from the Valve Body.
18. Remove the additional Washer (**14**), and Seal (**13**) from the Valve Body.

Slide Valve and Seat Assembly

19. Remove the Slide Valve portion of Slide Valve and Seat Assembly (**22**) from the Valve Body.
20. Remove Screws (**26**) and Lock Washers (**25**) that secure the Seat to the Valve Body.
21. Remove the Seat and Gasket (**21**) from the Valve Body.

Adjusting Screw Assembly

22. Unscrew Plug (**1**) from the Valve Body.
    - Remove O-Ring (**2**) from the Plug.

23. Unscrew Nut (**10**) from Packing Screw (**8**).

24. Unscrew the Packing Screw and Adjusting Screw assembly from the Valve Body.

25. Remove O-Ring (**2**), V-Packing (**9**), and Adjusting Screw (**12**) from the Packing Screw.

26. Push the Measuring Piston assembly from the Valve Body.

    *IMPORTANT: Backup Ring (**5**) is of Teflon construction. The earlier model contained leather washers.*

27. Remove O-Ring (**3**), V-Block Packing (**4**), and Backup Ring (**5**) from each end of Measuring Piston (**6**).

28. Unscrew Plug (**11**) from the Valve Body as required.

Clean and Inspect

NOTE: Use a repair kit for replacement parts. Make sure all the components are included in the kit before discarding used parts.

1. Clean all metal parts in a modified petroleum-based 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.

   EXAMPLE: Make sure the halves to Slide Valve and Seat Assembly (**22**) mate properly.

