

# ML-2203

## LAUNDRY SYSTEM

Installation and Operating Manual



**DiverseyLever**

# PREFACE

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This manual describes how to install, set up, operate and maintain the ML-2203 Laundry System.

Material in this manual is subject to change without notice. Manual revisions will be made on an as needed basis. Special circumstances involving important design, operation or application information will be released via Technical Service Bulletins.

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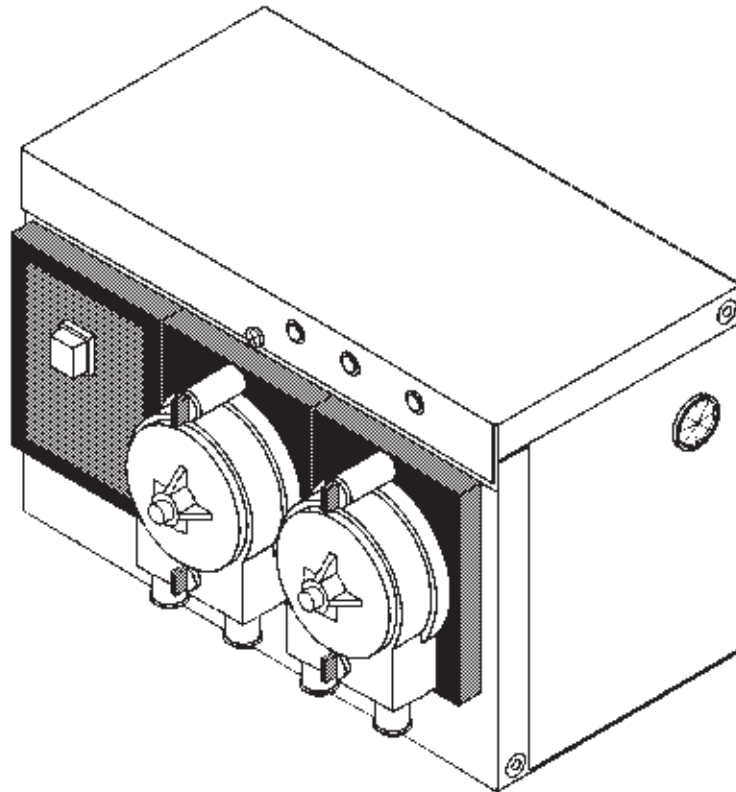
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# INTRODUCTION & EQUIPMENT DESCRIPTION

## APPLICATION DESCRIPTION

The ML-2203 Laundry System is designed to deliver detergent and destainer into small washers. The equipment delivers the products when the operator presses the start button on the pump enclosure at the beginning of the wash cycle. An optional two button model is also available which allows the operator to select the detergent without the destainer.



## TERMS

The following definitions apply throughout this manual:

Line—Polyflow or other plastic tubing that carries chemical supply from the source to the pump or from the pump to the washer.

Tube & Squeeze Tube—Tubing installed and designed to be used in peristaltic pumps.

Pipe—Metal or plastic rigid pipes, plumbing.



# SPECIFICATIONS

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## PHYSICAL DIMENSIONS, CONSTRUCTION & MOUNTING

Size	H	W	D
	14 x	20.3 x	14.3 cm
	(5 <sup>1</sup> / <sub>2</sub> x	8 x	5 <sup>5</sup> / <sub>8</sub> in)
Weight	1.5 Kg (3.3 lb)		
Enclosure	Type 304 Stainless Steel		
Mounting	Wall mounted with two (2) keyhole slots in the backplate		

## OPERATING CONDITIONS

Ambient Operating Temperature	+2 to +49 °Celsius (+36 to +120 °Fahrenheit)
Electrical Power Configurations	24 Volts AC, 2 Amperes maximum

## COMPONENTS

Fuses	One located on the printed circuit board Type AGC, 250 Volts, fast blow, 2 Amperes
Pumps	Peristaltic, dual roller, self-priming and self-checking Voltage ----- 24 VDC Inlet vacuum ----- 8 inches of mercury Detergent outlet pressure --- 5 pounds per square inch Destainer outlet pressure ---- 30 pounds per square inch Tubing material ----- Norprene Fluid at one centipoise

### Speed & Displacement

<u>Detergent &amp; Destainer Pump - (<sup>3</sup>/<sub>16</sub> ID Tube)</u>
Standard 100 rpm ----- 148 ml per min
----- 5 oz per min

### Hydraulic Performance

<u>Detergent &amp; Destainer Pump</u>
Maximum vacuum ----- 8 inches of Mercury [Hg]
Maximum pressure ----- 20 pounds per square inch



Design and specifications are subject to change without notice.

