



lubecore™

GENERAL MANUAL

Lubecore_GM_013

Modular Progressive Automated Lubrication System



NEXT GENERATION AUTOMATED LUBRICATION

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Preface to the Manual

The operation instructions contain important information for the safe and proper operation of an automated lubrication system. It is recommended that a user read the instructions carefully prior to operation, Lubecore will not be held liable for damages and failures resulting from non-observance of these instructions. All instructions must be completed respective to national regulations pertaining to accident and environmental protection.

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Responsibility to ensure the safe operation of the automated lubrication system, the end user is responsible for the following:

- 1). The automated lubrication system shall be operated only for the intended use and its design shall neither be modified nor transformed.
- 2). The automated lubrication system shall be operated properly only if it is in a proper functioning condition and if it is operated in accordance with the maintenance requirements.
- 3). Personnel must be familiar with this operation manual and the safety instructions mentioned herein and observe these carefully.
- 4). Wastes (e.g. used oil, detergents, lubricant) must be disposed in accordance with relevant federal, state, provincial and territorial environmental regulations.

Service

Lubecore offers users full service in the form of advice, on-site installation assistance, training, etc if requested. In case of inquiries pertaining to maintenance, repairs and parts, Lubecore requires model specific data to enable us to identify the components of the automated lubrication system. Lubecore will not accept any liability for damages caused by the misuse of the designed automated lubrication system and/or the repair of said system by using any other parts other than Lubecore International original (OEM) parts.

Safety Precautions

- 1). Comply with all safety regulations applicable within the locality where all work is performed.
- 2). Always take the necessary precautions to prevent potentially dangerous situations from occurring during installation, inspection and maintenance. Always apply or use adequate safety measures to prevent personal injury and material damage, before starting work on any piece of the equipment.
- 3). The electrical system of the equipment must be disconnected before any work is performed.
- 4). The pressurized air system of the equipment must be drained of all air and pressure.
- 5). Inquire with the facilities management to the prescribed procedure to immobilize equipment and prevent operation of equipment. When these are not prescribed, remove any means that can start the equipment (ignition key / main power switch) and place indicator tags to show others not to start the equipment.
- 6). Never work underneath a machine, vehicle or any other piece of equipment, which is raised by a jack only. Always use a jack stand and check that the ground is firm and sufficiently flat.
- 7). Keep in mind that a vehicle with air suspension may drop of its own accord.
- 8). Only work underneath a cab if it is fully tilted and latched, or otherwise secured preventing accidental return-tilt.
- 9). Disconnect the ground battery lead from the vehicle's battery. This prevents electrical equipment from being inadvertently activated or otherwise electrically damaged.
- 10). Avoid working on a machine, vehicle or other equipment that recently was in use. Give time to allow components to cool (coolant, exhaust, turbo, etc).
- 11). A vehicle, machine or other equipment may only be operated by those who are trained and licensed to do so and are aware of all possible dangers.
- 12). Only use tools that fit and are designed for the specific task.
- 13). Adhere to all regulations, specifications and limitations as specified by the manufacturer of the machine, vehicle, equipment and /or engine.

Keep the environment in which you work clean for you and others.

Introduction

Lubecore™ Automated Lubrication Systems take care of daily regular and preventive maintenance for components requiring lubrication.

An automated lubrication systems prevents unnecessary wear and downtime, thus reducing operating costs and preventing unforeseen expenses.

Automated lubrication systems not only assist with extending maintenance intervals, they also prolong the useful technical and economic life of the equipment thus providing a higher residual value.

Lubecore automated lubrication systems are environmentally friendly; they are suitable for biodegradable lubricants, and prevent manual over-lubrication, and grease waste. The reduced need for replacement components also has a positive impact on the environment reducing the need for raw materials and energy to produce these replacement components.

The most important advantages:

- Extension of maintenance intervals.
- Reduced wear on components.
- Lower repair and replacement costs.
- Prevents downtime.
- More effective use of lubricant.
- Less time spent by technicians servicing equipment.
- Less expensive lubricant required, as expensive additives can be avoided.
- Reduces strain on equipment.
- Improved fifth wheel performance; avoid trailer-steer and improves safety.
- Promotes the use of a single type of lubricant. Preventing compatibility problems and the accidental application of the incorrect type of grease.

A Lubecore automated lubrication system ensures that all connected lubrication points on a vehicle or equipment are lubricated with a predetermined amount of grease at the correct interval. As lubrication takes place while the vehicle is in use, the lubricant is dispensed to all the connected lubrication points during movement of those components that are connected, ensuring an improved distribution of the lubricant over the surface area.

Apart from refilling the grease reservoir and performing a periodic quick system inspection, the Lubecore automated lubrication system does not require anything else to get the job done.

Lubecore's automated lubrication systems are designed with the utmost care and tested rigorously. This ensures an extended operational life and trouble-free operation, even under the most extreme operating conditions.

High Lubecore installation standards along with the use of the correct type of grease and periodic inspections ensures years of trouble-free system operation. Periodic inspections, which take little time and effort, can be performed during the regular daily circle check by the operator as well as monthly by the maintenance staff..

The Concept of Automated Lubrication

Greases are used where a mechanism can only be lubricated infrequently and where a lubricating oil would not stay in position. They also act as valuable sealants to prevent ingress of water and dust.

Equipment requires lubrication for the following reasons:

- 1). Keep moving components separated.

Lubricants are typically used to separate moving components, reducing friction, surface fatigue, heat generation, operating noise and vibrations. The most common way lubricants achieve this is by creating a physical barrier. In cases of high surface pressure (EP) or temperatures the fluid film is thin and some of the forces are transmitted between the surfaces through the lubricant. This is termed elastohydrodynamic lubrication.

- 2). Carry away contaminants and debris (“Wash Out” or “Purge”).

Any accidental metal-to-metal contact created by debris or externally introduced contaminants like dirt or water, need to be removed to reduce the risk of damage and prevent corrosion.

- 3). Protect against wear.

Lubricants do not just prevent wear by keeping the moving parts apart. Lubricants may also contain anti wear or extreme pressure additives to boost their performance against wear and fatigue.

- 4). Prevent corrosion.

Quality lubricants are typically formulated with additives that form chemical bonds with surfaces to prevent corrosion and rust.

Under normal circumstances, lubricants / greases are applied to moving parts using a manual grease gun during regular maintenance intervals. These maintenance intervals could coincide with other service requirements like engine oil changes or can be determined based on hours of operation.

Proper equipment maintenance incorporates OEM recommended lubricant application at regular intervals. The goal is to ensure that the protective grease film is preserved between moving surfaces. The required interval (hours of operation or mileage) is determined by user operating information, equipment type, and environmental conditions. The equipment owner/operator is responsible to review the equipment and the lubricant application interval and adjust as needed to refresh the lubricant and prevent premature wear.

The manual application of lubricant relies on flush out of old lubricant in one instance during a service interval, while the equipment is idle. The goal is to prevent the failure of the lubricant film, as mentioned earlier, to prevent metal to metal contact.

Benefits

Automated lubrication Systems by Lubecore™ are designed to ensure the proper quantity of lubricant is applied during equipment operation ensuring:

The better distribution of lubricant to moving parts, increases the longevity and reliability of the equipment being lubricated. Automated lubrication systems (ALS) provides higher frequency of lubricant application with nominal quantities of lubricant to sustain the lubrication film while the equipment is in operation. This ensures proper protection without over greasing and unnecessary waste.

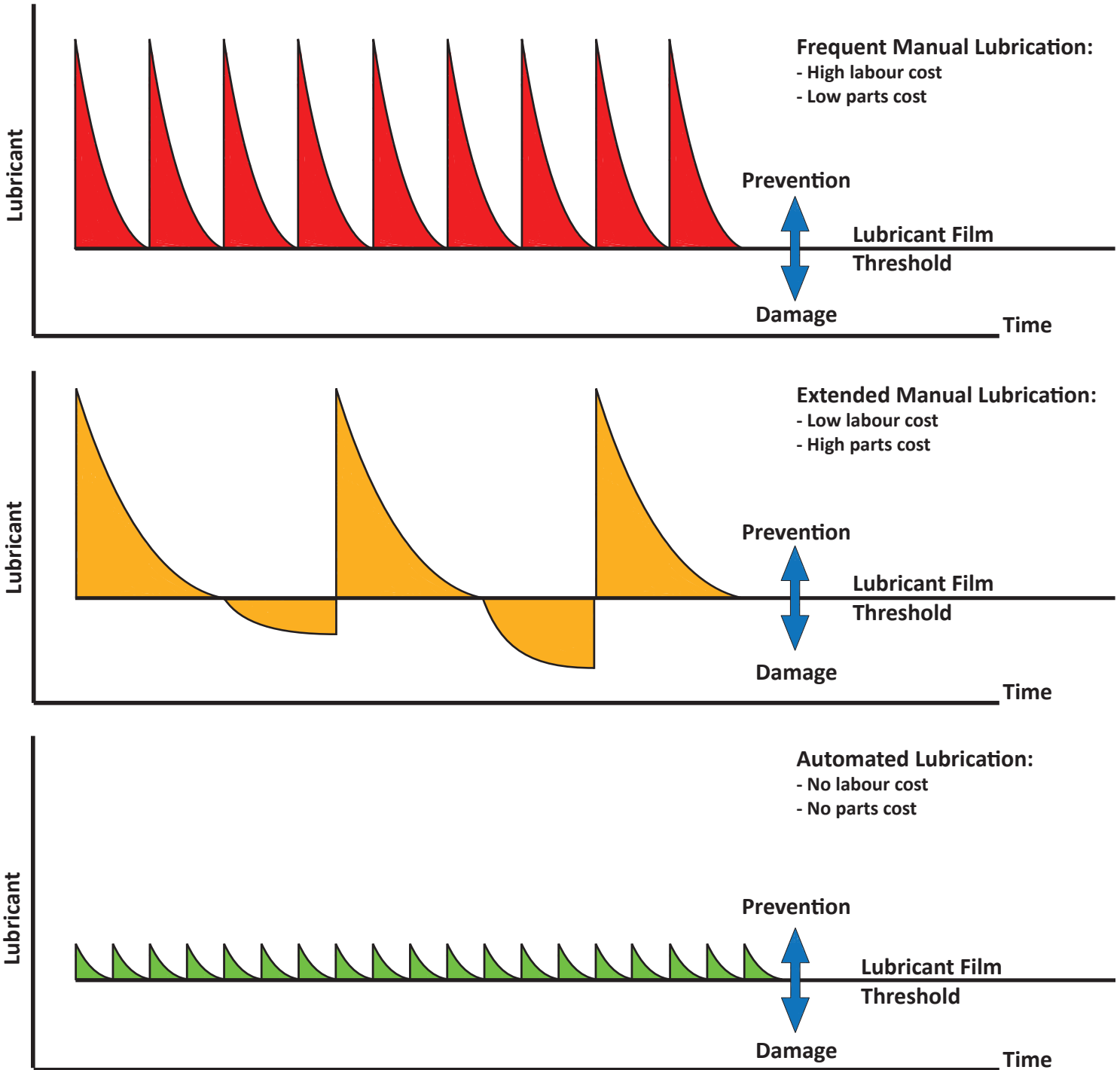


Illustration 1. **Manual Versus Automatic Lubrication, Representation of Concept.**

General Operation of the Modular Progressive Lubrication System

The Lubecore Modular Progressive Automated Lubrication System can be used in a variety of applications. This section describes the general operation of Modular Progressive lubrication system with standard components. For details regarding the operation of our other pumps and components, please refer to the appropriate Lubecore documentation or contact Lubecore directly. A Lubecore Modular Progressive Automated Lubrication system consists of the following main components.

Note: The ① are identification markers referring to items in the illustration on the next page.

- ① Electrically operated Modular Progressive pump unit.
- ② Potted timer with 7 segment LED which is integrated into the motor housing.
- ③ Distribution blocks and ④ filler coupling.
- ⑤ Metering elements.

A Lubecore Automated Lubrication System will be designed and assembled according to the specific type of equipment and the associated operating conditions. Starting with the manufacturer specifications regarding the lubrication requirement, the system layout will be designed and the appropriate components selected.

The automated lubrication system is designed to function as follows:

While the equipment is in operation, the ignition switch provides the electronic timer ② with power to perform its program. When ignition is turned to the on position, the 7- segment LED display indicates availability of power by a singular blinking LED in the lower right corner. If the LED does not come on, there is either no power present or the polarity is reversed.

After reaching the end of the interval timer count down, the timer engages an electric motor located on the bottom of the Modular Progressive pump ①. The electric motor drives a steel cam at 23 RPM and in a clockwise direction pushing against one or multiple metering elements ⑤. The 7- segment LED display indicates operation of the motor with a rotating segment.

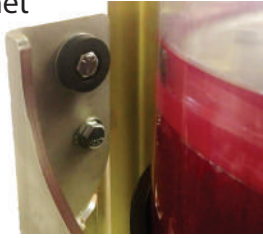
Depending on the total pumping time preset in the timer, the motor will be activated for a predetermined and set the number of minutes and pump lubricant to the connected distributor blocks. ③ In a progressive lubrication system the total amount of lubricant to be dispensed to all connected points is determined by the timer setting.

The metering elements ⑤ are calibrated to dispense a predetermined amount of grease, per stroke of the cam (0.30 cc), to the connected distributors. The distributor blocks divide the lubricant to each connected lubrication point one after the other. This continues until the pump is deactivated by the timer or the ignition is turned off.

At the completion of the lubrication cycle, the electric motor is deactivated by the timer. After the timer deactivates the electric motor the system program sets the time interval back to the start of the preset value and initiates another countdown (as long as the timer is supplied with power).

Optionally the pump can be equipped with a low level sensor. Which when triggered by the follower plate at minimum grease level, will stop the pump and alert the operator that the reservoir needs to be filled.

Location Manual Test Cycle Magnet



Status LED Indicating Operation, Alarms and Time Selection for Pause and Working



Illustration 2. Modular Progressive Automated Lubrication System Layout.

Modular Progressive Pump

Pump features:

The pump is available with either a 4 Kg (8.8lbs.) or 6 Kg (13.2 lbs) capacity reservoir. The Makrolon® impact resistant reservoir is fitted with a bright red silicone follower plate and Positive Inlet Pressure (PIP™) spring. This provides a clear indication of the grease level and prevents funneling of the grease.



Illustration 3.
4 Kg Modular Progressive Pump.



Illustration 4.
Makrolon™ Reservoir with Red Follower Plate.

The 4 / 6 Kg reservoir comes equipped with a PIP™ - Positive Inlet Pressure spring (patent pending). This spring is situated on top of the red follower plate pushing it down, providing extra pressure to the grease. This prevents air locks from developing in and at the elements, allowing the use of NLGI / EP2 grade greases.



Illustration 5.
PIP™ Follower Plate

A fill connector of either a 1/4" quick disconnect for EP0 or a standard grease fitting for EP2 or other greases may be used. The filler coupling is threaded into the pump housing and is equipped with a large capacity stainless steel filter. Lubricant can be pumped into the reservoir by using a hand filler pump or standard grease gun. It is recommended to service or replace the filter every 5 pails of grease to ensure ease of filling.

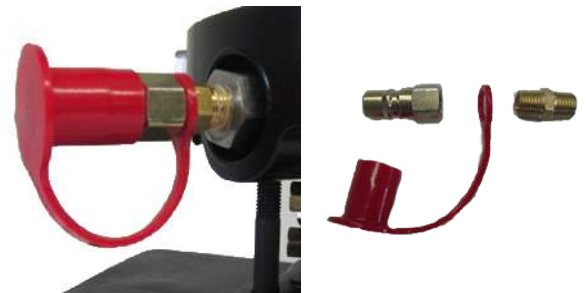


Illustration 6.
1/4" QD Fill Coupling with Red Dust Cap.



