

AC3 Installation Manual

This Manual is applicable to AC lubrication Kits only. For professional use only.

Applicable Kit(s): All AC3 Kits containing AC3XXX-X Pump variants.

AC3 Pump Info

Maximum Working Pressure: 1740 psi (120 bar, 12 MPa)

Maximum operating temperature: 122°F/50°C

(Note that operating over the maximum temperature will effect life of the pump)

Minimum operating temperature: -40°F/-40°C (with SAE 80/90 Oil), 5°F/-15°C (with grade 2 grease).

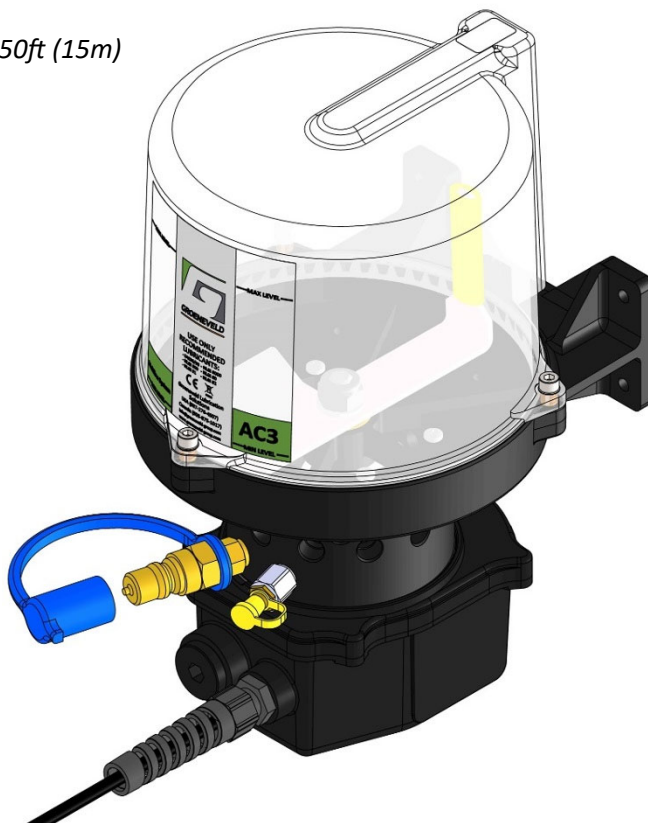
IP Rating: IP66

Voltage: 12V or 24V

Power Rating: 2A

Fuse Rating: 2A

Max Line Length per Injector: 50ft (15m)



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WARNING



INSTALLATION

Only install the Groeneveld AC System if you are suitably qualified. Read the installation instructions in full before commencing installation. If in doubt contact Groeneveld on +1 (937) 276 4507



PERSONAL PROTECTIVE CLOTHING

You must wear appropriate protective equipment when operating and servicing the equipment, this is to protect you from serious injury.



This equipment includes but is not limited to:



- Protective eyewear.
- Respirators, protective clothing and gloves as recommended by the Lubricant manufacturer.



PLASTIC PART CLEANING SOLVENT HAZARD

Many solvents can damage plastic parts and cause them to fail, which could cause serious injury or property damage.

- Use only compatible cleaning products.



ENVIRONMENT

Ensure that all Lubricants are responsibly disposed of in accordance with the manufacturers MSDS sheets and local regulations.

Please retain these safety and operation instructions for future reference.



EC Declaration of Conformity

In accordance with ISO/IEC 17050-1:2010

We **Groeneveld UK**
 Of **85a St Modwen Rd, Parkway Industrial Estate,
 Plymouth, Devon, United Kingdom, PL6 8LH.**

I hereby declare that:

Equipment: **AC3XXX/X Multi-Line Lubrication System**

In accordance with the following Directive (s):

2004/108/EC **The Electromagnetic Compatibility Directive**
2006/42/EC **Machinery Directive**
UN ECE Reg.10.05 **Automotive Electromagnetic Compatibility Directive**
2011/65/EC **Restriction of Certain Hazardous Substances**

Has been designed and manufactured to the following specifications:

97/23/EC, BS EN ISO 50498:2008

I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications. The unit complies with all essential requirements of the Directives.

Signed:

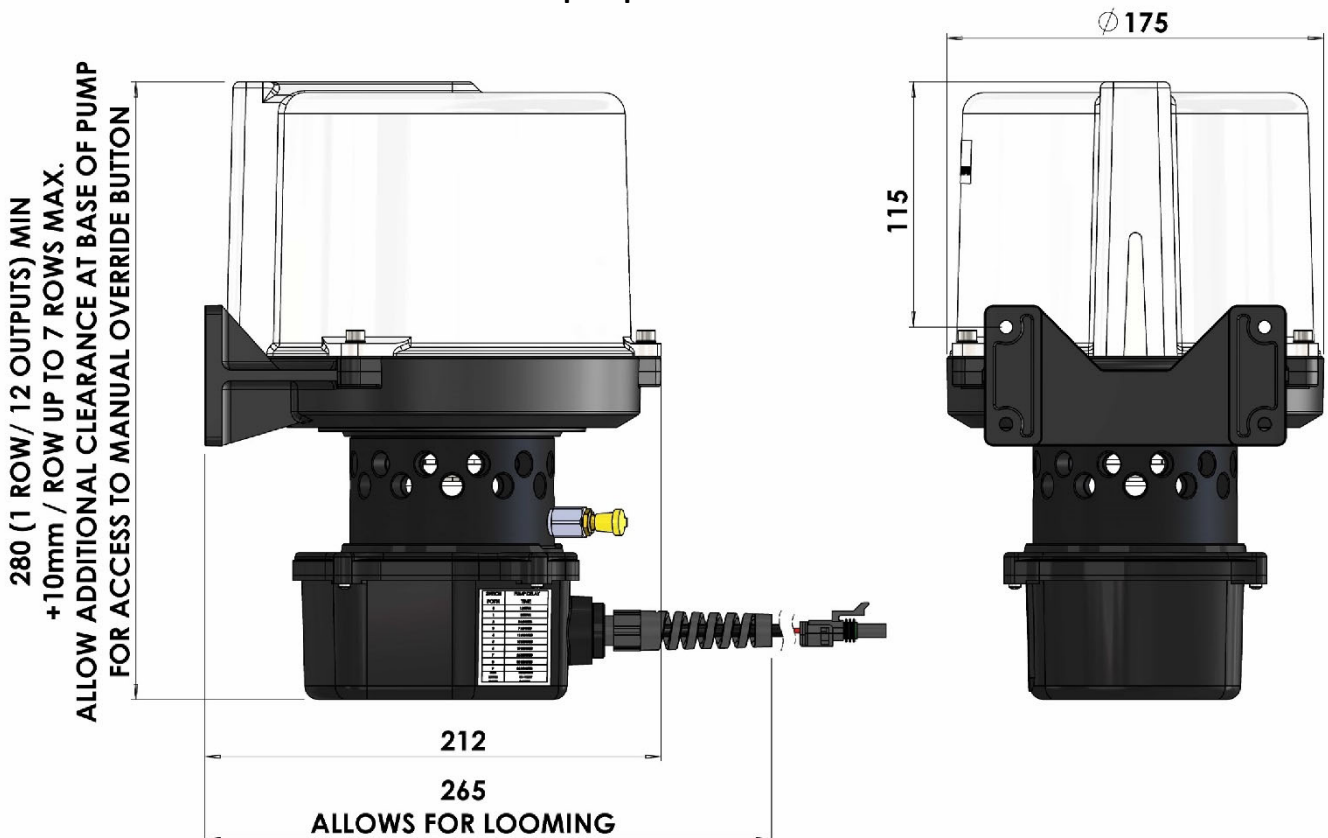
Richard Butler FCMI
Divisional Managing Director

Name: **Richard Butler** **Position:** **Divisional Managing Director**
Done at: **Plymouth, UK** **Date:** **04/01/2016**

