



**ANNOVI  
REVERBERI**®  
The Power of Experience

**AR 20 LFP**  
**AR 25 LFP**

140° F - Max Water Temp

1" - Suction

3/8" HB - Outlet



## INSTRUCTION MANUAL

### AR20LFP - 1450 RPM - SEMI-HYDRAULIC THREE-DIAPHRAGM PUMP

MODEL	MAX GPM	MAX L/MIN	MAX PSI	MAX BAR	HP POWER	WEIGHT LBS.
AR20LFP	5.3	20	290	20	1.0	9.2

### AR25LFP - 1450 RPM - SEMI-HYDRAULIC THREE-DIAPHRAGM PUMP

MODEL	MAX GPM	MAX L/MIN	MAX PSI	MAX BAR	HP POWER	WEIGHT LBS.
AR25LFP	6.4	24.3	290	20	1.1	9.2

#### DIAPHRAGM KITS

MODEL	DESCRIPTION
AR46561	BlueFlex™

#### VALVE KITS

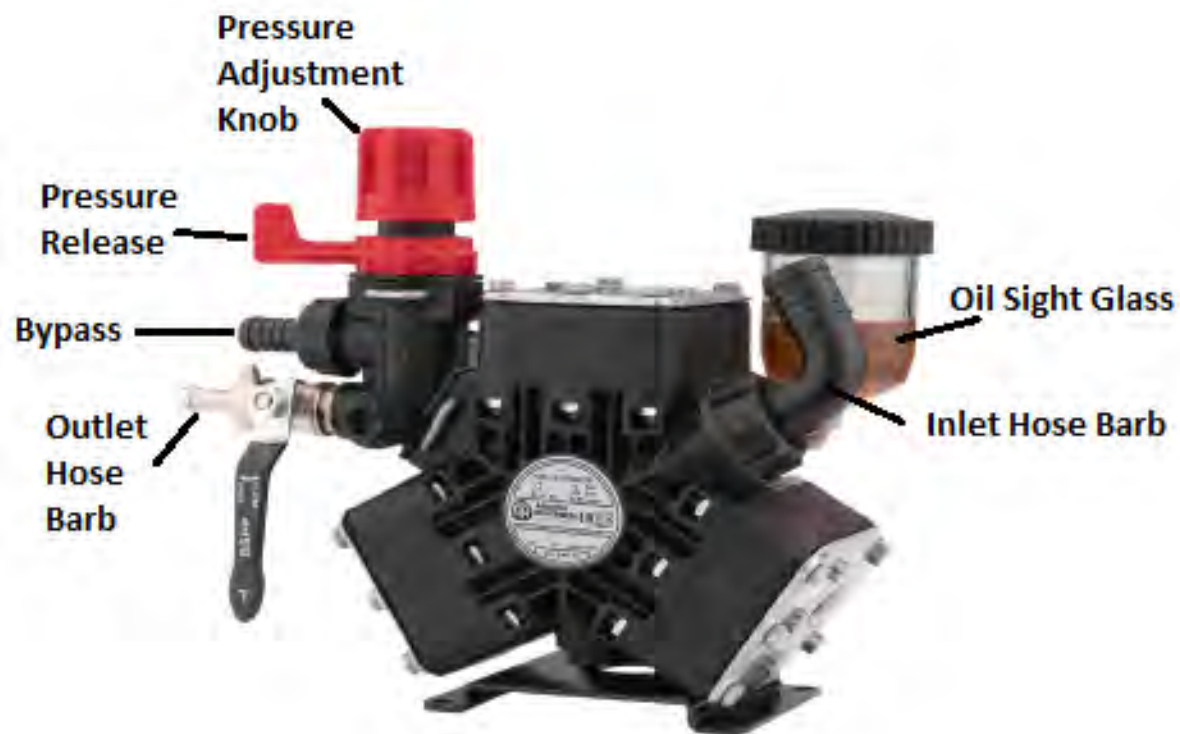
MODEL	DESCRIPTION
AR46564	Valves (bp)
AR46565	Valves (LFP)