SPECIFICATIONS

# INSTALLATION & SETUP PROCEDURES

## PHYSICAL INSTALLATION

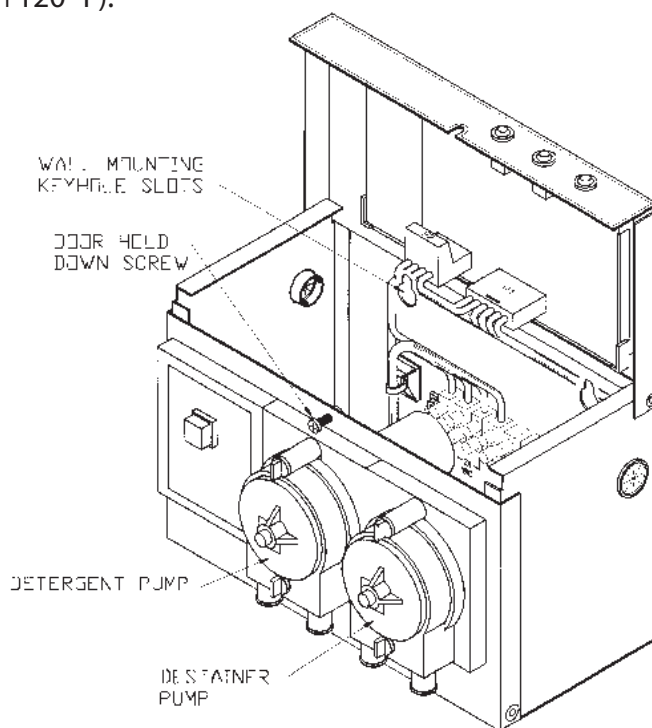


Safety • Refer installation and service to qualified personnel only.

- Installation must comply with all applicable plumbing & electrical codes.

### Mounting the Unit

Carefully select a place to mount the unit. Remember that there must be room around it for access to switches, wires and tubing, and to swing the top door open for both installation and maintenance. The unit is normally mounted against a stable vertical surface with the pumps side-by-side and their tube openings at the bottom. Avoid steam and other sources of moisture, such as from spray or splash. Do not subject the unit to temperatures outside the range +2° to +49° C (+36° to +120° F).



You may do wall mounting using the two keyhole slots on the interior back panel. Wall anchors and mounting screws are provided in the installation kit. No mounting template is required. A bracket kit is available for top mounting applications (see Recommended Spare Parts & Accessories).

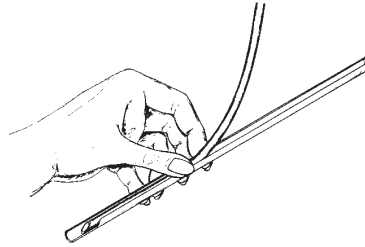
The circuit board door is held closed by a captive hold down screw that fits through a slot in the door. The pump door is held closed by the circuit board door. There are no user serviceable parts that are accessible without proper tools.

## Connecting Chemical Supply Lines

Illustrations showing installation and hookup are in Appendix B.

### Detergent & Destainer Pump Input Lines

Connect the  $\frac{1}{4}$  inch (6 mm) polyflow lines to the barbed fittings on the left (suction side) of the pump squeeze tubes. Secure with tie wraps. Make sure the connection is airtight. Run the polyflow lines to the chemical drums, and secure the end of each supply line into its respective container. Use a snap-in standpipe for liquid detergent lines.



The snap-in standpipe is a rigid three-quarter round “u”-shaped tube section 18 inches (46 cm) long. Cut the polyflow line at a 45° angle. Press the feed end of the polyflow line into the open part of the “u”. Leave the bottom of the standpipe slightly lower than the inlet of the polyflow line.

### Detergent & Destainer Pump Output Lines

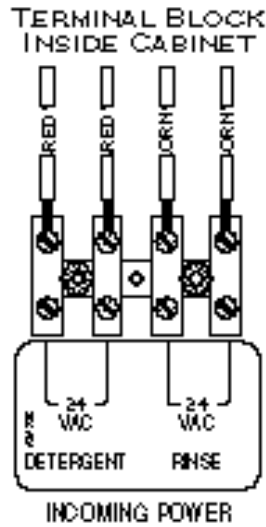
Connect the  $\frac{1}{4}$  inch (6 mm) polyflow lines to the barbed fittings on the right side of the detergent and destainer pump squeeze tubes. Secure with tie wraps. Run the feed lines to the washer, directing the products into the wash water away from the soiled laundry. Use as short a run of line as possible and keep the lines away from steam pipes, open flues or any other place where they may be accidentally damaged by the machine operators. In this and other output line runs, always try to avoid uphill runs.

## ELECTRICAL CONNECTIONS



- Dangerous voltages are wired into this unit and are present in the cabinet even when the power switch is set to off.
- Refer installation and service to qualified personnel only. Installation must comply with all applicable electrical codes.

Locate electrical circuits on the washer that provide power as described in the Specifications section of this manual. Power must be supplied to the ML 2203 on a continuous basis. Connect 24 VAC to the terminal block marked Rinse from an external transformer.



