

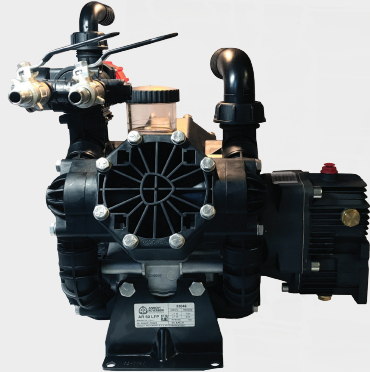


**ANNOVI  
REVERBERI**<sup>®</sup>  
The Power of Experience

## AR 60 LFP



140° F - Max Water Temp  
1 1/2" - Suction  
1" - Outlet



140° F - Max Water  
Temp 1 1/2" - Suction  
1/2" - Hose Barb Outlets  
1" - Bypass Hose Barb

### INSTRUCTION MANUAL

#### AR60LFP - 550 RPM - SEMI-HYDRAULIC THREE-DIAPHRAGM PUMP

MODEL	MAX GPM	MAX L/MIN	MAX PSI	MAX BAR	HP POWER	WEIGHT LBS.
AR60LFP-SP	15.6	59.1	290	20	2.14	24
AR60LFP-GR-GCI*	15.6	59.1	290	20	2.14	40

#### DIAPHRAGM KITS

MODEL	
AR43247	BlueFlex
AR43245	Desmopan
AR43244	NBR
AR43246	Viton

#### VALVE KITS

MODEL	
AR43138	Valves 316SS

#### O-RING KITS

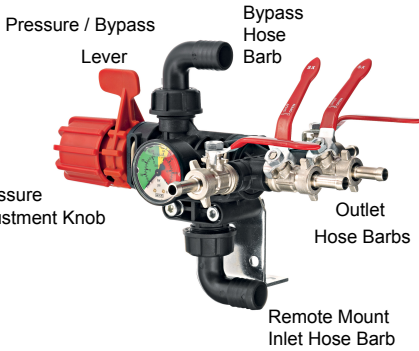
MODEL	DESCRIPTION
AR43128	O-Rings

#### OIL

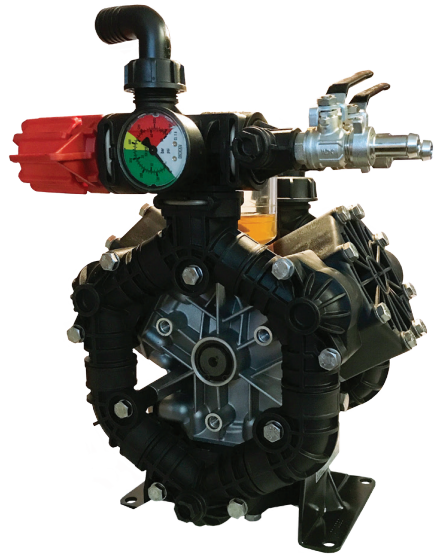
MODEL	DESCRIPTION
AR64532D	Oil
AR64532D-C	Case (6)Oil



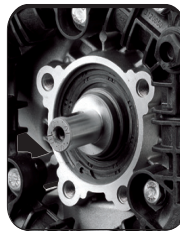
# INSTALLATION INSTRUCTIONS



GS35V Control Unit  
Model No. AR3249006



GR-GCI Version  
Pump with Viton® Diaphragms  
and Gearbox AR31185 with  
3/4" Hollow Shaft and GS255  
Viton® Control Unit



SP Version  
Straight 3/4" Keyed Shaft



For models AR45, AR60 & AR80  
(SP Models Only)  
Fits SAE 2-bolt A Flange Motors  
with 1" Shaft



## 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.**

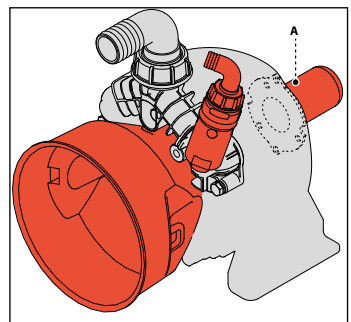
The drawing shows the position of the safety devices mounted on the machine.

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.

