

# MLX™ Lubrication System

312146B

Bulletin RW-40050, 30020

*- For automatically lubricating Class 3, 4, and 5 vehicle chassis -*

**12 VDC Models: 258344, 258345, 563605, 563606, 563607, 563608, 563609, 563610, 563611, 563619, 563621,**

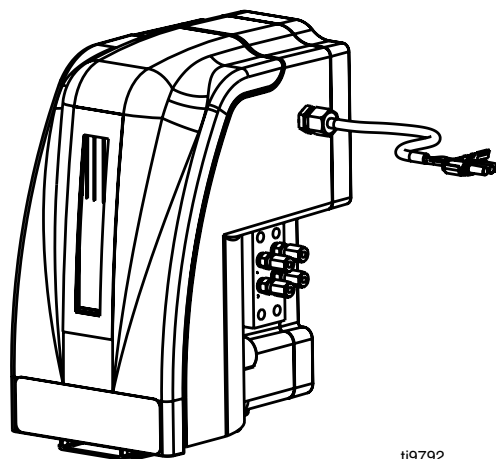
**24 VDC Models: 24B307, 24B308, 24B309, 24B310, 24B311, 24B312, 24B313, 24B314, 24B315, 24B316**



**Important Safety Instructions**

Read all warnings and instructions in this manual. Save these instructions.





*1200 psi ( 8.3 MPa, 82.74 bar) Maximum Working Pressure*








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# Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbol refers to procedure-specific risk. Refer back to these warnings. Additional, product-specific warnings may be found throughout the body of this manual where applicable.

 <b>WARNING</b>	
	<p><b>FIRE AND EXPLOSION HAZARD</b></p> <p>When flammable fluids are present in the work area, such as gasoline and windshield wiper fluid, be aware that flammable fumes can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> <li>• Use equipment only in well ventilated area.</li> <li>• Eliminate all ignition sources, such as cigarettes and portable electric lamps.</li> <li>• Keep work area free of debris, including rags and spilled or open containers of solvent and gasoline.</li> <li>• Do not plug or unplug power cords or turn lights on or off when flammable fumes are present.</li> <li>• Ground all equipment in the work area.</li> <li>• Use only grounded hoses.</li> <li>• If there is static sparking or you feel a shock, <b>stop operation immediately</b>. Do not use equipment until you identify and correct the problem.</li> <li>• Keep a working fire extinguisher in the work area.</li> </ul>
	<p><b>EQUIPMENT MISUSE HAZARD</b></p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> <li>• Do not operate the unit when fatigued or under the influence of drugs or alcohol.</li> <li>• Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See <b>Technical Data</b> in all equipment manuals.</li> <li>• Use fluids and solvents that are compatible with equipment wetted parts. See <b>Technical Data</b> in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS forms from distributor or retailer.</li> <li>• Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.</li> <li>• Do not alter or modify equipment.</li> <li>• Use equipment only for its intended purpose. Call your distributor for information.</li> <li>• Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.</li> <li>• Do not kink or over bend hoses or use hoses to pull equipment.</li> <li>• Keep children and animals away from work area.</li> <li>• Comply with all applicable safety regulations.</li> </ul>
	<p><b>ELECTRIC SHOCK HAZARD</b></p> <p>Improper grounding, setup, or usage of the system can cause electric shock.</p> <ul style="list-style-type: none"> <li>• Turn off and disconnect power at main switch before disconnecting any cables and before servicing equipment.</li> <li>• Connect only to grounded power source.</li> <li>• All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.</li> </ul>

 <b>WARNING</b>	
	<p><b>SKIN INJECTION HAZARD</b></p> <p>High-pressure fluid from dispense valve, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. <b>Get immediate surgical treatment.</b></p> <ul style="list-style-type: none"> <li>• Do not point dispense valve at anyone or at any part of the body.</li> <li>• Do not put your hand over the end of the dispense nozzle.</li> <li>• Do not stop or deflect leaks with your hand, body, glove, or rag.</li> <li>• Follow <b>Pressure Relief Procedure</b> in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.</li> </ul>
	<p><b>MOVING PARTS HAZARD</b></p> <p>Moving parts can pinch or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> <li>• Keep clear of moving parts.</li> <li>• Do not operate equipment with protective guards or covers removed.</li> <li>• Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the <b>Pressure Relief Procedure</b> in this manual. Disconnect power or air supply.</li> </ul>
	<p><b>BURN HAZARD</b></p> <p>Equipment surfaces and fluid that's heated can become very hot during operation. To avoid severe burns, do not touch hot fluid or equipment. Wait until equipment/fluid has cooled completely.</p>
	<p><b>PERSONAL PROTECTIVE EQUIPMENT</b></p> <p>You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:</p> <ul style="list-style-type: none"> <li>• Protective eyewear</li> <li>• Clothing and respirator as recommended by the fluid and solvent manufacturer</li> <li>• Gloves</li> <li>• Hearing protection</li> </ul>

# Installation

You will need the items identified in Table 1 and all tools listed in Table 2 to install the MLX lubrication system.

**Table 1**

Description	Quantity per Kit				
	8 Pt	9 Pt	10 Pt	11 Pt	12 Pt
Installation Manual	1	1	1	1	1
Mounting Guide	1	1	1	1	1
Housing Assembly	1	1	1	1	1
Manifold Assemblies (attached to Housing)	2	2	2	2	2
Hardware Kit (Includes Mounting Hardware)	1	1	1	1	1
Grease Cartridge	1	1	1	1	1
Power Cord	1	1	1	1	1
Tie Wraps / Pack 100	1	1	1	1	1
Single Tube 20 ft	1			1	
2 Tube Bundle 20 ft	1	4	2	2	3
3 Tube Bundle 20 ft	2	0	2	2	2



**Table 2: Tools Needed**

Center punch and Hammer
3/16", 7/16", 9/16", 1/2", 3/4" (19 mm) open end wrench
3/16", 7/16", 1/2" deep well socket and ratchet
Nylon tube cutter (available from Parker Hannifin or Synflex tubing)
Wire brush
Grease Gun
Electric drill motor
5/16" drill bit
9/64" Allen wrench
Wire Cutters w/ stripper and crimper
"Romex" Wire splitter (Available from any tool supply or electrical supply company.)

## Before You Begin

1. Clean the area around the fitting using a wire brush and rags.
2. Verify that all existing zerk grease fittings are accepting grease using a grease gun set at a maximum of 500 psi.

**NOTE:** If fitting does not accept grease at this pressure, do not connect the system to this point. Instead, determine the reason the fitting is not accepting grease and rectify. All lube points should be filled with grease before removing the zerk fittings.

						
Use proper safety jack stands to secure the vehicle. Improper safety precaution can be fatal to the individual installing and working under the vehicle.						

3. Jack the front end of the vehicle off the ground to ensure no part of the vehicle comes in contact with any MLX Pump components when turning the wheels.

## 1. Determine Mounting Location

First determine where to mount the MLX Pump. Depending on clearance and congestion, mount the MLX Pump for easy access to and protection for the unit. This unit can be mounted under the hood, behind the cab, on the frame or under the vehicle.

**NOTE:** Each tubing bundle is 20 ft long, therefore mount unit within 20 ft of the farthest lube point.

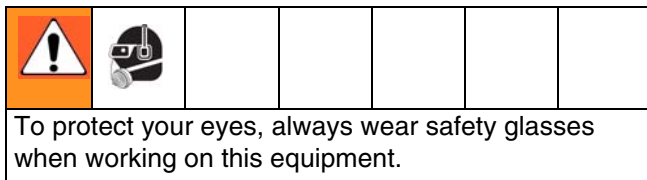
Units are shipped with manifolds and tubing attached. Reference the **Manifolds** section (Pages 9-11) for volumetric output per point and recommended connection locations.

## Proper Tubing and Fitting Assembly:

**Original Assembly:** With nut finger tight on fitting body, insert tubing until it bottoms in the fitting. Complete the seal with one wrench turn.

**Re-Assembly:** Tighten to original make-up position plus 1/16 turn to reseal sleeve. This can be done approximately 8 times before new ferrules and nuts will be required if this assembly method is used.