## EXTERNAL CONTROLS DESCRIPTION

### Power ON/OFF Switch

This double-pole single-throw switch provides control over the incoming power to the ML-2203.

### Detergent Prime Switch

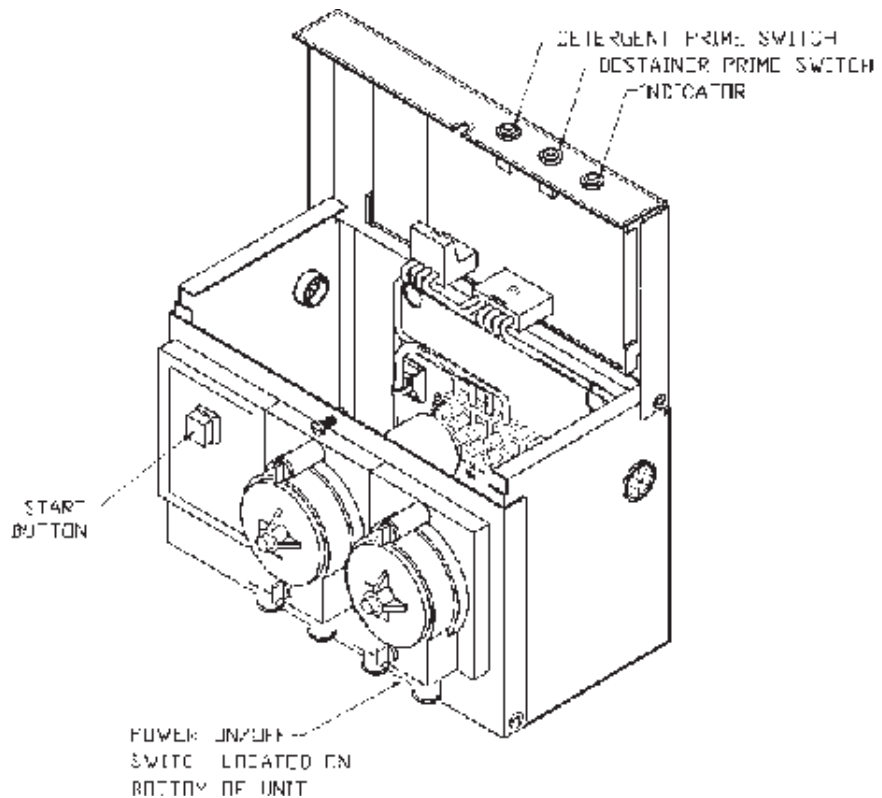
There must be power to the ML-2203 for this switch to work. The detergent pump runs for a programmed length of time when this switch is pressed.

### Destainer Prime Switch

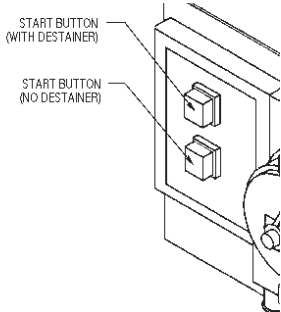
There must be power to the ML-2203 for this switch to work. The destainer pump runs for a programmed length of time when this switch is pressed.

### Start Button (With Destainer)

The detergent and destainer pumps will run to deliver the programmed amounts of product.

