



# lubecore™

## General manual

Lubecore™ Parallel ALS

Equipped with an electrically operated gear pump.



**Next Generation Automated Lubrication**



# Document information

Title: General Manual Lubecore Parallel Automated Lubrication System for an electrically operated pump

File ref: Lubecore\_GM\_004

Revision: 03

Publication date: January 2012

## Revisions:

01: 1st release.

02: general update

03: LCT timer electrical schematic

All rights reserved. No part of this publication may be copied and/or published by any means without obtaining prior written permission from Lubecore™. Due to continuous product development and improvement Lubecore™ reserves the right to update parts at any time, the contents of this manual may also be changed without prior notice. This manual applies to the standard version of the product. Lubecore™ cannot accept liability for any damage arising from the use of this publication. Please contact Lubecore™ in case of any questions related to the revision of, required service, repairs and or maintenance as described in this publication



# Contents Manual

4	<b>Safety precautions</b>
5	<b>About Lubecore™</b>
11	<b>Introduction</b>
12	<b>The concept of automated lubrication</b>
15	<b>General operation of a parallel ALS</b>
17	<b>Electric gear pump</b>
18	<b>Pump Operation</b>
19	<b>Timer operation</b>
22	<b>MK2 Timer memory report</b>
26	<b>Trouble shooting the timer</b>
27	<b>Pressure switch</b>
28	<b>LCT timer operation</b>
31	<b>Metering unit process</b>
36	<b>Problem prevention</b>
37	<b>Removing air-pockets from the ALS</b>
38	<b>Lubricants / Grease</b>
40	<b>Filling of the reservoir</b>
42	<b>Technical specifications</b>
43	<b>Lubecore™ limited warranty</b>



# Safety precautions

- 1). Comply with all safety regulations applicable at the locality where the tasks are performed.
- 2). Always take the necessary precautions to prevent potentially dangerous situations from occurring during installation, checking and maintenance. Always apply or use adequate safety measures to prevent personal injury and material damage, before starting work on 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 other 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 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.



# About Lubecore™

## ***Our Vision***

Lubecore™ International's vision, just like any other leading corporate vision, is a short, succinct and inspiring statement of what we intend to become and what aspirations we have in delivering value for our customers.

We also know that we must live to the standards set forth through our vision. Yet, we know, as an ancient Japanese proverb says, "vision without action is a daydream. Action without vision is a nightmare". That's why we have chosen our vision to create sustainable value through what we do. At Lubecore™,

**We deliver sustainable value by protecting your company, your employees, the environment, and your equipment through next generation lubrication and after-care solutions.**

We achieve our vision through our core values, the products and solutions we generate, and the customer service we provide. Look further at our web-site at [www.lubecore.com](http://www.lubecore.com) or just ask any one of our colleagues.

## ***A Step Ahead***

What makes Lubecore™ International so different? Well, we think it is a number of things.

First, we are in a class of our own.

We are just not your regular, run-of-the-mill provider of automated lubrication systems. Instead, we are a provider of solutions mixed together with great product and service; we first listen to your business problem then we propose a solution that fixes the problem long term for the price you can pay.

Second, our 4P Value Chain makes all the difference in the world. Our business philosophy / principles, our product, our people, and our promise make us one of the best in delivering value, each and every day.

And, three, we keep you, the customer, in mind when we develop the solution that meets your business and budget needs.



Illustration 1. Lubecore™ pneumatic 4 Kg parallel pump with stone guard.



## ***Our Philosophy***

Lubecore™ was built on the principle of a network of trusted business partners working together to provide solutions for customers which want to protect their assets while making the most out of their resources; whether these are their people, their equipment, their environment or their organization.

Bottom-line, through our network and business dealings, we protect your organization's financial resources and reputation. It's about good business done well.

## ***Our Core Values***

Lubecore™ International's core business values, listed below, guide our actions.

### **Focus on the Customer, First**

Since our beginning, we have focused on providing the best possible experience for our Distributors, Dealers and End Customers. Whether we're designing a new automated lubrication system or an air filtration device, we take great care to ensure that they will ultimately serve you, rather than our own internal goal or bottom line.

### **Be the Best at What We Do**

Our business is about protection. Protection of your organization's equipment, protection of your employees while operating equipment, protection of the environment, and ultimately, protecting your organization. With well over 100 years of collective staff time on the job in this industry, we know what we do well, and how we could do it better. Through continued iteration on difficult problems, we've been able to solve complex issues and provide continuous improvements to products and services that most of our end customers demand almost on the spot. Our dedication to "being easy to do business with" helps us apply what we've learned to new products and services. Our hope is to ensure that every piece of company equipment doesn't fail because of poor lubrication or people suffer due to poor air quality or air borne contaminants.

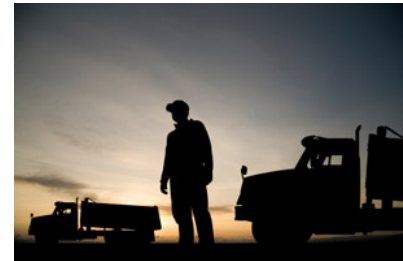


Figure 2. Lubecore™ EP2 3 port variable output distributor.



## Be Passionate

We are passionate about wanting to provide our Distributors and Dealers with the best products and the best possible service; we work tirelessly to do so. Our reward is measured by more than just meeting budgets and achieving sales targets. It's more about the relationships we're building, by going the extra mile, and doing what it takes to ensure our Distributors and Dealers, and ultimately the End Customer, obtain maximum value for their investment. At the end of the day, it is important for us to know we can share a friendly handshake when we meet, and look our partners in the eye with pride because our actions speak for themselves.



## Show a Sense of Urgency

We know your time is valuable, so when you're seeking an answer to a problem right away, we aim to please. We aim to understand the problem first, rather than just hear about the symptom. Once we've done that, then we move into hyper-speed to move to a solution that works for you.

## Make Money the Honest Way

Lubecore™ International is a business. The revenue we generate is derived from the sale and service of our products around the globe. Hundreds of End Customers buy our products because they are great solutions to their air filtration or equipment lubrication needs. We hire employees and establish great relationships with Distributors and Dealers that we can trust. This trust is based on mutual respect, good business practices, honest and direct communications, helping each other out, and always doing good for our End Customer, even when we have to bear the cost when something goes wrong. It's about trust. Trust in the relationship. But, trust always in the result.

## Be Close to Our Partners, All the Time

In order to build and maintain long lasting relationships, we need to be close to our Distributors and Dealers, understanding the markets they serve, where their strengths lie, and what they envision for the future of their organization, so that we can better service their needs.

We are committed to meeting with our Distributors and business partners in annual meetings, and in training sessions to bring together a comprehensive knowledge base where we can learn from each other's best practices and proven results. We believe that we have as much to learn from our Distributors as they have to learn from us, and we value the technical, sales, and general business experiences they bring to our organization and broader Lubecore™ network.



Figure 3. Lubecore™ Single Line injectors and manifold.



## Take the Long-Term View

We strive to face challenges head on, and see them as opportunities for improvement; always focusing on building a stronger and sustainable organization that will still be standing when the others are not.

Since the inception of Lubecore™, we have faced such challenges in bringing new products from schematic plan stage to the market and we continue to face new challenges daily. Those challenges may originate from newer equipment on the market which requires customization to our systems, to customer driven need for additional features, or new concepts in technology which we need to understand and help our Distributors and Dealers understand.

It is the nature of our business to be in a constant state of change and we're up to the challenge.

## Being Great Just Isn't Good Enough

At Lubecore™, we always aspire to being great at something as a starting point, not an endpoint. We set ourselves objectives we know we can't reach yet, because we know that by stretching to meet them we can get further than we expected. Through innovation and experimentation, we aim to take things that work well and improve upon them in unexpected ways.

Our founder, Jan Eisses, always reminds us that, "if you always do what you've always done, then you can only expect what have always got." Ultimately, our constant dissatisfaction with the way things are becomes the driving force behind everything we do. We want you to partner with us in being great.

## Turnkey Solutions

Our Distributors and Dealers are the cornerstone of our business; therefore what matters to them, is what matters to us.

From Distributor feedback, and from first-hand knowledge, we know that there is an overwhelming need for complete turnkey solutions for end customers. We also know that we create additional value by understanding the customer's business and operational challenges in order to serve them. We show, at every stage of our value chain, that we care about them.



Figure 4. Lubecore™ MLP Spyder pump.





At Lubecore™ International, we prove that we care by providing total solutions, not just by selling a product or part. Our objective of “being easy to do business with” makes us make it easy for our Distributors, Dealers, and ultimately for the end customer; whether it is the sale and installation of a system solution, to providing aftermarket supplies, and / or to providing technical support.



For the Distributor, we provide sales tools, training, literature, in-house and onsite technical support, and wide ranging levels of information on our website for quick reference. For Dealers, we set them up with a local or regional Distributor that can assist them in the selling or installation process.

### ***Our Founder`s Dream***

Seasoned business entrepreneurs know that it takes 20 years to build a reputation and five minutes to ruin it. That’s why visionaries like Jan Eisses stick to their knitting when building and living their dreams.



As a pioneer of automated lubrication systems in North America, Jan knew that the secret sauce to success was when “locals deal with locals”. After watching, with dismay, customers across North America suffer from poor service support for automated lubrication systems, Jan realized he needed to get back into business to do it right. He knew that the product that he brought to North America would last in value only if serviced the way it was intended. That’s why Jan jumped back into the market to build the “great grease franchise”.