## 2. Replace Zerk Grease Fittings



- Make sure area where fittings are to be installed is clean. Use rags, wire brush, or low-pressure air to clean area.
- Remove zerk grease fittings.
- Install the new 3/16 in. (8 mm) fittings to the lube points on the vehicle.

## 3. Mount Housing

- Select the desired location where the MLX will be mounted.
- Referring to the guide provided on page 25 for hole locations, mark the four holes with a centerpunch and hammer.
- Drill 3/8 in. holes.
- Use 5/16 in. grade 5 bolts and self-locking nuts to mount the MLX Pump unit to the chassis of the vehicle.

## 4. Route Grease Tubes and Electrical Cable

Pre-measured lengths of tube bundles are supplied with each kit.

- Route tubing and cable along the inside of the frame.
- Anchor every 12 - 15 in. (305 - 381 mm).

### NOTE:

- Always use pre-filled approved 3/16 OD Graco tubing. Other lines cannot withstand pressure developed by the MLX Pump.
- The tube bundles should be routed inside the frame and secured for protection. The maximum distance between anchor points should be 12 - 15 in. (305 - 381 mm).
- When installing the tubing, AVOID routing any tubing within 3 in. (76 mm) of an exhaust manifold or muffler.
- The electrical cable should be routed at the same time as the tubing bundles. It is run between the MLX Pump unit and the electrical box where an "ignition on" signal, a constant 12 VDC or 24 VDC source and ground are presents.
- The electrical cable can be tied off with the tubing bundles to the frame of the vehicle.

## 5. Prepare Tubing Bundles and Install at the Various Lube Points

- After the tubing bundles are secured to the frame and inserted into the tire well area, use the Romex wire stripper to score and cut the outside sheath on the tube bundles back to the point where the tube bundle meets the first lube point. Care must be used to prevent puncturing or cutting the tubes inside of sheath.
- Peel back the outside sheath and roll the sheath back on itself to form a 1/2 - 3/4 in. ( 13 - 19 mm) protective collar. Any excess tubing sheath can be removed.

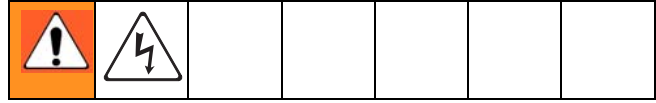
- c. Route tubes where they can be tied down securely with plastic tie straps and yet flex or move with moving parts.
- d. Align tubing with the fittings and make square cuts using a tube cutter.
- e. Turn the wheels in each direction and determine if tubing of the MLX Pump rubs or interferes.
- f. After determining that there is no interference, attach and tighten the tubes to the lube points with a 7/16 in. open-end wrench.

## 6. Set the Time Delay

- a. Remove the front cover of the MLX Pump.
- b. Slide the grease reservoir assembly out of the housing.
- c. Remove the long black grommet on the right side to expose the setting switches. Verify initial time delay is set to 1 minute.
- d. From top to bottom, set the switches to left (0), left (0), left (0), left (0). This same information can also be found on the label attached inside of the housing and on the chart in the MLX Time Delay section (Page 8).
- e. Replace the black grommet after setting the switches.

**NOTE:** The 1 minute setting is for set-up testing of the MLX Pump system. Reset the wait time to the desired time prior to the vehicle heading back out on the road.

## 7. Connect Electrical Wiring

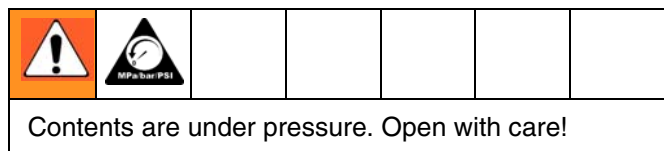


The MLX Pump has its own fused wiring. Refer to the **Wire Diagram** on page 26.

Perform the following actions in order:

- a. Disconnect positive lead from battery.
- b. Remove fuse from fuse holder.
- c. Connect black lead to an environmentally protected battery negative.
- d. Connect white, fused lead to positive lead at convenient location, preferably close to the battery.
- e. Connect green lead to an ignition-switched lead.
- f. Reinstall fuse in fuse holder.

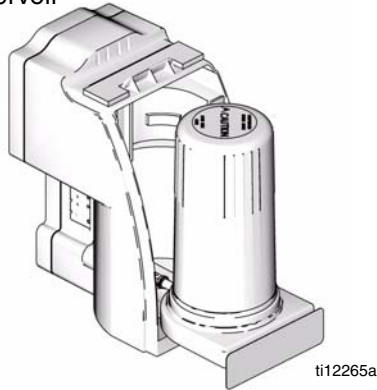
## 8. Install Grease Cartridge to Grease Reservoir and Connect MLX Pump



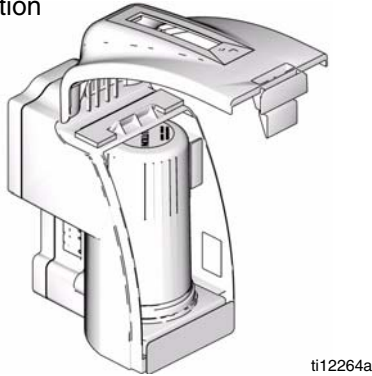
- a. Disassemble the grease reservoir.
- b. Install the grease cartridge into the opening of the cartridge base.
- c. Place plastic follower plate, spring and clear outer plastic reservoir cover over the grease cartridge and lock the cartridge base with the clear plastic cartridge cover.

- d. Insert the grease reservoir into the MLX Pump and install the front cover.

Sliding Reservoir



Cover Installation



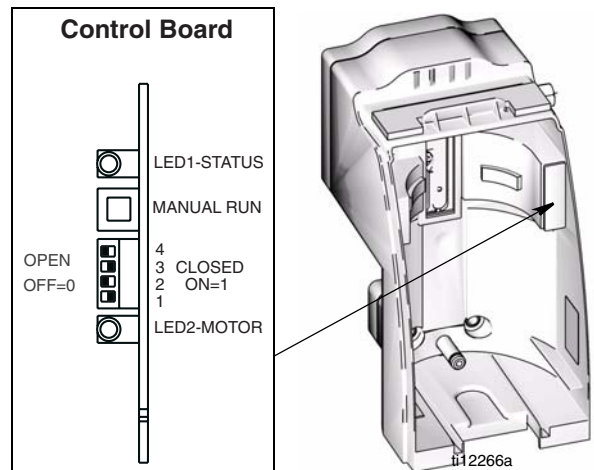
- e. Reconnect battery and the MLX Pump will go into a lube cycle. This can be verified by listening to the pump or by monitoring pump output with the manifolds removed. If the MLX Pump does not go into a lube cycle, refer to troubleshooting section.

**NOTE:** After lube cycle, it takes approximately one minute for the grease piston to return to home position.

## 9. Run, Check and Reset Lubrication Cycle

- a. Run the vehicle for 15 to 30 minutes. Check all lubrication points to ensure fresh grease is visible.
- b. Reset the time delay from 1 minute to 2 hours. Follow the same procedure as in Step 6, Page 6, but change the settings top to bottom to read: L (0), R (1), L (0), R (1).