#### OIL

MODEL	DESCRIPTION
AR64532D	Oil
AR64532D-C	Case (6)Oil



## AR20LFP AR25LFP Pump



**-SP-GCI Version**



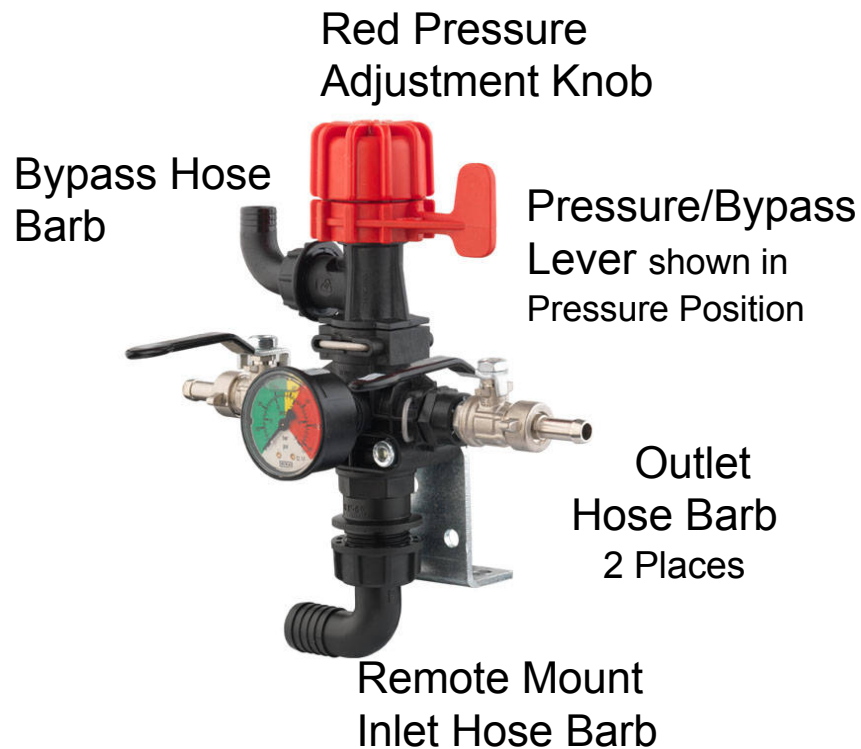
AR20LFP-GCI-12VDC  
AR25LFP-GCI-12VDC  
AR20LFP-GCI-24VDC  
AR25LFP-GCI-24VDC



Shown with Hydraulic Flange SAE A-A  
Part Number AR55387  
(Hydraulic Motor not included)



**-GR-GCI Version**  
for Gas Engines with 3/4" Shaft



1. When starting the pump, keep the control unit in the full bypass position until the pump has primed.
2. After starting the pump, and after the pump is primed, move the control unit into the pressure regulation position. Adjust the pressure by turning the red pressure adjustment knob on the control unit.
3. To stop the pump, reduce the pressure by rotating the lever to the full bypass position.
4. Stop the pump.



### Intended uses

The pump is designed and constructed for incorporation in plants and machinery (spraying machines for the protective treatment of agricultural crops and garden plants). **All other uses constitute misuse unless approved by the manufacturer's technical service**

The pump must be used in a manner appropriate to its technical data (see "Technical Data"), and must not be modified or improperly used.

### Misuses

**Do not** put the pump into service until the plant or machinery in which it is incorporated has been declared compliant with the relevant national and local legal requirements.

**Do not** use the pump in a potentially explosive atmosphere.

**Do not** use the pump for **flammable**, toxic or corrosive liquids or liquids with unsuitable density, especially **seawater, adhesives, bitumens, asphalt sealers, two-step curing compounds, concrete sealers, liquefied gases or solvents** of any kind, paints of any kind or liquids containing solids in suspension, and in all cases **do not** use with any liquid unless certain that it is compatible with the materials used in the pump circuit.

**Do not** draw in liquids at temperatures above 50°C or below 5°C.

**Do not** use the pump in drinking water supply systems.

**Do not** use the pump on products for human consumption.

**Do not** use the pump on pharmaceutical products.

**Do not** use the pump without first checking that the intake and delivery circuit pipelines are correctly secured and free from leaks.

**Do not** use the pump without the safety devices provided: guards for shafts and drive couplings and suitably rated relief valve on the delivery circuit.

**Do not** use the pump to wash or spray: people, animals or delicate items, live electrical equipment or chemicals whose characteristics are not known.

### Safety devices



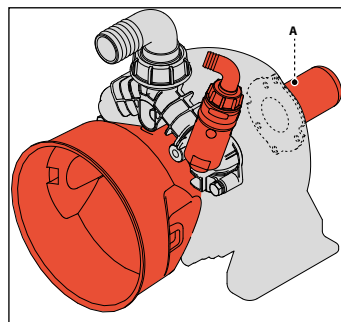
#### Danger - Warning

**Never tamper with or by-pass the safety devices. Maintain all safety devices regularly to ensure they all work efficiently.**

The drawing shows the position of the safety devices mounted on the machine.

Additional safety devices must be added as necessary during the design phase (see "Installation information").