Illustration 7.
Stainless Steel Filter with Standard Grease Fitting and Dust Cap.



Illustration 9.
**Archimedes Screw and Steel Cam
on Motor Shaft.**

Occasionally small air pockets may accidentally enter the reservoir during filling. In order to prevent air lock at the metering elements during the recharge cycle, an Archimedes screw is installed to push the grease toward the metering element(s).

A steel rather than plastic cam with roller is used on the motor shaft to push the metering elements. This prevents premature wear and allows for higher operating pressures.

There is a magnet attached to a pump bracket mounting bolt. 1 extra large 5/16 washer is placed behind the bolt to provide an attachment surface for the magnet. It can be used to operate the pump manually or to make adjustments to the timer settings.



Illustration 10.
Magnet Location



Illustration 11.
7- Segment LED



Illustration 12.
Timer Location



Illustration 13.
Timer Location

A sealed 10 to 30 Volt timer is mounted inside the motor housing near the front 7- segment LED. Electrical connections are made with high quality fully insulated Deutsch® connectors.

There are a variety of timers available from Lubecore that are functional with Modular Progressive pump design.

The segmented LED, as installed in the motor housing, indicates when the pump is active and when timer setting adjustments are made.

The bottom of the motor and timer housing is slightly sloped. This allows for any accumulated moisture to run off through the slots in the bottom cover preventing any possibility of corrosion from taking place.



Illustration 8.
**Sloped Housing Prevents Moisture
Build Up.**

The Modular Progressive pump is equipped with 1 ring collar (For more ring collar options inquire with Lubecore for more details). The ring collar has 3 openings for metering elements and 1 return port. A ring collar with 3 metering elements provide the Modular Progressive pump the ability to deliver of up to 18cc's of grease per minute.

The pump may optionally be equipped with a low level proximity sensor which can be installed in the base of the reservoir and connected to the timer. The timer is ready to receive the signal from the switch.

The pump is equipped with 2 overflow vents. The vents are located at the rear right of the pump housing when looking directly at the front of the pump. In case the pump is filled beyond the maximum level the vent opening in the guide rod will allow excess grease to escape. Also, when air is trapped under the follower plate it is recommended to fill the reservoir such that the bottom of the follower plate surpasses the vent opening to allow air to escape.

(Note: Do not fill to rapidly as you may blow the lid off!!!)

The pump is designed with 2 overflow vents. One of the vent locations is threaded which allows for a grease line to be attached and extend to overflow away from the pump.

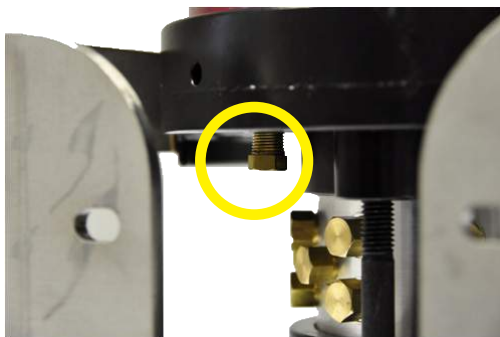


Illustration 15.
Grease Overflow Location



Illustration 14.
Metering Element



Illustration 16.
Low Level Proximity Sensor



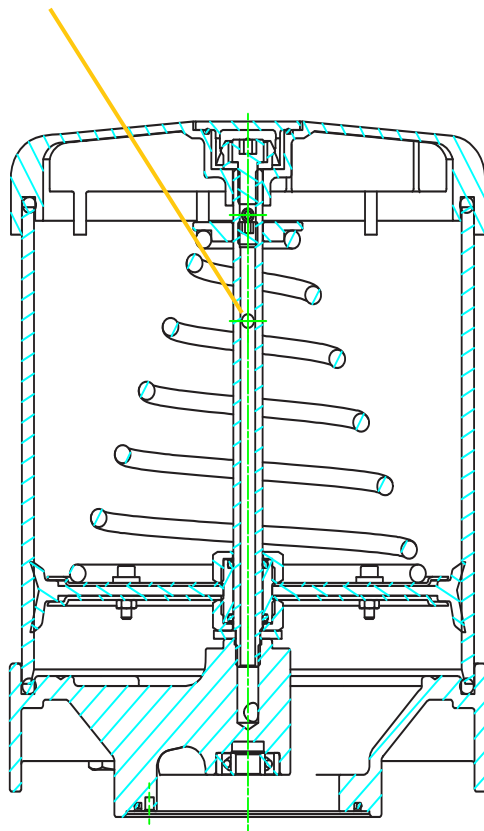
Illustration 17.
Grease Overflow Ports Shown In Yellow.
Low Level Sensor Port Shown In Red

CAUTION:

Caution!!! Must be observed when changing elements, plugs, and low level sensor in the Modular pump series.

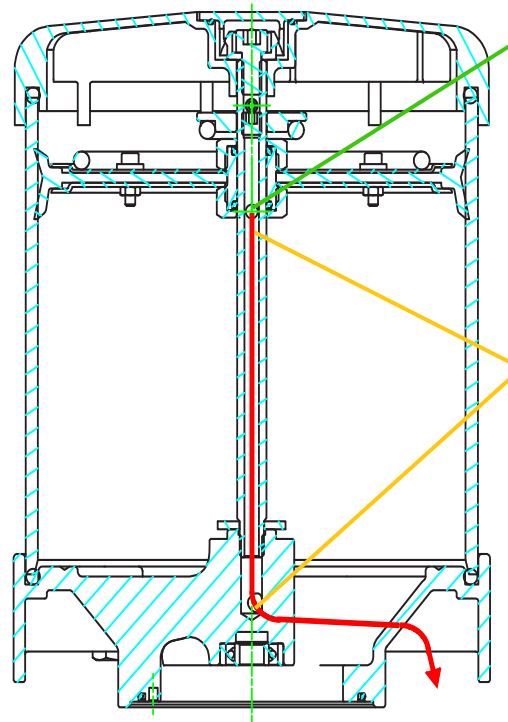
DO NOT ATTEMPT!!! To remove the guide rod and follower plate assembly in a Modular series pump, due to the increased downward force applied by the PIP spring upon the surface of the grease when the reservoir is full. It is highly recommended to perform all these procedures when the reservoir is empty of grease or is going to be emptied by removing of the fill connector.

Vent Opening
in Guide Rod.



Bottom of Follower
Plate Surpasses
Vent Opening

Escape Route of
Excess Grease
and Trapped Air
Through Guide
Rod and Reservoir
Base.



Pump Mounting

The pump should be mounted vertically at an easily accessible location. The pump mounting brackets (arms) and installation hardware are made from Stainless steel. As the pump housing is an aluminum casting, it is required to utilize the provided nylon inserts and gaskets to prevent a galvanic reaction leading to oxidation of metals.

The bolt pattern, to mount the pump bracket, is the same as used with the Lubecore pneumatic and hydraulic pumps. As such, if so required, pneumatic and hydraulic pump bracket can be interchanged.

It should be noted that the secondary lining to the lubrication points be kept as short as possible. These lines should not exceed 10 meters / 30 feet in length. Contact Lubecore or an authorized re-seller when secondary line length exceeds 10 meters long.



Illustration 18.
Stainless Steel Mounting Hardware and Insulation Components.



Illustration 19.
Pump Bracket Mounting Hardware Assembly Order. (Pre-tightening)



Illustration 20. **Pump Bracket Installation Options**

Electrical Connections

The 10-30 VDC timer for the automated operation of the lubrication system is located inside the motor housing. The motor housing is slotted on the bottom to allow moisture to dissipate while the timer itself is permanently sealed (potted).

The pump comes pre-wired with a 2 core SAE approved cable connected to a Deutsch® DT weather proof connector. The DT connector is wired: Ignition (Red) +15 / Ground (Black) -31. When connecting ignition it is recommended to use a 5 Amp fuse.

A second connection is available for an optional low level sensor. That 3 - core wire provides a proximity sensor with a power source, ground and signal contact. The proximity sensor may be ordered separately and can be connected to the pump with no need for programming. When installing a proximity sensor adhere to the safety precautions as previously listed on page 14.

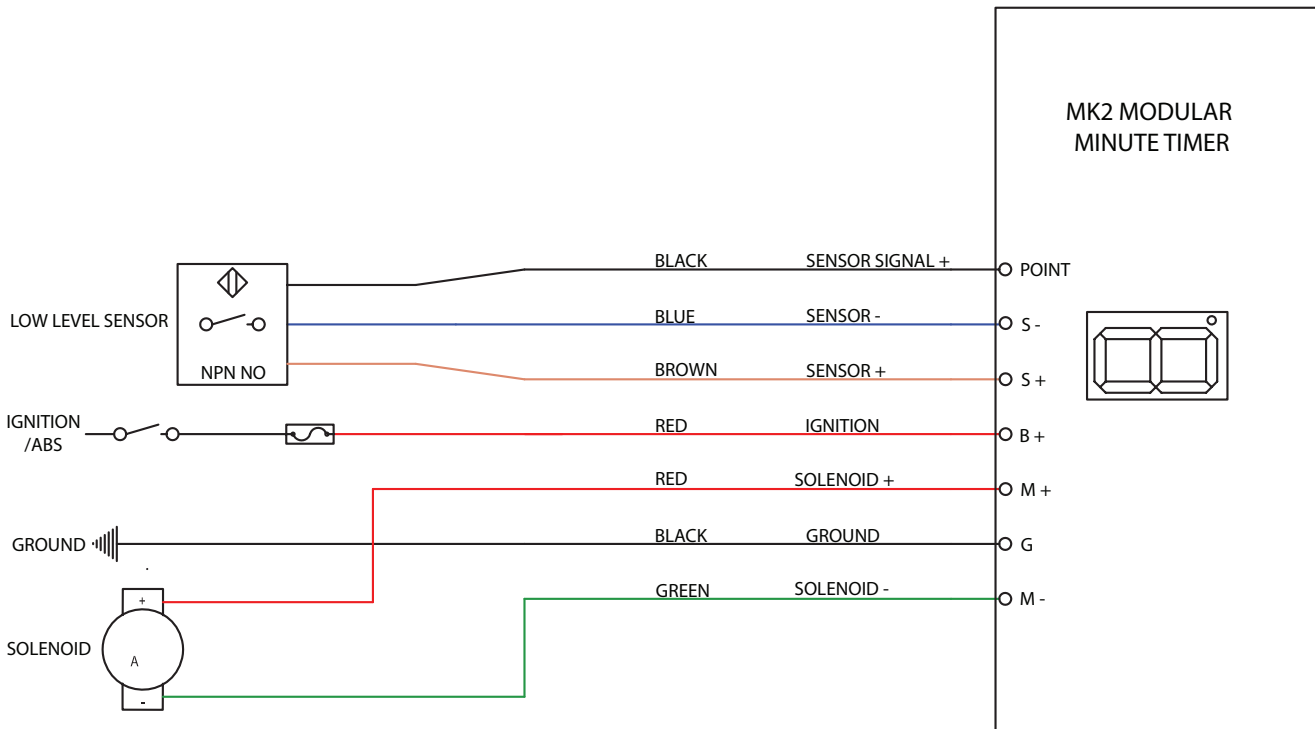


Illustration 21. Electrical Connections for the Modular Progressive Pump

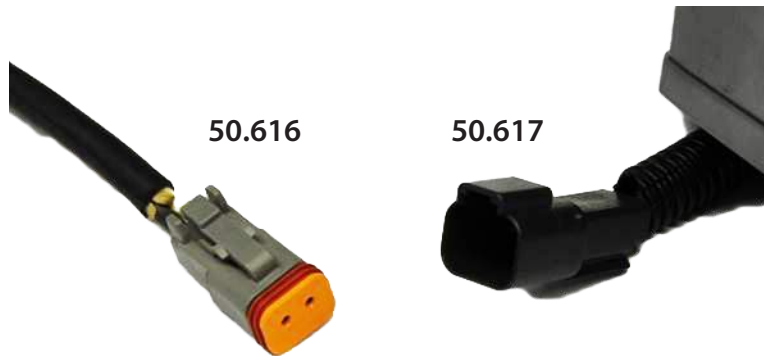


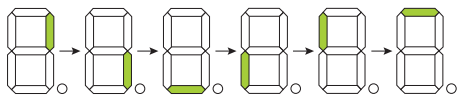
Illustration 22.
Weatherproof with Deutsch® Electrical Connectors

Timer Setting and Display Operation

The Modular Progressive pump is equipped with a 7 segment digital display. This display indicates power, operation, error and is used for timer setting.

Following is an overview of possible display codes:

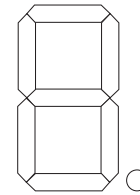
- No segments lit. Power is "Off".
- Solitary LED (Bottom right corner of the Segmented display) momentarily stays on (5 Seconds) performing a self check.
- Solitary LED starts blinking, 2 blinks per second indicating that the timer is active
- Pump ON (T2) is started the segmented LED 'Chases'. The bar rotates clockwise for the entire pump cycle.



- If during a pump cycle (T2) an error occurs, the display shows "E". The error can be low level or over-current draw. The "ERROR" status is displayed throughout the entire T2 pump cycle time.

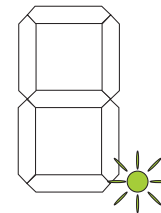
- After the pump cycle (T2) the display will show "E" and a blinking solitary LED during the T1, pause time. The "E" status will return to normal after the error is resolved (example: pump filled) and a new cycle is started.

Power "Off"



No segments lit.

Power "On"
Battery and Ignition



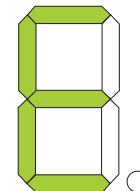
Solitary LED

Motor Running



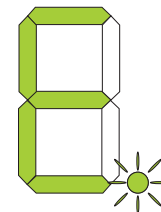
Rotating segments.

Error During
Pump Cycle



An error is present during pump cycle.

Error at Pause
Time.



An error is present when power is on. Blinking point

Testing and Programming

For correct operation of the pump (T1) the "Pause", and (T2) "Work" times must be set using the magnet. The following menu choices are available.

With power on (ignition) hold the magnet against the Lubecore logo on the timer enclosure near the segment display. After 3 seconds and with about 3 second steps thereafter, the segment display will change as follows:

7 Segment Display Mode Selection

- 1). To start a single test cycle, place the magnet on the Lubecore logo. When the bottom horizontal bar lights up, remove the magnet from the logo to initiate a single test cycle. The pump will run for the programmed period of "on time".
- 2). To change the pump running/working time (T2) setting. Place the magnet on the Lubecore logo until 3 horizontal bars light up.

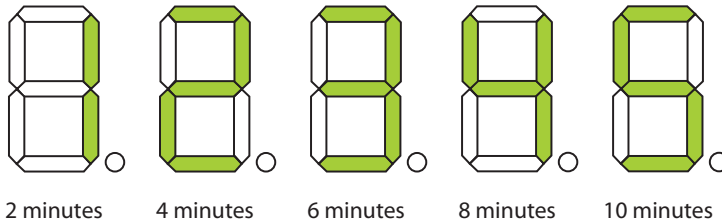


When the display shows 3 horizontal bars, remove the magnet to go into time selection mode.

- When the sensor is not operated for 20 seconds it will return to the start.
- After a change the display will show an "A" for accept after 20 seconds or if the magnet is placed on the sensor for 5 seconds.



The display will show your current choice of one of the following 5 settings:



2 minutes 4 minutes 6 minutes 8 minutes 10 minutes

A one second touch or slow swipe with the magnet, at the Lubecore logo, will change the time selection.