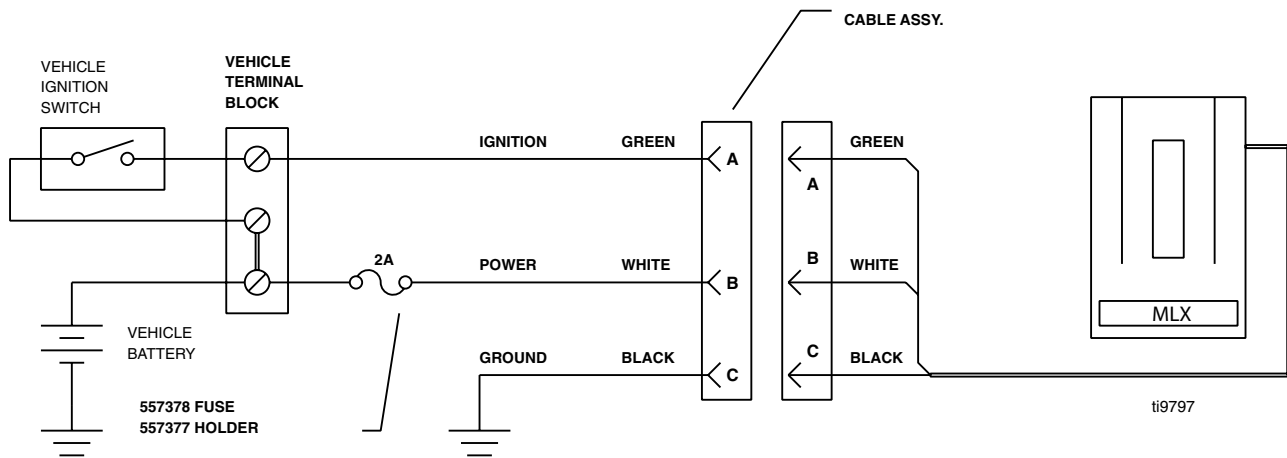
Vehicle lubrication points should be checked at 2 - 3 weeks intervals until the optimum setting for your application is achieved. Operating and environmental conditions will dictate the setting required.



# MLX Pump Time Delay

	Switch 1 = ON (CLOSED) (RIGHT) 0 = OFF (OPEN) (LEFT)				
Value	4	3	2	1	Delay
0	0	0	0	0	1 min
1	0	0	0	1	15 min
2	0	0	1	0	30 min
3	0	0	1	1	45 min
4	0	1	0	0	1 hr
5	0	1	0	1	2 hr
6	0	1	1	0	3 hr
7	0	1	1	1	4 hr
8	1	0	0	0	5 hr
9	1	0	0	1	6 hr
10	1	0	1	0	7 hr
11	1	0	1	1	8 hr
12	1	1	0	0	9 hr
13	1	1	0	1	10 hr
14	1	1	1	0	11 hr
15	1	1	1	1	12 hr

## Installation Hookup

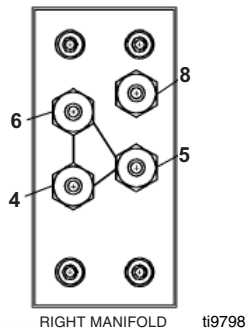
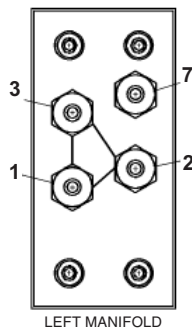




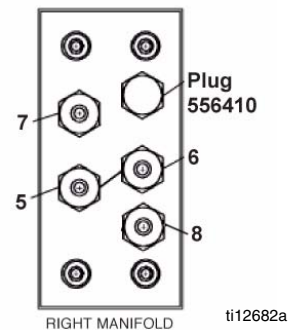
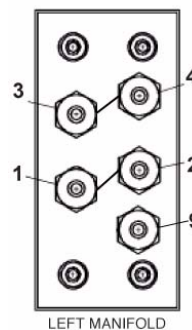
## 8 - Point Auto Lubrication System

Lube Points	Volume	Tube Color	Bundle	Recommended Fitting
1-KINGPIN Upper	0.015	Orange	3-TUBE	556638
2-KINGPIN Lower	0.015	Blue		556644
3-TIE ROD	0.005	Black		556644 / 15K740
4-KINGPIN Upper	0.015	Orange	3-TUBE	556638
5-KING Lower	0.015	Blue		556644
6-TIE ROD	0.005	Black		556644 / 15K740
7-DRAG LINK	0.005	Orange	2-TUBE	556644 / 15K740
8-DRAG LINK	0.005	Black		556644 / 15K740

8-point system



9-point system



## 9 - Point Auto Lubrication System

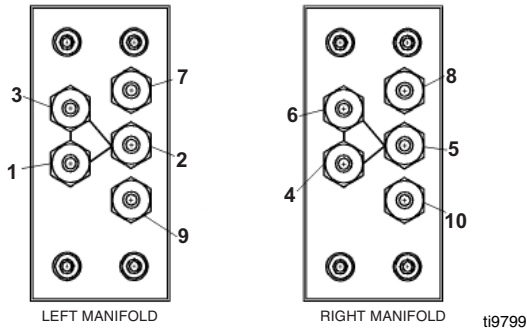
Lube Points	Volume	Tube Color	Bundle	Recommended Fitting
1-KINGPIN Upper	0.010	Orange	2-TUBE	556638
2-KINGPIN Lower	0.010	Black		556644
3-DRAG LINK	0.005	Orange	2 TUBE	556644/15K740
4-DRAG LINK	0.005	Black		556644/15K740
5-KINGPIN Upper	0.010	Orange	2 TUBE	556638
6-KINGPIN Lower	0.010	Black		556644
7-CLUTCH PEDAL	0.005	Black	1 TUBE	556638
8-TIE ROD	0.010	Orange	2 TUBE	556644/15K740
9-TIE ROD	0.010	Black		556644/15K740

# 10 - Point Auto Lubrication System

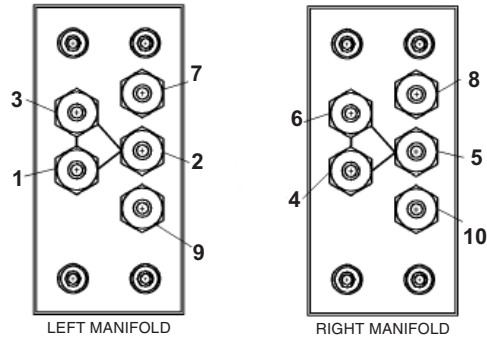
Lube Points	Volume	Tube Color	Bundle	Recommended Fitting
1-KINGPIN Upper	0.010	Orange	3-TUBE	556638
2-KINGPIN Lower	0.010	Blue		556644
3-TIE ROD	0.005	Black		556644 / 15K740
4-KINGPIN Upper	0.010	Orange	3-TUBE	556638
5-KINGPIN Lower	0.010	Blue		556644
6-TIE ROD	0.005	Black		556644 / 15K740
7-DRAG LINK	0.005	Orange	2-TUBE	556644 / 15K740
8-DRAG LINK	0.005	Black		556644 / 15K740
*9-CLUTCH CROSS-SHAFT	0.010	Orange	2-TUBE	556644 or 556638
*10-CLUTCH CROSS-SHAFT	0.010	Black		556644 or 556638

\* Points 9 and 10 could run to Rear Springs, Torison Bar or Sway Bar lubrication points

10-point Clutch System



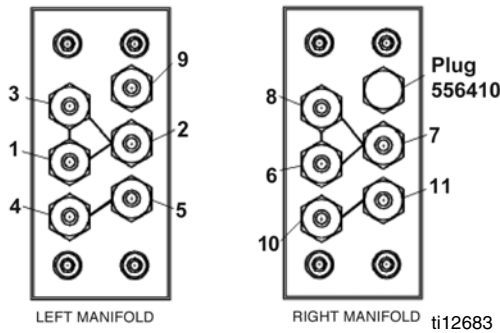
10-point Rear Spring System



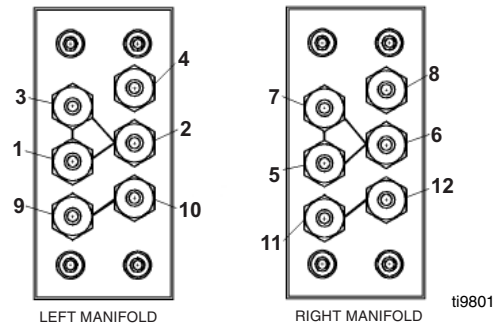
# 11 - Point Auto Lubrication System

Lube Points	Volume	Tube Color	Bundle	Recommended Fitting
1-KINGPIN Upper	0.010	Orange	3 TUBE	556638
2-KINPIN Lower	0.010	Blue		556644
3-TIE ROD	0.005	Black		556644/15K740
4-DRAG LINK	0.005	Orange	2 TUBE	556644/15K740
5-DRAG LINK	0.005	Black		556644/15K740
6-KINPIN Upper	0.010	Orange	3 TUBE	556638
7-KINGPIN Lower	0.010	Blue		556644
8-TIE ROD	0.005	Black		556644/15K740
9-CLUTCH PEDAL	0.005	Black	1 TUBE	556638
10-REAR SPRING	0.005	Orange	2 TUBE	556638
11-REAR SPRING	0.005	Black		556638