Document Ref: ISF 336 Issue 4

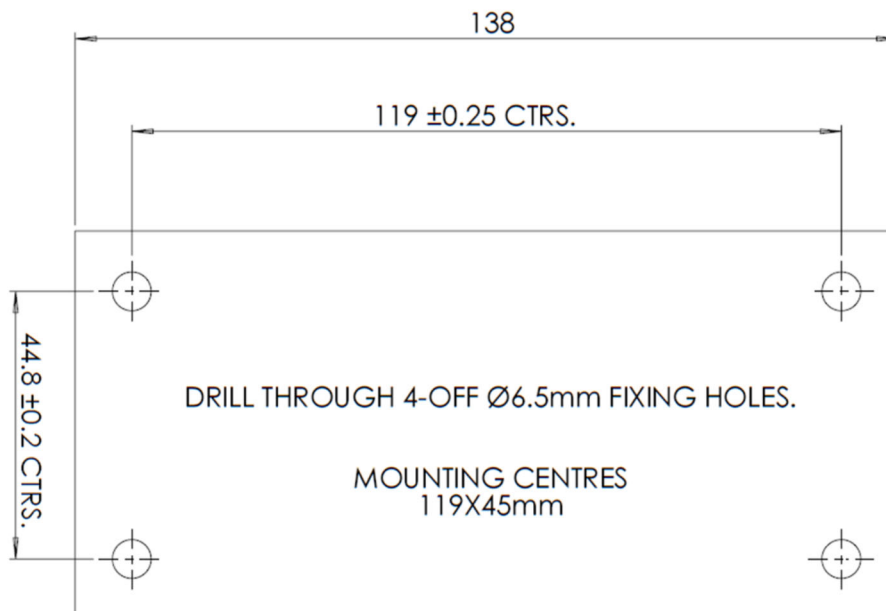
Pump Clearance Requirements

AC3 pump clearance:



Mounting Hole Dimensions

AC3 standard mounting positions:



Select a suitable mounting point for the pump on the chassis, preferably in a position where it is protected from debris. Ensure adequate clearance for the looming, access to the override button and refilling clearance is made (see images on the following page).

Do not mount the pump on to ancillary equipment, such as the battery housing or cover.

Using the pump mounting template, supplied with the pump, position and drill the bracket holes (mounting — positions detailed as above). Use bolts, nuts and spring washers supplied to securely mount the pump in position.

Pumping Units

Standard Pumping Units for AC3 Pumps.

Part No.	'F' No.	Output/stoke	Color	Outlet Size
78033-PL	F800091	0.010 cc	Red	Ø4mm OD Push Type
78034-PL	F800092	0.015 cc	Green	
78035-PL	F800093	0.025 cc	Yellow	
78036-PL	F800094	0.040 cc	Blue	
78037-PL	F800095	0.060 cc	Grey	
78038-PL	F800096	0.100 cc	Black	
34237-402	F800108	Blanking Plug		N/A

Output pressure

Maximum Output pressure from each Pumping Unit	1740 PSI / 120 Bar
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Making the Looms

This lubricant distribution lines should be made up of Groeneveld Ø4mm, semi-rigid, nylon tubing. It is recommended that the — tubing is pre-filled with grease to save on the requirement to prime the system once installed.

From the pump position establish the most convenient route for the lubrication lines. It may be preferred to group the lines into looms depending on pump location and quantity and positioning of the grease points. If grouping the lines, into looms, allow - sufficient length for connection to the bulkhead outlet connectors and the bearings, making an allowance for movement on the machinery. In conjunction with the 'Installation Record' sheet (see page 16), fit the number identification sleeves to the lines at the pump and bearing ends. The loom should be protected along its length with the conduit/ spiral binding/ sleeving and/or tape (for part numbers see 'Accessories' on page 13).

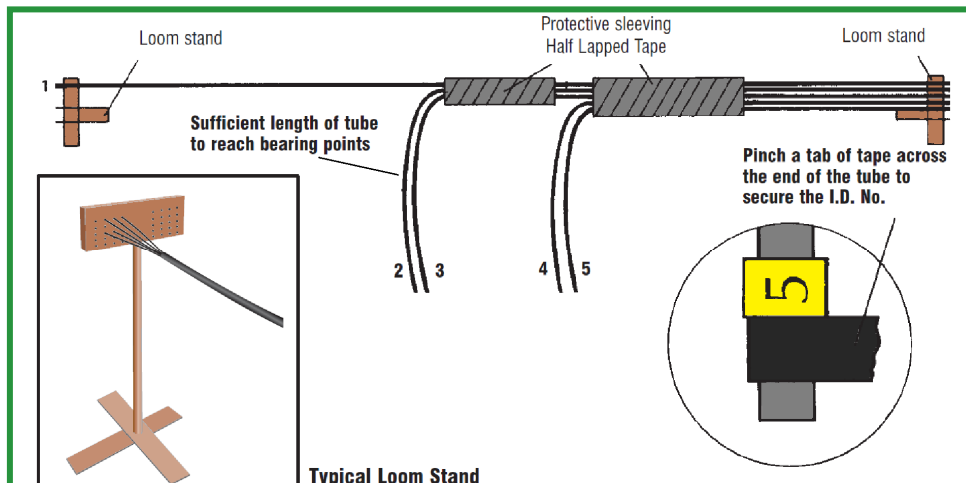
Installation:

Working from the furthest point from the pump, feed the lubrication lines through the machine following existing machine services, where possible. Ensure that the lubrication lines are positioned to fit the bearing fittings. Where a bearing is on a moving part, - ensure that the line is sufficient to allow for full movement. To avoid rubbing or friction with moving parts, grommets or protective sleeving should be used. Also, depending on the severity of movement, compression fittings may be preferred at the bearing points.

Connecting the lines:

Cut each lubrication line to length ensuring a clean, square cut is achieved. Connect to the bearing using push fit or compression connectors. **ENSURE TUBING IS PUSHED FIRMLY INTO CONNECTOR. TEST ASSEMBLY BY PULLING FIRMLY ON THE LINE AFTER INSTALLATION.** Using the System Specification Sheet connect the loom to corresponding numbered pumping units. When - running the tubing into the pumping units, to give the loom strength and rigidity, the tubes should be clipped together to form an arrangement with an offset from the pump of 50 to 60mm (2" - 2-1/2"). The starting point for the loom can be as required. Starting with the bottom row of outlets and pumping unit "1", the loom should then run around the pump, then on to connect with the next row of pumping units so that the loom takes the form of a spiral, and so on until all pumping units are connected. Tubes should be kept together with tie-clips at intervals of every 6 pumping units. The loom, or looms, can then be routed on to the chassis as required.

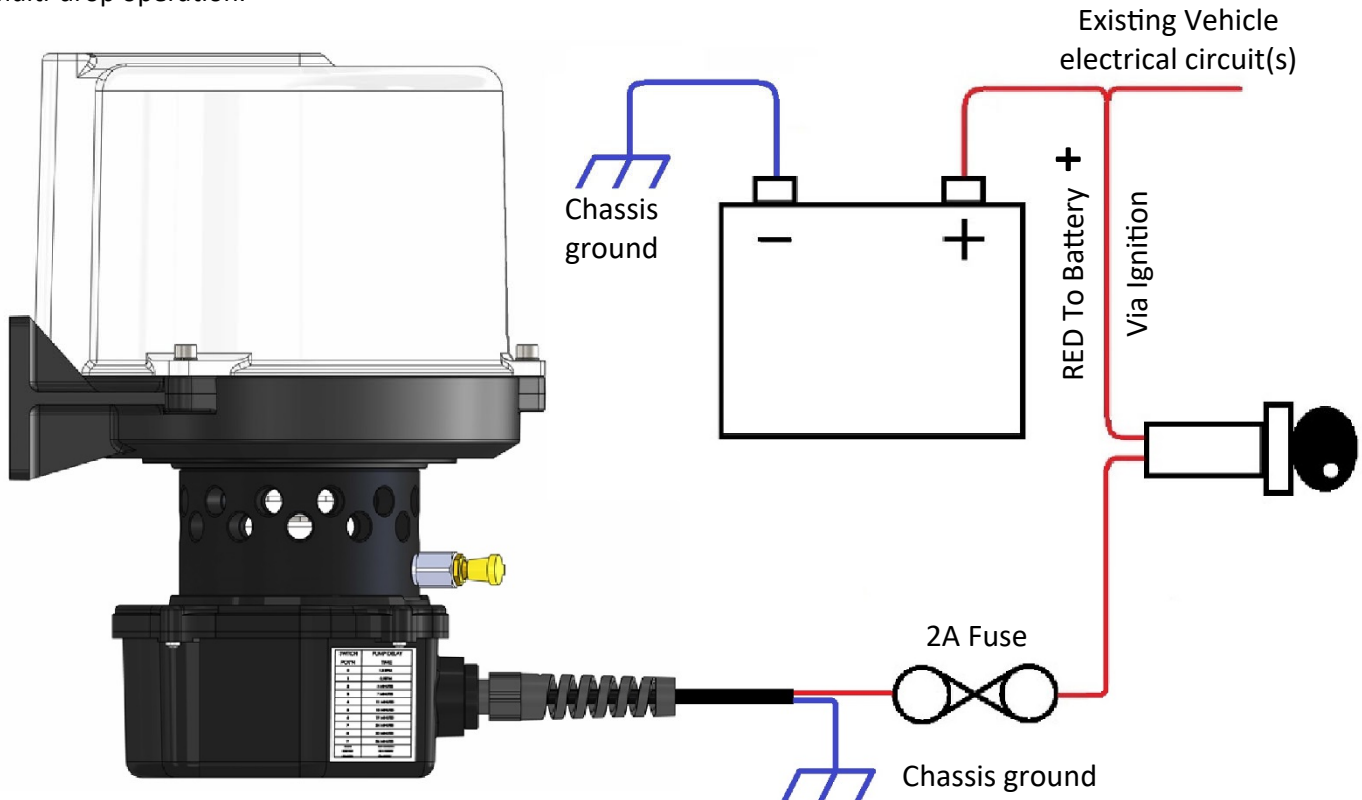
Note: All damaged pipework should be replaced using genuine spare parts, failure to do so can cause system malfunctions and safety issues.