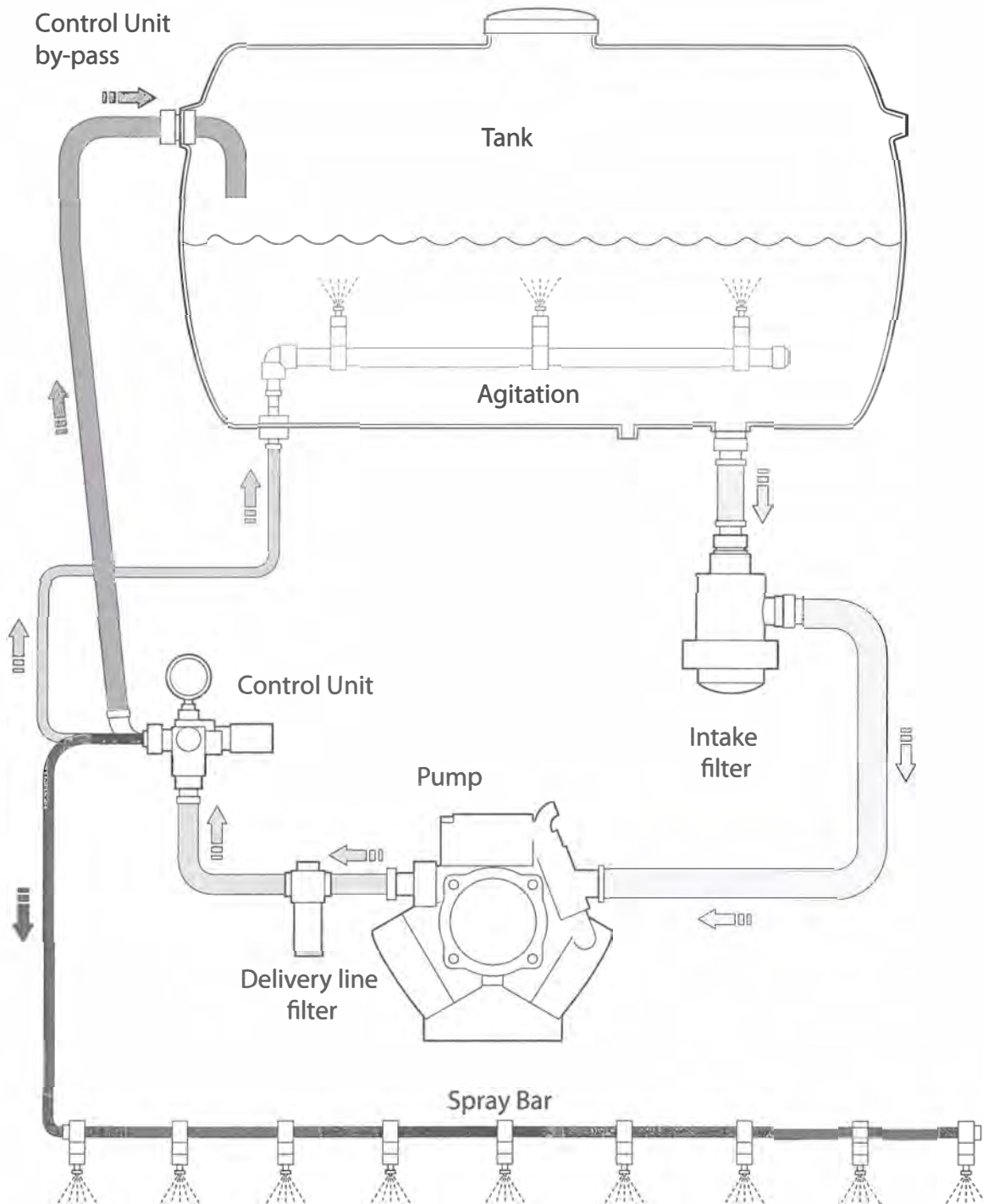




# INSTALLATION INSTRUCTIONS

## Installation diagram (guideline)

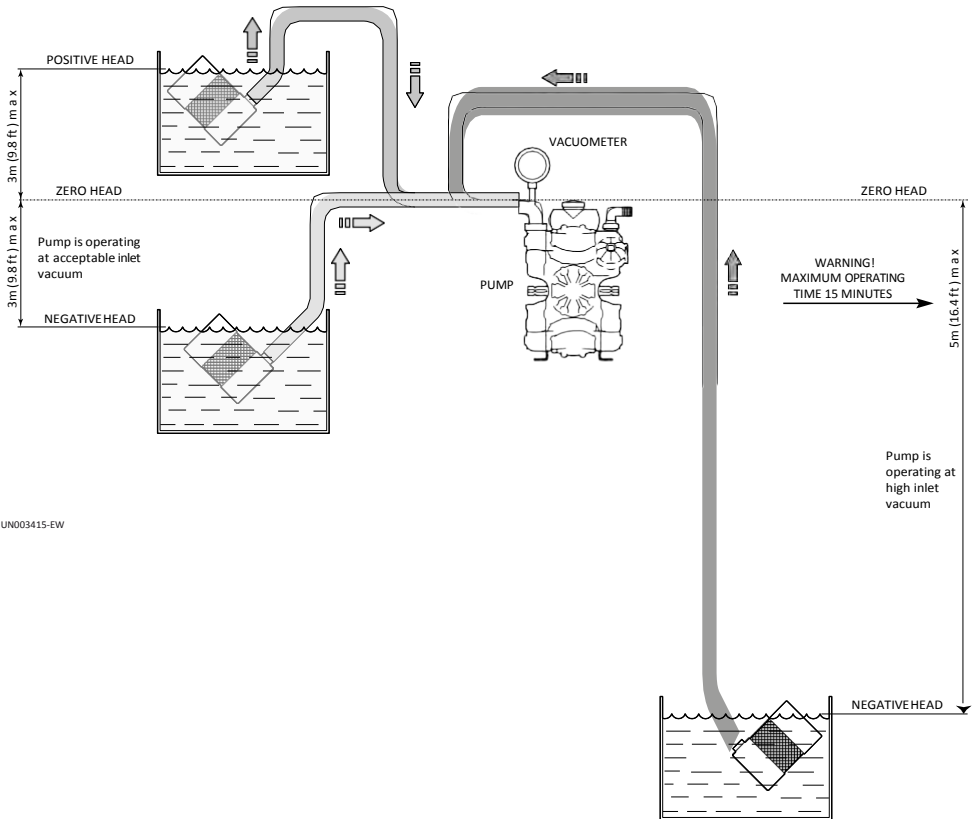
The following is a simplified illustration of the typical installation layout and is purely a guideline.