With a strong distributor network along with an efficient and cost effective strong supply chain focused on producing and delivering high performance products worldwide, Jan, Lubecore International, and its distributor network will be able to achieve that great big goal.

The power behind our promise, principles, people and product allows Lubecore and its distributors worldwide to achieve the world status of delivering next generation protection solutions.



## ***Our History***

Lubecore™ International Inc.'s history is intertwined with the history of Jan Eisses, our founder and pioneer of automated lubrication systems in North America.

Lubecore's geneses as a global leader in next generation protection solutions evolved out of over 22 years of market leadership dominance driven by the vision of Jan Eisses. His keen business sense coupled with an exacting eye for filling a market void brought automated lubrication systems to the market.

It all started with one vision, a first-class distribution and manufacturing operation, and a commitment to quality, innovation and customer value. This is the history of Lubecore™ International Inc.:

**1988** Jan Eisses immigrates to Canada from The Netherlands with 10 Automated Lubrication Systems (ALS). Eisses registers his own company. Immediate focus: to penetrate the "over the road" transport truck and trailer market with EPO lubrication systems. Canadian transport market is introduced to ALS.

**1989** Eisses sets up an exclusive distributor coast-to-coast network in Canada. Customers serviced nationwide with ALS as their equipment moves across the country.

**2001** After over 10 years building and managing his own organization, Jan Eisses sells majority ownership of the company while still managing the company.

**2006** By 2006, as North American managing director, Jan Eisses expands into new markets and grows the business to \$33 Million. 150 service points were added to the USA and Canadian markets.

**2007** After substantial growth and a need to move on, Jan leaves the company to consider other business options.

**2008** On April 15th, after witnessing several years of declining servicing of lubrication systems across North American, Jan Eisses starts a new company with a renewed push for "locals dealing with locals". Lubecore™ International, Lubecore™ Ontario and Lubecore™ Alberta are all registered to gain a footprint in the Canadian market. The first product is a "next generation automated lubrication system".

**2009** By year end 2009, sales grow substantially along with the development of new products and addition of new distributors across the globe.

**2010** Lubecore™ poises itself for expansion and growth.





# Introduction

Lubecore™ parallel (single line) automated lubrication systems take care of daily regular and preventive maintenance for components requiring lubrication.

The automated lubrication systems prevent unnecessary wear and downtime, thus reducing operating costs and preventing unforeseen expensive problems.

Automated lubrication systems not only assist with extending of maintenance intervals, it also prolongs 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 over-manual lubrication, and grease waste. The reduced need for replacement components also has a positive impact on the environment as it reduces the need for raw materials and energy to produce these replacement components.

The most important advantages:

- Extension of maintenance intervals.
- Reduces wear on components.
- Lower and less 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.
- Improves 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 other 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 the components, 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 problem free operation, even under the most extreme operating conditions.

The high Lubecore™ installation standards along with the use of the correct type of grease and periodic checks ensures trouble free operation of the system. The periodic checks, which take little time and effort, can be performed during the normal maintenance of the equipment.



# 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, thus 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 elasto-hydrodynamic lubrication.

2. Carry away contaminants and debris.

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 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 in operation.

The goal of the maintenance interval and the pre-set type of lubricant is to overcome the period of lubricant film deterioration. Depending on the equipment application, the manufacturer based on user information and design data preset the interval to either hours or mileage, whichever is applicable. It is up to the operator and/or owner or the equipment to watch over the correct interval 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, preventing metal to metal contact.

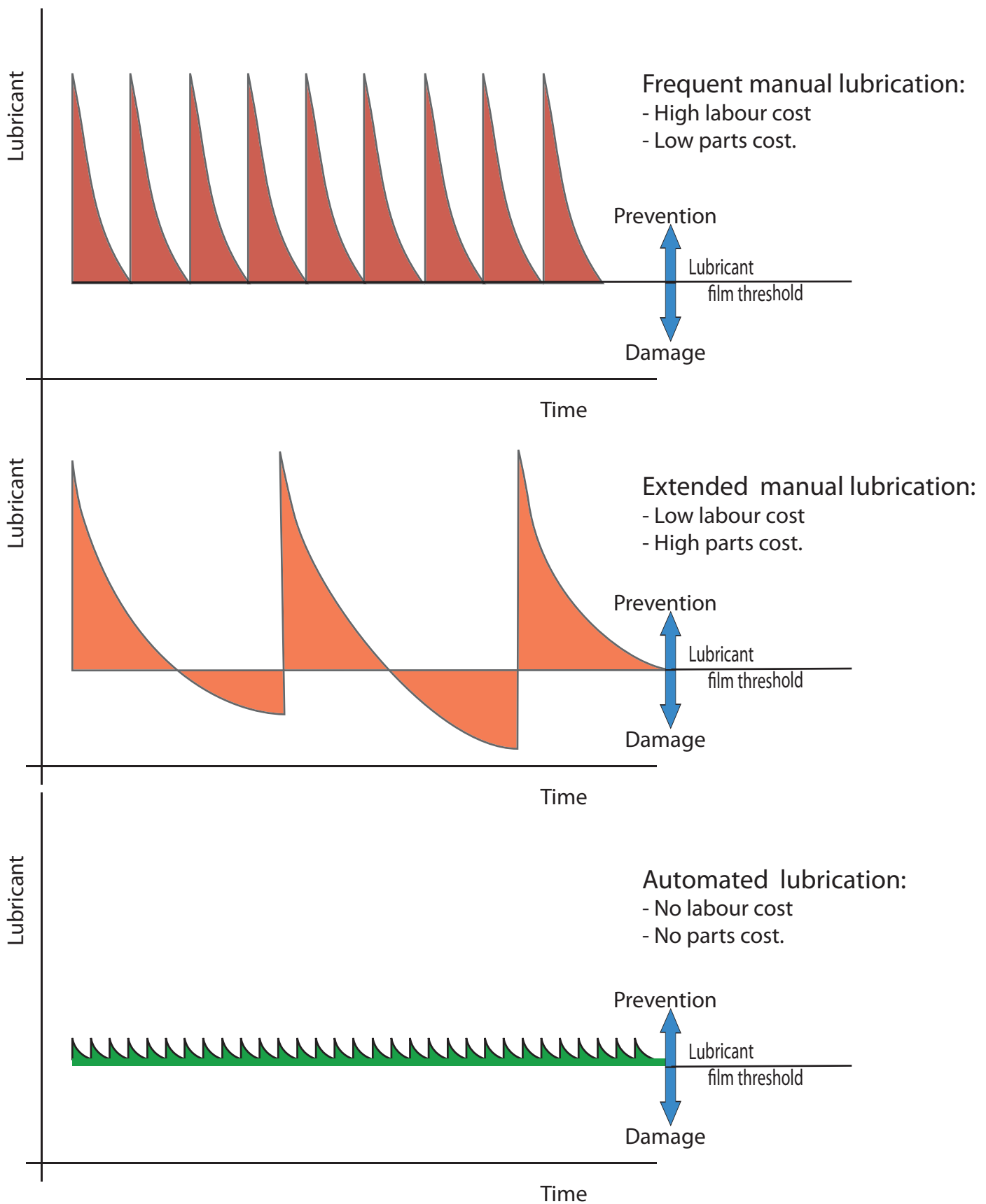


Illustration 5. Manual versus automatic lubrication, representation of concept.



## ***Benefits***

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

- A better distribution of the lubricant on the moving parts, than manual greasing.
- Higher frequency of lubricant application with nominal quantities of lubricant to sustain the lubrication film when the equipment is in operation. Thus preventing metal to metal contact and wear without operator interference and reducing waste grease.
- Reduced need for lubricants that are manufactured with expensive additives that prevent wear during small periods of metal to metal contact.
- Reduced downtime; less time required to perform service and the potential to increase service intervals as the application of lubricant is performed during operation of the equipment.



# General operation of a parallel ALS

The Lubecore™ Automated Lubrication System (ALS) can be equipped with several options and a variety of pump styles. This section describes the general operation of a standard electrically operated lubrication pump with standard components. For details regarding the operation of our other pumps and components, please refer to the appropriate Lubecore™ manual or contact Lubecore™ directly. A Lubecore™ parallel single line 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 gear pump
- ② Electronic timer
- ③ Manifold
- ④ Injector assemblies
- ⑤ Primary and
- ⑥ Secondary tubing with Fittings

A Lubecore™ parallel single line 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 will be selected.

The automated lubrication system is designed to function as follows:

While the equipment is in operation, the ignition switch provides the electric timer ② with battery power to perform its program. The timer's internal memory retains the last status prior to shut down; at start-up, the program resumes and counts down the time that remains of the predetermined interval.

After reaching the end of the interval, the timer engages an electric motor located on the top of the lubrication pump ①. The electric motor drives a gear pump, which is submerged in the lubricant reservoir. The gear pump, pumps grease, under pressure, into the mainline tubing that connects the pump to either one or more manifolds, which are located at centralized point(-s) on the equipment.

The moment maximum pressure is reached in the mainline tubing, injectors ④ mounted on the manifold(-s) ③ begin to measure and disperse a predetermined and consistent amount of lubricant through the secondary tubing ⑥ and fittings and into the lubrication points.

Once 40 Bar/600 psi is reached, the pressure switch closes and makes a connection to ground. This indicates to the timer that the system operating pressure has been achieved. The pressure switch then signals to the ALS that the lubrication cycle has been completed successfully.

At the completion of the lubrication cycle, the electric motor is stopped by the timer. Lubricant pressure from mainline (primary line) and excess lubricant is bled back into the reservoir over the pump gear element.