Wiring Information

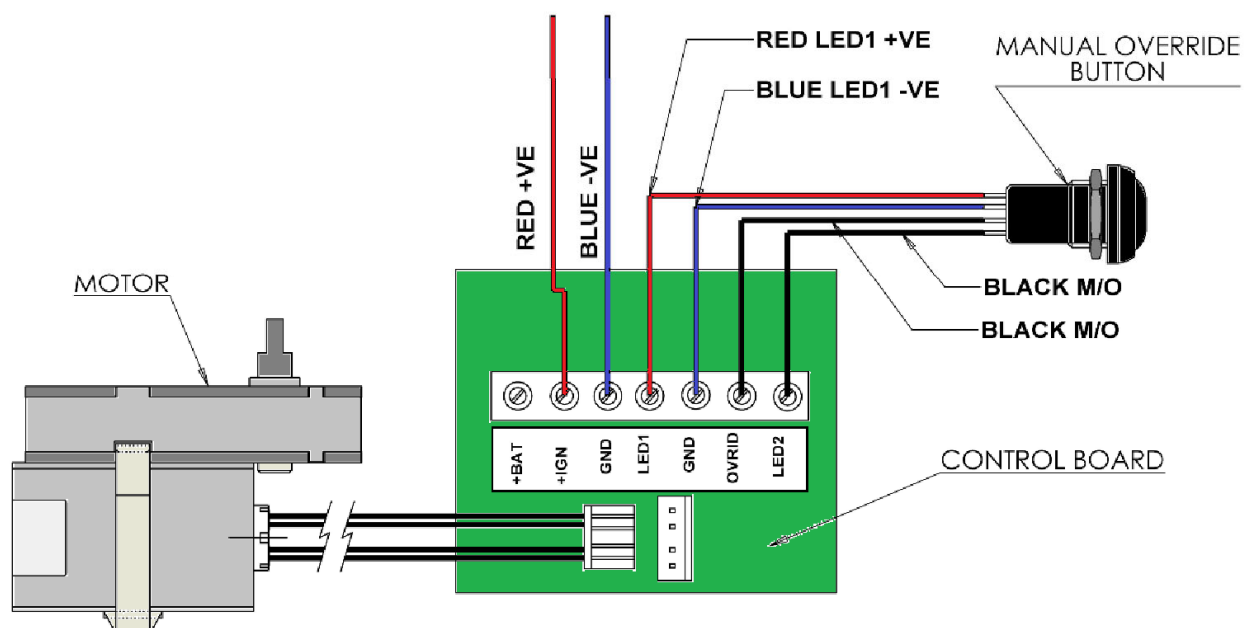
Installation of the AC range of pumps should ideally incorporate direct connections to the vehicle ignition system. This provides automatic lubrication whenever the ignition is switched on.

A memory, built into the pumps printed circuit board, removes the possibility of over-lubrication on a short trip/ multi-drop operation.



AC3 Electrical Schematic

POWER CONNECTION
LEAD



PCB Adjustments

Pump Cycle times and programming table:

Rotary Switch Position	Setting *(Pump runs for 1 minute 8 seconds after delay period has elapsed).
0	Continuous Operation at 1.8 rpm
1	Continuous Operation at 0.9 rpm
2*	3 minutes delay
3*	7 minutes delay
4*	11 minutes delay
5*	15 minutes delay
6*	19 minutes delay
7*	24 minutes delay
8*	30 minutes delay
9*	36 minutes delay

The AC range of pumps are factory set to — continuous operation at 1.8rpm (setting 0 on the PCB), unless otherwise specified. However, if the setting needs to be adjusted it can be easily changed following the procedure below:

To access the internal PCB and adjust the run settings, via the rotary switch.

- 1) Disconnect power to the pump.
- 2) Remove blanking plug from motor housing using an 8mm (or 5/16") Hex Key (see Fig. 1 and 2). Make sure to retain O-ring on the blanking blank.
- 3) Access PCB and adjust rotary switch as required using a 3/32" (2.4mm) flathead screwdriver (See Fig. 3 and see 24V PCB (83344-107) image below for rotary switch location).
- 4) Re-assemble, ensuring the O-ring is correctly fitted on the blanking plug. Torque to 5.0Nm (3.7lbf.ft).
- 5) Reconnect power to the pump.

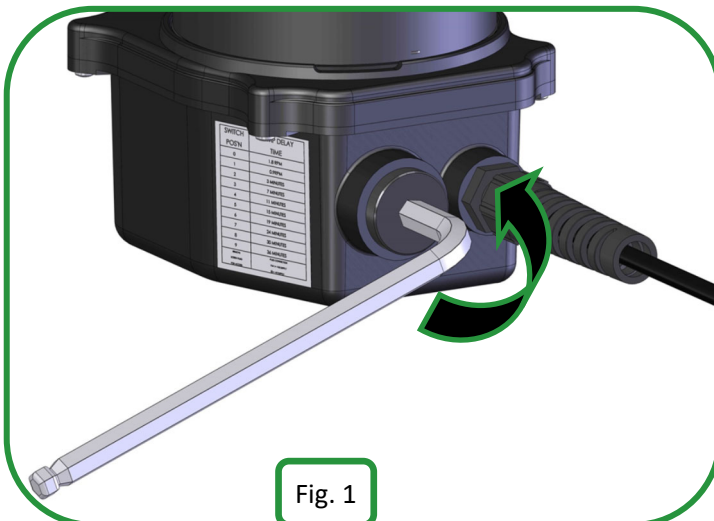


Fig. 1

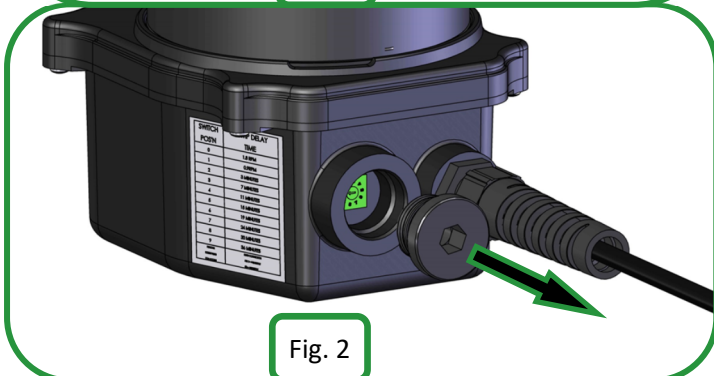


Fig. 2

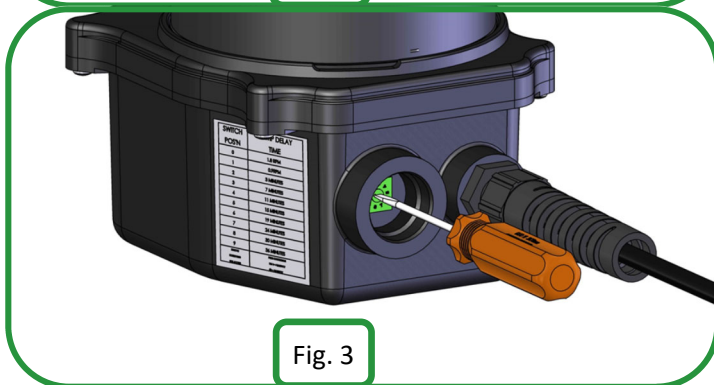
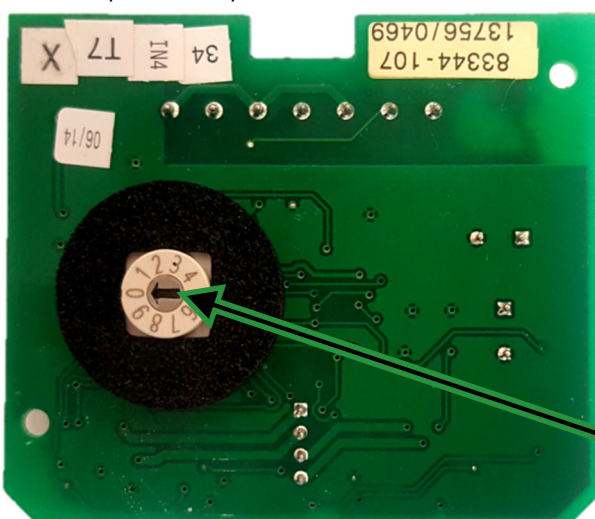


Fig. 3

24V PCB (83344-107):



Rotary switch set to position '0'.