## 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 3 m.



UN003415-EW

For continuous duty, the pump should not draw in liquids by vacuum from containers with the liquid level more than 3 m 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 5 m 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.



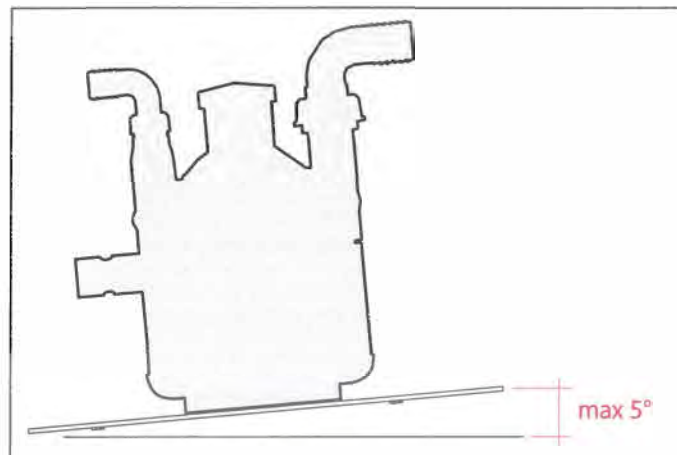
## Installation

- 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

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**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.

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### Starting and stopping the pump

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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 with the red knob.
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.





## 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

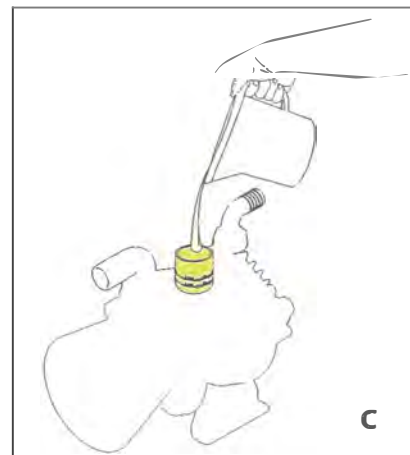
- Check the oil with the pump level, ensuring that it has been running for at least 5 minutes in normal working conditions.
- If the oil level is not visible or completely full, add or remove oil to restore this level and check, still with the pump running, that the oil level does not vary so much that 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

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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

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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

