

## Gaulin Laboratory Homogenizers

Models 15MR & 31MR

FORM NO.: J899886

REVISION: 05/2018

READ AND UNDERSTAND THIS MANUAL PRIOR TO OPERATING OR SERVICING THIS PRODUCT.





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# 1. General Information

## 1-1. Introduction

The drive end, cylinder assemblies, valve assemblies, and accessories described in the following pages are standard on the 15MR and 31MR.

If any further information is needed regarding the installation or maintenance of your machine, please contact your local distributor, regional manager, or SPX FLOW Application Engineering. A qualified SPX FLOW service technician may be contracted to assist with installation and general start-up through your distributor.

Complete familiarity with your equipment and its working parts will give you an increased awareness of its construction and wide range of capabilities. Study this manual fully and carefully. It will help you to install the machine correctly, operate it safely and efficiently, and maintain it properly.

## 1-2. Damage in Transit

If equipment is damaged or lost in transit, file a claim at once with the delivering carrier. The carrier has a signed Bill of Lading acknowledging that the shipment has been received from SPX FLOW in good condition. SPX FLOW is not responsible for the collection of claims or replacement of materials due to transit shortage or damages.

## 1-3. Machine Weights, Dimensions and Specifications

(Applies to both 15MR and 31MR)

Height: 24" (610 cm)

Width: 36" (914 cm)

Depth: 38" (965 cm)

Weight: 410 lbs. (186 kg)

	15MR	31MR
Capacity (approximately + or – 5%)	15 gph (57 lph)	31 gph (117 lph)
Minimum Sample	One pint (500 ml)	One quart (1000 ml)
Operating Pressure		
• Continuous	8,000 psi (550 bar)	3,000 psi (200 bar)
• Intermittent (20 min. max)	10,000 psi (690 bar)	3,500 psi (240 bar)

## 1-4. Utility Requirements

1. The motor must be installed by qualified personnel, e.g., a licensed electrician, in accordance with local codes and the diagram on the electrical conduit box on the motor.
2. See the text in the "Installation" section, starting on page 7 of this manual, for details. The plunger spray system will require water connections.
3. Oil for the crankcase is not provided and must be purchased locally. The crankcase must be filled with oil. Refer to section 2-6 "Lubricating Oil" on page 7 for further instructions.

## 1-5. If Start-Up is Delayed More Than One Month

Often, homogenizers and high pressure pumps are not installed and placed in operation immediately after their arrival at the jobsite. As soon as possible after its arrival at the plant, the unit should be uncrated per instructions on page 7. After the spare parts and tools have been checked against the packing list, store them in a suitable place to prevent loss or damage.

There are many removable parts in the cylinder assembly, as shown on the applicable drawings. If the start-up is to be delayed for more than one month, remove all cylinder metal parts and gaskets and store them with the spare parts and tools, as listed above. Wrap all parts separately to prevent damage.

Parts in the power end have been cleaned and lightly coated with a lubricant, prior to shipping, as a temporary protection against rust. On delayed start-up it is essential that these parts be thoroughly coated with corrosion-proof grease or sprayed with a vapor-phase inhibitor.

The complete machine should then be covered with a plastic sheet or other suitable cover to protect it against weather, dirt, dampness, etc.

When the machine is installed on location, contact your local distributor and advise the approximate date of initial start-up, so that assistance and correct assembling instructions can be offered.

### **1-6. How to Order Parts**

Contact your local distributor. To help them to help you, please have the following information available:

1. Your machine **model** and **serial number**;
2. The **correct part number** and **name**, as identified from the parts lists or from illustrations in this manual.

The serial number can be found on a nameplate tag attached to the top of the base casting, forward of the oil fill and breather cap. For machines built after April 2018, refer to the parts lists or illustrations in this manual for a bill of material for these machines. Be careful to select the part numbers specific to your machine/requirements as noted. If there are any questions regarding the proper part numbers, please contact your local distributor for further assistance.

### **1-7. How to Return Materials**

Materials or equipment cannot be returned without a **Returned Material Authorization (RMA)** from the Seller or returns will not be accepted. Contact 800-252-5200 or 262-728-1900.

Materials and/or equipment accepted for credit are subject to a restock charge, plus all transportation charges.

Materials or equipment built to order are not subject to return for credit under any circumstances. Any materials or equipment authorized for return must be securely packed to reach SPX FLOW without damage.

### **1-8. Warranty**

LIMITED WARRANTY: Unless otherwise negotiated at the time of sale, SPX FLOW US, LLC (SPX FLOW) goods, auxiliaries and parts thereof are warranted to the original purchaser against defective workmanship and material for a period of twelve (12) months from date of installation or eighteen (18) months from date of shipment from factory, whichever expires first. If the goods or services do not conform to the warranty stated above, then as Buyer's sole remedy, SPX FLOW shall, at SPX FLOW's option, either repair or replace the defective goods or re-perform defective services. Third party goods furnished by SPX FLOW will be repaired or replaced as Buyer's sole remedy, but only to the extent provided in and honored by the original manufacturer's warranty. Unless otherwise agreed to in writing, SPX FLOW shall not be liable for breach of warranty or otherwise in any manner whatsoever for: (i) normal wear and tear; (ii) corrosion, abrasion or erosion; (iii) any good or services which, following delivery or performance by SPX FLOW, has been subjected to accident, abuse, misapplication, improper repair, alteration, improper installation or maintenance, neglect, or excessive operating conditions; (iv) defects resulting from Buyer's specifications or designs or those of Buyer's contractors or subcontractors other than SPX FLOW; or (v) defects resulting from the manufacture, distribution, promotion or sale of Buyer's products.

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## 2. Installation

### 2-1. Uncrating Instructions

Instructions for uncrating your machine are attached to the shipping crate. The top and sides of the crate can be removed, prior to moving the machine to the installation area, on the skids provided. Uncrating at the installation area is preferable. Take reasonable care to avoid damage to the unit while removing the crate.

### 2-2. Location

The 15MR and 31MR do not have to be bolted to a supporting area. The unit can be installed on the floor, a stationary or portable bench, or a table. Vibration dampening material installed between the machine and table can help alleviate excess noise and shaking. The 15MR and 31MR weigh 410 lbs. (186 kg), and consideration should be given to this when mounting on a dolly, bench, or table. Installing the unit with the handwheel height from the floor between 30" (76 cm) and 36" (91 cm) will simplify operation.

### 2-3. Removal from Skids

The machine must be lifted off the bolts that pass through the shipping skids.

### 2-4. Machine Leveling

The unit should be level for best operation. Use the machined surfaces of the cylinder block for leveling side-to-side and front-to-back.

### 2-5. Water Supply

This machine requires water for cooling the plunger packing. The plunger cooling inlet valve is supplied with a compression-type fitting to accommodate 1/4" (6.4 mm) ID plastic tubing (customer supplied). The plunger well drain line is equipped with a barbed fitting to accommodate a 5/16" (8 mm) ID plastic hose.

### 2-6. Lubricating Oil

A combination oil-splash and mist lubrication system is used on the gears, sleeve bearings, connecting rods and crossheads.



**OIL IS NOT FURNISHED WITH THIS MACHINE. DO NOT USE OIL OTHER THAN THAT SPECIFIED BELOW.**

Add the oil to the crankcase until the oil level is in the center of the oil level gauge. Oil capacity is approximately 2 gallons (7.5 liters)

**Specification:** The oil required is a premium-grade, paraffinic-base, A.G.M.A. No.5, industrial oil with a defoaming agent and oxidation and corrosion inhibitors. It has a viscosity of 1000/1165 SUS at 100°F/38°C. and 90 to 105 SUS at 210°F/99°C. with a viscosity index of 95, pour point + 10°F/-12°C: and flash point of 450°F/232°C. min.

## 2-7. Electrical

The motor provided with the machine has been selected to meet the specific requirements of the machine's capacity and operating pressure. It has been supplied according to specific electrical specifications and must be wired to meet local codes. When connecting power to the motor, ensure the direction of rotation is clockwise while facing the motor fan as indicated with the directional arrow mounted near the motor flange.


The Laboratory Homogenizer is a single-plunger, positive-displacement unit; therefore, the motor is under load only 50% of the time. This results in abnormal amperage 50% of the time. Most starting boxes will require heaters having a rating 50% higher than ampere rating on the motor. This condition will not cause motor failure or provide an unsafe condition.

Maintain the motor in accordance with the manufacturer's recommendations. Should difficulty arise, contact the motor manufacturer directly.

## 2-8. Product Piping

If used, it is essential that adequate product piping to the machine be provided. The suction (inlet) piping size must never be smaller than the suction (inlet) connection and should be as short as possible.

The inlet system for your machine must provide a constant flow of liquid to the cylinder at a pressure sufficiently above the product's vapor pressure to prevent flashing as the liquid enters the pumping chambers. If air bubbles are entrained in the liquid or if flashing occurs in the cylinder, volumetric efficiency will drop and homogenizing efficiency will suffer.

 <b>WARNING</b> Your machine is a positive-displacement pump. A three-way valve, designated for a continuous, open position, is supplied for altering the flow direction of processed material at the discharge directly from the unit to recirculation or sample taking. <b>NEVER USE A FLOW CONTROL VALVE!</b> To prevent damage to your machine, never stop the flow of processed material while the machine is in operation.
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### 3. Disassembly, Cleaning, Reassembly

#### 3-1. Introduction.

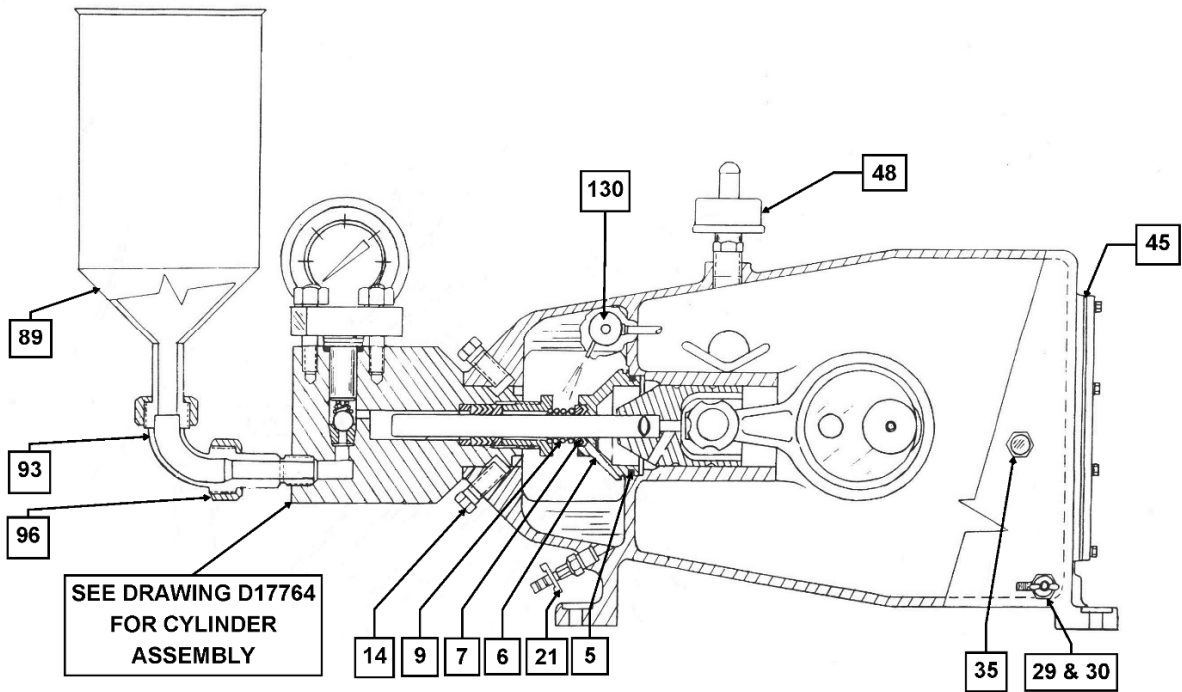
Gaulin brand laboratory homogenizers employ a single-plunger, positive-displacement pump equipped with a versatile homogenizing valve assembly, specifically designed for laboratory or pilot-plant use.