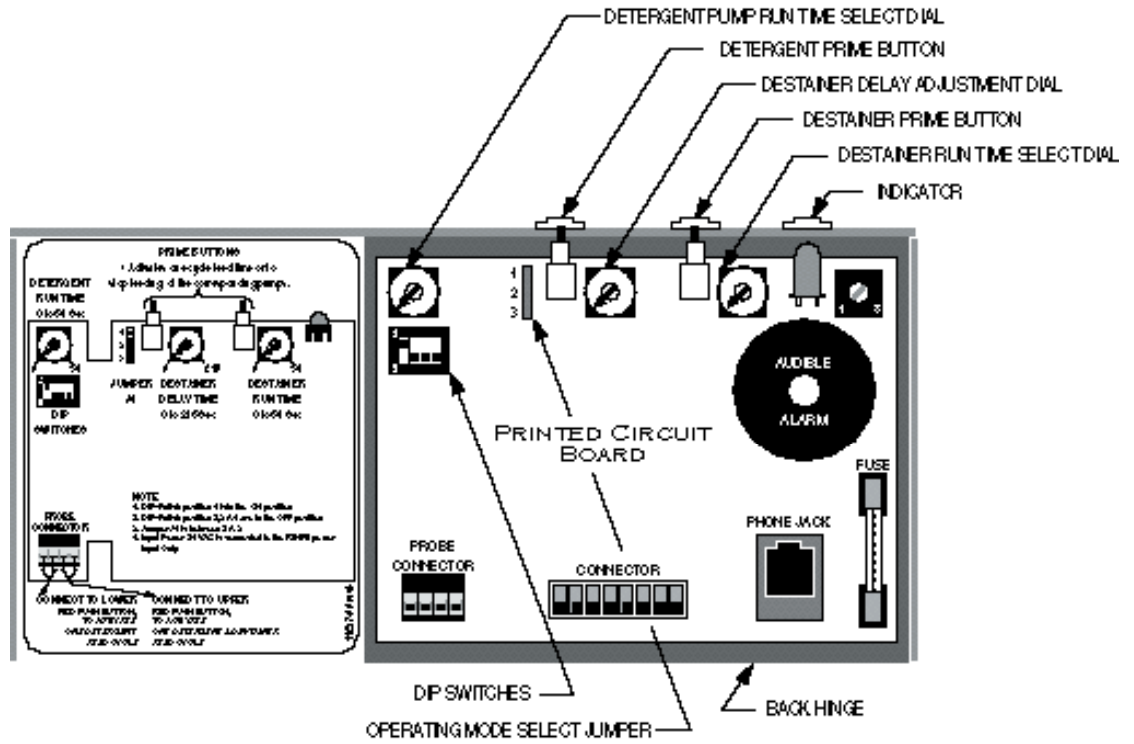


### Start Button (No Destainer) Optional



The detergent pump will run to deliver the programmed amount of product.

# INTERNAL CONTROLS DESCRIPTION



## Detergent Control

### Operating Mode Select Jumper

Position 2 & 3 for two product laundry operation.

### DIP Switches



Switch 1 - On for laundry mode.

Switch 2 - Off, unused.

Switch 3 - Off, unused.

Switch 4 - Off, unused.

### Detergent Pump Run Time Select Dial



This dial setting determines the length of time the detergent pump will be on when either start button is pressed.

Range - 0 to 54 seconds.

## Destainer Control

### Destainer Pump Run Time Select Dial



This dial setting determines the length of time the destainer pump will run when the start button (with destainer) is pressed.

Range - 0 to 54 seconds.

### Destainer Pump Delay Adjustment Dial

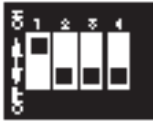


This dial sets the destainer pump delay after the start signal is received.

Range - 0 to 216 second delay.

## SETUP PROCEDURES

### DIP Switch



Set DIP switch 1 ON and switches 2, 3 and 4 OFF for the ML-2203 operation.

### Detergent System



Set the Detergent Pump Run Time Select dial so that the pump will deliver the desired amount for a single wash load. After the dial is set, test the delivered amount by measuring the output of the detergent pump when you press the detergent prime button. Maximum run time is 54 seconds.

### Destainer System Delay Time



Adjust the Destainer Delay Adjustment dial to establish the start of the destainer pump after the start button has been pressed. Maximum delay is 216 seconds.

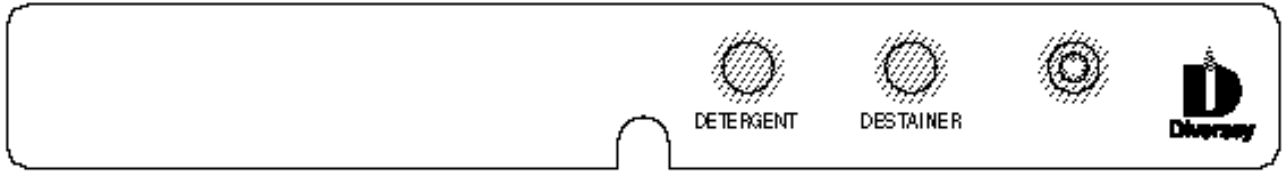
### Run Time



Set the Destainer Run Time Select dial so that the pump will deliver the desired amount of product for a single wash load. After the dial is set, test the delivered amount by measuring the output of the destainer pump when you press the destainer prime button. Maximum run time is 54 seconds.

OPERATION

The indicator lamp on the front panel provides the following operating status information:



Power ..... Indicator on continuously

Detergent or destainer feeding ..... Indicator flashing slowly

Destainer delay ..... Indicator flashing rapidly



# MAINTENANCE

## PERIODIC MAINTENANCE

### Pump & Squeeze Tube Replacement Schedule

Since every installation is different (chemicals, tube runs, operating frequency, etc.), an exact tube replacement schedule cannot be specified. With use the tube slowly evolves from round to oval, and the amount of chemical pumped decreases. By regularly checking the amount of chemical pumped, you can determine general tube life. It is recommended that you closely monitor the time it takes the original tube to reach the end of its flex life, and then establish a replacement schedule. Replacing tubes at regularly scheduled intervals ensures more accurate product use and reduces service calls. In general short feed lines of a large diameter will improve pump tube life.

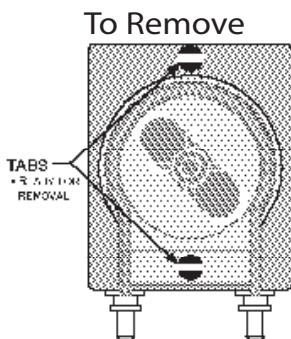


It is very important not to let the tubes become worn to the point where they tear and allow chemicals to saturate the pump housing.

