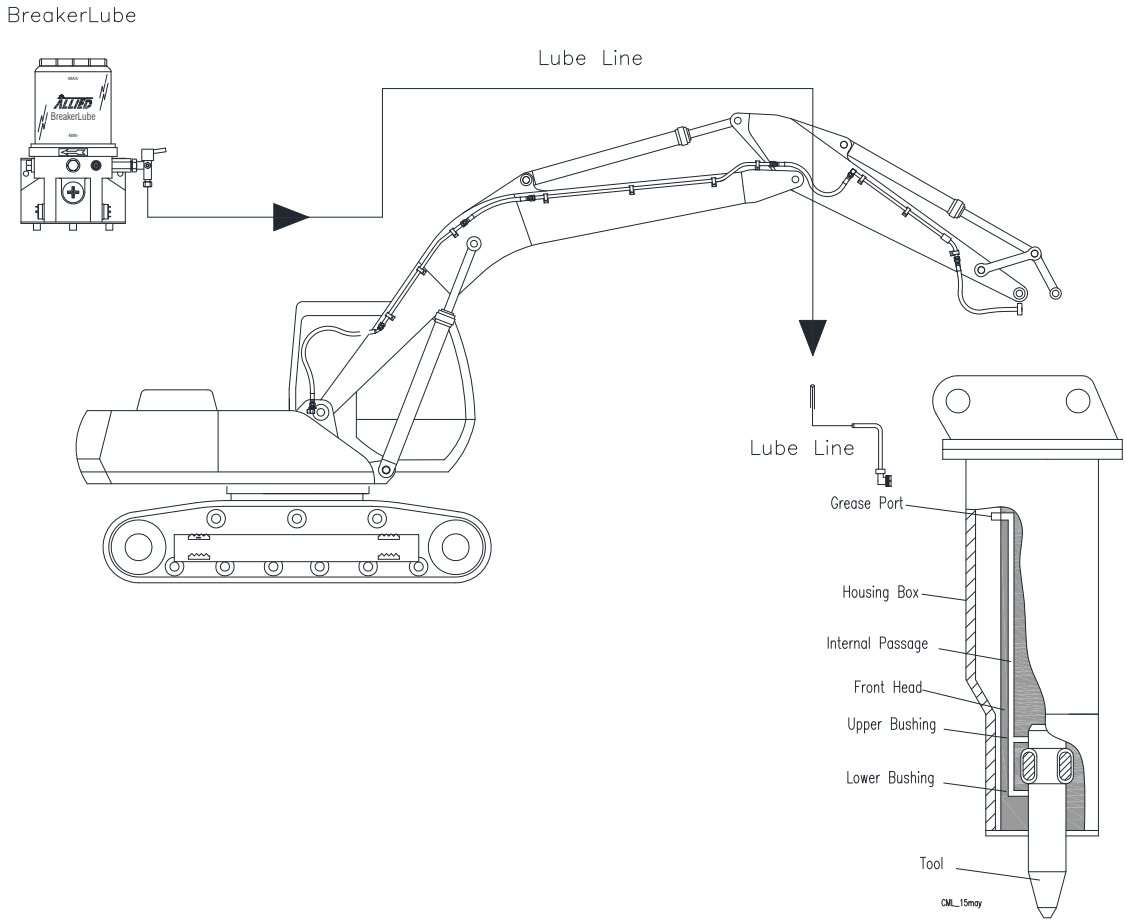
BreakerLube™

CML Series

Electric Grease Pump



ALLIED® Construction Products, LLC

Safety, Installation, Operation, Maintenance and Parts

This manual was prepared to assist qualified personnel with the information necessary to install, operate and maintain the Allied BreakerLube. Read, understand and follow the information contained in the safety messages. Keep for future reference.

TM102783

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Revision History for Document No. TM102783

Continuous improvement of our products is an Allied policy. The material in this publication, including figures, captions, descriptions, remarks and specifications, describe the product at the time of its printing, and may not reflect the product in the future. When changes become necessary, these will be noted in the table below. Specifications are based on published information at the time of publication. Allied Construction Products, LLC, reserves the right to change, edit, delete or modify the content of this document, including descriptions, illustrations and specifications without prior notification. For product or document updates go to www.alliedcp.com .

Table of Revision History

Effective Date	Page	Summary of Change
15, Jul	17,18,19,40,41,42,43,44, 45,46,47,48	Update figures for black and gray connectors. Update breaker models & installation kits. Revise electrical diagrams. Revise parts tables and figures for 2 & 3 element adapter kits. Add figures for items used in electrical kits.
09, Jan	6	Technical Data Table revise lubricant output.
08, May		Model change over
07, Apr	11, 22 & 28	Add 12 Volt Electrical kit
06, Nov	3,9,10,12,17,19,22,27,28,30	Add hose, update instructions, 5.2, 5.2.1, 2 update Figure 5-1 Add diagram for hydraulic/electric installation Section 6-6, add hammers to chart Add Section 6.6.3 pump Instruction for larger-size hammer models Add Figure 6-8 Update parts list for hose kit. Add parts for pilot circuit Update table 9-1 for models BR2214, BR2518, BR3088 & BR7013 (M14, M18, G88 & G130) Update Table 2-1.
05, Jan	2 & 27 25	Add relay socket in electrical schematic. Update description item 25
04, Oct		Add Rammer Series Models
03, Aug	24-27, 12 & 30	Update parts list, update electrical kit diagram
03, Sep	27, 35-36	Add adjustable pump element (optional)
		Release original issue of TM102783

Safety Information

Safety Statements and Hazard Alerts

Safety messages appear throughout this manual and on labels affixed to the Allied equipment. Read and understand the information communicated in safety messages before any attempt to install, operate, service or transport the Allied equipment.

Keep all safety labels clean. Words and illustrations must be legible. Before operating this equipment, replace damaged or missing labels.

Purpose of Safety Messages

Information provided in safety messages is important to your safety. Safety messages communicate the extent, magnitude and likelihood of injury associated with unsafe practices such as misuse or improper handling of the Allied equipment. Safety messages also explain how injury from potential hazards can be avoided.

Safety messages presented throughout this manual communicate the following information:

1. **Alert** personnel to potential hazards
2. **Identify** the nature of the hazard
3. **Describe** the severity of the hazard, if encountered
4. **Instruct** how to avoid the hazard

Safety Alert Symbol

The safety alert symbol is represented by the exclamation point within an equilateral triangle. This symbol means - **ATTENTION, BECOME ALERT, YOUR SAFETY IS INVOLVED.**

Fig. S1 Safety Alert Symbol

The Safety Alert Symbol (Fig. S1), either used alone or in conjunction with a signal word, is used to draw attention to the presence of potential safety hazards.

Signal Words

“DANGER”, “WARNING” and “CAUTION” are signal words used to express severity of consequences should a hazard be encountered.

DANGER - Indicates an imminent hazard, which, if not avoided, **will** result in death or serious injury.

WARNING - Indicates an imminent hazard, which, if not avoided, **can** result in death or serious injury.

CAUTION - Indicates hazards which, if not avoided, **could** result in serious injury or damage to the equipment.

Pictograms

Safety messages may also include a pictogram in addition to the safety alert symbol and signal word. Pictograms provide another component of information that will further enhance the effectiveness of the hazard communication.

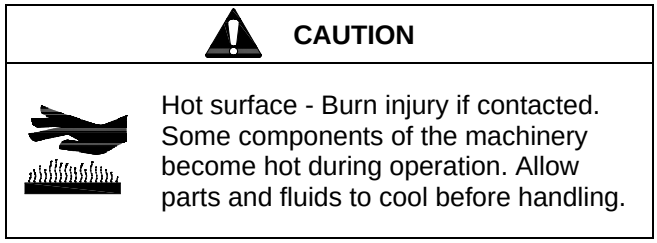


Fig. S-2 Components of Safety Message - Typical

Signal Words Used for Non-Hazard Messages

Other message types appearing in this manual utilize signal words 'IMPORTANT' and 'NOTE'. These contain messages that describe instructions and suggestions, but are not safety-related.

IMPORTANT – Identify instructions that if not followed, may diminish performance; interrupt reliability and production or cause equipment damage.

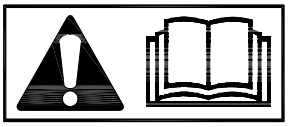
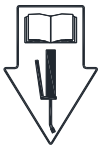
NOTE – Highlight suggestions, which will enhance installation, reliability, or operation.

Safety Information – [cont'd]

Safety, Information and Identification Labels

Information labels affixed to the Allied equipment include safety warnings, identification and instructions important to operation and service. Refer to Figure "L-15" for their location on the equipment.

Keep all safety labels clean. Words and illustrations must be legible. Before operating this equipment, replace damaged or missing labels. For replacement, refer to the appropriate Parts Manual for identification.

Fig.	Label	Description
L1		**READ INSTRUCTIONS** - Decal directs personnel to the manual for further information / instructions.
L2		**Crush Point** – Decal alerts personnel to maintain a safe distance from moving parts.
L3		**LUBRICATION POINT** – Decal identifies lubrication points. Refer to the manual(s) for grease type, re-lubrication schedules, procedures and precautions that must be observed to prevent risk of equipment damage if instructions are not followed or through unapproved methods.
L4		**Maximum Fill Line** – Decal indicates the maximum fill line when refilling the cartridge with lubricant. The decal also calls attention to hazard if overfilled.
L5		**Grease Refill** - Decal identifies the location of the lube fitting used for refilling the reservoir with grease.
L6		**Manual Greasing** – Decal identifies the location of the lube fitting used to manually grease the bushing & tool. Use this lube fitting to pre-fill lube lines and passages.
L7		**Rotation Arrow** – Indicates the direction in which the motor should turn.
L8		**ALLIED LOGO** – This decal is the Allied brand identifier and is a registered trademark of Allied Construction Products, LLC.
L9	**BreakerLube**	**Product Name** – Decal identifies the product.
L10		**Product ID Tag** - Contains identifying information about the equipment, including: Manufacturer's name, model and series number, maximum pressure and operating voltage.

Safety Information – [cont'd]

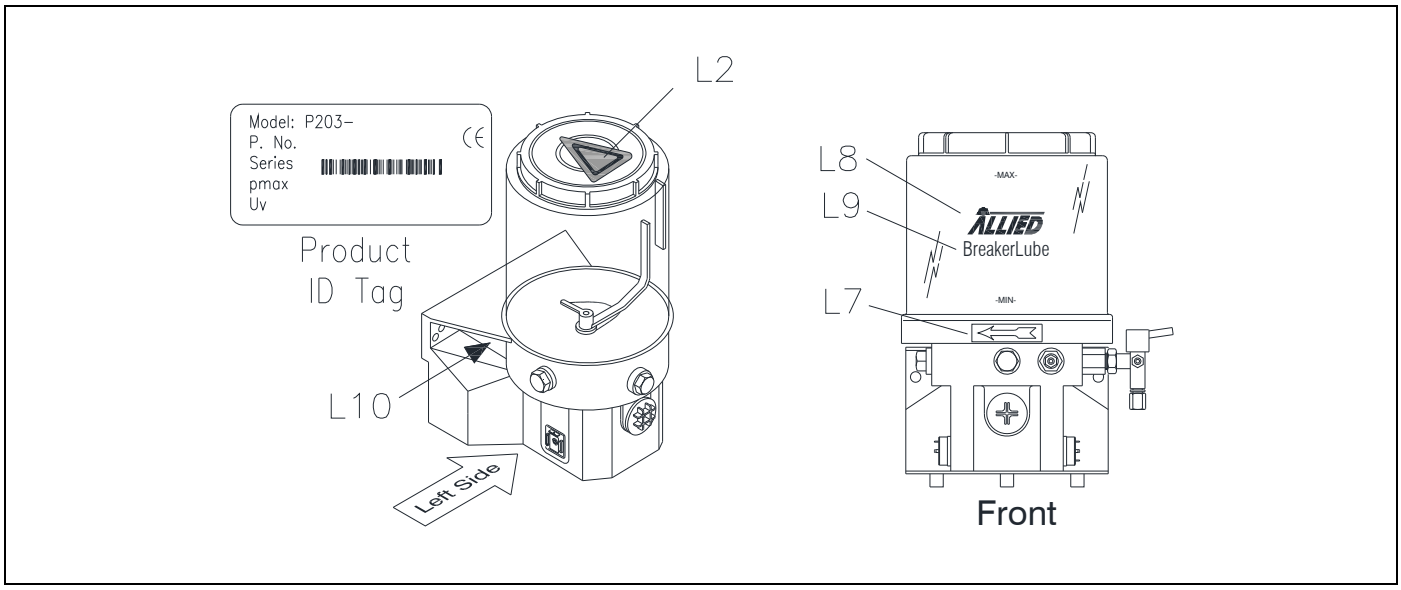


Fig. L11 Label Positions Identified

Table S-1 Labels

Item	Part Name	Part No	Qty	Description
L2	Crush Point	576737	1	
L7	Rotation Arrow		1	
L8	Allied	676652	1	
L9	BreakerLube	679967	1	
L10	Product ID Tag		1	

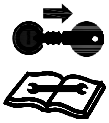
Safety Information – [cont'd]

Meaning of Pictograms

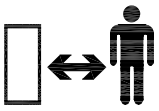
Pictograms are used to rapidly communicate information. For the purposes of this manual and labels affixed to the Allied equipment, pictograms are defined as follows:

- Read the manual
- Refer to the manual for further details
- Procedures are explained in the manual

Read the Service Manual For Additional Information



Shut off carrier & remove key before servicing



Personnel maintain a safe distance

- Falling object
- Unsupported loads

Personal Protection Equipment

- Hearing protection

- Safety eyewear

- Gloves

- Safety shoes
- Falling part

Moving part (in direction indicated by arrow)

Crush point

Crush / Entanglement Moving Parts

Crush / Pinch point

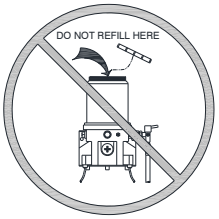
Leaking fluid under pressure

Hot surfaces

Gas / Oil under pressure

Electric Shock Hazard

Prohibited actions must be avoided to prevent injury and/or equipment damage



A prohibited action is identified with an X-out or a circle with a diagonal slash.

The check mark symbol is used to indicate actions and methods that are recommended, correct and approved

Safety Information – [cont'd]

Attention Read the Manual

Improper installation, operation or maintenance of the Allied equipment could result in serious injury or death. Only qualified operators may operate the Allied equipment. Personnel responsible for the maintenance of the Allied equipment or its systems, including inspection, installation or adjustments must also be qualified. Operators and personnel responsible for maintenance of this equipment should read this manual. Other manuals, such as those published by the manufacturer of the machinery used along with the Allied equipment, should also be read.

Qualified Person

For the purposes of this manual, a qualified person is an individual that has successfully demonstrated or completed the following:

- Has read, fully understands and adheres to all safety statements in this manual.
- Is competent to recognize predictable hazardous conditions and possesses the authorization, skills and knowledge necessary to take prompt corrective measures to safeguard against personal injury and/or property damage.
- Has completed adequate training in safe and proper installation, maintenance and operation of this Allied equipment.
- Is authorized to operate, service and transport the Allied equipment identified in Table 1.1.

Safety Information Overview

This manual contains important safety information that must be followed so that unsafe situations may be avoided. It's important for all personnel working with the Allied equipment to read this manual in its entirety. Safety information is generic at the beginning of this manual. As you continue reading through later sections of this manual, instructions and safety information become tool-specific and operation-specific.

Allied has made every effort to provide information as complete and accurate as possible for this document. Allied cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this manual and labels affixed to the Allied attachment are therefore not all inclusive.

General Construction Safety

Always follow procedures that promote safe conditions for workers and bystanders. The standard safety precautions expected and required of those working in construction shall include, but not limited to:

- Locating existing underground service and utility lines
- Establishing pedestrian barriers
- Using personnel protection equipment appropriate to working conditions, etc.

Federal, State, Local and OSHA Construction Guidelines and Regulations

Use the Allied equipment in accordance with all federal, state and local regulations regarding construction practices and public safety. Identification of, and compliance to, governing regulations are the responsibility of the owner and operator.

In the United States, comply with the recommendations of the Occupational Safety and Health Administration standards of the U.S. Department of Labor. For OSHA construction guidelines contact your local federal government office or write:

U.S. Government Printing Office Superintendent of Documents P.O. Box 371954 Pittsburgh, Pa. 15250-7954
Website: www.osha.gov

Ask for Construction Industry OSHA Standards Stock #869-034-00107-6.

Owner's Responsibilities

Ensure that only qualified personnel operate and service the Allied equipment.

Ensure personnel protection equipment is available to personnel and enforce the use of PPE

Ensure equipment is kept in safe operating condition

Ensure safety-related materials such as instructions and including this manual are kept in a convenient location so that they are easily accessible to operators and maintenance personnel.

Safety Information – [cont'd]

Operational Safety Program

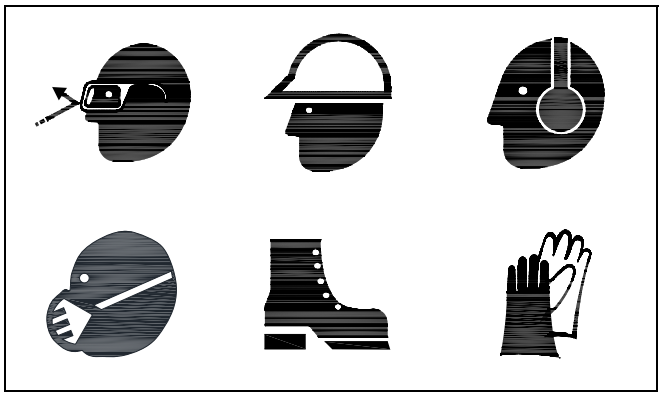
The safe and efficient use of the Allied equipment depends upon proper installation, operation, maintenance and repair. Operational safety programs must encompass all of these elements.

Accident prevention through operational safety programs are most effective when the equipment owner further develops the program by taking into account his own experience in using and maintaining equipment.

Developing such programs will help minimize equipment downtime, while maximizing service life and performance. Most importantly, it will minimize the risk of personal injuries.

Personal Protection Equipment (PPE)

Personal protection equipment (PPE) must be available to any personnel operating or nearby the equipment that may be exposed to hazards such as falling, flying and splashing objects, or harmful dusts, fumes, mists, vapors, or gases. Approved PPE, when used correctly, helps protect against certain harmful effects from exposure with the identified hazard.



Examples of PPE include safety eyewear, safety hat, hearing protection, dust mask, safety footwear, and gloves. (Shown Pictograms of PPE is not all-inclusive).

Those responsible for administering PPE shall train personnel with the proper selection and use of PPE to protect against misuse.

Safety Guards and Protective Barriers

A safety guard is a physical barrier designed to prevent access to danger areas. Guards are fitted to the Allied equipment to protect against unsafe situations that could not be eliminated through design measures. Guards are only effective when properly installed and in place. Guards shall not be removed unless for the purpose of inspection and service of components. Reinstall all guards after service or adjustments are completed.

Where it was not possible to prevent an unsafe situation by means of a guard, safety messages appear on the equipment, warning personnel of a recognized hazard.

Additional guarding, not included with the Allied equipment, is necessary at the operator's station to protect the operator and other nearby personnel against flying debris from material being cut or demolished. Do not handle, demolish or cut material overhead without proper guards installed.

The control switch shall be located in a protected area that is guarded against accidental operation of the Allied work tool.

Unapproved Use or Modifications

In order to provide and maintain efficient operation with reliable service, while ensuring operator safety, the Allied equipment may not be used for any purpose other than, for which it was intended. Use of the Allied equipment, other than those cited in this manual, may place personnel at risk of injury and/or may subject the equipment to damage.

When making repairs, use only the manufacturer's genuine parts. Substitute parts may not meet the required standards for fit and quality, or may impair function, safety and performance. The Allied equipment shall not be modified or used in unapproved applications unless written consent is received from the Allied Engineering Department.

Table of Contents

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List of Figures **Page**

List of Tables **Page**

1.0 Introduction and Scope

1.1 About this Manual

Prior to use, confirm that the information recorded on the equipment's identification label (Fig. 2-1) corresponds with Table 1.1.

Table 1.1 About This Manual

Document ID No.	TM102783
Type:	Safety, Operation, Maintenance, Installation & Parts
Current Status:	See Inside Cover
Product Name:	BreakerLube™
Series / Generation:	CML-II
Applicable Model[s]:	12 & 24VDC / 1 & 2 Gallon
Years of Production:	Begin 2002

This manual has been prepared in support of the product named in Table 1.1 and is intended to assist the operator and maintenance personnel with the information necessary for the safe and proper use of the Allied equipment.

The spare parts list is also included in this manual. Illustrations depicted in the Parts Information Section are for purposes of parts identification and are not intended for use in repair or service of the equipment.

Material presented in this manual, including tables, figures, descriptions and captions, may show equipment that is optional. Figures, captions, parts tables and descriptions are intended solely for use with the product identified in Table 1.1 and may not be suitable for use with other models.

This manual is an integral part of this product. Keep it in a convenient location so that it is easily accessible for future reference.

1.2 Content Includes

- Safety Section
- Equipment Identification
- Operating Principle
- Configurations – Equipment Options
- Installation Guidelines
- Maintenance & Care
- Recommended Lubricants
- Priming / Pre-filling Lines
- Troubleshooting
- Removal & Storage
- Technical Data / General specifications
- Parts Information - Spare / Replacement

The publication identified in Table 1.1 was created solely for information purposes and should not be considered all-inclusive. If further information is required, contact your local Allied dealer or the Allied Customer Support Department.

The content of this document has been reviewed for accuracy. Allied Construction Products, LLC has endeavored to deliver the highest degree of accuracy and every effort has made to provide information as complete as possible. However, continuous improvement of our products is an Allied policy. The material in this publication, including figures, captions, descriptions, remarks and specifications, describe the product at the time of its printing, and may not reflect the product in the future. A table of revision history for this document is found on the inside cover.

1.3 How To Order Replacement Publications

Replacement manuals may be ordered by contacting your local Allied dealer or the Allied Customer Support Department. Manuals may also be viewed and downloaded at: www.alliedcp.com

1.3.1 Related Publications

Allied Construction Products, LLC offers the following publications for the product identified in Table 1.1.