The following photographs provide the operator with step-by-step instructions for dismantling and reassembling the laboratory homogenizer for cleaning and normal maintenance. Since the photographs are based on a single-stage unit, the photograph of a two-stage unit is provided for reference in Figure 3-1, below.



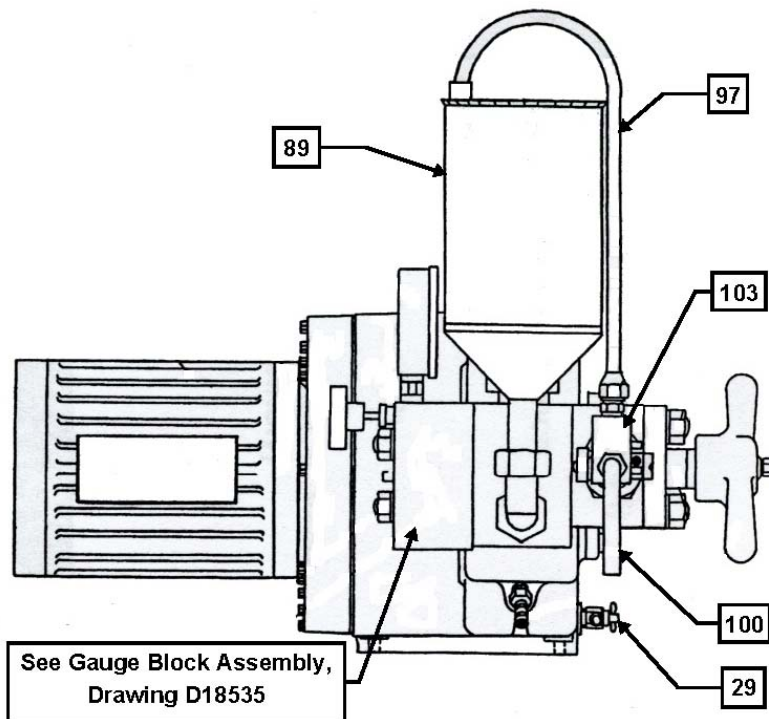
**Figure 3-1: Two-stage Homogenizer**

# Base



Note: for drawing D17764, see Figure 3-5 on page 14.

Figure 3-2



Note: for dwg D18535, see Figure 8-2 on page 38

Figure 3-3

## Parts List - Base

**Note: Items marked with an asterisk, (\*), are common service items.  
All other items should only be serviced by a qualified technician. Contact the distributor or factory if you have questions or require further assistance on these items. Unit of measure is each unless otherwise noted.**

Ref. Model	Ref. Motor Info.	Item	Part #	Description	Qty.
		1	J001009	BASE - 15/31MR	1
		2	J004000	ECCENTRIC	1
		3	J005000	CONNECTING ROD	1
		4	J008000	CROSSHEAD	1
		5	* J801730	O-RING; Ø78,97X3,53	1
15MR		6	* J009010	CROSSHEAD COVER-15MR	1
31MR			J009011	CROSSHEAD COVER-31MR	
15MR		7	* J415114	OIL SEAL	1
31MR			* J415115		
		9	* J405003	CROSSHEAD COVER SPRING	1
		10	J012004	OUTER BRG HOUSING CAP ASSY	1
		11	J012003	INNER BRG HOUSING CAP ASSY	1
	60 HZ	12	J056008	ELECTRIC MOTOR 3 3 60 230-460 1800 TEFC	1
	50 HZ		J056011	MOTOR 3HP, 3/50/190-380 182TC	
		13	J820168	SCREW ALLEN HD SET 0.375-16X0.75IN	1
		14	* J820169	SCREW SQUARE HD SET 0.625-11X1.75IN ST	2
		15	J116000	WRIST PIN	1
		17	J158001	OIL FLINGER	1
		18	J820164	SCREW SQUARE HD SET 0.375-16X0.75IN ST	2
		19	J820113	SCREW HEX HD CAP 0.5X13X1IN STEEL	8
		20	J820184	SCREW HEX HD CAP 0.5-13X1.75IN STEEL	4
		21	* J827138	DRAIN-COCK 0.125IN NPT BRASS	1
		22	J81410292	NAME PLATE - CE DELAVAN	1
15MR	60 HZ	24	J399002	BASE COVER	1
15MR	50 HZ		J399003		
31MR	60 HZ		J399003		
		25	J341004	BASE COVER GASKET	1
		26	000037013+	KEY 3/8 X 3/8 X 1 3/8	1
		27	J820258	SCREW HEX HD CAP 0.3125-18X2.25IN STEEL	15
		28	J801581	O-RING;	12
		29	* J827136	DRAIN COCK 0.25"NPT BRASS	1
		30	J830037	BUSHING REDUCING 0.25INX0.125IN BRASS	1
		33	M525S1670AB	PIN SS A 0.25 0.875 TYPE 18-8	2
		35	* J412800	GAUGE, OIL LEVEL 1.25 NPT CONN ST/CH PLT	1
		36	J821103	WASHER SPR LOCK 0.5" STEEL	4
		37	J129000	DRIVESHAFT	1
		38	J340000	DRIVESHAFT BEARING	2

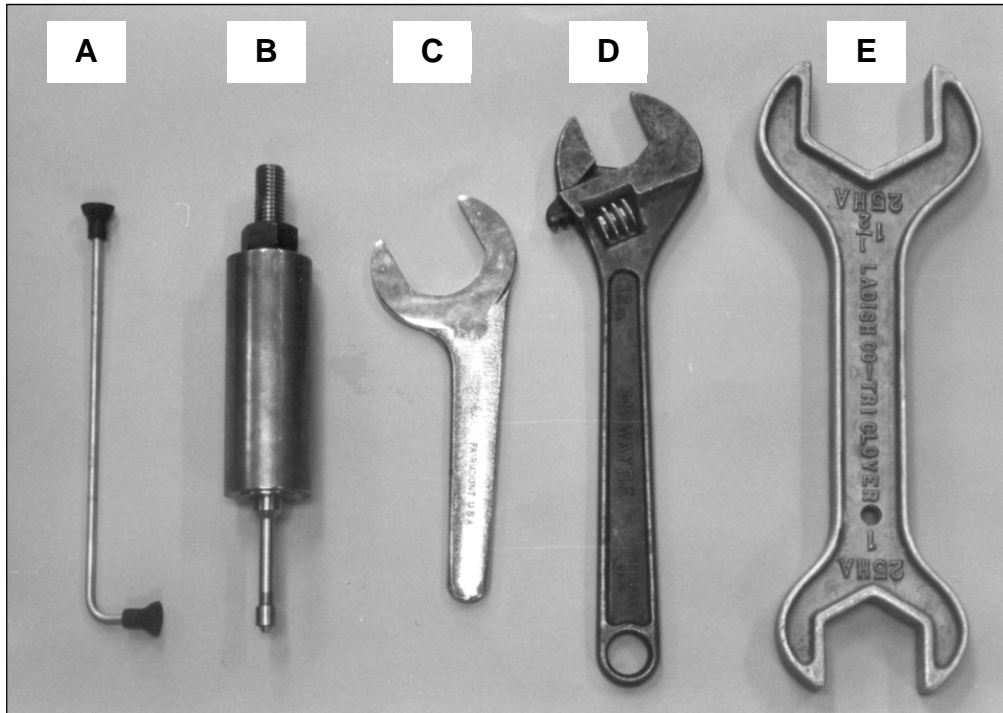
## Parts List – Base, continued

**Note:** Items marked with an asterisk, (\*), are common service items.  
**All other items should only be serviced by a qualified technician. Contact the distributor or factory if you have questions or require further assistance on these items. Unit of measure is each unless otherwise noted.**

Ref. Model	Ref. Motor Info.	Item	Part #	Description	Qty.
		39	J350001	GEAR, DRIVE SHAFT PINION	1
		40	J082000	DRIVESHAFT KEY	1
		41	J400001	DRIVESHAFT GEAR	1
		42	J349001	GEAR, ECCENTRIC SHAFT	1
15MR	60 HZ	43	J401010	PINION. SHAFT HELICAL	1
15MR	50 HZ		J401011		
31MR	60 HZ		J401011		
		44	J399004	REAR COVER	1
		45	* J341005	REAR COVER GASKET	1
		48	* J899904	CAP, OIL FILTER BREATHER	1
		49	J800595	GASKET, FLAT	1
		89	* J903049	TANK ASSEMBLY/1 GALLON 316SS	1
		93	* 137-270X	2C-7 1.0" 316L	1
		94	J841070	UNION TUBING 0.5T IN 316SS	3
		95	J840114	FERRULE SANITARY 1.5 X 0.75-16FNPT 316SS	1
		96	* 36-2X	13H 1.5" 316 HEX NUT	1
		97	* J903036	BYPASS TUBE SUB ASSY	1
		100	* J903029	DISCH TUBE SUB ASSY	1
		103	* J560019	3 WAY VALVE BODY ASSEMBLY	1
		103	J840343	DISCHARGE FITTING FOR 3-WAY VALVE	1
		126	J841382	SCREWED CONNECTION	1
		127	J831023	ANGLE NEEDLE VALVE	1
		128	J841346	ADAPTER BULKHEAD 0.125FP X 1.5LG IN BRS	1
		130	* J842141	ASSEMBLY, NOZZLE	1
		133	J830052	BUSHING HEX HEAD SOLID	1
		134	J823410	EYE BOLT 0.5-13IN STEEL ASTM A489	1
		135	J81410293	NAME PLATE	1
		138	J899853	DECAL, MOTOR DIRECTION ROTATION	1
		139	J27330007	STICKER, CAUTION/WARNING	1



