MILTON ROY

Milroyal B Packed Plunger Pump (Mfg. after 1995)

INSTRUCTION MANUAL

339-0065-000
Issued 2/1/00

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METERING PUMP PRODUCTS
THIRTY-SIX MONTH LIMITED WARRANTY

The Flow Control Division of the Milton Roy Company warrants its metering pump products against defects in workmanship or materials for three years under normal use form the date of shipment from our warehouse or the warehouse of our agent. All metering pump components are warranted for three years, except that warranties on equipment and accessories furnished with the pump but manufactured by others are limited to the warranties offered by the manufacturers of their respective products. This warranty is not extended to electronic or Pneumatic control devices supplied with a Milton Roy metering pump. These items are covered by the warranties offered by the manufacturer or the Milton Roy Warranty for Electronic Controls and Actuators.

All obligations and liabilities under this warranty are limited to refunding, repairing or replacing (at our option), f.o.b. our plant, such allegedly defective units as are returned to our plant, carrier charges prepaid. Repairs or replacements are made subject to factory inspection of returned items.

This warranty does not extend to damage by corrosion or erosion. The materials of construction offered are recommendations subject in all cases to verification and acceptance by the customer. These recommendations, based on previous Company experience and best available information, do not constitute guarantees against wear or chemical action.

Expressly excluded from this warranty are defects caused by misuse, abuse, or improper application, employment, or operation of the unit. Expendable items and damage resulting from unauthorized repair are not covered by this warranty. No liability for consequential damages or reinstallation labor is accepted. Milton Roy Company will not assume responsibility for contingent liability for alleged failure of its products.

This warranty is in lieu of all other warranties expressed or implied.

PACKED PLUNGER STYLE LIQUID ENDS (IDENTIFICATION)

Milroyal B pumps manufactured during and after 1995 (new model code) contain either spring loaded non-adjustable V-ring packing or adjustable braided packing sets (as shown in Figure 1 and 2 respectively).
Model Code example: (first line) MBP101 second line 8GCBM4TMLRSEST11. (TM indicates material of packing and plunger)

For earlier model Milroyal A and B packed plunger pumps, see manual 339-0007 (manufactured pre-1995, these pumps contained adjustable style packing sets. Pre-1995 Model code example: MBP25B10B1M11AA or MA1M40P101.

Liquid End (Figure 1)

Spring Loaded Packing Design (Non-Adjustable V-ring packing used on pumps after 1995.) The V-Type (Chevron) packing rings are provided as a set. The set includes the lantern ring, V-rings, seal ring, o-ring and spring. In some cases a separate kit of V-rings and other soft seal parts (not including the metal parts) may be purchased.

Packing Replacement (Spring loaded, Non-Adjustable packing type only)

See pump model code for packing identification.

The liquid end must be removed from the pump to replace the packing set. Flush liquid end of process liquid. Disconnect suction and discharge lines. The hex head pipe plug (1770) in the end of the liquid end connects to the process cavity, and need not be removed (the hole connects to the packing cavity providing continuous venting).

1. Unscrew the plunger adapter (1750) and move it away from the crosshead. Remove tubing (1760) or grease fitting from the liqud end, and the bolts fastening it to to the pump housing.
2. Push the plunger until it bottoms out and measure the length of plunger protruding from the liquid end (record this length).
3. Withdraw plunger from liquid end. Inspect plunger and the inside of the liquid end. Both areas must be free from scoring (longitudinal grooves) and other irregularities. Also replace any scored or corroded plungers.
4. Clamp the liquid end in a vise and loosen the packing follower retaining nut (1660), expecting the internal spring to push the packing parts outward.

CAUTION, the spring force may suddenly loosen stuck packing, causing it to fly out of the liquid end. (The same precaution must be use during re-instalation).

5. Thoroughly clean the liquid end body of old packing, contamination and lubricant.
6. The metal parts: lantern ring, spring etc. may be re-used if they are in good condition. The V-rings and seals are typically replaced.
7. IT IS IMPORTANT TO PACKING LIFE to soak the packing rings in the normal packing lubricant prior to installing them in the pump, in order to reduce friction and aid the break-in process. If packing grease is used, work some grease into each ring before assembly. Also coat the inside of the liquid end with the same lubricant.
8. Replace ALL packing parts as shown in figure 1. Proper packing compression and minimized leakage require use of the packing components as designed. Begin assembling the components one ring at a time.
9. When installing the gland cap, anti-seize lubricant must be applied to the threads. Thread the gland cap onto the liquid end and tighten it until it bottoms out against the packing follower.