- 3). To set the "Off time" (cycle interval), place the magnet on the Lubecore logo until the top 4 bars light up in the shape of a square. This indicates that the "off time" change mode is selected. The function is the same as in the "on time" programming mode. When the sensor is not operated for 20 seconds or the magnet is placed on the sensor for longer than 5 seconds the timer returns to normal start mode. If a change has been made the display will indicate this with an "A" for accept.

7 Segment Display Mode Selection

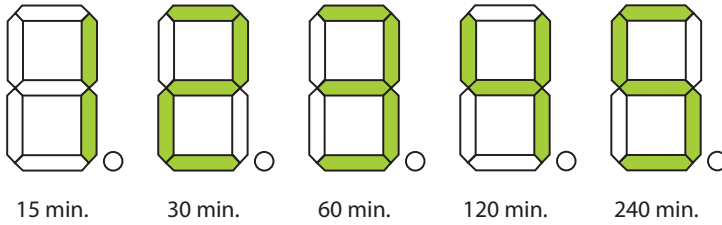
The display will show your current choice of one of the following 5 settings:

A one second touch or slow swipe with the magnet, at the maple leaf logo, will change the selection.

After changing settings or testing, switch off the ignition and verify that the timer accepted the new values. The timer can at any point be returned to 'normal' by switching off the ignition.



Error reporting by the display



When the display indicates an "E" for error, the following could be the problem:

- Low Grease Level Detected.

When installed and activated by the follower plate, the low level switch signal stops the pump from pumping, fill pump.

- Over-Load / Short Circuit.

PIP™ - Positive Inlet Pressure Follower Plate

PIP (Positive Inlet Pressure Spring Patent Pending)

Modular Progressive and Modular Spyder MLP lubrication systems are suitable for use with NLGI-2 / EP2 grade grease when a PIP™ - Positive Inlet Pressure spring is installed on top of the follower plate. Especially with low temperatures, it may occur that air pockets present in the grease accumulate at the intake opening of the metering elements. The PIP™ follower plate allows, even at low temperatures, the use of a NLGI2 / EP2 grease.

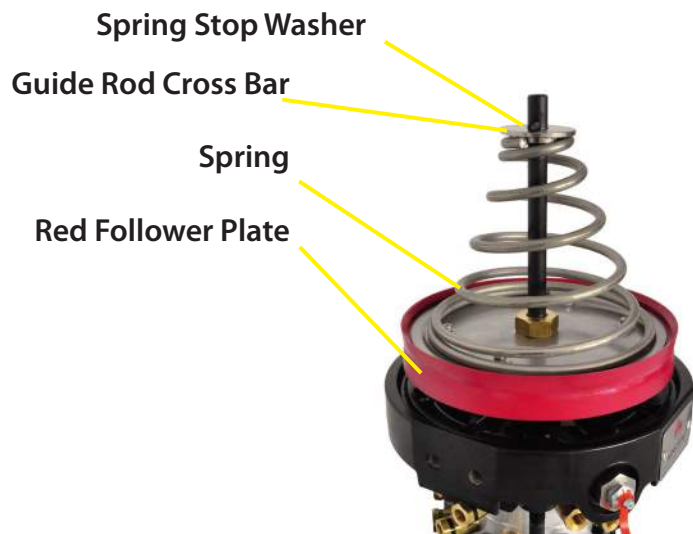


Illustration 23.
PIP™ Spring Follower Plate

Note In case of service / repairs:

- o *Before starting any repairs ensure reservoir is empty to reduce spring tension.*
- o *When removing M8 Allen cover bolt ensure guide rod is not rotating / coming loose: it is under spring tension, when guide rod is spinning loose stop and call Lubecore for alternative disassembly procedure.*
- o *Always follow supplied instructions with OEM replacement part to prevent damage and personal injury!*
- o *Although when reservoir is empty there is still an assembly tension in the spring! When loosening components this may be released and cause harm when done incorrectly!*

CAUTION:

Caution!!! Must be observed when changing elements, plugs, and low level sensor in the Modular pump series.

DO NOT ATTEMPT!!! To remove the guide rod and follower plate assembly in a Modular series pump, due to the increased downward force applied by the PIP spring upon the surface of the grease when the reservoir is full. It is highly recommended to perform all these procedures when the reservoir is empty of grease or is going to be emptied by removing of the fill connector.

Low Level Proximity Sensor - LLPS

The pump may be equipped or retrofitted with a low level proximity sensor. This sensor is a normally closed proximity sensor which detects the metal components on the bottom of the follower plate. The benefits of a low level proximity sensor are that the operators are additionally informed by the 7 segment LED display of a low level event when the reservoir is obscured by dirt such that a clear level indication is not visible.

The timer stops the pump from operating during a low level event, preventing air from being pumped into the grease points and the requirement to prime the pump after filling.

The sensor is located on the lower rear right side of the reservoir assembly.



Illustration 24.
12.045 Low Level Proximity Sensor (LLPS).

Fitting instructions:

Remove the bottom cover from the pump housing. Make sure that there is no power to the timer (disconnect the 2 pin Deutsch connector)

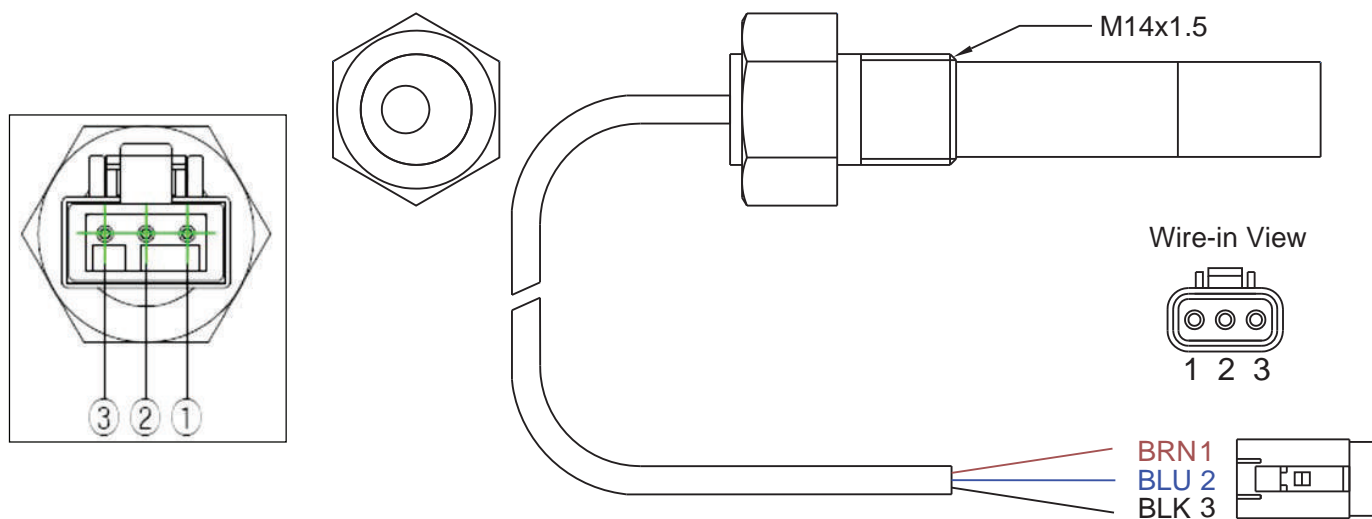
Inside the housing you will find a black cable with a white insulator cap on the end. This is the 3 core low level switch pigtail. Cut off the end cap and strip the 3 wires so that the terminals provided in the kit can be connected. Use appropriate stripping and crimp tools to do this.

After crimping the terminals plug them into the Deutsch body that is in the kit, match the colors of the wires (i.e. blue on blue, brown on brown and black on black).

Remove the brass plug from the underside of the pump body (grease will come out if the reservoir is full, (it is highly recommended that this procedure be done with the reservoir empty) and fit the low level sensor in place. Move "O" ring from plug to the sensor. Lead the low level switch wire into the pump housing and connect the two halves of the 3 pin connector and re-connect the two pin power connector. Secure the wires and connector and close the housing.

Your Lubecore Modular pump is now ready and will signal a low level event when the follower plate in the reservoir is nearing 'empty'. In case of a low level event the timer will show an 'E' on the display for as long as the reservoir is empty. As long as the 'E' is displayed, the pump will not do any cycles. After filling the pump, it is advisable, to perform at least one minute continuous test cycle to make sure the pump is operational and functioning normally.

Note: When the pump is empty (low level event) and showing an "E" on the display, it is possible to use the magnet to initiate a continuous cycle, this will override a low level event ('E' error). Filling while the pump is running assist with re-priming the pump.



Position	Color	Identity
1	Brown	+
2	Blue	-
3	Black	signal

Table 25. Low Level Sensor Connections (LLPS)

Stainless Steel Metering Element

The Modular Progressive pump is equipped with at least 1 stainless steel metering element. There are 3 models of metering elements available.

The metering element is made from stainless steel to prevent corrosion, this also allows for higher tolerances. Because of the high tolerances the metering element is capable of achieving extremely high pressures, exceeding 400 Bar / 6000 Psi. It is therefore recommended to install a pressure relief valve. Standard from Lubecore the pressure relief valves are set to a maximum system pressure of 250 Bar / 3700 Psi.

Each metering element is threaded into the outlet port until it meets with solid resistance. Then use a suitable wrench to turn the elements for further 1/8 turn (45°) with torque of 16Nm / 12 ft-lbs.

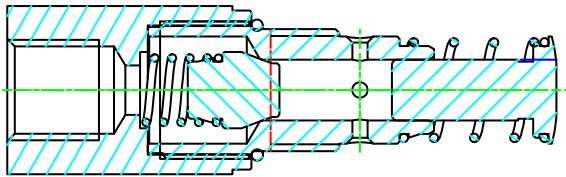
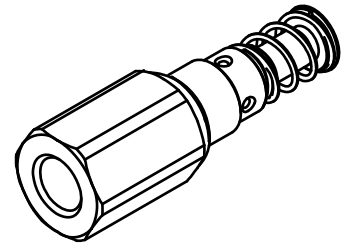


Illustration 26.
Stainless Steel Metering Element # 11.637



Part Number	Description	Identifying Markings
11.637	Element Progressive MK2 0.30cc (SS) M16x1.5 (6cc/23RPM)	# 6 (Stamped on hex)
11.639	Element Progressive MK2 0.20cc (SS) M16x1.5 (4cc/23RPM)	# 4 (Stamped on hex)
11.640	Element Progressive MK2 0.10cc (SS) M16x1.5 (2cc/23RPM)	# 2 (Stamped on hex)

Table 28. Available Metering Element



Illustration 27.
Pump with Single Metering Element Installed.

RPM	23	PRO Pump Elements			
	Part Number	11.640	11.639	11.637	
ON Time	Per Minute	2.00cc	4.00cc	6.00cc	
	Per Stroke	0.10	0.20	0.30	
Setting	Seconds	Strokes			
T2 - 1	8	3.07	0.307	0.613	0.920
T2 - 2	12	4.60	0.460	0.920	1.380
T2 - 3	16	6.13	0.613	1.227	1.840
T2 - 4	20	7.67	0.767	1.533	2.300
T2 - 5	24	9.20	0.920	1.840	2.760
MIN	60	23.00	2.300	4.600	6.900

Pressure Relief Valve

The Modular Progressive pump is equipped with 1 pressure relief valve. This valve should be placed directly in-line with the stainless steel metering element. The system is capable of achieving extreme high pressures, exceeding 400 Bar / 6000 Psi. It is therefore recommended to install a system pressure relief valve.

Standard Lubecore pressure relief valves are set to a maximum system pressure of 250 Bar / 3700 Psi.

Its function is to protect the lubrication system against extreme pressures which possibly can cause damage, also informs the operator or service technicians of any system blockages if they occur.

When grease is accumulating near or around the pressure relief valve it is important to inspect the lubrication system for blockages in the distributor blocks and or grease points.

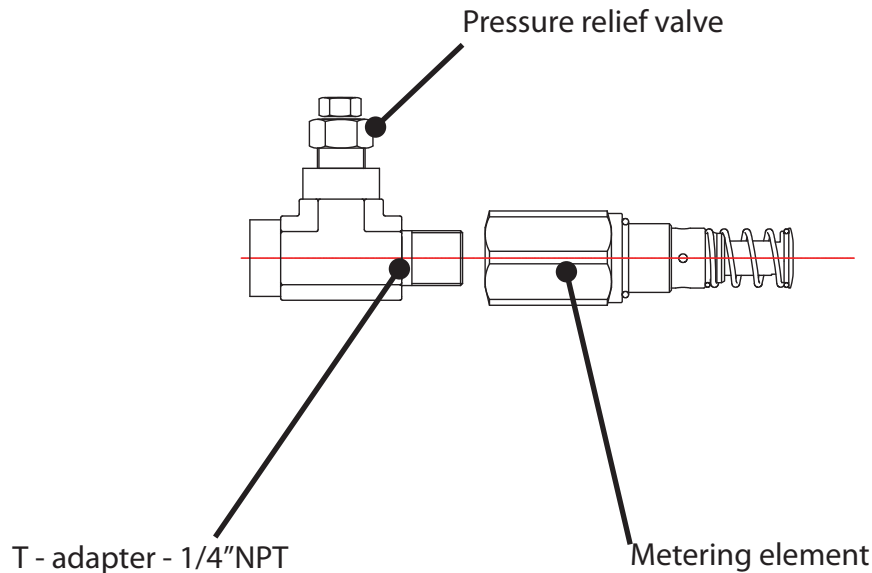


Illustration 29.
Pressure relief valve 10.641: is non-adjustable

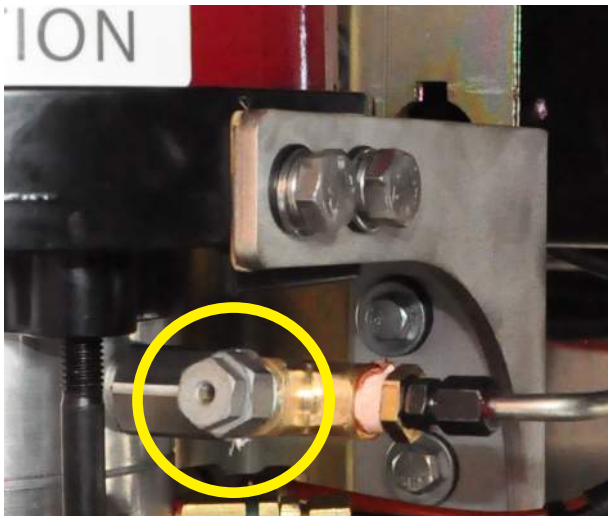


Illustration 30.

Example location of a pressure relief valve at pump. Use of 1/4" ID Korilla Hose with #4 JIC fittings recommended to be used as standard from pump to first divider.

Tracing A System Blockage

When grease is visibly coming out of the pressure relief valve the lubrication system may be blocked or experiencing a increased resistance from a restriction at a distribution block or in a hose / fitting. Follow the next steps to determine the location of the blockage / restriction.

Blockage or restriction:

- Install a pressure gauge capable of handling at least 345bar (5000psi) between the check valve in the end of the pump element and the first or main distributor block. This will give you the system operating pressure.
- Start a single lubrication cycle.
- Carefully monitor the pressure gauge. A pressure reading of between 1400-1700psi may be experienced depending on the size of the system and the ambient temperature of the grease.

Under normal system operation some pressure may arise in the system to overcome natural distributor and grease point resistance, however the pressure relief valve, when correctly set, should not open under these circumstances.

Resolving / tracing a blockage - restriction:

- With the pressure gauge still installed, maintain maximum system pressure.
- Follow the primary grease line from the pump and locate the first distributor block, this is the main distributor for the system.
- Slowly loosen the secondary grease lines from the main distributor block one by one, while observing the pressure gauge; check if system pressure has dropped: If so, blockage or restriction is being caused by one of the other disconnected distributor blocks in the system. If the secondary lines are all loose and pressure still does not drop than the main distributor is the issue.
- Re-connect secondary lines to main distributor and locate another distributor block, repeat the above procedure. If no pressure drop is observed, blockage or restriction is in one of the lubrication points.