**A) Fixed guard:** provides protection against accidental contacts with the drive shaft when in operation.



### Residual risks

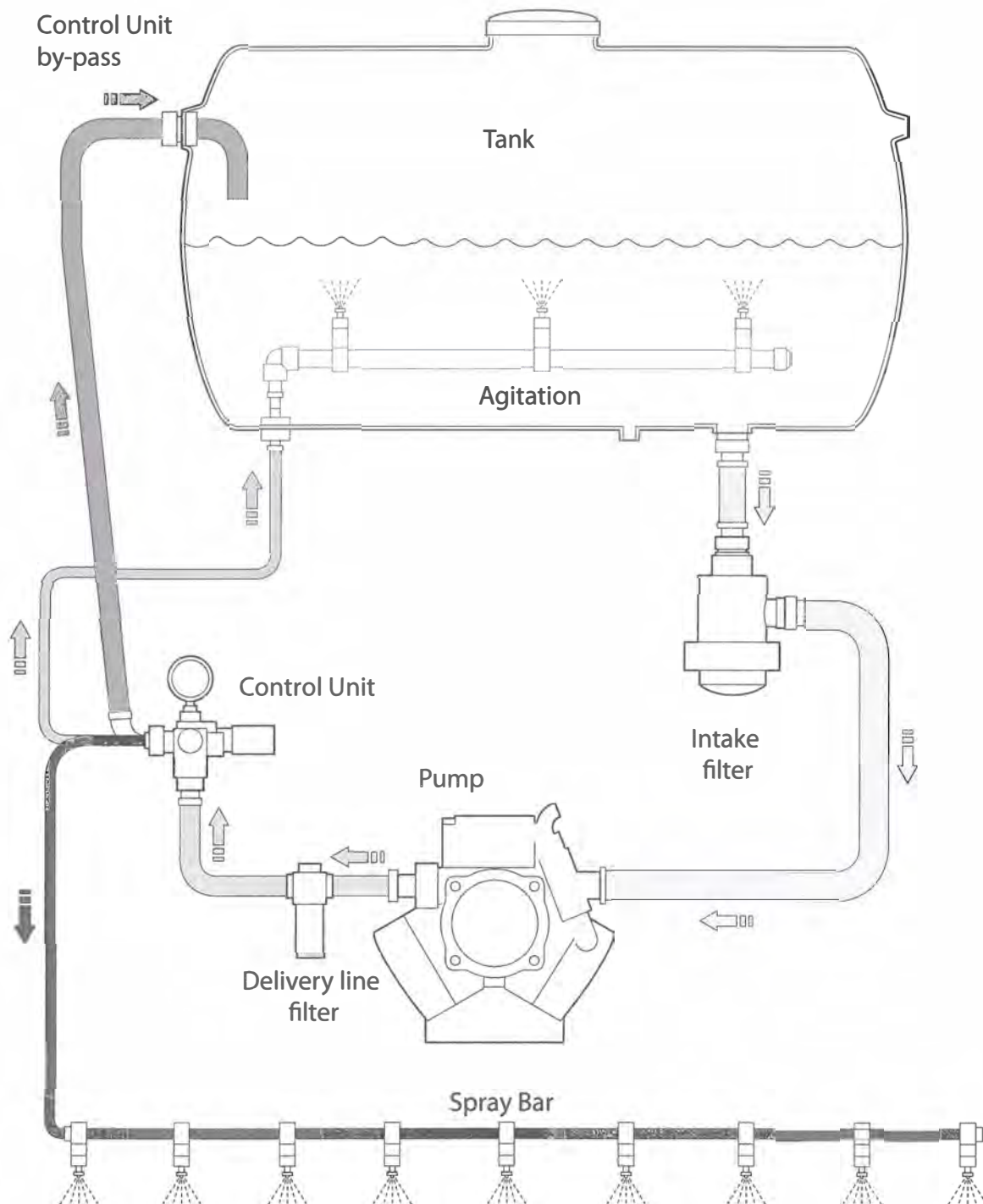
Even if the safety regulations and information provided in the manual are complied with, the residual risks described in the declaration of incorporation still apply when the pump is in operation.



## INSTALLATION INSTRUCTIONS

### Installation diagram (guideline)

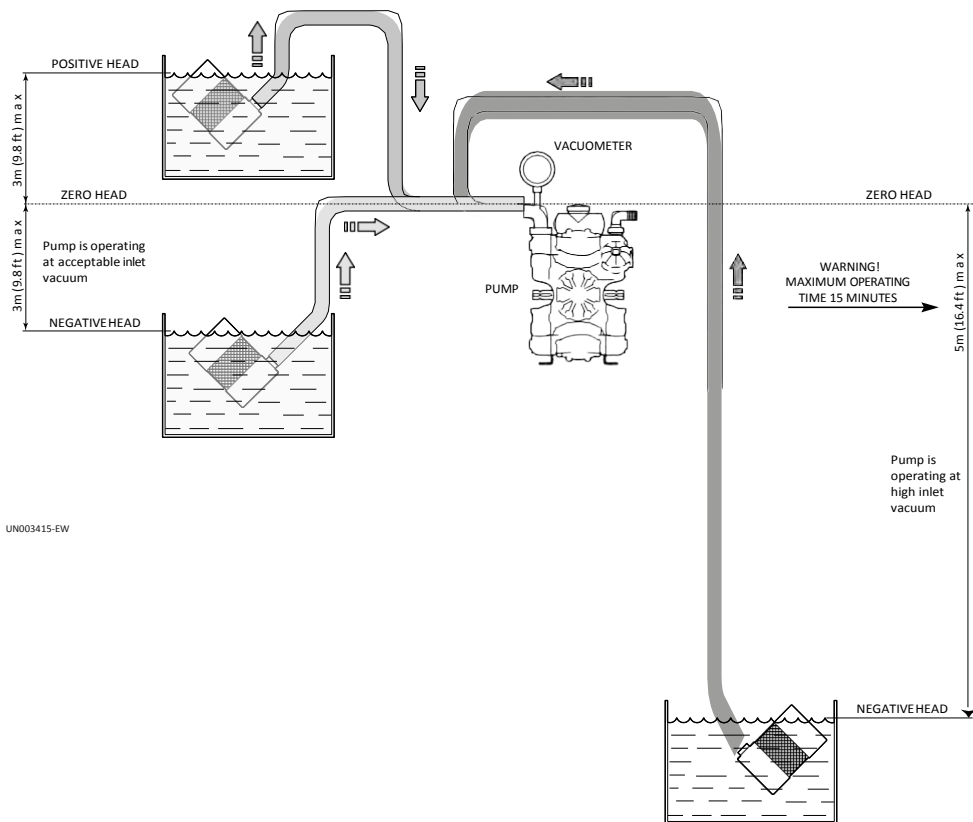
The following is a simplified illustration of the typical installation layout and is purely a guideline.