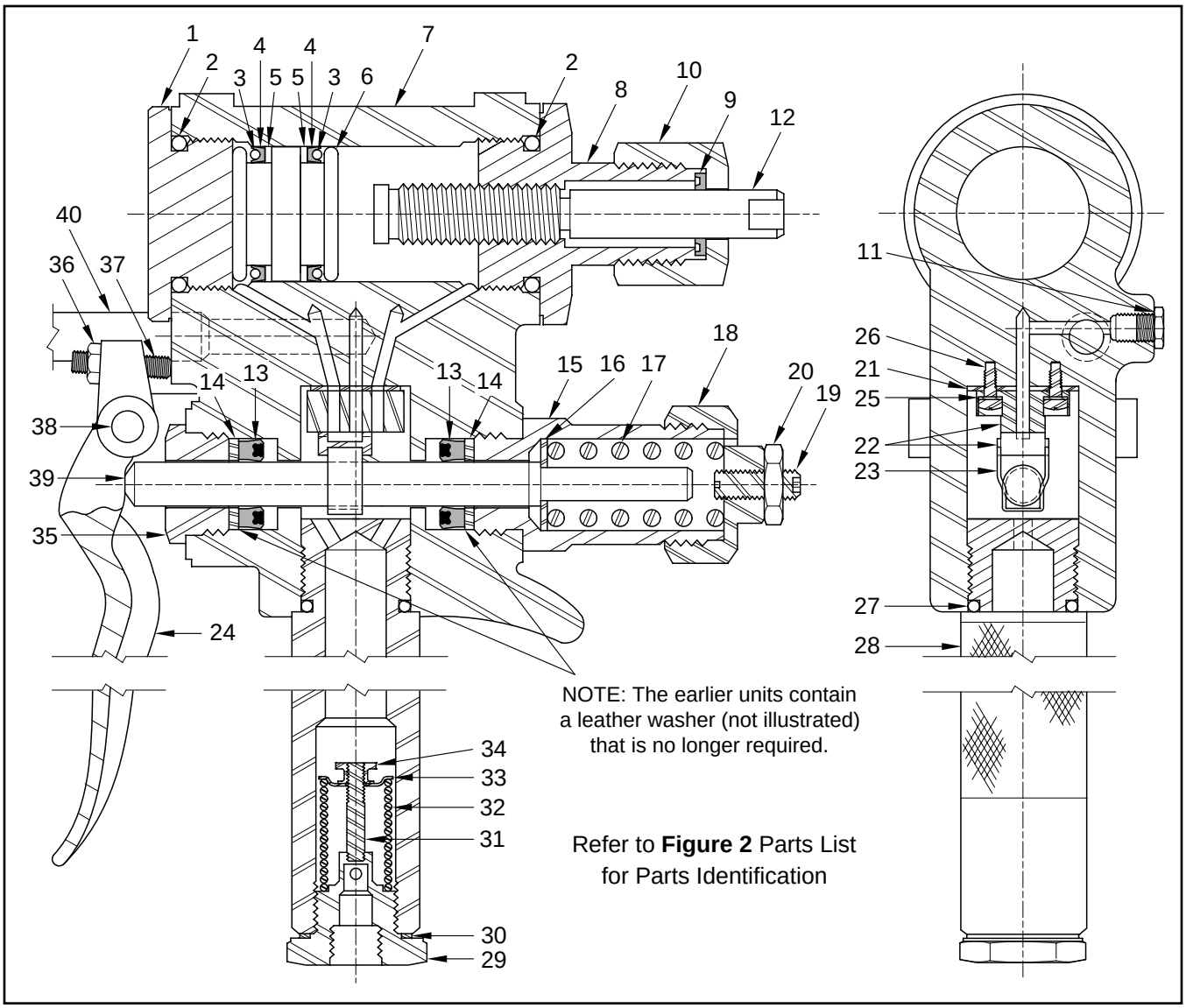


Figure 3 *High-Pressure Measuring Control Valve Model 7716-D1 - Section View*

Assembly

NOTE: Prior to assembly, certain components require lubrication in clean oil. Refer to **Table 4** for details.

Valve Body

Measuring Piston Assembly

1. Install Backup Ring (**5**) onto each end of Measuring Piston (**6**).
   • Seat each Ring against the center of the Piston.
2. Install V-Block Packing (**4**) onto each end of the Measuring Piston.
   • Make sure the lip of each Packing faces the outside of the Piston.
3. Install O-Ring (**3**) onto each end of the Piston.
4. Clamp Valve Body (**7**) vertically in a soft-jaw vise with the Inlet Handle port facing downward.

CAUTION

Use care installing the Piston assembly past the threads of the Valve Body. Damage to the Packings can occur.

5. Install the Piston assembly into the Valve Body.

Adjusting Screw Assembly

6. Install O-Ring (**2**) onto Plug (**1**).
   • Make sure the O-ring does not roll.
7. Screw the Plug assembly into the discharge end of the Valve Body.
8. From the opposite end of the Valve Body, seat the Measuring Piston assembly against the Plug.
9. Install the additional O-Ring (**2**) onto Packing Screw (**8**).
   • Make sure the O-ring does not roll.
10. Grease the threads of Adjusting Screw (**12**).
11. Screw the Adjusting Screw fully into the Packing Screw. This setting allows the maximum amount of product to be dispensed.
12. Install V-Packing (**9**) [lip-end first] onto the stem of the Adjusting Screw.
13. Screw Nut (**10**) onto the Packing Screw.
14. Screw the Packing Screw assembly into the Valve Body.
    • Tighten securely.
15. Tighten the Nut to the Packing Screw.

Slide Valve and Seat Assembly

16. Turn the Valve Body assembly end-for-end in the vise.
17. Install Gasket (**21**) into the Valve Body.
    • Make sure the holes align properly.
18. Install Lock Washer (**25**) and Screw (**26**) into both ends of the seat portion of the Slide Valve and Seat assembly (**22**).
19. Install the Slide Seat and Screw assembly into the Valve Body.
    • Make sure the screw holes align properly. Tighten both Screws securely.
20. Grease the face of the Valve portion of the Slide Valve and Seat assembly (**22**).
21. Install the Slide Valve [cavity end first] onto the Seat.
    • Make sure the Slide Valve and Seat are in proper alignment.

Lever and Valve Actuation Stem Travel Assembly

CAUTION

Use care installing Seal (13) past the threads of the Valve Body. Damage to the Seal can occur.

22. Install Seal (**13**) [lip end first] into each end of the Valve Body.
    • Make sure both Seals seat properly.
23. Install Washer (**14**) into each end of the Valve Body.

NOTE: The earlier units contain a leather washer (not illustrated) that is no longer required

Item No. 1n **Figure 2**	**Description**	**Item No.** on **Figure 2**	**Description**
2	O-Ring, 1-5/16 " OD x 1-1/16 " ID	9	V-Packing
3	O-Ring, 15/16 " OD x 1-1/16 " ID	13	Seal, 3/4 " OD x 3/8 " ID
4	Packing, V-Block, 1.20 " OD	27	O-Ring, 1.00 " OD x 13/16 " ID

Table 4 *Lubricated Components*

24. Screw Packing Screw **(35)** into the Valve Body.
    - Tighten securely.

25. Grease Valve Actuation Stem (**39**).

CAUTION

Do not install the Valve Actuation Stem small diameter first. Damage to the Seals can occur.

26. Install the Valve Actuation Stem [large diameter first] through the rearward Washer and Seal first.
    - Use a small hammer.