11-point System



12-point System



# 12 - Point Auto Lubrication System

Lube Points	Volume	Tube Color	Bundle	Recommended Fitting
1-KINGPIN Upper	0.010	Orange	3-TUBE	556638
2-KINGPIN Lower	0.010	Blue		556644
3-TIE ROD	0.005	Black		556644 / 15K740
*4-CLUTCH CROSS-SHAFT	0.005	Orange	2-TUBE SPLIT	556638
5-KINGPIN Upper	0.010	Orange	3-TUBE	556638
6-KING Lower	0.010	Blue		556644
7-TIE ROD	0.005	Black		556644 / 15K740
*8-CLUTCH CROSS-SHAFT	0.005	Black	2-TUBE SPLIT	556644 / 15K740
9-DRAG LINK	0.005	Orange	2-TUBE	556644 / 15K740
10-DRAG LINK	0.005	Black		556644 / 15K740
11-REAR SPRING	0.005	Orange	2-TUBE	556638
12-REAR SPRING	0.005	Black		556638

\* Points 4 and 8 could be run to Torison Bar or Sway Bar lubrication points.

## Connections

The supplied fittings connect the grease tubing to the various lube points. They replace the current zerk grease fittings. The lube points being greased will determine which fittings to use. Each lube point arrangement will have a kit containing the required fittings. Some zerk fittings on the vehicle may have been pressed in. If pressed in grease fittings are found, snap-on or self tapping adapters must be used.

## Fittings

Description	Part Number	Quantity per Kit				
		8 Pt	9 Pt	10 Pt	11 Pt	12 Pt
3/16 in. Tube Straight Male	556644	6	6	8	10	10
3/16 in. Tube Male 90° Elbow Connector	556638	6	6	6	6	6
3/16 in. Tube, 1/4 in. SAE Street Elbow	15K740	6	6	6	8	8
3/16 in. Straight Press on Zerk Adapters	563777	-	-	-	-	-
90° Elbow Press on Zerk Adapter	563776	-	-	-	-	-

### Proper Tubing and Fitting Assembly Procedure:

**Original Assembly:** With nut finger tight on fitting body, insert tubing until it bottoms in the fitting. Complete the seal with one wrench turn.

**Re-Assembly:** Tighten to original make-up position plus 1/16 turn to reseal sleeve. This can be done approximately 8 times before new ferrules and nuts will be required if this assembly method is used.

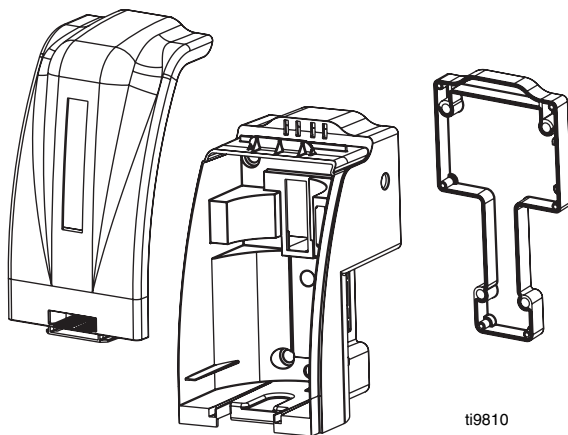
# System Components

## Housing

The housing consists of a three piece molded enclosure which has been made from a high impact resistant material that has been tested to withstand the operating environment.

The removable front cover allows for easy access to the grease cartridge, programmable lubrication settings and manual run switch.

The back cover allows access to the motor drive assembly, pump assembly, limit switches, and the circuit control board. (These components cannot be serviced in the field.)

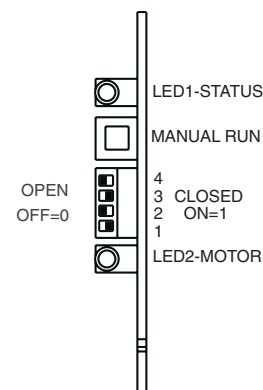


## Control Board

The controller is a microprocessor circuit specifically designed to control the MLX Pump. The lights on the board indicate the current function of the MLX Pump. See Troubleshooting on page 21. The Control board controls the pump operation and wait time between lubricant dispensing cycles. The controller has 16 different settings to program the wait time between lubrication cycles. The different time delay settings can be found inside the MLX Pump behind the reservoir assembly or in the MLX Pump Time Delay section.

The MLX Pump works off of a 12 or 24 volt DC negative grounded system. The control board receives continuous power at a very low power level from the vehicle battery. The timing signal is taken from the ignition-on signal of the vehicle. When the adjustable preset time delay has been reached, the control board activates the electric motor that drives the piston pump.

**Note:** Ignition on-time is stored in the processor; therefore the total time is monitored regardless of starting and stopping of the vehicle.



## Drive Motor

The drive motor assembly uses a 12 or 24 VDC electric motor and a gear assembly. When a lubrication cycle is initiated, the gear assembly attached to the motor drives the grease piston down and dispenses grease to the various lube points on the vehicle.

## Limit Switches

There are two limit switches used to detect the end of travel in each direction of the piston within the pump assembly. They indicate the home position and end of travel of the piston. Piston movement will continue in either direction until it encounters a limit switch.

## Grease Pump

The grease pump consists of a pump body and a piston. The grease pump assembly has a matched piston and bore. The pump dispenses a uniform amount of grease to the manifold. Each of the sixteen openings on the pump produces .005 cubic inch of grease per stroke. Pump outputs can be connected via standard manifolds to vary the amount of grease per lube point from .005 cu. in. to .015 cu. in. The maximum pressure the pump can deliver is 1200 PSI (8.3 MPa, 82.74 bar).

## Manifolds

There are two manifolds, one mounted on each side of the pump. They are designed to regulate the volume and direct the flow of the grease to the lube points. The tubing going to the lube points are connected to the manifolds.

Selection of the number of outlets per manifold is governed by the number of lube points on the vehicle. Each manifold has a number by the port. The number corresponds to a specific volume per cycle at the pump.

#1	#2	#3
0.05 cu. in. <sup>3</sup>	0.010 cu. in. <sup>3</sup>	0.015 cu. in. <sup>3</sup>

**NOTE:** Any manifold output port can be plugged without impacting the output of the remaining ports using plug part number 556410.