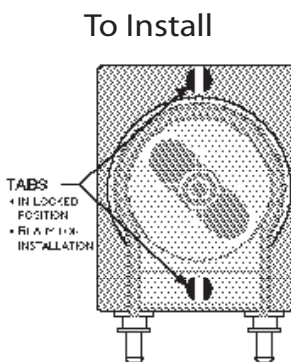
### How to Replace Pump Cartridges and Squeeze Tubes

Only the cartridge replacement should be done in the field. Tube replacement can be accomplished later. See the Pump Assembly exploded view drawing in Appendix B.

- Detergent Pump .....  $\frac{3}{16}$  inch tube ID.....  $\frac{3}{8}$  inch barb fitting
- Destainer Pump .....  $\frac{3}{16}$  inch tube ID.....  $\frac{3}{8}$  inch barb fitting



1. Turn off power to the unit.
2. Remove the pump from the motor housing by twisting the two quarter turn fasteners at top and bottom (rotate the tabs 90° to horizontal).
3. Remove the old pump from the motor housing.
4. Remove the supply and feed lines from the old pump and connect them to the new pump.



1. Install the new pump as follows:
  - Turn the tabs to vertical.
  - Mesh the pump drive spline with the motor gear (rotate pump until it engages).
  - Hold the pump in the vertical position.



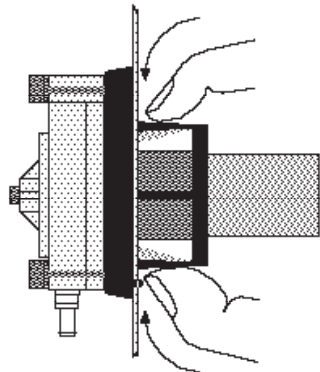
Press the tabs into the motor housing until you hear a distinct click.

It is very important that the tabs are vertical & that you press them firmly & hear the click.

3. Turn on power to the unit.

### How To Replace Pump Motor Subassemblies

#### To Remove



1. Turn off power to the washer.
2. Remove the supply and feed lines from the old pump motor and connect them to the new pump motor.
3. Remove the quick disconnect tabs from the electrical connections at the back of the pump motor. Take care to keep the pump wire pairs together.
4. Two flexible ears hold the pump motor assembly in the cabinet. To remove the pump motor, compress the two ears sufficiently to allow it to slide out through the hole in the cabinet.

#### To Replace

1. Place the alignment tip of the pump motor housing in the down position.
2. Slide the pump motor housing into the cabinet hole. The holding ears will be compressed by the sheet metal, then will expand to hold the pump motor in place. Verify that both ears popped out and are locked in place.
3. Reinstall the quick disconnect tabs on the electrical connections at the back of the pump motor. Turn on power. Use the Prime button to verify the proper pump rotation (clockwise). Reposition the motor wires if necessary to change direction.

## TROUBLESHOOTING

Refer to the exploded assembly drawings, item lists, and the complete unit wiring diagram in Appendix B, and the circuit board illustration in Internal Controls Description. To order items from the drawings, find the item on the drawing and note its sequence number, locate it in the item list using the sequence number, and order using the item number.

### No Power

1. Is the On/Off switch on?
2. Is 24 VAC connected to the power input terminals in the unit? Is a circuit board fuse blown?

### Properly Rated Fuse Blows Repeatedly

1. Is there a mechanical problem with a motor (e.g., jammed tubing or frozen gears in the gearbox)?
2. Does motor resistance measurement fall in the approximate range from 4 to 100 ohms? If yes, go on to the next step. If no, replace suspect part(s) since a shorted motor will cause the fuse to blow.



Measure resistance only when the power is turned off. A short will typically measure less than 0.2 ohms; an open will typically measure more than 2000 ohms.

3. Are proper voltages measured across the appropriate output terminals (i.e., detergent drive and destainer drive) when power is applied? If not, replace the circuit board. Maximum voltage is 33 to 34 VDC (without load).

### Pumps will Neither Prime nor Feed

1. ML-2203 must be powered on.
2. Check for a loose wire connection to the pump.
3. When you push the Prime switch, 33 to 34VDC should be measured across the motor terminals.
4. If voltage in the proper range is present and the pump will still not run, remove the pump cartridge and observe the drive spline while you push the Prime switch. If the drive spline does not turn, replace the motor assembly.
5. Replace the PCB if either of these tests (steps 3 and 4) does not fix pump.

### Pump Will Not Pull the Chemical Out of the Drum

1. Too much vacuum created. The supply line in the chemical drum may be up against either the side or bottom, the supply lines may be too long for a viscous product, or there may be a crimp in the intake supply line, thus exceeding the pump's vacuum specifications .
2. There may be an air leak somewhere in the input supply line. Most often this is caused by inadequate sealing of the supply line into the barb fitting.
3. Squeeze tube is worn and the rollers can no longer squeeze the tube properly. Correct by changing the pump cartridge with the correct size squeeze tube and barb fitting for the chemical being pumped.