27. Install Valve Guide (**23**) over the Valve Actuation Stem and onto the Slide Valve.
    - Make sure the Valve Guide seats properly on the Stem.

28. Cycle the Stem to ensure the Slide Valve moves freely and functions properly.

29. Screw Retainer (**15**) into the Valve Body.

30. Install Washer (**16**) into the Retainer.

31. Install Spring (**17**) into the Retainer.

CAUTION

Overcome Spring pressure with Cap (18) before installation. Cross-threading can occur.

32. Screw Cap (**18**) onto the Retainer.

33. Screw Setscrew (**19**) halfway into the Cap.

34. Install Nut (**20**) onto the Setscrew.
    - Do not tighten.

35. Align Lever (**24**) to the Valve Body,

36. Secure the Lever to the Valve body with Pin (**38**).
    - Use a small hammer and make sure the knurled end of the Pin is flush with the Valve Body.

37. Screw Setscrew (**37**) into the Lever.

38. Install Nut (**36**) onto the Setscrew.
    - Do not tighten.

Setscrew Adjustment (Lever Free-Play)

Adjust the Setscrew against the Valve Body until a 0.010 to 0.030 " [0.25 - 0.76 mm] clearance exists between the end of the Valve Actuation Stem and the surface of the Lever. Use a feeler gauge. See **Figure 4**.

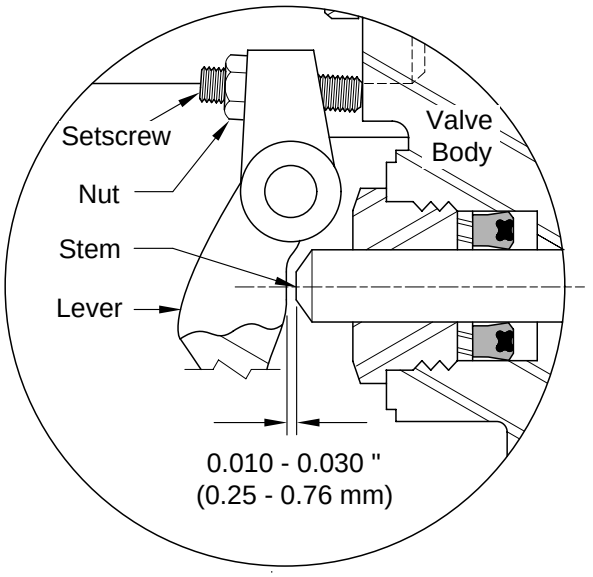


Figure 4 *Lever Free-Play*

Turn the Setscrew clockwise to increase the amount of free-play and counterclockwise to decrease the gap.

Tighten the Nut securely.

Inlet Handle

39. Install O-Ring (**27**) onto Inlet Handle (**28**).
    - Make sure the O-ring does not roll.

40. Screw and seat Stud (**31**) into Bushing (**29**).

41. Install Gasket (**30**) onto the Bushing.

42. Install and seat Strainer (**32**) onto the Bushing.

43. Position Retaining Washer (**33**) over the Stud and onto the Strainer.

44. Screw Knurled Nut (**34**) onto the Stud.
    - The top of the Stud should be flush with top of the Knurled Nut.

45. Screw the Inlet Handle assembly into the Valve Body and tighten securely.
    - Use a strap wrench or other suitable tool that will not mar the surface of the Inlet Handle.

46. Screw Extension (**40**) into the Valve Body.
    - Make sure the head of the Extension points toward the Inlet Handle.

47. Screw Coupler (**41**) onto the Extension and tighten securely.

48. Screw Plug (**11**) into the Valve Body and tighten securely.

Installation

Attach the control valve to its delivery line. Tighten the connection securely.

Operation and Adjustments

WARNING

Should leakage occur anywhere within the system, disconnect power to the motor. Personal injury can occur.

Prime and Test

NOTE: Perform the following procedures at a pressure not to exceed 3000 psi (207 Bars). Should valve leakage occur at anytime, refer to the **Troubleshooting Chart.**

1. Point the control valve into an appropriate collection container.
2. Allow the pump to deliver grease to the control valve.
   - The control valve should show no leakage nor dispense the product.
3. Cycle the control valve Lever (**24**) several times.
   - Product should flow once air is eliminated from the control valve (and system).