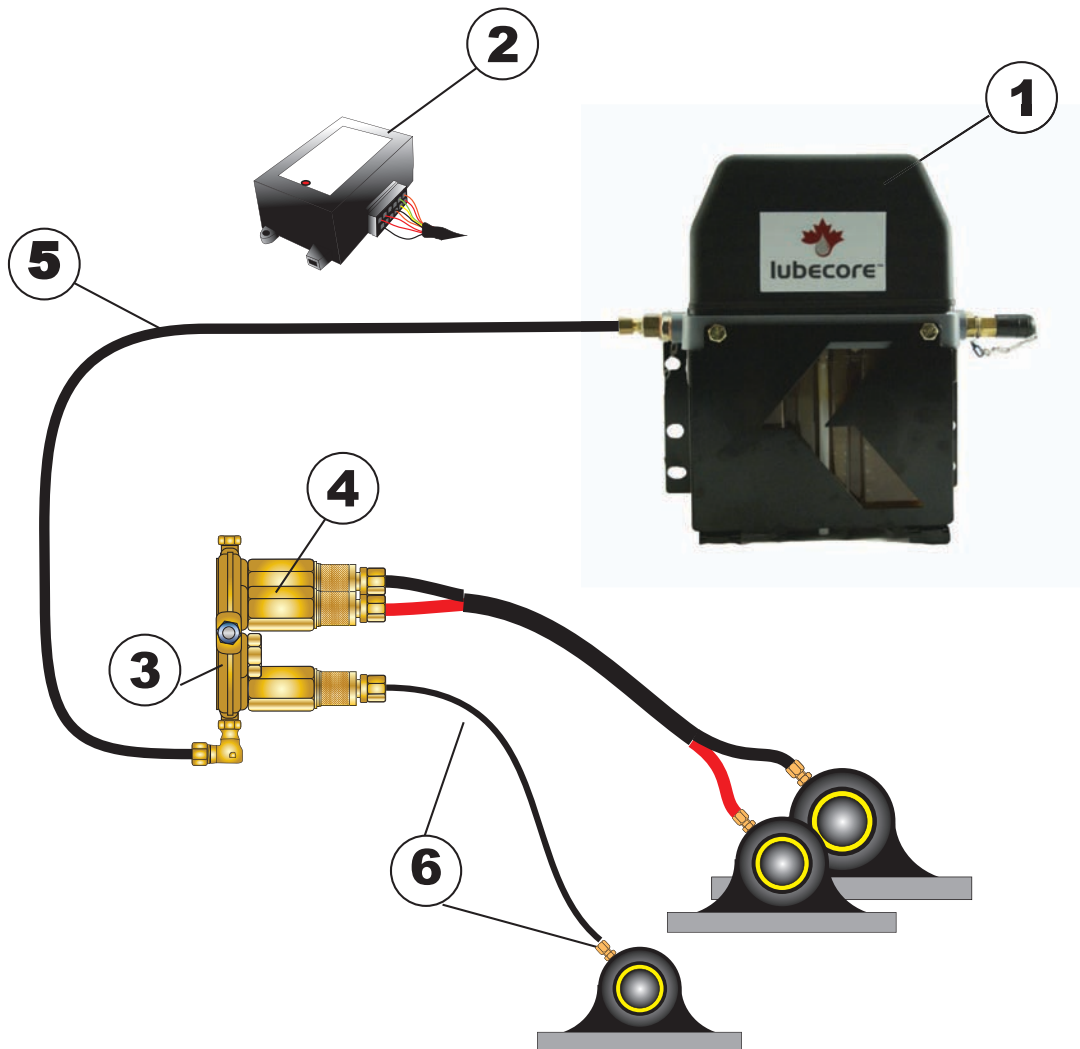


Illustration 6. **Simplified layout of a Lubecore™ automated lubrication system.**

Once all the grease pressure has been removed, the re-loading process within the injectors begins. Please refer to the Metering unit operation section for more information.

After the timer deactivates the motor, the system program sets the time interval back to the start of the pre-set value and initiates another countdown (as long as the timer is supplied with power).





# Electric gear pump

The Lubecore™ 10.320 and 10.400 model range versatile and compact electric gear pump, is excellently suited to automatically lubricate transport, industrial and construction equipment

The pump features:

- o The electric gear pump is supported and protected by a 13Ga steel mounting case and features a clear 2.7kg / 6 lbs capacity reservoir made from a high impact resistant plastic.
- o Optional pressure switch: Pump is equipped with a M10 threaded port for the installation of a pressure switch. Enhancing the compact design and eliminating long electrical harnesses.
- o Optional mounting of a timer under the cover; enhancing the compact design of the electric gear pump lubrication system even further and reducing the harness and connections to a minimum.
- o High capacity gear pump unit, capable of pumping up to 140 cc/min, expanding the use of the pump for larger sized systems or longer mainline applications. (Exceeding total of 80 lubrication points.) Integrated pressure relieve valve is set to 50 Bar / 750 psi which ensures extended life of the pump.
- o 2 outlets for lubricant, one per side, allow for a variety of equipment mounting situations including a split system
- o 2 filler ports are provided for replenishment of the gear pump from either side of the unit, simplifying the installation.



Illustration 7. Front view of electric gear pump with protective cover in place.



Illustration 8. Rear view of an electric gear pump showing the clear reservoir and gear set housing.

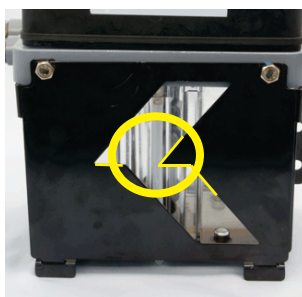


Illustration 10. Reservoir "half-way" marker



Illustration 9. Side view of an electric gear pump with a LCT optionally mounted timer.



# Pump Operation

The timer activates the gear pump, once it has reached its programmed settings.

The electric motor drives a shaft in the lubricant submerged gear pump. Lubricant now travels via a main internal gallery upward and through an internal pressure relief valve, which prevents the pump from exceeding 40bar/600psi. If the pump experiences excessive pressure during its lubrication cycle, the internal pressure relief valve opens and redirects the excessive lubricant back into the reservoir.

Lubricant now travels down the main lubricant supply gallery and leaves the pump through the delivery port(s). Once sufficient pressure has been reached and maintained within the system, determined by the pressure switch and timer programming, the pump de-activates the electric motor driving the gear pump, completing a lubrication cycle.

Now that the system has come off pressure, the excessive lubricant which is not needed travels back through the gear pump and into the reservoir, allowing for the injectors to reload and await the next lubrication cycle.



Illustration 11. Side view of pump electric motor. Main supply port can be seen in the lower left hand corner of the photo.



Illustration 12. Rear view of an electric motor with an optionally mounted LCT timer installed.

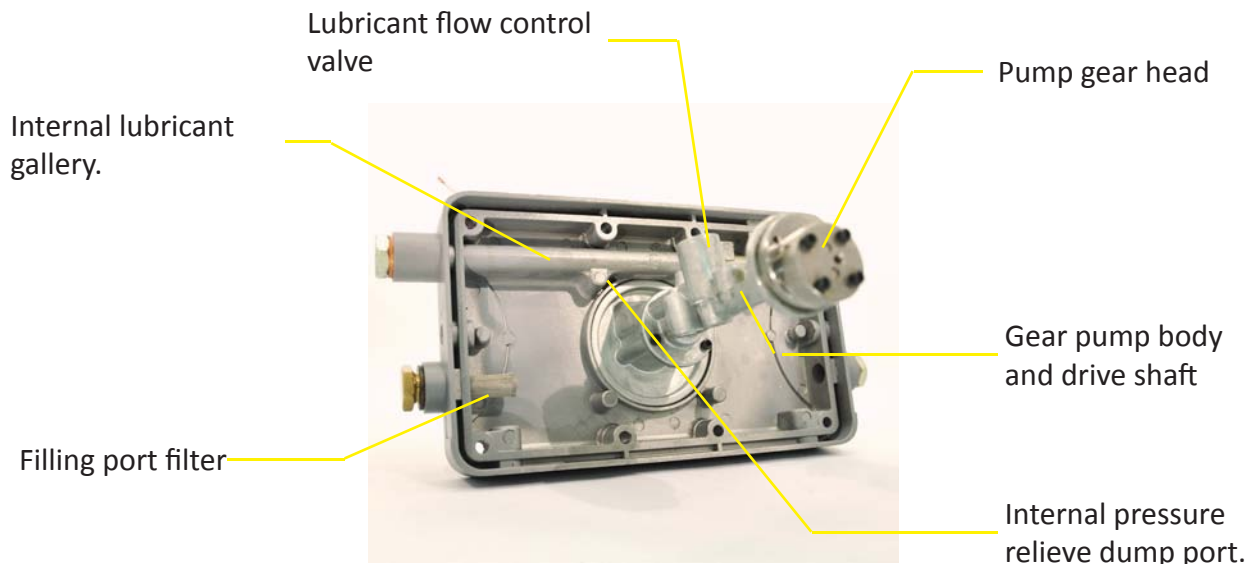


Illustration 13. Inside view of electric gear pump filter and main lubricant gallery.



# Timer operation

## **General operation of the Lubecore™ MK2 truck timer**

Following is a functional description of the Lubecore™ ALS MKII truck timer. This information pertains to model 12.016. For a description of the Lubecore™ ALS for trailer timer or others, please see the appropriate documentation.