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



**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.

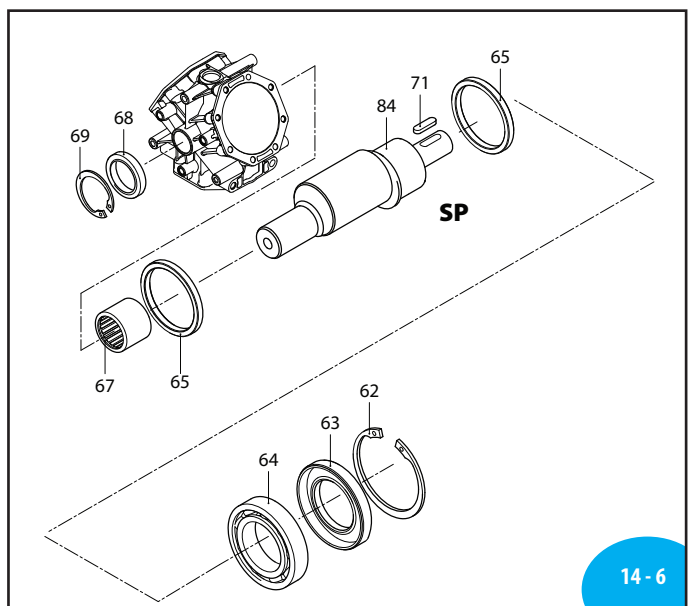
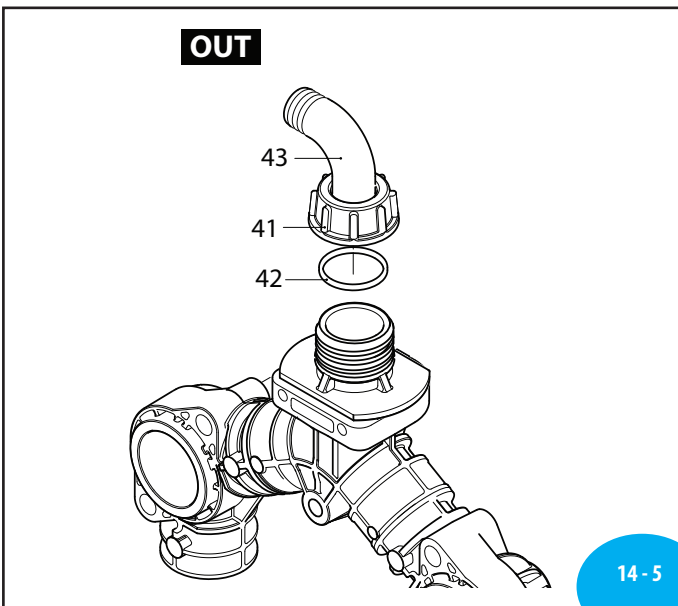
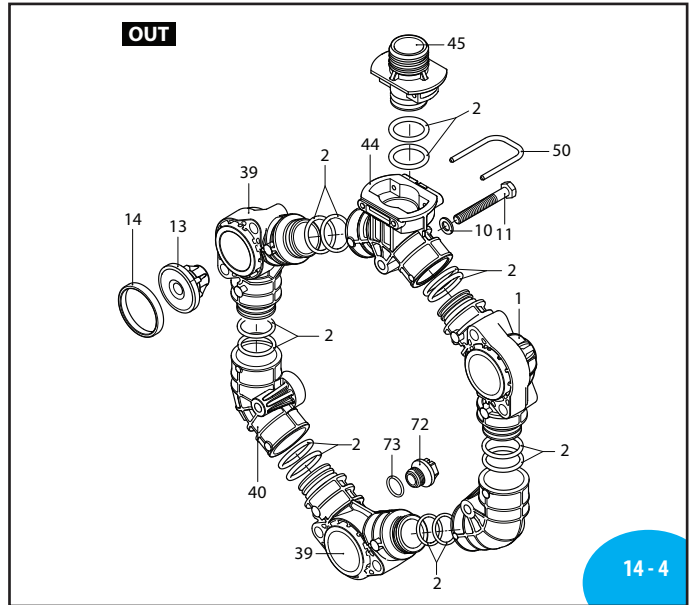
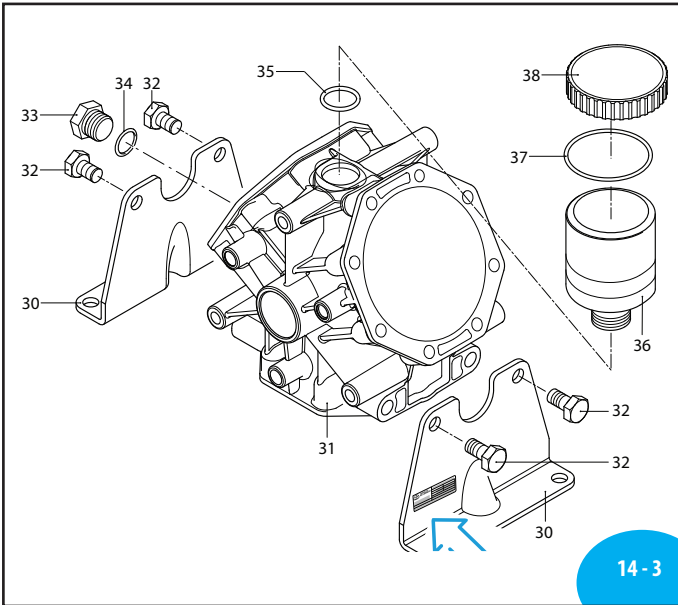
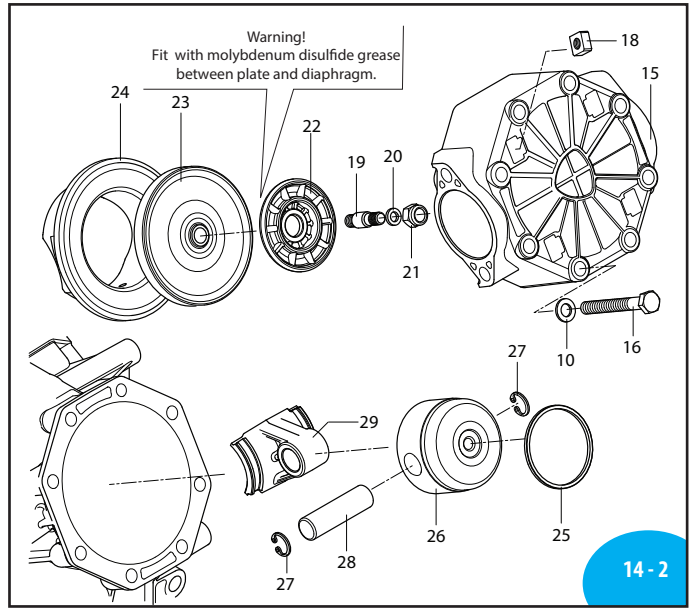
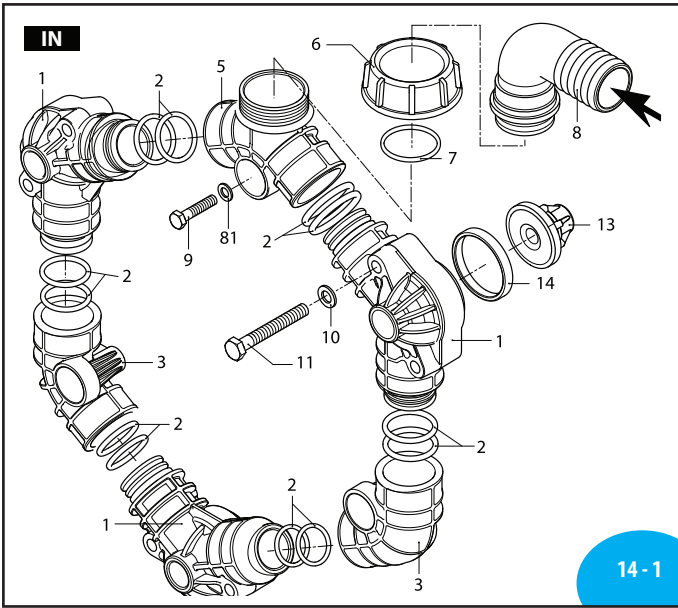