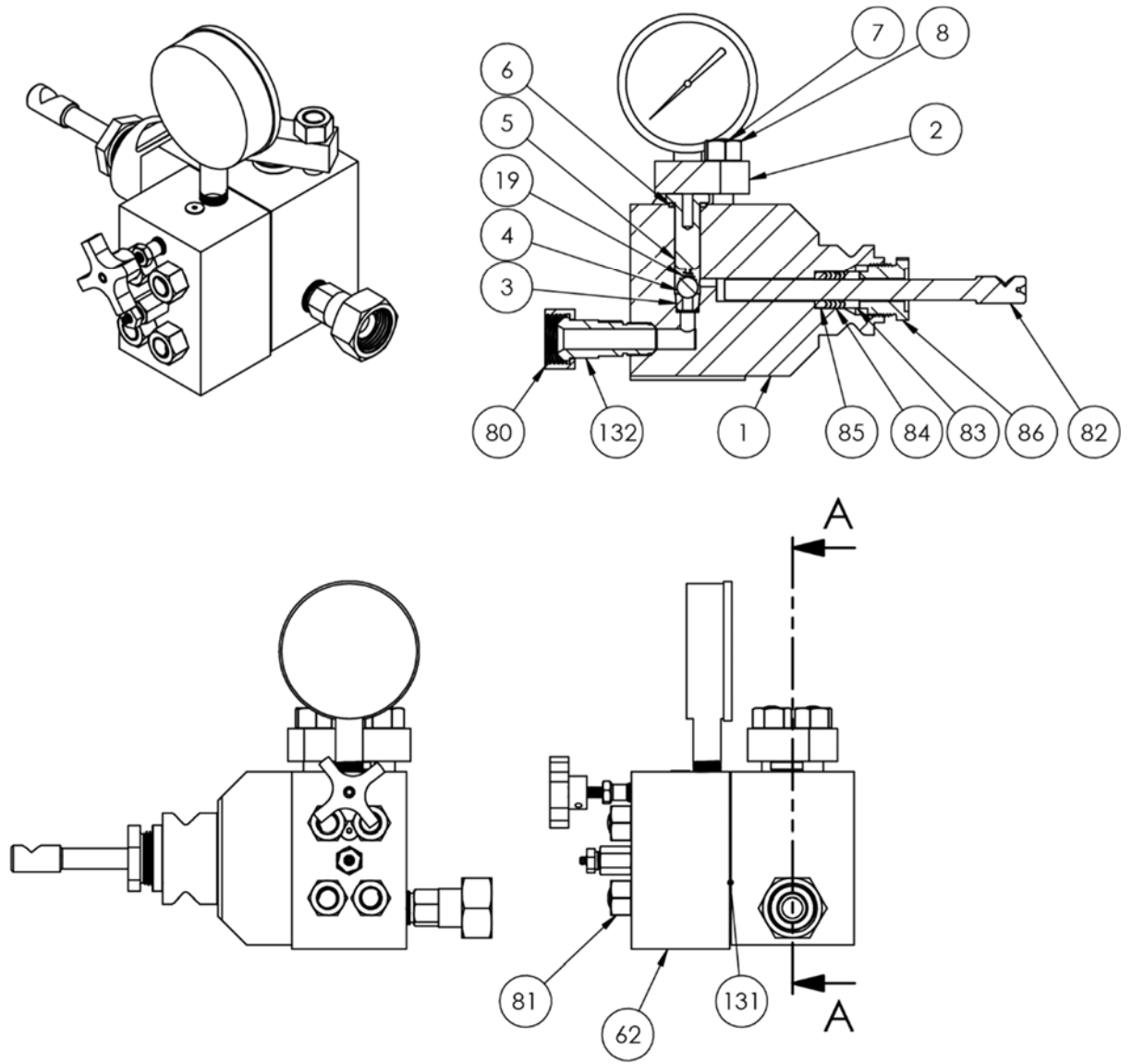
## Tool List



**Figure 3-4**

<b>Item</b>	<b>Description</b>	<b>Part No.</b>
<b>A</b>	Ball Valve Removal Tool	J373407
<b>B</b>	Tapered Pump Valve Seat Removal Tool (see instructions for use on page 26)	J373346
<b>C</b>	Packing Adjusting Screw Wrench	J812905
<b>D</b>	General Wrench	J812936
<b>E</b>	Sanitary Pipe Wrench (1 x 1Y2")	J812403
<b>F</b>	Allen Wrench (3/16") (not shown)	J812341
<b>18</b>	Grease Fitting (not shown)	J171403
<b>19</b>	Adapter (not shown)	J843009
<b>N/S</b>	Grease Gun (not shown)	J373900

### Cylinder Assembly



Ref. D17764

Figure 3-5

## Parts List – Cylinder Assembly

Note: part numbers below apply to both the 15MR and 31MR, and unit of measure is each, unless otherwise noted.

Model	Item	Part #	Description	Qty.
15MR	1	J127016	CYLINDER BLOCK	1
31MR		J127017		
	2	J015004	CAP, UPPER	1
	3	J036001	VALVE SEAT	1
	4	J035102	BALL	1
	5	J015005	UPPER CAP PLUG	1
	6	J802745	FLAT GASKET; 19,60X28,50X3,20	1
	7	J569202	STUD; 0.625-11UNC X 2.75"	2
	8	J570010	NUT, 5/8"	2
	9	J408113	STUD; 0.625-11 X 4.500"	4
	19	J039104	SPRING	1
15MR	62	J900065	ASSEMBLY, DAMPENER GAUGE BLOCK	1
31MR		J900066		
	80	36-1	13H 1.0" 304 HEX NUT	1
	81	J570010	NUT, 5/8"	4
15MR	82	J122009	PLUNGER; Ø15,90X233	1
31MR		J122001		
15MR	83	J027003	RING, FOLLOWER	1
31MR		J027000		
15MR	84	J507316	PLUNGER PACKING; 1.125" X 0.625" X 0.142"	4
31MR		J503029		
15MR	85	J026006	BUSHING, THROAT FRONT	1
31MR		J026001		
15MR	86	J025001	SCREW, PACKING ADJUSTING	1
31MR		J025000		
	131	J802667	FLAT GASKET; 27,40X36,40X3,20	1
	132	J151005	INLET CONN NIPPLE	1

### 3-2. Disassembly

Remove the discharge tube (100) and bypass tube (97).

See Figure 3-6.



**Figure 3-6**

Remove the feeder tank (89) using a wrench (item E in the tool list on page 13) to loosen the nut.

See Figure 3-7.



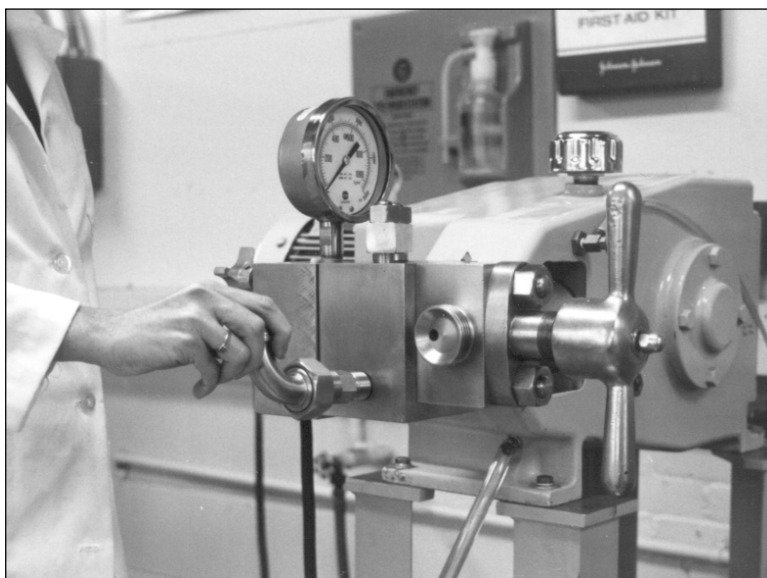
**Figure 3-7**

Remove the three-way valve bypass assembly (103).  
See Figure 3-8.



**Figure 3-8**

Remove the tank nut (96) and tank elbow (93). Use a sanitary pipe wrench (item E in the tool list on page 13) to loosen the nut.  
See Figure 3-9.

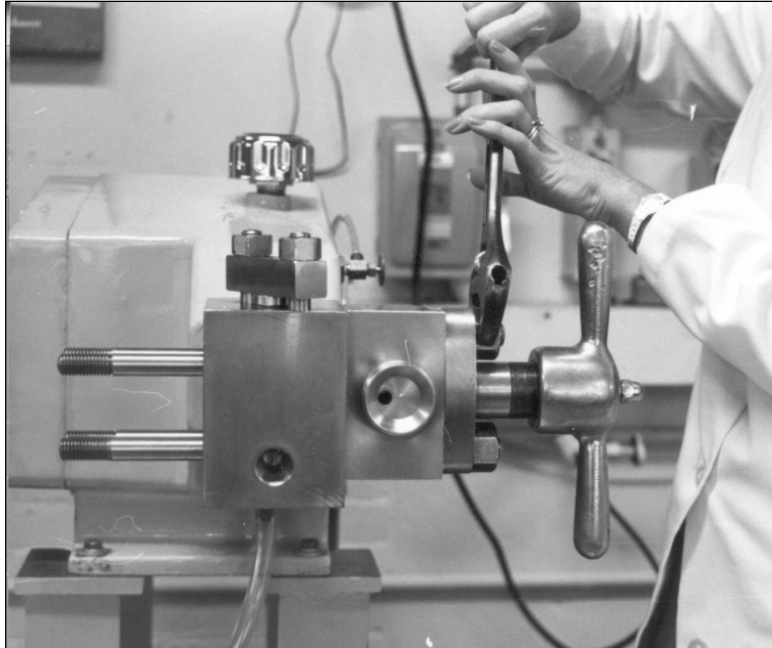


**Figure 3-9**

Remove the two valve body stud nuts (9 for single stage; 19 for two-stage) with a wrench (item D in the tool list on page 13).

Note: On two-stage units, remove the second stage valve body stud nuts first (24).

See Figure 3-10.



**Figure 3-10**

Remove the handwheel (1) and handwheel support (2). See Figure 3-11.

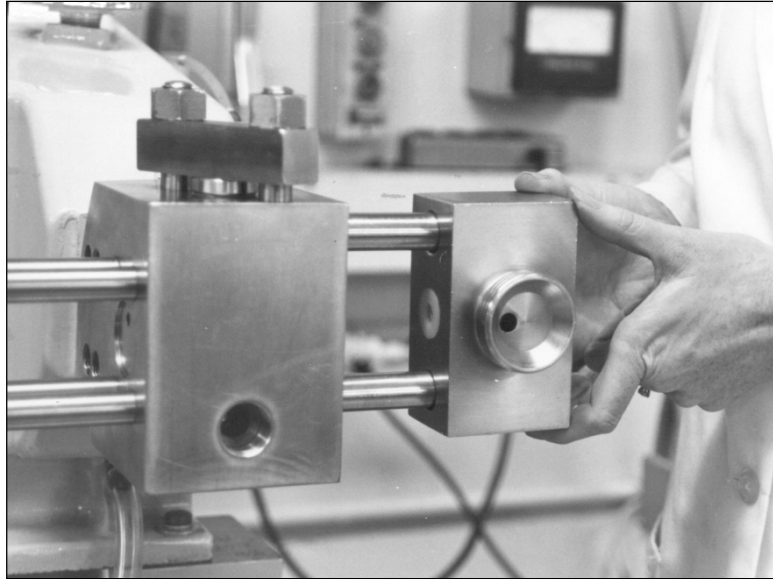
Note: See Figure 3-13 on page 19 for a two-stage assembly.



**Figure 3-11**

Remove the valve body (5). See Figure 3-12.

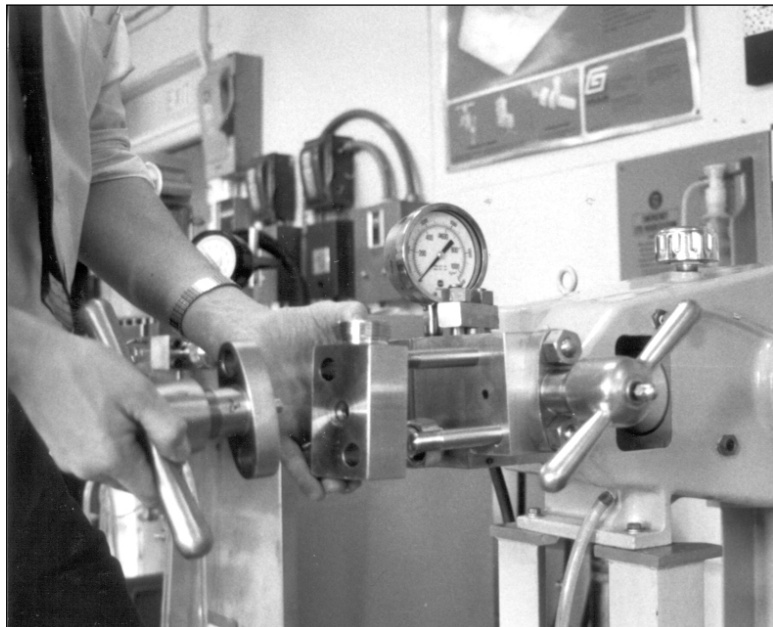
Note: See Figure 3-13 for a two-stage assembly.



**Figure 3-12**

Remove the second stage handwheel (23), handwheel support (22), and valve body (16).

See Figure 3-13.



**Figure 3-13**

Remove the dampener gauge block assembly stud nuts (see item 81 in the cylinder assembly, Figure 3-5, on page 14) with a wrench (item D in the tool list on page 13) or closed-end wrench, if available.

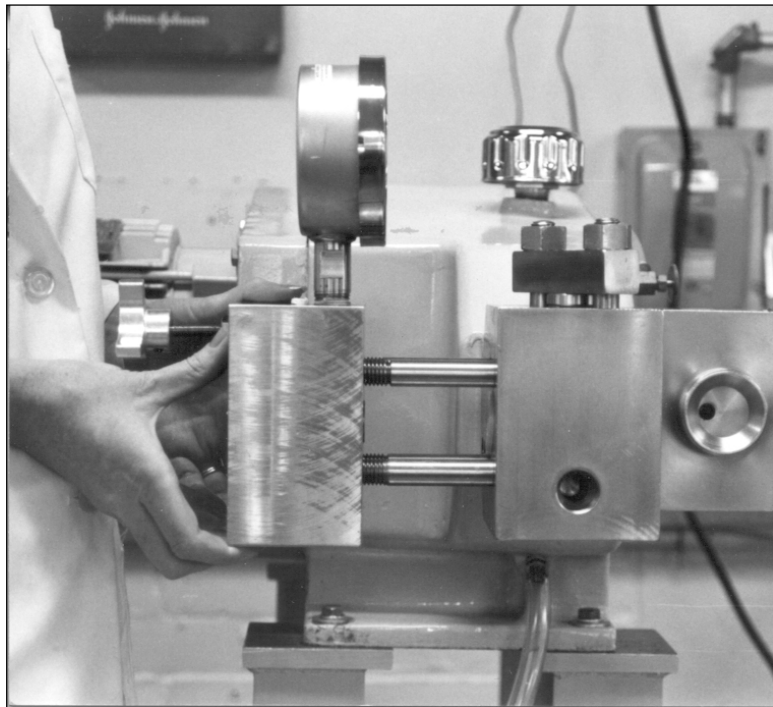
See Figure 3-14.