## General guidelines on water supply connection

To operate correctly, the diaphragm pump must draw in liquids from containers at atmospheric pressure. **Do not supply the pump with pressurised liquids.**

For continuous duty, the pump should not draw in water by gravity from containers with liquid level at heights above 3m.



UN003415-EW

For continuous duty, the pump should not draw in liquids by vacuum from containers with the liquid level more than 3m below the pump intake fitting and the circuit must consist of hoses of length and diameter appropriate to the pump intake fitting (see "Technical Data"), free from restrictions and elbows, and with a filter of suitable capacity (see "Installation").

For occasional duty, such as filling water supply tanks, the pump can be operated at a vacuum drawing in liquids from reservoirs having the surface of the liquid up to 5m below the pump intake fitting, for periods of no more than 15 minutes.

**Drawing in liquids from lower levels or for longer times causes cavitation in the pump circuit and reduces the lifetime of the diaphragms, valves and mechanical parts.**



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### **Safety recommendations for handling and lifting**

**Before starting the operations, organise the intended working area so that the materials can be lifted and handled in safety.**

**Unloading, loading, handling and lifting operations must be carried out by skilled, authorised, specifically trained staff.**

**During lifting and handling operations, the people not involved in the operations must remain at a safe distance.**

**For lifting, use hooks and ropes which are free from damage and appropriate for the load to be lifted.**

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### **Packaging description and unpacking**

The packaging normally consists of a cardboard box for easy, safe transport.

Depending on the quantity of goods to be shipped and the place of destination, packages may be fixed on a pallet for easier lifting and handling.

Check the weight of the item on the transport documents to allow the use of suitable lifting equipment.

When unpacking, check that all components are present and intact. If items are missing or damaged, contact the dealer or manufacturer to agree the procedures to be followed.

The packaging material must be disposed of appropriately in accordance with the relevant statutory requirements.

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### **Transport**

The pump may be shipped by a variety of means of transport (road, rail, sea or air) depending on its destination. Secure the packaging firmly to the vehicle during transport, to prevent random movement.

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### **Storage**

In the event of a lengthy period out of use, place the pump (in its packaging if possible, or otherwise protected) under cover, protected from the weather.

Do not store in places where the ambient conditions might impair the pump's operating condition over time.

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### **Safety recommendations for installation**

Take all possible precautions to allow the pump to be installed in a safe, risk-free manner.

All installation phases must be taken into consideration when designing the machinery or plant in which the pump is to be installed.

The design must consider all mounting points, the means of transmission of the energy sources, and the protective and safety devices required by the relevant regulations to prevent the risk of injury.





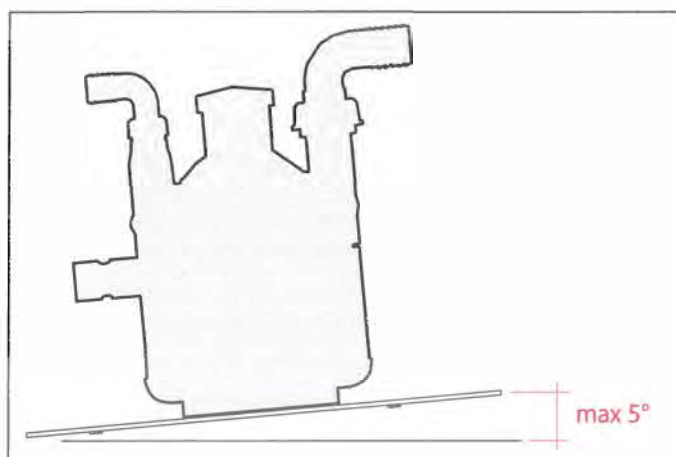
### Installation

- The crankshaft may turn in either direction.
- The water connection with the pump must be made using hoses of suitable diameter, in all case no less than that of the pump fittings, securing them to the fittings using good quality clamps. The intake hose must be coil-reinforced to prevent restrictions.
- The pump inlet must be fitted with a filter having suitable capacity for the pump delivery rate and must be designed to generate a vacuum of no more than - 7 Hg. This value can be measured by connecting a vacuum gauge to the pump intake fitting.
- The rated pressure of the outlet hose, fittings and clamps must be no less than the maximum rated pressure of the pump. Replacing the intake and outlet fittings provided on the pump by the manufacturer with smaller diameter alternatives may reduce the pump's performance and void the warranty.

### Mounting the pump

The pump must be installed on a horizontal surface with no flexible components between it and the mounting surface.

The illustration shows the maximum permitted pump installation angle beyond which proper lubrication of the crank mechanism is not ensured.



**Fix the pump** by bolting the pump base onto the machine with suitable bolts, tightening appropriately.





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### **Safety recommendations for use**

**Before start-up, the operator must perform the necessary safety checks.**

**In the event of leaks from the pressurized pipes, stop the pump at once and fix the leak.**

**Do not operate the pump above the limits set by the manufacturer to increase its performance.**

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### **Preliminary checks**

If the pump has a pressure accumulator, check its level of inflation, see "Checking the inflation pressure".