System Operation and Testing

The system has been designed to be maintenance free, but testing the system is always recommended to diagnose any faults or to check the general working condition of the system.

The lubrication process starts after either the ignition is switched on (if set to continuous run mode and the pump is only powered when the ignition is on) or after the allotted delay time (of the already programmed pump) has elapsed. The pump will run for 1 minute and 8 seconds (equivalent to one full cam revolution) and delay for the - allotted time as programmed.

If the power drops out at any time to the pump the delay counter will be stopped and will retain its value, thus remembering its position within the delay cycle. The system will then continue from that point when the power / run signal resumes.

An indication lamp is located on the manual override button, on the base of the pump (see below images). The indication light will be lit when there is a continuous power supply to the circuit and pump. The indication light will flash slowly when the motor is in operation.

Pressing the manual override button (See Fig. 1B) will operate the pump for 1 minute and 8 seconds (or one - complete cycle / one complete cam revolution).

The following inspection procedures are recommended to help ensure proper operation of the AC chassis lubrication system. Once the reservoir refill period has been determined make certain that the interval is part of scheduled maintenance.

- A. Inspect all lubrication points for signs of FRESH grease,
- B. Check the condition of all fittings and connections. Tighten or replace loose or damaged fittings.
- C. Check all lubrication lines; make certain that there are not any breaks. Check for wear or chaffing that may lead to leakage.
- D. Confirm pump operation by pressing Manual Override button (See Fig. 1B) and checking the indication light flashes located on the button.

If, during these checks, any issues are found use the **Lubrication Troubleshooting Chart** on page 14 to help— resolve them.

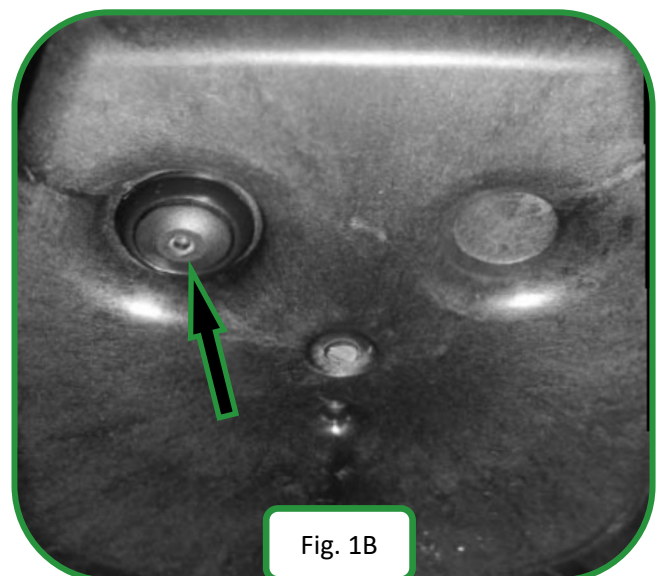
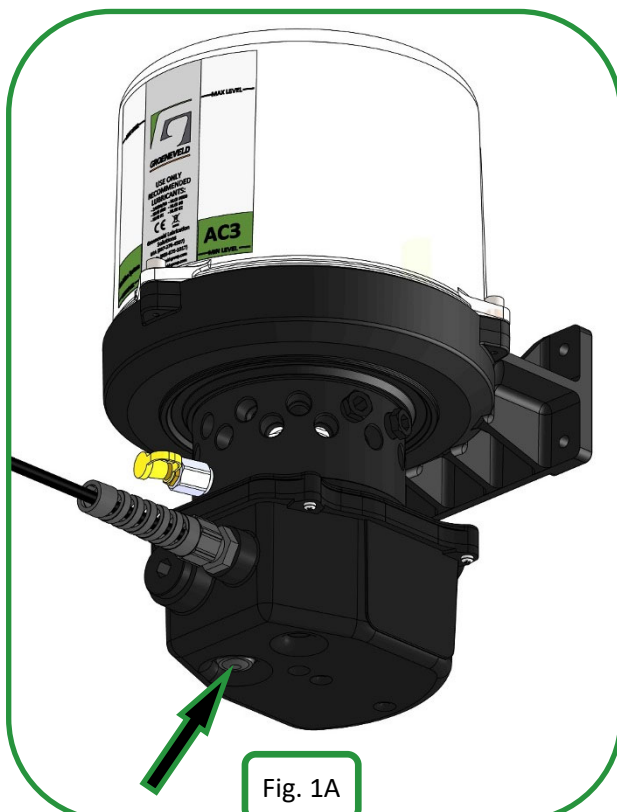


Fig. 1B

Fig. 1A

Recommended Lubricants

The AC Pump has been developed specifically to run with NLGI Grade 000, 00, 0, 1 and 2 grease and FG3,0 fluid grease. Oils to a minimum viscosity of SAE80 are also acceptable. Do not use heavy tackified greases or greases containing bentone/bentonite, molybdenum and/or graphite.

NOTE: To ensure proper operation of the lubrication system only ever fill with clean lubricant that has been in a sealed container and correctly stored. If clean lubricant is not used it can result in premature system or bearing failures.

AC3 Pumps	Recommended Lubricants					
	Oils SAE 80/90	000 Fluid	00 Semi Fluid	0 Soft	1 Stiff	2 Hard
Minimum operation Temp.	-40°C / -40°F	-35°C / -31°F	-30°C / -22°F	-25°C / -13°F	-20°C / -4°F	-15°C / 5°F
Maximum operation Temp.	+50°C / 122°F for all pumps* *(Motor is operable up to 60°C/140°F, but operating at over 50°C/122°F shortens the life of the pump).					

Typical Refill Periods

The AC3 refill periods range greatly, depending on the number of pumping units, the output quantities, and the programmed delay times. Due to the accuracy of the pumping units output quantities and the reliability of pump functionality refill periods can be simply calculated to ensure that the pump and the bearing points don't run dry. Use the following to calculate refill periods:

Calculation:

Add up the total output from all pumping units:

$$(N \times O_1) + (N \times O_2) + (N \times O_3) + (N \times O_4) + (N \times O_5) + (N \times O_6) = A$$

Divide the reservoir capacity (R_1 or R_2) by the total output (A):

$$\frac{R_1 \text{ or } R_2}{A} = E$$

Multiply the number of revs until empty (E) by the programmed delay time (P), plus the run time (M):

$$E \times (P + M) = \text{Total Runtime in minutes (T)}$$

$$T / 60 = \text{Total Runtime in hours (H)}$$

$$H / 24 = \text{Total Runtime in days}$$

Example:

An AC3 (R_1) calibrated with 2 Red P.U. (O_1), 4 Yellow P.U. (O_3) & 6 Grey P.U. (O_5) programmed for a 15minute delay time:

$$(2 \times 0.01) + (4 \times 0.025) + (6 \times 0.06) = 0.48 \text{cc}$$

$$2800 \text{cc} / 0.48 \text{cc} = 5833.33 \text{ Revs}$$

$$5833.33 \times (15 + 1.13) = 87500 \text{ minutes until empty,}$$

$$19531.25 / 60 = 1458.33 \text{ hours until empty,}$$

$$1458.33 / 24 = 60.76 \text{ days between refills.}$$

Key:

N = Number of Pumping Units (P.U.) with a particular output volume.

O_1 = 0.010cc Output (Red P.U.)

O_2 = 0.015cc Output (Green P.U.)

O_3 = 0.025cc Output (Yellow P.U.)

O_4 = 0.040cc Output (Blue P.U.)

O_5 = 0.060cc Output (Grey P.U.)

O_6 = 0.100cc Output (Black P.U.)