- Further publications are not available at the time of this release

2.0 Product Identification

2.1 Product Identification Tag

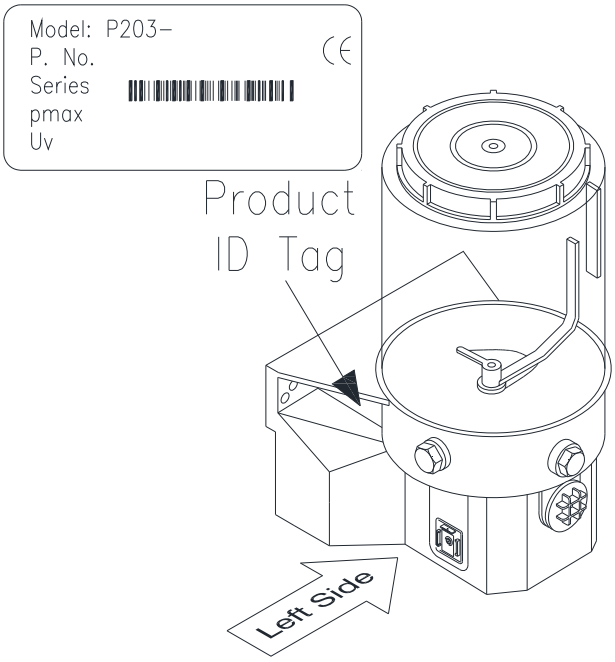


Fig 2-1 Product Identification

Refer to Figure 2-1. The Model and Series Number assigned to this equipment can be found on the Product Identification Tag

The Identification Tag is affixed to the pump housing. It provides the following information:

- Manufacturer's name
- Model Code
- Series
- P max Bar
- Operating Voltage U= P=W

Confirm that the information contained on the Tag corresponds with the information provided in Section 1, Table 1.1.

2.2 Record Product ID Information for Future Reference

Your local Allied dealer requires complete information about the equipment to better assist you with questions regarding parts, warranty, operation, maintenance, or repair.

- Copy the Model and Series Number from the Equipment Identification Tag to the space provided below.
- Indicate the date in which the Allied equipment was placed into service.
- Fill out the Warranty Registration form and return to Allied Construction Products, LLC.

Product / Series **BreakerLube CML**

MFR: _____

Model Code _____

P. No: _____

Series Number: _____

In Service Date: _____

Registration Date _____

When inquiries are made, specify by name, voltage, reservoir capacity and number of pumping elements and lube lines, e.g.: BreakerLube CML, 24VDC, 2 gallon, 2-pumping elements bridged into 1 lube line 60'.

X	**BreakerLube**
X	**CML (BPA units without pcb controller)**
	Operating Voltage
	Reservoir Size
	Pumping Elements – Qty
	Relief Valves – Qty
	Lube Lines – Qty & Length

Notes:

3.0 Warranty Protection Summary

3.1 Overview

The Allied equipment is delivered assembled and factory tested. Upon receipt of the equipment, inspect for possible shipping damage or loss.

Before this equipment is installed and used, familiarize yourself with the features and functionality of the unit. Refer to the technical data section of this manual for specifications and dimensions. When properly installed, operated and maintained by qualified personnel, the Allied equipment will remain productive with a minimum of service. Improper installation, including failure to properly calibrate (test and adjust) the equipment, may negatively impact performance or subject the equipment to conditions beyond its operating specifications.

The use of non-genuine parts or unapproved lubricants, modifications, installation, service methods and operation not in accordance with the contents of this manual may cause loss of performance, equipment failure or personal injury.

Warranty does not cover conditions, which in the reasonable judgment of Allied Construction Products, LLC, arise from improper installation / set-up, misuse, unauthorized alteration, accident, or inattention to maintenance requirements. Complete warranty terms and conditions can be found in document 100785.

3.2 General Maintenance Policy

The following general maintenance policies outline the minimum requirements for reducing failures and minimizing unscheduled equipment downtime. The owner is strongly encouraged to implement these guidelines and further develop them to manage particular applications and operating environments.

Owner's responsibility includes:

- Ensure that personnel entrusted with installation, operation, and maintenance of the Allied equipment adhere to the following:
- Read and fully understand the information included in this manual.
- Recognize that operating this equipment in conditional applications, such as working underwater, requires modifications to the standard breaker and additional training for the operator, maintenance and service personnel.
- Use the Allied equipment only if it is in sound operating condition. Take prompt action to rectify any faults that, if left uncorrected, could lead to further damage of this equipment or subsequent damage to supporting equipment or personal injury
- Use the Allied equipment only for the purpose for which it is intended.
- Regularly conduct inspections of the equipment and follow the recommendations found in the Maintenance Section of this manual.
- Understand effective communication is key to the success of any maintenance program. Appointing ‘Who Does What’ ensures that all personnel understand exactly what their specific responsibilities include.

1. Establish maintenance responsibilities to be performed by the Operator.
2. Establish maintenance responsibilities to be performed by the Service Technician.

- Recognize problems and know how to take corrective action as outlined in the Troubleshooting Section of this manual.
- Allow only qualified operators and service technicians to perform maintenance and repair.
- Maintain written records of equipment maintenance, service and repair. These records are helpful if warranty coverage is ever in question.

Each record shall include at least:

- Date of service, maintenance or repair.
- Description of the service, maintenance or repair performed. Include part numbers if applicable.
- Copies of purchase order(s) and invoice(s) for repair parts and service.
- The name and signature of the person performing the service, maintenance or repair.

3.0 Warranty Protection Summary - [cont'd]

3.3 Allied Product Policies

In this manual, Allied recommends the use, applications, maintenance and service consistent with industry practices.

Allied assumes no responsibility for the results of actions not recommended in this manual and specifically the results of:

- Improper Installation, Set-up, Calibration
- Carelessness / Incorrect operating methods
- Inattention to re-lubrication and other maintenance requirements
- Misuse / Unapproved applications
- Inadequate or Absence of Training
- Use of non-genuine Allied replacement parts
- Unapproved modifications
- Use of grease, which is not or is only conditionally Pumpable
- The use of a lubricant type that is unsuitable for the application. Allied Chisel Paste is recommended for all breaker models.
- Contaminated lubricants.
- Improper disposal of used or contaminated lubricants.

These exclusions apply to damage to the Allied equipment, associated equipment and injury to personnel.

4.0 Product Description and Operation

4.1 BreakerLube Description and Application

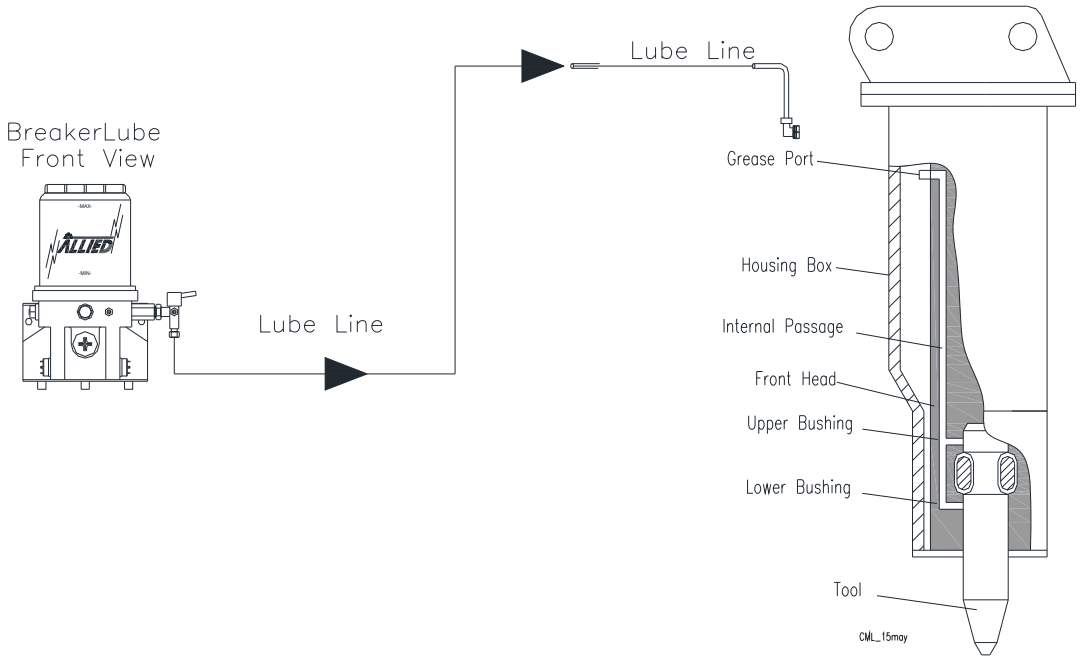


Fig. 4-1 Configured with Single Pump & Lube Line. Breaker Shown with Single Lube Passage to Both Bushings

The BreakerLube CML Series is an electrically operated grease dispensing pump. It is designed for mounting on mobile construction vehicles and offers a simple, effective and inexpensive method for lubricating the bushing and tool. The fully automated system eliminates the need to stop production to manually lubricate the bushing and tool.

4.1.1 Benefits of BreakerLube

The BreakerLube offers the following benefits:

- Increased uptime and overall productivity of the Breaker, while reducing costs related to downtime as in the course of stopping work to manually grease the tool.
- Safety is improved as operators are not required to lubricate in hazardous areas
- Increase service life of components. Lubrication occurs while the breaker is in operation, when it is of the most benefit
- Will dispense the precise amount to maintain sufficient lubrication while reducing costs from excessive consumption with less waste and environmental pollution.
- With proper delivery, the constant replenishment of grease flushes dust from bushings and seals against entry.
- Prevents down time and expensive repairs to replace damaged parts caused when manual greasing schedules are missed.
- Prevents seal damage resulting from improper grease methods. Grease is dispensed only when breaker is operating.

4.1.2 Features of BreakerLube Include:

- Compact size occupies less space. Mounts easily to large and medium-size carriers
- Proven reliability from simple design, with few moving parts
- Heavy-duty motor available in 12 or 24VDC.
- Available with 1 or 2 gallon reservoir
- Low-level control monitors grease level in reservoir and activates if below ‘MIN’ mark

4.0 Product Description and Operation

- Basic pump assembly is extremely customizable offering numerous configuration possibilities to suit the different requirements of breakers and carriers
- Accepts up to 3 pumping elements for increased delivery output
- Can be configured so that each pump is bridged into a single lube line for large size breakers needing maximum output or independently to accommodate breakers having separate grease passages to each bushing.
- Clear reservoir provides immediate visual monitoring of lubricant level
- Large capacity reservoir extends run times before refills
- Re-fillable reservoir is quickly and easily refilled with no special tools required. Can be bulk filled or through grease nipple
- Equipped with special pump elements for use with Chisel Paste.
- Delivery of grease up to NLGI No. 2 at temperatures from -25C to 70C
- System activation works with both electrically-operated and pilot-operated controls for breaker valve. (Note: Additional parts required for pilot-operated control, not included in standard installation kit)
- Custom designed install kits facilitate quick installations. Kits include a basic pump that's specifically configured to the size of the breaker to ensure the proper amount of lubricant is delivered. Also included are pre-filled lube lines, fittings, mounting bracket and hardware. Ordering information is found in Section 11.

4.2 Basic Pump Familiarization of Components

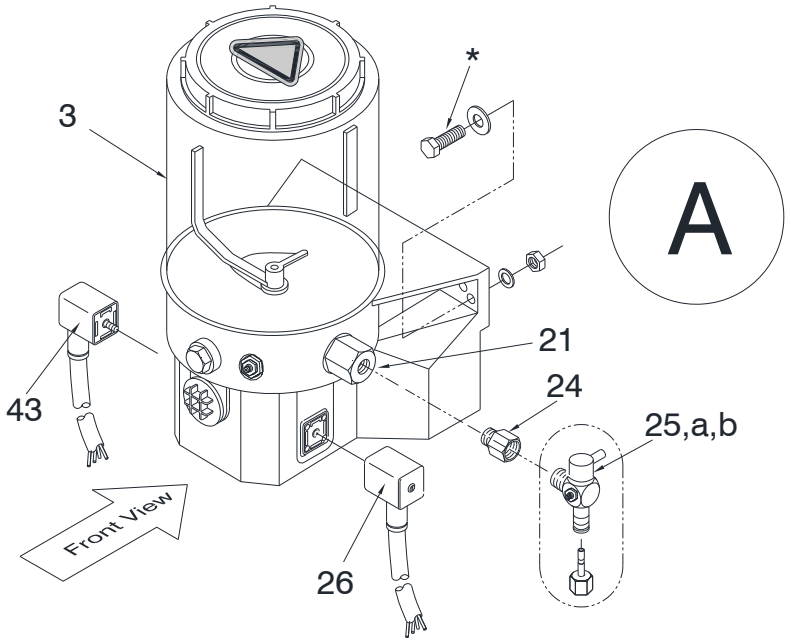


Fig. 4-2 Basic Pump Assembly BreakerLube CML Series

A	Basic Pump Assembly
3	Reservoir
21	Pump Element
25	Pressure Relief Valve Assembly
26	Gray Connector Pre-wired With 4-conductor Cord for Low-Level Control
43	Black Connector Pre-wired With 4-conductor Cord for Power Supply to Motor
*	Hardware for Mounting

4.0 Product Description and Operation

4.3 Operation

The power needed to operate the BreakerLube is supplied by an external electrical source that is controlled through a momentary switch. The heavy-duty electric motor drives the cam that pushes the piston through the grease filled chamber and discharged through the open check valve.

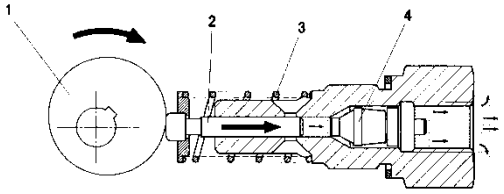


Fig. 4-3. Pump Element – Cross Section View
1-Cam, 2-Piston, 3-Spring and 4-Check Valve.

The spring returns the piston and the chamber is re-filled. The closed check valve prevents the back flow of grease.

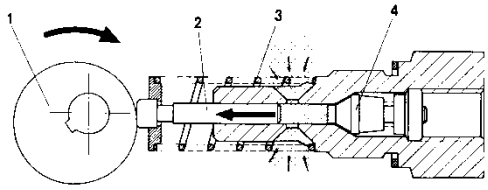


Fig. 4-4. Pump Element – Cross Section View
Piston Return Stroke, Check Valve Closed.

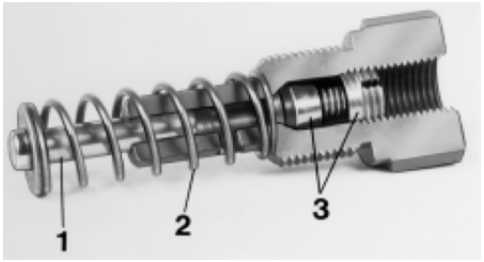


Fig. 4-5 Pump Element Assembly – Item 21

1-Piston 2-Spring 3-Check Valve

By design, the BreakerLube is a low capacity pump. The pump's discharge rate is purposely metered for small quantities only.

4.4 Operation of Low-level Control

The basic pump assembly comes standard equipped with a low level control. When wired to a light or alarm, the operator is signaled that the grease level inside the reservoir has fallen below the minimum mark.

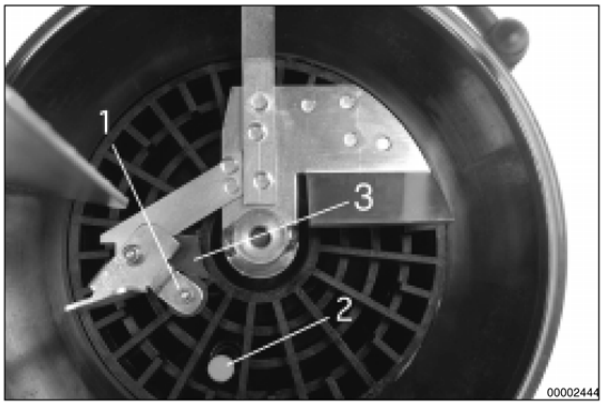


Fig. 4-6. Low-level Control 1-Magnetic switch, 2-Electromagnetic switch, 3-Control Arm

4.4.1 Low-level Control - Full Reservoir

Refer to Figure 4-6. The magnetic switch (1) and control arm (3) are attached to the stirring paddle. With the grease level above the minimum mark, the control arm pivots the magnetic switch out of range of the electromagnetic switch (2).

4.4.2 Low-level Control - Empty Reservoir

The control arm pivots outward when the grease level falls below the minimum mark. The normally open electromagnetic switch will close when the magnetic switch passes over it. The closed switch illuminates the dash lamp.

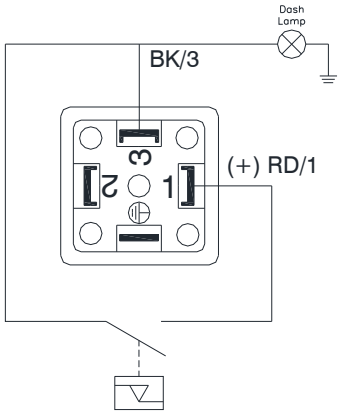


Fig. 4-7 Item 28 Plug– 3 Pole Plus Ground

5.0 Product Configuration

5.1 Introduction to Available Pump Configurations

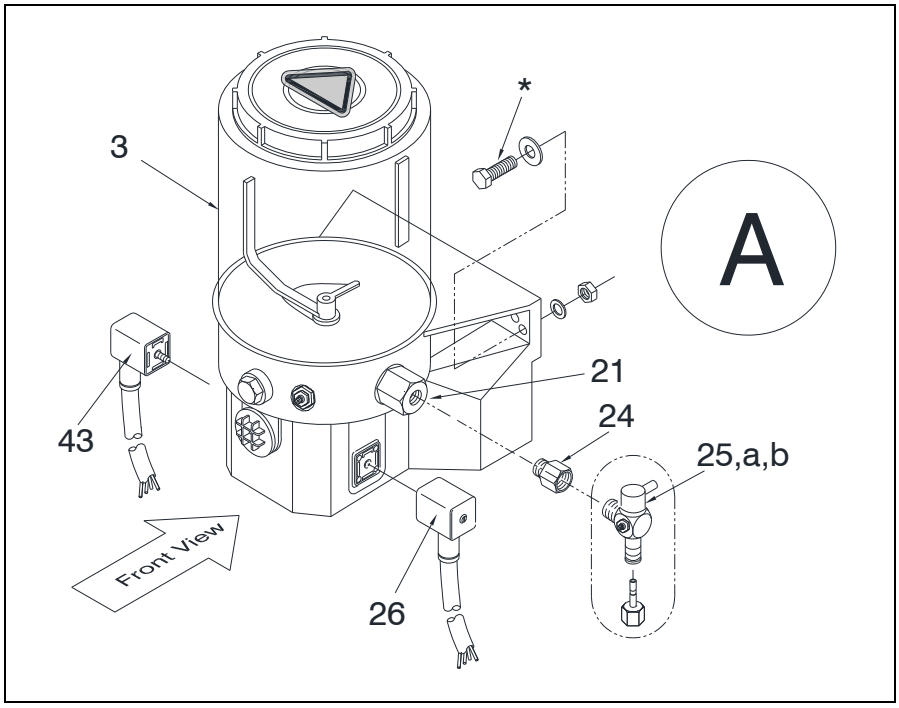


Fig. 5-1 Basic Pump Assembly BreakerLube CML Series

The design of the basic pump assembly is the same but differences are seen in the way that it can be adapted to suit the different needs of the carrier and breaker.

A1) Basic Pump A102472
Input Voltage - 24VDC
Reservoir - 2 Gallon
w/ Single Element

A2) Basic Pump A102473
Input Voltage - 24VDC
Reservoir - 1 Gallon
w/ Single Element

A3) Basic Pump 102474
Input Voltage - 12VDC
Reservoir - 1 Gallon
w/ Single Element

Table 5.1 Basic Pump Assembly - Parts Common to A1, A2, A3.

A	Basic Pump Assembly With Low Level Control and Single Pump Element (Specify 12VDC or 24VDC)
3	Re-fillable Reservoir. (Specify Size 1 or 2 Gallon)
21	Pump Element (Qty-1 included. Order additional elements separately)
24	Adapter
25	Pressure Relief Valve (Qty-1 included. Order additional relief valves separately)
26	Gray Connector Pre-wired with 4-conductor wire Cord for (Low-Level Control)
43	Black Connector Pre-wired with 4-conductor Cord (Power Supply to Motor)
*	Mounting Hardware

Table 5.2 Several adaptations are available to suit different needs of the carrier and breaker, including:

B)	Operating Voltage	12 or 24VDC (VAC also available upon request)
C)	Reservoir Size	1 or 2 Gallon
D)	Pump Element(s)	1 Standard, or Two Element Adapter or Three Element Adapter Kit
E)	Separate Lube Passage	Requires 2nd element , relief valve and lube line
F)	Lube Line Kits	Available in standard lengths of 40', 60', 80' and come pre-filled. A 2nd pre-filled hose is also included. It will attach to the breaker.

5.0 Product Configuration –[cont'd]

5.1.1 What the BreakerLube System Includes

Install kits are available from Allied. These custom designed kits include a basic pump that's specifically configured to the size of the breaker to ensure the proper amount of lubricant is delivered. Kits also include pre-filled lube lines, fittings, mounting bracket and hardware. Kit ordering information is found in Section 11.

IMPORTANT
The breaker must be equipped with a qualified grease connection port to attach the lube line.

5.1.2 Basic Pump Assembly A1, A2, A3

A. The basic pump assembly includes items shown in Fig. 5-1. Begin configuration with the basic pump. Select from A1, A2, or A3.

B. Identify the supply voltage of the carrier and match it with the correct basic pump assembly.

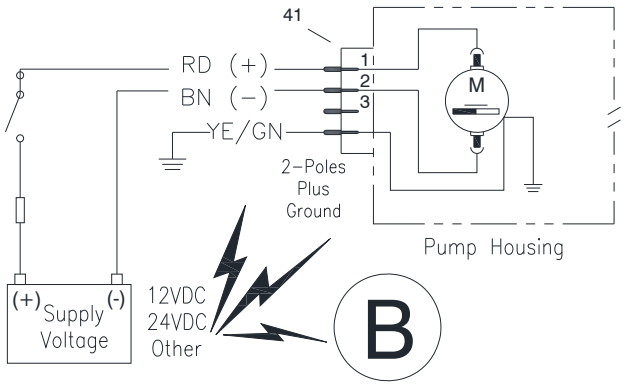


Fig. B Match Carrier's Supply Voltage

C. Choose size of reservoir 1 or 2 gallon. Mounting considerations should include easy access for re-filling and protection against damage. General dimensions of the basic pump assemblies are found in the Technical Data Section of this manual.