Check the fittings of the hoses and the pump's intake and delivery circuits to prevent restrictions, the intake of air and leaks of liquid.

Check the pump tank oil level as described in the "Checking the oil level" section.

Before putting the pump into operation, check that the control unit is set for full bypass (low pressure.)

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### **Starting and stopping the pump**

To start the pump, proceed as described below.

1. When starting the pump, keep the control unit in the full bypass position until the pump has primed.
2. After starting the pump, and after the pump is primed, move the control unit into the pressure regulation position. Adjust the pressure by turning the red knob on the control unit.
3. During the first few hours of operation, check that the oil level in the tank remains between the minimum and maximum limits. If top-ups are required, use A/R diaphragm pump oil, AR64532D.

To stop the pump, proceed as described below.

1. Reduce the pressure by rotating the lever to the full bypass position.
2. Stop the pump.



## MAINTENANCE INSTRUCTIONS

### Safety recommendations for maintenance



#### Caution - Take Care

**Before doing any maintenance work, depressurise the water system and isolate the pump from all energy sources.**

**When the jobs are done, before restarting the pump, check that no tools, rags or other materials have been left close to moving parts or in hazardous zones.**

**Replace any excessively worn components with original parts and use the lubricants recommended by the manufacturer.**

Scheduled maintenance table			
Frequency	Component	Procedure	Reference
Every working day	Filter	Inspect filter cartridge	See "Inspecting the filter"
	Pump	Checking the oil level	See "Checking the oil level"
	Connection of pump to power source (pulley, belt, coupling)	Inspection	-
	Pump	Inspect mounting	See "Inspecting the pump mounting"
	Pipes and connections	Inspection	See "Inspecting the connections and pipes"
Every 100 working hours	Pressure accumulator (if installed)	Check inflation pressure	See "Checking the inflation pressure"
	Reduction gear (if installed)	Check oil	See "Checking the oil level"

**Dispose of the worn-out components and lubricants in accordance with the relevant statutory requirements.**

**Carry out the routine maintenance procedures specified by the manufacturer to keep the pump safe and performing well.**



### Table of lubricants

The pump is delivered complete with high-performance 30 weight, non-detergent oil suitable for the intended ambient conditions (see "Environmental operating limits").

### Inspecting the pump mounting

Check that the pump's fixing screws have not become loose.

If necessary, tighten them with the driving torque stated in the installation design.

### Inspecting the connections and pipes

#### - **Inspect the connections for leaks.**

Leaks can normally be dealt with by tightening the connections properly.

If leaks from the intake pipeline connections are noticed, the seals must be repaired.

#### - **Inspect the hoses.**

If the pipes show signs of aging, breakage, swelling, rubbing, etc., they must be replaced.

### Inspecting the Inlet Filter

#### - **Inspect the inlet filter cartridge.**

If the cartridge is fouled, wash it thoroughly to remove the dirt.

If the cartridge is torn or cracked, it must be replaced.

### Checking the oil level

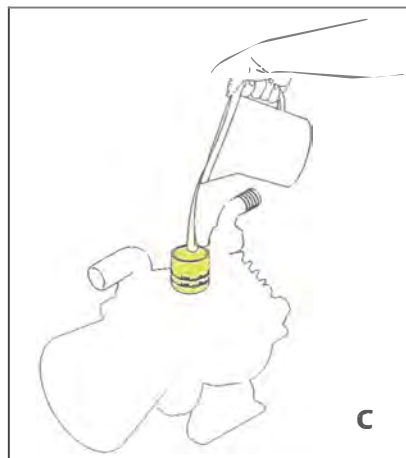
- Check the oil with the pump level, ensuring that it has been running for at least 5 minutes in normal working conditions.
- If the oil level is not visible or completely full, add or remove oil to restore this level and check, still with the pump running, that the oil level does not vary so much that it leaks from the cap or is no longer visible in the tank.
- If necessary, top up with oil with A/R Premium Diaphragm Pump oil P/N 64532D.
- Check the oil level regularly, as it may vary significantly with the operating conditions.

To top up with oil proceed as described below.

- 1) Unscrew the cap and pour in oil.
- 2) Screw the cap back into place.



A/R Pump Oil  
P/N AR64532D





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### Pump Storage

It is important to comply with the recommendations for storage in the operator's manual of the machine into which the pump is incorporated.

For the pump itself, at the end of pumping operations it is essential to flush out the pump by pumping clean water. After this, open the pump inlet to air and leave the pump in operation until the pump is completely empty. Following this simple procedure at the end of every operating session will prevent the retention inside the pump of products which are often corrosive and may damage its wetted parts over the long-term.

If the pump is in storage during the winter in locations with severe weather conditions, it is very important to flush out the internal circuit as described above and then fill the pump with A/R Pump Saver, AR64511. Then take care to drain the liquid from the system and the pump.

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### Putting the pump back into service

Before putting the pump back into service after storage, check the oil level and the tightness of the mounting screws.

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### Scrapping the pump

Used units must be disposed of in compliance with local legislation.

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**A/R Pump Saver**  
**P/N 64511**  
**Protects Pumps from  
Freezing Conditions**



## TROUBLESHOOTING

The information provided is intended to provide guidance how to deal with malfunctions which may occur during use.