The 10-30V MK2 truck timer has been designed to operate the full product line of the Lubecore™ parallel single line lubrication pneumatic and electric pump models. There is no need to modify or adapt the electrical schematic of the ALS when switching between a pneumatically operated or electrically operated pump.

Each automated lubrication system requires a timer to control the closed-loop operation. Depending on the model of pump connected (pneumatic or electric), the operation of the system may be slightly different, but the operation of the timer remain the same.

Upon turning ignition key, a programmed interval is counted down (“pause phase”). Each time the ignition is switched on or off, the MK2 truck timer stores the current status and resumes that status after the ignition is turned on again. After the pause phase is concluded, the timer engages either a solenoid or an electrically driven pump unit, starting the “working phase”.

When the system has been equipped with an optional in-dash test switch a green LED, will illuminate momentarily during working phase until the pressure switch is closed, 3 seconds, then go off. The working phase will last for a programmed period of time. After 66% of the working phase has been completed, the program checks for feedback from the pressure switch.

When sufficient pressure has been reached within the ALS and the pressure switch is closed, the timer reads the signal that pressure is fine within the system. If there isn't enough pressure present to close the pressure switch, it stays open and after 66% of the cycle has been completed the timer reads no signal from the pressure switch because it has not completed the circuit. The timer now sends out a warning, informing the operator that there is a low pressure situation. If the switch does not close, an audible and visual alarm is activated for the remainder of the working phase. The alarms will continue through subsequent lubrication cycles until the problem has been corrected.

The timer is equipped with a real time clock. This clock, synchronized during programming with a computer, registers all completed cycles, total running time, errors and more. See the timer report section for more details. All errors are recorded with a date and time stamp from when they occurred and when they are resolved.



Illustration 14. Lubecore™ 10-30V-DC digital MKII timer with RTC.



## ***Performing a test cycle***

A single manual “test cycle” can be performed on the timer without connecting to a computer. There are two ways to initiate a test cycle.

- 1). The truck timer has been equipped with a red test cycle switch in the timer cover.
- 2). An in cab manual test switch with light, can be installed in the dashboard.

## ***Accelerated test cycles***

Depressing the red test button on the timer or press the dash mounted switch for a duration of 10 seconds initiates a continuous “accelerated” test cycle.

The timer will engage the electric motor for 10 seconds (working time) and subsequently dis-engage the motor for 10 seconds. This accelerated cycle of 10s on and 10s off, will be repeated until the ignition is turned off.

## ***Red test button***

To prevent accidental operation of the ALS, the red button has been set flush with the cover.

To engage a test cycle:

- 1). Set ignition to auxiliary position.
- 2). Using a small instrument (pencil), press the red test button located in the timer cover.

The timer will perform a single lubrication cycle as programmed.



Illustration 15. Location and method to push test button on timer.

## ***In cab manual test switch with operator communication light***

To engage a test cycle with the external switch:

- 1). Set ignition to auxiliary position.
- 2). Press the external test switch. While depressed, the LED will illuminate, communicating to the operator that a test cycle has been initiated.

The timer will perform a single lubrication cycle as programmed.



Illustration 16. In cab manual test switch (50.453).



## Communication light and audible signals

The following is an overview of possible visual and audible warning signals. Depending on installed system features, the low level indication by the timer and light may or may not occur. Refer to the installed features to check if a low level switch or pressure switch are present in the system.

The in cab manual test switch, when installed, is normally located on the dashboard. A label surrounding the switch indicates the relationship to the Lubecore™ automated lubrication system.



Light illuminates for 3 seconds when ignition is turned on. Indicates a self check –**SYSTEM OK.**



**3 Sec.**

### Pressure alarm



At the beginning of each lubrication cycle the light will come on, indicating a lubrication cycle is in progress. Once sufficient system pressure has been detected by the pressure switch, the light will go out:



When a pressure failure has been detected, an audible alarm will sound, the light will flash in same frequency as the audible alarm. This alarm will be activated for the last 33% or 1 minute of the lubrication cycle.

At earliest opportunity inspect the automated lubrication system for leaks, air pockets or consult trouble shooting guide for further assistance.



# MK2 Timer memory report

The MK2 truck timer is equipped with a real time clock (RTC), which enables more accurate record keeping. With the use of a pressure switch the following is stored in the memory in each timer:

- Date of installation This is automatically stored in system memory once the timer is activated for longer than 30 minutes..
- Total running time: hours from first date of installation
- Total number of completed lubrication cycles.
- Real time clock synchronization will be recorded when performed.
- Timer serial number: a unique number pre-programmed and not erasable.
- Last Connected ID: Serial number of the last dongle connected to the timer
- Last Connected Time: date and time of last dongle connected to the timer

With the use of the CLS dongle the operator can push the report button in the reports tab in the software program and produce a report which is displayed on screen. In the report you can identify, add customer information. For example fleet or VIN number and select the save button for future retrieval.

The errors as recorded for low pressure (in reports identified as no-pressure) are stored additionally with a date and time stamp from the real time clock. This will allow for more accurate performance review of the automated lubrication system.

When after an alarm notification the error is corrected, for example a mainline break is repaired the active alarm is removed and a date and time stamp stored as end of error detection. This is stored in the timer and presented in the report as an error-block, indicating the duration of the error.

\* The 12.015 LCT timer does not have a real time clock and no reporting features.

No.	Start	End	Event	Count
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Illustration 17. Screen shot of the timer performance report.



## Programming the timer

The timer can be programmed using a CLS Dongle Timer Interface Unit and a computer with USB capability. For a more in-depth explanation on how to use the Dongle, please see the Timer Programming manual..

Using the CLS Dongle Timer Interface Unit, the timer can both be programmed and reviewed for lubrication system performance. The primary goal of programming the timer is to set the values for the “pause” and “working” phases, as described in the General Operation section.

To program the timer:

- 1). Connect the timer to the Dongle Timer Interface Unit.
- 2). Ensure the timer has power by turning the ignition switch to the auxiliary position.
- 3). Start the timer programming software and plug in the USB-cable to the computer.
- 4). In the menu bar, select “open connection” from the drop-down menu.
- 5). In the report tab of the program, click “refresh” to display current timer values.
- 6). Go to tab 3, “Parameters”.
- 7). In the left screen under “pause time”, use the up and down arrows to set the desired values for hours and minutes.
- 8). In the left screen under “working time”, use the up and down arrows to set the desired value for minutes.
- 9). In the bottom of the left screen, click “set” to send and save the values to the timer. Go to the “report” tab, click “refresh”, and return to tab 3 to verify that the values are set correctly.
- 10). Turn off the ignition switch and computer, and remove the Dongle device.
- 11). Verify the functionality of the ALS system by performing a test cycle. Do this either by pressing the red test switch in the timer cover or by pressing the optionally installed dash mounted switch with the ignition in the auxiliary position.

The timer is now programmed and ready for use.

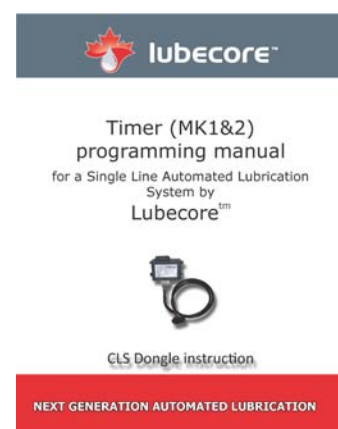


Illustration 18. MK1 & MK2 Timer programming manual



## Electrical connections

The Lubecore™ MK2 truck timer is a multi-functional timer that can be connected to all Lubecore™ lubrication systems. It can also be connected to various other systems that operate on the same principle. For this and other service purposes, we have included a standard electrical schematic below. For schematics related to the exchange of timers in other systems, please visit <http://www.lubecore.com> or contact Lubecore directly.

The MKII truck timer installation schematic below includes the low-level switch operation. For lubrication systems that do not have the low-level switch operation, a separate connection is required for input into the timer. To ensure proper timer operation without a low-level switch, connect a separate wire from pin location no. 7 to ground. This can also be done by combining it with the ground connection of pin no. 3.