A = Total Output Amount per 1 revolution

E = Number of revolutions until Empty

R_1 = 2,800cc AC3 Reservoir

M = 1.13 = Motor run time of 1min 8secs.

P = Programmed delay time (3, 7, 11, 15, 19, 24, 30 or 36 minutes).

Note that this calculation is based on the pump having an uninterrupted power supply and being in continuous operation

AC3 System Output (cc's/grams per hour)										
Injector	Timer Setting (Delay Cycle)									
	#0 1.8rpm	#1 0.9rpm	#2 3min	#3 7min	#4 11min	#5 15min	#6 19min	#7 24min	#8 30min	#9 36min
Red	0.53	0.3	0.15	0.07	0.05	0.04	0.03	0.024	0.019	0.016
Green	0.8	0.44	0.22	0.11	0.07	0.06	0.04	0.036	0.03	0.02
Yellow	1.33	0.74	0.36	0.18	0.12	0.09	0.07	0.06	0.05	0.04
Blue	2.12	1.18	0.58	0.3	0.2	0.15	0.12	0.1	0.08	0.06
Grey	3.19	1.77	0.87	0.44	0.3	0.22	0.18	0.14	0.12	0.1
Black	5.31	2.96	1.45	0.74	0.49	0.37	0.3	0.24	0.19	0.16

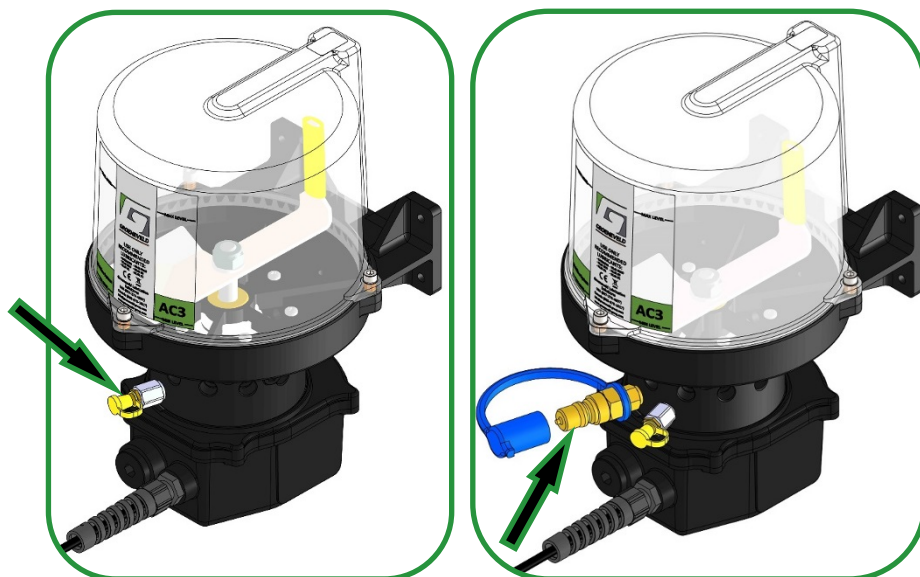
Pump Refill Procedure

The AC3 Groeneveld multiline pumps are fitted with a grease nipple adaptor as standard (see '1' below) for filling with most types of grease up to and including NGLI Grade 2. Using the grease nipple adaptor for grease fill avoids the possibility of air entrapment and air pockets (cavitation).

Bulk fill adaptors are also available on special request. These can be fitted as an alternative to the grease nipple in addition to the grease nipple (see '2' below right).

IMPORTANT NOTES:

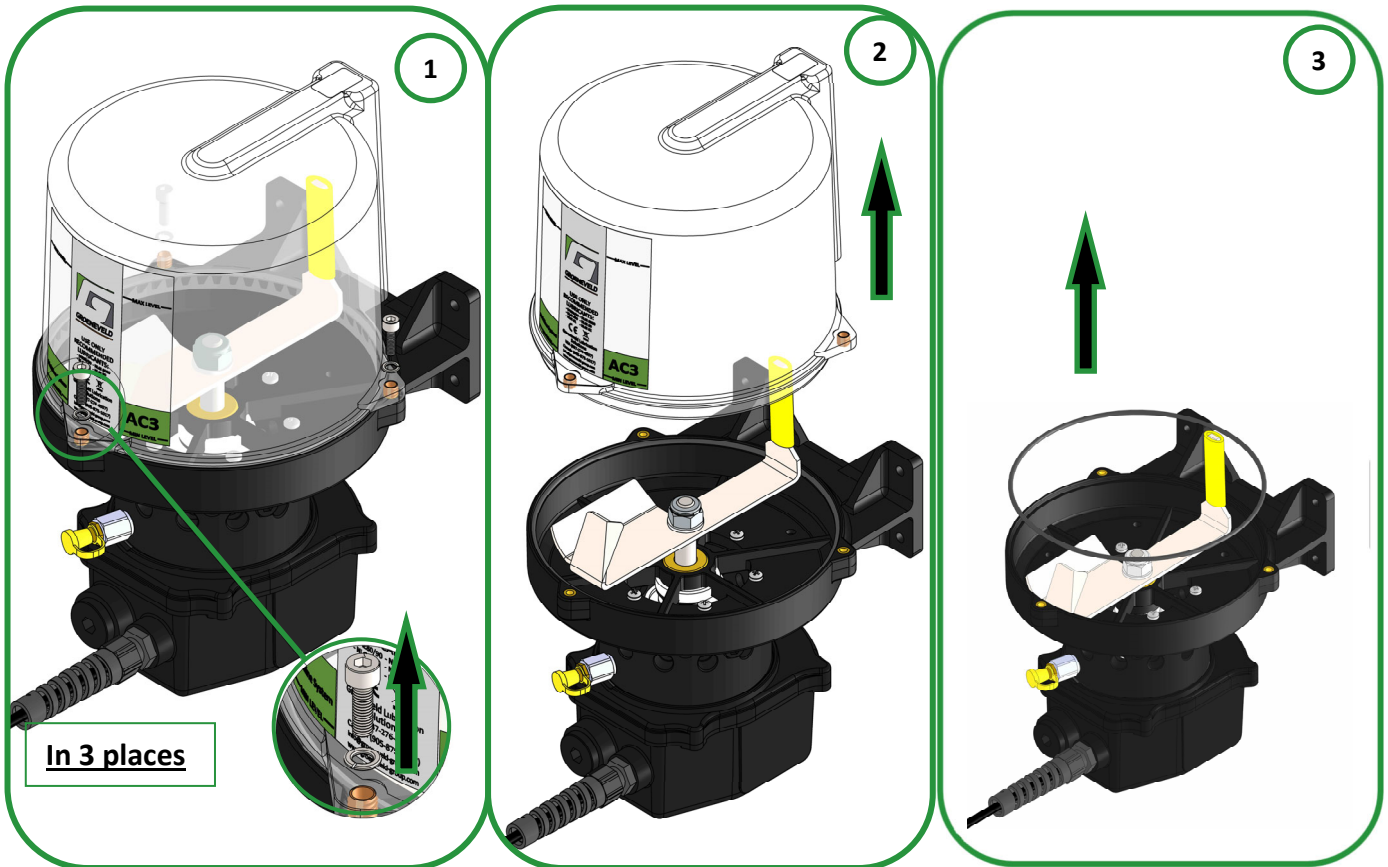
- Ensure that the grease nipple or bulk fill adaptor is clean before refilling. Place the dust cap back on the grease nipple or bulk fill adaptor when finished.
- **DO NOT OVERFILL THE RESERVOIR.** Fill only to the MAX Level Label.