## TROUBLESHOOTING

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

## AR60LFP-SP / AR80LFP-SP



# AR60LFP-SP / AR80LFP-SP

	SP
AR60LFP	33154
AR80LFP	33086

Low pressure

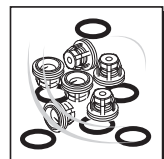
Pos	Code	Description	Qty	Note
1	3240030	Manifold closed vavle	5	
2	390292	O-ring Ø 28.25x2.62	24	Viton
3	3240040	Manifold asp./mandate	4	
5	3240050	Manifold asp. Threaded	1	
6	750670	Ring nut 1-1/2" G	1	
7	180460	O-ring Ø 29x3	1	Viton
8	50267	Elbow Ø 40	1	
9	324280	Bolt TE M8x55	6	SS T106*
10	3120760	Washer	36	SS
11	380211	Bolt TE M8x75	12	SS T88*
13	2429051	Valve AISI 316L	6	
14	3460380	Gasket	6	Viton
15	3240020	Head	3	
16	621771	Bolt TE M8x80	24	SS T124*
18	3120510	Nut M8	12	SS
19	3240101	Hub pin AISI 316L	3	T265*
20	320622	Washer	3	SS
21	2240670	Nut M10 AISI 316L	3	
22	6240110	Retaining washer	3	BlueFlex™
23	1040083	Diaphragm Øe 105	3	
24	3240130	Sleeve	3	
25	650190	Piston ring	3	
26	1040120	Piston Ø 63	3	
27	1040270	Ring Seeger Øi 15	6	
28	1040070	Pin	3	
29	3240120	Connecting-rod	3	
30	3240090	Base	2	
31	3240010	Pump body	1	
32	620342	Bolt TE M10x20	4	SS T265*
33	880530	Plug 3/8" G	1	T177*
34	740290	O-ring Ø 14x1.78	1	
35	720030	O-ring Ø 22.22x2.62	1	
36	3120240	Oil sight glass	1	T177*
37	650920	O-ring Ø 53.65x2.62	1	
38	1040324	Plug red	1	
39	3240031	Manifold	1	
41	3120440	Ring nut 1" G	1	
42	1140451	O-ring Ø 20.24x2.62	1	Viton
43	3120460	Elbow Ø 25	1	
44	3240080	Manifold per controller	1	
45	3240460	Threaded adapter	1	
50	3460210	Fork	1	
62	961790	Ring Seeger Øi 68	1	
63	3120160	Ring Seal	1	
64	961780	Bearing	1	
65	3240320	Ring	2	
67	3460110	Bearing	1	
68	1300230	Ring Seal	1	
69	480900	Ring seeger Øi 35	1	
71	2280950	Key	1	(d)
72	3120690	Plug 3/8" G	1	C2
73	2840891	O-ring Ø 14x2	1	Viton
74	621782	Bolt TE M8x40	6	SS T177*
81	390315	Washer	6	SS

Pos	Code	Description	Qty	Note
84	3240190	Shaft SP marcate EB	1	AR80
84	3240180	Shaft		AR60
85	3240460	Adaptor 1" G	1	
86	550351	O-ring Ø 23.81x2.62	2	Viton

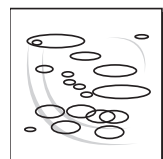
(a) Bolt with Loctite 242 thread lock STRONG.  
 (d) Supplied in kit applications.  
 \* Torque: in-lbs +/- 10%