Note: once the gland cap is tightened the compression on the spring loads the packing. NO OTHER ADJUSTMENT WILL BE NECESSARY.

Braided packing will be covered later, and does require adjustment.

10. Coat the plunger with lubricant and insert it into the liquid end far enough that it extends from the liquid end the distance measured in step 2. This verifies proper packing alignment. Remove the plunger from the liquid end.

Liquid End Installation:

1. Install the plunger into the crosshead. Tighten the plunger adapter. It will not clamp tight on the plunger, but allow the plunger to have a small amount of angular and radial clearance. Rotate the plunger, to be sure that the plunger is not clamped tight. Foreign material captured with the end of the plunger may eliminate the needed clearance and cause premature packing failure. The plunger should have less than 1/64" axial movement when tightened in the crosshead.
2. Install liquid end to pump casing, guiding the plunger into the liquid end. Guide the liquid end to its mounting place on pump housing.
3. Install and tighten bolts to hold liquid end to pump housing.
4. Install any tubing previously removed.

Packing Drip Lubrication System (option) Figure 3:

This system as shown in figure 3 and Table 1 is designed to extend packing life. It is gravity fed and requires air purging during start-up. Intial monitoring and adjustment of the sight glass drip control valve (1840) is required.

Filling the liquid end and tubing lines of the drip lubrication system is necessary.

1. Disconnect the tubing fitting just below the drip valve in order to fill and purge the tubing and liquid end until all air is removed. This will eliminate running the packing dry during start-up, extending packing life.
2. Fill the liquid end and tubing using a syringe. The overflow tube (1760) near the gland nut will allow the air and lubricant to escape as the syringe fills the cavities.
3. Reconnect the tubing fitting below the drip valve once the air hs been removed from the lines.
4. Add lubricant to the Oiler and open the on/off valve (1870) immediately beneath the oiler. The adjustment of the drip is not controlled by this valve.
5. Adjust the thumb knob on the sight glass drip oiler and observe the drops per minute. A normal starting point for the drip rate is 4 to 10 drops per minute.

Once the pump is running, the lubricant may appear with some process liquid at the overflow tube or enter the process. Therefore the oiler drip rate may not be equal to the overflow tube drip rate.

6. The sight glass in the drip oiler SHOULD NOT be full of oil. This would indicate too high a flow rate or a blocked line. The sight glass is intended to show the drip rate, and is not to be filled. A drip rate of 4 to 10 drops per minute is usually satisfactory as long as the sight glass does not fill with oil.