If the control valve does not dispense the product, refer to the **Troubleshooting Chart.**

With the Lever in the released position, no product should appear at Coupler (**41**). If product does appear, refer to the **Troubleshooting Chart.**

Lever Travel Adjustment

1. Loosen Setscrew (**19**) from Cap (**18**).
2. Depress and hold the Lever in the full open position.
3. Turn Setscrew (**19**) clockwise and allow the Lever to be moved until product no longer appears.
4. Turn the Setscrew counterclockwise 1-3/4 turns. See **Figure 5**.
5. Tighten Nut (**20**) securely.

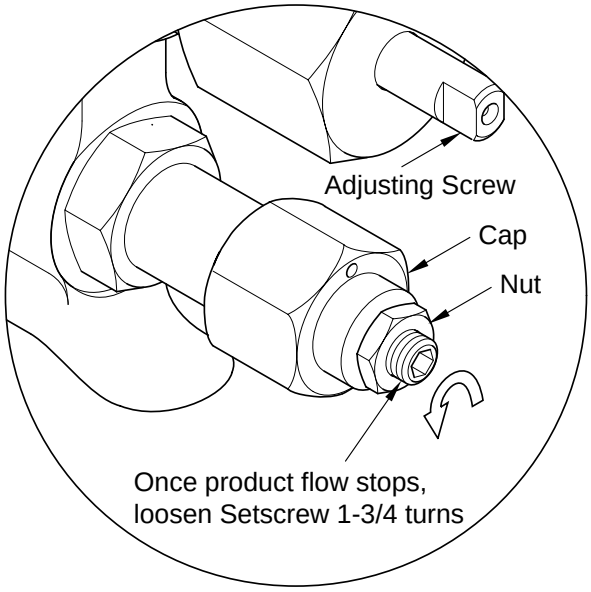


Figure 5 *Lever Travel Adjustment*

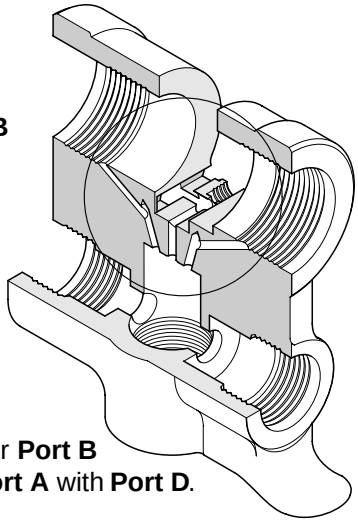
Product Delivery Adjustment

NOTE: **Figure 6** illustrates product flow through the Valve Body portion of the control valve.

Upon assembly, Adjusting Screw (**12**) was set to allow the maximum amount of product to be dispensed, approximately 1 ounce (28.4 grams). One-half of the product amount is dispensed when the Lever is depressed and the additional amount when the Lever is released.

Should a lesser amount be required, turn the Adjusting Screw clockwise to decrease the amount dispensed.

Product Flow



Initial Fill

With the lever released and the system pressurized, product enters **Port B** and fills **Chamber B**.

Lever Depresssed

When the lever is depressed, the slide valve moves to allow product to enter **Port A** and fill **Chamber A**. At the same time the slide valve aligns **Port B** with **Port D**. This allows product to flow from **Chamber B** via **Port B** and into **Port D** to discharge.

Lever Released

When the lever is released, the slide valve moves to allow product to enter **Port B** and fill **Chamber B** once again. At the same time the slide valve aligns **Port A** with **Port D**. Product from **Chamber A** flows via **Port A** into **Port D** to discharge.