**Figure 3-14**

Remove the dampener gauge block assembly (62) as a complete assembly. See Figure 3-15.

(See Figure 8-2 on page 37 for dampener gauge block assembly details.)



**Figure 3-15**



Remove the upper cap stud nuts (8) and upper cap (2) with a wrench (item D in the tool list on page 13) or closed-end wrench, if available.

See Figure 3-16.



**Figure 3-16**

Remove the upper cap plug (5), spring (19), and gasket (6).

See Figure 3-17.



**Figure 3-17**

Remove the ball valve (4) with the ball valve removal tool (item A in the tool list on page 13).

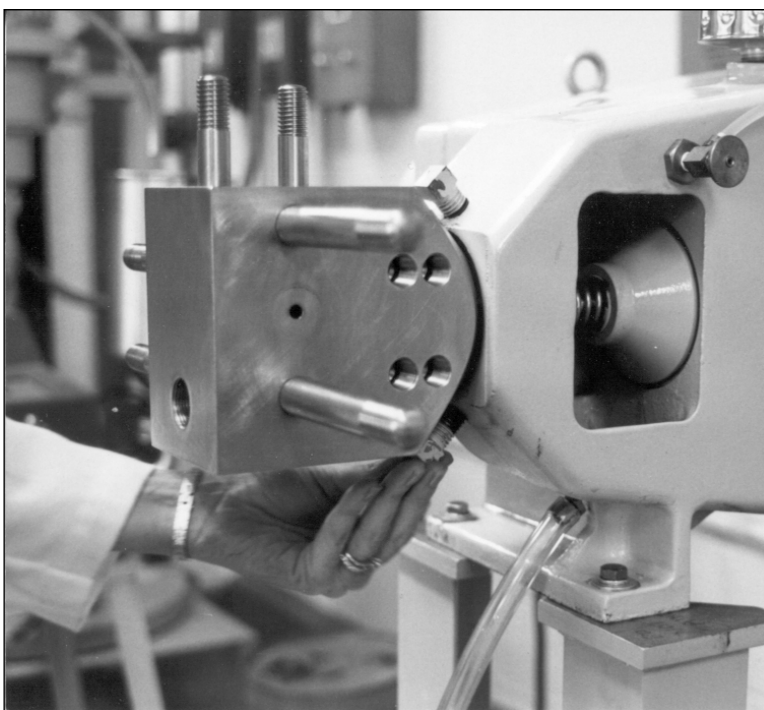
See Figure 3-18.



**Figure 3-18**

Loosen the packing adjusting screw (86) slightly and then loosen the top and bottom cylinder set screws (14) using a wrench (item D in the tool list on page 13).

See Figure 3-19.



**Figure 3-19**

Slide the cylinder block off the cylinder studs by lifting and pulling. See Figure 3-20.



Figure 3-20

**CAUTION**

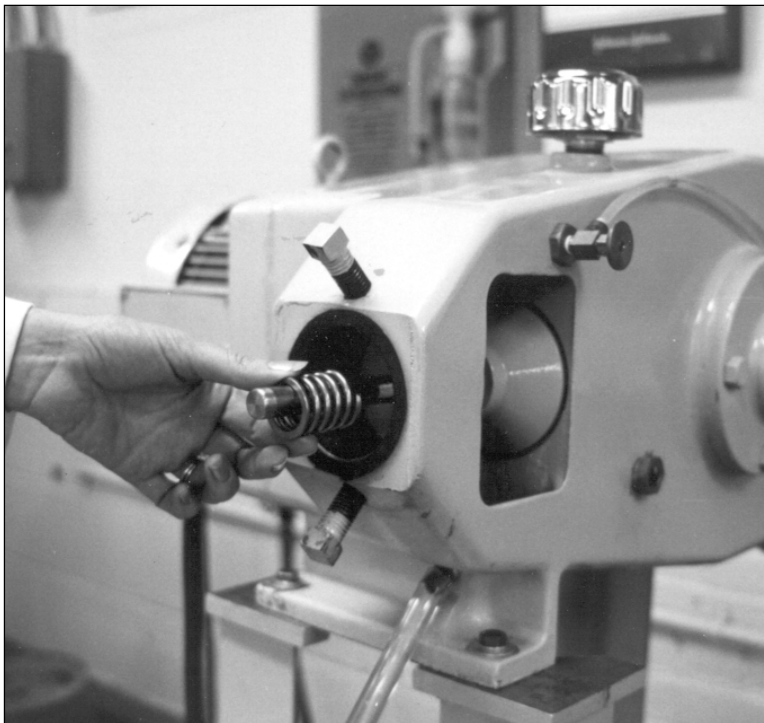
The cylinder block weighs approximately 30 lb. (14 kg). Do not allow the block to rest on the plunger—irreparable damage to the plunger will result.



Figure 3-21

Remove the crosshead cover spring (9).

See Figure 3-22.

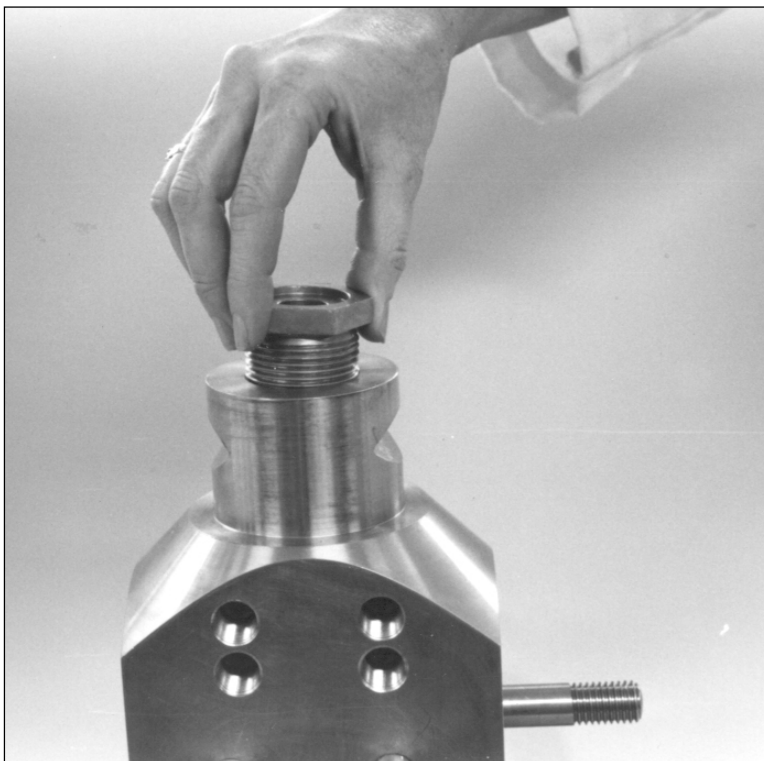


**Figure 3-22**

Remove the packing adjusting screw (86) from the cylinder block with the packing adjusting screw wrench (item C in the tool list on page 13).

See Figure 3-23.

(Refer to cylinder assembly drawing in Figure 3-5 on page 14 for details.)



**Figure 3-23**

By hand, remove the follower ring (83), plunger packing (84), and throat front bushing (85).

See Figure 3-24.

Plunger packing quantity:

15MR = 4 pieces

31MR = 3 pieces

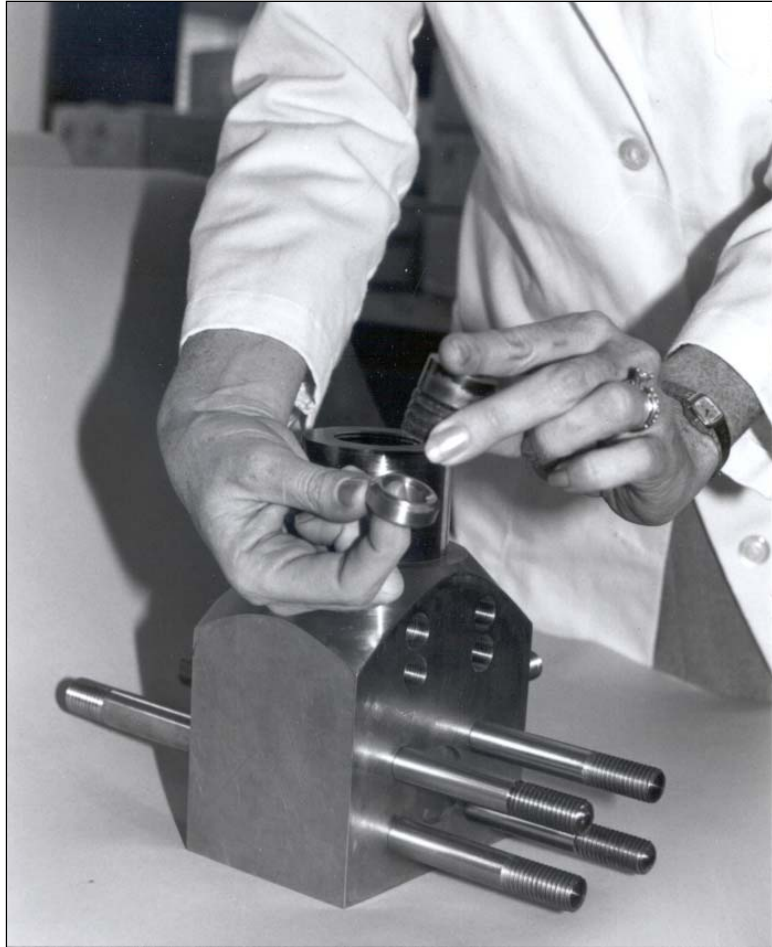


Figure 3-24

### 3-3. Plunger Removal

Remove the Crosshead Cover (6). A flat screwdriver may be necessary to pry the cover off and break the O-ring seal.

Loosen the setscrew in the crosshead, then remove the plunger.

See Figure 3-25.

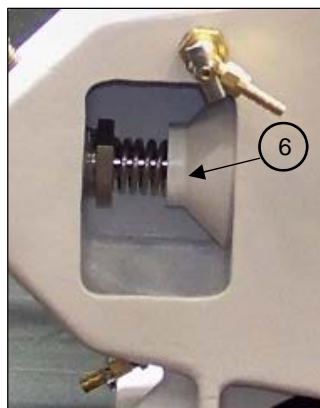


Figure 3-25

### 3-4. Cleaning

Clean all parts thoroughly. Use brushes. Do not use metal brushes, sponges, or other abrasive aids on parts. Be careful to prevent metal parts from striking each other or other metal objects.

Lubricate all external threads with an acceptable lubricant before reassembling. Repeat this procedure on disassembly for at least one month to allow the threaded parts to become work-hardened.

### 3-5. Reassembly

Reassemble the homogenizing valve assembly per the instructions in section 4 starting on page 30. Then, using Figure 8-1 on page 35, Figure 3-23 and Figure 3-24 on page 25 and Figure 3-5 on page 14) for reference:

1. Insert the throat front bushing (85) into the cylinder block (1), flat side facing inward.
2. Insert 3 or 4\* pieces of plunger packing (84), concave side facing inward.  
(\* 4 pieces of plunger packing for 15MR; 3 pieces for 31MR)
3. Insert the follower ring (83) concave side facing inward.
4. Install the packing adjusting screw (86) hand-tight.

To reassemble the remainder of the unit, follow the steps for disassembly (page 30 for single-stage; page 31 for two-stage) in reverse. Make sure all nuts are tightened.