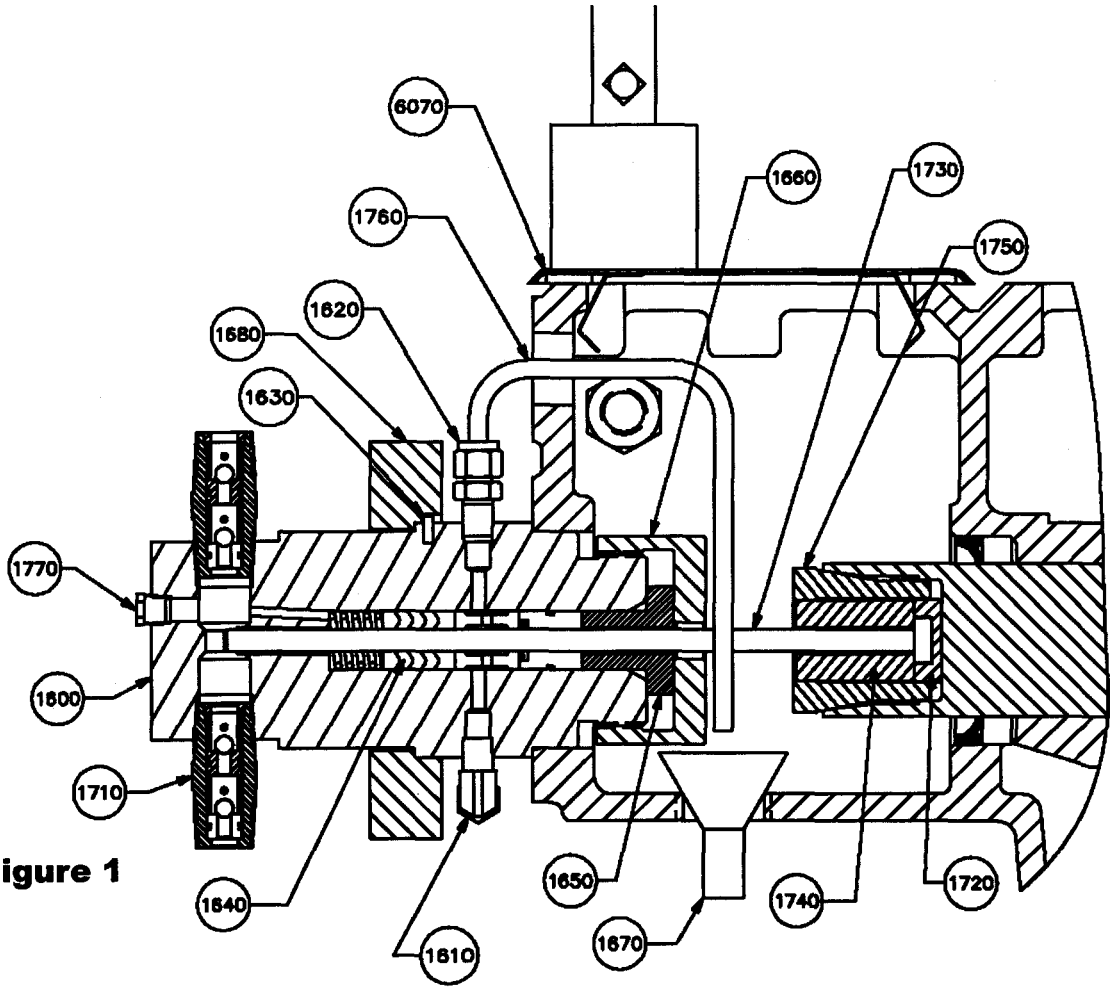

Figure 1

Drg. Location	Description	Qty. Req.		Drg. Location	Description	Qty. Req.
1600	Liquid End Body	1		1730	Plunger	1
1610	Male Elbow 1/4T X 1/8 NPT	1		1740	Floating Plunger Retainer	1
1615	Hex Pipe Plug, 1/4" 316SS	1		1750	Plunger Adapter, Steel	1
1620	Connector Female	1		1760	Drain Tube	1
1630	Spirol Pin 1/8 X 3/8 Steel	1		1770	Hex Pipe Plug 1/8" 316SS	1
1640	V-Ring Packing Set	1		1790	Reservoir Bracket	1
1650	Packing Follower 316SS	1		1800	Hex Hd. Screw 5/8" 316SS	1
1660	Gland Cap 316SS	1		1810	Lock Washer	1
1670	Funnel, Drain	1		1820	Hex Nut 5/8" Gr. 8	1
1680	Back-up Ring 316SS	1		1830	Reservoir	1
1690	Socket Head Screw 1/2 X 3-1/2	4		1840	Sight Feed Drip Valve	1
1700	Lock Washer 1/2" 316SS	4		1850	Connector, 1/4 SWG X 1/8 NPT	1
1710	Check Valve Assembly 316SS	2		1860	Tubing 1/4 X .035 Wall	14 In.
1720	Crosshead Thrust Disc	1		1870	Sq. Head Pipe Plug 1/4" NPT	1