Distributor blocks can be cleaned and repaired by using EP0 grease. Inject grease into the block without the secondary lines attached. When distributor block does not operate freely; replace.

Metering Process

How does the (series) progressive distributor metering work?

The series progressive distributor assembly forms the basis of the operating principle on which the automated lubrication system works. The distributor is responsible for metering the correct amount of lubricant that is needed to be dispensed to the lubrication points. The Lubecore™ series progressive automated system does this under full pump pressure.

Lubecore™ series progressive distributor blocks are manufactured from corrosion resistant steel and are available in 6, 8, 10, 12, 14 and 18 port configurations.

Operating principle

A single line (series) progressive system consists of a main and several secondary distribution.

A single line progressive system uses lubricant flow to cycle individual shuttle valves that are located in the distributor blocks. Each shuttle valve depends on flow from the previous shuttle valve to shift and displace lubricant. In case of a main distributor, the dispensed lubricant operates the shuttle valve in subsequent secondary distributors.

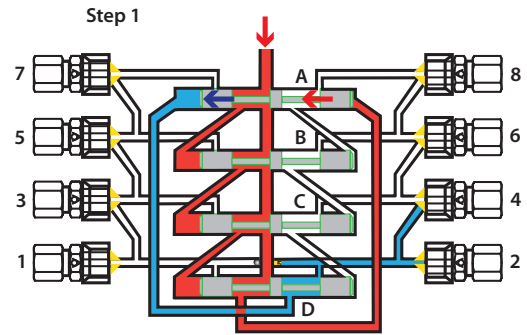
Lubrication begins when the timer sends a signal to the pump to start the lubrication cycle. The pump then feeds lubricant into the supply line which is connected to the main distributor.

Lubricant is fed to the multiple lubrication points one after another via (secondary) distributors which are calibrated to deliver precise lubrication directly to each individual lubrication point via secondary tubing.

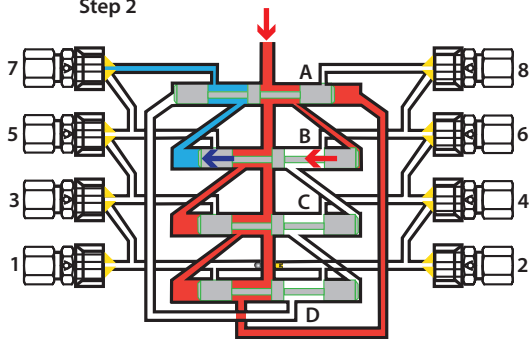
In contrast to parallel automated lubrication systems, series progressive lubrication systems continue to distribute the lubricant to all points as long as the pump is operating. Therefore the total amount of lubricant is determined by the combination of pump and distributor block configuration.

Step 1

- 1). In the illustration to the right, grease is delivered to the top of the distributor block, red arrow, grease under pump pressure travels through the distributor block (red) and moves through the distributor, to the right hand side of the shuttle valve (A).
- 2). Shuttle valve (A) moves, under pressure, to the left, displacing the grease on the opposite side of the distributor through the shuttle valve (blue) and out of the distributor at gallery #2 (blue arrow).



Step 2

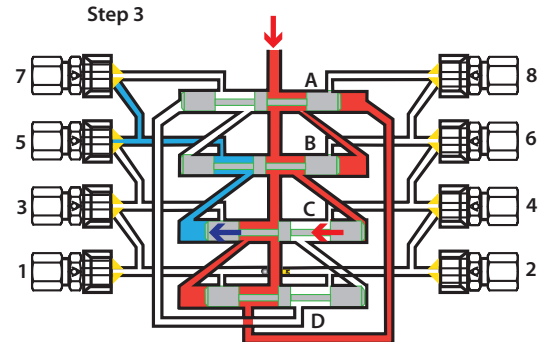


Step 2

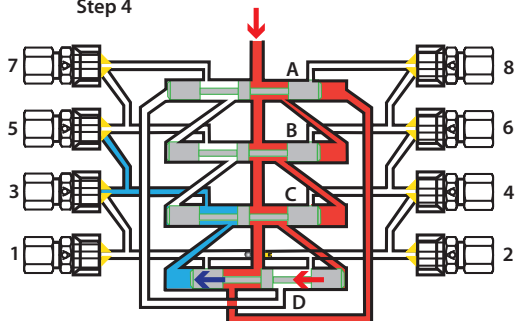
- 3). As long as grease continues to move through the distributor block, red arrow; and the shuttle valve (A) reaches its end-point on the left. A gallery opens to shuttle valve (B).
- 4). Shuttle valve (B) moves, to the left, displacing the grease on the opposite side of the shuttle valve (blue) and out of the distributor block at port #7 (blue arrow).

Step 3

- 5). As long as grease continues to flow, red arrow; and shuttle valve (B) has reached its end-point on the left. Another channel is opened this time to shuttle valve (C).
- 6). Shuttle valve (C) moves to the left hand side of the distributor block again, displacing grease on the opposite side of the shuttle valve (blue) and out of the distributor at gallery #5 (blue arrow).

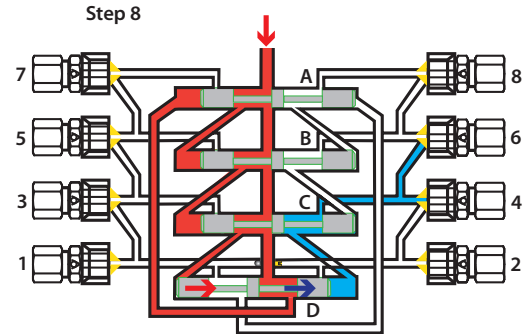
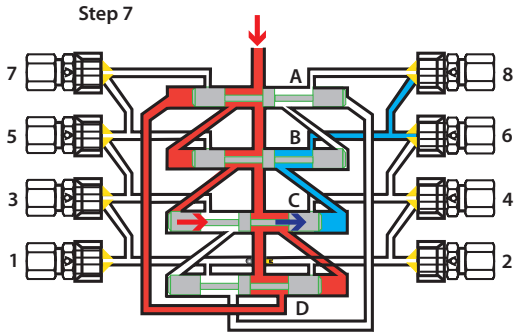
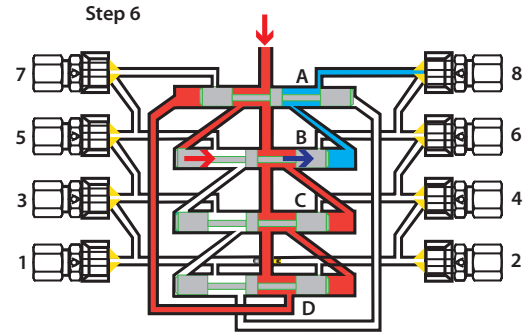
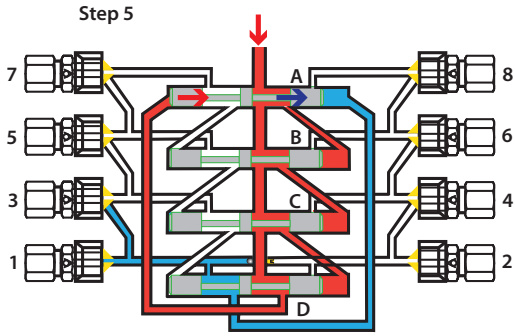


Step 4

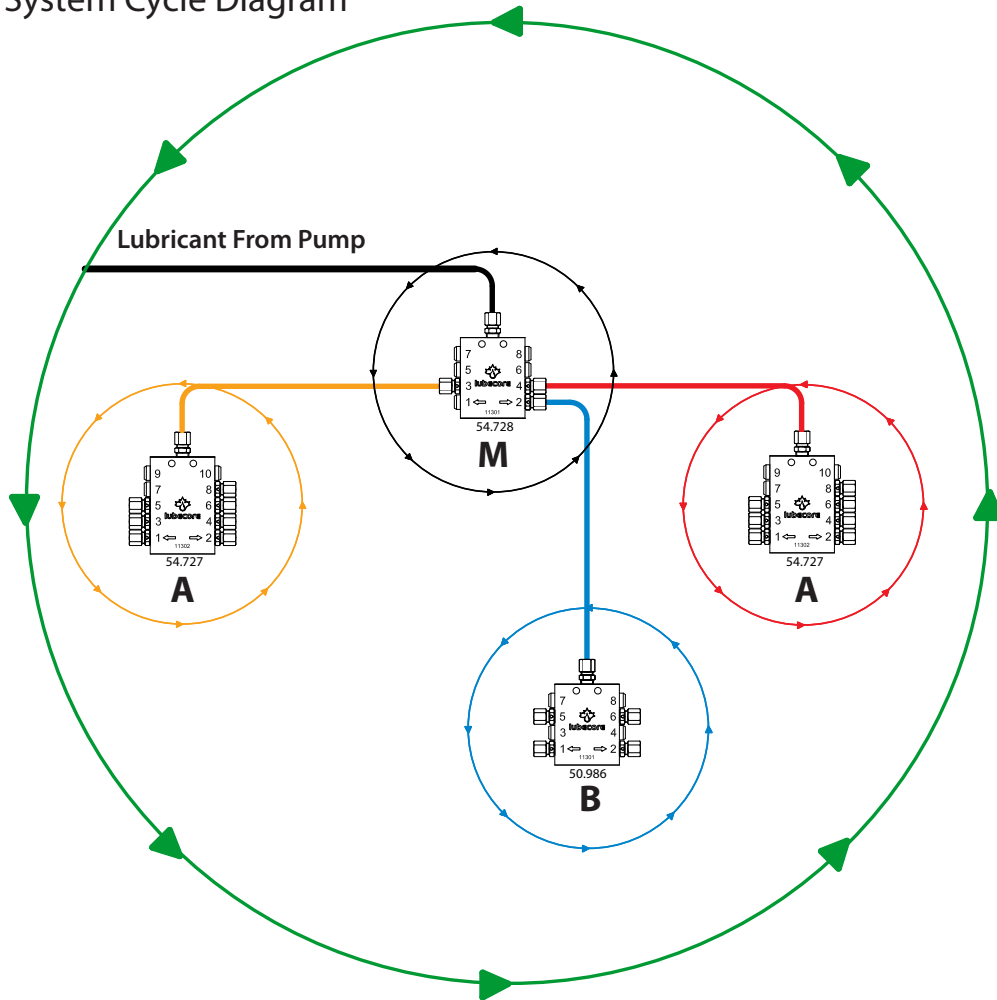


Step 4

- 7). This circular process continues throughout the entire cycling of the pump, via the timers programming. Grease is then transmitted to each individual lubrication point through this process, which is multiplied numerous times over a lubrication cycle, by the use of multiple distributor blocks which deliver grease in predetermined quantities.



Progressive System Cycle Diagram



Combining Outlet Ports for Volume Adjustment

Series progressive distributor outlet ports are cross-drilled to allow for increases in grease delivery. Brass olives that are attached to the outlet check valve fittings are used to normally close off these ports to only allow grease delivery to 1 outlet.

Once these check valves are removed and replaced with a plug. The grease normally delivered to the now plugged outlet is diverted to the next port. (Same side of the distributor, numbered lower)

As shown in the illustrations to the right, port #7 has been plugged with the check valve removed, thus opening and diverting grease delivery to port #5.

At step 2, with the movement of shuttle valve B to the left, the grease is diverted to port #5.

At step 3, also the regular amount of grease is delivered to port #5, thus increasing the amount of grease delivered in this situation from 12.5% to 25% of the pump output.

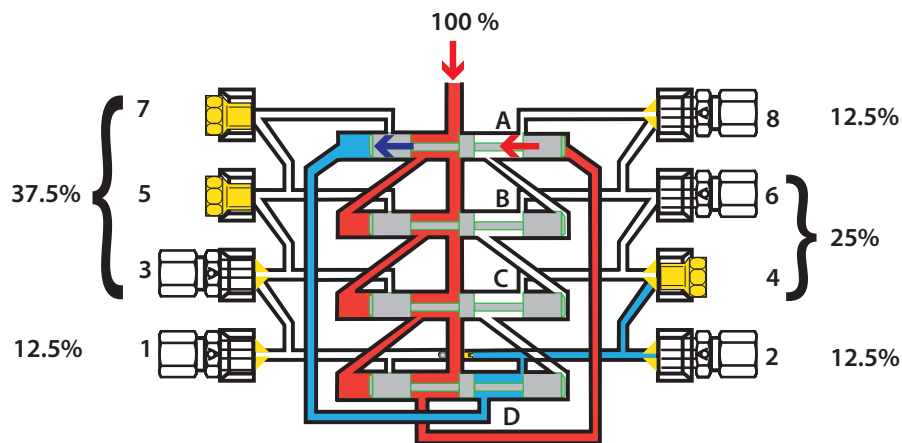
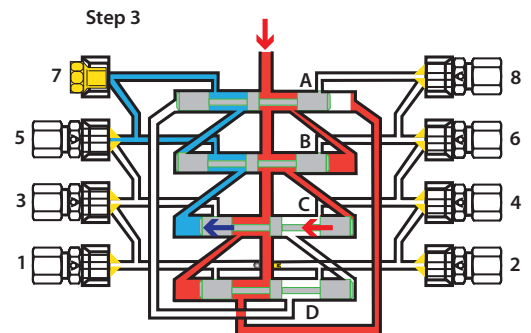
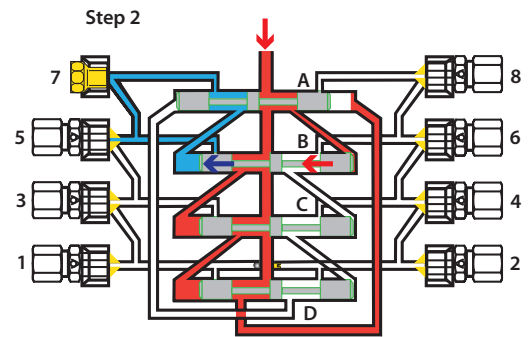
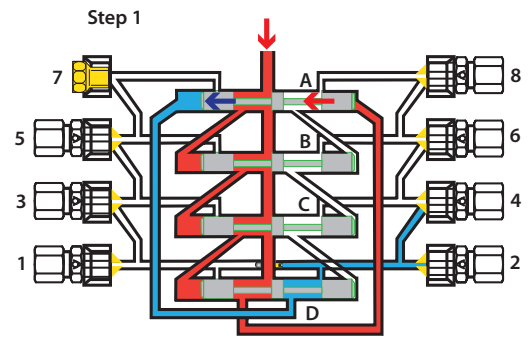


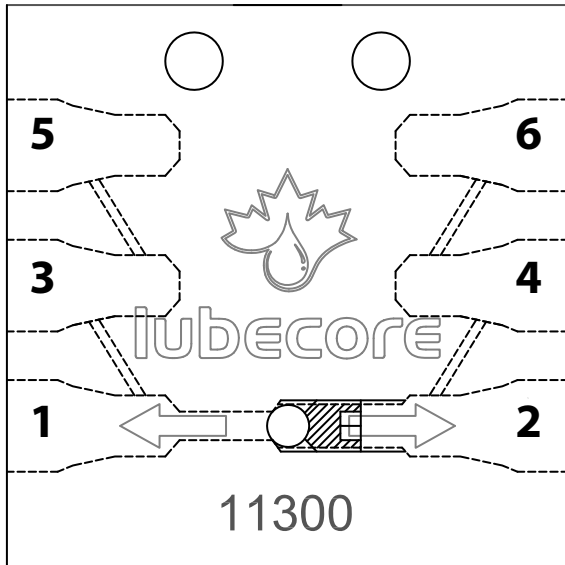
Illustration 31.
Sample Displaying the Disbursement of Grease when
Several Outlets are Combined.