### 3-6. Dampener Gauge Block Assembly

For normal maintenance, the dampener gauge assembly is not disassembled. If this becomes necessary, refer to "Dampener Gauge Block Assembly" on page 40.

### 3-7. Use of Pump Valve Seat Removal Tool J373346

See Figure 3-26 and Figure 3-27.

1. Remove the small, round nut from the tip of the removal tool. Insert in the inlet bore under the valve seat.
2. Insert the valve seat removal tool stem into the top bore and screw it into the small round nut.
3. Attach the tool sleeve. Insert the nut on the threaded end of the stem.
4. Tighten all parts and apply pressure with a wrench (item D in the tools list on page 13) to the top nut to remove the valve seat.
5. To reassemble, use the instructions in the Maintenance Section starting on page 35.



Figure 3-26



Figure 3-27

#### 4. Homogenizing Valve Assemblies

##### Single-Stage Homogenizing Valve Assembly

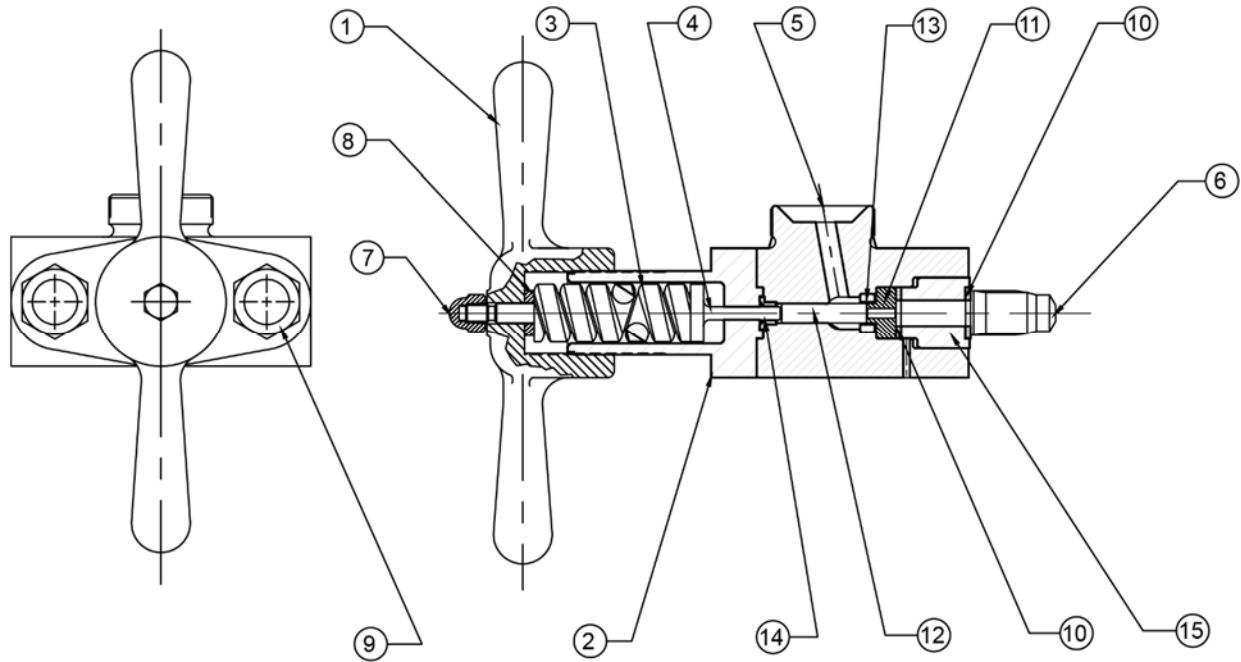
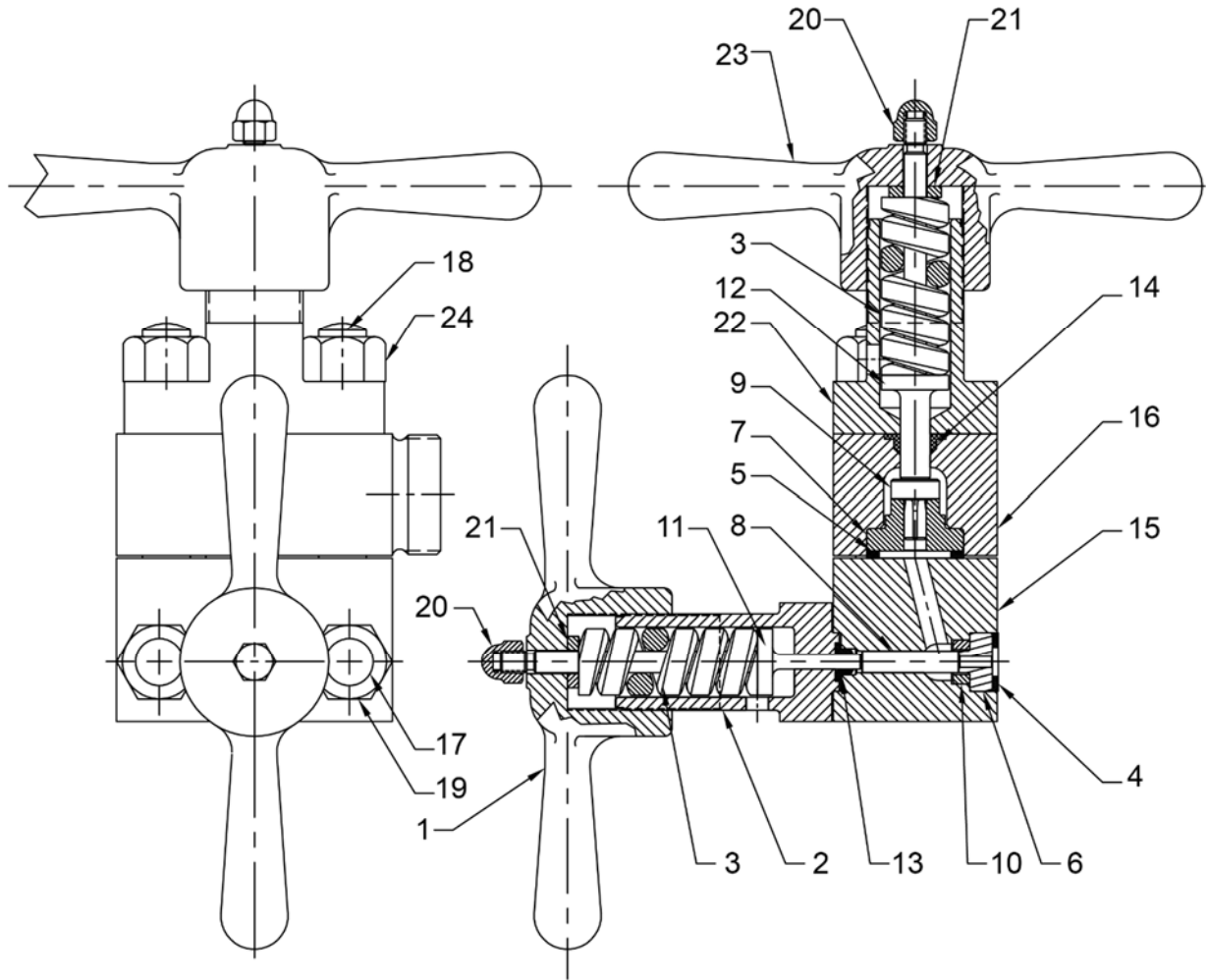


Figure 4-1

Material	Item	Part #	Description	Qty.	Units
	1	J010200	HANDWHEEL	1	EA
	2	J017100	SUPPORT, HANDWHEEL	1	EA
	3	J038200	SPRING	1	EA
	4	J130103	ROD, HOMO VALVE	1	EA
	5	J178105	BODY, SINGLE STAGE VALVE	1	EA
	6	J189368	STUD, STRAIGHT	2	EA
	7	J498200	NUT, HEX CAP	1	EA
	8	J501200	WASHER, VALVE ROD	1	EA
	9	J570012	NUT,HEAVY HEX	2	EA
	10	J802645	FLAT GASKET; 12,70X25,20X2,50	1	EA
<b>Cobalt Based Wear Resistant Alloy</b>	11	J124100	HOMOGENIZER VALVE SEAT	1	EA
<b>Tung. Carbide</b>		J124105			
<b>Ceramic</b>		J124129			
<b>Cobalt Based Wear Resistant Alloy</b>	12	J125100	HOMOGENIZING VALVE, PLUG	1	EA
<b>Tung. Carbide</b>		J125104			
<b>Ceramic</b>		J125120			
<b>Cobalt Based Wear Resistant Alloy</b>	13	J126117	IMPACT RING	1	EA
<b>Ceramic</b>		J126119			
	14	J145100	PACKING	1	EA

# Two-Stage Homogenizing Valve Assembly



Ref. D21086

Figure 4-2



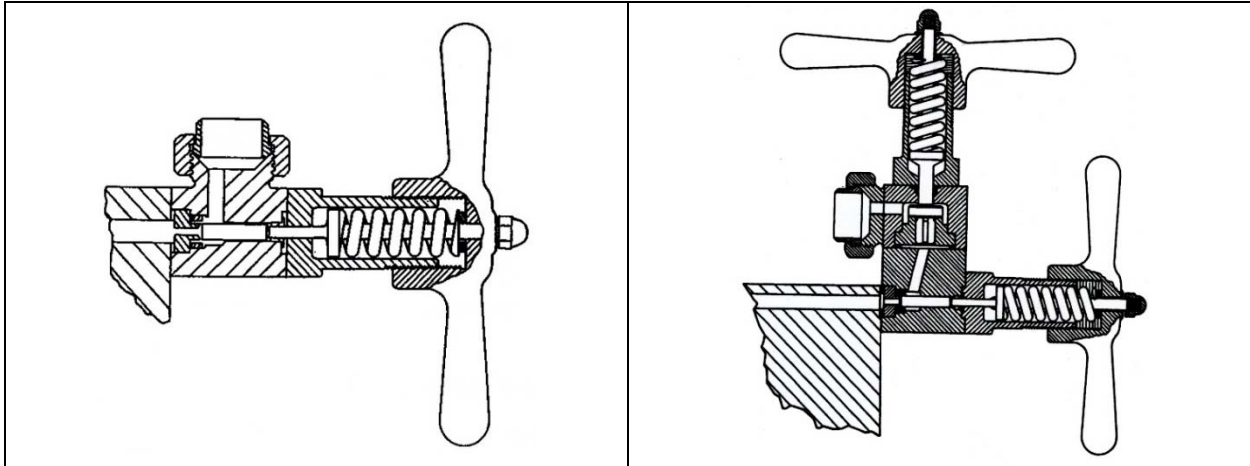
## Two-Stage Homogenizing Valve Assembly - Bill of Materials

Material Options	Item	Part #	Description	QTY	Units
	1	J010200	HANDWHEEL	1	EA
	2	J017100	SUPPORT, HANDWHEEL	1	EA
	3	J038200	SPRING	2	EA
	4	J802645	FLAT GASKET; 12,70X25,20X2,50	1	EA
	5	J802662	FLAT GASKET; 30,60X41,00X3,20	1	EA
<b>Cobalt Based Wear Resistant Alloy</b>	6	J124100	HOMOGENIZING VALVE SEAT	1	EA
<b>Tung. Carbide</b>		J124105			
<b>Ceramic</b>		J124129			
<b>Cobalt Based Wear Resistant Alloy</b>	7	J124206	HOMOGENIZING VALVE SEAT	1	EA
<b>Tung. Carbide</b>		J124216			
<b>Cobalt Based Wear Resistant Alloy</b>	8	J125100	HOMOGENIZING VALVE, PLUG	1	EA
<b>Tung. Carbide</b>		J125104			
<b>Ceramic</b>		J125120			
<b>Cobalt Based Wear Resistant Alloy</b>	9	J125207	HOMOGENIZING VALVE, PILOT	1	EA
<b>Tung. Carbide</b>		J125215			
<b>Cobalt Based Wear Resistant Alloy</b>	10	J126117	IMPACT RING	1	EA
<b>Tung. Carbide</b>		J126105			
<b>Ceramic</b>		J126119			
	11	J130103	ROD, HOMO VALVE	1	EA
	12	J130104	ROD, HOMO VALVE	1	EA
	13	J145100	PACKING	1	EA
	14	J145200	PACKING	1	EA
	15	J178104	BODY, FIRST STAGE VALVE	1	EA
	16	J178103	BODY, SECOND STAGE VALVE	1	EA
	17	J189368	STUD, STRAIGHT	2	EA
	18	J189203	STUD; 3/4"-10UNCX100	2	EA
	19	J570012	NUT, HEAVY HEX	4	EA
	20	J498200	NUT, HEX CAP	2	EA
	21	J501200	WASHER, VALVE ROD	2	EA
	22	J017200	SUPPORT, HANDWHEEL	1	EA
	23	J010200	HANDWHEEL	1	EA
	24	J570012	NUT, HEAVY HEX	2	EA

#### 4-1. Introduction

Laboratory homogenizers can be supplied with a single-stage homogenizing valve assembly or a two-stage valve assembly, recommended for emulsions. Cobalt based wear resistant alloy is standard for homogenizing valves, seats, and impact rings, and is suitable for emulsions and some dispersions. For abrasive applications, tungsten carbide material is also available.