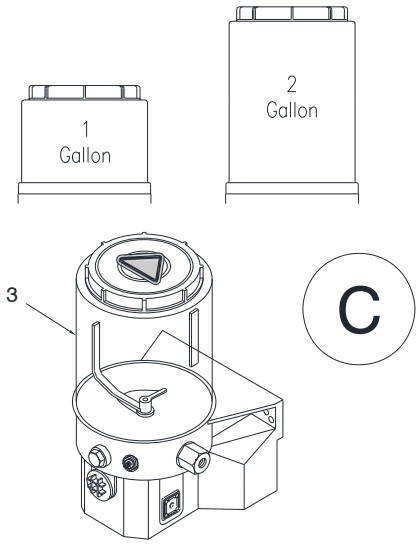


Fig. C Select 1 or 2 Gallon Reservoir

D. Grease delivery is determined by the number of pumping elements installed. For larger size breakers, the BreakerLube is configured with the 2 or 3-Element Adapter Kit.

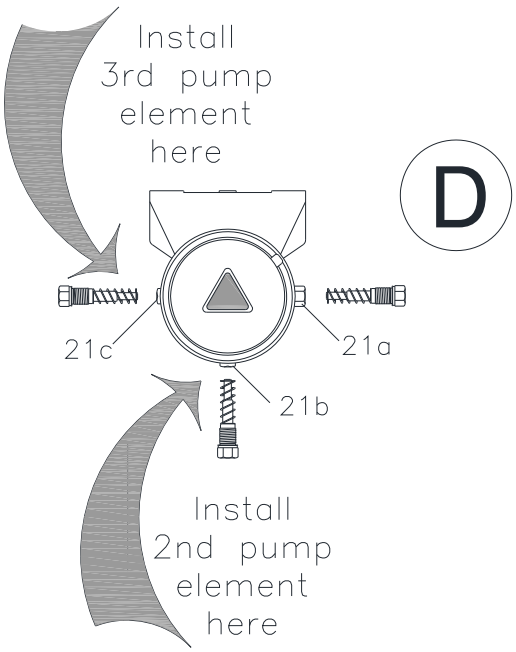


Fig. D Add Pump Elements to Increase Output

5.0 Product Configuration –[cont'd]

E. Some breakers have two separate grease connection ports and passages that feed bushings independently. Configure the basic pump with two pump elements and provide each with separate lube lines and relief valves.

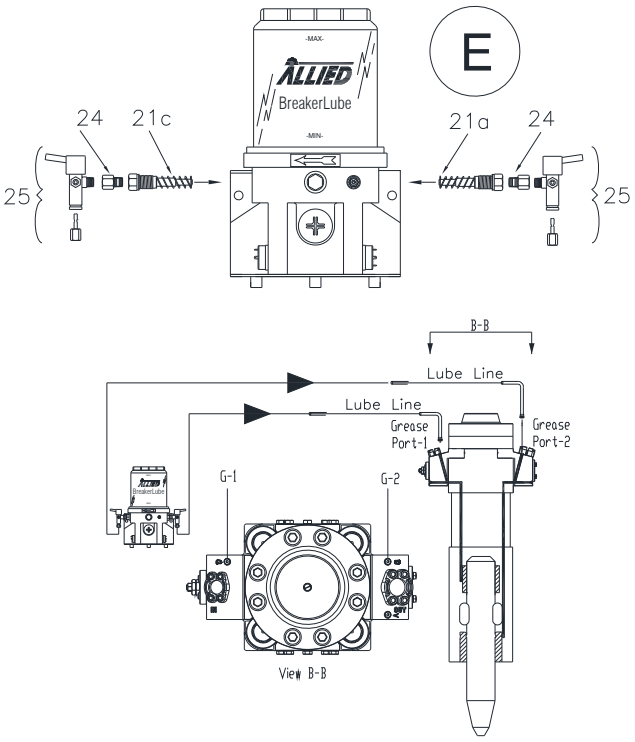


Fig. E Breaker with Two Grease Ports - Bushings With Independent Grease Passages

CAUTION

Each separate pump line must have a relief valve installed.

F. Follow configuration 'F' for breakers designed with a single grease passage to both the upper and lower bushings will this.

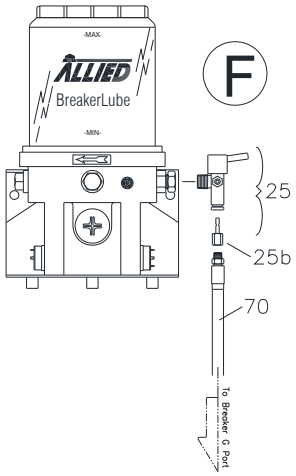


Fig.-F1 Lube Line Kit (Item 70) Determined By Carrier Reach

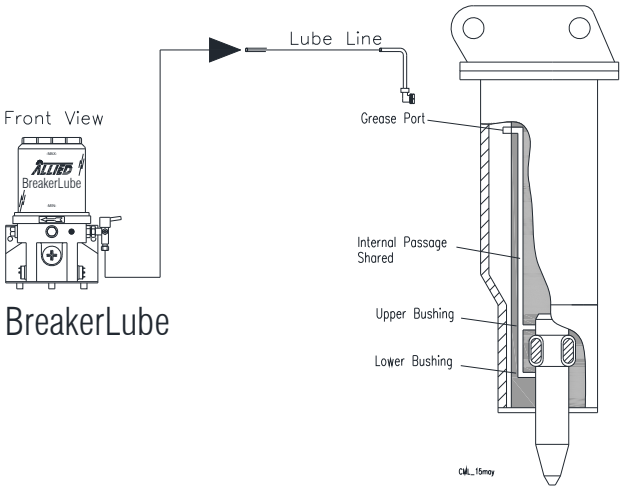


Fig.-F2 Single Feed Passage Lubricates Both Bushings

6.0 Installation - BreakerLube CML Series

6.1 Observe Safety Precautions During Install

Attention Read the Manual

Improper installation, operation or maintenance of the Allied equipment could result in serious injury or death. Only qualified operators may operate the Allied equipment. Personnel responsible for the maintenance of the Allied equipment or its systems, including inspection, installation or adjustments must also be qualified. Operators and personnel responsible for maintenance of this equipment should read this manual. Other manuals, such as those published by the manufacturer of the machinery used along with the Allied equipment, should also be read.

Attention Read the Manual

- Only authorized and trained personnel familiar with this equipment shall attempt installation.
- Use the BreakerLube only for dispensing chisel paste to breaker's bushings and tool.
- Do Not Operate the BreakerLube without the pressure relief valve installed.
- Disconnect power supply before installing.
- Do not modify, disable or interfere with any existing safety equipment already fitted to the carrier.
- Mount the BreakerLube CML away from sources of heat. Refer to Table in Technical Data section for operating temperatures.
- Do not run any lube lines through the operator's cab; they may leak or even burst, injuring the operator.

6.1.2 Safety Precautions - Welding

WARNING

Electric shock hazard. Prevent battery damage by disconnecting battery cables before welding. Locate the welder ground clamp near the welding point.

CAUTION

Risk of fire or damage. Shield hoses from heat when welding. Follow the carrier manufacturer's welding instructions.

6.2 Mounting Location of the Pump – General

CAUTION

Unwanted moisture buildup may damage motor. A drain hose is located on the pump housing. Do NOT block, obstruct or modify the drain hose. It's designed to prevent moisture buildup and not allow liquids to siphon into the pump housing.

1. Find a suitable mounting location for the BreakerLube. Keep pump and lines away from sources of heat. The BreakerLube must be mounted in an upright position.
2. Weld or bolt mounting bracket to carrier.
3. Use the supplied hardware set to attach the BreakerLube to the bracket.

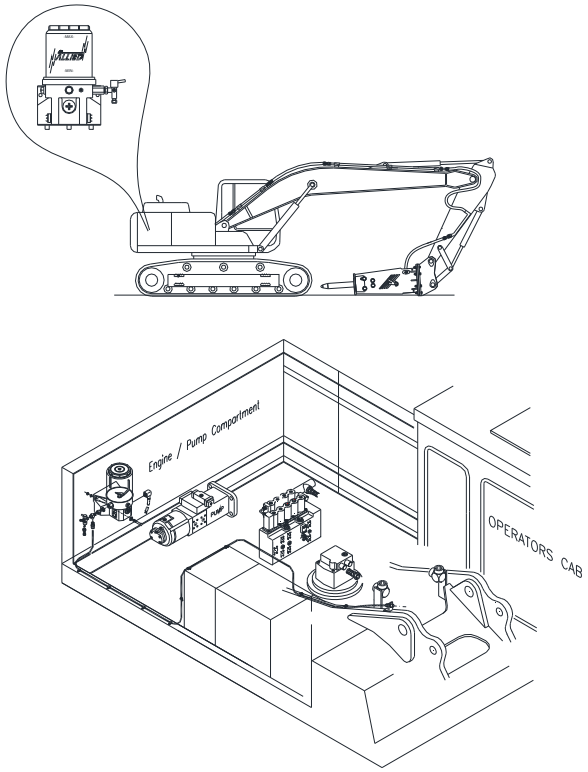


Fig. 6-1 Mounting Location - Typical

6.0 Installation – [cont'd]

6.3.1 (F) - Single Element Into Single Lube Line

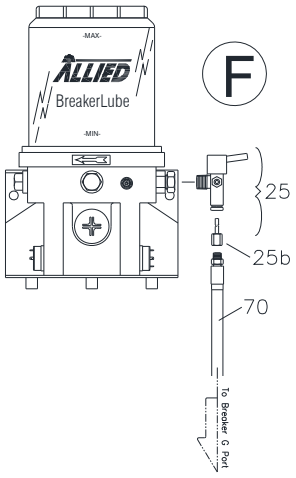


Fig. 6-2 Single Pump Element & Lube Line

1. If not already installed, refer to instructions in Section 6.6 for installing the pump element and relief valve assembly.

2. Route lube lines along the existing hydraulic hoses. Allow for proper slack at pivot joints.

IMPORTANT

Route hoses avoiding sharp bends. Wrap any hose susceptible to damage from rubbing. Before cutting hose, check for proper length to both termination points, knowing where each component mounts.

3. Measure, cut and assemble connectors to lube lines according to figure 6-3. Quick disconnect couplers are provided for easy connection and removal of the breaker.

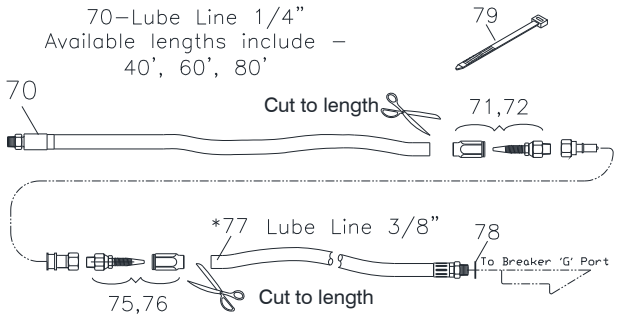


Fig. 6-3 Cut-to-Length and Assemble Lube Lines

4. Secure lube lines with supplied nylon ties.

5. For the location of port 'G', refer to breaker's Operating Manual. Location of the 'G' port can vary. Typical location is on the valve housing or back head. The port is marked "G".

6.3.2 (G) - Two Elements Into Single Lube Line

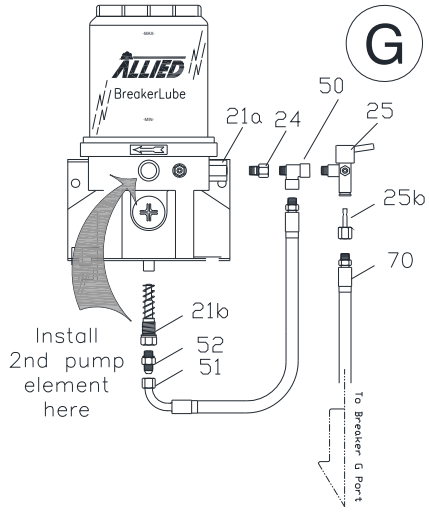


Fig. 6-4 Add 2nd Pump & Bridge into 1 Lube Line

1. If not already installed, refer to the pump element instructions in Section 6.6. Refer to above figure for assembly of 2-element adapter kit.

2. Route lube lines along the existing hydraulic hoses. Allow for proper slack at pivot joints.

IMPORTANT

Route hoses avoiding sharp bends. Wrap any hose susceptible to damage from rubbing. Before cutting hose, check for proper length to both termination points, knowing where each component mounts.

3. Measure, cut and assemble connectors to lube lines according to figure 6-3. Quick disconnect couplers are provided for easy connection and removal of the breaker.

4. Secure lube lines with supplied nylon ties.

5. For the location of port 'G', refer to breaker's Operating Manual. The port location can vary. Typical location is on the valve housing or back head. The port is marked "G".

6.0 Installation – [cont'd]

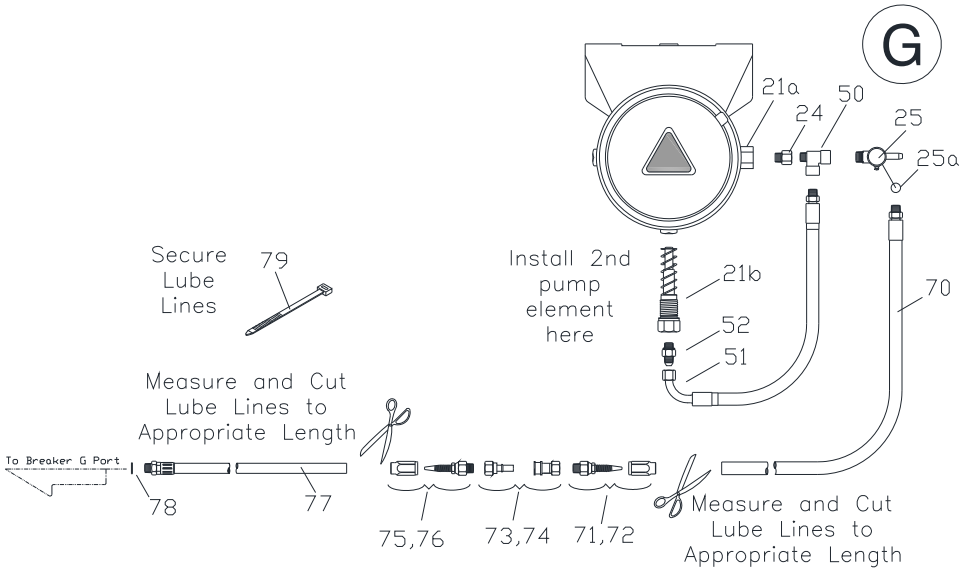


Fig. 6-5 Configuration 'G' - Top View

6.3.3 (E) Two Elements and Separate Lube Lines

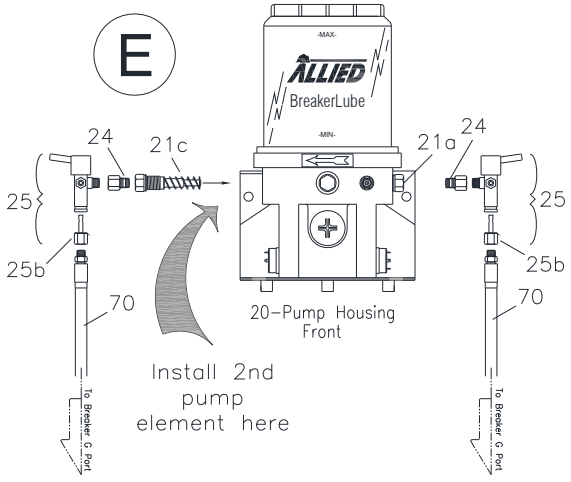


Fig. 6-6 Add 2nd Pump & Lube Line

1. If not already installed, refer to the pump installation instructions in 6.6. Refer to above figure for assembly. (Parts table in Section 11)

2. Assemble element and relief valve assembly according to the figure. Repeat with 2nd hose assembly.

3. Route lube lines along the existing hydraulic hoses. Allow for proper slack at pivot joints. Wrap any hose susceptible to damage from rubbing.

IMPORTANT

Route hoses avoiding sharp bends. Wrap any hose susceptible to damage from rubbing. Before cutting hose, check for proper length to both termination points, knowing where each component mounts.

4. Measure, cut and assemble connectors to lube lines according to figure 6-3. Quick disconnect couplers are provided for easy connection and removal of the breaker.

5. Secure lube lines with supplied nylon ties.

6. For the location of port 'G', refer to breaker's Operating Manual. Location of the 'G' port can vary. Typical location is on the valve housing or back head. The port is marked "G".

6.0 Installation – [cont'd]

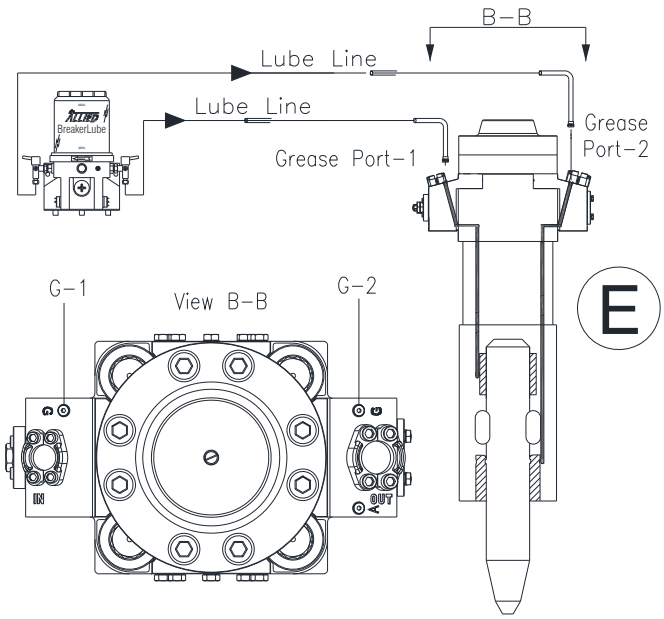


Fig. 6-7 Location of Port 'G' On Valve Housing Identified.

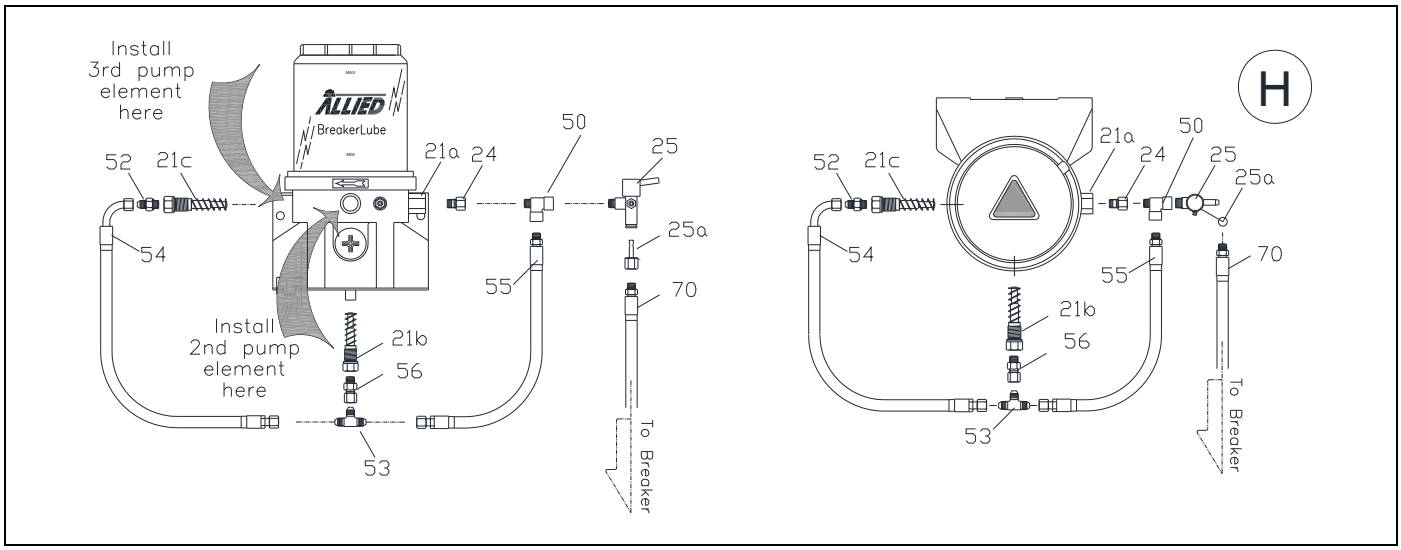


Fig. 6-8 Three Pump Elements Bridged Into Single Line To Breaker

6.3.4 (H) Three Elements Into Single Lube Line

1. If not already installed, refer to the pump element instructions in Section 6.6. Refer to above figure for assembly of 3-element adapter kit.

2. Route lube lines along the existing hydraulic hoses. Allow for proper slack at pivot joints.

IMPORTANT

Route hoses avoiding sharp bends. Wrap any hose susceptible to damage from rubbing. Before cutting hose, check for proper length to both termination points, knowing where each component mounts.

3. Measure, cut and assemble connectors to lube lines according to figure 6-3. Quick disconnect couplers are provided for easy connection and removal of the breaker.

6.0 Installation – [cont'd]

4. Secure lube lines with supplied nylon ties.

5. For the location of port 'G', refer to breaker's Operating Manual. Location of the 'G' port can vary. Typical location is on the valve housing or back head. The port is marked "G".

6.4 Install Short Lube Line

The shorter hose supplied with the kit is equipped on one end with a 3/8BSPP male thread. The other end is plain.

1. Route the lube line from the carrier. Allow for proper slack at pivot joints.

IMPORTANT

Route hoses avoiding sharp bends. Wrap any hose susceptible to damage from rubbing. Before cutting hose, check for proper length to both termination points, knowing where each component mounts.

2. Cut lube line to length and assemble connections according to figure. Quick disconnect couplers are provided for easy connection and removal of the breaker.