Combining Outlet Ports for Volume Adjustment

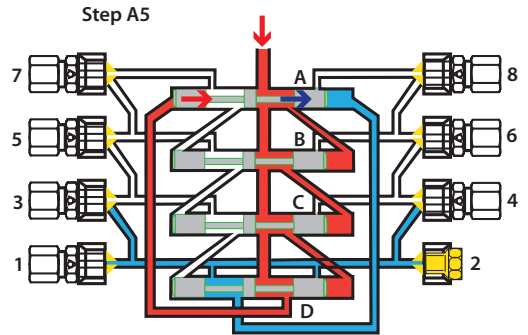
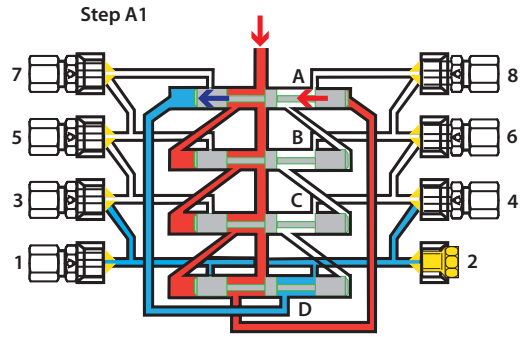
Ports 1 and 2 in Lubecore series progressive distributors are drilled through and can also be combined. However, prior to combining outlet ports 1 or 2 with each other a 3mm Allen screw and steel sealing bearing must be removed from the grease channel.

Note: Gallery 1 or 2 must be used and one must be plugged. You may not plug galleries 1 and 2 at the same time.

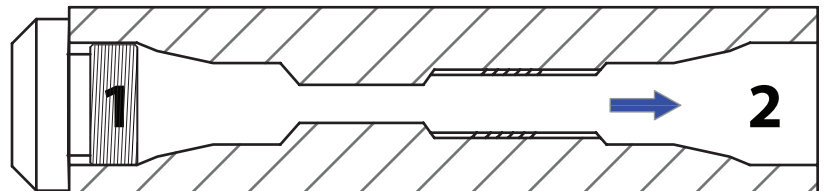
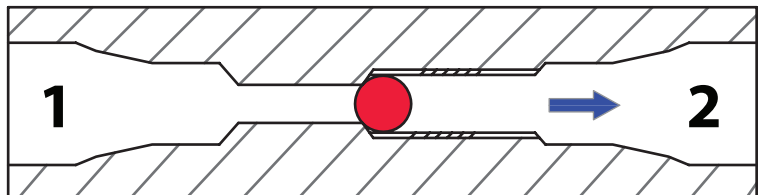
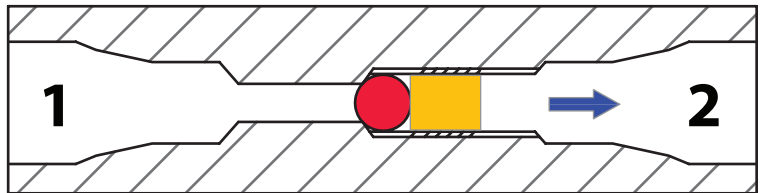
Distributor Block Top View



3mm Allen Wrench



Lower Distributor Block Delivery Gallery Cross Sections End View



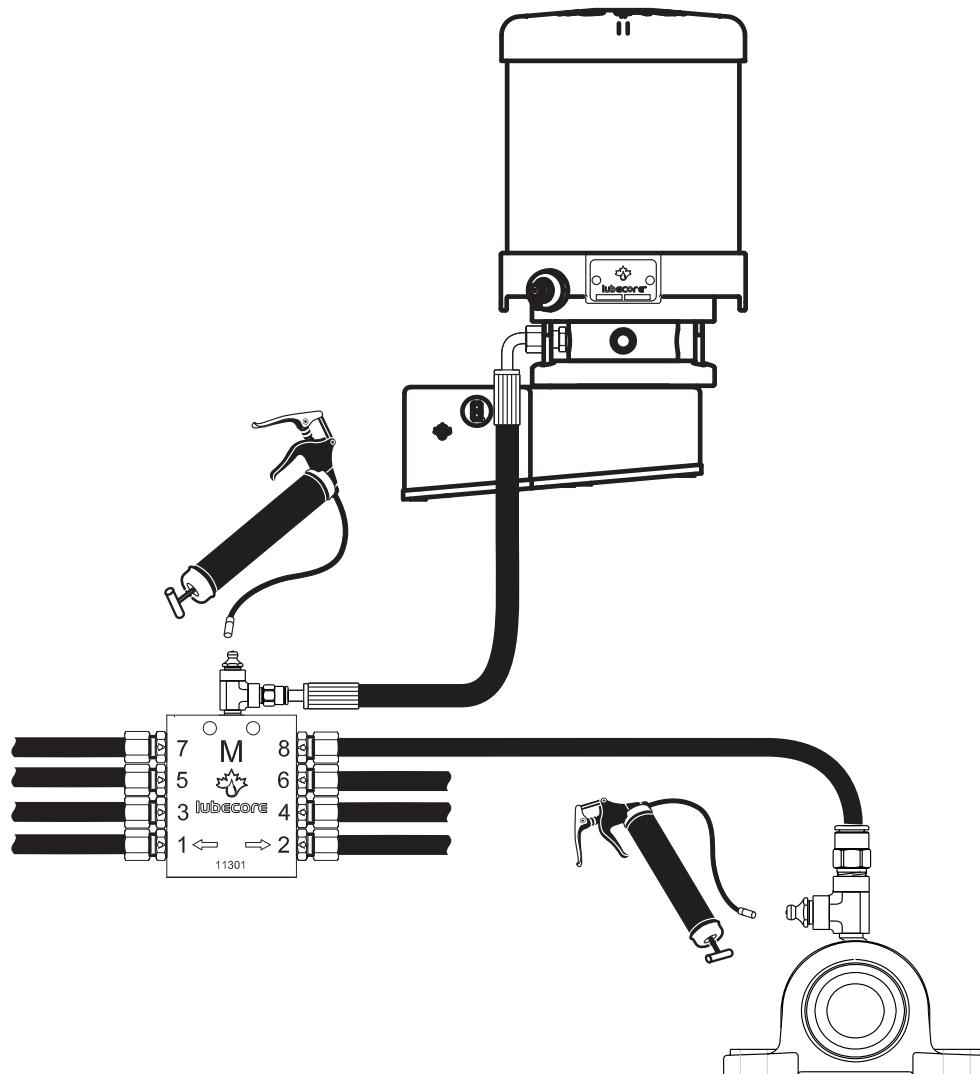
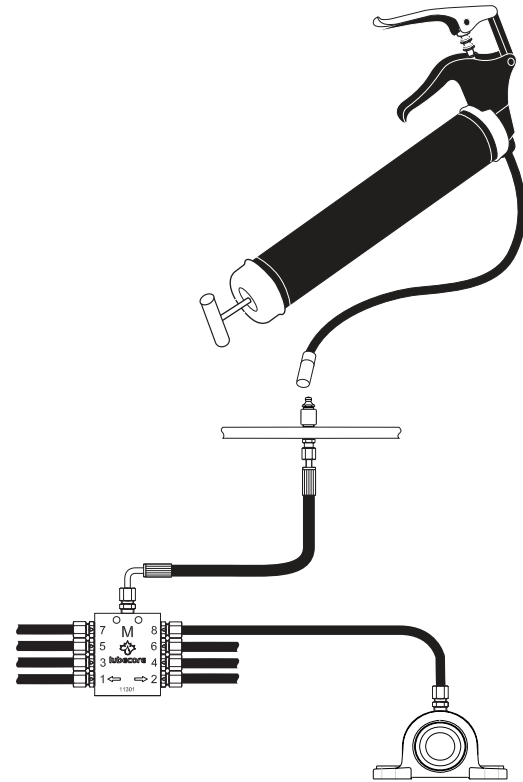
Port 1 or 2 Need To Be Plugged

Lubrication Options

The Lubecore series progressive lubrication system also offers the option to have a single or multiple point centralized lubrication point.

Series progressive distributors can individually or in combination be utilized to create a single point to grease the equipment.

It is also possible to integrate a manual service port into the lubrication system to manually provide additional lubrication to individual points or sections of the equipment.



Available Progressive Distributors

Distributor Size (ports)	Standard
6	11.300
8	11.301
10	11.302
12	11.303
14	11.297
18	11.299

Table 32. Overview of Available Progressive Distributor Blocks.



Figure 33.
11.301, Standard 8 Port Progressive Distributor.

Due to the great variety of available parts, which can be used in the construction and design of a series progressive automated lubrication system, it is highly recommended that you contact your local Lubecore Distributor or Lubecore International for assistance in determining your equipment and business needs.

Filling of the Reservoir

If during a system inspection it is visible that the reservoir has reached minimum level, the pump needs to be filled with an appropriate NLGI - grade lubricant. Review the labeling as the pump is suitable for use with a wide range of lubricants.

For filling the reservoir, follow the steps as described below to ensure that no contaminants and/or air enter the lubrication system.

Step 1: Remove the dust cap from the male filler coupler (EP0) or grease fitting (EP2) located on the pump.

Step 2: Clean the male filler coupler or grease fitting located on the pump.

Step 3: With the female coupler of the filler pump, still mounted on the lid to the male coupler, ensure there are no air-pockets in the filler hose, by making **at least 3** strokes, circulating the grease. This is especially important when exchanging buckets of grease.

Step 4: Inspect the female coupler or other filler nozzle used, for dirt and clean when required. Then secure it to the male coupler on the pump, until it latches.

Step 5: Fill the reservoir with grease until the top of the follower plate has reached the maximum level mark on the reservoir. (This is located 1 inch / 3 cm below the black reservoir cap.) The bottom of the follower plate should have passed the vent opening in the follower plate guide rod.

During filling of the reservoir or immediately after the maximum level has been reached, some lubricant may be expelled from the pump at the vent opening. Air possibly trapped underneath the follower plate and excess lubricant may come out at this opening. The opening corresponds to the vent opening as located in the centre guide rod.

Step 6: Place the dust cap back on the male coupler or grease fitting on the pump and the female filler pump coupler on the male coupling on the lid of the filler pump.

It is suggested that the filter be replaced after every 5 pails of grease



Illustration 35.
Male Filler Coupling with Dust Cap. Either a Regular Grease Zerk for EP2 Grease or a Male Quick Disconnect for EP0 Grease.



Illustration 37.
Reservoir Overflow / Vent Location



Illustration 34.
Circulate Grease to Remove Air Pockets.



Illustration 36.
Overflow Opening in the Center Guide Rod.



Illustration 38.
Reservoir Filter.

Caution note:
Automatic Lubrication Systems are not compatible with Moly or Metallic greases!

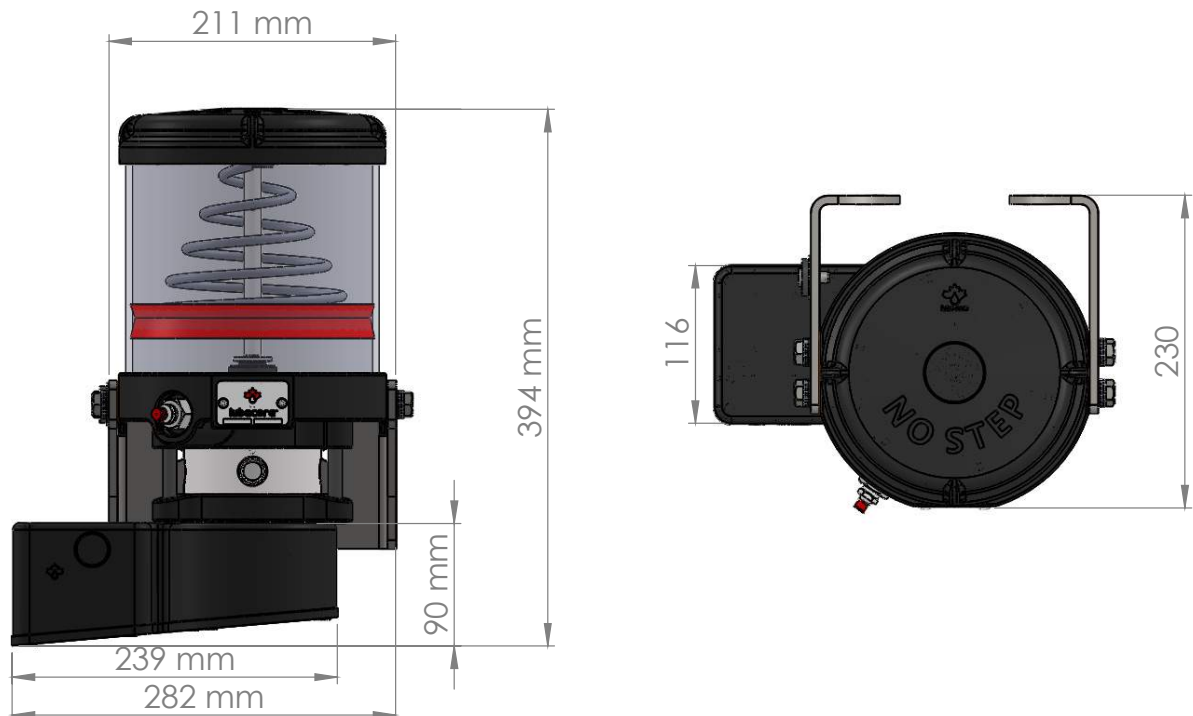
Extra caution must be used when mixing greases. See Lubecore Grease Compatibility chart for details

Technical Specifications

Modular Progressive Pump

Feature	Available
Reservoir Capacity	4 & 6 Kg (8.8 - 13.2 Lbs)
Standard Number of Element Ports	3 Port Collar
Pressure @ 23 RPM - Max	250 BAR - 3625 PSI
Timer	10 -30 VDC Minute Timer
Working Time Interval [Seconds] - T2	2/4/6/8/10
Pause Time Interval [Minutes] - T1	15/30/60/120/240
Operating / Ambient Temperature Range	-20 C / 80 C -4 F / +160 F
Lubricant Grade:	NLGI 000 to NLGI 2 Depending on Installed Tubing Size and Follower Plate.
Pump Weight Without Grease	8 Kg / 18 Lbs (4Kg Reservoir Model)
Available Number of Elements	2 / 4 / 6 cc
Cycle Counter	Optional - External
Low Level Sensor LLPS	Optional - Proximity Sensor
Filler Coupling Size:	1/4" Quick Disconnect for EP0 with Filter or Standard Grease Zerk for EP2 with Filter.
Voltage / Amp (20 C)	(12V) 2 Amp (24V) 1 Amp Fuse: 20A Recommended.