Laboratory homogenizers can also be equipped with a ceramic valve for cell disruption. These parts are constructed of ceramic for long wear life.



**Figure 4-3: Single-Stage Homogenizing Valve Assembly**

**Figure 4-4: Two-Stage Homogenizing Valve Assembly**

#### 4-2. Single-Stage Homogenizing Valve

Refer to Figure 4-1 on page 27.

#### 4-3. Valve Disassembly

1. Remove the single-stage valve body stud nuts (9), single-stage handwheel (1), and handwheel support (2).
2. Remove the single-stage valve body (5) assembly, being careful not to drop the valve and seat.
3. Remove the valve seat gasket (10), valve seat (11), impact ring (13), and valve (12).

#### 4-4. Cleaning

Clean all parts thoroughly. Use brushes. Do not use metal brushes, sponges or other abrasive aids on parts. Be careful to prevent metal parts from striking each other or other metal objects.

Lubricate all external threads with an acceptable lubricant before reassembling. Repeat this procedure on disassembly for at least one month to allow the threaded parts to become work-hardened.

#### 4-5. Valve Reassembly

1. Lubricate the valve (12) with an acceptable lubricant and insert it in the valve body (5), making sure that the valve moves freely.
2. Install the impact ring (13), valve seat (11), and valve seat gasket (10).
3. Slide the valve body assembly over the studs (6).
4. Reassemble the handwheel (1) and handwheel support (2) assembly on the studs (6).
5. Replace the stud nuts (9) and tighten them evenly and securely.

#### **4-6. Two-Stage Homogenizing Valve**

Refer to Figure 4-2 on page 28.

#### **4-7. Valve Disassembly**

1. Remove the second-stage valve body stud nuts (24), second-stage handwheel (23) and handwheel support (22).
2. Remove the second-stage valve body (16) being careful not to drop the valve and seat.
3. Remove the valve (9), seat (7) and gasket (5) from the second-stage body (16).
4. Remove the first-stage valve body stud nuts (19), first-stage handwheel (1) and handwheel support (2).
5. Remove the first stage valve body (15) assembly, being careful not to drop the valve components.
6. Remove the valve seat gasket (4), valve seat (6), impact ring (10) and valve (8).

#### **4-8. Cleaning**

Clean all parts thoroughly. Use brushes. Do not use metal brushes, sponges or other abrasive aids on parts. Be careful to prevent metal parts from striking each other or other metal objects.

Lubricate all external threads with an acceptable lubricant before reassembling. Repeat this procedure on disassembly for at least one month to allow the threaded parts to become work-hardened.

#### **4-9. Valve Reassembly**

1. Lubricate the valve (8) with an acceptable lubricant and insert in the valve body (15), making sure that the valve moves freely.
2. Install the impact ring (10), valve seat (6) and valve seat gasket (4).
3. Slide the valve body assembly over the studs (17).
4. Reassemble the handwheel (1) and handwheel support (2) assembly on the studs.
5. Replace the stud nuts (19) and tighten them evenly and securely.
6. Assemble the second-stage valve (9) and valve seat (7) into the valve body (16).  
NOTE: To guard against possible valve stem breakage, be certain that valve (9) remains inserted into the valve seat (7) after the assembly has been placed into position in the valve body.
7. Assemble the valve seat gasket (5) into the second-stage valve body (16).
8. Assemble the second-stage valve body (16) to the first-stage valve assembly on the studs (18).
9. Assemble the handwheel support (22) and handwheel (23) as a unit onto the valve body studs (18).
10. Replace the stud nuts (24) and tighten them securely.

## **5. Product Characteristics and Conditions**

### **5-1. Introduction**

The Laboratory Homogenizer can be used for processing many different types of products in the chemical, food, dairy, cosmetic, and pharmaceutical industries. These products include water-in-oil emulsions, oil-in-water emulsions and dispersions of many types (solids dispersed in water or oils). Food products include ketchup, baby foods, fudge toppings, flavor emulsions, peanut butter, fruit nectars and soy beverages.

Before running a material through the Laboratory Homogenizer, it is helpful to consider the nature of the material and the processing conditions.

### **5-2. Temperature**

If the material to be processed is temperature-sensitive, it should be chilled before running, and cooled after each pass. Homogenization adds heat to the product and the higher the pressure, the greater the added energy. If the material requires heating, either to melt one or more phases or to reduce viscosity, then it might be necessary to preheat the cylinder. Preheating can be done by recycling a hot liquid compatible with the product, or by using electric heaters in a specially-cored cylinder block. Preheating the metal in contact with the material to be processed prevents solidification of the product in the pumping chamber, and, thereby, loss of pumping action.

### **5-3. Flammability**

If the material to be processed is highly flammable, then the unit should have an explosion-proof motor, and all switches and controls in the vicinity of the unit should be explosion-proof.

### **5-4. Viscosity**

For gravity feeding to the Laboratory Homogenizer, the product should be pourable. There is no absolute value for the maximum viscosity of a gravity-fed material; however, even though the unit will pump a gravity-fed, high-viscosity product, the output of the pump will be reduced. This could affect homogenized product quality. Therefore, for high-viscosity products, a pressure feeder should be used to assure proper pumping efficiency.

### **5-5. Solids or Precipitates**

Large, gritty particles may cause pumping problems in the unit by lodging between the ball pump valve and seat. In this condition, the unit may pump without homogenizing pressure; however, when homogenizing pressure is applied, the fluid is forced back through the pump valve (between the ball and seat), which stops the pumping action. This problem can also occur with products that coat the pump ball valve, such as fibrous materials (cellulose) or latex dispersions. The unit may run for some time before build-up occurs and pumping becomes erratic. If this happens, the pump valve and homogenizing valve should be inspected and cleaned. If the particles are too large and the machine does not pump, these particles need to be ground or milled to a smaller size. In some cases, the pressure feeder may help with the pumping problem.

### **5-6. Compatibility**

Make sure that the material to be processed is compatible with the gaskets and plunger packing.

### **5-7. Abrasiveness**

If the processed material is abrasive, wear-resistant carbide or ceramic parts should be used for the pump valve seat and homogenizing valve assembly.

### **5-8. Cell Disruption**

If the unit is to be used for cell disruption, then the homogenizing valve should be of "CD" design.

## 6. Operation

### 6-1. Start-Up and Operation

1. Open the homogenizing valve or valves by backing off the handwheel or wheels (single-stage and/or two-stage). Turn in the pressure dampener knob until snug. **Do not over-tighten!**
2. Start the homogenizer. When the unit pumps steadily, set the pressure.

- a. Two-Stage Homogenizing Valve Assembly:

The first-stage body is attached directly to the cylinder block. The second-stage body is attached to the first-stage body, from which product is discharged to the bypass assembly. Always adjust the second-stage valve first, reading the pressure on the pressure gauge. To achieve proper adjustment, set the second-stage pressure between 10 and 15% of the total pressure.

For example, if the total required homogenizing pressure is 5000 psi (345 bar), then the second stage would be adjusted to 500 psi (34 bar).

Next, adjust the first-stage valve until the required total homogenizing pressure is read on the pressure gauge. It may be necessary to tighten the pressure dampener knob to dampen the motion of the pressure gauge needle. If the unit does not begin to pump steadily, release and reapply handwheel pressure a few times to prime the unit, before setting the second-stage pressure.

- b. Single-Stage Homogenizing Valve Assembly:

Set the homogenizing pressure with the handwheel. It may be necessary to tighten the pressure dampener knob to dampen the motion of the pressure gauge needle. If the unit does not begin to pump steadily, release and reapply handwheel pressure a few times to prime the unit.

3. Once the pressure is set, collect a sample, after allowing several pump strokes to purge the discharge tube. Set the next desired pressure and allow the discharge tube to purge, then collect a sample.
4. When processing a small sample, it is sometimes desirable to place a clear solvent or water in the supply tank and start the machine operating with this liquid, at the pressure desired. When pressure has been reached and the machine is operating smoothly, divert the discharge to some suitable container and watch the water level in the bottom of the supply tank. When the water has reached the bottom of the tank, pour the material to be processed into the tank. If this is done at the proper time, the pressure will not vary to any appreciable extent. The beginning of the sample coming through the #1 discharge pipe should be caught in a container and discarded, as it will be a mixture. As soon as the product is discharged through the pipe, it may be collected in sample containers.

## **7. Recommended Regular Maintenance Schedule**

### **7-1. Daily Inspection**

1. Before starting the machine, drain any condensate from the power frame oil through the petcock.
2. Check the oil level (visible through the oil-level sight glass) and add oil if required.
3. Check the water lubrication system. Check the water-spray nozzle to make sure it is flowing freely and aimed correctly.
4. Check for any leaks from the cylinder or power frame.
5. With the machine running, listen for any abnormal sounds.

### **7-2. Monthly Inspection**

1. Check the tightness of all bolts, nuts, and fittings.
2. Check for oil leaks.
3. Disassemble and inspect all homogenizer valves and cylinder parts for wear and damage.
4. Inspect the baffle packing and crosshead extension for leaks. Readjust or replace if necessary.

### **7-3. Six-Month Inspection**

1. Drain the oil, clean the crankcase, gear case, and oil-level sight glass. Fill with oil to the proper level.
2. Repeat all monthly checks.
3. Lubricate the motor bearings according to the manufacturer's instructions.

## 8. General Maintenance

### 8-1. Plunger Packing

Leakage through the plunger packing is the result of worn packing, usually caused by the following: worn packing adjusting rings, worn or misaligned plungers, packing material unsatisfactory for high temperature or highly abrasive conditions, or insufficient compression of the packing. Even new packing blows out from shock-loading.

The packing adjusting ring is made of bronze, which is a bearing metal. The plunger ring is always of stainless steel with a minimum clearance of 0.040" over the plunger. No metal contact between sliding members, when both are made of stainless steel, can be permitted without immediate damage. Colmonoy<sup>®</sup>-coated stainless steel plungers are standard for the 15MR; 316 SS is standard for the 31MR.

Figure 8-1 shows the packing assembly in relation to the plunger (82). Item 85 is the throat front bushing. Item 84 is three or four separate pieces of plunger packing, (three pieces for the 31MR; four pieces for the 15MR), and item 83 is the follower ring. Item 82 is the packing adjusting screw.

If the packing in your machine is leaking, try tightening the packing adjusting screw, while the machine is running (but **NOT** under pressure). The leaking should stop. If not, try replacing the pieces of plunger packing, (three pieces for the 31MR; four pieces for the 15MR). See instructions under cylinder reassembly in section 3 starting on page 9.

Should you find yourself replacing packing prematurely, the packing adjusting ring could be suspect.

**Measuring wear on the packing adjusting ring:** When new, the packing adjusting ring will be a .002-.003" (.05-.07 mm) fit on the plunger. To check the wear, measure the plunger OD (Figure 8-1, item B) and the adjusting ring ID (item A). The packing will fail prematurely if there is .007" (.18 mm) of height clearance between the plunger and ring. Replace the adjusting ring if you find this much wear.

Note: on older machines, the plunger may have worn. The plunger should measure .624-.625" (15.84-15.87 mm). Anything measuring less than this means the plunger is worn and may have to be replaced.