Some of these procedures may be carried out by skilled staff, while others have to be performed at specialised service centres since they require the use of specific equipment as well as detailed knowledge of repair operations.

Problem	Cause	Remedy
The pump does not prime properly.	Intake circuit not airtight.	Tighten, repair or replace hoses and fittings as necessary.
	Control unit switching lever on "Pressure" setting.	Move control switching lever to "By-pass" setting.
The pump does not require the required pressure.	Seat and plate of intake and delivery valves worn.	Replace the worn valves.(1)
	Nozzles worn or too large in diameter.	Replace the worn nozzles. Use nozzles of suitable diameter.
	Restriction in intake circuit.	Remove the restriction from the circuit.
	Intake filter fouled.	Clean the filter cartridge.
Pressure gauge needle wobbles, pressure pulsating.	Intake circuit not airtight.	Clean or replace the intake and delivery valves. (1)
	Residual air left inside pump.	Discharge the air by opening a ball valve/central unit connected to the delivery side with the pump in operation.
	Valve plate stuck to its seat.	Tighten, repair or replace hoses and fittings as necessary.
	Pressure accumulator deflated	Inflate accumulator to the correct pressure.
Uneven flow of liquid to nozzles.	Pressure accumulator deflated	Inflate accumulator to the correct pressure.
Increase in noise and simultaneous drop in oil level (pump cavitation).	Restriction in intake circuit.	Remove the restriction from the circuit.
	Intake filter fouled.	Clean the filter cartridge.
	Pump drawing in liquid from too low a level.	See "Pump Intake Conditions" section.

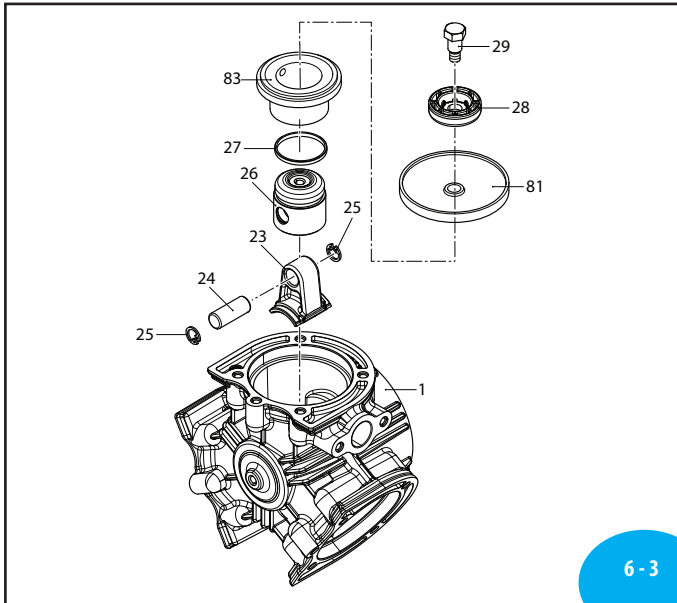
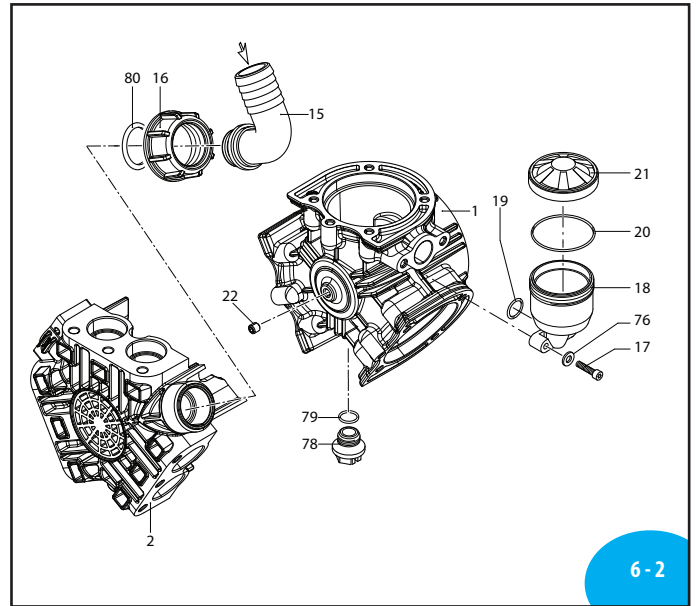
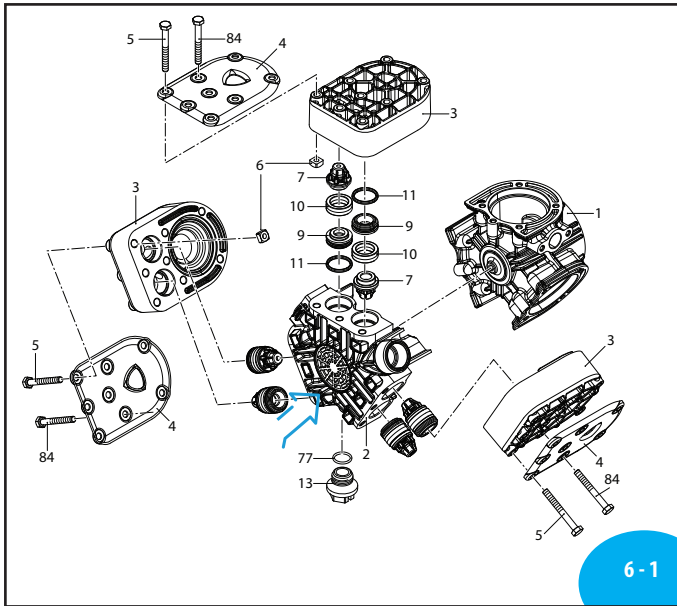