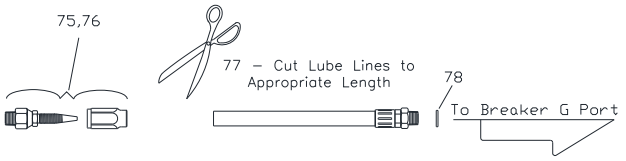


Fig. 6-9 Assemble Fitting to Plain Hose End

3. Secure lube lines with supplied nylon ties.

4. For the location of port 'G', refer to breaker's Operating Manual. Location of the 'G' port can vary. Typical location is on the valve housing or back head. The port is marked "G".

6.5 Install Re-usable Fittings to Plain End of Hose

1. Thread hose nut item 76 onto hose.

2. Insert stem end of item 75 into hose. Turn until tight.

6.6 Installing the Pump Element

WARNING

Electric shock hazard. Shut off power to BreakerLube before servicing.

1. Install new pump element as shown in Fig 6-11. The sealing ring (2) can be re-used if not damaged.

2. Tighten to 18 lb.-ft. Ft. (25Nm).

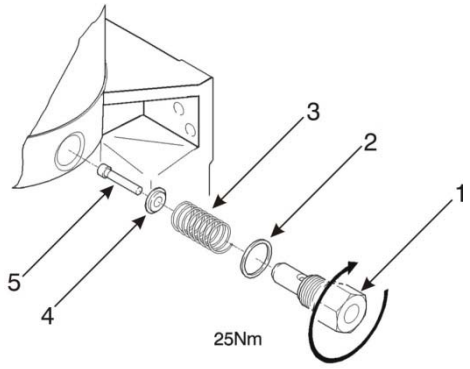


Fig. 6-10 Pump Element Tightening Torque

6.6.1 Removing the Pump Element

CAUTION

Exercise care while removing pump element assembly from housing. The pump element assembly (Fig. 6-11) should come out in one piece. If not, the reservoir must be disassembled and pieces removed. DO NOT leave behind in housing; they may block the motor from turning.

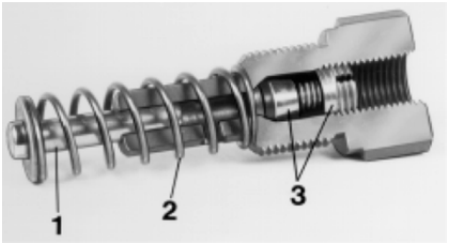


Fig. 6-11 Pump Element Assembly – Item 21

1-Piston 2-Spring 3-Check Valve

6.0 Installation – [cont'd]

6.7 Adjusting the Delivery Output

The basic pump assembly is standard equipped with one pump element. This is a fixed delivery type.

Larger size breakers require a higher delivery output. Higher output is achieved by adding a 2 or 3-element adapter kit to the existing pump element installed.

6.8 Option - Adjustable Type Pump Element

Also available, is the optional pump element that is manually adjusted to various deliveries.

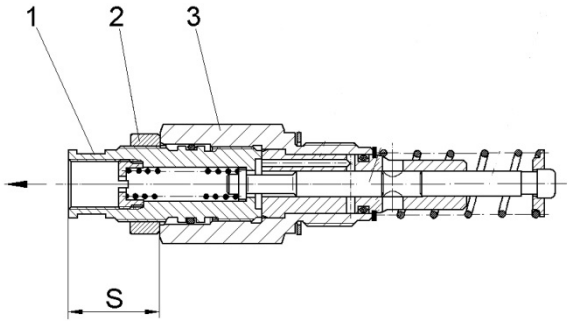


Fig. 6-12 Adjustable Type Element

IMPORTANT

The Adjustable Pump Element is factory set to the maximum output.
Adjusting may take several attempts to reach satisfactory delivery. When properly set, a fresh discharge of lubricant maintains a wet coating that is visible on the tool shank while working – without waste. Refer to Figure 6-14.

6.8.1 Delivery Adjustment Setting - Adjustable Element

Adjusting may take several attempts to reach proper delivery. Every application is different, the variety of operating conditions is unlimited and other factors need to be taken into account such as the size of breaker and wear of bushings and tool.

1. Loosen locking nut (2) while holding the pump element body (3) in position with a second wrench.

2. Change the position of the adjusting spindle (1).

3. Refer to the delivery diagram Fig. 6-13 when adjusting to dimension "S" Fig. 6-12.

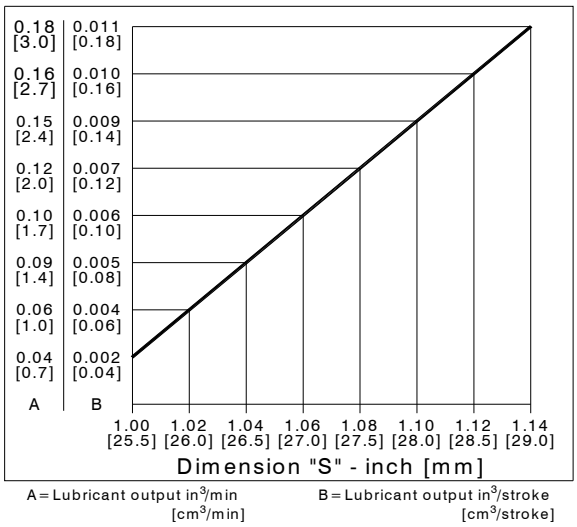


Fig. 6-13 Delivery Adjustment Diagram

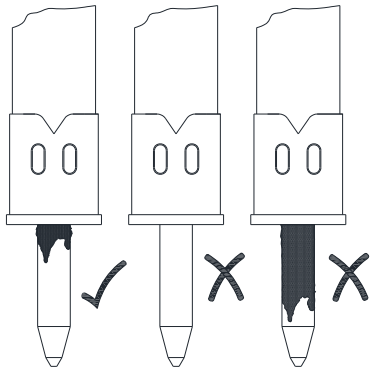


Fig. 6-14 Delivery Adjustment – OK ✓ - Lacking X - Excessive X

IMPORTANT

Keep the bushings and tool well lubricated during breaker operation. Actively monitor tool for sufficient lubrication. Lubricant must always be visible on the tool as shown in Fig. 6-14.

6.0 Installation – [cont'd]

6.9 Electrical Installation - General

When properly installed, the BreakerLube will start and stop simultaneously with the breaker. The BreakerLube must never operate if the breaker is not operating.

Many possibilities exist when it comes to wiring the BreakerLube. Wiring diagrams shown here, 1E thru 4E, are generic.

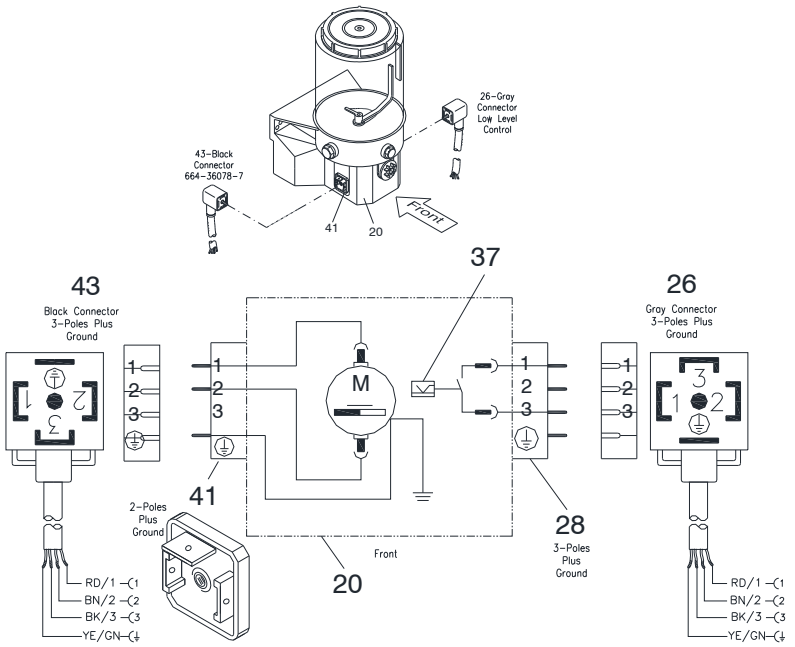


Fig. 6-15 Electrical Connections on Pump Housing (20)

6.10 Black Connector (43) Identified

The Basic Pump Assembly is provided with one black and one gray connector. The black connector (43) is pre-wired to a 4-conductor cable and used to power the motor.

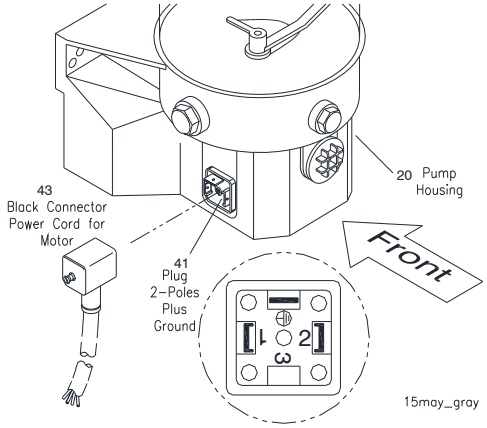


Fig. 6-16 Black Connector

The black connector is keyed (the pole positions) to fit the plug (41) that's located on the left side of the pump housing.

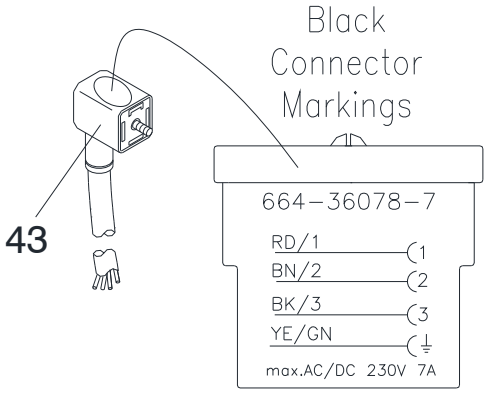


Fig 6-17 Black Connector - Top View Identified

6.0 Installation – [cont'd]

6.10.1 Basic Wiring '1E' Motor (LLC Disabled)

For Basic On / Off Operation of Motor Without LLC, refer to Fig. 6-18 1E. Wire the fuse and momentary switch per diagram.

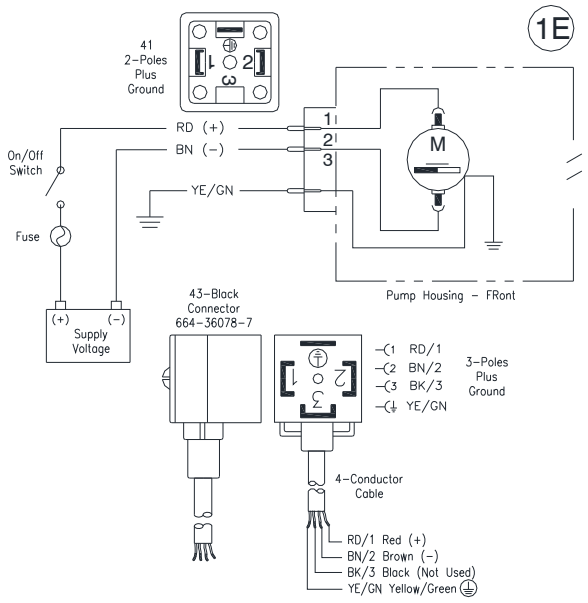


Fig. 6-18 '1E' Power to Motor – Basic Circuit

RD/1 Red (+)	BK/3 Black (Not used)
BN/2 Brown (-)	YE/GN (Ground)

1. Route and connect the power wire (RED) to the (+) side of battery after the in-line fuse and foot switch.

2. Route and connect the brown wire to negative side of battery (-).

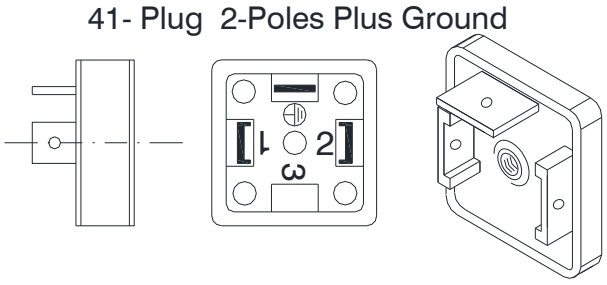


Fig. 6-19 Plug (41) 2-Pole Plus Ground

6.11 Gray Connector (26) Identified

The gray connector is keyed to fit the plug (28) located on the right side of the pump housing. It is pre-wired with a 4-conductor cable and used to wire the low level control to an alarm.

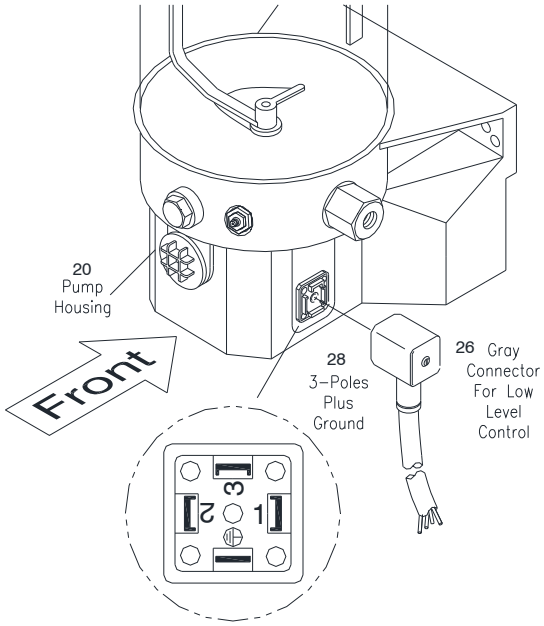


Fig 6-20 Gray Connector

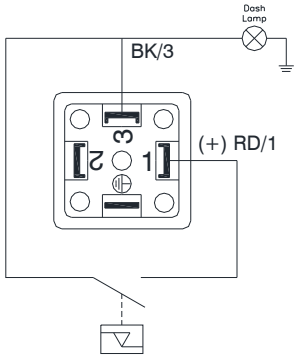


Fig. 6-21 Low Level Control Wired to Dash Lamp

One option is to use the low level control switch with a warning light. Or, add a relay and the switch can be used to activate a warning light and disable the breaker's operating valve.

RD/1 Red (+)	BK/3 Black (+)
BN/2 Brown (Not Used)	YE/GN (Not Used)

6.0 Installation – [cont'd]

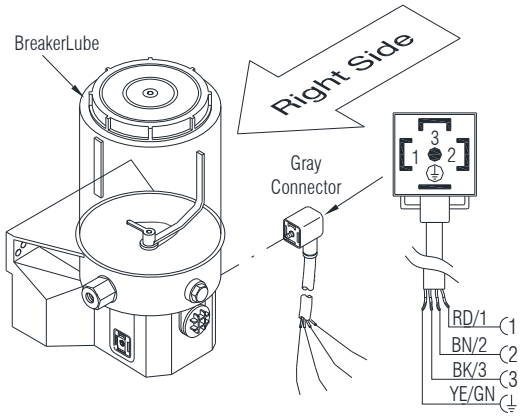


Fig. 6-22 Gray Connector – 3 Pole Plus Ground

6.12 Wiring '2E' LLC Stops Breaker / Activates Dash Lamp

Refer to Fig. 6-23 2E. Wire per diagram and instructions. When triggered, the Low Level Control cuts power to the breaker's operating valve. Wire 3 will hold the relay energized until ignition switch is turned off.

6.12.1 Electrical Diagram '2E' – Warning Light & Breaker Shut Down

1. Install the fuse holder in a location that's accessible for service.

2. Find a protected location for installing the relay.

3. Install the dash lamp in a position inside the cab so it's visible to the operator while the breaker is in operation.

6.12.2 Gray Connector (26) with Pre-wired Cord

RD/1 Red (+)	BK/3 Black (+)
BN/2 Brown (Not Used)	YE/GN (Not Used)

In Fig 6-23, wires identified as 1, 2, 3, 4, 5 and 6 are not supplied with the installation kit. Source locally.

6.0 Installation – [cont'd]

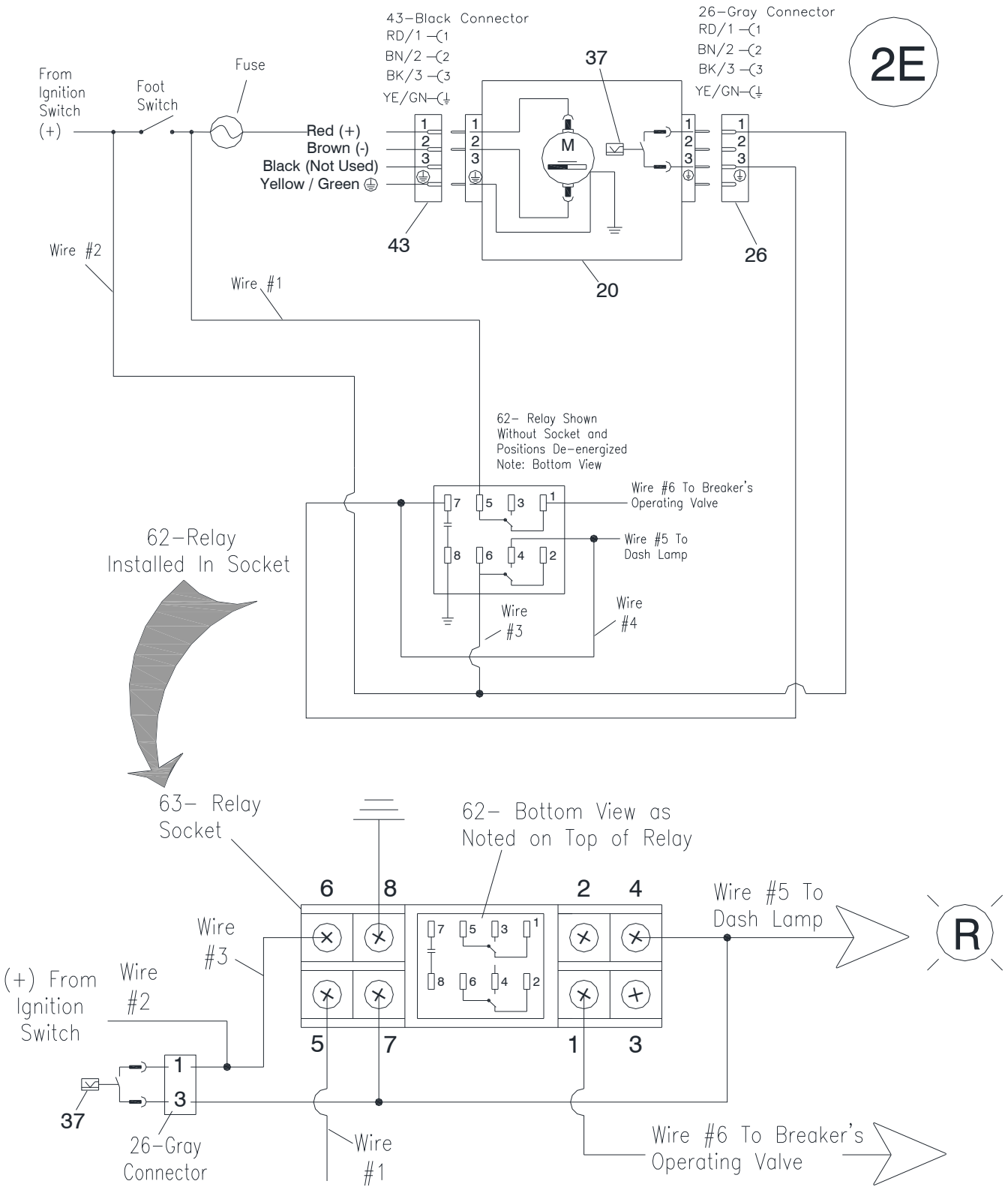


Fig. 6-23 Electrical Diagram '2E'

6.0 Installation – [cont'd]

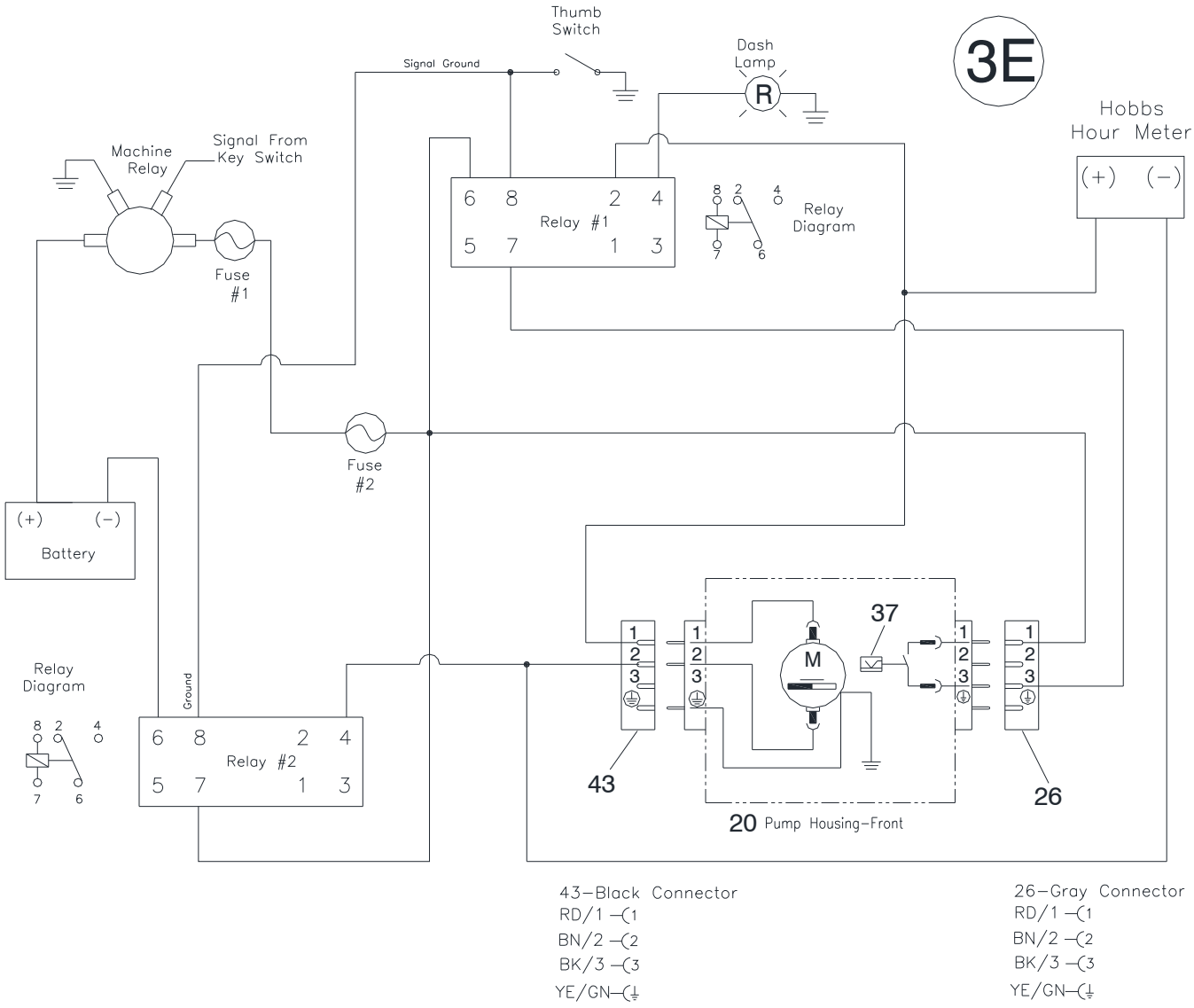


Fig 6-24 Electrical Diagram '3E'

6.13 Diagram 3E LLC Enabled and 2 Relays

Wire per Fig. 6-24 diagram '3E'.