Pump Service Procedures

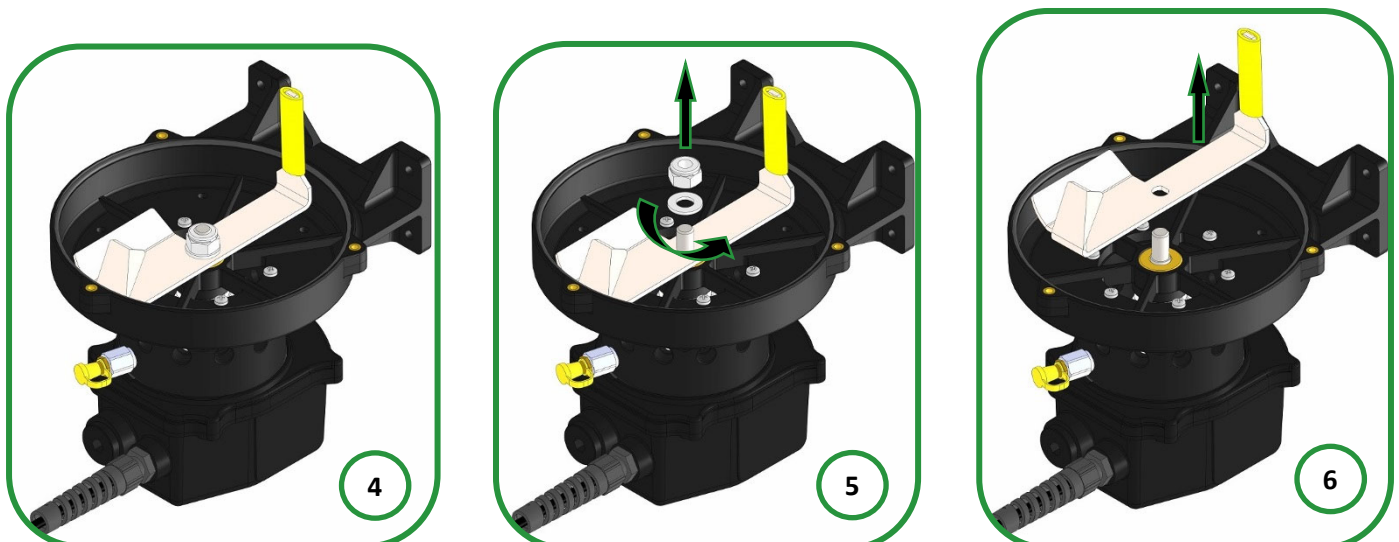
A) AC3 Reservoir Replacement

1. Using 4mm (5/32") hex key remove three screws holding the reservoir in position (see image 1).
2. Remove reservoir and 'O' ring (see image 2 and 3).
3. Position new 'O' ring on new reservoir.
4. Reassemble reservoir to pump body, **ensuring the breather is closest to the mounting bracket.**
5. Reinsert and tighten screws to torque 3Nm (2.2lbf.ft). **Do not over tighten screws.**



B) AC3 Paddle Replacement.

1. Follow step '1' in section 'A' to remove reservoir (see image 1 and 2).
2. Remove, with 17mm wrench, the retaining nut and washer that holds paddle assembly in position (see image 5).
3. Lift paddle blade off drive shaft (see image 6).
4. Position new paddle blade on drive shaft ensuring correct positioning of the "D" shaped hole.
5. Put washer and retaining nut back in position on drive shaft and tighten to torque 7Nm (5.16lbf.ft).
6. Refer to steps '4' and '5' in section 'A' to refit reservoir.

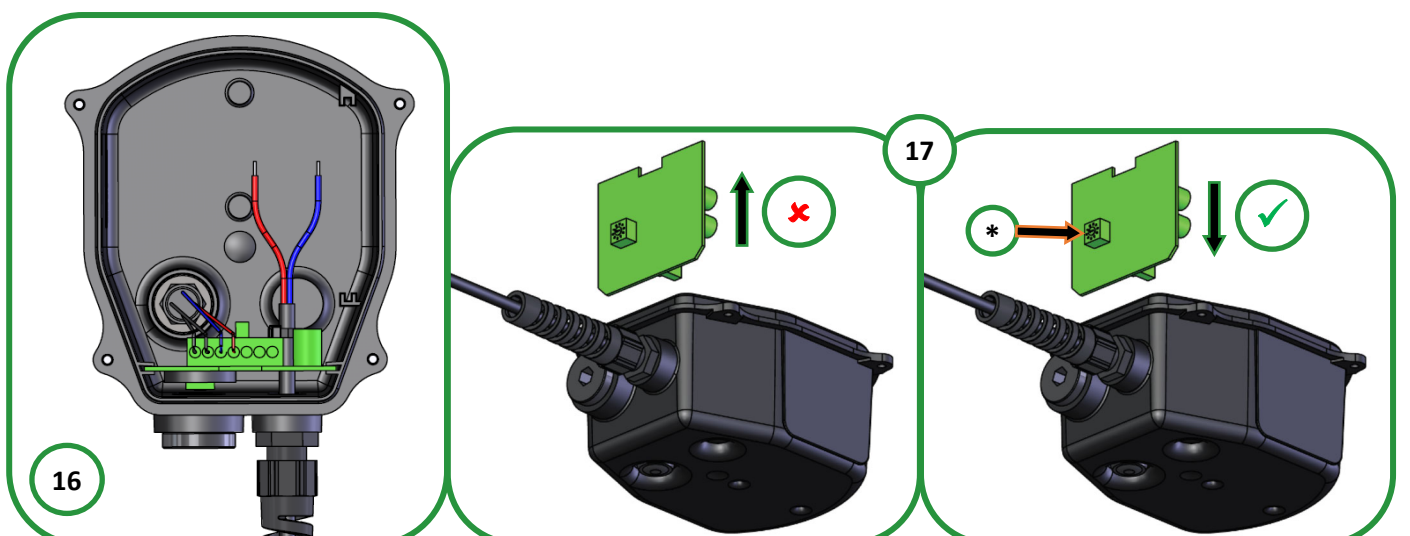


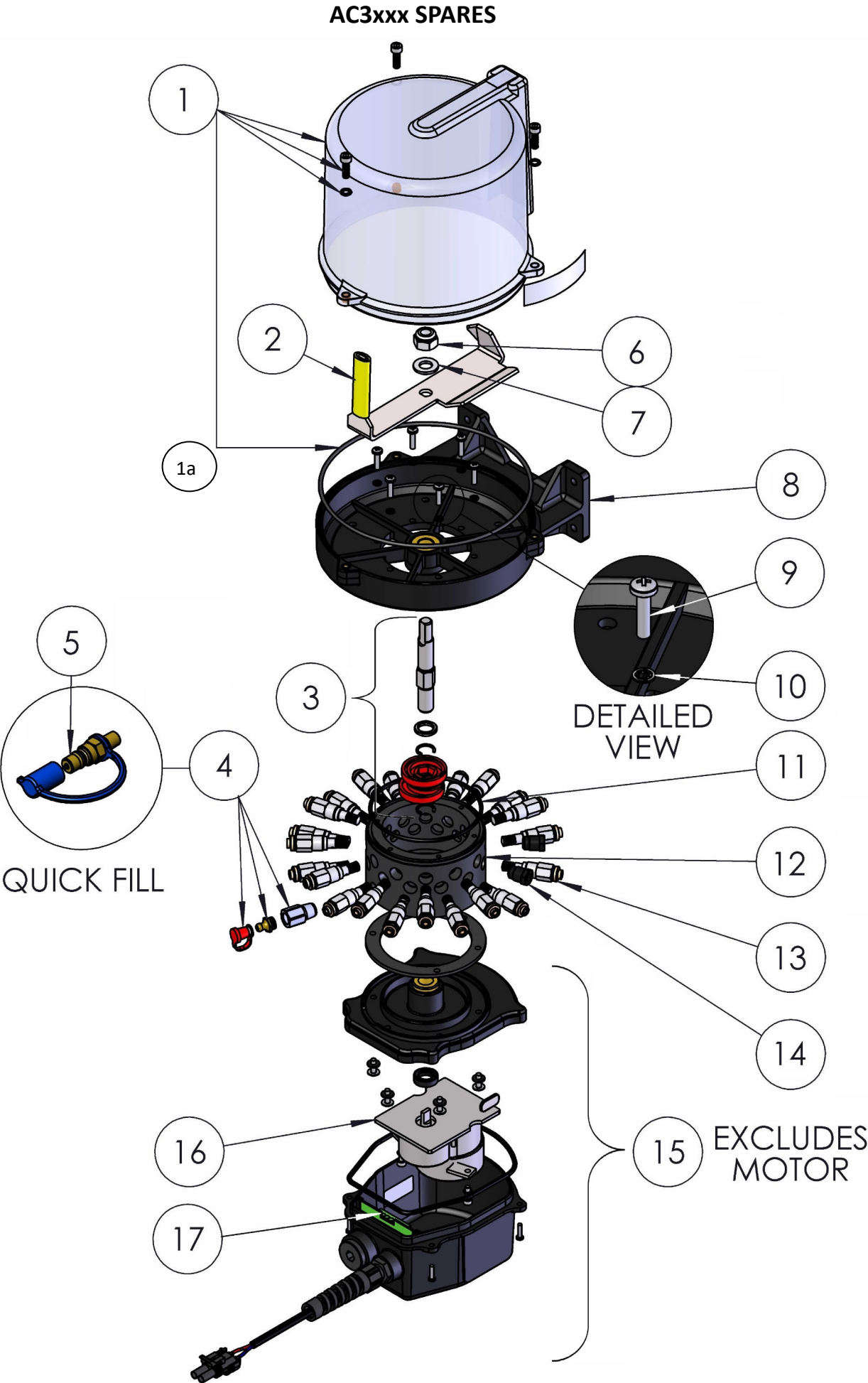
E) AC Motor Replacement:

1. Loosen and remove the four screws that hold the motor cover to the motor housing (see image 12).
2. Pull the motor cover away from the housing and dispose of the old 'O' ring (see image 13).
3. Disconnect the motor Molex connector from the PCB. Put the motor housing assembly aside.
4. Loosen, but do not remove, two screws that hold the retaining plate over the motor (see images 14 and 15).
5. Remove the motor and place the new one in position. Ensure the motor drive shaft fits into the camshaft drive.
6. Place retaining plates in position and tighten the screws to torque 1.5Nm (1.1lbf.ft).
7. Reconnect the Molex connector from the new motor to the PCB.
8. Locate new 'O' ring seal on motor cover.
9. Fit motor housing to motor cover and fix with the four original screws to torque 0.3Nm (0.22lbf.ft).