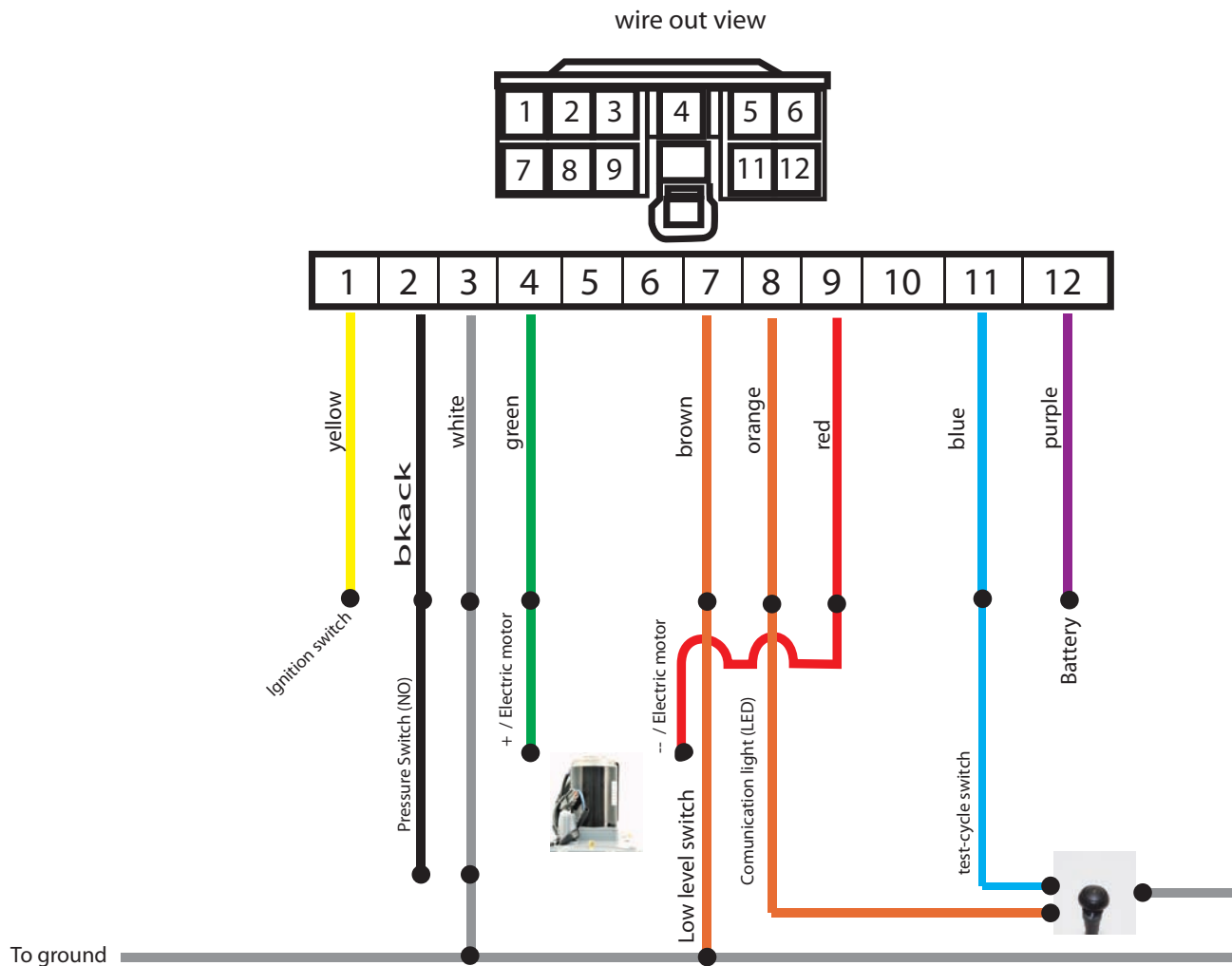


Illustration 19. Common electrical connection schematic for Lubecore™ MK2 truck timer.





Pin	Connection	
1	Ignition	Yellow
2	Pressure switch	Black
3	Ground	White
4	+ Solenoid/motor	Green
5	Interface	
6	Interface	
7	Low level Switch	Brown
8	+ Cab light	Orange
9	- Solenoid/motor	Red
10	-	
11	Test button / switch	Blue
12	Battery	Purple

Table 1. MK2 timer wiring connections.

### *Technical specifications*

Timer specification based on model (335.)12000		Remarks
Voltage range	10-30	Vdc
Audible Alarm	87	DbA
Output Current Max	50 / 600	Amp / Watt
Alarm light output Current Max	5 / 75	Amp / Watt

Table 2. MK2 timer specifications.



# Trouble shooting the timer

For certain sections in this trouble shooting overview for the MK2 truck timer, the following tools might be required: Multi meter / Test-light, Pressure gauge, 10cm / 5 inch long loop wire.

Defect description	Diagnosis / check item	Solution
Timer does not engage pump motor when test button is pressed.	Check for broken fuse.	Replace fuse if broken. Perform cycle test with timer to determine why fuse protected the electrical system.
	Check ground connection. Measure resistance with multi meter between pin 3, and again with pin 7 to ground location. (When ALS is <b>not</b> equipped with a low level switch, pin 7 must be connected directly to ground.)	<i>Measured resistance in range of 0-10Ω: Go to next step, connection OK. Measured resistance in range of 100-∞Ω: Connection interrupted or broken lead wire, repair connection.</i>
	Check pump motor connection. Remove pump motor connector. Start timer test cycle. Measure voltage over motor connector with voltmeter.	<i>Measured value is in range of 10-13V: pump motor defective, replace pump motor. No voltage measured: Broken lead in pump harness, replace pump harness.  If all tests fail, this may indicate a timer defect; replace the timer.</i>
Intermittent visual alarm from timer. (2 seconds on - 2 seconds off, no audible alarm)	<i>Refill reservoir. If reservoir is full: Remove connector from low-level switch. Check connectivity over the low-level switch with multi meter.</i>	<i>Measured resistance in range of 100-∞ Ω: Low-level switch is defective replace low level switch. Measured resistance in range of 0-10Ω: Check for broken wire lead in harness. Remove 12-pin connector from timer and insert wire loop between pin 7 and pin 3. Measure resistance at low-level connector to determine if there's a defect in the harness and repair.  Possible that plunger on low level switch is stuck or broken. Remove low level switch from pump and depress plunger. Plunger should return under its own spring pressure.  If all tests fail, this may indicate a timer defect; replace the timer.</i>
Visual and audible alarms from timer have activated. (Alarm light and buzzer are uniform in frequency)	Pressure failure. Insert pressure gauge in front location of the pump. Remove pressure switch connector. Start timer test cycle. If pressure in gauge is less then 10-20 bar: Pressure problem is not in the electrical system. Proceed with general troubleshooting. If pressure gauge indicates more then 40 bar: Measure the resistance over the two pins of the pressure switch during the test cycle.	<i>Measured resistance in range of 100- ∞Ω: Defective pressure switch replace pressure switch. Measured resistance in range of 0-10Ω: Check for broken wire lead in harness. Remove 12-pin connector from timer and insert wire loop between pin 2 and pin 3. Measure resistance at pressure switch connector to determine if there's a defect in the harness and repair.  If all test fail, this may indicate a timer defect; replace the timer.</i>

Table 3. Trouble shooting chart parallel electrical gear ALS.



## Pressure switch

A Lubecore™ parallel single line lubrication system can be equipped with a pressure switch of 25 Bar / 350 Psi. The pressure switch can either be located in the pump or in one of the manifolds in the lubrication system.

The pressure switch provides feedback to the timer by closing a ground connection, thus confirming to the timer a lubrication cycle has been correctly completed.

In case of insufficient mainline pressure the connection to the timer remains open.. After 2/3 of the pumping time has passed (66%), the operator is informed by an audible alarm from the timer. Or when installed, a visual alarm from a green flashing LED on the dashboard. This alarm lasts for the remaining 33% of the programmed lubrication cycle interval (working phase). The alarms will last until the low pressure issue has been resolved.

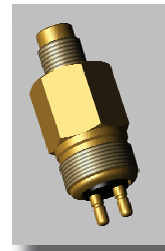


Illustration 20. 40 bar pressure switch for pump mount.



Illustration 21. 40 bar pressure switch for manifold assembly.



# LCT timer operation

## General operation of the Lubecore™ LCT (low cost) timer

Lubecore™ recognized that in today’s market price is a major concern. In the world of automated lubrication systems, this means that some customers may choose to sacrifice enhanced features such as low level and pressure alarms to reduce the cost of their systems.

To meet this market need, Lubecore™ has developed the LCT Timer (low cost timer) Part # 12.015

Each automated lubrication system requires a timer to control a pump. Upon ignition, a set interval is counted down (“pause-phase”). This interval is set by moving jumper pegs located on the circuit board.

The LCT timer does not retain any memory. Once the battery connection with the timer is interrupted the memory is lost. Once reconnected, the timer resumes by counting down a complete .

After the pause phase is concluded, the timer engages either a solenoid or electric motor starting the “working phase”. Same as for the pause-phase, the working-phase is set on the timer-board using jumper pegs. At the completion of the working-phase a new pause-phase is started. This cycle continues as long as there is ignition power.



Illustration 25. Lubecore™ 10-30VDC LCT timer model 12.015.

## Programming the LCT-timer

The LCT timer working and pause times are set by adjusting the jumpers on the circuit board. There is 1 bank with 5 selections for pause time and 1 bank with 3 selections for working time.

Bank 1 options: 37.5, 75, 150, 300 or 600 minutes

Bank 2 options; 45, 90 or 180 seconds

A diagram is located on the reverse side of the LCT timer. Which shows the setting options factory default settings and wiring connections.

Illustration 26. Jumper peg wiring chart located on the bottom of the LCT timer.



Illustration 27. Jumper-peg locations for timer pause and working phase adjustments.



# Performing a test cycle

A single manual “test cycle” can be performed with the timer

The LCT timer has been equipped with a red test cycle switch in the timer cover.

An accelerated test cycle is not available.

## Red test button

To prevent accidental operation of the ALS, the red button has been set flush with the cover.

To engage a test cycle:

- 1). Set ignition to auxiliary position.
- 2). Using a small instrument (pencil), press the red test button located in the timer cover.

The timer will perform a single lubrication cycle as programmed.



Illustration 28. Location and method to push test button on timer.

## Technical specifications

Timer specification based on model (335.)12000		Remarks
Voltage range	10-30	Vdc
Audible Alarm	N.A.	DbA
Output Current Max	40 / 500	Amp / Watt
Alarm light output Current Max	N.A.	Amp / Watt

Table 3. LCT timer technical specifications.



## Electrical connections

The Lubecore LCT timer can be connected to all pneumatic (parallel and progressive) and electric pumps (parallel) lubrication systems. For this and other service purposes, we have included a standard electrical schematic below. For schematics related to the exchange of timers in other systems, please visit [www.lubecore.com](http://www.lubecore.com) or contact Lubecore directly.