Table 1 Applies to Figures 1 & 3

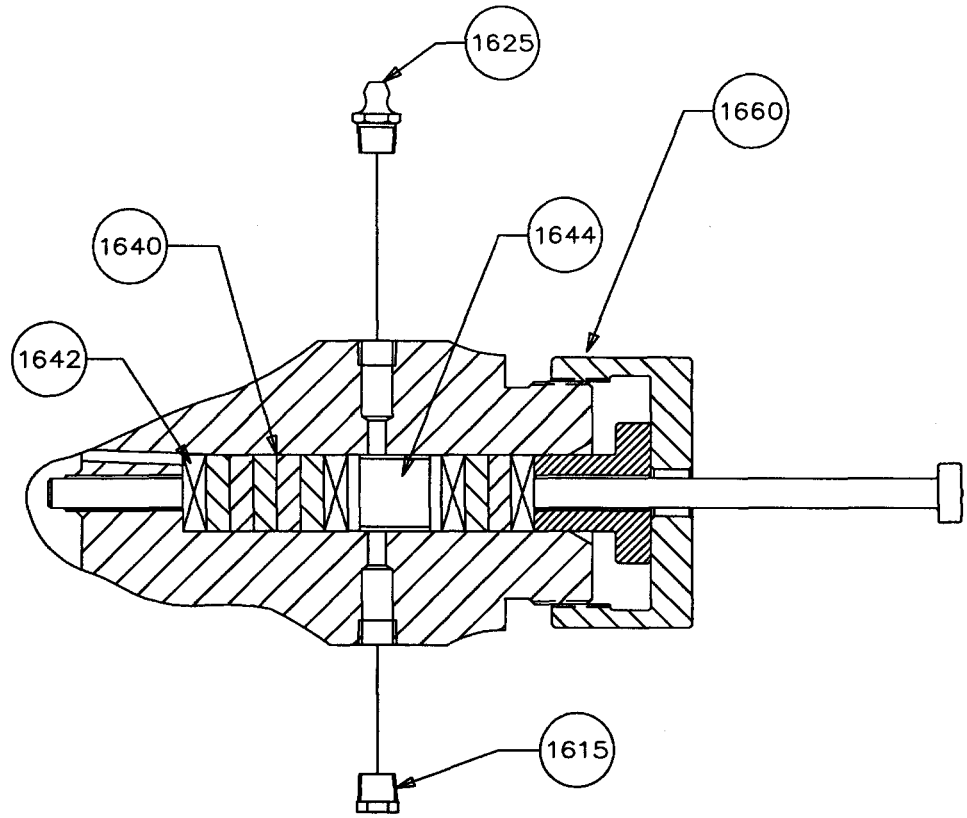

Figure 2 Braided Adjustable Packing

Drg. Location	Description	Qty. Req.		Drg. Location	Description	Qty. Req.
1600	Liquid End Body	1		1680	Back-up Ring 316SS	1
1615	Hex Pipe Plug, 1/4" 316SS	1		1690	Socket Head Screw 1/2X3-1/2	4
1630	Spirol Pin 1/8" X 3/8" Steel	1		1700	Lock Washer 316SS 1/2"	4
1640	Braided Packing Set	1		1710	Check Valve Assembly 316SS	2
1642	Packing Spacer 316SS	4		1720	Crosshead Thrust Disc	1
1644	Lantern Ring 316SS	1		1730	Plunger	1
1650	Packing Follower 316SS	1		1740	Floating Plunger Retainer	1
1660	Gland Cap 316SS	1		1750	Plunger Adapter, Steel	1
1670	Funnel, Drain	1		1770	Hex Pipe Plug 1/8" 316SS	1