## RECOMMENDED SPARE PARTS & ACCESSORIES

This Parts and Accessories list provides a quick reference source for ordering spare or replacement parts. It also lists accessory items that may be needed that are not on the detailed assembly drawings. To order parts from the listings or drawings, find the part's sequence number (the number in the bubble in the drawing), use that to find the item number, and order by item number.

### Spare Parts

Item Description	Item #
Printed Circuit Board	055746
Tube, 3/16" ID	037617
Tube Insert, 3/8" Barb Fitting	056581
Pump Cartridge	039556
Pump Roller Assembly	039550
Quarter turn Pin for Pump	051160
Pump Motor Gearbox	043998
Fuse (AGC 250 Volt 1 Amp)	042881

### Accessory Kits

Mounting Bracket Kit	018224
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## TECHNICAL ASSISTANCE

If you require technical assistance or additional product technical information contact the appropriate Technical Support Department. See Preface for company information and telephone numbers.

## PRODUCT REPAIR

If you need to return an item for repair you must call or write to obtain an “RPR” number before you may return the product. The Repair Department will issue a unique Return Product Request (RPR) number for any product that satisfies the Warranty requirements. Multiple items in a single shipment will not normally require multiple RPR numbers, but always make sure that the Repair Department knows the entire extent of your shipment in case this general rule doesn’t apply. Refer to this number in all your documentation, prominently display it on the outside of the shipping container, and refer to it if you need to call for information about the status of the repair.

It is very helpful to the Repair Department if you include in the shipping container a description of the problem, symptoms, failure or abnormality that precipitated the equipment’s return.

Failure to obtain an authorization number before sending an item in for repair or replacement may seriously delay the repair and/or return of your equipment.