<b>AR 43247</b> BlueFlex diaphragms	
<b>AR 43244</b> NBR diaphragms	
<b>AR 43246</b> Viton diaphragms	
<b>AR 43245</b> Desmopan diaphragms	
Pos.	Qty
14	6
23	3
45	2
47	1



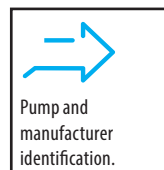
<b>AR 42805</b> Valves - AR80bp	
<b>AR 43138</b> Valves - AR80LFP	
Pos.	Qty
13	6
14	6



<b>AR 42857 - AR 80 bp</b> <b>AR 43128 - AR 80 LFP</b> O-Rings			
Pos.	Qty	Pos.	Qty
2	24	45	2
7	1	52	1
34	1	57	1
35	1	58	1
37	1	73	1
42	1		

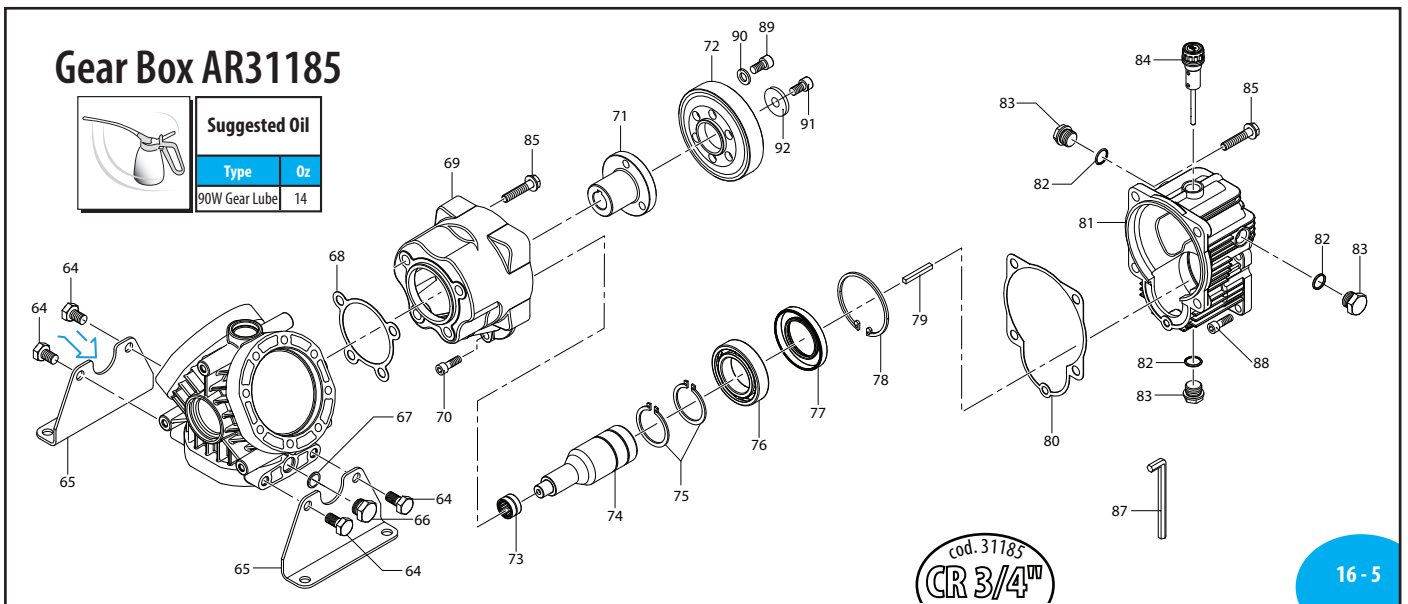
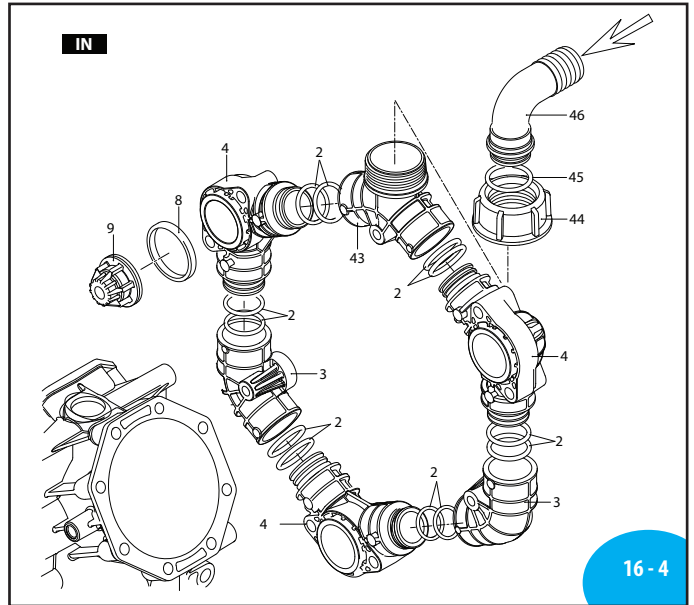
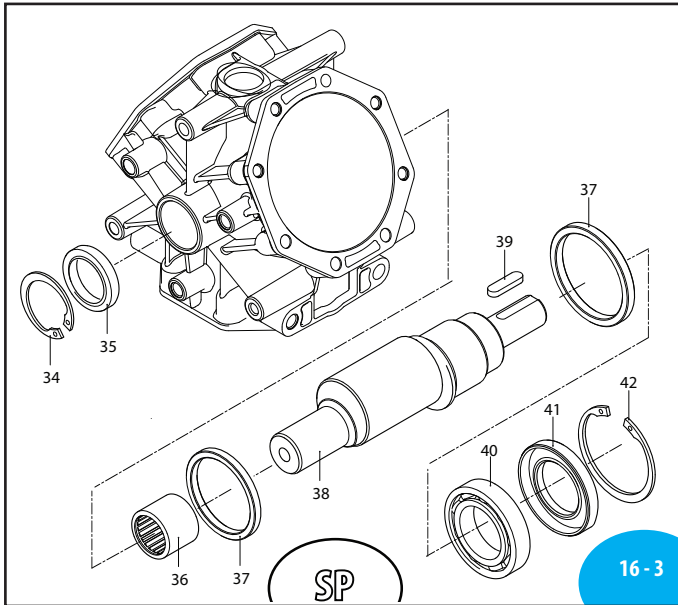
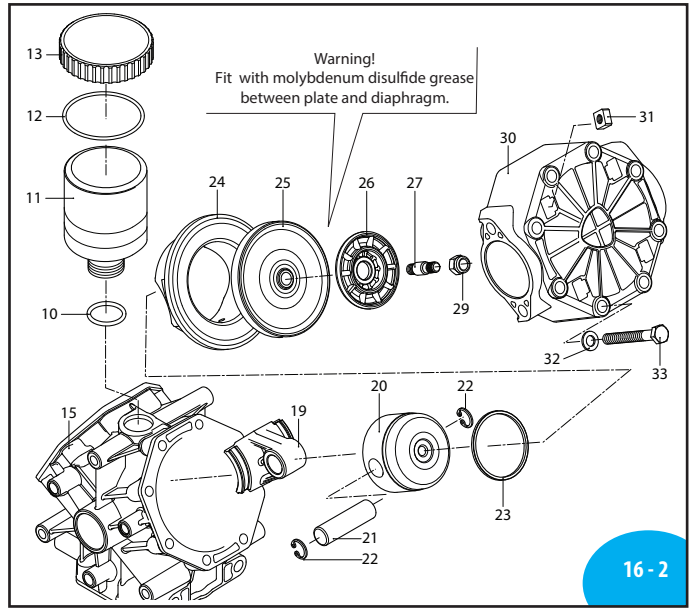
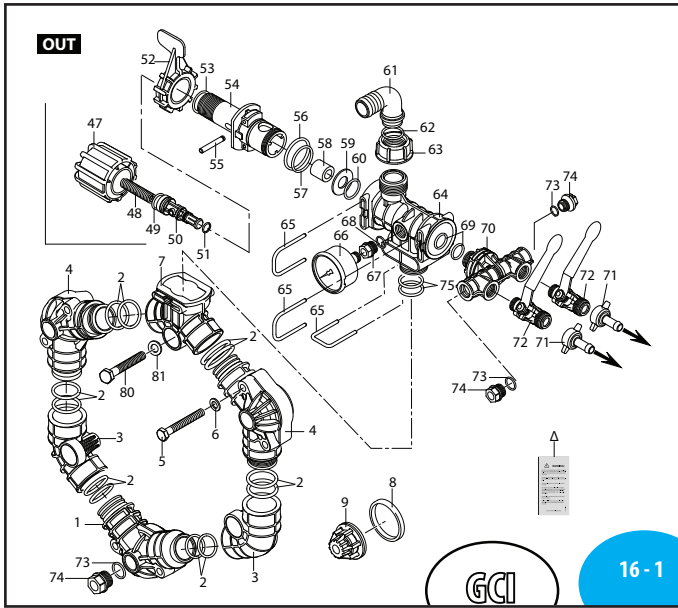