Table 2 See Figures 1, 3 for items not shown

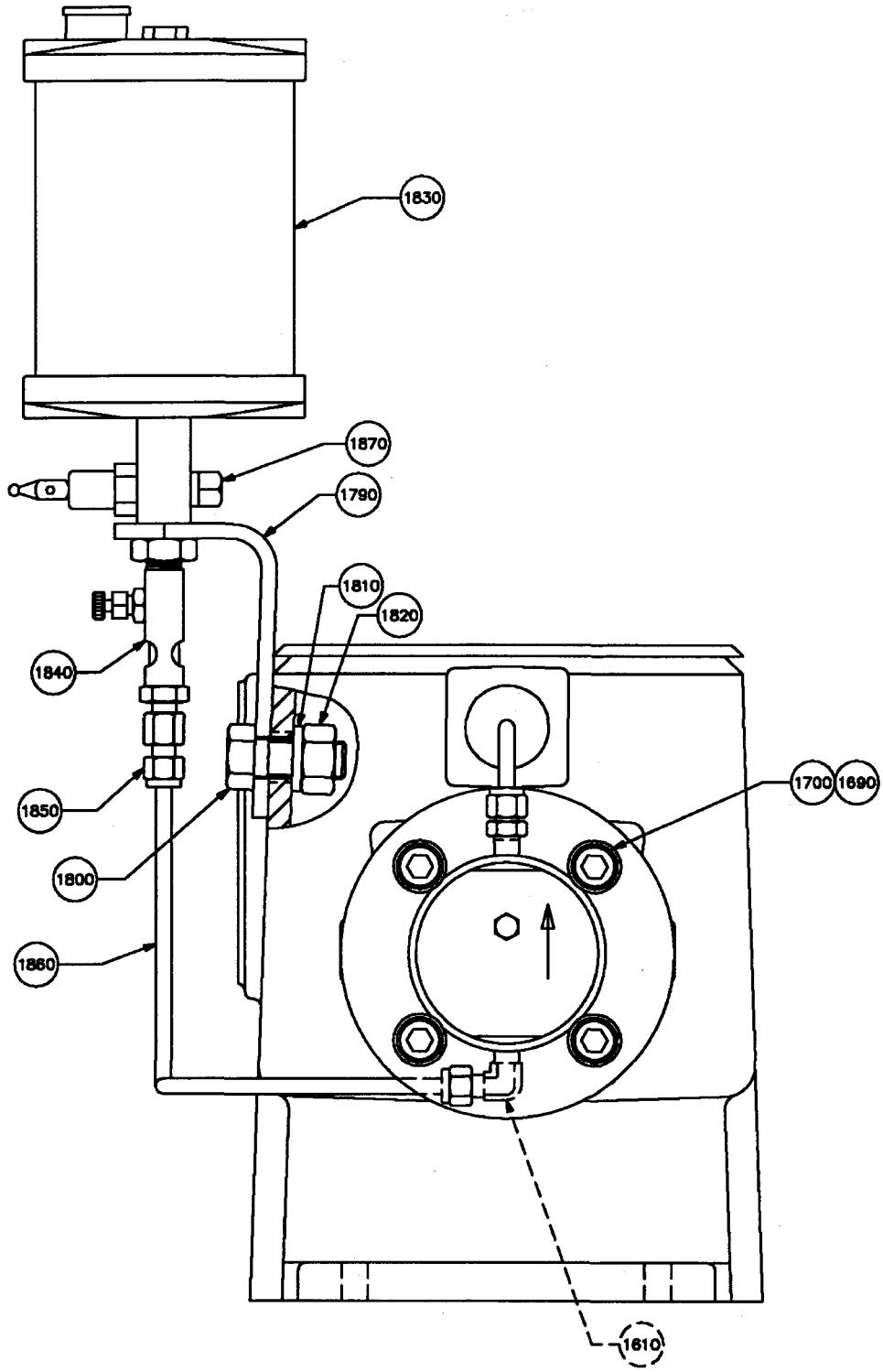

Figure 3

See Table 1 for item descriptions

Braided adjustable packing (Figure 2)

Initial Adjustments: Adjustable Plunger Packing ONLY (See Figure 2 and Table 2. Also see Product Code for identification).

Before pumping under load, break in plunger packing as follows: release gland cap (1660, Figure 2); then retighten one-quarter turn past finger tight. Tighten the gland cap until moderate resistance is felt. After 15 minutes, release then retighten again until moderate resistance is felt.

1 Inject a packing lubricant compatible with the liquid being pumped into the packing grease fitting (1625, Figure 2).
2. When adding grease to the packing grease fitting, stop the filling process once noticeable resistance on the grease gun handle is felt. Over-pressurizing the packing causes deformation of the packing and eariy failure.
3. Start pump.
4. Place pump in service and adjust output. If gland leaks, tighten a little at a time (1/6 turn) until leakage is minimized, waiting at least 5 minutes between adjustments to allow packing to settle.
5. If packing temperature increases, it may be necessary to loosen gland to prevent damage to packing.

If it is possible to tolerate some leakage at the gland cap, the leaking liquid will help cool and lubricate packing and plunger, greatly extending the life of each.

The first 24 hours of operation is critical to packing life. Packing adjusted too tightly will overheat and decompose rapidly, while properly adjusted packing will wear in with a good running surface. In some cases—especially at high pressures—frictional heat will expand the packing and the gland may have to be loosened during operation.

Packing

Lubricate the plunger packing daily with a lubricant compatible with the liquid being pumped. Do not add any other kind of lubricant to the packing.

Check Valves

Check valve assemblies are designed to be self-cleaning and should seldom need servicing. Fouled check valves can usually be cleaned by pumping a hot detergent solution for 15 minutes, followed by water flushing.

Packing Replacement (Adjustable packing type only)

Liquid End removal is similar to the method used on the Spring loaded packing configuration. Adjustable style packing (Figure 2) does not have the compression spring and the spacer and rings (1640, 1642, 1644) are different. Likewise, reassembly is similar the that shown under the "Liquid End Installation" section.

Follow "Initial Adjustments" section, after re-assembly of the liquid end.

Returning Units to the Factory

Pumps will not be accepted for repair without a Return Material Authorization, available from the Factory Repair Department. Pumps returned to the Factory for repairs should be clearly labeled to indicate the liquid being pumped. Process liquid should be flushed from liquid end before pump is shipped. These safety precautions will aid the troubleshooting and repair procedure and preclude injury to repair personnel from corrosive residue in pump liquid end. Material Safety Data Sheet must accompany all returns.

All inquiries or parts orders should be addressed to your local Milton Roy representative or sent to:

Parts Department:
Milton Roy Company
Flow Control Division
201 Ivyland Road
Ivyland, PA 18974
Phone: (215) 441-0800
FAX: (215) 441-8620

Milton Roy Company
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www.miltonroy.com

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