## TROUBLESHOOTING

Problem	Cause	Remedy
Oil on pump body or base.	Oil seal on pump shaft worn.	Replace the worn oil seal.
	Oil pressure inside pump too high.	Restore correct oil level in tank.
Pump using too much oil (oil flowing from delivery port) or oil whitish in color (water/oil emulsion in tank).	One or more diaphragms ruptured.	<b>Stop the pump at once.</b> Replace the diaphragms (1)

# A. R. NORTH AMERICA

## AR20LFP-GR-GCI / AR25LFP-GR-GCI





# AR20LFP-GR-GCI / AR25LFP-GR-GCI

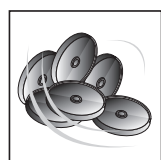
	GR GCI
AR20LFP	33280
AR25LFP	33279

Low pressure

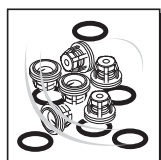
Pos	Code	Description	Qty	Note
1	3340011	Pump body	1	
2	3340030	Manifold	1	
3	3340020	Head	3	
4	3340590	Retaining washer	3	
5	3340221	Bolt M6x55	9	T44* SS
6	3340600	Nut M6	9	SS
7	3349051	Valve AISI 316L	6	
9	3340200	Spacer	6	
10	3340211	Gasket	6	Viton
11	390061	O-ring Ø 20.63x2.62	6	Viton
13	3120690	Plug 3/8" G	1	T18*
15	3120460	Hose barb Elbow 1"	1	
16	3120440	Ring nut 1" G	1	
17	394380	Bolt M6x30	2	T88* SS
18	1040310	Oil sight glass	1	
19	390180	O-ring Ø 18.72x2.62	1	
20	650920	O-ring Ø 53.65x2.62	1	
21	1040326	Cap black	1	AR20
	1040324	Cap red	1	AR25
22	820440	Bolt M6x6	1	
23	3340541	Connecting-rod aluminum	3	
24	3340510	Pin	3	
25	480160	Snap ring Øi 10	6	
26	3340060	Piston Ø 30	3	
27	3340280	Piston ring Ø 30	3	
28	3340090	Retaining washer	3	
29	3340070	Retaining Bolt	3	T88*
30	3340610	Body	1	
31	3340290	Fork	2	
32	1880250	Fitting	1	
33	391240	Pressure gauge Ø 63	1	0 - 350 psi
34	2840891	O-ring Ø 14x2	1	Viton
35	3120690	Plug 3/8" G	1	
36	800211	O-ring Ø 13.10x2.62	1	Viton
37	3340630	Plug	1	
38	390181	O-ring Ø 18.72x2.62	1	Viton
39	3340351	Plug	1	
40	390061	O-ring Ø 20.63x2.62	1	Viton
41	2540100	O-ring Ø 6.02x2.62	1	Viton
42	3340310	Valve spool	1	
43	3340450	Pin	1	
44	3340620	Body	1	
46	3340330	Knob	1	
47	3120430	Ring nut 3/4" G	1	
48	800211	O-ring Ø 13.10x2.62	1	Viton
49	3120470	Hose barb 3/4" G	1	
51	1880492	Valve 3/8" G - 1/2" GM-MSX	1	
52	110130	Ring nut 1/2" G	1	
53	3340130	Spacer	1	
54	3340580	Bearing	1	
55	3340491	Ring	2	
57	3340560	Shaft marked EC	1	AR20
	3340570	Shaft marked ED	1	AR25
58	380230	Bearing	1	

Pos	Code	Description	Qty	Note
60	3120150	Ring	1	
61	1460490	Snap ring Øi 47	1	
76	393790	Washer	2	SS
77	2840891	O-ring Ø 14x2	1	Viton
78	3202140	Plug 1/4" G	1	T177*
79	820510	O-ring Ø 10.82x1.78	1	
80	1140451	O-ring Ø 20.24x2.62	1	Viton
81	3340081	Diaphragm	3	BlueFlex™
82	960161	O-ring Ø 17.86x2.62	2	Viton
83	3340520	Sleeve Ø30	3	AR20
	3340530	Sleeve Ø30	3	AR25
84	3340181	Bolt M60x60	15	T44* SS
85	740291	O-ring Ø 14x1.78	1	Viton
86	1880260	O-ring Ø 15.08x2.62	1	Viton
87	3340670	Spring	1	
88	3340320	Lever	1	
89	3340400	Body	1	
90	130610	Bolt M6x20	3	T88*
91	820510	O-ring Ø 10.82x1.78	1	
92	3340710	Dipstick	1	
93	880581	Plug 1/4" G	1	
94	11640	Bolt M6x16	1	T780*
95	391470	Washer	1	SS
96	881670	Snap ring Øi 55	1	
97	881660	Ring	1	
98	320242	Snap ring Øe 30	1	
99	881650	Bearing	1	
100	3340480	Pinon Z=8(3/4")	1	
101	3340470	Gear Z=23	1	
102	1200450	Key	1	
103	3340410	Gasket	1	
104	3340770	Key	1	
105	320360	Bolt M8x22	4	T221*
106	620440	Bolt 5/16" 24 UNF 7/8"	4	T221*