Table 39. Overview: Modular Progressive MLP Technical Specifications

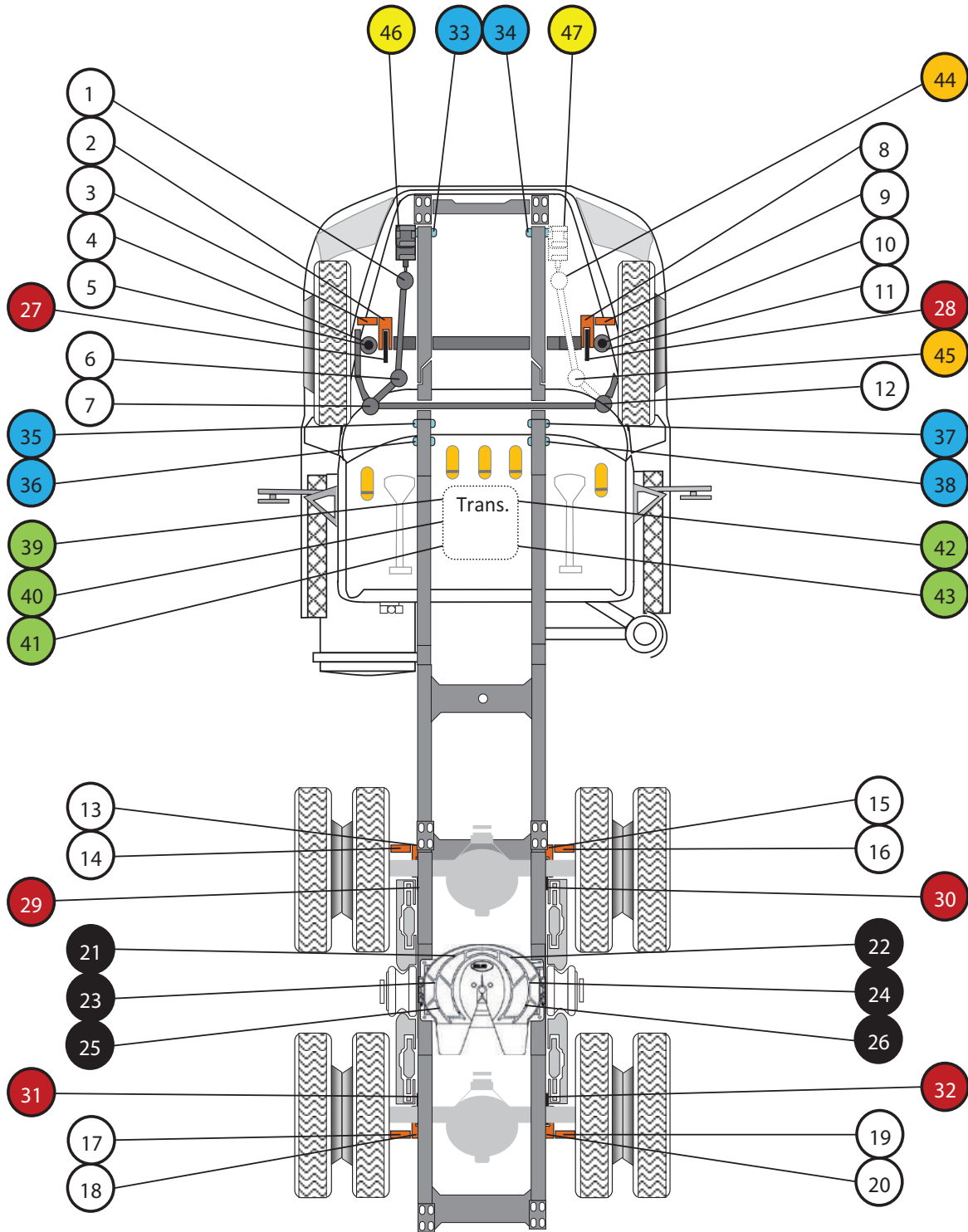


Lubrication Point Maps, Samples & General Parts

Injector and Point Identification of a Tandem Axle Tractor

Lube Point	Injector Size 1hr/3min	Lubrication Point Description	Lube Point	Injector Size 1hr/3min	Lubrication Point Description
Standard Tandem Axle Tractor					
1	2	Left Forward Drag Link	27	1	Front Left Clevis Pin
2	2	Left Front Slack Adjuster	28	1	Front Right Clevis Pin
3	2	Left Front Cam Tube	29	1	Front Left Drive Axle Clevis Pin
4	4	Left Front King Pin	30	1	Front Right Drive Axle Clevis Pin
5	4	Left Lower King Pin	31	1	Rear Left Drive Axle Clevis Pin
6	2	Left Rear Drag Link	32	1	Rear Right Drive Axle Clevis Pin
7	2	Left Tie Rod End	Optional Spring Pins		
8	2	Right Front Slack Adjuster	33	3	Front Left Spring Pin
9	2	Right Front Cam Tube	34	3	Front Right Spring Pin
10	4	Right Upper King Pin	35	3	Front Left Upper Spring Shackle
11	4	Right Lower King Pin	36	3	Front Left Lower Spring Shackle
12	2	Right Tie Rod End	37	3	Front Right Upper Spring Shackle
13	2	Left Front Drive Axle Slack Adjuster	38	3	Front Right Lower Spring Shackle
14	2	Left Front Drive Axle Cam Tube	Optional Transmission Points		
15	2	Right Front Drive Axle Slack Adjuster	39	0	Release Bearing (Automatic)
16	2	Right Front Drive Axle Cam Tube	40	1	Left Cross Shaft (Automatic)
17	2	Left Rear Drive Axle Cam Tube	41	1	Right Cross Shaft
18	2	Left Rear Drive Axle Slack Adjuster	42	1	Clutch Linkage
19	2	Right Rear Drive Axle Cam Tube	43	1	Clutch Linkage
20	2	Right Rear Drive Axle Slack Adjuster	Optional Double Drag Link		
Optional Fifth Wheel Points					
21	8	Front Left 5 th Wheel Plate	44	2	Right Forward Drag Link
22	8	Front Right 5 th Wheel Plate	45	2	Right Rear Drag Link
23	9	Middle Left 5 th Wheel Plate	Optional Steering Box		
24	9	Middle Right 5 th Wheel Plate	46	1	Left Steering Box
25	9/2	Rear Left 5 th Wheel Plate/Saddle Pin	47	1	Right Steering Box
26	9/2	Rear Right 5 th Wheel Plate/Saddle Pin			

Example - Possible Number of Grease Points on a Tandem Axle Tractor



Lubrication Injector and Point Identification of a Tandem Axle Trailer with Steer Lift

Lube Point
 Injector Size 1hr/3min
 Lubrication Point Description

Tandem Axle Trailer

1A	2	Left Front Cam Tube
2A	2	Right Front Cam Tube
3A	2	Left Rear Cam Tube
4A	2	Right Rear Cam Tube
1B	2	Left Front Inner Cam Bushing
2B	1	Left Front Outer Cam Bushing
3B	2	Right Front Inner Cam Bushing
4B	1	Right Front Outer Cam Bushing
5B	2	Left Rear Inner Cam Bushing
6B	1	Left Rear Outer Cam Bushing
7B	2	Right Rear Inner Cam Bushing
8B	1	Right Rear Outer Cam Bushing
5	2	Left Front Slack Adjuster
6	2	Right Front Slack Adjuster
7	2	Left Rear Slack Adjuster
8	2	Right Rear Slack Adjuster

Optional Tandem Axle Clevis

9	1	Clevis Pin
10	1	Clevis Pin
11	1	Clevis Pin
12	1	Clevis Pin

Trailer Axle Configuration - Lubrication Point Count:

1)	Disc Brake	None
2)	"S" Cam Inner & Outer	4
3)	"S" Cam Tube	2
4)	"S" Cam Tube	4

Trailer Steer Axle Configuration - Lubrication Point Count:

1)	Disc Brake	None
2)	Mod 1 "S" Cam Tube	10
3)	Mod 2 "S" Cam Tube & Locks	12
3)	Mod 3 "S" Cam Tube & Spider Bushing	12
4)	Mod 4 "S" Cam Tube, Locks & Spider Bushings	14

NOTE: THESE MODS DO NOT INCLUDE CLEVIS PINS

Lube Point
 Injector Size 1hr/3min
 Lubrication Point Description

Lift Steer 10/12/14/16 Point

13	2	Left Steer Axle Cam Tube
14	3	Left Upper King Pin
15	3	Left Lower King Pin
16	3	Right Lower King Pin
17	3	Right Upper King Pin
18	2	Right Steer Axle Cam Tube
19	2	Left Tie Rod End
20	2	Left Steer Axle Slack Adjuster
21	2	Right Steer Axle Slack Adjuster
22	2	Right Tie Rod End
23	1	Left Steer Axle Spider Bushing (Select Models)
24	1	Right Steer Axle Spider Bushing (Select Models)
25	1	Clevis Pin (Optional)
26	1	Clevis Pin (Optional)
27	2	Steer Axle Lock (Select Models)
28	2	Steer Axle Lock (Select Models)

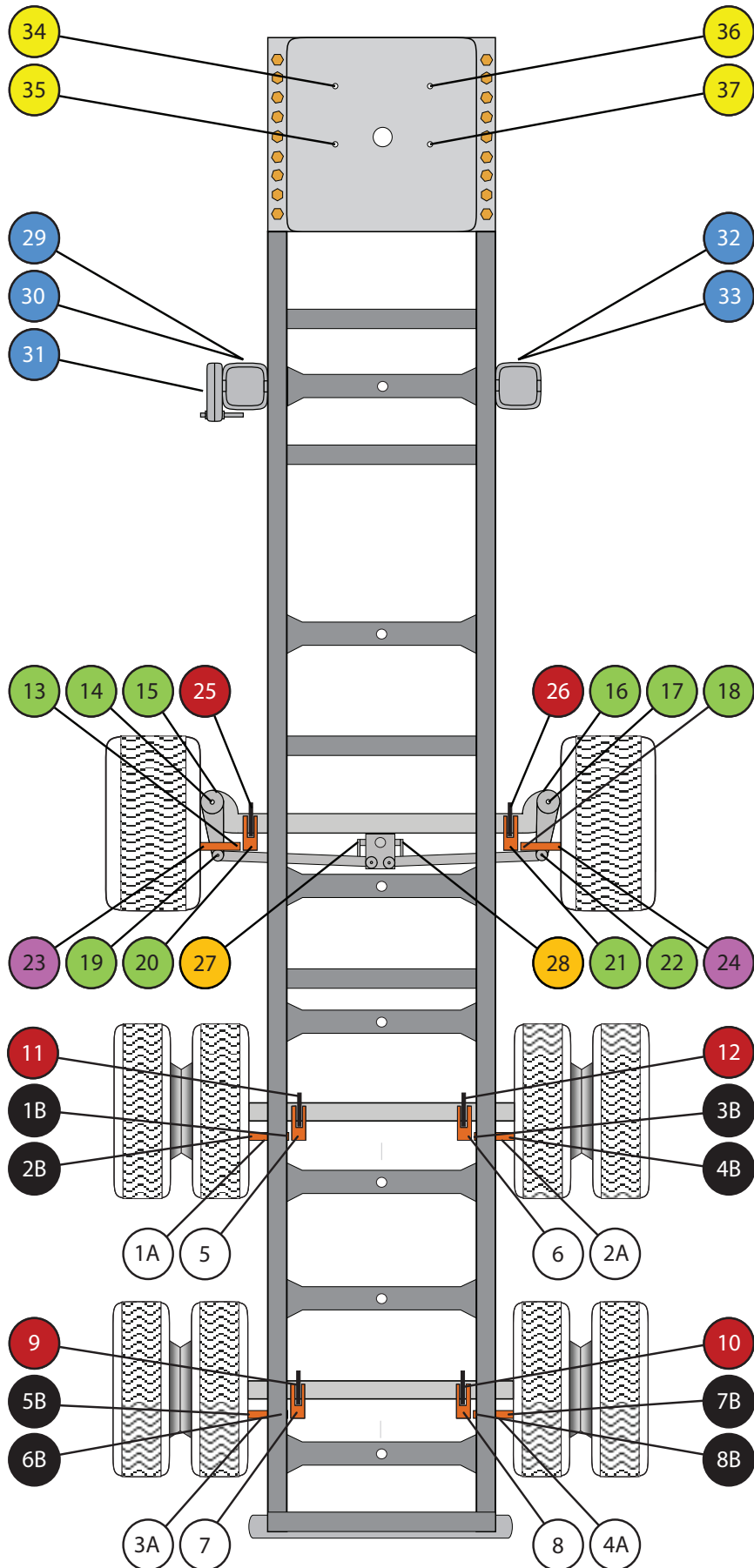
Optional Dolly Legs

29	4	Left Lower Dolly Leg
30	4	Left Upper Dolly Leg
31	4	Gear Box
32	4	Right Lower Dolly Leg
33	4	Right Upper Dolly Leg

Special Application - Upper Coupler

34	9	Front Upper Coupler/Pickup Plate
35	9	Rear Upper Coupler/Pickup Plate
36	9	Front Upper Coupler/Pickup Plate
37	9	Rear Upper Coupler/Pickup Plate

Possible Lubrication Points and Identification of a Tandem Axle Trailer with Lift Steer



Sample - 30Pt - Tandem Axle Tractor Modular Progressive Kit

Part#	Part Description	Quantity	
57.527	Pump/Modular/12v/4kg/LL/1pt/Timer/EP2 Progressive 6cc	1	ea
50.179	Kit, Spyder/MLP Fuse	1	ea
54.624	kit, 2x2 Post Pump Mount	1	ea
41.009	Locknut 3/8 - 16 Nylon Insert	7	ea
41.005	Hex Bolt 3/8 - 16 X 1 1/2 Grade 5 PLTD	7	ea
41.011	Flat Washer 3/8 PLTD	14	ea
54.335	Hose Ass'ly 10' x 1/4" ID Korilla FJICSW - Filled	1	ea
20.210	Body - Check Valve Outlet	1	ea
21.012	Elbow # 4 JIC (M) X 1/4 (M) NPT - Steel	1	ea
21.009	Straight # 4 (M) JIC X 1/8 (M) NPT - Steel	1	ea
30.250	Hose Hydraulic 12000 psi High Pressure 8.6 OD X 4 ID FILLED	60	feet
20.215	Re-usable For 8.4OD X 4ID X 6(M) Sleeve-Steel (with 20.216)	6	ea
20.216	Stud Straight 6mm Short For 8.4OD X 4ID X - Steel(20.215)	6	ea
40.023	Bracket - Progressive Block "Z" Bracket - Long	4	ea
41.025	Hex Bolt 1/4 -20 X 1-3/4" Grade 5 PLTD	8	ea
41.013	Lock Nut 1/4 - 20 Nylon Insert	8	ea
41.004	Flat Washer 1/4 - 20 PLTD	16	ea
41.022	Clevis Pin 1/2" Greasable (truck) + Cotter Pin + Yellow Hat	6	ea
20.056	Fitting, 5mm - M6x1 Conical Male	6	ea
21.087	Street Tee 1/8 (M) X 1/8 (F) X 1/8 (F) - Brass	4	ea
21.231	Grease Zerk X 1/8 NPT	4	ea
54.179	8/8 CC CC CC CC 5mm Outlets	1	ea
54.264	6/6 CC CC CC 5mm	1	ea
54.781	12/12 CC CC CC CC CC CC 5mm	1	ea
54.780	8/7 CC CC CC C - 6 + 5mm Outlets	1	ea
30.003	Tubing Secondary Single 5mm X 2.6mm FILLED - Black	20	feet
30.004	Tubing Secondary Double 5mm X 2.6mm FILLED - Red/Blk	70	feet
30.013	Tubing Secondary Triple 5mm X 2.6mm FILLED Red/Black/Blue	100	feet
20.022	Straight Compression 1/8 BSPT X 5mm	10	ea
20.024	Elbow Compression 1/8 BSPT X 5mm - Brass	14	ea
20.001	Cube Connector 1/4 -28 (M) UNF X 1/8 (F) BSPT - 21 Long	6	ea
20.003	Cube Connector 1/8 (M) NPT X 1/8 (F) BSPT - 25.5 Long	6	ea
41.000	Ty-Rap Large (13UV) - Black	150	ea
41.001	Ty-Rap Small (7UV) - Black	150	ea
41.002	Spiral Wrap Large 1/2"	30	feet
41.003	Spiral Wrap Small 3/8"	20	feet
10.159	Label - Frame Rail Sticker	1	ea