### SPECIAL NOTE

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# APPENDIX

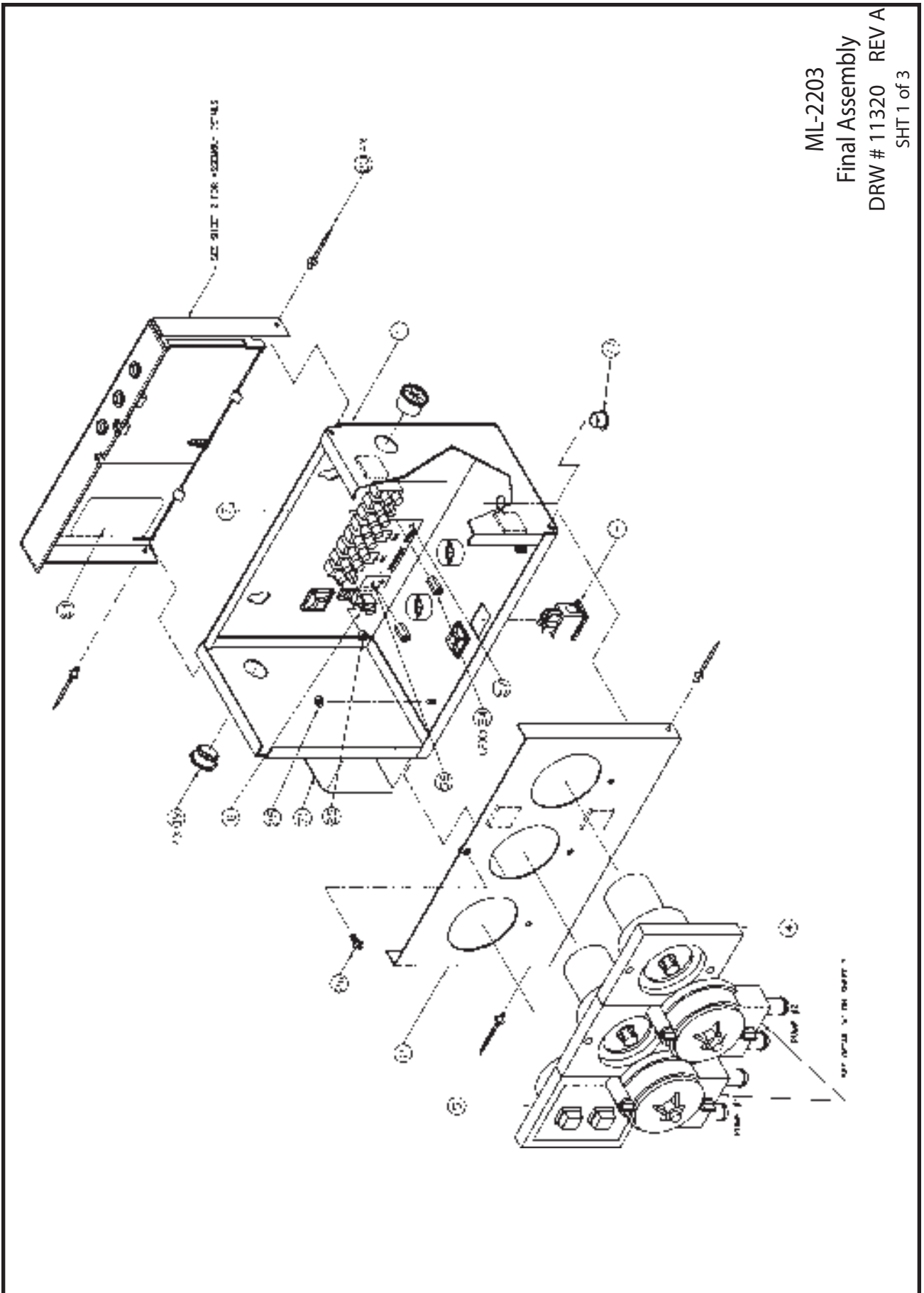
## ITEM LIST, DIAGRAMS & DRAWINGS

Sequence to Item Number List

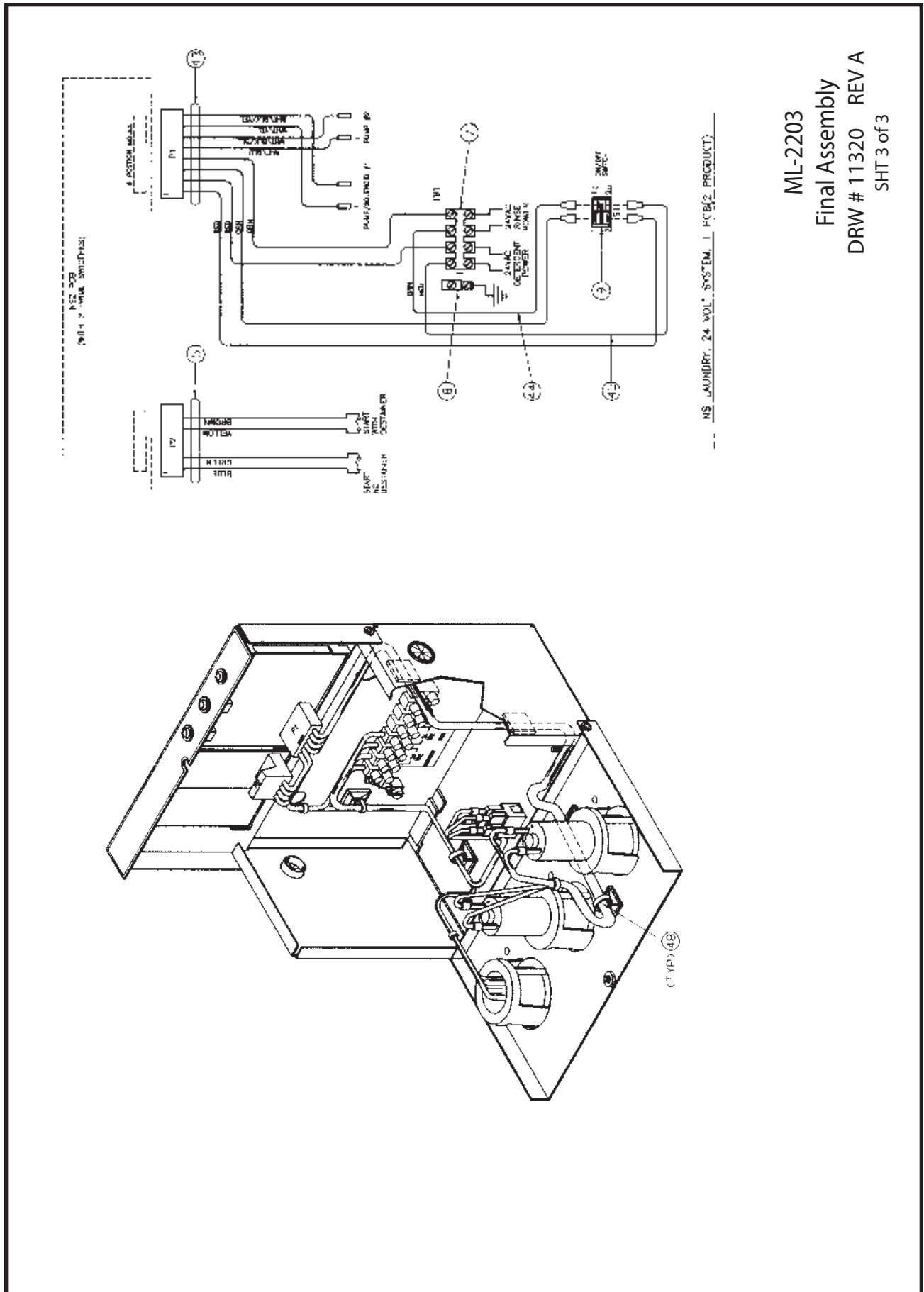
Seq #	Item #	Item Description
1	057125	ENCL BASE ASSY,3PROD ENCL
2	039457	DR,FRNT,SST,NS1
3	039456	DR,TOP,SST,NS1
4	051351	GR/MOT ASSY,5 OZ PMP
5	056934	TILE,2SW,MC DONALDS
7	035504	TERM BLK,10MM,SCR,8X2
8	041711	TERM BLK,1X1,PNL,GND LUG,#8
9	037598	SW,DPST,RKR,ON/OFF,PNL,4A/250V
11	057132	PCB,ASSY,NS2000
13	036983	HLDR,PCB
14	056933	LBL,SS,LID,7.75,3 HOLES
17	039460	BOOT,SW,ELSTMR,CLR,NS1
18	044144	ADH,SHT,PLSTC,3.22X3.38
19	031618	BSHG,W/FGR,7/8
21	056581	INSR,PMP,5 OZ,1/4T,BARB
23	041155	RVT,POP,1/8 X 1/8,DOME,SST
24	041175	STDF,3/16HEX,4-40X1/2
25	041088	NUT,KEP,6-32
26	040992	SCR,PH PNH,6-32X3/4
31	037617	TBG,CLTH,NRPRN,.188ID X 5.25L,
34	036964	HSG,PMP,FRNT,5 OZ
35	036965	HSG,PMP,REAR,5 OZ
36	036967	SPNR,PMP,5 OZ,DEL,BLK
37	043981	RLR,.496OD,DEL,WHT
38	036980	SFT,RLR,5 OZ,.188ODX.70L,DEL
39	039455	SFT,SPNR,.250DIA X 1.250L,SST
Seq #	Item #	Item Description
40	051160	PIN,QT TURN,5OZ,PUMP
41	043839	SCR,HI-LO,PH PNH,#4X3/8,SST
43	056185	HARN,NS2,24V,2 PROD PCB
44	039734	WIRE,18 GA,10,ORG,QDC
45	057335	WIRE,18GA,8.5,RED,QDC