## Fill Stud

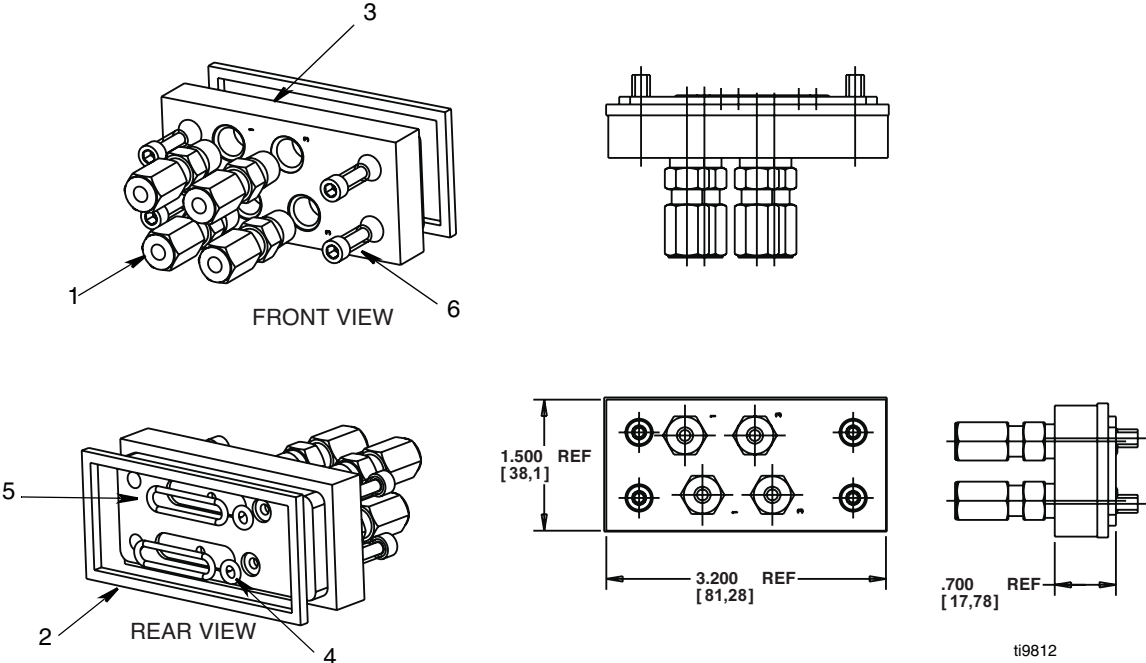
1. Remove the plug at the bottom of the pump (this will port will be used to install the fill stud and elbow).
2. Apply Loctite® 565 or an equivalent thread sealant to both threads on the elbow (part number 556423).
3. Install elbow in port (See Step 1). Tighten until snug with a 9/16" open-end wrench.
4. Install dust cap (part number 557875) on elbow with open end up.

**NOTE:** Properly orient dust cap, making sure it will cover fill stud after it is installed.

5. Install fill stud (part number 557896) on elbow. Tighten until snug with a 3/4" (19 mm) open-end wrench.
6. Cover fill stud with dust cap installed in Step 4.

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# 4 - Outlet Manifold Assembly: 563123



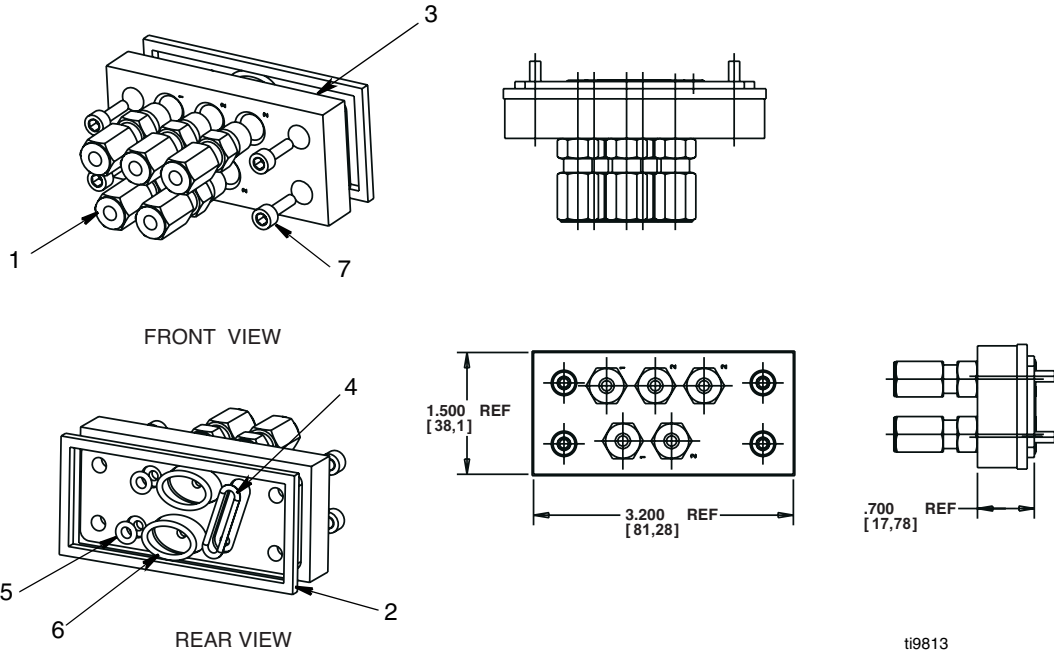
Item	Part No.	Description	Qty.
1	556644	CONNECTOR - MALE 1/8 npt x 3/16 T	4
2	*	MANIFOLD GASKET	1
3		MANIFOLD, 4 POINT	1
4	*	O-RING, .007 Buna-N	2
5	*	O-RING, .018 Buna-N	2
6		SHCS, #8-32 X 1/2 LG	4

\* Included in Manifold Gasket and O-Ring Kit - 563949

**Assembly Note:**

1. Adhesive side of manifold gasket to be assembled to manifold.
2. Torque fittings to 50-55 in. lbs.

## 5 - Outlet Manifold Assembly: 563125



ti9813

Item	Part No.	Description	Qty.
1	556644	CONNECTOR - MALE 1/8 npt x 3/16 T	5
2	*	MANIFOLD GASKET	1
3		MANIFOLD, 5 POINT	1
4	*	O-RING, .007 Buna-N	1
5	*	O-RING, .014 Buna-N	2
6	*	O-RING, .016 Buna-N	2
7		SHCS, #8-32 X 1/2 LG	4

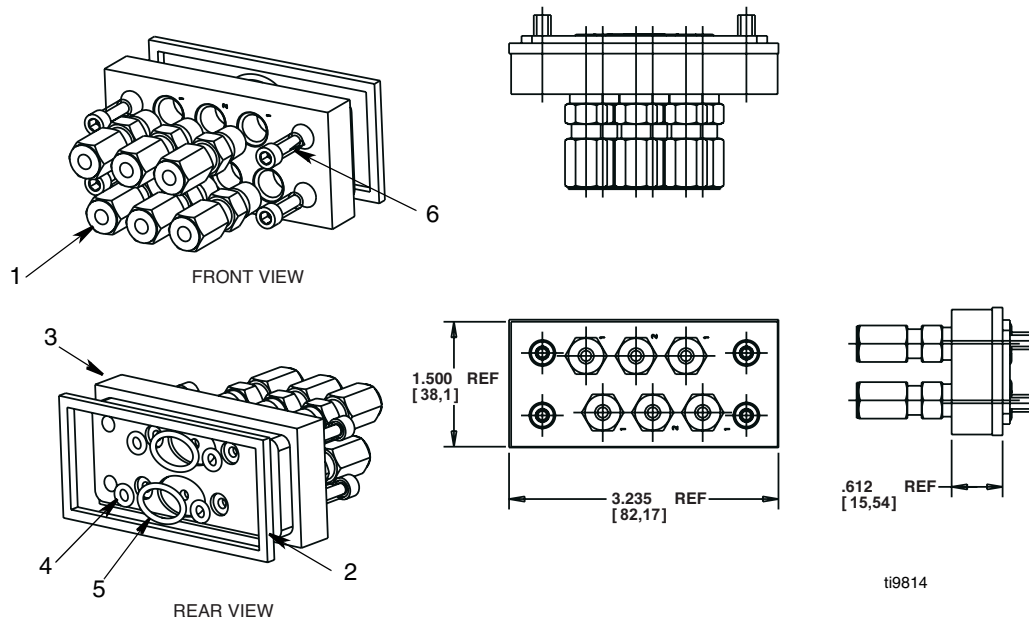
\* Included in Manifold Gasket and O-Ring Kit - 563949