NOTE:

**THESE ARE GENERIC KITS GIVEN AS A SAMPLE -
PLEASE CONTACT LUBECORE INTERNATIONAL AND PROVIDE A REQUIREMENT
SHEET DETAILING THE PARTICULAR SYSTEM REQUIREMENTS**

Sample - 34Pt - Quad Axle Trailer Modular Progressive Kit

Part#	Part Description	Quantity
57.527	Pump/Modular/12v/4kg/LL/1pt/Timer/EP2 Progressive 6cc	1. ea
40.004	Bracket - Universal	1. ea
50.070	Pump & Bracket Hardware Mounting Kit (Pur)	1. ea
54.332	8/4 CC -- CC -- 5mm	1. ea
54.345	10/3 - C - C -- C ---	1. ea
54.344	18/18 CC CC CC CC CC CC CC CC CC 5mm	1. ea
54.346	18/12 CC CC CC CC -- CC CC ---- 5mm	1. ea
40.203	Weld-on Plate - 3 Port SLD/10 Port Progressive- EP2	1. ea
40.204	Weld-on Plate - 4 Port SLD/14 Port Progressive - EP2	2. ea
40.208	Weld-on Plate - 8 Port - EP2	1. ea
41.120	3/8 x 1 1/2 Flat Skt Counter Sunk 82 degree	4. ea
41.009	Locknut 3/8 - 16 Nylon Insert	4. ea
41.030	1/4-20 x 1-3/4" Socket Head Cap Screws (Progressive)	8. ea
41.096	Lock Washer 1/4-20	8. ea
40.023	Bracket - Progressive Block "Z" Bracket - Long	4. ea
10.115	Stud Reducer for Pump M16 X 1.5 x 1/2 - 1/4 BSPT	2. ea
10.249	Ø12.37mm ID x 2.62 CS O Ring	2. ea
21.075	Nipple Hydraulic QDC 1/8 X 1/8 (F) NPT - Stainless Steel	2. ea
21.076	Coupler Hydraulic QDC 1/8 X 1/8 (F) NPT - Brass	4. ea
21.027	Flat Washer 16mm - Copper	2. ea
20.208	Straight Compression - 1/8 (M) BSPT X 6mm - Steel	7. ea
20.223	Stud Straight 6mm Steel with Claw for 8.4ODX 4ID Hose	14. ea
20.224	Stud 45 6mm Steel with Claw for 8.4OD x 4ID Hose	2. ea
20.225	Stud 90 6mm Steel with Claw for 8.4OD X 4 ID Hose	4. ea
20.236	Stud Straight 5mm for 8.4 OD to 4 ID Hose	68. ea
20.232	Clamp S.S. 9.5mm for 8.4 OD x 4 ID Hose	100. ea
20.022	Straight Compression 1/8 BSPT X 5mm	24. ea
20.024	Elbow Compression 1/8 BSPT X 5mm - Brass	12. ea
20.001	Cube Connector 1/4 -28 (M) UNF X 1/8 (F) BSPT - 21 Long	15. ea
20.003	Cube Connector 1/8 (M) NPT X 1/8 (F) BSPT - 25.5 Long	15. ea
30.250	Hose Hydraulic 12000 psi High Pressure 8.6 OD X 4 ID FILLED	164. feet
30.004	Tubing Secondary Double 5mm X 2.6mm FILLED - Red/Blk	100. feet
30.013	Tubing Secondary Triple 5mm X 2.6mm FILLED Red/Black/Blue	200. feet
21.072	Reducer Bushing 1/4 (M) NPT X 1/8 (F) NPT - Steel	1. ea
11.210	Plug 1/8" NPT Steel	1. ea
53.002	SUB - Wraps and Straps Kit LARGE - 37 - 52pt	1. ea
10.159	Label - Frame Rail Sticker	1. ea

NOTE:

**THESE ARE GENERIC KITS GIVEN AS A SAMPLE -
PLEASE CONTACT LUBECORE INTERNATIONAL AND PROVIDE A REQUIREMENT
SHEET DETAILING THE PARTICULAR SYSTEM REQUIREMENTS**

Common Parts List - Modular Progressive MLP System

Category	Part#	Part Description
Elements		
	11.637	Element Progressive MKII 6cc (SS) M16
	11.639	Element Progressive MKII 4cc (SS) M16
	11.640	Element Progressive MKII 2cc (SS) M16
Plug		
	11.033	Element Plug M16x1.5 with "O" ring
Distributor Block & Check Valves		
	11.300	6 Port Distributor Block
	11.301	8 Port Distributor Block
	11.302	10 Port Distributor Block
	11.303	12 Port Distributor Block
	11.297	14 Port Distributor Block
	11.299	18 Port Distributor Block
	20.204	6mm x 1/8 BSPP (M) Check Valve Complete
	20.210	6mm x 1/8 BSPP (M) Check Valve Body
	20.235	6mm Check Valve Compression Olive
	20.234	6mm Check Valve Compression Nut
Lubrication Point Adapter Fittings (In Conjunction With Compression Fittings)		
	20.001	Cube 1/4 - 28 (M) UNF x 1/8 (F) BSPT - 21.0 Long - Steel
	20.002	Cube 1/4 - 28 (M) UNF x 1/8 (F) BSPT - 33.0 Long - Steel
	20.003	Cube 1/8 - 27 (M) NPT x 1/8 (F) BSPT - 25.5 Long - Steel
	20.004	Cube 1/8 - 27 (M) NPT x 1/8 (F) BSPT - 38.3 Long - Steel
	20.005	Cube 1/8 - 27 (M) NPT x 1/8 (F) BSPT - 51.0 Long - Steel
	20.028	Cube M8 x 1 (M) x 1/8 (F) BSPP - Steel
	20.059	Cube 1/8 (M) BSPT x 1/8 (F) BSPT - 25.5 Long - Steel
	20.061	Cube 1/8 (M) BSPT x 1/8 (F) BSPT - 38.3 Long - Steel
	20.062	Cube 1/8 (M) BSPT x 1/8 (F) BSPT - 51.0 Long - Steel
	20.006	Straight Adapter 1/4 - 28 (M) UNF x 1/8 (F) BSPP - Steel
	20.060	Cube Connector 1/8 (M) BSPT X 1/8 (F) BSPT - 25.5 Long
Lubrication Point 6mm Compression Fittings		
	20.031	6mm x 1/8 (M) BSPT Compression Straight - Brass
	20.046	6mm x 1/8 (M) BSPT Compression 90° Elbow - Brass
	20.057	6mm x M6 x 1 (M) Compression Conical - Brass
	20.200	6mm x 1/8 (M) BSPT Push-IN Elbow
	20.218	6mm x 1/8 (M) BSPT Push-IN Elbow Swivel
	20.201	6mm x 1/8 (M) BSPT Push-IN Straight

Common Parts List - Modular Progressive MLP System

Category	Part#	Part Description
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Lubrication Point 6mm Compression Fittings (Continued)

20.214	6mm x 6mm Push-IN Union
20.207	6mm x 1/8 (M) BSPT Compression Elbow - Steel
20.208	6mm x 1/8 (M) BSPT Compression Straight - Steel
20.033	6mm Compression Olive (Brass)
20.047	6mm Compression Nut (Brass)
20.234	6mm Compression Nut (Steel)
20.235	6mm Compression Olive (Steel)

Lubrication Point 6mm Secondary Tubing

30.017	6mm Single Secondary Lining - Black
30.255	6mm Double Secondary Lining - Black/Red
30.208	6mm Triple Secondary Lining - Black/Red/Blue

System Mounting Hardware, Brackets & Protection

40.000	6Kg Bracket
40.001	4kg Bracket
40.004	Universal Bracket
40.027	Backing Plate
40.043	Deck Bracket
40.240	Modular Deck Plate
40.018	Progressive Block "Z" Bracket - Short
40.023	Progressive Block "Z" Bracket - Long
40.206	6 Port Distributor Weld On Plate
40.208	8 Port Distributor Weld On Plate
40.203	10 Port Distributor Weld On Plate
40.210	12 Port Distributor Weld On Plate
40.204	14 Port Distributor Weld On Plate
50.070	Pump Mounting Hardware Kit
41.000	Ty-Rap - Large (13UV) Black
41.001	Ty-Rap - Small (7uv) Black
41.002	1/2" Large Spiral Wrap
41.003	3/8" Small Spiral Wrap

Electrical

12.057	MKII Progressive - Externalized Timer - 10V - 30V
12.045	LLPS 4 & 6 Kg Low Level Sensor

Common Parts List - Modular Progressive MLP System

Category	Part#	Part Description
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Special Application

Lubrication Point Compression Fittings

20.211	5mm x 6mm Compression Olive
20.212	5mm x 1/8 BSPP (M) Check Valve Complete
20.022	5mm x 1/8 (M) BSPT Compression Straight - Brass
20.024	5mm x 1/8 (M) BSPT Compression 90° Elbow - Brass
20.025	5mm x 5mm Compression Union - Brass
20.056	5mm x M6 x 1 (M) Compression Conical - Brass

Lubrication Point Secondary

30.003	5mm Single Secondary Lining - Black
30.004	5mm Double Secondary Lining - Black/Red
30.013	5mm Triple Secondary Lining - Black/Red/Blue

Heavy Duty Fittings, Hose & Accessories

30.250	8.6 x 4 Hydraulic Hose
20.198	Elbow 90 reusable Stud with Groove for 8.4OD X 4ID Hose
20.199	Stud Straight 6mm for 8.4OD X 4 ID Hose (with 20.215)
20.216	Stud Straight 6mm Short For 8.4OD X 4ID X - Steel(20.215)
20.217	Hose Stud - 45 Degree - Short - Steel
20.223	Stud Straight 6mm Steel with Claw for 8.4ODX 4ID Hose
20.224	Stud 45 6mm Steel with Claw for 8.4OD x 4ID Hose
20.225	Stud 90 6mm Steel with Claw for 8.4OD X 4 ID Hose
20.227	Stud Straight 8mm Steel for 11.6 X 6.3 Hose
20.228	Reusable Sleeve (for 8mm Stud 20.229)Steel
20.229	Stud 8mm (for Reusable Sleeve 20.228)Steel
20.236	Stud Straight 5mm for 8.4 OD to 4 ID Hose
20.244	Stud 45 - 6mm Steel for 8.4OD x 4ID Hose
20.232	Clamp S.S. 9.5mm for 8.4 OD x 4 ID Hose

Lubecore™
Modular Progressive
Parts & Service
Components

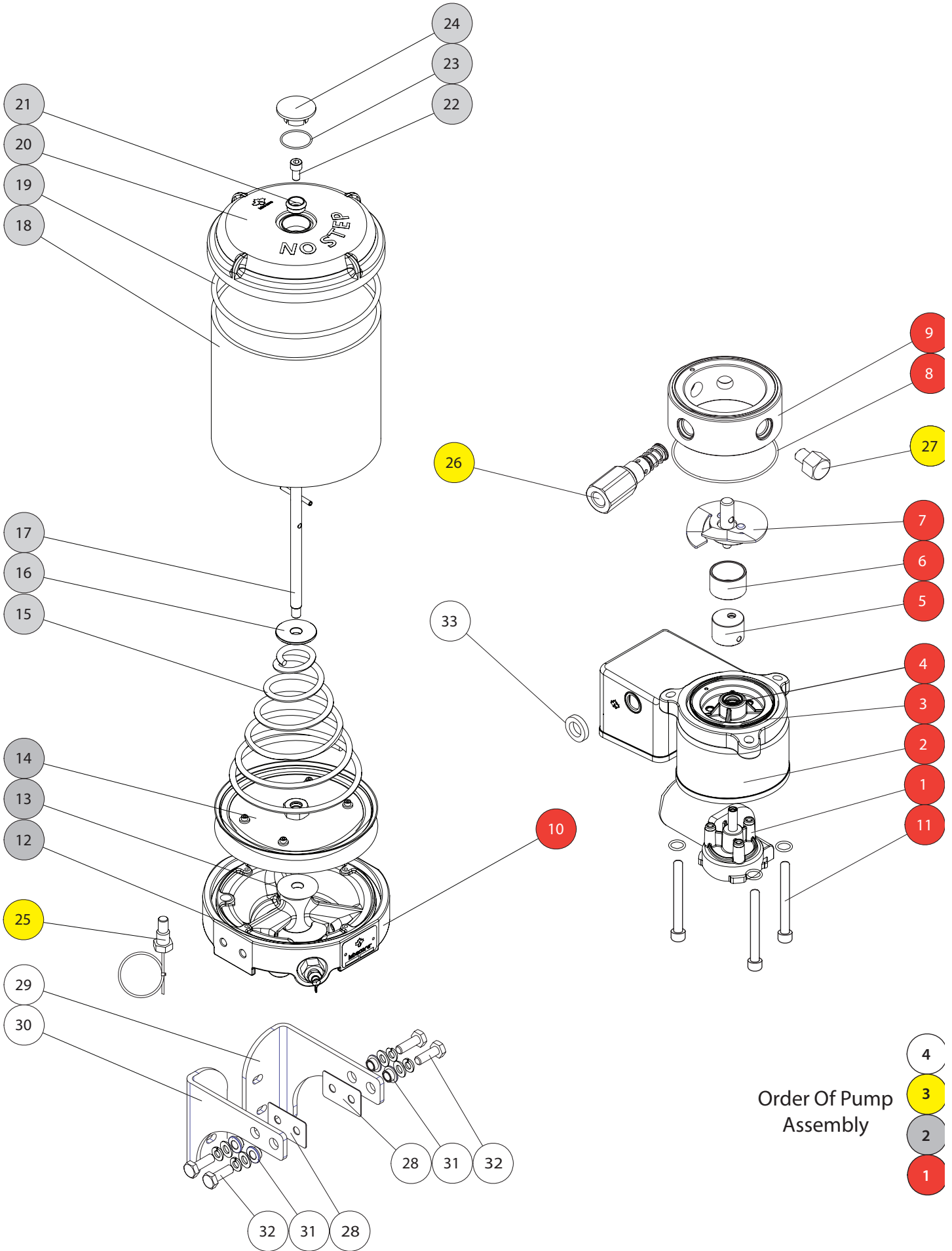


Modular Progressive Pump Base Assemblies

Pump	Part #	Description
57.011	10.213	Spyder 4Kg Res Module
	10.197	Spyder, Bottom, 12 Volt Pro.
	10.175	Ring Module, 3 Port Modular
	10.174	Screw Plate Module
	10.188	Bolt Kit - 60mm (1L)
	10.187	Spyder, Bracket Kit, 6mm
	50.594	Bolt Kit, Modular Bracket
	50.931	Kit, LCI Modular Hardware
	50.581	Kit, 30' Power Harness
57.007	10.214	Spyder 6Kg Res Module
	10.197	Spyder, Bottom, 12 Volt Pro.
	10.175	Ring Module, 3 Port Modular
	10.174	Screw Plate Module
	10.188	Bolt Kit - 60mm (1L)
	10.187	Spyder, Bracket Kit, 6mm
	50.594	Bolt Kit, Modular Bracket
	50.931	Kit, LCI Modular Hardware
	50.581	Kit, 30' Power Harness
57.005	10.213	Spyder 4Kg Res Module
	10.198	Spyder, Bottom, 24 Volt Pro.
	10.175	Ring Module, 3 Port Modular
	10.174	Screw Plate Module
	10.188	Bolt Kit - 60mm (1L)
	10.187	Spyder, Bracket Kit, 6mm
	50.594	Bolt Kit, Modular Bracket
	50.931	Kit, LCI Modular Hardware
	50.581	Kit, 30' Power Harness
57.004	10.214	Spyder 6Kg Res Module
	10.198	Spyder, Bottom, 24 Volt Pro.
	10.175	Ring Module, 3 Port Modular
	10.174	Screw Plate Module
	10.188	Bolt Kit - 60mm (1L)
	10.187	Spyder, Bracket Kit, 6mm
	50.594	Bolt Kit, Modular Bracket
	50.931	Kit, LCI Modular Hardware
	50.581	Kit, 30' Power Harness

Table 1. Modular Series Pump Components.