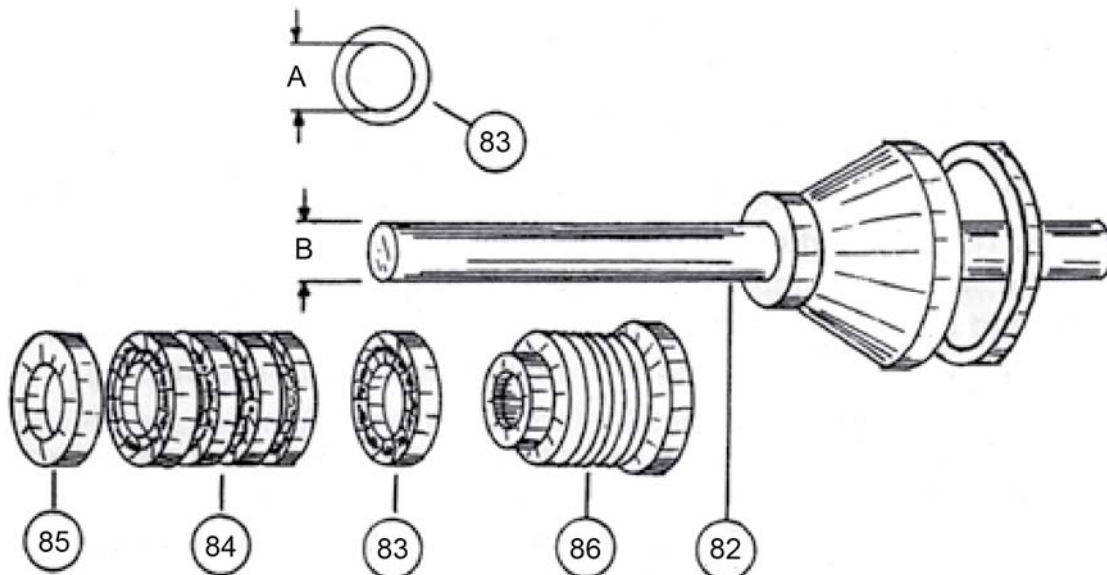


Figure 8-1

## 8-2. Pump Valve Seats

When replacing the seat, make certain that the taper on the seat and the cylinder bore are clean and dry. Pack the seat in dry ice or immerse in an alcohol/dry ice mixture for 20 to 30 minutes. Install it in the cylinder by tapping it into place with a piece of wood or brass. Since any leakage between the seat and the cylinder bore will create serious damage, take extreme care when assembling the seat.

For valve seat re-facing in the field, cobalt based wear resistant alloy seats may be refaced on a lathe, using a carbide tool bit. Carbide tapered seats are available for very abrasive products. These seats should be replaced when worn.

## 8-3. Pump Valves

Inspect the cobalt based wear resistant alloy ball valve. Pits, dents or surface cracking will quickly lead to erosion of the pump valve seat and the ball valve; therefore, they should be replaced promptly. Abnormal noise, pressure gauge fluctuation, and uneven pumping are associated with valves sticking.

## 8-4. Product Pressure Gauge

Gauge problems are primarily due to improper care in handling the gauge, or severe shock-loading. Severe shock-loading can be caused by operating with air in the product, inadequate feed pressure, or improper dampening.

## 8-5. Homogenizer Valve Assembly Parts

1. Valve Rod: When the valve rod is used with manually controlled valves, it must be kept straight and free from burrs, so it can move freely within the valve body. If it binds, pressure cannot be properly controlled.
2. Valve Rod Packing: This packing serves two purposes: the first is to seal against product leakage, and the second is to dampen down the motion of the valve rod. When the packing becomes worn, it allows rapid oscillation of the valve rod, accelerating wear and affecting pressure control.
3. Valve Spring: Valve springs can take a set, break and, although they are plated, corrode and weaken. They should always be lubricated with grease upon assembly, and the valve rod washer must be installed between the spring and the handwheel.
4. Handwheel and Handwheel Support: Other than an occasional check on the condition of the threads and lubrication prior to assembly, no maintenance is usually required.
5. Valve and Valve Seat: The valves are of cobalt based wear resistant alloy, tungsten carbide, or similar very hard materials. The wear patterns shown in Figure 8-2 on page 37 will apply to all materials and all configurations. Valves and valve seats must always have a continuous contact area around the full circumference on the valve and seat. If this contact is broken at any point, as illustrated in Figure 8-2, number 5, the valve and seat require re-lapping or regrinding.
  - a. Cobalt based wear resistant alloy valves can be lapped in your plant using a standard, oil-mixed grinding compound, medium grit. Piloted valves (ones in which there is a three- or four-sided pilot that enters the hole in the valve seat to keep the valve face parallel with the seat) are ground to each other. Apply a small dab of compound at three places on the seating surface. Either hold the parts in your hands and rotate them together or secure them in a lathe chuck, turning at slow speed.



Keep the grinding compound away from the wings of the valve pilot to avoid increasing the diameter of the valve seat hole.

Repeat the process, adding compound as required, until seating surfaces are restored to the number 2 pattern shown in Figure 8-2 (page 37).

- b. For valves and seats of the un-piloted type, apply the same type of automotive valve-grinding compound. Lap each piece separately by rotating them in a circular motion against a smooth, flat, hard surface such as a piece of heavy plate glass.



- c. When seating surfaces develop erosion channels, as shown in number 5 of Figure 8-2, they cannot be corrected by lapping. Factory regrinding will be required.
  - d. Ceramic Valves: Using Figure 8-2 for reference, replace the ceramic valves when they are worn.
6. Impact Rings: These are available in cobalt based wear resistant alloy and other materials, and are designed to help prevent the high velocity stream, upon leaving the faces of the valve and seat, from cutting deep grooves in the stainless-steel valve bodies. When the groove or grooves on the inside of the ring are worn to a depth of approximately 1/32" to 1/16" (.79 to 1.59 mm), replace the impact ring. Impact rings cannot be repaired.
  7. Valve Seat Gasket: All gaskets in the fluid end of the machine are available in several materials to handle the specific duty required. Replacement is only required when leakage develops.

### Homogenizing Valve and Seat Wear Patterns

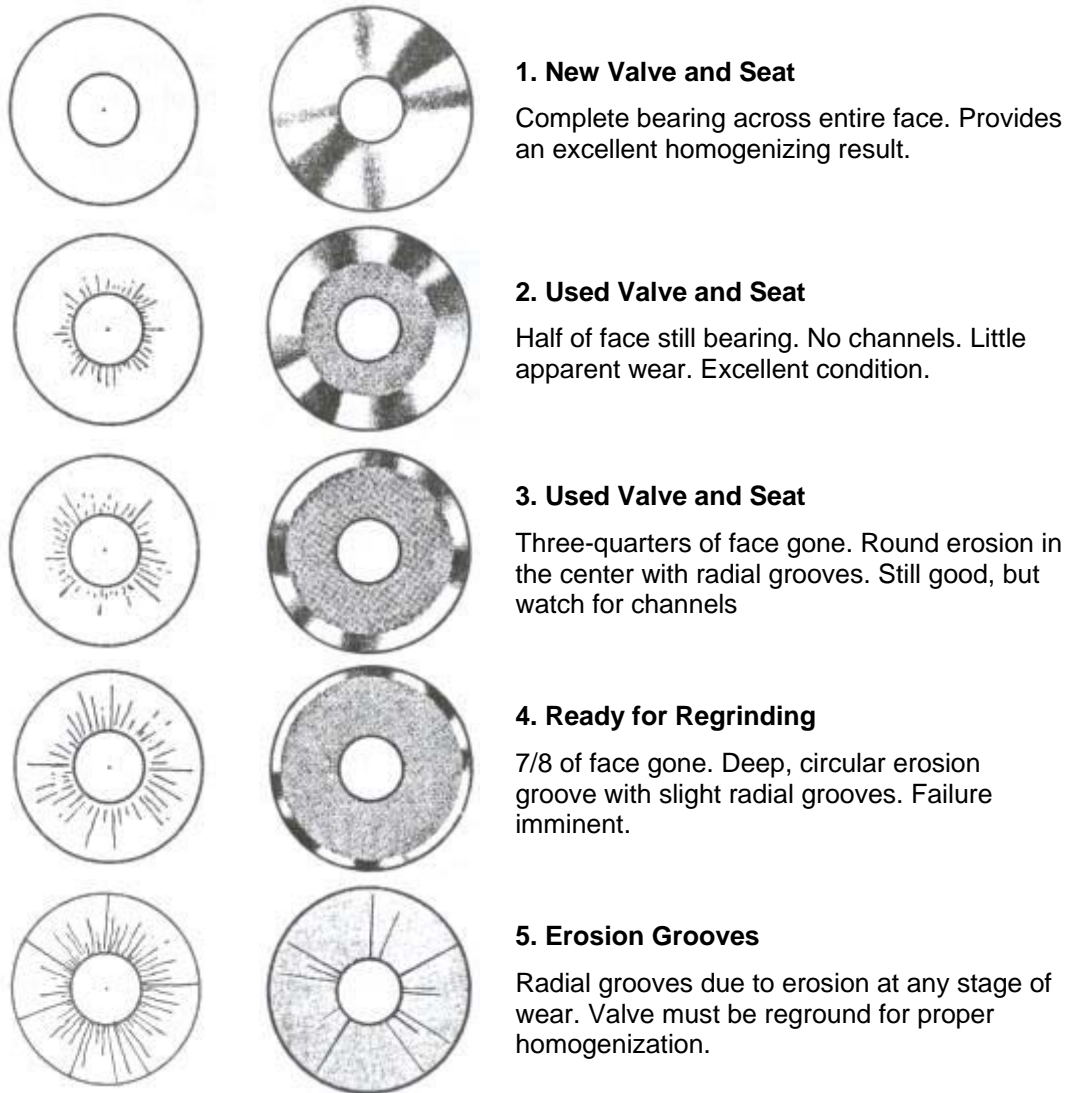
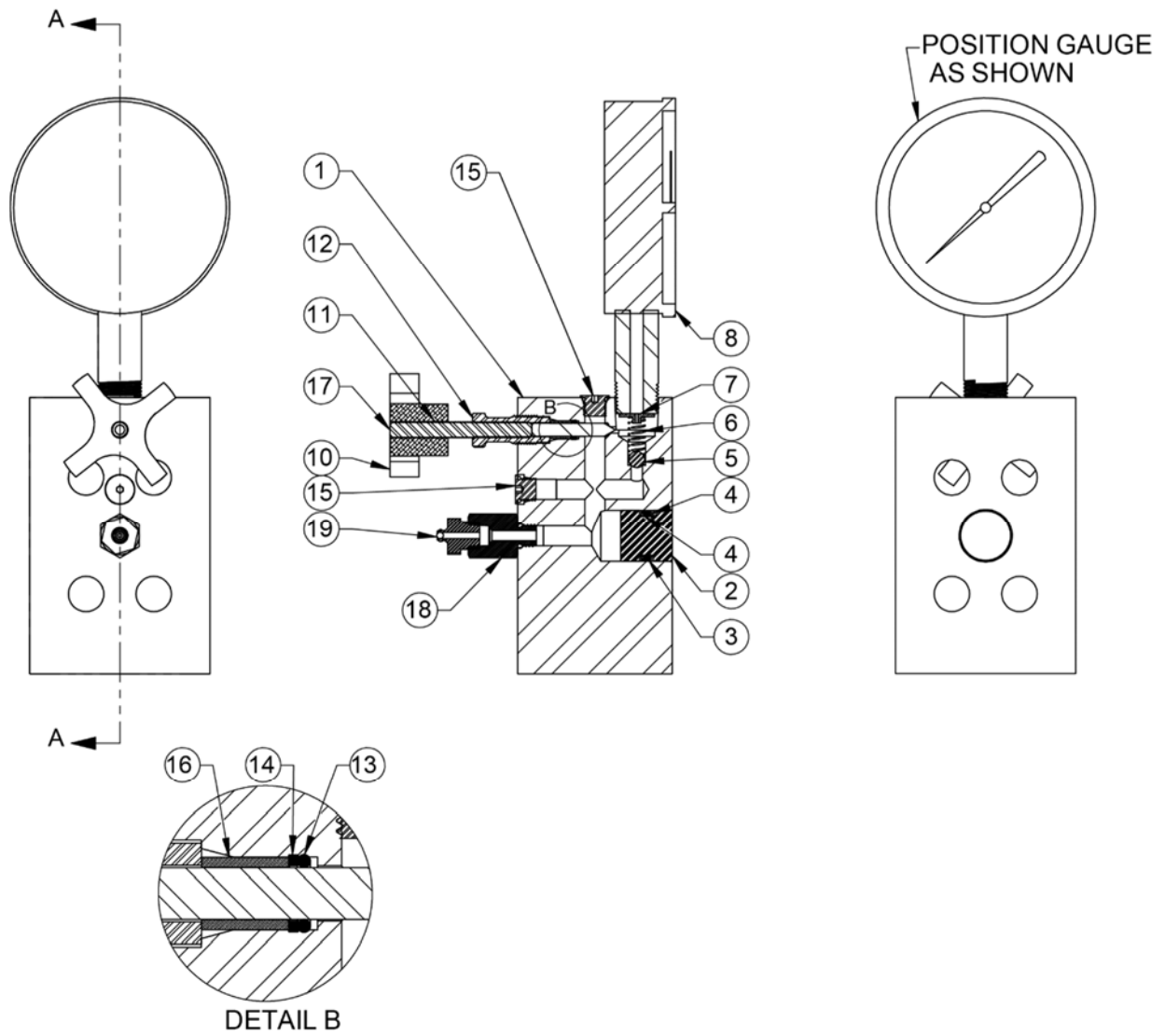


Figure 8-2

# Dampener Gauge Block Assembly



Ref. D18535

Figure 8-3

## Dampener Gauge Block Assembly - Bill of Materials

Note: part numbers below apply to both the 15MR and 31MR unless otherwise noted.