### Assembly Note:

1. Adhesive side of manifold gasket to be assembled to manifold.
2. Torque fittings to 50-55 in. lbs.



## 6 - Outlet Manifold Assembly: 563124



ti9814

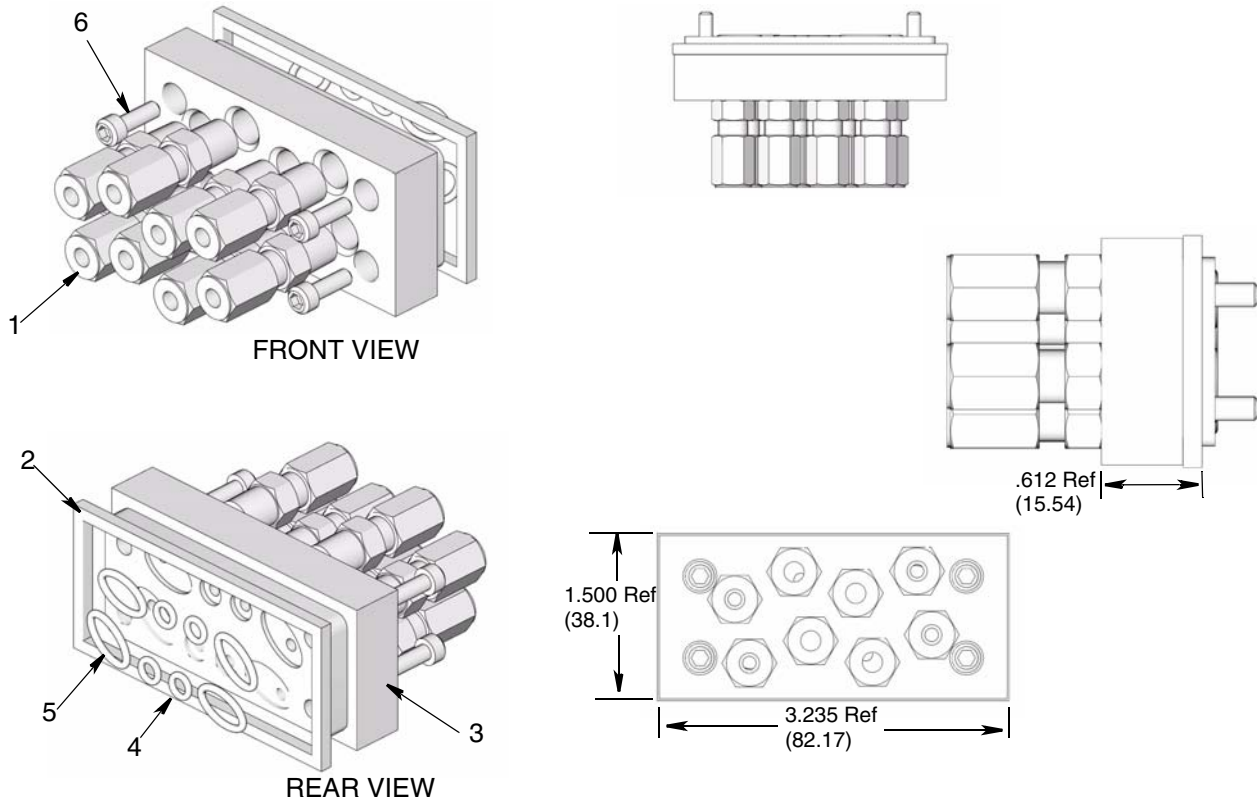
Item	Part No.	Description	Qty.
1	556644	CONNECTOR - MALE 1/8 npt x 3/16 T	6
2	*	MANIFOLD GASKET	1
3		MANIFOLD, 6 POINT	1
4	*	O-RING, .007 Buna-N	4
5	*	O-RING, .014 Buna-N	2
6		SHCS, #8-32 X 1/2 LG	4

\* Included in Manifold Gasket and O-Ring Kit - 563949

### Assembly Note:

1. Adhesive side of manifold gasket to be assembled to manifold.
2. Torque fittings to 50-55 in. lbs.

## 8 - Outlet Manifold Assembly: 24B320



Item	Part No.	Description	Qty.
1	556644	CONNECTOR - MALE 1/8 npt x 3/16 T	8
2	*	MANIFOLD GASKET	1
3		MANIFOLD, 8 POINT	1
4	*	O-RING, .007 Buna-N	4
5	*	O-RING, .012 Buna-N	4
6		SHCS, #8-32 X 1/2 LG	4

\* Included in Manifold Gasket and O-Ring Kit - 563949

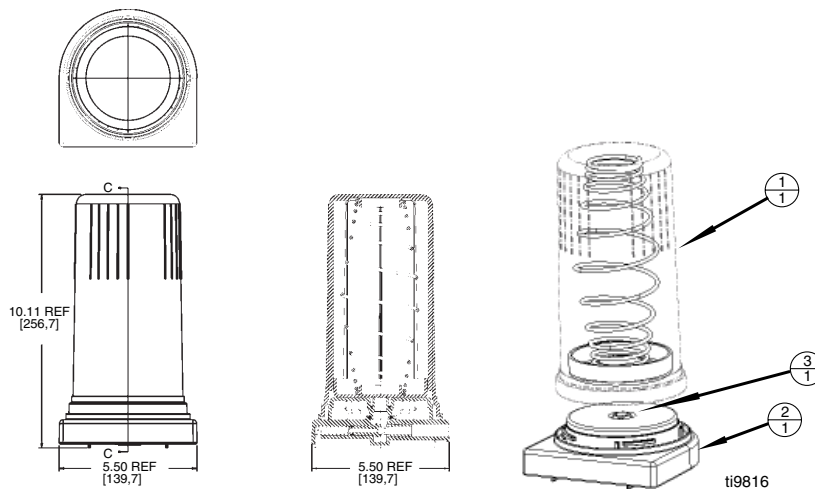
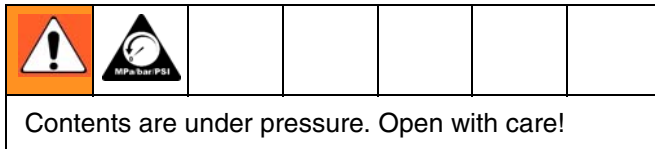
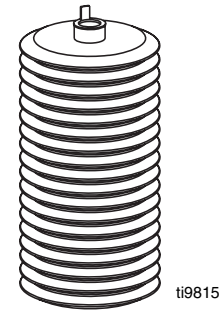
### Assembly Note:

1. Adhesive side of manifold gasket to be assembled to manifold.
2. Torque fittings to 50-55 in. lbs.

## Grease Reservoir

A grease cartridge holds the supply of grease for the MLX Pump. The top cover, follower plate, spring, bottom base, and grease cartridge are the major components that make up the reservoir. The cartridge is designed for easy exchange by removing the front cover of the MLX Pump housing.

### Grease Cartridge

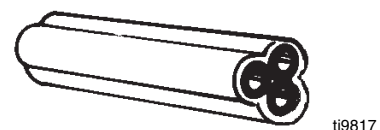


Item	Part No.	Description	Qty.
1	557982	COVER FOLLOWER ASSEMBLY	1
2	557978	RESERVOIR BASE	1
3	556545	O-RING	1

## Tubing

The MLX Pump uses 3/16 (8 mm) nylon tubing to deliver the grease from the manifolds to the different lube points. The tubing is made in different bundle sizes. The number of lube points determines the different tube bundle arrangements required for installing the MLX Pump. There are single, double and triple tubing bundles. Each tube is color-coded to help link tube location on the manifolds to the lube points on the vehicle during installation.

### Distribution Lines 3/16 in. OD Tubing



Bundles
563797 = 3 Tube bundles - 20 ft
258346 = 2 Tube bundle - 20 ft
563993 = 1 Tube orange - 20 ft

# Troubleshooting

Problem	Cause	Solution
Too much grease at all lube points.	Timer cycle too frequent	Adjust timer setting for higher off cycle.
Not enough grease at lube point.	Timer cycle is too infrequent	Adjust timer setting for lower off cycle.
	Broken grease lines	Replace grease lines.
	Damaged fitting	Replace fitting
Hose pulled from fitting or burst hose	Lube point not accepting grease	Verify joint readily accepts grease and reconnect.
	Lines not correctly routed	Correct line routing
No grease being dispensed	Broken grease line(s)	Check and replace
	Damaged fitting(s)	Check and replace (Fittings can be re-used up to 8 times.)
	Electrical circuit problems	Perform electrical circuit test. See the Electrical Circuit Trouble Shooting section, page 22.
	System needs to be bled	Follow bleeding instructions in the <b>Bleeding Instructions</b> section, page 23.
	Grease Pump Malfunction	The grease pump is not repairable. It must be replaced as a unit.  Follow the Troubleshooting the MLX Pump instructions, page 21.  Disconnect MLX Pump power cable. To prevent line contamination, leave unit installed until replacement is available.