The above listed pumps are base pumps only and do not come with elements, plugs, grease or low level



Individual Modular Progressive Pump Components Order of Assembly

Position	Part #	Description
1	10.261	Motor & Gear Assembly - 12V
	10.262	Motor & Gear Assembly - 24V
2	10.197	Motor Assembly 12V - Progressive (Minute Timer)
	10.198	Motor Assembly 24V - Progressive (Minute Timer)
	10.184	Motor Assembly 12V - No Timer
	10.185	Motor Assembly 24V - No Timer
3	10.267	"O" Ring
4	10.173	Cam Spacer
5+6+8+9	10.175	Ring Module, 3 Port Progressive (Includes Cam 20mm)
7	10.174	Screw Plate Module
10	-	Modular Pump Body
11	10.188	Bolt Kit - 60mm (1L)
12+19	10.007	Reservoir Seal (Top & Bottom)
13	10.114	M10x28x3mm Washer (Guide Rod)
14	10.110	Follower Plate - 4kg & 6kg -
15	10.253	PIP™ Spring 4kg
	10.254	PIP™ Spring 6kg
	10.213	4KG Reservoir Module- PIP™ (Top) Spring
	10.214	6KG Reservoir Module- PIP™ (Top) Spring
16	10.255	Spring Stopper - Washer for PIP™ / Guide Rod
17	10.251	Guide Rod 4Kg
	10.252	Guide Rod 6kg
	10.224	Guide Rod Assembly 4Kg - PIP™ (Top) Spring (Rod with Spring Stopper)
	10.223	Guide Rod Assembly 6Kg - PIP™ (Top) Spring (Rod with Spring Stopper)
18	10.001	Makrolon™ Reservoir 4Kg
	10.207	Makrolon™ Reservoir 6Kg
20	10.006	Reservoir Lid
21	10.008	Reservoir Spacer Bushing
22	10.011	Cover Bolt - PIP Spring Model / Bolt For Reservoir Lid - M8 x 1.25 x 15 mm SS
23	10.004	"O" Ring Seal - Lid Cap
24	10.003	Lid Cap
25	12.045	Sensor Low Level Modular – 4kg Std & 4/6kg PIP™ Top Spring
26	11.637	Element Progressive Mk2 6cc (SS) M16x1.5
	11.639	Element Progressive MK2 4cc (SS) M16x1.5

Table 2. Modular Series Pump Replacement Components.

Position	Part #	Description
	11.640	Element Progressive MK2 2cc (SS) M16x1.5
	54.128	1/4" Quick Fill Connector- 1/4"M NPT (With Dust Cap)
27	11.033	Element Plug M16x1.5 with "O" Ring for Progressive Ring Module
	10.195	"O" Ring for Progressive Element
28 x 2	10.926	Gasket for Mounting Bracket
29	-	Bracket Arm Left Stainless Steel
30	-	Bracket Arm Right Stainless Steel
	10.187	Bracket Complete Assembly
31 x 4	41.135	Nylon Isolation Bushing
-	12.057	External Timer w/30' Harness
31+32	50.594	Bolt Assembly M10
	50.931	Bolt Assembly Pump Mount 5/16"x3 + 1x5/16" Machine Screw for Magnet
	50.581	30 Feet / 9m Power Harness with Deutsch Connector

Table 2. Modular Series Pump Replacement Components.

Lubecore™ Limited Warranty

Lubecore™ warrants the product manufactured and supplied by Lubecore and its authorized distributors to be free from defects in material and workmanship for a term as defined in the enclosed table, following the date of purchase, excluding any special, extended, or limited warranty published by Lubecore.

If product is determined to be defective during this warranty period, it will be repaired or replaced, within Lubecore sole discretion, without charge. This warranty is conditional upon the determination by Lubecore or authorized representative that the product is defective. For a complete list of Lubecore and authorized representative locations call 1-905-864-3110 or visit www.lubecore.com.

This warranty is non-transferable and applies to the original retail purchaser only. This warranty does not apply to product damaged from accident, overload, abuse, misuse, negligence, faulty installation or abrasive or corrosive material, equipment that has been altered, or equipment repaired by anyone not authorized by Lubecore.

This warranty applies only to product installed, operated and maintained in strict accordance with the written specifications and recommendations provided by Lubecore or authorized representative.

This warranty is exclusive of any other warranties, expressed or implied, including, but not limited to, the warranty of merchantability or warranty of fitness for a particular purpose.

In no event shall Lubecore or authorized representative be liable for incidental or consequential damages. Lubecore or authorized representative's liability for any claim for loss or damages arising out of the sale, resale or use of any Lubecore equipment shall in no event exceed the purchase price. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, therefore the above limitation or exclusion may not apply. Warranty shall not exceed original purchase price.

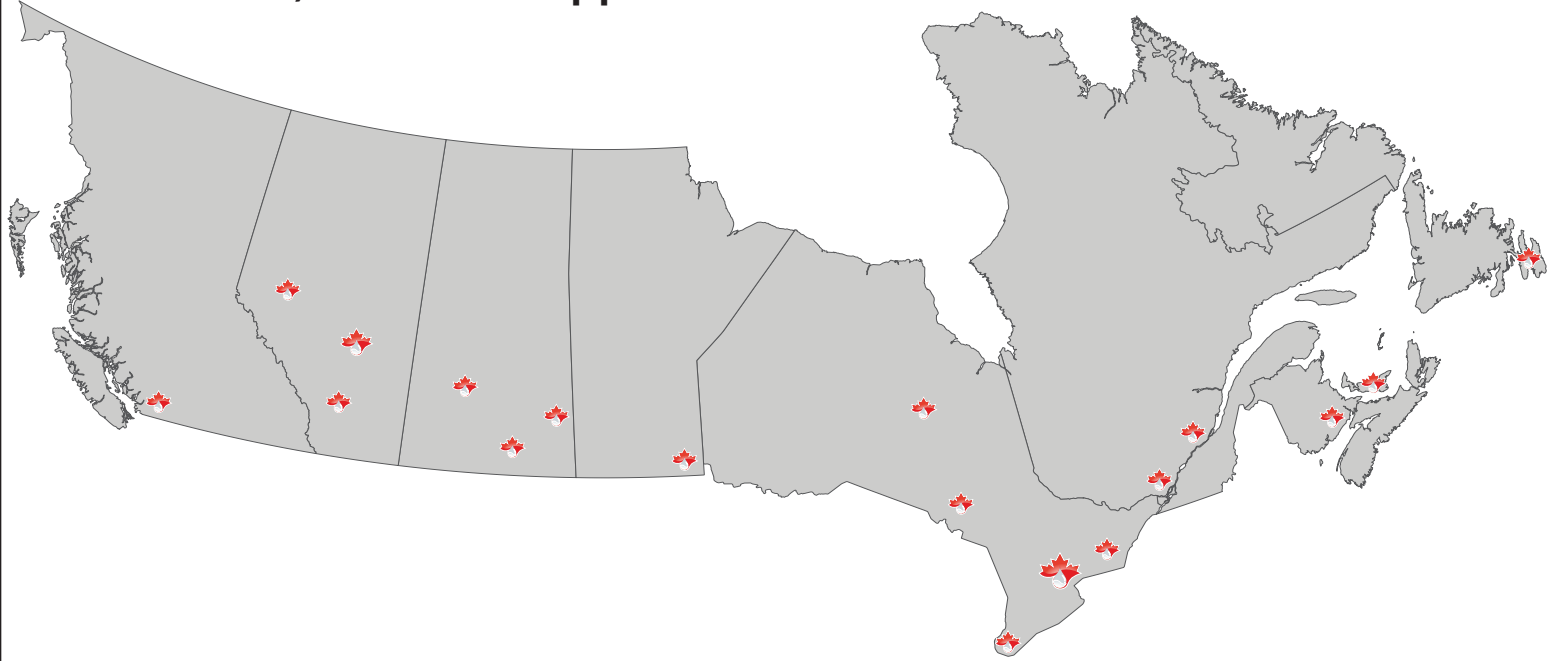
Product	Limited Product Warranty	Limited Steadylube Extended Warranty	
		On-Road / Transport	Off-Road
Parallel Pneumatic* EPO	1- year	5 -years	2 -years
Parallel Electric* Gear EPO		2 years	1 -year
Parallel High Pressure Electric* - Hydraulic		-	1 -year
Series Progressive Electric*		-	1 -year
Series Progressive Pneumatic*		5 -years	2 -year
MLP/Multiline - Including Modular		1 -years	1 -year

Table 40. **Limited Warranty Terms / Period. * Defines the Method of Pump Operation.**

Both the Regular and the Extended Warranty are void in case of the following:

- Damage from grease contamination or using alternate grease. - Service from an unauthorized dealer - Cut wires or missing parts - Water above the follower plate from pressure washing - Damage caused by negligence, theft, or accident.
- Contact Lubecore International or your local distributor for further details pertaining to the extended warranty provided with the use of Lubecore lubrication products.

Lubecore International - Canadian Local Parts, Service & Support



Map of Canada with Provinces - Outline Copy© - FreeVectorMaps.com

Map of World Countries - Outline Copy© - FreeVectorMaps.com

Lubecore International Inc. Corporate Head Office,

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Lubecore Alberta, A Div. of Lubecore International.

Western Canada Distribution

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(780) 224-3905

rkooger@lubecore.com

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Traction Charlottetown

2 Macneill Ave. Charlottetown, PEI Canada

C1E 3A8

(902) 566-4822

traction.com

**Traction - Moncton**

377 Edinburgh Dr. Moncton, NB Canada

E1E 4A6

Sales Location Service Location

(506) 857-8840

1 800 561 7900 FREE

(506) 857-9788

traction-moncton@uapinc.com

**National Tank Services Mount Pearl**

21 Kyle Ave. Mount Pearl, NL Canada

A1N 4R5

Service Location

(888) 221-7776 FREE

nationaltankservices.com

**Lubecore Quebec (Quebec City Area)**

984 Rue Marie-Victorin, St-Nicolas, QC Canada

G7A 3T6

Sales Location, Service Location

(418) 571-3383

(855) 554-7627 FREE

jcd@lubecorequebec.com

**Lubecore Quebec (Montreal Area)**

5790 Vanden Abeele St. Saint-Laurent, QC Canada

H4S 1R9

Sales Location Service Location

514 250 3506

1 855 554 7627 FREE

jcd@lubecore.com

**National Tank Services Pointe-Claire**

200 Reverchon Ave. Pointe-Claire, QC Canada

H9P 1K1

Service Location

(888) 776-8627 FREE

nationaltankservices.com



Lubecore Peterborough

529 Emily park Rd. Kawartha Lakes /
Peterborough, ON Canada
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Sales Location Service Location

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dthompson@lubecore.com

dave.thompson4@sympatico.ca

**Lubecore International Inc. North**

4525 Dill Lake Rd. Sudbury, ON Canada
P3G 0A5

Sales Location, Service Location

(705) 918-3326

rparsons@lubecore.com

**Tru-Nor Truck Centre**

2439 Riverside Dr. Timmins, ON Canada
P4R 1M9

Sales Location Service Location

(705) 268-6199

nci.truck@ncitrucks.com

ncitrucks.com

**Tru-Nor Truck Centre**

1035 Falconbridge Rd. Sudbury, ON Canada
P3A 4M9

Sales Location Service Location

(705) 560-6625

nci.truck@ncitrucks.com

ncitrucks.com

**Tru-Nor Truck Centre**

605 Third Line E. Sault Sainte Marie, ON Canada
P6A 5K7

Sales Location Service Location

(705) 450-6626

nci.truck@ncitrucks.com

ncitrucks.com

**National Tank Services Sarnia**

396 McGregor Side Road, Sarnia, ON Canada
N7T 7H5

Service Location

(519) 344-8509

nationaltankservices.com



National Tank Services Winnipeg

955 Maginot St. Winnipeg, MB Canada
R2J 0Z6
Service Location
(204) 233-8945
nationaltankservices.com

**National Tank Services Regina**

705 Henderson Dr. Regina, SK Canada
S4N 6A8
Service Location
(306) 721-1988
nationaltankservices.com

**National Tank Services Yorkton**

315 Ball Rd. Yorkton SK Canada
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Service Location
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**Lubecore Saskatchewan/Ernie's Trailer**

863 60 St. East, Saskatoon, SK Canada
S7K 8G8
Sales Location ☐ Service Location
(306) 931-7777
ets@sasktel.net

**National Tank Services Fort McMurray**

425 Gregoire Dr. Fort McMurray, AB Canada
T9H 3R2
Service Location
(780) 750-1481
nationaltankservices.com

**National Tank Services Dawson Creek**

2700 92 Ave. Dawson Creek, BC Canada
V1G 1C6
Service Location
(877) 877-5108 FREE
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**Lubecore BC Distributors Inc.**

Abbotsford, BC Canada
V2S 8R1
Sales Location ☐ Service Location
(604) 897 1528
adminbc@lubecore.com



National Tank Services Fairburn

6800 McLarin Rd. Fairburn, GA USA
30213
Service Location
(770) 969-9177
nationaltankservices.com

**Tico Manufacturing**

66 Cyprus Ridge Dr. Ridgeland, SC, USA
29936
Sales Location
1 (843) 717-2215
1 (800) 269-8426
1 (912) 232-9025
rdennis@ticottractors.com
ticottractors.com & traction.com

**National Tank Services Wellford**

150 Old Spartanburg Highway, Wellford, SC USA
29385
Service Location
(864) 439-2270
nationaltankservices.com

**National Tank Services Holly Hill**

469 Boyer Rd. Holly Hill, SC USA
29059
Service Location
(803) 496-1500
nationaltankservices.com

**National Tank Services Charlotte**

201 Black Satchel Dr. Charlotte, NC USA
28216
Service Location
(704) 399-1133
nationaltankservices.com

**National Tank Services Winston-Salem**

190 Park Plaza Dr. Winston-Salem NC USA
27105
Service Location
1 (336) 784-9900

**Truck Crane Solutions**

4525 North Point Boulevard, Edgemere, MD USA
21219
Sales Location
1 (904) 342-0395
danielh@truckcranesolutions.com
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Pioneer Truck Sales

106 Sewell Road, Sewell, NJ USA
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1-856-582-8888



Smithfield Diesel

170 Washington Hwy. Smithfield, RI USA
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tony@smithfielddiesel.com



Stewart-Amos Sweeper Company

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Sales Location Service Location
(717) 514-6119
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stewart-amos.com



National Tank Services Bristol

Bristol, PA USA
19007
Service Location
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nationaltankservices.com



Automated Maintenance Solutions, llc

4402 Pine Lake Dr. Medina, OH USA
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Sales Location Service Location
330-871-4006
Sales@autolubeparts.com
www.autolubeparts.com



National Tank Services Portage

1940 Douglas St. Portage, IN USA
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(800) 492-2671
nationaltankservices.com



Rapid Repair Inc.

3167 Bellevue St. Detroit, MI USA
48207
Sales Location Service Location
313-267-9800
perry@rrepair.biz



National Tank Services Taylor

Taylor, MI USA
48180
Service Location
(313) 292-1385
nationaltankservices.com



National Tank Services Calvert City

C Ave. Northwest, Calvert City, KY USA
42029
Service Location
270) 395-4175
nationaltankservices.com



National Tank Services Louisville

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National Tank Services Sulphur

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Truck Components TCS

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