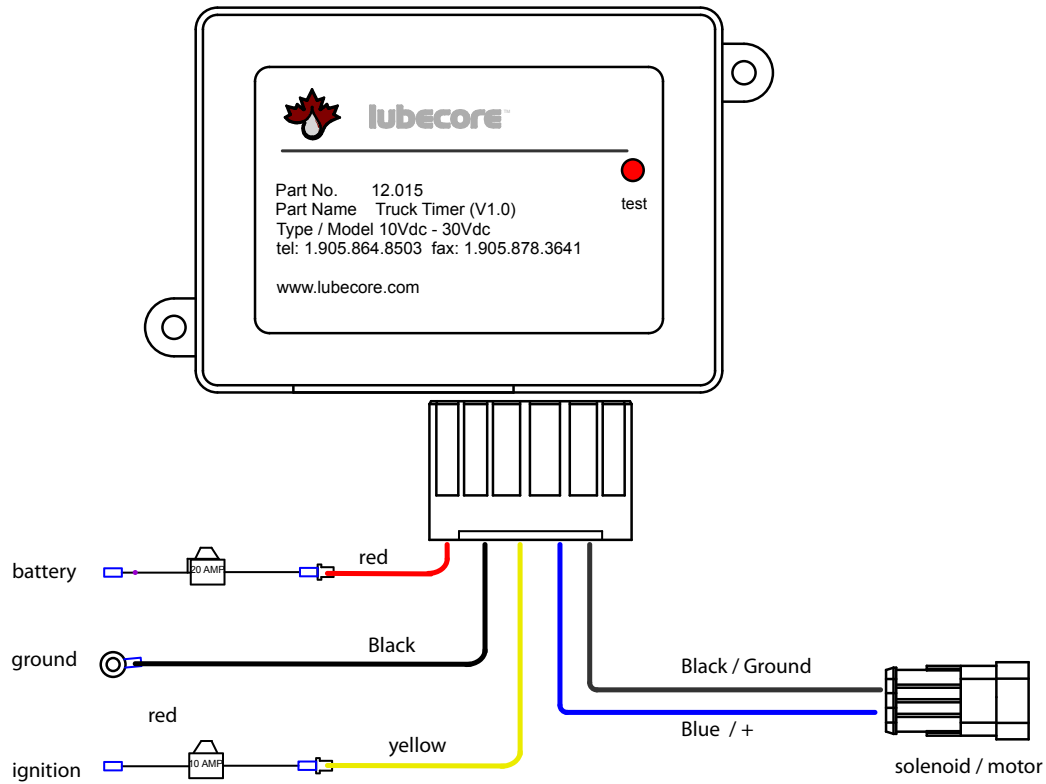


Illustration 29. Common electrical connection schematic for Lubecore LCT timer.

Pin	Connection	Wire color coding
1	Battery	Red
2	Ground	Black
3	Ignition	Yellow
4	+ Solenoid / motor	Blue
5	- Solenoid / motor	Black

**Table 4. LCT timer pin allocations.**



# Metering unit process

A metering unit (injector) is the core component and forms the basis of the principle on which the operation of the automated lubrication system is based. Lubecore™ single line automated lubrication system injectors operate parallel to each other: all injectors disperse lubricant simultaneously.

The injector meters and disperses the appropriate amount of lubricant to the connected lubrication point. In the Lubecore automated single line system, this occurs under full pump pressure.

Lubecore has designed corrosion-resistant brass metering units, available in 7 different output sizes. Lubecore single line lubrication system injectors use only one piston and one spring to accurately measure the lubricant, creating a highly reliable trouble free metering unit that is virtually indestructible.

In an automated lubrication system, metering units are installed on manifolds that are strategically placed on the equipment's chassis, and can reach 100 injectors.

## The injection process:

The below description assumes that the metering unit is being operated for the first time and is not filled with lubricant.

- 1). Lubricant, being forced under pressure by the pump, enters the metering unit from the bottom through opening A.
- 2). Passing by on the outside of a double acting seal B, lubricant continues to flow through the outer openings of the inner metering unit, cylinder C, pushing against piston D.
- 3). The piston is held in place by spring E. Until enough pressure is provided to overcome the spring tension, the piston will move upward until it reaches end-point F.
- 4). The volume of displacement by piston D is the measure of lubricant that the metering unit will provide to the lubrication point.
- 5). Once the piston has reached its top most point against the spring pressure, it remains there until the lubricant pressure is removed.

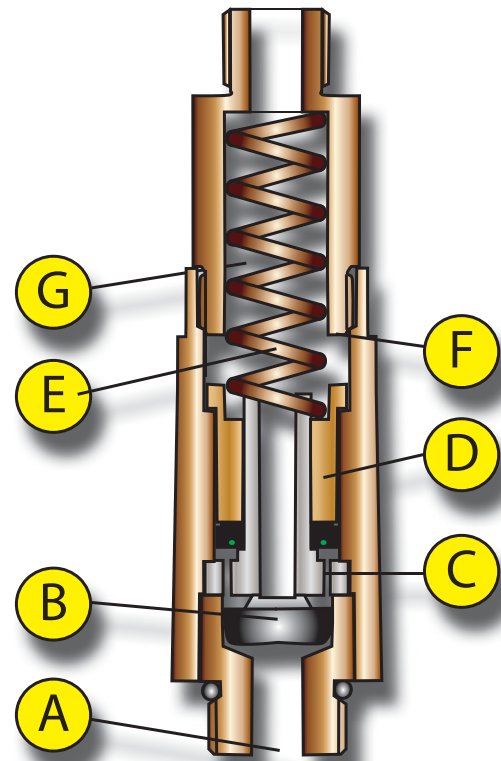


Illustration 49. Cross sectional representation of a standard Lubecore single line principle metering unit

After removal of lubricant pressure:

- 1). The loaded spring tension pushes the piston back down. Seal B then blocks the route back to the main channel and opens a grease channel in the center of the metering unit, cylinder C. The measured amount of lubricant is now moved to chamber G.

**NOTE: Depending on the metering unit size, previous steps are repeated several times until the metering unit is clear of air pockets. These steps are already performed at the factory. The metering unit is delivered completely filled with lubricant, ready for use.**

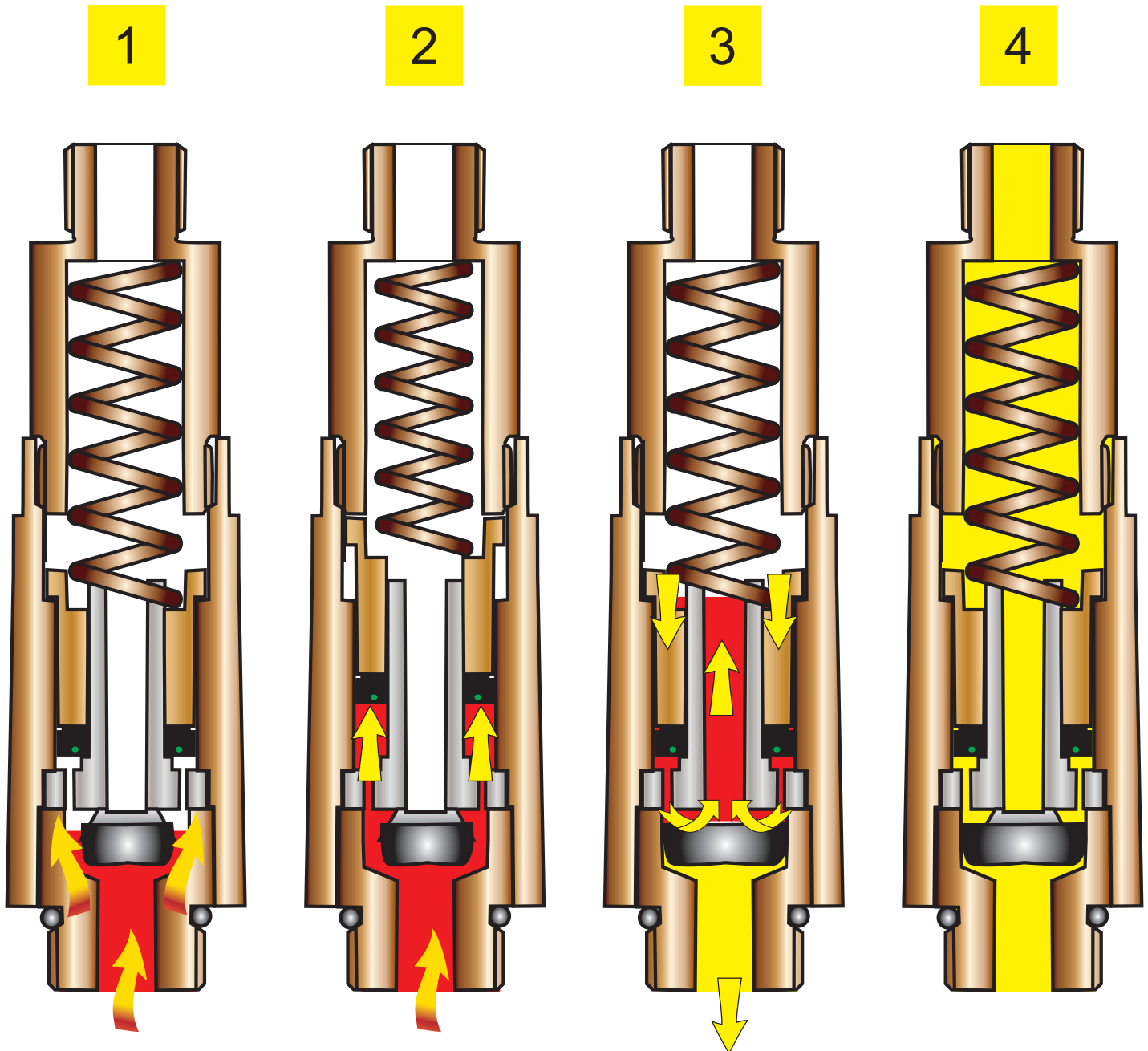


Illustration 50. Step by step overview of the metering unit operation (bleeding).