## Troubleshooting the MLX Pump

Step/Instruction	Yes	No
1. Open Cover and remove circuit board switch grommet.  Are any lights illuminated on the circuit board?	Top light is Green. Go to step 2.  Both lights are Green. Go to Step 5.	No lights are illuminated. Go to step 7.
2. Press MANUAL RUN button  a. Does lower light turn Green and pump cycle?	Pump cycles and stops after approx 15 seconds. Lower light goes out. Go to Step 3.  Pump runs but does not stop. Go to Step 14.	Lower Light does not turn Green and pump does not cycle. Go to step 19.
3. After 1 min wait, pump cycles and lower light turn Red. Be sure to hold reservoir tight against back of pump housing.  Does this occur?	Go to step 4.	Go to Step 19.
4. Remove one tube from manifold. Press MANUAL RUN button again. Listen for lube cycle and watch lights.  Does grease come from exposed outlet?	Pump is functioning normally. Reconnect tube and return to service.	Go to Step 14.
5. Wait 3-4 min. for lower light to shut off.  Does lower light shut off?	Go to Step 6.	Go to Step 19.
6. Wait 3-4 min. for lower light to turn RED and pump to recycle.  Does this occur?	Go to Step 4.	Go to Step 19.
7. Press MANUAL RUN button.  Do any lights illuminate?	Top light is Green. Go to Step 2a.  Both lights are Green.  Go to Step 5.	No lights are lit. Go to Step 8.
8. Disconnect electrical connector. Check voltage at Points B and C. See Figure 3.  Is 12VDC or 24 VDC present?	Go to Step 9.	Go to Step 11.
9. Turn ignition on and check voltage at Points A and C.  Is 12 VDC or 24 VDC present?	Go to Step 10	Go to Step 12.
10. Turn off ignition and reconnect electrical plug.  Are any lights illuminated on circuit board	Top light is Green. Go to Step 2.  Both lights are Green.  Go to Step 5.	No lights are lit. Go to Step 8.

Step/Instruction	Yes	No
<p>11. Locate fuse in pump wiring. See Figure 4 for wiring schematic.</p> <p>Is fuse blown?</p>	<p>Replace fuse. Go to Step 8.</p>	<p>Go to Step 12.</p>
<p>12. Troubleshoot wiring from pump plug to vehicle.</p> <p>Is wiring intact?</p>	<p>Go to Step 13.</p>	<p>Repair wiring. Go to Step 8.</p>
<p>13. Troubleshoot vehicle wiring to connections.</p> <p>Is wiring intact?</p>	<p>Go to Step 19.</p>	<p>Repair wiring to restore voltage to pump. Go to Step 8.</p>
<p>14. Prepare to remove reservoir by pushing in and pulling out about 1/2 in. 2-3 times to break the vacuum and allow valve to close. Remove reservoir and remove gear cover grommet at center of pump (See FIG. 1, FN1, page 25). Observe location of drive gear and piston rack.</p> <p>Is the rack engaged with pinion and moving?</p>	<p>Go to Step 15</p>	<p>Go to Step 19.</p>
<p>15. Press MANUAL RUN button again and observe the male nipple at bottom that connects pump to reservoir.</p> <p>Is the rack engaged with the pinion and moving?</p>	<p>Go to Step 19.</p>	<p>Go to Step 16.</p>
<p>16. Replace switch grommet and reservoir before pump recycles.</p> <p>Has pump been purged?</p>	<p>Go to Step 19.</p>	<p>Go to Step 17.</p>
<p>17. Purge pump of air and re-prime.</p>		
<p>18. After purge is complete, does pump function normally?</p>	<p>Return to service.</p>	<p>Go to Step 19.</p>
<p>19. Disconnect Pump Electrical Connector and order replacement pump 563611 or 563623.</p>		

## Electric Circuit Troubleshooting

1. Remove front plastic front cover from the MLX Pump.
2. Remove rubber cover to opening to control circuit board. This is cover just right of the bellows grease cartridge.

3. Initiate a lube cycle. Push the black button.

The control circuit board has two LED's. When working properly, one of the following conditions will exist:

LED 1	LED 2	Condition
Green	Green	The piston is in a positive position of discharging grease.
Green	Off	One-minute wait stage before it returns to the home position.
Green	Red	The piston is returning home.
Blinking Green	Off	The unit is in a time delay between lube cycles.
Off	Off	During Initiated lube cycle, 12 or 24 VDC not present. Check fuse. Refer to schematic in section 3.6

## Bleeding Instructions

1. Remove manifolds.
2. Initiate lube cycle via manual run button.
3. Using 3/4 in. (19 mm) wrench, remove fitting from bottom of unit.
4. Allow grease to flow.
5. Replace fitting.
6. Wait one minute until unit resets.
7. Verify pump by manual operation for 3 to 5 cycles.
8. Attach manifolds.

## Fill Stud

1. Remove the plug at the bottom of the pump (this will port will be used to install the fill stud and elbow).
2. Apply Loctite® 565 or an equivalent thread sealant to both threads on the elbow.
3. Install elbow in port (See Step 1). Tighten until snug with a 9/16" (14 mm) open-end wrench.
4. Install dust cap on elbow with open end up.

**NOTE:** Properly orient dust cap, making sure it will cover fill stud after it is installed.

5. Install fill stud on elbow. Tighten until snug with a 3/4" (19 mm) open-end wrench.
6. Cover fill stud with dust cap installed in Step 4.

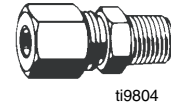
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# Parts

## Replacement Parts

Part No.	Description
563622	12 VDC MLX Replacement Pump
563620	24 VDC MLX Replacement Pump
563779	MLX Pump Front Cover with decals
557894	Reservoir Assembly (complete)
557982	Cover Follower Assy
557978	Base Assembly
556545	O-ring between grease cartridge and base assembly
563086	Cartridge with Grease - 6 pack
557265	Grommet - Circuit Board Access
557266	Grommet - Setting Switches Seal
563949	Manifold Gasket and O-ring Kit
563993	Precharged 3/16 in. Tubing Bundles
258346	1 Tube Bundle - Orange 20 ft (7.5 m)
563797	2 Tube Bundle - 20 ft (7.5 m)
	3 Tube Bundle - 20 ft (7.5 m)
	Nylon Tie Straps
563770	100 bag
56638	1/8 npt x 3/16 in. Tube Fitting 90°
556644	1/8 npt x 3/16 in. Tube Fitting St.
15K783	Street Elbow 1/8 npt to 1/8 npt
15K740	Street Elbow 1/4-28 SAE to 1/8 npt
563777	Zerk Adaptor - Straight 3/16 in. Tube
563776	Zerk Adaptor - Elbow 3/16 in. Tube
15M037	Zerk Adaptor - Press-in 1/8 npsf
556423	Elbow, 1/4 NPTF male
557896	Fill Stud, 1/4 NPTF female
557875	Dust Cap, 4TS2-02201

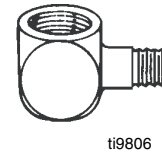
MALE CONNECTOR  
3/16 in. (8 mm) tube, 1/8 npt  
556644



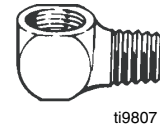
MALE 90° ELBOW  
3/16 in. tube, 1/8 npt  
556638



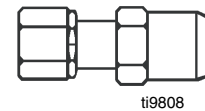
ELBOW, STREET  
1/4-28 SAE to 1/8 npt  
15K740



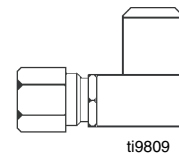
ELBOW, STREET  
1/8 npt to 1/8 npt  
15K783