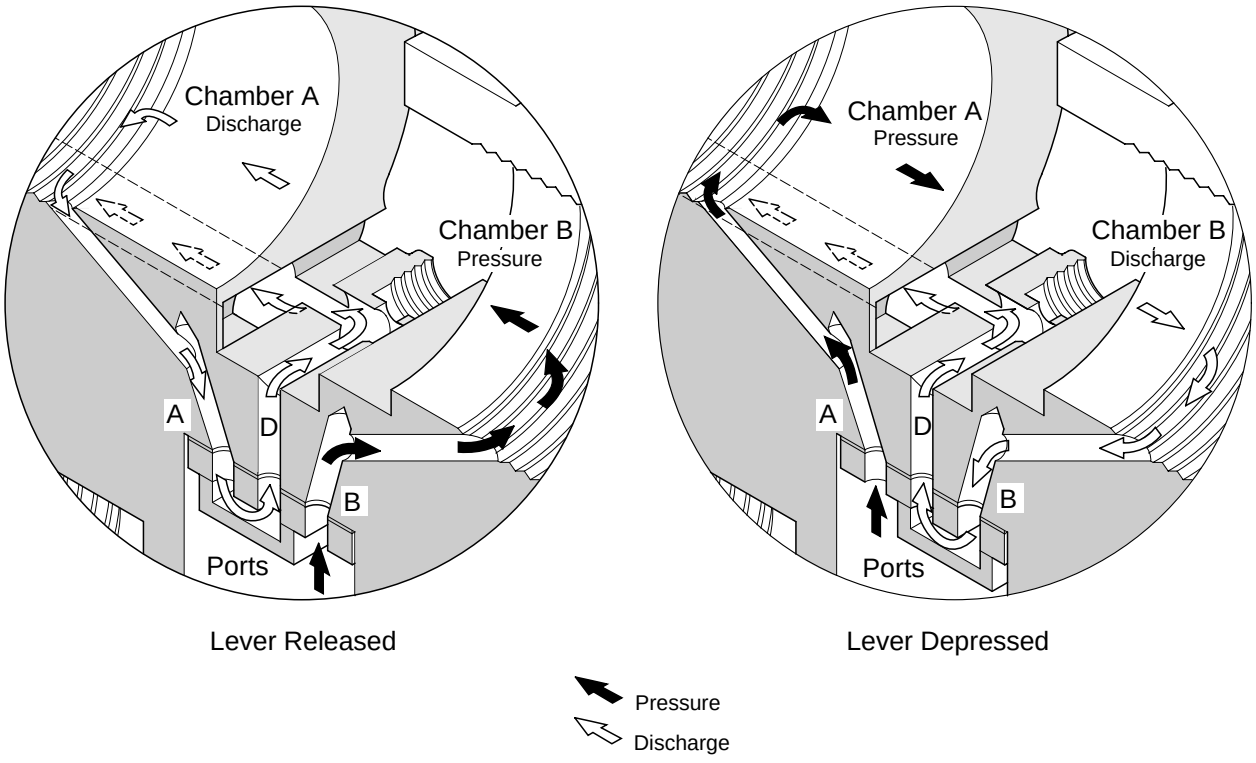


Figure 6 *High-Pressure Measuring Control Valve Model 7716-D1 - Section View of Valve Body*

Troubleshooting Chart

Control Valve in Static Condition or in Unattached Operation		
Control Valve Indications	**Possible Problems**	**Solution**
Continuous product flow	1. Foreign material under Slide Valve and Seat Assembly (**22**) 2. Worn or damaged V-Block Packings (**4**)	1. Disassemble, clean, and inspect seat area. Check mating surfaces and replace parts as necessary. Locate and eliminate source of foreign material. Clean Strainer (**32**) 2. Replace V-Block Packings (**4**)
Lever requires to be more fully depressed before product appears	1. Valve Guide (**23**) worn or damaged 2. Valve Actuation Stem (**39**) worm or damaged	1. Replace Valve Guide (**23**) 2. Replace Valve Actuation Stem (**39**)
No product flow during Lever cycle	Adjusting Screw (**12**) set fully closed	Adjust setting.
No product flow upon Lever release	Setscrew (**19**) not adjusted properly	Adjust setting.
Leakage at Extension (**40**)	Initial tightening not sufficient	1. Tighten Extension (**40**) into Valve Body (**7**) 2. Apply Teflon tape* to Extension threads
Leakage at rear end of Coupler (**41**)	Initial tightening not sufficient	1. Tighten Coupler into Extension (**40**) 2. Apply Teflon tape* to Extension threads
Leakage at Nut (**10**)	Seal (**9**) worn or damaged.	Replace Seal (**9**)
Leakage at vent hole in Cap (**18**)	Seal (**13**) worn or damaged.	Replace Seal (**13**)
Leakage at Packing Screw (**35**)	Seal (**13**) worn or damaged.	Replace Seal (**13**)
Leakage at bottom of Inlet Handle (**28**)	1. Initial tightening of Bushing (**29**) not sufficient 2. Crush Gasket **(30**) not sealing	1. Tighten Bushing (**29**) 2. Replace Gasket (**30**)
Control Valve Connected to Fitting		
Control Valve Indications	**Possible Problems**	**Solution**
Leakage at front end of Coupler (**41**)	1. Coupler damaged 2. Coupler to fitting mismatch 3. Foreign or damaged fitting	1. Replace Coupler (**41**) 2. Replace fitting and/or Coupler (**41**) 3. Replace with Alemite fitting
* Do not apply Teflon tape to the first two (2) threads. Contamination can occur.		

Changes Since Last Printing

Added Teflon Back-Up Ring 338971
Deleted Washer 326355
Deleted Washer 310106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