The metering unit has now returned to its original position. As pressure increases, lubricant flows past the outside of seal B and pushes piston D upward against the spring tension E. Simultaneously, the displaced volume of lubricant above piston D is pushed through channel G to the lubrication point. ***Piston D is lubricating the connected grease point, using full pump pressure, while it is measuring the lubricant for the next cycle.***

Once the pressure is removed, piston D returns to its starting point under tension of spring E. The measured amount of lubricant is then positioned into the center of the metering unit cylinder for the next cycle.

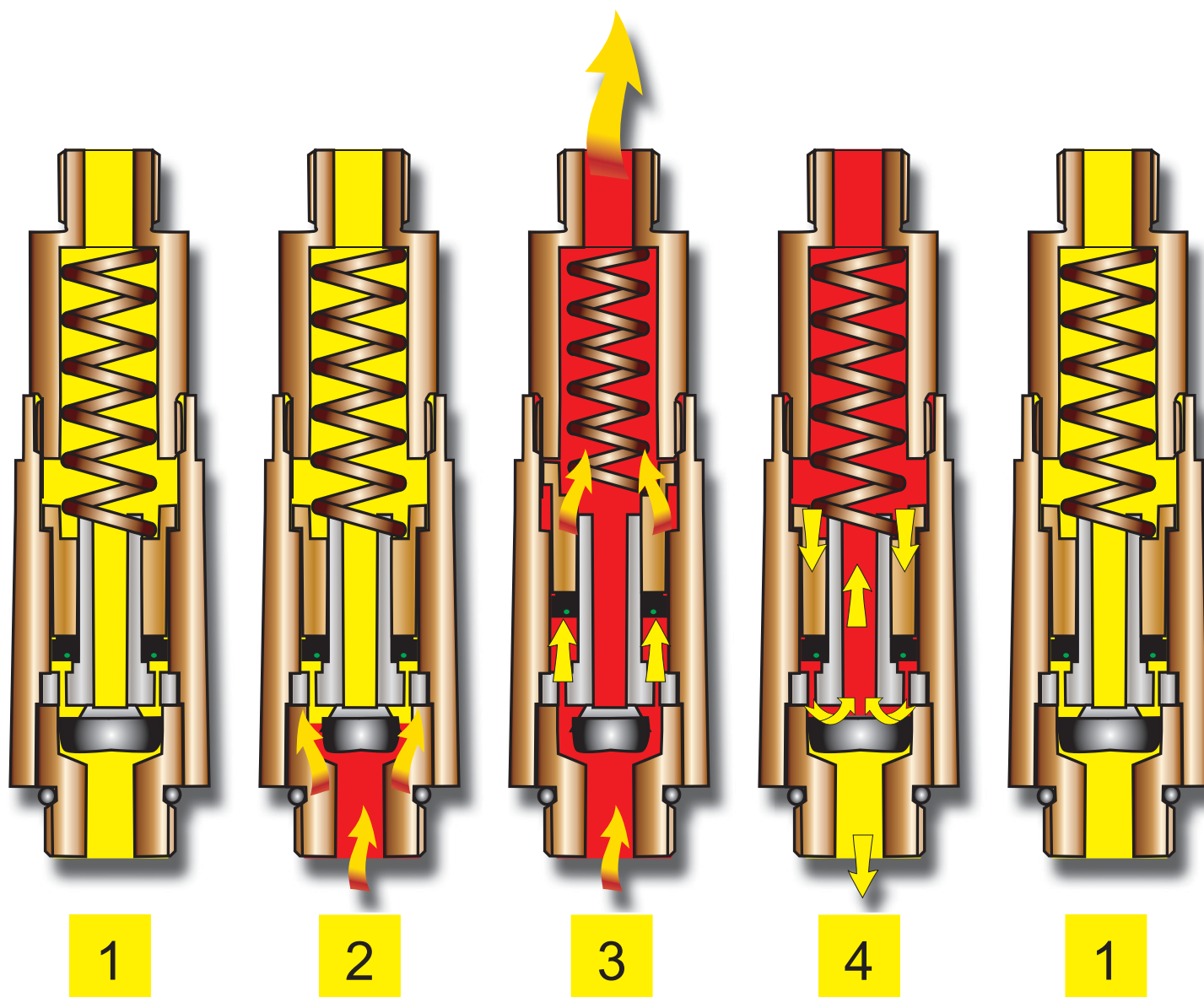


Illustration 51. Step by step overview of the metering unit operation, lubricating a grease point.



### **Metering unit sizes**

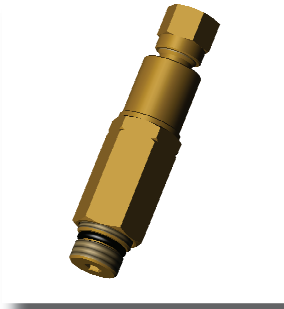


Illustration 52. Standard brass single line principle metering unit.

Metering units are available in 7 different sizes, with varying levels of output.

By selecting the appropriate metering unit size, you ensure that each lubrication point is receiving the optimum amount of grease per lubrication cycle.

By using metering units that vary in output size, an automated lubrication system that contains points with a varying degree of lubricant requirements can all be connected within 1 system.

With the exception of the compression sleeve and nut, metering unit components are not interchangeable (i.e. it is not possible to adjust the metering unit output by exchanging components).

The different metering unit sizes can be identified by the following characteristics:

- Overall length (height) of the metering unit. The longer the metering unit, the greater the output.
- Total number of notches in the body of the injector.
- A part number is printed on the body.



Illustration 53. Available metering unit sizes, smallest to largest. Spacer O-rings have been highlighted.



Description	Part number	Output size [cc/stroke]	Identification
Metering unit no. 0.	11.100	0.025	Notches or grooves in body must be uniform.
Metering unit no. 1	11.101	0.05	No notches, no grooves.
Metering unit no. 2.	11.102	0.10	1 groove.
Metering unit no. 3.	11.103	0.15	2 grooves.
Metering unit no. 4.	11.104	0.20	1 thick groove.
Metering unit no. 8.	11.108	0.40	2 thick groove.
Metering unit no. 9.	11.109	1.00	Overall length.

### ***Manifold blocks***

Metering units are centrally located near a cluster of lubrication points and are connected to the system by manifolds. Manifolds are manufactured out of corrosion resistant brass and mounted by using a 8.8 class stainless steel stud, internal locking star washer and nut. Manifolds currently available are: 4, 7, 8, 9 and 14 ports.



Illustration 54. Front view of 9-port brass single line manifold with M10 stud mount.



# Problem prevention

The Lubecore™ parallel automated lubrication system was designed to be the best lubrication system on the market today. Our team of engineers are continually working to improve the system to ensure that the Lubecore™ ALS remains the best system available.

To extend the life of your Lubecore™ ALS and to prevent any potential service issues, please review the following:

## ***Air Pockets***

Air pockets can be introduced into the system by: a) filling the reservoir without bleeding the filler hose, or b) continued use of the lubrication system after the reservoir has reached minimum grease level. An air pocket in the lubrication system does not cause direct harm to the lubrication equipment, but it does prevent the system from functioning correctly. The equipment components can be damaged if the appropriate amount of lubrication is not delivered.



# Removing air-pockets from the ALS

As described in the Problem Prevention section, air pockets may disable the lubrication system and cause serious damage to equipment components. To prevent damage to your system, Lubecore™ strongly recommends to ensure the reservoir is always filled up with fresh clean grease of the right specification for the system.

When air pockets are introduced into the ALS accidentally, it is crucial that they are removed as soon as possible.

Follow the steps below to purge the automated lubrication system of any air pockets.

Recommended tool: 100 bar / 1500 psi pressure gauge with ¼" NPT stem.

- Step 1). Review the total layout of the ALS. Follow the mainline (8mm diameter nylon line or hydraulic hose) from the pump and locate the manifold positions on the equipment. Please contact Lubecore™ if you need assistance locating the manifolds.
- Step 2). Locate the ALS timer and ensure access to the red test button on the front cover.
- Step 3). Remove the plug located on the opposite side of where the mainline is connected to the pump and install pressure gauge.
- Step 4). Remove end cap / plug from the manifold and collect all escaping lubricant to prevent spillage.
- Step 5). Turn ignition key to "auxiliary" position.
- Step 6). Press red test button to initiate a test cycle; during pump cycle, check the open manifold port to ensure that lubricant is flowing. Repeat step 4 until all air pockets are removed.

Repeat steps 4, 5, and 6 for each of the end manifolds present in the ALS. End manifolds are the last manifolds connected to the mainline.

- Step 7). Once all the air has been purged from the automated lubrication system reinstall and tighten the manifold end caps.
- Step 8). After all mainline sections have been bled, initiate a final test cycle to ensure that the appropriate pressure is reached. The pressure should rise to a minimum of 1000 Psi rapidly and then return to 0 Psi after the timer disengages the pump. Finally, remove the pressure gauge and re-install the plug.