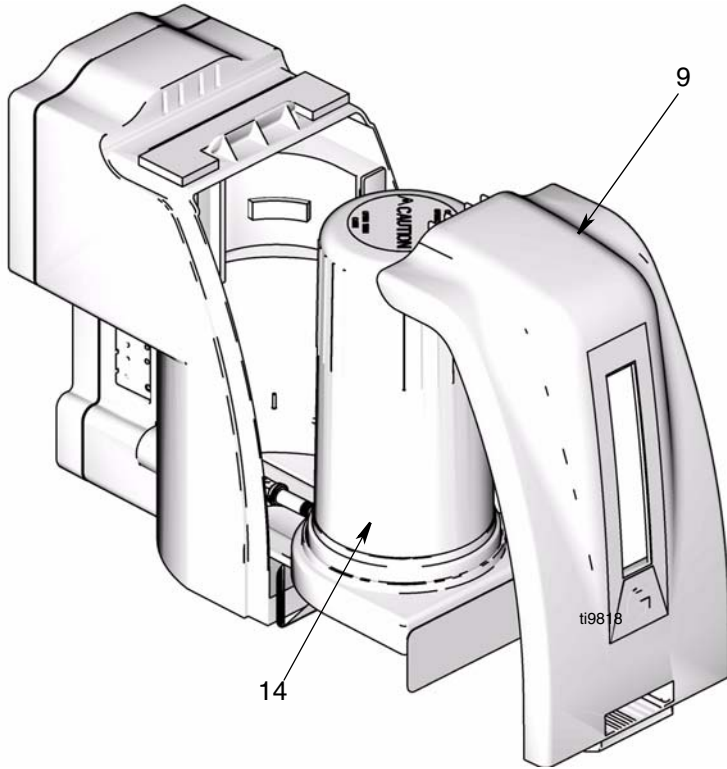
ZERK ADAPTORS,  
PRESS ON:  
3/16 in. TUBE CONNECTION  
STRAIGHT - 563777



ZERK ADAPTORS,  
PRESS ON:  
3/16 in. TUBE CONNECTION  
ELBOW - 563776







Item	Part No.	Description	Qty.
9	557980	FRONT COVER	1
14	557894	RESERVOIR	1

## Mounting Guide

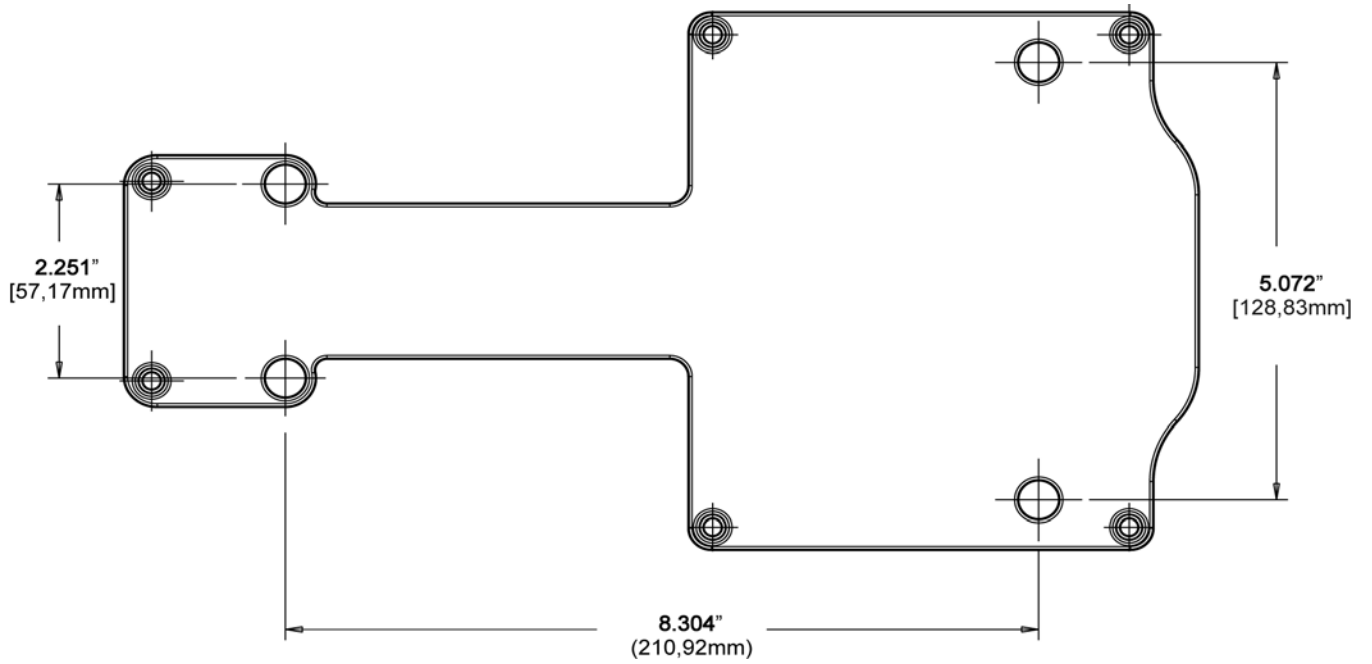
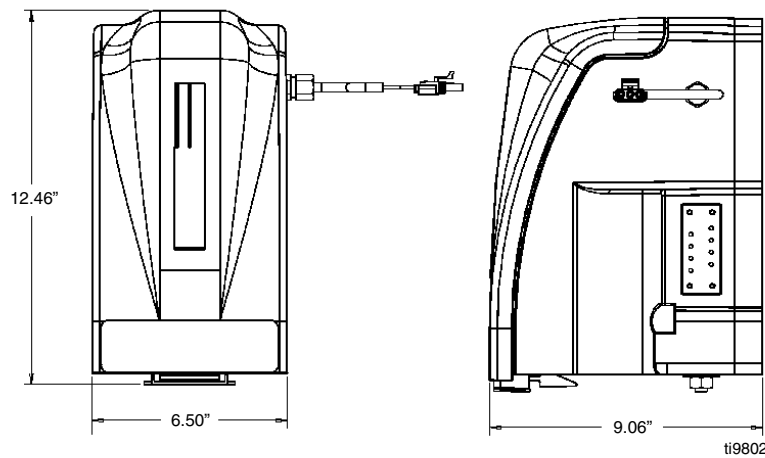


FIG. 1

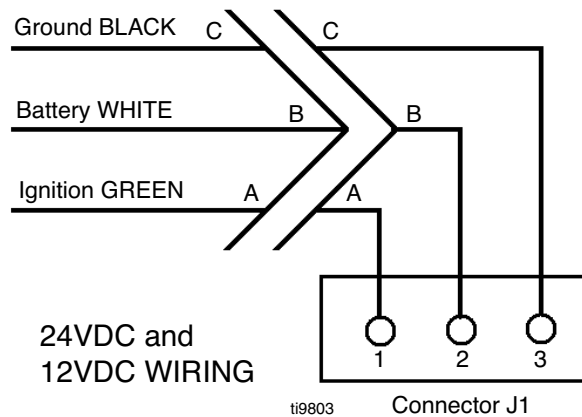
# Technical Data

Pump Type . . . . .	Positive Displacement Piston
Pump Construction . . . . .	Zinc Plated Steel, Anodized Aluminum, Nylon
Drive Type . . . . .	Electric Gear Motor
Lubricant Capability . . . . .	NLGI #00
Output Volume . . . . .	16 shots of 0.005 cu. in. each (0.080 cu. in. total)
Operating Pressure . . . . .	1200 psi max.
Motor Voltage . . . . .	12 or 24 VDC
Reservoir Type . . . . .	Collapsible plastic bellows
Reservoir Capacity . . . . .	61 cu. in. (Approx. 2 lbs)
Solid State Timer Voltage . . . . .	12 VDC
Lube Cycle Frequency . . . . .	Adjustable from 1 min to 12 hrs
Line Sizes . . . . .	3/16 in. O.D. heavy wall nylon

# Dimensions



# Wire Diagram





# Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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**TO PLACE AN ORDER**, contact your Graco distributor or call to identify the nearest distributor.

**Phone:** 612-623-6928 or **Toll Free:** 1-800-533-9655, **Fax:** 612-378-3590

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