Part Name	Part Number
Relay 24V	102598
Relay Socket	102599
Fuse Holder / Fuse	679342 / 815641
Dash Lamp 24V / Lens	102122 / 102597
Hour Meter	---

6.0 Installation – [cont'd]

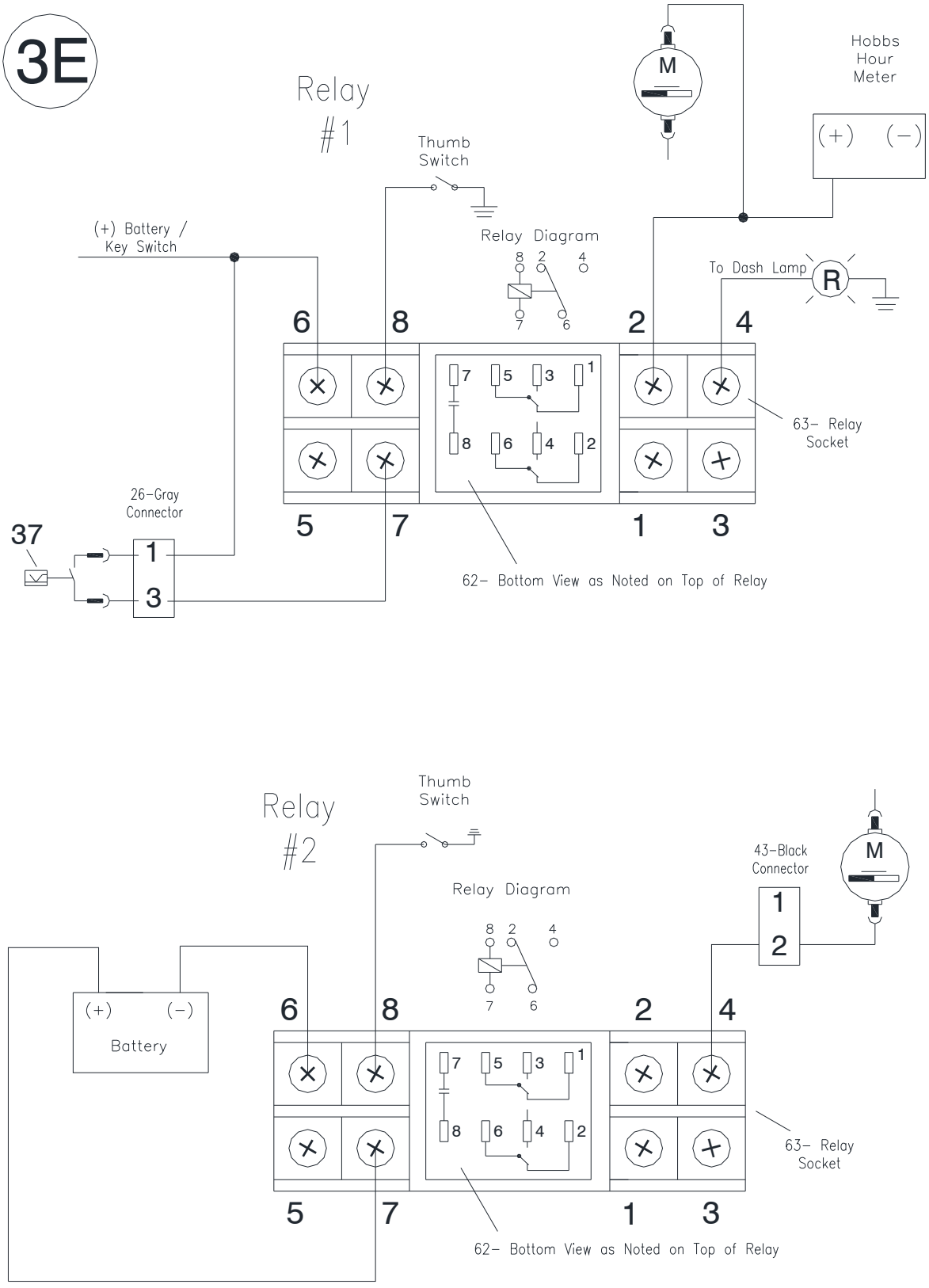


Fig. 6-25 Electrical Diagram '3E' Detail View Relay 1 & 2.

6.0 Installation – [cont'd]

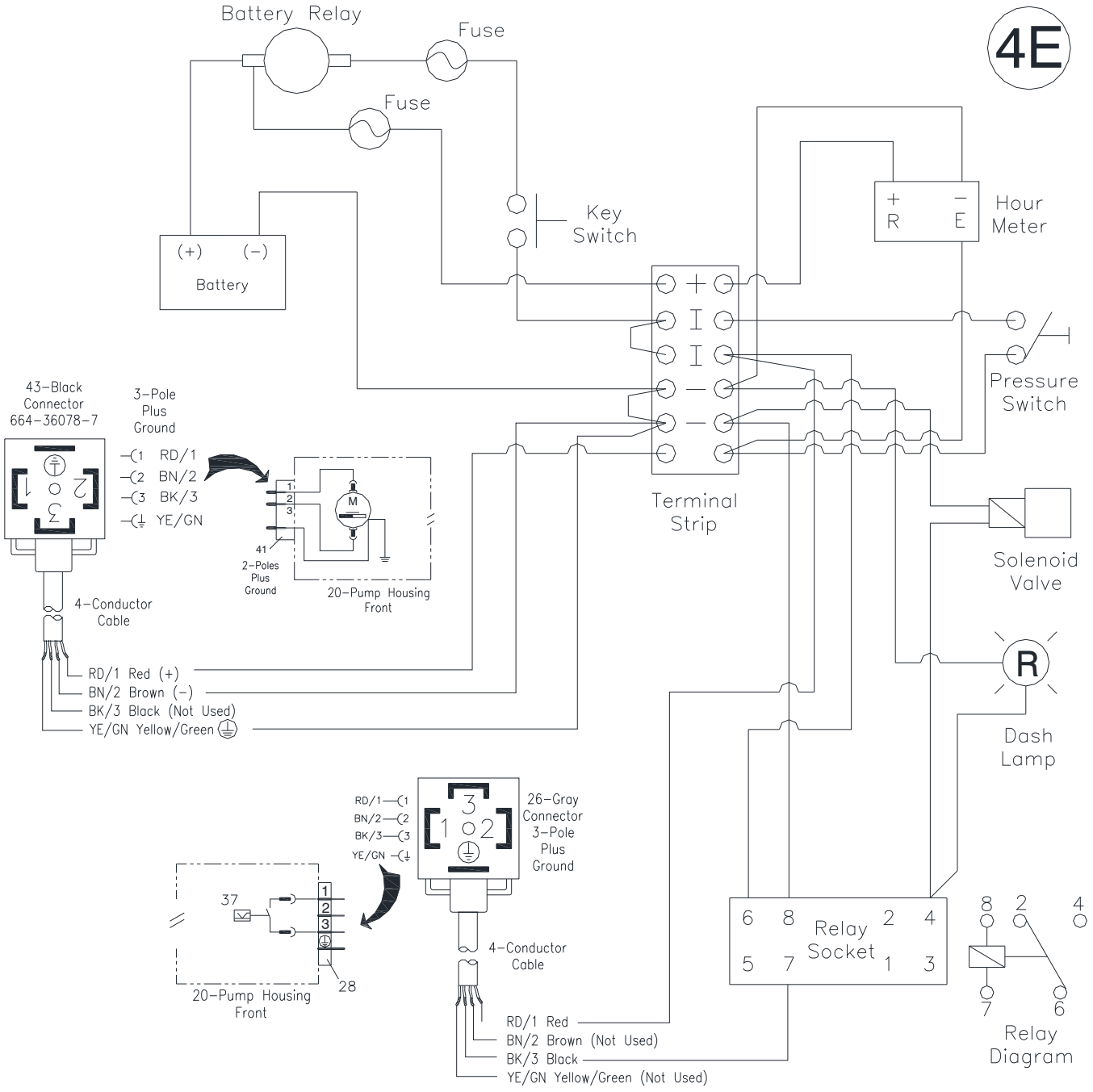


Fig. 6-26 Electrical Diagram '4E'

Part Name	Part Number	Part Name	Part Number
Relay 24V	102598	Fuse Holder / Fuse	679342 / 815641
Relay Socket	102599	Dash Lamp 24V / Lens	102122 / 102597
Hour Meter	---	3-way Valve	571327
Terminal Strip	---	Key Switch	---

6.0 Installation – [cont'd]

6.14 Pilot Operated Auxiliary Valve System

Refer to Fig. 26 4E. Wire per diagram.

With some carriers, the auxiliary valve is used to power the breaker. In these situations, additional components are required to tie in the electrical requirements of the BreakerLube.

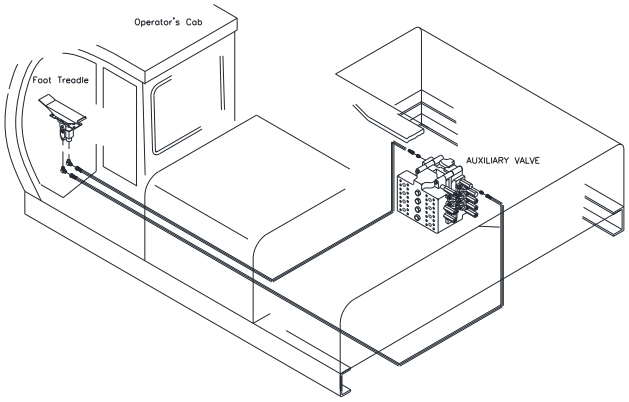


Fig. 6-27 Foot Treadle & Auxiliary Valve

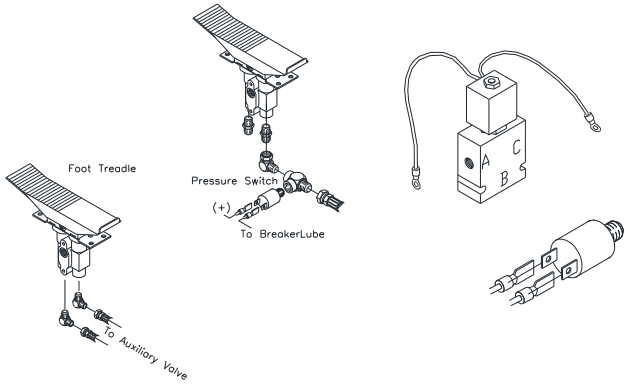


Fig. 6-28 Breaker Operated By Foot Treadle

For carriers using the auxiliary circuit with a foot treadle, the installation will require the addition of a pressure switch and 3-way valve.

The pressure switch becomes the power on / off switch for the BreakerLube. The 3-way valve is incorporated into the pilot lines and will activate if triggered by the low-level control.

NOTE: The switch and valve are not included in the BreakerLube kit. These items are available from Allied at an extra cost.

6.15 Commissioning System Pre-Start-up

Use the following checklist to verify proper installation and set-up of the BreakerLube.

- ☐ The BreakerLube is securely fastened to prevent movement.
- ☐ Wiring is completed and verified to operate BreakerLube only when breaker is operating. Correct rotation is verified. Operation of the Low Level Control should be verified before reservoir is filled
- ☐ Reservoir filled with clean grease (Test low level control prior to filling).
- ☐ The carrier has been operated through a complete range of motion to check lube lines for unrestricted movement without rubbing, excessive sag or kinking.
- ☐ Lube line connections are made at all connection points from pump to breaker.
- ☐ All lube lines have been pre-filled
- ☐ A solid flow of grease (no air bubbles) was verified at the open end of lube line at the 'G' port. Re-attach line.
- ☐ The breaker's bushings and tool have been filled with grease according to procedure found in the Breaker's Operator's Manual.
- ☐ If a new tool was installed, pre-greasing was completed before insertion into front head. Refer to Fig. 6-29. Follow the instructions found in the Operator's Manual for the breaker.
- ☐ The operator must actively monitor for new formation of grease around the bushings and tool. After the first 2 hours of operation, the operator should stop and check for fresh grease at the bushings and tool. Refer to Fig. 6-14.
- ☐ During the first few hours of operation, the operator should check for leaks. If leakage is detected, make repairs to eliminate.
- ☐ When all systems are verified as working properly, the BreakerLube should be maintained according to the checklist included in the 'Daily Walk-Around Inspection'.

6.0 Installation – [cont'd]

6.16 Set-up and Adjustment Procedures

CAUTION

When servicing this equipment, use personal protection equipment, including eye protection, to prevent splashing of material into eyes or onto skin.

CAUTION

Neglecting to complete the set-up and adjustment procedures may risk damage to bushings and tool. If left unchecked and flow of lubricant is disrupted or insufficient, even if only for a short time, the bushing and tool will be rendered unusable.

IMPORTANT

Before components are disassembled, take steps to prevent spills. Have a suitable container available to collect fluids. Comply with local regulations for fluid disposal.

The following start-up procedures must be carried out to protect the bushings and tool against damage resulting from deficient lubrication.

1. Pre-fill all lines and passages leading to the bushings and tool

2. If a new tool is installed, apply a liberal amount of lubricate to the shank of the tool before inserting into front head (Fig. 6-29).

3. Procedure #2 applies to tools and related parts that are wiped clean for purposes of inspection. These parts include retainers for tool.

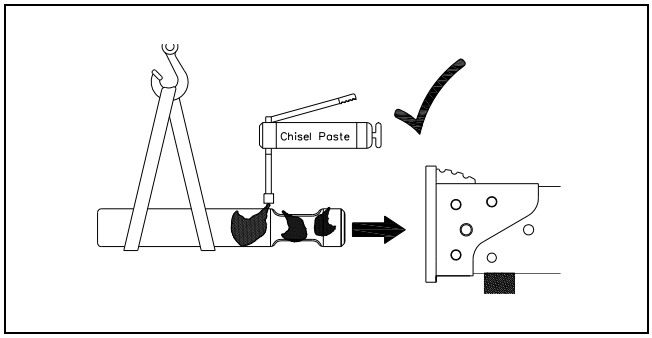


Fig. 6-29 Pre-Lube Tool Shank Before Installing

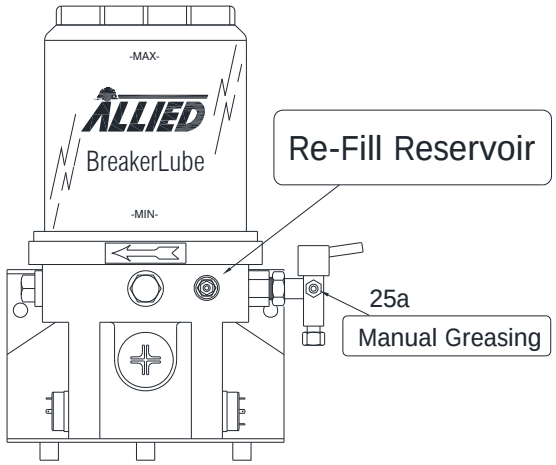


Fig. 6-30 Grease Fittings - Locations Identified

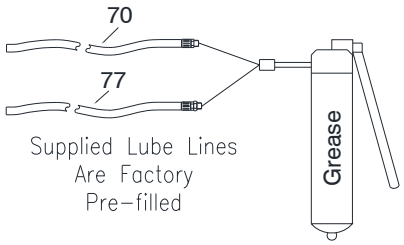


Fig. 6-31 Pre-fill Non-factory or Empty Lube Lines

6.17 Test Operation of BreakerLube

Testing verifies that the installation is completed properly and ensures both performance and function is in accordance with operating specifications.

Test Functionality of Delivery Output:

1. Disconnect hose at relief valve

2. Operate breaker (only long enough to complete test)

3. Confirm a solid flow of grease (no air bubbles) is visible

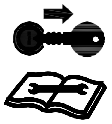
4. Re-attach hose end to pump

5. Make further adjustments, as needed, until performance and function is satisfactory

7.0 Maintenance

7.1 Maintenance - Safety Precautions

WARNING



Service in safe work areas. Unless otherwise instructed, all maintenance is performed with the work tool supported on stable ground. Ensure all loads remain adequately supported while performing any service work. Shut off the machine and remove the ignition key, engage interlock and apply parking brake.

Attention Read the Manual

- Only authorized and trained personnel familiar with this equipment shall perform repairs.
- Read and follow all equipment and machinery instructions.
- Do not modify, disable or interfere with any existing safety equipment already fitted to the carrier.
- Disconnect power supply before servicing.
- Do Not run BreakerLube with lid removed.
- Always stop operation to re-fill.
- Switch off power supply before re-filling the reservoir.
- Check all lube lines for damage. Replace as necessary.

CAUTION

When servicing this equipment, use personal protection equipment, including eye protection, to prevent splashing of material into eyes or onto skin.

IMPORTANT

Before components are disassembled, take steps to prevent spills. Have a suitable container available to collect fluids. Comply with local regulations for fluid disposal.

7.2 Grease Level Inside the Reservoir

CAUTION

Make regular checks of the grease level in reservoir and re-fill when nears the minimum mark. Always refill reservoir as soon as low-level signal is triggered. If the grease inside the reservoir is fully depleted, air will have entered the system. Air pockets disrupt the flow of grease and are time-consuming to purge. Follow instructions in Section 7.5.

CAUTION

The reservoir may burst if overfilled. DO NOT exceed the 'MAX' fill mark. Blocking the vent can affect grease flow.

The grease level is visible through the clear reservoir. Keep levels between the marked 'MIN' and 'MAX' lines.

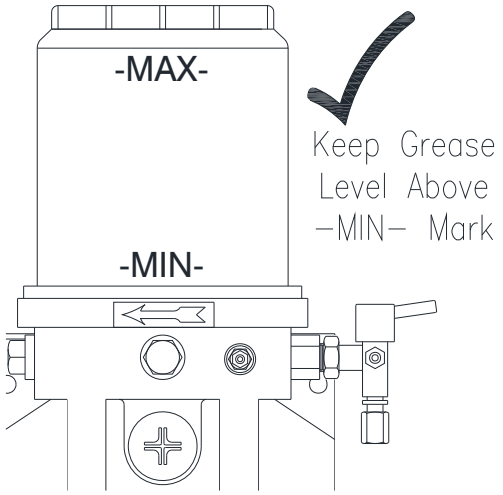


Fig. 7-1 MIN / MAX Grease Levels Identified

A steady supply of lubricant is vital for controlling heat and contamination which are the main cause of wear with bushings and tools. Though the bushing and tool may be sufficiently lubricated at first, if levels are not constantly replenished, rapid deterioration will result.

Actively monitor the tool for sufficient lubrication. Refer to Fig. 7-4. A wet covering of lubricant must be visible on the tool shank at all times when working.

7.0 Maintenance – [cont'd]

7.3 How to Re-fill the Reservoir

WARNING

Electric shock hazard. Shut off power to BreakerLube before servicing.

CAUTION

Crush / entanglement hazard. Keep hands clear of moving parts. Shut off power to BreakerLube before servicing.

CAUTION

Follow correct procedures to prevent the formation of air pockets. Air pockets disrupt the flow of grease to bushings and tool and are time-consuming to purge. The low level control is triggered when the grease level has reached the intermediate plate. Stop and re-fill the reservoir through the grease nipple located on the front of pump housing.

CAUTION

Contamination interferes with reliable operation and will shorten pump life. Prevent contaminants from entering when re-filling. Do not re-fill by removing the reservoir lid. Store unused portions of Chisel Paste in a clean dry area. Do not use grease that has change consistency over time.

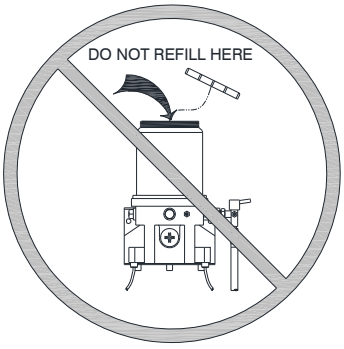


Fig. 7-2 Unapproved Re-fill Method

The recommended method for refilling the reservoir is thru the grease nipple located on the front of the pump housing.

1. Use a hand operated grease gun (manual lever or power type). Wipe debris from grease nipple. Attach the grease gun to lubrication nipple on the front of the pump housing.

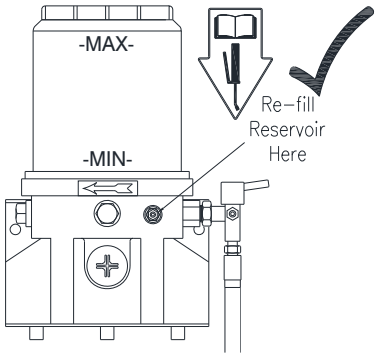


Fig. 7-3 Reservoir Re-fill Location Identified

CAUTION

The reservoir may burst if overfilled. DO NOT exceed the 'MAX' fill mark. Blocking the vent can affect grease flow.

7.4 Daily Walk Around Inspection

- Check the grease level in reservoir. Re-fill as necessary.
- Check for leaks in system. Tighten connections that are loose.
- Replace kinked, crushed or worn hoses.
- Check relief valve at pump element for signs of grease discharge. If buildup is observed, locate restriction and make necessary corrections.