If pressure is not reached:

- Repeat bleeding procedure
- Review Error Recovery section
- Contact Lubecore for assistance

**NOTE: As an alternative to using the red test button, you may also use the in-cab light switch. Please refer back to the Timer Operation section for more information.**



# Lubricants / Grease

Lubecore™ has with years of experience and in conjunction with the leaders in the petroleum industry, developed a superior lubricant, specifically designed for use in the transport, off-road sector to provide superior protection with the Steadylube™ line. Besides providing excellent and superior protection under a wide range of climatic conditions, it also is “the” lubricant for use in Automated Lubrication Systems of the NLGI-0 class.

Lubecore™ is so confident of Steadylube's™ performance, that if you decide to use Steadylube™ EP0 lubricant in the Lubecore™ Automated Lubrication System, Lubecore extends the warranty. (For details see Chapter Lubecore Limited Warranty on page 35.)



## **Features of Steadylube™ EP-0**

- Stable and pumpable to -25° C / -13 °F
- Excellent EP protection
- Contains heavy base oils
- Corrosion protection
- Environmentally friendly (does not contain heavy metals)
- Dependable delivery of grease
- Prevents System clogging
- Exceeds original equipment manufacturer's specifications

## **Lubricant selection**

The use of appropriate grease is not only important for the vehicle, machine or other equipment, but also for the correct operation of the Automated Lubrication System. Lubecore recommends the use of the specifically designed Steadylube-line of lubricants. However, it's not mandatory and other lubricants are allowed to be used in the Automated Lubrication System, as long as they meet the following criteria:

- They be of the appropriate class of NLGI-grade as specified for the Automated lubrication system. In Case of the single Line pneumatic system, this is the NLGI-0 grade. For lower ambient temperatures it is allowed to switch to a NLGI-00 grade or use Steadylube EP0 - Low Temp.
- The following additives are to be avoided: Graphite and Teflon. Up to and including a percentage of 3% of Molybdenum is allowed.
- When in doubt; please contact Lubecore™ or your lubricant supplier.



### **Steadylube™ EP0 specification**

Testing standard	Description	Specifications	
		Steadylube EP-0	Steadylube EP-0 low-temp
	NLGI_grade	0	0
ASTM D 217	Cone Penetration 77°F, worked 60 strokes	355-385	355-388
ASTM D 128	Thickener type	Lithium 12 Hydroxy	Lithium 12 Hydroxy
ASTM D 128	Thickener content, %	3-6	4-6
ASTM D 2265	Dropping point, °F	370	360
ASTM D 445	Base Oil Viscosity: CST @ 40°C CAT @ 100°C	180-210 18	55-65 -
ASTM D 2270	Viscosity Index	85	95
VISUAL	Colour	Medium Amber	Amber
VISUAL	Appearance	Smooth	Smooth
ASTM D 2509	Timken OK Load LBS.	40	40
ASTM D 2296	Four Ball Weld Point [KG]	250	250
ASTM D 2266	Four Ball Wear	0.5	-
ASTM D 4048	Rust Prevention	Pass	-
ASTM D 1743	Copper Corrosion	18	-

**Table 6. Steady-lube EP0 specification.**

For a copy of the Material Safety Data Sheet (MSDS) please visit [www.lubecore.com](http://www.lubecore.com) or call 1-905-864-3110.



# Filling of the reservoir

During a system inspection, if it is apparent that the pump's reservoir needs to be replenished, use the appropriate NGLI/EP-0 lubricant.

For refilling the reservoir, please 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 located on the pump.

**Step 2:** Clean the male filler coupler 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 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 overflow shows fresh grease being purged from the reservoir. Foreign material that has been allowed into a ALS system due to improper filling procedures or grease type are not covered by manufacture warranty.

During filling of the reservoir or immediately after the maximum level has been reached, some lubricant may be expelled from the pump vent opening on the front of the pump. Air possibly trapped in the reservoir and excess lubricant shall come out from the vent tube.



Illustration 33. Reservoir level minimum level.

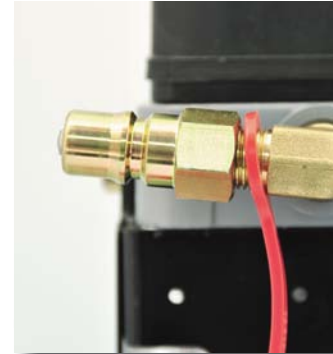


Illustration 34. Step 1, remove dust cap and clean coupler.



Illustration 35. Circulate grease to remove air pockets.



Illustration 36. Fill the reservoir until maximum level.



Illustration 37. Overflow tube in front center of the pump.

**WARNING:** (Excess) back pressure may crack or otherwise damage reservoir **when filling the reservoir too fast!** Allow air and or grease to vent through the vent tube during filling.







Note: the lubrication pump is equipped with an internal filter. When filling of the reservoir is difficult, inspect the filter, clean or replace when necessary. See illustration 41 for more details.

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

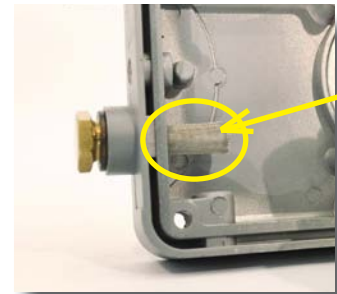


Illustration 38. Grease filter inside pump.



Illustration 39. Place dust cap back on the male filler coupler.



Illustration 40. Return female coupler to the male coupler on the lid.



Illustration 41. Reservoir "half-way" marker



# Technical specifications

## Electric gear pump

Part number	10.320	10.400
Reservoir capacity	2.7 Kg / 6 Lbs	2.7 Kg / 6 Lbs
Voltage (DC)	12	24
Current consumption at T = 20C	15 Amp	7.5 Amp
Max grease pressure at ambient T = 20C	55 Bar / 800 Psi	55 Bar / 800 Psi
Pump grease output	140 cc/min	140 cc/min
Operating temperature range	-25 C / 80 C   -13 F / +160 F	-25 C / 80 C   -13 F / +160 F
Lubricant grade*:	NLGI-0	NLGI-0
* Note: lubricant grade application may vary in certain markets. Please contact your authorized Lubecore™ representative for more information.		
Pump weight with grease / without grease	5.5 / 8.2Kg	5.5 / 8.7 Kg
Follower plate:	Not available	
Pressure switch	Optional	
Pressure switch rating	40 bar / 600 Psi	
Low level switch	Optional	
Filler coupling size:	1/4"	

Table 7. Overview of the electric gear pump technical specifications.



## Lubecore™ limited warranty

Lubecore™ warrants the product manufactured and supplied by Lubecore™ and authorized distributors to be free from defects in material and workmanship for a term as defined in enclosed table, following the date of purchase, excluding there from 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™'s sole discretion, without charge. This warranty is conditioned upon the determination of Lubecore™ or authorized representative that the product is defective. To obtain repair or replacement, you must ship the product, transportation charges prepaid and non-refundable, with proof of purchase to Lubecore™ or authorized representative within the warranty period. For a complete list of Lubecore™ and authorized representative locations call 1-905-864-3110 or visit <http://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 and in place of any other warranties, express 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.

Lubecore™ has specially designed Steadylube Grease to provide optimal performance in the Lubecore™ Automated Lubrication System (ALS). Lubecore™ Steadylube Grease ensures trouble-free operation of the Lubecore™ ALS even in extreme climate applications.

Lubecore™ stands behind the capabilities of the Steadylube and will extend the Lubecore™ ALS regular warranty. If Steadylube is used exclusively in the Lubecore™ ALS, the regular warranty will be extended to the terms as listed in the table 1.

Both regular and extended warranties apply to injectors, manifolds, electronics (including wiring harnesses) pumps and or combinations thereof.



Product name	Limited product warranty	Limited Steady-Lube extended warranty
Parallel pneumatic* EPO	1- year	6 -years
Parallel Electric* EPO		3 years
Parallel High Pressure Electric* / SLD		-
Series Progressive Electric*		-
Series Progressive Pneumatic*		-
Multiline (Electric*)		-

Table 7. Limited warranty terms / period.  
\* Defines the method of pump operation.

Warranty terms apply to automated lubrication systems installed on standard equipment and environmental conditions. In case deviated from the standard application, inquire with Lubecore™ or authorized representative for a warranty statement specific to your application.

## Steadylube Grease

Lubecore™ has specially designed Steadylube Grease to provide optimal performance in the Lubecore™ Automated Lubrication System (ALS). Lubecore Steadylube Grease ensures trouble-free operation of the Lubecore™ ALS even in extreme climate applications.

### What it means to YOU:

Steadylube has a number of advantages over regular greases that will save time and money for an operator of the Lubecore™ ALS.

**Steadylube:**

- Exceeds equipment manufacturer`s specifications.
- Protects against corrosion.
- Withstands extreme pressure.
- Environmentally sound.
- Guarantees performance.
- Prevents ALS clogging.
- Increases pump life.
- Superior water resistance.
- Includes heavy base oil.
- Pumpable and regular consistency.

Lubecore™ stands behind the capabilities of the Steadylube and will extend the Lubecore™ ALS regular warranty. If Steadylube is used exclusively in the Lubecore ALS, the regular warranty can be extended:

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.



# lubecore™

Head-office:  
Lubecore International, Inc.  
7065 Twiss road  
Campbellville, Ontario  
Canada LOP-1B0  
Web site: <http://www.lubecore.com>

Distributor:

<http://www.Lubecore.com>



**Next Generation Automated Lubrication**