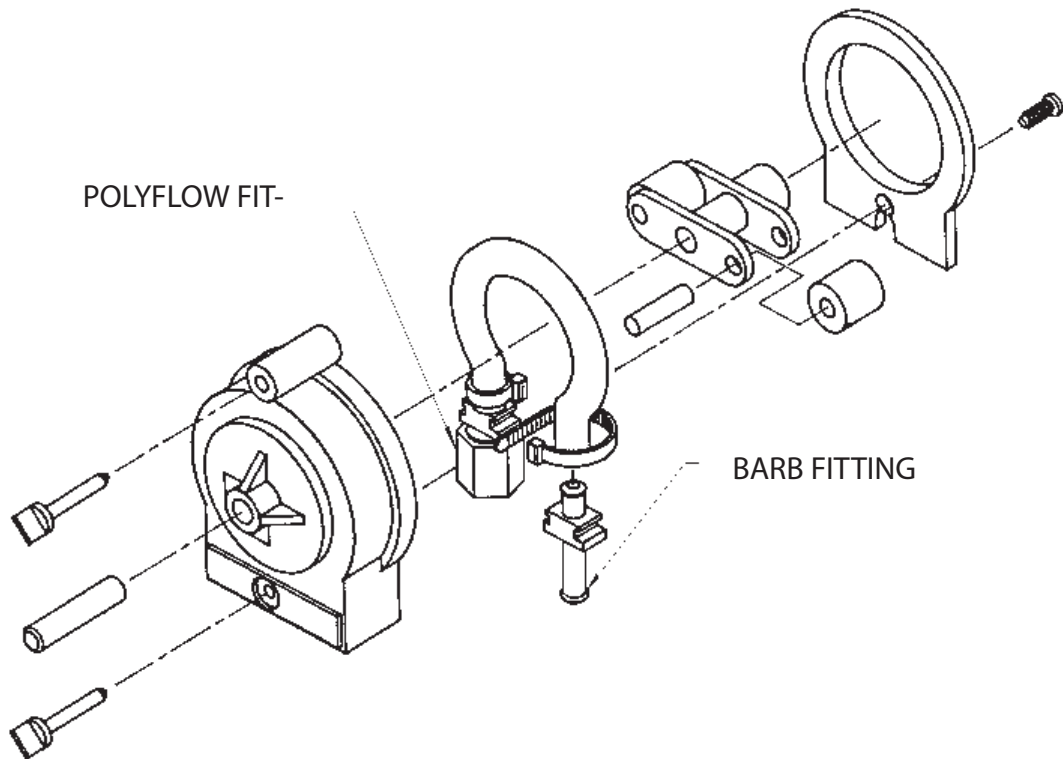


ML-2203  
Final Assembly  
DRW # 11320 REV A  
SHT 1 of 3









ML-2203 Snaphead Pump  
Assembly