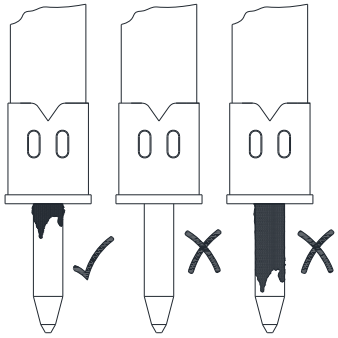


Fig. 7-4 Delivery Adjustment – OK ✓ - Lacking X - Excessive X

7.0 Maintenance – [cont'd]

- Check bushings and tool for fresh grease. A wet coating must be clearly visible on the tool shank at all times when working. Fig. 7-4.

7.5 Replace Lube Lines – Pre-fill and Bleed

IMPORTANT

Inspect grease lines regularly for damage. If replaced, the hose must be the correct size and type. Minimum diameter is 0.25 in. (6.35mm). The hose must be pre-filled before the breaker is operated.

It's important to pre-fill replacement hoses. Do not use the BreakerLube to pre-fill empty lube lines. The delivery output is much too low to perform this task. Use a grease gun to pre-fill lines and bleed air pockets.

If lube lines are replaced or pumped dry, bleed air pockets and fill hose as follows:

1. Disconnect lube line at breaker.
2. Attach grease gun to lube fitting on relief valve. Refer to Figure 7-5.
3. Continue to pump grease until a solid flow without bubbles is seen at open end of hose.
4. Re-attach lube line to breaker.

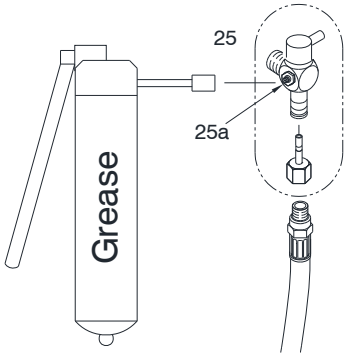


Fig. 7-5 Grease Fitting 25a On Relief Valve

IMPORTANT

Before components are disassembled, take steps to prevent spills. Have a suitable container available to collect fluids. Comply with local regulations for fluid disposal.

7.6 By-pass BreakerLube Grease By Hand

CAUTION

When servicing this equipment, use personal protection equipment, including eye protection, to prevent splashing of material into eyes or onto skin.

The breaker's bushings and tool can be lubricated manually if needed. Attach the grease gun to lube fitting on relief valve. Refer to Figure 7-5.

7.6.1 Manual Greasing Tool At BreakerLube

Locate the grease nipple on the relief valve for manual greasing of the breaker (Fig. 7-5).

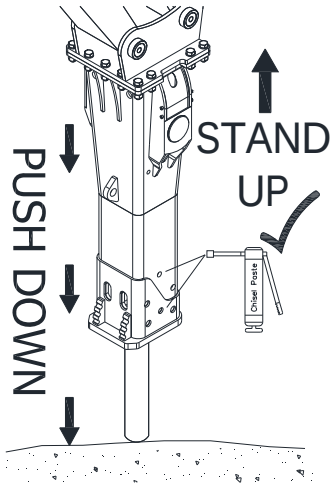


Fig. 7-6 Manual Tool Greasing At Front Head

Instructions Must Be Followed Carefully to Avoid Damage:

1. Stand Breaker Upright
2. Push Tool Against Firm Surface Until Top Of Tool Is Fully Seated Against Thrust Ring

☑ OK To Grease Tool

7.6.2 Manual Greasing Tool At Front Head

Locate the grease nipple(s) at the breaker's front head. (Fig. 7-6 Location may vary by model).

7.0 Maintenance – [cont'd]

Instructions Must Be Followed Carefully to Avoid Damage:

1. Stand Breaker Upright
2. Push Tool Against Firm Surface Until Seated Against Thrust Ring

☑ OK To Grease Tool

CAUTION

Improper re-lubrication of bushings and tool may result in damage.

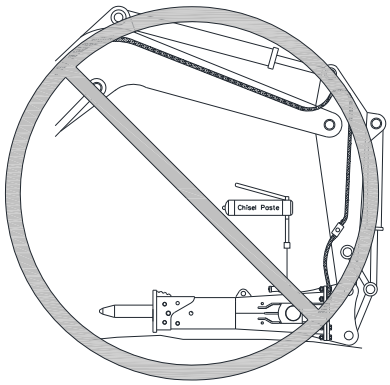


Fig. 7-7 DO NOT Grease Tool When Horizontal

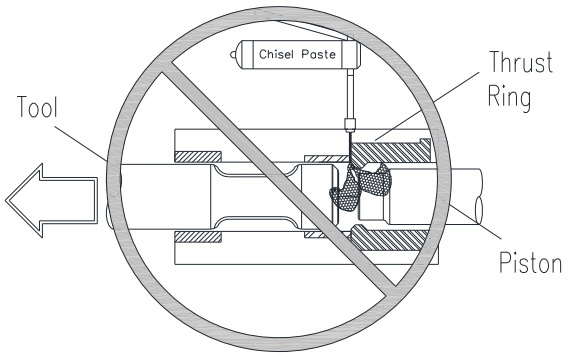


Fig. 7-8 Tool Unseated - Risk of Seal Damage

CAUTION

Use the BreakerLube only for dispensing grease. Allied recommends the use of Chisel Paste.

CAUTION

If the breaker is removed from the carrier or lube line is disconnected, power to the BreakerLube must be switched off. If power is not cut-off, grease will continue to pump from open line or relief valve.

IMPORTANT

Use benzene or petroleum for cleaning the system. Do not use tri-perchloroethylene or similar solvents. Do not use polar organic solvents such as alcohol, methylacohol, acetone or similar chemicals.

8.0 Removal and Storage

8.1 Removal (Uninstall) BreakerLube From Carrier

CAUTION

The BreakerLube can generate high pressure. Relieve trapped pressure before disconnecting or removing existing hoses on the carrier.
When servicing this equipment, use personal protection equipment, including eye protection, to prevent splashing of material into eyes or onto skin.

IMPORTANT

Contamination interferes with reliable operation and will shorten pump life. Prevent dirt and debris from entering the pump system. Always clean the area around connections prior to opening the system.

IMPORTANT

Before components are disassembled, take steps to prevent spills. Have a suitable container available to collect fluids. Comply with local regulations for fluid disposal.

8.2 Disconnect From Power Supply & Remove Lube Lines

1. Disconnect electrical connections.
2. Disconnect lube line(s) from the BreakerLube at push connector located on the pressure relief adapter.
3. Disconnect lube line(s) from the breaker's 'G' port.
4. Plug openings to protect dirt and debris from entering.
5. Loosen and remove bolts holding BreakerLube to mounting plate.

8.3 Storage and Handling Techniques

- Store BreakerLube in a secure place and protected against heat, dust and moisture.
- Reinstall mounting hardware on BreakerLube to avoid loss or damage.
- Prevent contamination from entering the system. Plug openings to keep out dirt and debris.

8.4 Re-attach After Idle Period

Grease may change its characteristics and deteriorate during periods of storage. The rate and degree in which grease may deteriorate can vary.

Some grease may undergo change in consistency becoming firmer and forming a putty-like condition that can impair the operation and reliability of the BreakerLube. This behavior can occur when grease is stored for long periods or exposed to heat or becomes contaminated.

Contaminates from dusty conditions can draw out the base oils from the thickener system, resulting in the thickening of the grease.

- **X** Do not use any grease that shows signs of contaminants. Discard and replace with new grease.
- **X** Do not use grease that has changed consistency over time.
- **X** Do not use grease if stored for long periods of time unless their condition and cleanliness can be verified. If grease is more than a year old, the National Lubricating Grease Institute (NLGI) recommends that it be inspected and the worked penetration tested to ensure that the grease is still within its intended NLGI grade.

8.4.1 Re-attach BreakerLube

1. Remove grease if it has changed consistency over time. Clear any blockages formed by hardened lubricant.
2. Clean all fittings before connecting.
3. Refer to SECTION 6.0 for installation instructions.

CAUTION

If a lube line is replaced, it must be pre-filled with lubricant before the breaker is operated. Follow procedure in Section 7 for important instructions.

8.0 Removal and Storage – [cont'd]

CAUTION

Pre-filled lube lines are supplied as part of the kit. If alternate hose is used, it must be at least .25 in. (8 mm) id nominal. Always pre-fill any replacement hose.

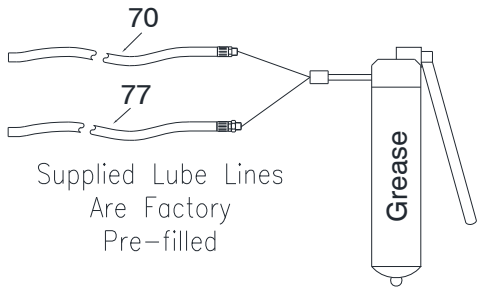


Fig. 8-1 Lube Lines Supplied with Installation kit are Pre-filled with Grease

8.4.2 System Start-up Checklist

Use the following checklist to verify proper installation and set-up of the BreakerLube.

- ☐ The BreakerLube is securely fastened to prevent movement.
- ☐ Wiring is completed and verified to operate BreakerLube correctly. Operation of the Low Level Control should be verified before reservoir is filled
- ☐ Reservoir filled with clean grease
- ☐ The carrier has been operated through a complete range of motion to check lube lines for unrestricted movement without rubbing, excessive sag or kinking.
- ☐ Lube line connections are made at all connection points from pump to breaker.
- ☐ All lube lines have been pre-filled
- ☐ Grease delivery was verified at the open end of lube line at the 'G' port. Line then re-installed.
- ☐ The breaker's bushings and tool have been filled with grease according to procedure found in the Breaker's Operator's Manual.
- ☐ If a new tool was installed, proper procedures were followed and pre-greasing was completed before insertion into front head. These instructions can be found in the Operator's Manual.
- ☐ The operator must confirm operation of the pump by monitoring the presence of grease around the bushings and tool. During first 2 hours of initial operation, the operator should stop and check that fresh grease is seen at the bushings and tool.
- ☐ During the first few hours of operation, the operator should check for any leaks. If leakage is detected, make repairs to eliminate.
- ☐ When all systems are verified as working properly, the BreakerLube should be maintained according to the checklist included in the 'Daily Walk-Around Inspection'.

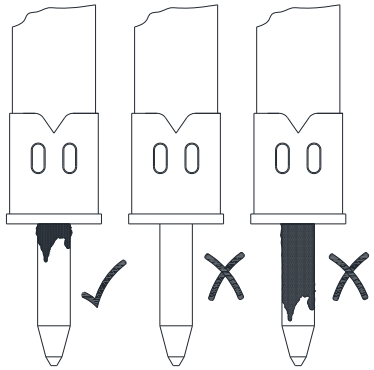


Fig. 8-2 Delivery Adjustment – OK ✓ - Lacking X - Excessive X

CAUTION

The formation of air pockets is minimized when the reservoir is replenished through the grease nipple located on the front of the pump housing, (Fig. 7-3). Following this method eliminates the need to prime and bleed air from the pump or lines.

9.0 Troubleshooting

Troubleshooting

> **CAUTION**
>
> Follow referenced procedures when correcting faults. Observe all CAUTIONS and WARNINGS.

The function and performance of this device is highly dependent upon proper installation and setup.

If the BreakerLube CML fails to work properly and the cause cannot be determined from the troubleshooting table below, contact Allied's Technical Service Department for further assistance.

Fault	Possible Cause	Remedy
Pump fails to run	Power supply interrupted	Check fuse and voltage at power supply. The motor voltage and supply voltage must match.
	Mechanical bind prevents motor rotation	Clear obstruction
Pump running, but lubrication fails to reach discharge point	Reservoir is empty	Fill Reservoir with chisel paste. Trigger a lube cycle and allow pump to operate until grease dispenses from lubrication point.
	Blockage	Impurities in grease. Damaged lube lines. By-pass at relief valve. Vent on reservoir is blocked.
	Formation of air pocket	Disconnect line at pump and run pump until solid flow of grease is verified. Next bleed air from lines with grease gun attached to lube fitting on relief valve.
	Lube line replaced but not pre-filled	Pre-fill line using grease gun. Do not attempt pre-fill with pump.
Pump running, but delivery output at discharge point is low	Cold temperature.	Check NLGI number of grease. Pumpability of selected grease is too high. At cold temperatures lubricant it may take up to 10 minutes of operation before the pump elements reach their full output.
	Restriction in line	Clear impurities. Locate source of contamination and eliminate. Line size is too small. Kinked or crushed hose.
	By-pass	Bypass at relief valve or piston. Check valve inside pump element not closing.
	Worn parts	Inspect piston, check valve and spring for wear.
Formation of air pockets or contamination	Incorrect re-filling method	Re-fill reservoir with clean grease at fitting located on pump housing. Pre-fill replacement lines. Keep lid on reservoir. Store grease properly. Do not use contaminated grease or grease that has changed consistency over time. Wipe grease fitting before attaching grease gun.

Pumpability is the ability of grease to be pushed through passages until it is distributed at points where the lubrication is needed. Pumpability, in terms related to grease-dispensing systems and their use with breakers, is defined as the ease with which grease can flow through hoses, fittings and passages that lead to the front head and bushings.

Pumpability becomes increasingly difficult at colder temperatures. If the system is to be used in temperatures below freezing, a cold weather paste must be used. In such cases, please contact Allied's Technical Service Department for recommended cold weather pastes.

The use of Allied Chisel Paste is recommended for all Allied breakers. Allied Chisel Paste can be used in a temperature range of 32º F to 122º F (0º C to 50º C).

10.0 Technical Data

Table 10.1 BreakerLube CML Specifications

Weight	1 gallon……	21 lbs. [9.5 kg]
	2 gallon..….	22 lbs. [9.8 kg]
Reservoir Capacity……..		1 & 2 gal. [4 & 8 liter]
Operating Pressure (max)…….		3600 psi [248 bar]
Pressure Relief Valve……..		4000 psi (+/- 250) [276 bar (+/- 17)]
Output/Min Per Element……..		.244 in^3/min [4 cm^3/min]
Piston Diameter……..….		.28 inch [7 mm]
Available Outlets……..		Up to 3 pump elements
Connection Thread – Element.		
Connection Thread – QD……..		1/8 NPT (F) QD (Push Connector)
Pumpable Lubricants……..		Greases up to NLGI grade 2
Motor Voltage……..		12Vdc or 24Vdc
Motor Connection Type…….		2-Pole Plus Ground
Black Connector……..		Pre-Wired With 4-Conductor Cord
Input Current……..……		3 A
Fuse……..		5 A (250V/5A Bussman)
Pump Operating Time*…..……		30 minutes max.
Motor……..		D-C gear (interference-suppressed)
Max. Power Input……..		24VDC, 3 A 12VDC, 6.5 A
Speed……..		17 RPM (approximate)
Low-level Control……..……..		Switched current 3 A
LLC Connection Type……..		3-Pole Plus Ground
Gray Connector……..……		Pre-Wired With 4-Conductor Cord
Operating Temperature…..……		-13°F to 158°F [-25°C to 70°C]
Storage Temperature……..		-13°F to 176°F [-25°C to 80°C]

***** The motor is designed for intermittent operation. Run time is 30 minutes maximum.

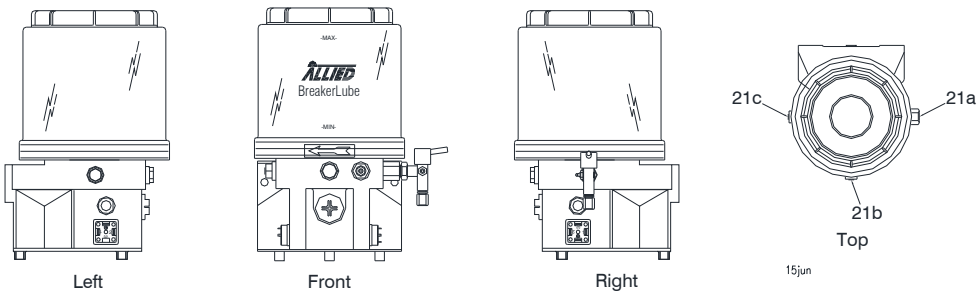


Fig. 10-1 Views Identified

10.0 Technical Data – [cont'd]

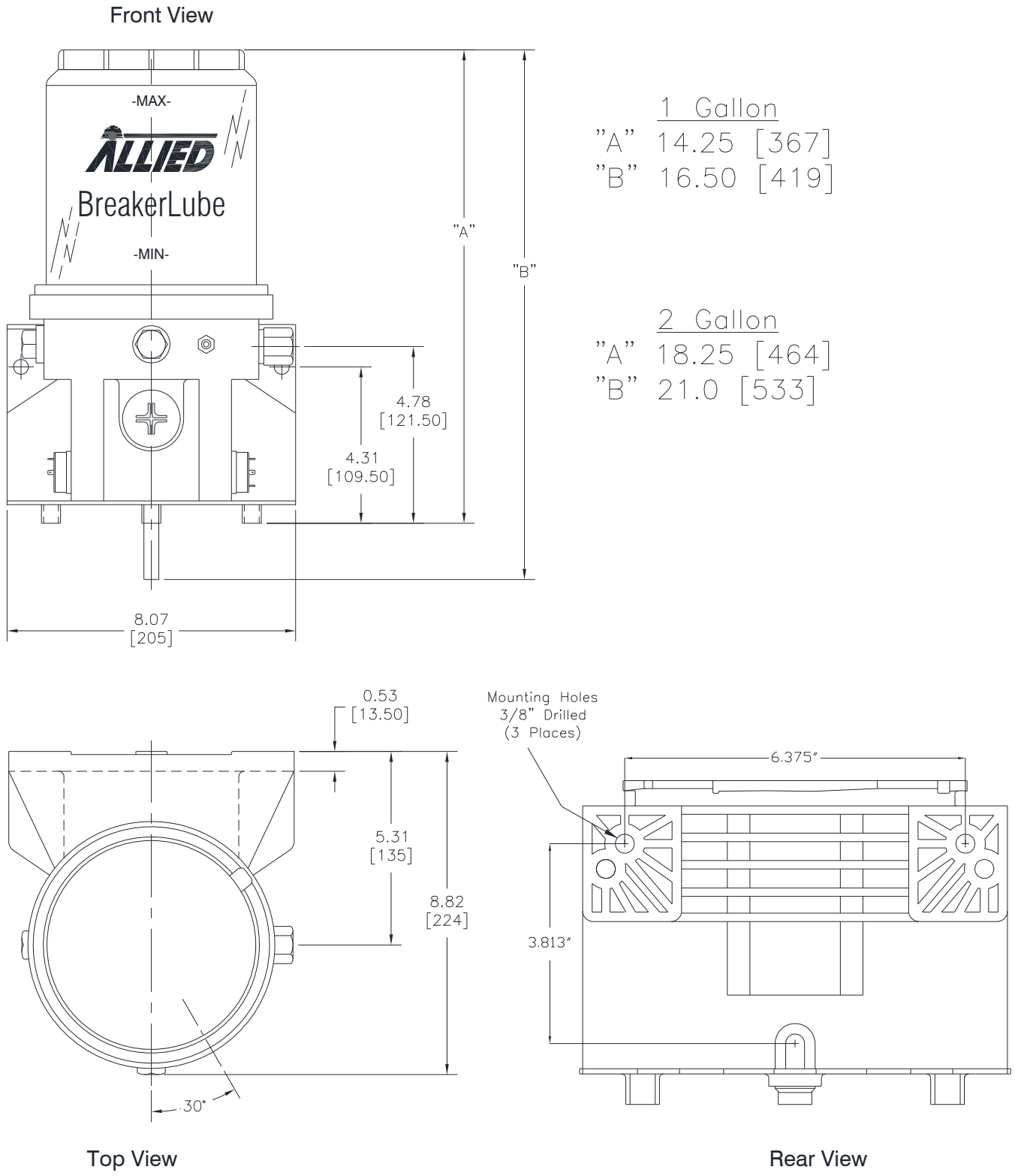
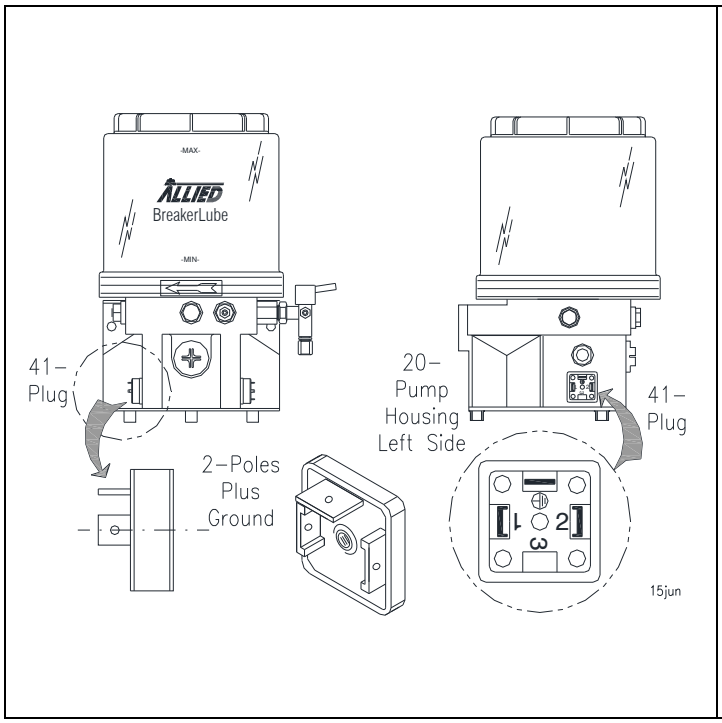
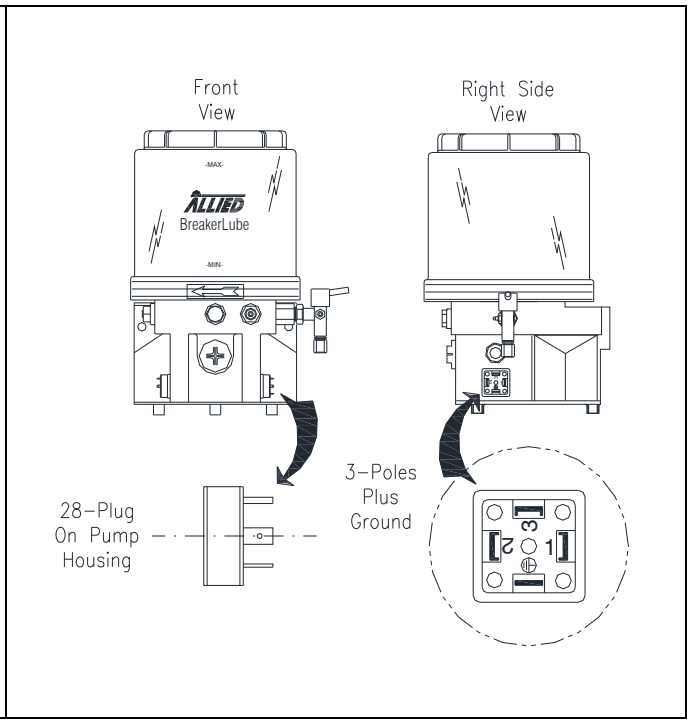