\* Torque: in-lbs +/- 10%



AR 46561 BlueFlex diaphragms	
Pos.	Qty
81	3

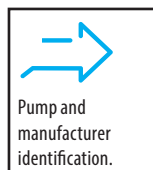


AR 46565 Valves	
Pos.	Qty
7	6
10	6



Suggested oil	
Type	Oz
AR64532D	32

Crankcase Oil  
Capacity oz 6.3



# AR20LFP-SP-GCI / AR25LFP-SP-GCI



4 - 4



4 - 5



4 - 6

# AR20LFP-SP-GCI / AR25LFP-SP-GCI

	SP GCI
AR20LFP	33310
AR25LFP	33309

Low pressure

Pos	Code	Description	Qty	Note
1	3340011	Pump body	1	
2	3340030	Manifold	1	
3	3340020	Head	3	
4	3340590	Retaining washer	3	
5	3340221	Bolt M6x55	9	T44* SS
6	3340600	Nut M6	9	SS
7	3349051	Valve AISI 316L	6	
9	3340200	Spacer	6	
10	3340211	Gasket	6	Viton
11	390061	O-ring Ø 20.63x2.62	6	Viton
12	3340270	Base	1	
13	3120690	Plug 3/8" G	1	T18*
14	180433	Bolt	2	
15	3120460	Hose barb Elbow 1"	1	
16	3120440	Ring nut 1" G	1	
17	394380	Bolt M6x30	2	T88* SS
18	1040310	Oil sight glass	1	
19	390180	O-ring Ø 18.72x2.62	1	
20	650920	O-ring Ø 53.65x2.62	1	
21	1040326	Cap black	1	AR20
	1040324	Cap red	1	AR25
22	820440	Bolt M6x6	1	
23	3340541	Connecting-rod aluminum	3	
24	3340510	Pin	3	
25	480160	Snap ring Øi 10	6	
26	3340060	Piston Ø 30	3	
27	3340280	Piston ring Ø 30	3	
28	3340090	Retaining washer	3	
29	3340070	Retaining Bolt	3	T88*
30	3340610	Body	1	
31	3340290	Fork	2	
32	1880250	Fitting	1	
33	391240	Pressure gauge Ø 63	1	0 - 350 psi
34	2840891	O-ring Ø 14x2	1	Viton
35	3120690	Plug 3/8" G	1	
36	800211	O-ring Ø 13.10x2.62	1	Viton
37	3340630	Plug	1	
38	390181	O-ring Ø 18.72x2.62	1	Viton
39	3340351	Plug	1	
40	390061	O-ring Ø 20.63x2.62	1	Viton
41	2540100	O-ring Ø 6.02x2.62	1	Viton
42	3340310	Valve spool	1	
43	3340450	Pin	1	
44	3340620	Body	1	
46	3340330	Knob	1	
47	3120430	Ring nut 3/4" G	1	
48	800211	O-ring Ø 13.10x2.62	1	Viton
49	3120470	Hose barb 3/4" G	1	
51	1880492	Valve 3/8" G - 1/2" GM-MSX	1	
52	110130	Ring nut 1/2" G	1	
53	3340130	Spacer	1	
54	3340580	Bearing	1	
55	3340491	Ring	2	

Pos	Code	Description	Qty	Note
57	3340560	Shaft marked EC	1	AR20
	3340570	Shaft marked ED	1	AR25
58	380230	Bearing	1	
60	3120150	Ring	1	
61	1460490	Snap ring Øi 47	1	
76	393790	Washer	2	SS
77	2840891	O-ring Ø 14x2	1	Viton
78	3202140	Plug 1/4" G	1	T177*
79	820510	O-ring Ø 10.82x1.78	1	
80	1140451	O-ring Ø 20.24x2.62	1	Viton
81	3340081	Diaphragm	3	BlueFlex™
82	960161	O-ring Ø 17.86x2.62	2	Viton
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	3340530	Sleeve Ø30	3	AR25
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85	740291	O-ring Ø 14x1.78	1	Viton
86	1880260	O-ring Ø 15.08x2.62	1	Viton
87	3340670	Spring	1	
88	3340320	Lever	1	
106	620440	Bolt 5/16" 24 UNF 7/8"	4	T221*
107	3340150	Adapter	1	
108	3340381	O-ring Ø 10.5x2	1	
109	5374	Ring nut 1/2" G	3	
110	3340440	Hose barb 1/2" G	3	

\* Torque: in-lbs +/- 10%



AR 46561 BlueFlex diaphragms	
Pos.	Qty
81	3



AR 46565 Valves	
Pos.	Qty
7	6
10	6



Suggested oil	
Type	Oz
AR64532D	32
Crankcase Oil Capacity oz 6.3	



Pump and  
manufacturer  
identification.



## AR20LFP-SP-GCI & AR25LFP-SP-GCI Dimensions