**F) AC Replacement of PCB:**

1. Refer to steps '1' and '2' in section 'E' to access PCB, but retain O-ring.
2. Loosen and disconnect the **RED** and **BLUE** power cables from the PCB (see — image 16). Loosen and disconnect manual override cables, taking note of their connection positions. Disconnect the motors Molex connector from PCB.
3. Remove and dispose of existing PCB, insert new one. Set the rotary switch on the new PCB to the same setting as the old PCB (see image 17, right)*.
4. Reconnect wires from override button and power cable. Reconnect Molex - connector as in step '7' in section 'E'. See page 5 for electrical schematic.
5. See step '9' in section 'E' for re-assembly of motor housing, ensure correct fitment of O-ring.

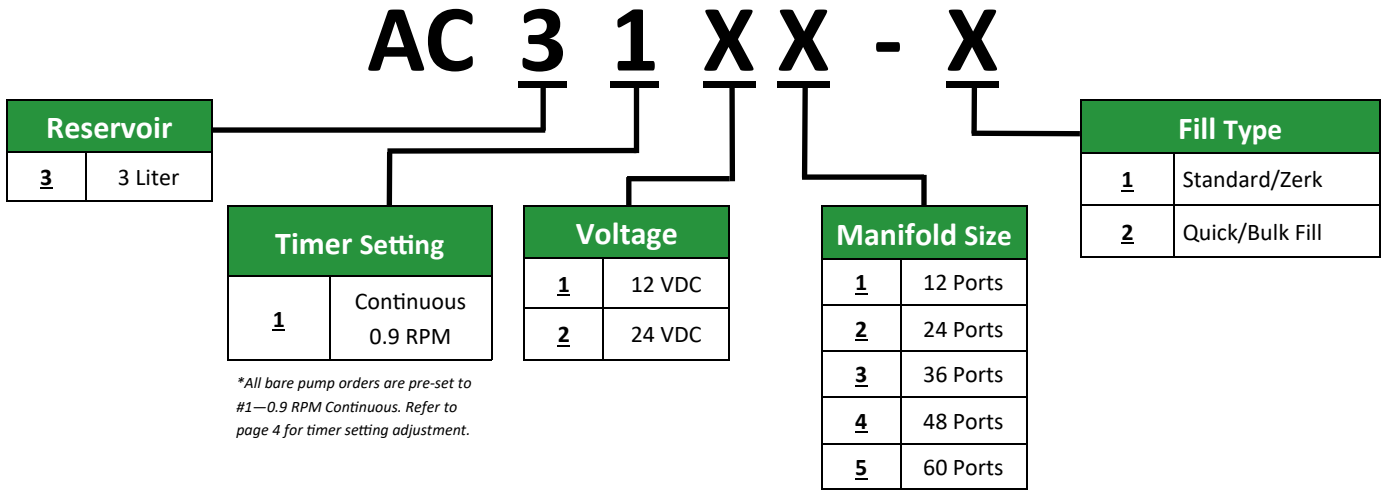




AC3xxx/x SPARES ORDERING METHOD

ITEM NO.	PART NUMBER	'F' NUMBER	DESCRIPTION	QTY.
1	AC3/SP9 ACR/SP1	F800043 F801125	AC3 RESERVOIR ASSEMBLY AC3 RESERVOIR ASSEMBLY W/ TOP FILL	1
1a	25153-965	F801191	AC3 RESERVOIR O-RING	
2	83416-352	F800036	PADDLE AND WIPER ASSEMBLY	1
3	AC3/SP5-1	F801177	12 PORT CAMSHAFT ASSEMBLY	1
	AC3/SP5-2	F801178	24 PORT CAMSHAFT ASSEMBLY	
	AC3/SP5-3	F801179	36 PORT CAMSHAFT ASSEMBLY	
	AC3/SP5-4	F801180	48 PORT CAMSHAFT ASSEMBLY	
	AC3/SP5-5	F801181	60 PORT CAMSHAFT ASSEMBLY	
4	83416-317	F801183	ZERK GREASE NIPPLE ASSEMBLY	1
5	83416-607	F801184	QUICK FILL ADAPTOR AND DUST CAP FOR AC3	1
6	21885-810	F801185	SELF LOCKING NUT (M10)	1
7	21171-806	F801186	FLAT WASHER (M10)	1
8	38580-126	F801187	AC3 MOUNTING BRACKET	1
9	21831-227	F801188	M4x16 PAN HEAD SCREW	6
10	21181-722	F801189	M4 SHAKE-PROOF WASHER	6
11	25153-966	F801190	AC3 MANIFOLD TOP O-RING	1
12	32478-221	F800081	12 PORT MANIFOLD	1
	32478-222	F800082	24 PORT MANIFOLD	
	32478-223	F800083	36 PORT MANIFOLD	
	32478-224	F800084	48 PORT MANIFOLD	
	32478-225	F800085	60 PORT MANIFOLD	
13	78033-PL	F800091	0.010cc PUMPING UNIT (RED)	AS REQUIRED
	78034-PL	F800092	0.015cc PUMPING UNIT (GREEN)	
	78035-PL	F800093	0.025cc PUMPING UNIT (YELLOW)	
	78036-PL	F800094	0.040cc PUMPING UNIT (BLUE)	
	78037-PL	F800095	0.060cc PUMPING UNIT (GREY)	
	78038-PL	F800096	0.10cc PUMPING UNIT (BLACK)	
14	34237-402	F800108	BLANKING PLUG	
15	AC3/SP10/12V	F800044	AC3 12VDC MOTOR HOUSING AND PCB ASM.	1
	AC3/SP10/24V	F800045	AC3 24VDC MOTOR HOUSING AND PCB ASM.	
15a	25153-890	F801192	AC3 MOTOR HOUSING O-RING	1
16	AC3/SP8-12VDC	F800041	12VDC STEPPER MOTOR	1
	AC3/SP8-24VDC	F800042	24VDC STEPPER MOTOR	
17	AC3/SP2-12VDC	F800037	AC3 12VDC CIRCUIT BOARD	1
	AC3/SP2-24VDC	F800038	AC3 24VDC CIRCUIT BOARD	
*	H2-62 H2-65M	F801146 F801147	FILL ADAPTER—FEMALE QUICK COUPLER DUST COVER FOR FEMALE QUICK COUPLER	1
*	1348-663-30/M 1348-663-65/M	F801150 F801151	30-FOOT MALE WIRE HARNESS ASSEMBLY 65-FOOT MALE WIRE HARNESS ASSEMBLY	1
*	MDC-2	F801148	MALE DELPHI CONNECTOR (12010973-B x1) MALE TERMINAL PINS (12124582-L x2) CONNECTOR PORT SEALS (12041351-B x2)	1
*	FDC-2	F801149	FEMALE DELPHI CONNECTOR (12015792-B x1) FEMALE TERMINAL PINS (12124580-L x2) CONNECTOR PORT SEALS (12041351-B x2)	1