Fig. 10-2 BreakerLube CML Series General Dimensions Identified

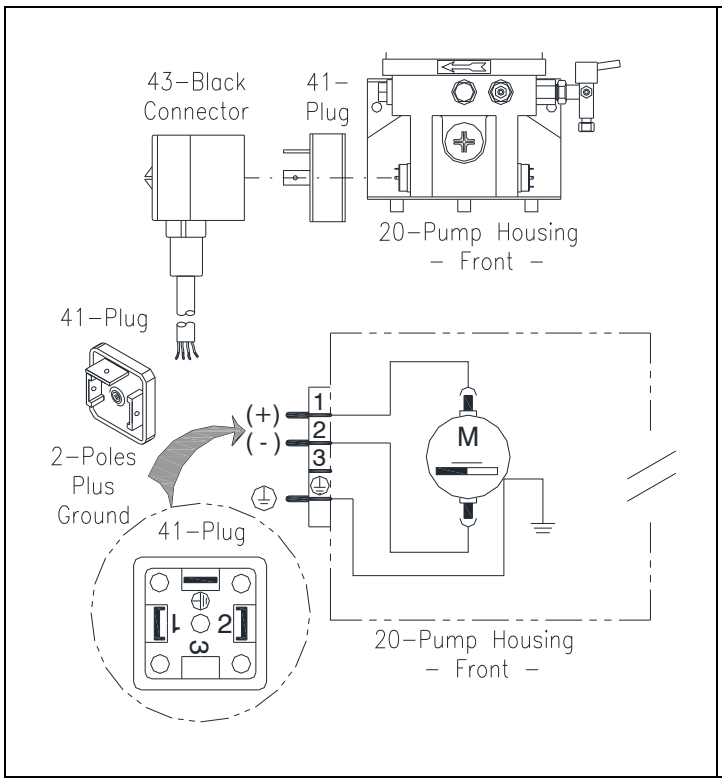
10.0 Technical Data – [cont'd]



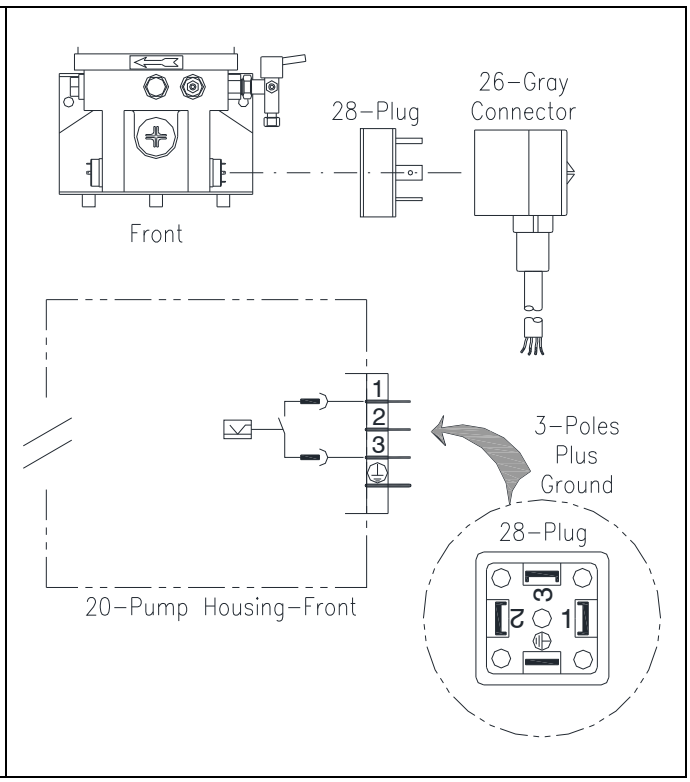
Left Side Plug 41 (Motor) 2-Poles Plus Ground



Right Side Plug 28 (LLC) 3-Poles Plus Ground



Left Side Black Connector 43 (Motor)



Right Side Gray Connector 26 (LLC)

Fig. 10-3 Location of Electrical Plugs and Connectors Identified

11.0 Parts – Basic Pump Assembly

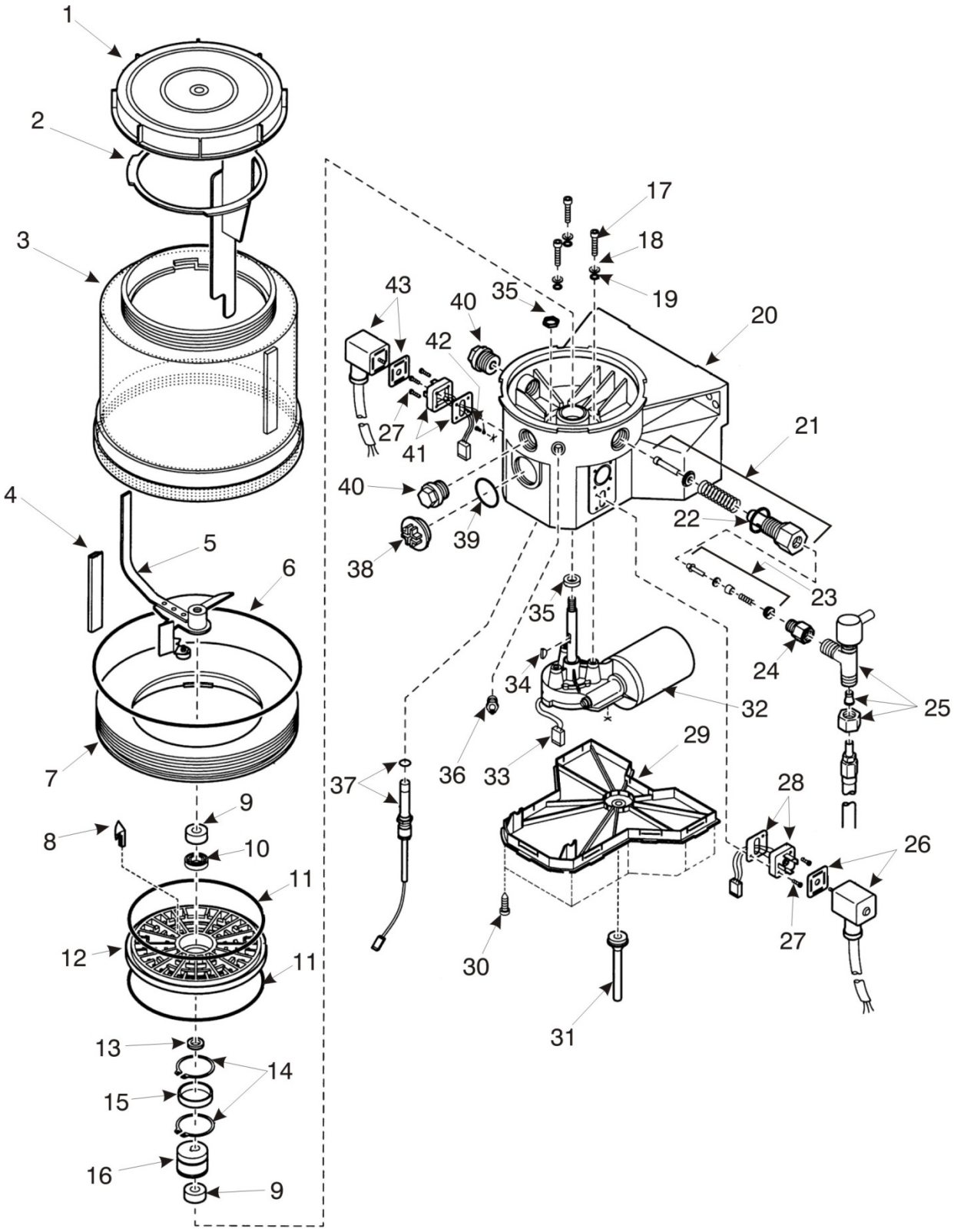


Fig. 11-1 Basic Pump Assembly BreakerLube CML Series

11.0 Parts – Basic Pump Assembly – [cont'd]

Table 11.1 Parts List for BreakerLube Basic Pump Assembly – CML Series

		Part Number
'A' - Basic Pump Assembly*	2 Gallon, 24V w/ Single Pump Element	A102472
	1 Gallon, 24V w/ Single Pump Element	A102473
	1 Gallon, 12V w/ Single Pump Element	102474

Table 11.2

Item	Part Name		Part No.	Qty	Description / Remarks / Notes
1	Top Cap		103767	1	
2.1	Fixed Paddle	1 Gallon	103830	1	
2.2		2 Gallon	103768		
3.1	Reservoir	2 Gallon	103769	1	
3.2		1 Gallon	103829		
4	Hose		103770	1	10 cm
5	Stirring Paddle		103771	1	
6	O-Ring		103772	1	210 x 5
7	Adapter Ring		103773	2	
8	Control Cam		103774	1	
9	Bearing Ring		103775	2	
10	Bearing		103776	1	
11	O-Ring		102628	1	144 x 4
12	Intermediate Plate		102610	2	
13	Shim		A103777	1	10 mm x 16 mm x 1.2 mm
14	Snap Ring		103778	2	
15	Pressure Ring		103779	1	33 mm x 37mm x 13 mm
16	Eccentric Cam		102612	1	
17	Hex Screw		103780	3	M6 x 25 C
18	Washer		103781	3	
19	O-Ring		A103782	3	6 mm x 2 mm
20	Housing,		103784	1	from S/N 9810010250 & 981000064c
	Housing (20), Cover (29), Screw (30) Kit		103785	1	

*BPA unit without pcb controller

11.0 Parts – Basic Pump Assembly – [cont'd]

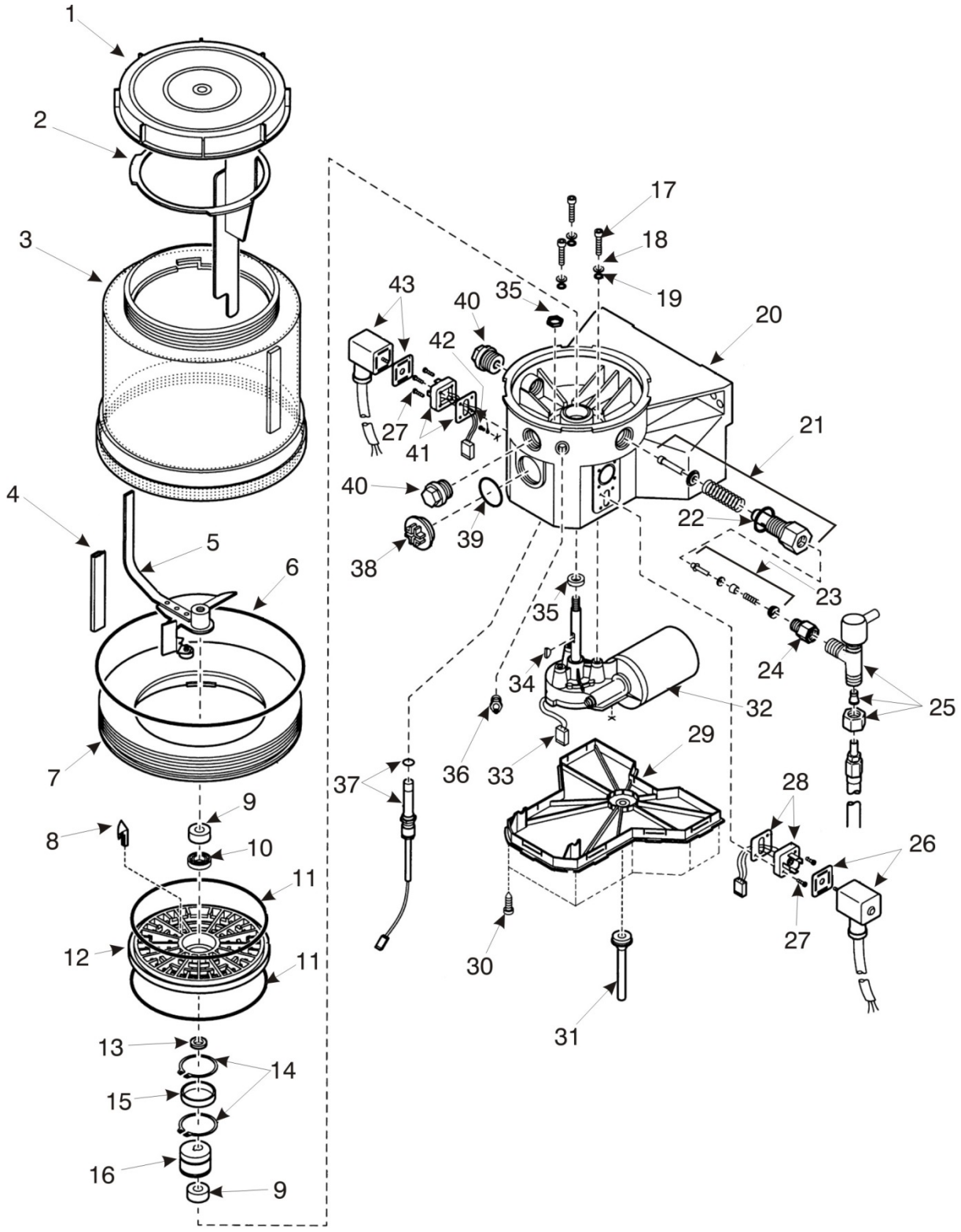


Fig. 11-1 Basic Pump Assembly BreakerLube CML Series

11.0 Parts – Basic Pump Assembly – [cont'd]

Table 11.2

Item	Description	Part No.	Qty	Description / Remarks / Notes
21.1	Pump Element, Chisel Paste	102623	1	Standard – Fixed Delivery
21.2	Pump Element, Adjustable	103692	---	Option
22	Gasket Seal	103786	1	
23	Check Valve	A103787	1	
24	Adapter Extension	103476	1	04BSPT
25	Pressure Relief Assembly	102625	1	Includes a & b
25a	QD (Push Connector)	102627	1	
25b	Grease Nipple	---	1	
26	Gray Connector Pre-Wired Cord	103788	1	3-Pole Plus Ground / 4-Conductor Cord
26a	Flat Packing	---	1	Gasket
27	Screw	A103789	8	BZ 3 x 10 C
28	Plug - LLC	103790	1	3-Pole Plus Ground
29	Cover	103791	1	From S/N 9810010250 & 981000064C
30	Screw	103792	10	M3 x 25 mm
31	Drain Hose	103793	1	
32.1	12Vdc Motor	103794	1	
32.2	24Vdc Motor	103795	1	
33	Plug, Motor	103796	1	
34	Woodruff Key	103797	1	3 x 5
35	Radial Seal,	A103798	1	BA 10 x 22 x 7
36	Lube Fitting	A103799	1	
37	Magnetic Switch	103800	1	Low Level
38	Sealing Plug	102620	1	M33 x 2
39	O-Ring	A103802	1	31 x 2
40	Closure Plug	103803	2	M22 x 1.5 x 12
41	Plug - Motor	103804	1	2-Pole Plus Ground
42	Self-Tapping Screw	103805	1	3.9 x 6.5 C
43	Black Connector Pre-Wired Cord	103806	1	664-36078-7 / 4-Conductor Cord
43a	Socket	103801	1	
43b	Flat Packing	103783	2	Gasket

11.0 Installation Kits

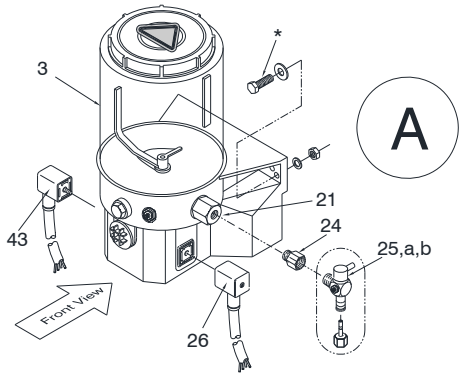


Fig 11-2 Basic Pump Assembly

Table 11.3 List of Items Shipped Standard With Basic Pump Assembly

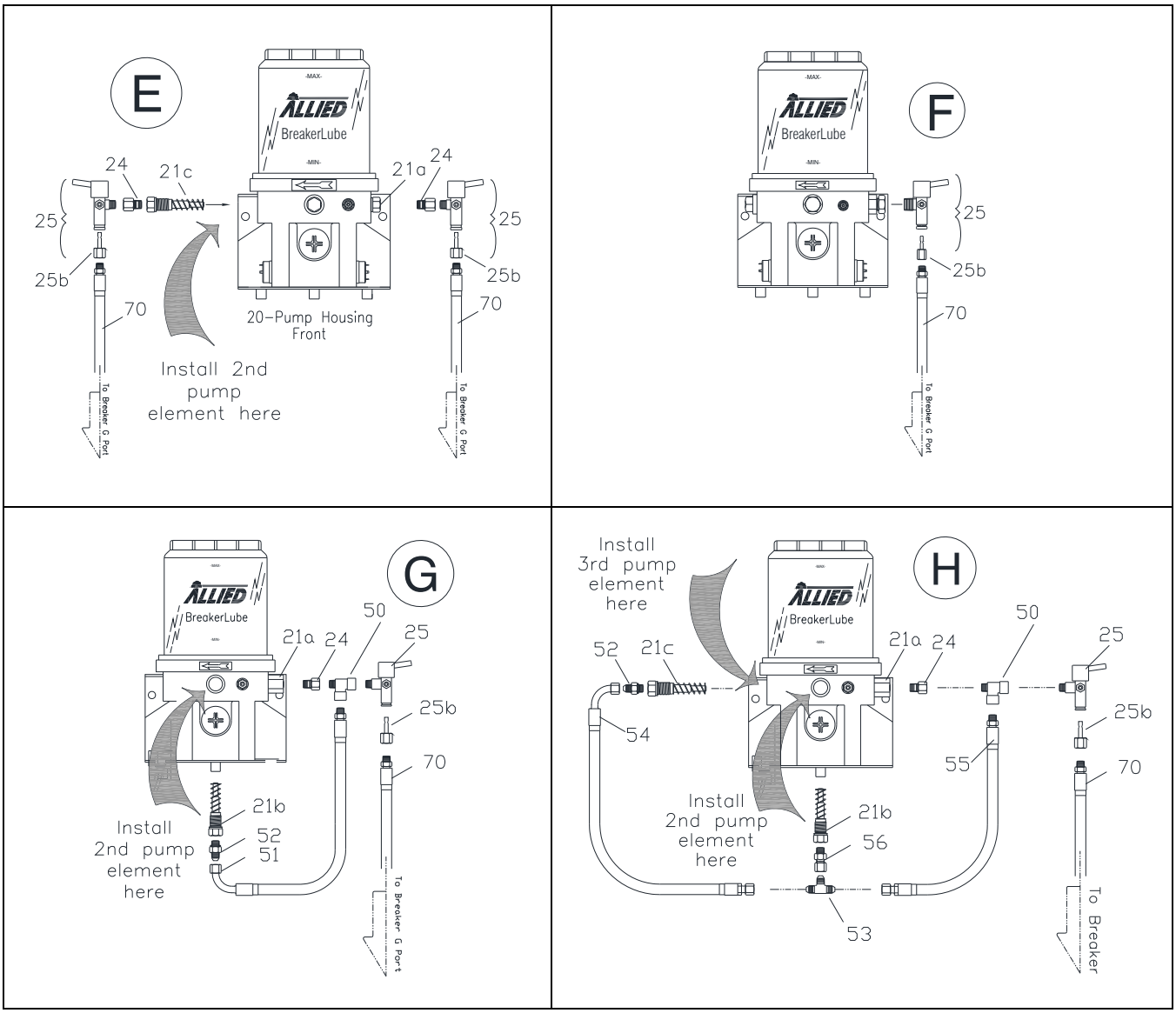
Pos	Part Name	Part No.	Qty	Description / Remarks / Notes
A	Basic Pump Assembly	A102472	1	2 Gallon Reservoir / 24VDC
		A102473		1 Gallon Reservoir / 24VDC
		102474		1 Gallon Reservoir / 12VDC
21	Pump Element	102623	1	Fixed (Standard)
24	Adapter BSPT	103476	1	04FBSPT X 04MBSPT
25	Relief Valve Assembly	102625		
25a	Grease Nipple	---	1	Assembly 25 Includes a & b
25b	Quick Disconnect (Push Connector)	102627		
26	Gray Connector with 4-wire cord	103788	1	
43	Black Connector with 4-wire cord	103806	1	
*	Mounting Hardware	---	1-Set	Bolts, Washers & Nuts

Table 11.4 Configuration of Installation Kits

Kit Number	576461	572063	572064	572065	572066	572067
Basic Pump	A102472					
Config.	F[1)]-40’	E [1)]-60’	F-60’	G	H-80’	G-80’
Elements	1	2	1	2	3	2+2
Element Kit	None	None	None	102602	570954	102602
Relief Valve	1	2	1	1	1	1+1
Line Kit	102603	571371	A102475	571925	571925	571925
Line(s)	1	2	1	1	1	2
Electric Kit-24V	102601					
Mounting Bracket	102696					

Note E [1)]: ‘E’ Kits Include the 2nd Lube Line, 2nd Pump Element and the 2nd Relief Valve.
Note F[1)]-40’: Kit 576461 Bill of Material includes hose 576449. This hose replaces standard hose 572521.