Model	Item	Part #	Description	QTY	Units
	1	J019012	DAMPENER BODY	1	EA
	2	J118002	DAMPENER PISTON	1	EA
	3	J80130022	O-RING; 1X3/4X1/8,EPDM 75DURO	1	EA
	4	J801925	RING, BACK UP 0.75x1x0.125 IN EPDM (12)	2	EA
	5	J334000	DAMPENER CHECK VALVE BALL .312 ST	1	EA
	6	J335001	DAMPENER CHECK VALVE SPRING	1	EA
	7	J308012	VALVE SPRING BUTTON	1	EA
<b>15MR</b>	8	J040131	GAUGE, PRESSURE - 0-15,000 PSI	1	EA
<b>31MR</b>		J040132	GAUGE, PRESSURE - 0-6,000 PSI		
	9	J332008	NEEDLE VALVE	1	EA
	10	J333002	KNOB	1	EA
	11	J820148	SCREW ALLEN HD SET 0.25-20X0.375IN	2	EA
	12	J740006	NEEDLE VALVE GLAND	1	EA
	13	J801746	O-RING; 0.25 X 0.375 X 0.0625 AS568-010	1	EA
	14	J801789	BACK-UP RING	1	EA
	15	J843124	HOLLOW HEX PLUG	3	EA
	16	J027006	RING, FOLLOWER	1	EA
	17	J332007	VALVE STEM	1	EA
	18	J843009	ADAPTER 0.4375 X 0.25FNPT IN 316SS	1	EA
	19	J171403	GREASE FITTING 1/4-18 NPT	1	EA
	20	J811110	GREASE/PINT	1	EA

## 8-6. Water Spray Assembly Adjustment



If the spray nozzle becomes clogged or misaligned, rapid deterioration of the plunger packing will result.

See item 130 in Figure 3-2 on page 10.

1. Turn on and adjust the flow of water to the water spray assembly to obtain a steady stream that will not splash when in contact with the plunger or spring.
2. Make sure that the spray nozzle is flowing evenly. A clogged nozzle can usually be freed by working a thin piece of wire into the end of the nozzle.
3. The nozzle is individually adjustable. Loosen the tubing nut around the nozzles. Aim the flow and tighten the nut.
4. Aim the stream of water from the nozzle to strike the top surface of the plunger or spring.

## 8-7. Dampener Gauge Block Assembly

Correct operation of the dampener assembly is important. Continued operation of the gauge with fluctuation of more than 200 lbs. (90 kg) will result in gauge failure. The dampener is charged with NLGI #2 food-grade grease. This grease is available from SPX FLOW in tubes (part no. J811110). **The chamber must be completely filled and air-free.**

See Figure 8-3 on page 38. During normal operation of the homogenizer, a small amount of grease *may* leak out of the dampener reservoir. If pressure cannot be built on the gauge, remove the gauge block and inspect the position of the dampener piston (2). If the piston is retreated 11/16", then grease has escaped and refilling is necessary. Also note the location of the grease: it may have escaped from the needle valve C-ring, or one of the pipe plugs may have leaked.

To refill the dampener:

1. Remove the pipe plug (15) opposite the dampener piston (2).
2. With a suitable tool, push the piston back, to position it 1/8" from the face of the block.
3. Add grease through the hole until full, then reinstall a pipe plug, using thread sealant (Teflon® tape) on the threads.
4. Stand the block upright and remove the pipe plug (15) from the top of the block (next to the gauge). Tip the gauge back and forth to bring any air bubbles to the top. Refill with grease and repeat until no more air escapes. Reinstall the pipe plug (use thread sealant).
5. Using both thumbs, press on the dampener piston. If sponginess is felt, the block still contains air pockets. Repeat step 4, until sponginess disappears from the piston.
6. When operating the homogenizer, check for any slight dampener grease leaks and correct them.

**Note:** item numbers 18 and 19 can be used to add grease once all air or voids have been removed. Only pipe plugs (item 15) should be installed and used during normal operation.

## 9. Troubleshooting Guide

The following is an easy-to-follow troubleshooting guide for the Laboratory Homogenizer. It will help you decide when a problem requires a simple adjustment, regular maintenance, or Factory replacement or assistance. If you have any questions not covered by this section, contact SPX FLOW Customer Service.

<b>Problem</b>	<b>Cause</b>	<b>Remedy</b>
Start switch is in ON position, motor turning, but homogenizer will not pump or will only pump intermittently	Air lock in cylinder block	Slowly turn the handwheel in and out until the unit starts pumping. NOTE: Do not put excessive pressure on the handwheel if pumping does not commence after it is turned to its stopping point. Excessive pressure on handwheel without product flow will result in damage to the homogenizing valve assembly. The homogenizer may also be primed by covering the end of the discharge tube until flow is established.
	Pump valve stuck in OPEN position	Disassemble and check pump valve to ensure free vertical travel of ball valve.
	Pump valve seat worn	Inspect seat for wear. Replace or recut, if necessary.
	Feed tank blocked or empty	Check for product and/or blockage from tank to homogenizer.
Growling sound from drive end	Worn gears in gearbox or dirty and/or insufficient oil	Check oil level and quality of oil. Replace if needed.
Homogenizer is pumping product, but is unable to obtain desired homogenizing pressure	Worn homo valve and/or seat	Disassemble homogenizing valve assembly and inspect valve and seat for wear. See wear pattern chart, Figure 8-2 on page 37.
	Packing failure Check: is packing leaking?	Tighten packing adjusting screw while machine is running (NOT under pressure). If still leaking, remove packing assembly and inspect packing. If worn, replace all four pieces. Inspect packing adjusting ring. See page 35 for proper method of measuring wear on the adjusting ring.
	Valve rod binding inside handwheel support	Disassemble handwheel assembly. Thoroughly clean valve rod, handwheel, and handwheel support. Dirt and rust may be polished off with fine emery cloth. Small burrs may require a file of heavier emery cloth. Also check valve rod to ensure that it is not bent at either end, preventing free travel of the rod through the handwheel support and valve body.
	Homogenizing valve binding in valve body	Remove valve and inspect for any product build-up or burrs. Remove any burrs with emery cloth. Also check body for burrs.
Capacity low or varies	Pump valve and/or seat may be worn	Check pump valve and seat for wear. Replace or regrind, if necessary. See Figure 8-2 on page 37.
Machine leaking product under pressure	Worn packing or worn gaskets	Tighten packing adjusting screw or replace worn gaskets. Packing may need to be replaced. See page 35 for Plunger Packing instructions. Also see Figure 8-3 on page 38.
Machine labors or slows down under pressure	Overload on machine, possibly because of defective gauge	Check servicing of dampener body. See Dampener Gauge Block Assembly instructions on page 40. Also see Figure 8-3 on page 38.

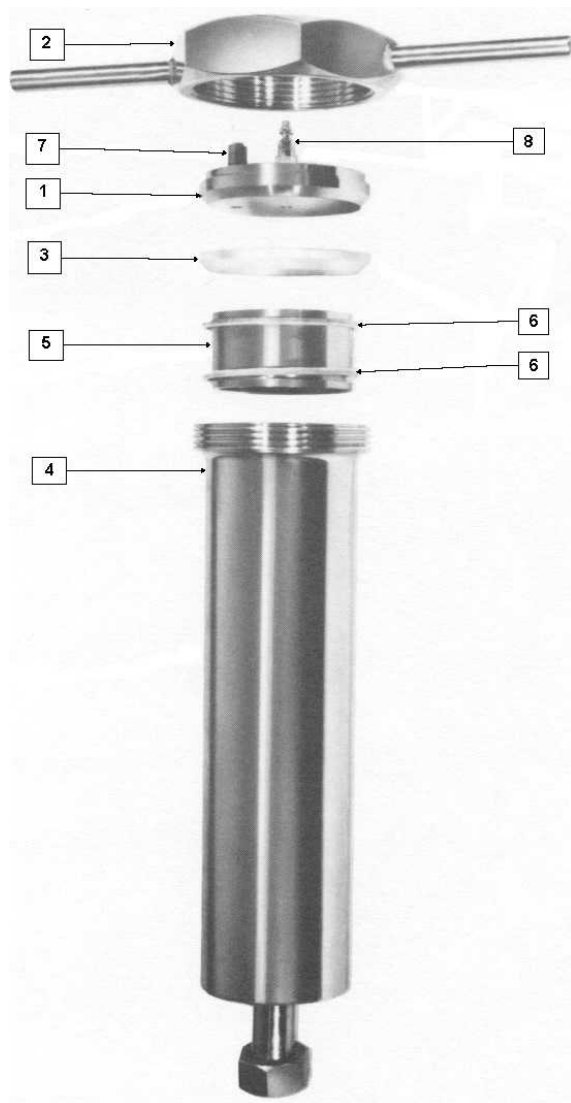
## 10. Optional Equipment

### 10-1. Pressure Feeder

The stainless steel assembly utilizes a simple plunger design, which is actuated by operator-controlled air pressure and should be used when viscosity of the product results in a decrease in capacity to less than 12 gph (45 lph) when processed by gravity feed. Erratic pumping when operating with gravity feed also indicates the need to use a pressure feeder. It is quickly installed and used, and it can be readily removed for disassembly and cleaning.

#### Instructions

Remove the standard tank and replace it with the Pressure Feed Tank. Fill the tank with the product to be processed, to approximately 2-1/2" (64 mm) from the top. Place the piston assembly in the tank. Install the cap gasket, cap, and cap nut. Tighten the cap nut securely to the tank. Connect the air to the air inlet connection. The air pressure required will depend on the viscosity of the product and can range from 10 to 100 psi (.69 to 6.9 bar). The maximum allowable air pressure is 100 psi (6.9 bar). Start the homogenizer and build up the air pressure, until the machine operates smoothly. Adjust the homogenizer pressure to the desired point by turning the handwheel. Take samples.



Item	Part #	Description	Qty
1	J840203	CAP SANITARY 4IN 304SS	1
2	J840134	ASSEMBLY CAP NUT 13H-840011 304SS	1
3	20-227P	GASKET-BEVEL 4.0" TEFLON	1
4	J247013	TANK SUB ASSEMBLY	1
5	J122010	PISTON; 3.779" X 2"	1
6	J026007	PISTON RING	2
7	J905197	SAFETY VALVE	1
8	J905196	CONNECTION, AIR INLET	1

Unless otherwise noted, all quantities are each.

Figure 10-1: Pressure Feeder



Gaulin Laboratory  
Homogenizers

Models 15MR & 31MR

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