AC3 Part Number Identification



AC3 12V Pump Variants		
PART#	F Number	DESCRIPTION
AC3111/1	F801153	3L, 12VDC, 12-Port, Zerk Fill, 1ft Lead + Harness
AC3111/2	F801154	3L, 12VDC, 12-Port, Quick Fill, 1ft Lead + Harness
AC3112/1	F801155	3L, 12VDC, 24-Port, Zerk Fill, 1ft Lead + Harness
AC3112/2	F801156	3L, 12VDC, 24-Port, Quick Fill, 1ft Lead + Harness
AC3113/1	F801157	2L, 12VDC, 36-Port, Zerk Fill, 1ft Lead + Harness
AC3113/2	F801158	3L, 12VDC, 36-Port, Quick Fill, 1ft Lead + Harness
AC3114/1	F801159	3L, 12VDC, 48-Port, Zerk Fill, 1ft Lead + Harness
AC3114/2	F801160	3L, 12VDC, 48-Port, Quick Fill, 1ft Lead + Harness
AC3115/1	F801161	3L, 12VDC, 48-Port, Zerk Fill, 1ft Lead + Harness
AC3115/2	F801162	3L, 12VDC, 48-Port, Quick Fill, 1ft Lead + Harness

AC3 24V Pump Variants		
PART#	F Number	DESCRIPTION
AC3121/1	F801165	3L, 24VDC, 12-Port, Zerk Fill, 1ft Lead + Harness
AC3121/2	F801166	3L, 24VDC, 12-Port, Quick Fill, 1ft Lead + Harness
AC3122/1	F801167	3L, 24VDC, 24-Port, Zerk Fill, 1ft Lead + Harness
AC3122/2	F801168	3L, 24VDC, 24-Port, Quick Fill, 1ft Lead + Harness
AC3123/1	F801169	2L, 24VDC, 36-Port, Zerk Fill, 1ft Lead + Harness
AC3123/2	F801170	3L, 24VDC, 36-Port, Quick Fill, 1ft Lead + Harness
AC3124/1	F801171	3L, 24VDC, 48-Port, Zerk Fill, 1ft Lead + Harness
AC3124/2	F801172	3L, 24VDC, 48-Port, Quick Fill, 1ft Lead + Harness
AC3125/1	F801173	3L, 24VDC, 48-Port, Zerk Fill, 1ft Lead + Harness
AC3125/2	F801174	3L, 24VDC, 48-Port, Quick Fill, 1ft Lead + Harness

When ordering spare parts or requesting information, it is best to reference the full part number and the date code of the pump in question (date code format: XX##, ex. AB21).

The date code can be found on the silver label located on the outside or inside of the motor housing.

Accessories

Ø4mm Elbow Connectors—Push

Part No.	'F' No.	Thread Size
38497S1	F617321	1/8" NPT Swivel
38497S2	F617322	1/4-28 UNF Swivel
PM90412	F800123	1/8" NPT
PM90484	F800124	1/4-28 UNF
PM90485	F800125	5/16-24 UNF
PM90487	F800126	1/8" BSPT
PM90489	F800127	M6x1
PM90490	F800128	M8x1
PM90491	F800129	M8x1.25
PM90492	F800130	M10x1

**Ø4mm Straight Connectors—Push Lock**

Part No.	'F' No.	Thread Size
LE 80512-PL	F617320	1/8" NPT
PM80412	F800114	1/8" NPT
PM80484	F800115	1/4-28 UNF
PM80485	F800116	5/16-24 UNF
PM80487	F800117	1/8" BSPT
PM80489	F800118	M6x1
PM80490	F800119	M8x1
PM80491	F800120	M8x1.25
PM80492	F800121	M10x 1
LE 505-PCM	F800102	4mm OD Union
38497Y2	F801194	4mm OD Y-Conn.

*Photos of fittings may be a loose representation of their actual appearance.

*Other fittings available upon request.

Split Convolute

Part No.	'F' No.	Description/Line Capacity
39694A250	F801116	1/4" Split Convolute (1 Tube)
39694A375	F801117	3/8" Split Convolute (2-4 Tubes)
39694A500	F801118	1/2" Split Convolute (5-7 Tubes)
39694A625	F801119	5/8" Split Convolute (8-12 Tubes)
39694A750	F801120	3/4" Split Convolute (13-19 Tubes)
39694A1000	F801121	1" Split Convolute (20-35 Tubes)
39694A1250	F801122	1-1/4" Split Convolute (36-44 Tubes)
39694A1500	F801123	1-1/2" Split Convolute (45-76)

**Ø4mm Nylon Tube**

Part No.	'F' No.	Description
152823-50	F801102	Ø4mm OD Primed w/ EP-0 Grade Grease (15m/50ft)
152823-164	F801103	Ø4mm OD Primed w/ EP-0 Grade Grease (50m/164ft)
152057-50	F801100	Ø4mm OD Un-Primed (15m/50ft)
152057-164	F801101	Ø4mm OD Un-Primed (50m/164ft)

**Numbered Sleeves**

Part No.	'F' No.	Description
39257-A1	F800109	For up to 12 point system
39257-A2	F800110	For up to 24 point system
39257-A3	F800111	For up to 36 point system
39257-A4	F800112	For up to 48 point system
39257-A5	F800113	For up to 60 point system



Lubrication Troubleshooting Chart

Problem	Cause	Solution
1. Inoperative Pumping Unit.	a) Inoperative Pump. b) Broken Spring. c) Air pocket in lubricant from incorrect fill	a) Refer to "Problem A" in 'Electrical—Troubleshoot'. b) Replace pumping unit. c) Bleed the pump & refill the reservoir.
2. All lubrication points appear dry.	a) Empty reservoir. b) Inoperative pump. c) Time between lube cycles is too long. d) Reservoir filled with an unsuitable lubricant. e) Pump Air locked from incorrect fill. f) Reservoir vent blocked from over filling. g) System / Pump has blockage.	a) Refill the reservoir, using the correct—lubricant. b) Refer to "Problem A." c) Adjust pump setting. d) Remove the lubricant and replace with correct grade of lubricant. e) Bleed the pump & refill the reservoir. f) Clear vent and only fill to max level. g) See "Problem 8". Bleed the pump & refill
3. Pump is working, but does not supply lubrication	a) Grease level dropped below minimum level. b) Defective pumping unit(s). c) Pump air locked from incorrect fill.	a) Bleed the pump & refill the reservoir. b) Replace the pumping unit(s). c) Bleed the pump & refill the reservoir.
5. No grease at one or more point of lubrication	a) The lubrication pipe is burst or leaking. b) Blocked or broken pumping unit. c) Defective pumping unit(s). d) Leakage at union point.	a) Renew the pipe. b) Determine defective pumping unit and replace. c) Replace the pumping unit(s). d) Retighten or renew the screwed union.
6. All lubrication points are over lubricated.	a) Incorrect setting of "Delay Time".	a) Increase "Delay Time" setting.
7. Some lubrication points are over-lubricated.	a) Incorrect pumping unit output.	a) Re-configure pumping unit for lower output quantity.
8. Split / burst lubrication line	a) Excessive pressure in the system caused by blockage. b) One or more lubrication points are blocked and will not accept grease.	a) Check the system. Check suitability of —lubricant for application low temperature. b) Remove pipe from fitting and flush bearing through with grease gun.

Electrical Troubleshooting Chart

Problem	Cause	Solution
A.) Pump Does Not Work.	a) No input power.	a) Check for power to the pump and controller.
	b) Fuse is blown.	b) Check for reason why fuse blew (excessive current draw). Replace fuse if necessary.
	c) Loose / broken wire connection inside the pump.	c) Check all wires and connections in the pump.
	d) Bad / incorrect wiring.	d) Check all wiring and connections to the pump and inside the pump.
	e) Manual Override button LED flashes, but motor does not run.	e) Check for correct grounding (if applicable). Check wire connections.
	f) Defective PLC.	f) Replace Controller Assembly.
	g) Defective Motor.	g) Replace Motor.
B.) Reduced Pump Speed.	a) High pressure in the system	a) Check the system / bearing points
	b) Low ambient temperature	b) Not a defect(1 or 2 manual override — lubrication cycles may be required)
C.) Override Switch Does Not work.	a) Bad wiring.	a) Check all wires and connections to the switch.
	b) Pump does not work.	b) Refer to “Problem A.”

Installation Record Guide

INSTALLATION RECORD

Vehicle Type Pump No.....
 Customer..... Voltage.....
 Timer Setting.....

Unit No.	Bearing location	Col. Code	Cal. CC	Unit No.	Bearing Location	Col. Code	Cal. CC
1				19			
2				20			
3				21			
4				22			
5				23			
6				24			
7				25			
8				26			
9				27			
10				28			
11				29			
12				30			
13				31			
14				32			
15				33			
16				34			
17				35			
18				36			

Pump Information: (for customer completion)

Part number: _____

Date code: _____

Supplier Name: _____

Supplier Address: _____

Phone: _____

Contact: _____



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ISO 9001:2015
GB00195

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