11.0 Installation Kits / Parts - Plumbing



Figs. 11-3 E, F, G, H

Table 11.5 Installation Kits – Rammer Series

Rammer Series	Config.	Part No.	Description / Remarks / Notes
1533, 2155	F-40’	576461	
1655, 2166, 2577	F-60’	572064	
3088	E [1)]-60’	572063	Note E [1)]: ‘E’ Kits Include the 2nd Lube Line, 2nd Pump Element and the 2nd Relief Valve.
4510	H-80’	572066	
7013	G-80’ X 2	572067	Basic pump x2 each equipped with x2 pump elements

11.0 Installation Kits / Parts - Plumbing

Table 11.6 Installation Kits – AR Series

AR Series	Config.	Part No.	Description / Remarks / Notes
AR85B, AR95B, AR110C, AR120B, AR130B	F-60’	572064	
AR140B, AR165	G-60’	572065	Equipped with 2 pump elements
AR175, AR180D	H-80’	572066	
AR205	G-80’ X 2	572067	Basic pump x2 each equipped with x2 pump elements

Table 11.7 Installation Kits – Hy-Ram Series

Hy-Ram Series	Config.	Part No.	Description / Remarks / Notes
HR290, HR330, HR390, HR470	F-60’	572064	
HR560, HR600	G-60’	572065	Equipped with 2 pump elements
HR710	H-80’	572066	

11.0 Installation Kits / Parts - Plumbing

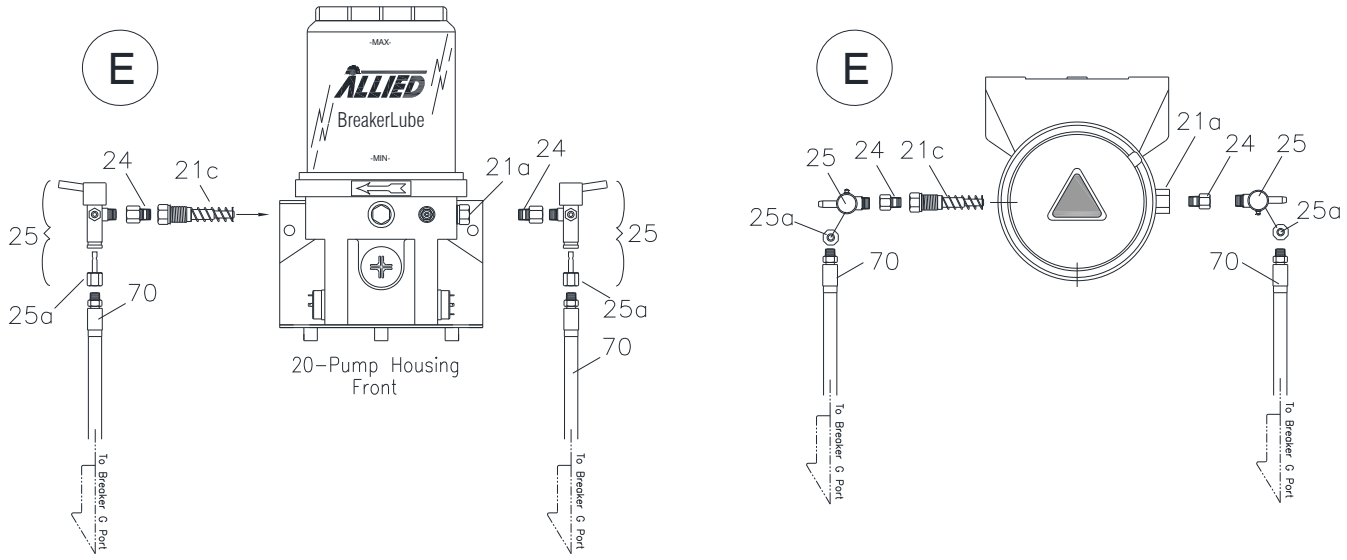


Fig. 11-4 'E' Kit Separate Pumps (x2) & Separate Lines (x2)

Table 11.8 Lube Line Kit – 'E'

Item	Part Name	Part No	Qty	Description / Remarks / Notes
E [1)]	Two Line Kit – Add 2nd Pump	571371	1	Includes 2nd Pump Element and Relief Valve & provides 2 Separate Lube Lines
21c	Pump Element	102623	1	Standard Fixed Delivery
24	Adapter	103476	1	
25	Relief Valve Assembly	102625	1	
70.2	Lube Line – 60'	572523	2	Hose 1/4 02MNPT Fitting x Plain End
71,72	Hose Fitting	572520	2	
73	QD CPLR Plug	563617	2	
74	QD CPLR Socket	563705	2	
75,76	Hose Fitting	572519	2	
77	Lube Line – 20'	572521	2	Hose 3/8 06MBSPP x Plain End
78	Bonded Seal	931102	2	
79	Nylon Tie Strap	719073	50	
	Hex Cap	572874	2	Used to close the hose ends during shipping
	Pipe Plug	572873	2	Used to close the hose ends during shipping

Note E [1)]: 'E' Kits Include the 2nd Lube Line, 2nd Pump Element and the 2nd Relief Valve.

11.0 Installation Kits / Parts - Plumbing

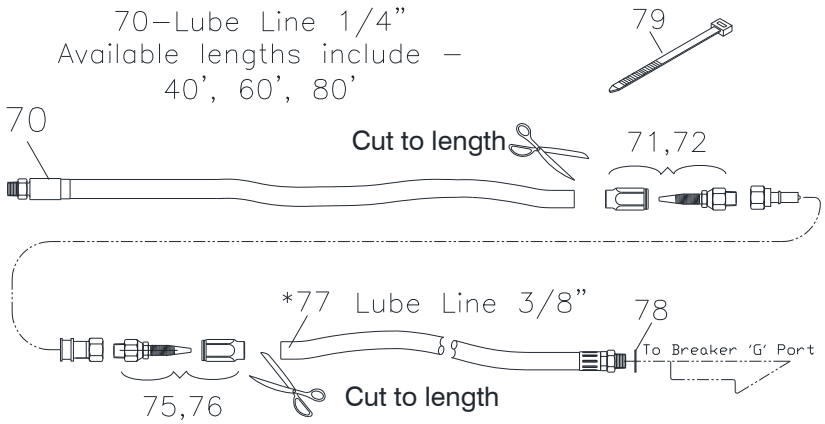


Fig. 11-5 Lube Line Kits

Table 11.9 Lube Line Kit – 'F' – 'G' – 'H'

Item	Part Name		Kit No.	Qty	Description / Remarks / Notes
70 thru 79	Lube Line Kit	40'	102603	1	See Bill of Material for list of items included
		60'	A102475		
		80'	571925		
		40'	576399		Note F[1)]-40' Item 77.2

Table 11.10 Bill of Material

Item	Part Name		Part No.	Qty	Description / Remarks / Notes
70.1	Lube Line	40'	572522	1	Hose 1/4 02MNPT Fitting x Plain End
70.2		60'	572523		Hose 1/4 02MNPT Fitting x Plain End
70.3		80'	572524		Hose 1/4 02MNPT Fitting x Plain End
70.4		40'	572522		Hose 1/4 02MNPT Fitting x Plain End
71,72	Hose Fitting		572520	1-Set	Re-usable 04MNPT – For 1/4 Hose
73	QD Socket		563705	1	
74	QD Plug		563617	1	
75,76	Hose Fitting		572519	1-Set	Re-usable 04MNPT – For 3/8 Hose
77.1	Lube Line – 20'		572521	1	Hose 3/8 06MBSPP x Plain End
77.2	Lube Line – 90"		576449	1	Hose 1/4 90" 06MBSPP x 04FJSW
78	Bonded Seal		931102	1	
79	Nylon Tie Strap		719073	20	

Note F[1)]-40' Item 77.2: Kit 576399 Bill of Material includes hose 576449. This hose replaces standard hose 572521.

11.0 Installation Kits / Parts - Plumbing

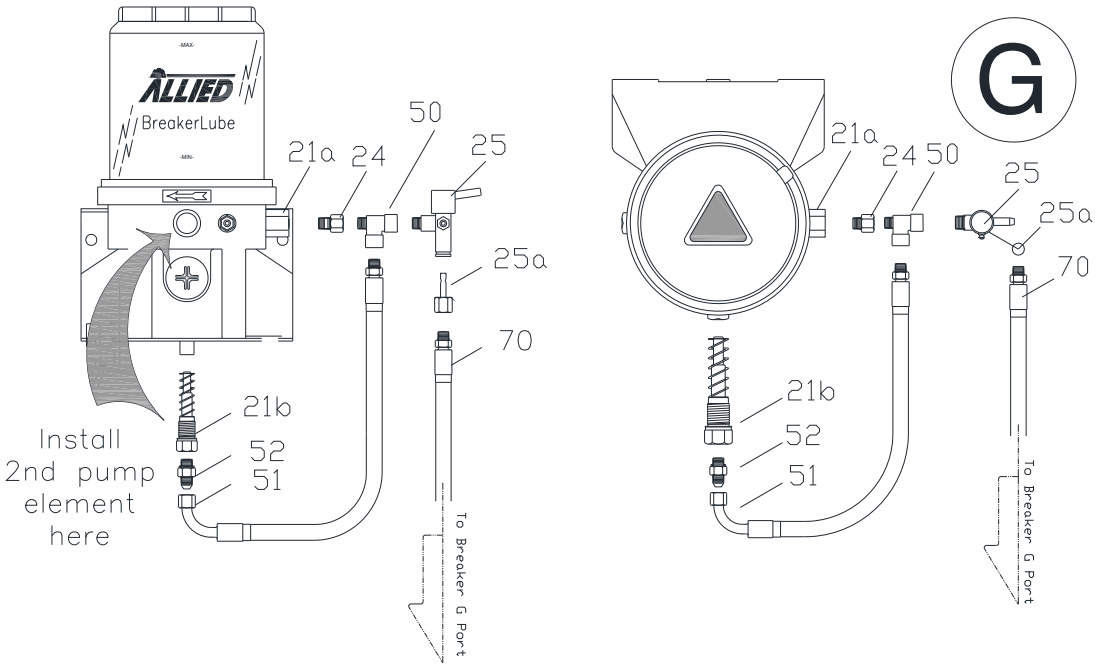


Fig. 11-6 Two Element Add-on Kit

Table 11.12 Two Pump Element Add-On Kit*

Item	Part Name	Part No.	Qty	Description / Remarks / Notes
---	Two Element Adapter Kit w/ Element	102602*	1	Includes all items listed in this Table
21b	Pump Element	102623	1	Fixed Delivery
---	Two Element Adapter Kit	102624	1	Includes 12,15,16,17
24	Adapter	103476	1	04FBSPT x 04MBSPT
50	Tee	102886	1	04FBPT X 04FBPT X 04MBPT
51	Hose	102887	1	HA 1/4 x 8” 04BSPT x 04JSW90
52	Adapter	679791	1	04MBSP X 04MJIC

Items 21a & 25, a, b are included with basic pump assembly ‘A’
*Item 70 is not included in this kit.

11.0 Installation Kits / Parts - Plumbing

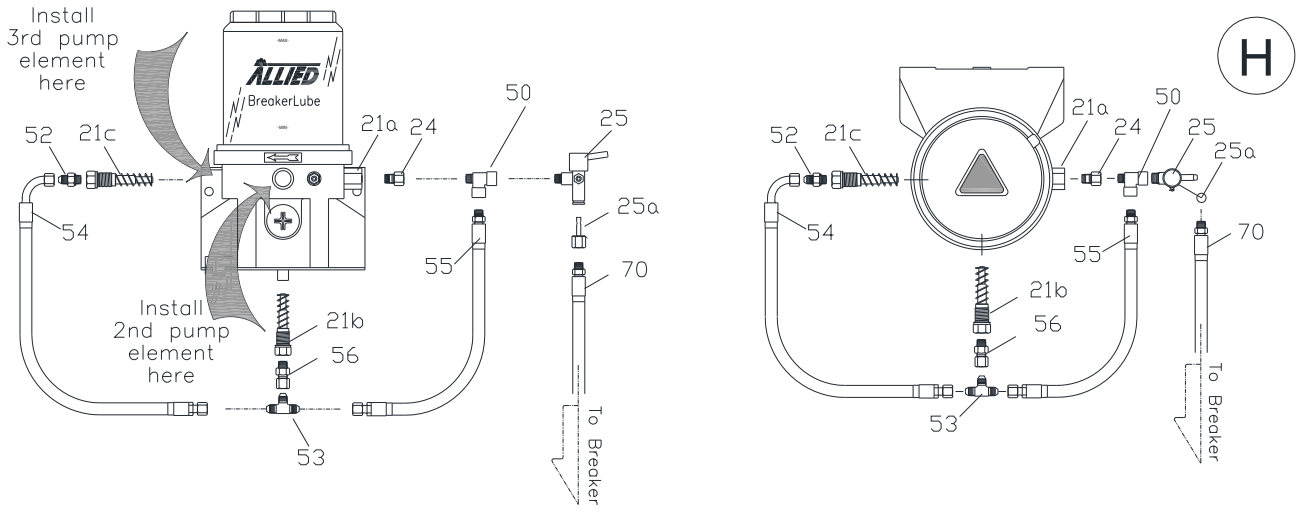


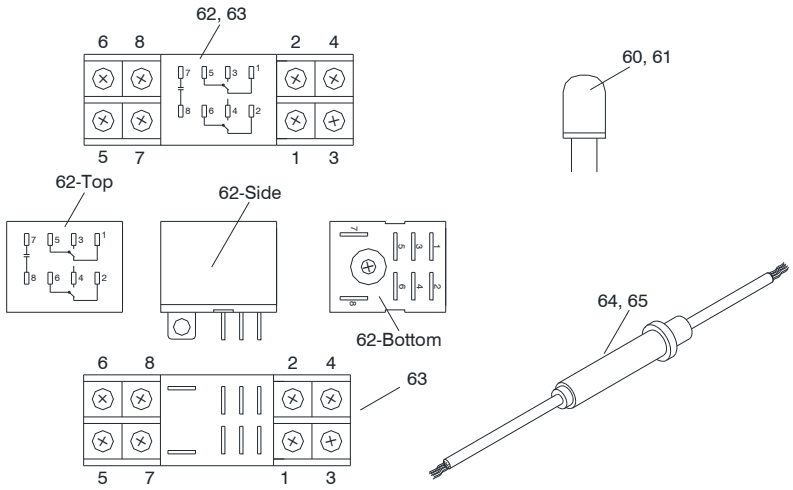
Fig. 11-7 Three Element Add-On Kit

Table 11.13 Three Pump Element Add-On Kit*

Item	Part Name	Part No.	Qty	Description / Remarks / Notes
---	Three Element Adapter Kit w/ Element	570954*	1	Includes all parts listed in this table
21b	Pump Element	102623	1	Fixed Delivery
21c	Pump Element	102623	1	Fixed Delivery
---	Three Element Adapter Kit	570932*	1	Includes 24,50,52,53,54,55,56
24	Adapter Extension	103476	1	04MBSPT X 04FBSPT
50	Tee	102886	1	04MBSPT X 04FBSPT X 04FBSPT
52	Adapter	679791	1	04MJ X 04MBSP
53	Tee	961820	1	04MJIC Union
54	Hose	274283	1	04BSPT X 04JSW
55	Hose	274282	1	04JSW X 04JSW-EL90
56	Adapter w/ Swivel	574015	1	04FJSW X 04MBSPT

Items 21a & 25, a, b are included with basic pump assembly ‘A’
*Item 70 is not included in this kit.

11.0 Installation Kits / Parts - Electrical



Electrical Kit Fig. 11-8

Table 11.14 Electrical Kits

Item	Part Name	Part No.	Qty	Description / Remarks / Notes
60-65	Electrical Kit	102601	1	24VDC
		572888		12VDC
60.1	Lamp	102122	1	28VDC
60.2		572889		14VDC
61	Indicator Lamp	102597	1	RED 1.35-28 VDC
62.1	Relay	102598	1	DPDT 24VDC
62.2		572623		DPDT 12VDC
63	Socket for Relay	102599	1	
64	Fuse Holder	679342	1	Knob type ¼ inch
65	Fuse	815641	1	250V/5A Bussman

Table 11.15 Components for Foot Treadle Operation

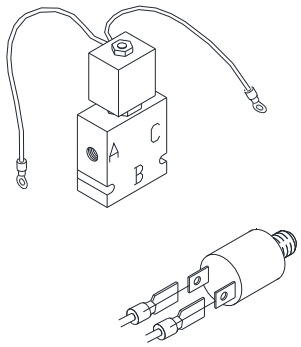


Fig. 11-9 Pressure Switch & 3-way Valve

Part Name	Part No.	Description / Remarks / Notes
Pressure Switch	054792	
3-way valve	571327	24VDC

12.0 Benefits of Allied Chisel Paste

Each time the breaker is put to work, the bushings and tool are subjected to extreme pressure, heat and abrasive debris. Bushings and tools are made of high quality, heat-treated alloy steel. Yet, missed lubrication schedules or using grease that's ineffective in this application will hasten wear and weaken parts rendering them unusable. Replacing these parts can be costly, both in terms of down time and price.

When choosing a grease, it's important to emphasize that the "right type" is equally important as "how much" and "how often".

There are many types of grease available, both basic and specialized. Basic types are generally well suited for a variety of applications. Specialized types are developed for specific tasks with unique properties and formulated with special additives.

Allied Chisel Paste is a specialty grease that's uniquely formulated with solid lubricants, which are highly effective in sliding and heavy side loading applications. Solid lubricants form a layer of protection between the bushing and tool that effectively reduce metal-to-metal contact and thereby reduce heat-generated damage from friction.

In comparison, grease labeled 'General Purpose' or 'Multi-Purpose' are basic lubricants. These types are less formulated and cheaper to produce. They normally contain few additives and most are unlikely to contain any solid lubricants. When subjected to heavy side loading, the liquid lubricant is squeezed out, leaving the bushing and tool unprotected.

Additionally, the right type of grease must be able to withstand high temperatures. The grease must have superior clinging ability to stay put at high temperatures, otherwise it offers little protection if it melts and runs down the tool.

Many factors, including operator technique, determine whether the breaker will remain productive. Everyday wear-and-tear is unavoidable and no other component receives more punishment than the bushings and tool. However, with attention to maintenance, including timely re-lubrication and through the regular use of Allied Chisel Paste, the wear of these parts and the cost to replace them can be minimized.

Allied Chisel Paste Specifications

- NLGI Grade - No. 2
- Thickener Type – Calcium sulfonate complex
- Solids include graphite and copper
- Dropping Point º F (º C), min. – 500 (260)
- Oil Viscosity @ 100º F (40º C) – 200-240
- Application methods include brushing, grease gun and all Allied automatic grease dispensers

IMPORTANT

Non-approved lubricants may cause loss of performance or equipment damage. The use Allied Chisel Paste is strongly recommended to protect total warranty coverage. Application Restriction - Chisel Paste is NOT suitable for use with roller type bearings.

Table 12.1 Packaging / Ordering Information

Container	Packaging	Part No.
14.5 oz. Tubes*	Qty x 10	574430
14.5 oz. Tubes*	Qty x 30	574431
35 lb. Bucket	Qty x 1	676698
120 lb. Drum	Qty x 1	679968

*Fits standard hand operated grease guns.

IMPORTANT

Contamination interferes with reliable operation and will shorten pump life. Prevent dirt and debris from entering the pump system. Always clean the area around connections prior to opening the system. Keep lubricants properly stored in their original, sealed container until ready for use.

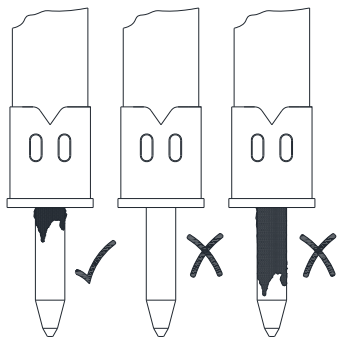


Fig. 12-1 Delivery Adjustment – OK ✓ - Lacking X - Excessive X

13.0 How To Order Spare Parts

Your local Allied dealer requires complete information to better assist you with questions regarding parts, warranty, operation, maintenance, or repair. Information about this Allied product should be noted in Section 2 of this manual.

Product BreakerLube – CML Series

Series / Model CML /

Serial No. _____

Please fill out completely

Line	Description	Part Number	Quantity	Price
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Contact information

Your Name _____ Company Name _____

Phone _____ Account Number _____

Fax _____ Purchase order _____

Email _____ Shipping method _____

*See note below

Billing Address _____ Shipping Address _____

***Note: All backordered parts will be shipped when available via the same method as the original order unless initialed and checked below:**

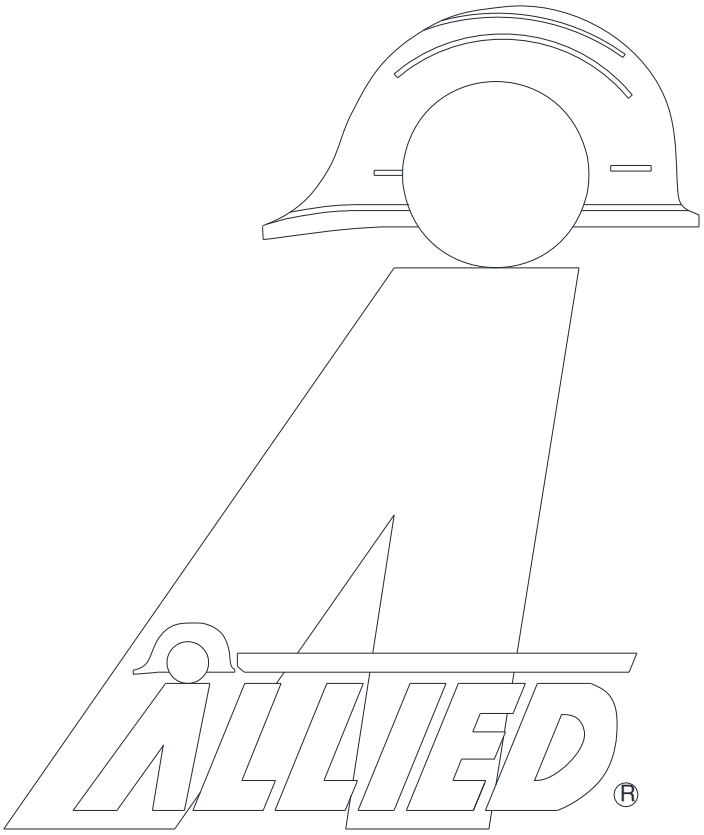
Initials

_____ ☐ Ship complete order only

_____ ☐ Ship available parts and contact customer on disposition of backordered parts

_____ ☐ Other – specify below

Notes



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