<b>Suggested oil</b>	
Type	Oz
AR64532D	32
Crankcase Oil Capacity 13 oz	



# A.R. NORTH AMERICA

## AR 60LFP GR-GCI / AR 80LFP GR-GCI





# AR 60LFP GR-GCI / AR 80LFP GR-GCI

Low pressure

Pos	Code	Description	Qty	Note
1	3240031	Manifold 3/8" G	1	
2	390292	O-ring Ø 28.25x2.62	24	Viton
3	3240040	Manifold	4	
4	3240030	Manifold	5	
5	380211	Bolt	12	SS T88*
6	3120760	Washer	12	SS
7	3240080	Manifold	1	
8	3460380	Gasket	6	Viton
9	2429051	Valve AISI 316L	6	
10	720030	O-ring Ø 22.22x2.62	1	
11	3120240	Oil reservoir	1	T177*
12	650920	O-ring Ø 53.65x2.62	1	
13	1040322	Plug	1	
15	3240010	Pump body	1	
16	620342	Bolt TE M10x20	4	SS T265*
17	880530	Plug 3/8" G	1	T177*
18	740290	O-ring Ø 14x1.78	1	
19	3240120	Connecting-rod	3	
20	1040120	Piston Ø 63	3	
21	1040070	Pin	3	
22	1040270	Ring Circlip Øi 15	6	
23	650190	Piston ring	3	
24	3240140	Sleeve	3	
25	1040082	Diaphragm Øe 105	3	Viton
26	3240110	Plate	3	
27	3240101	Hub pin AISI 316L	3	T265* (a)
29	2240670	Nut M 10 AISI 316L	3	T177**
30	3240020	Head	3	
31	3120510	Nut M8	12	SS
32	3120760	Washer	24	SS
33	621771	Bolt TE M8x80	24	SS T124*
34	480900	Ring Circlip Øi 35	1	
35	1300230	Ring	1	
36	3460110	Bearing	1	
37	3240320	Ring	2	
38	3240180	Shaft	1	AR60LFP
39	3240190	Shaft	1	AR80LFP
39	2280950	Key	1	
40	961780	Bearing	1	
41	3120160	Ring	1	
42	961790	Ring Circlip Øi 68	1	
43	3240050	Manifold	1	
44	750670	Ring nut 1-1/2" G	1	
45	1880460	O-ring Ø 29x3	1	Viton
46	50267	Elbow Ø 40	1	
47	3240440	Knob	1	
48	3240410	Spring	1	
49	480441	O-ring Ø 17.13x2.62	1	Viton
50	3240380	Piston	1	
51	391001	O-ring Ø 9.13x2.62	1	Viton
52	1880210	Ring nut	1	
53	961240	O-ring Ø 31.47x1.78	1	
54	3240360	Body	1	

Pos	Code	Description	Qty	Note
55	1880240	Pin	1	
56	660171	O-ring Ø 31.42x2.62	1	
57	394211	O-ring Ø 29.82x2.62	1	Viton
58	3240391	Piston	1	
59	3240421	Plug	1	
60	720031	O-ring Ø 22.22x2.62	1	Viton
61	3120460	Elbow Ø 25	1	
62	1140451	O-ring Ø 20.24x2.62	1	Viton Green
63	3120440	Ring nut 1" G	1	
64	3240350	Box	1	
65	3460210	Fork	3	
66	1880340	Pressure gauge Ø 50	1	to 50 bar
67	1880250	Fitting	1	
68	2840891	O-ring Ø 14x2	1	Viton Green
69	400441	O-ring Ø 17.13x2.62	2	Viton
70	3240450	Body	1	
71	110130	Ring nut 1/2" G	2	
72	1880492	Valve 3/8"G-1/2"GM-M SX	2	
73	2840891	O-ring Ø 14x2	3	Viton Green
74	3120690	Plug 3/8" G	3	T17*
75	50351	O-ring Ø 23.81x2.62	2	Viton
77	961800	Ring	1	
78	961790	Ring Circlip Øi 68	1	
79	881090	Key	1	
80	3240280	Bolt TE M8x55	6	SS C12
81	390315	Washer	6	SS
83	1980740	Plug Brass 3/8" G	3	T177*
84	1140370	Plug	1	
85	540300	Bolt TCEI M10x30	8	T217*
87	1380630	Key	1	
88	651000	Bolt TCEI 5/16" 24 UNF 1"	4	T217*
89	620470	Bolt TCEI M10x20	3	T177*
90	200231	Washer	3	
91	880280	Bolt TCEI M6x18	1	T88*
92	780230	Washer	1	
98	180030	Bolt TCEI M8x20	1	T217*
99	620950	Gasket	1	
100	651620	Gear Z=64	1	
101	3120350	Shaft	1	
102	3120360	Gasket	1	
103	320240	Ring Circlip Øe 40	2	
104	620960	Box	1	
105	620990	Bearing	1	
106	621660	Pinion Z=11	1	
107	740290	O-ring Ø 14x1.78	3	
108	961780	Bearing	1	
109	3120340	Flange	1	
110	3240090	Base	2	

(a) Bolt with Loctite 242 thread lock STRONG

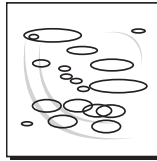
\* Torque: in-lbs +/- 10%



AR 42804 BlueFlex diaphragms	
Pos.	Qty
25	3



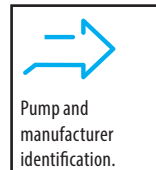
AR 43138 Valves	
Pos.	Qty
8	6
9	6



AR 42995 O-Rings			
Pos.	Qty	Pos.	Qty
2	24	57	1
8	6	60	1
12	1	62	1
18	1	68	1
45	1	69	2
51	1	73	3
56	1		

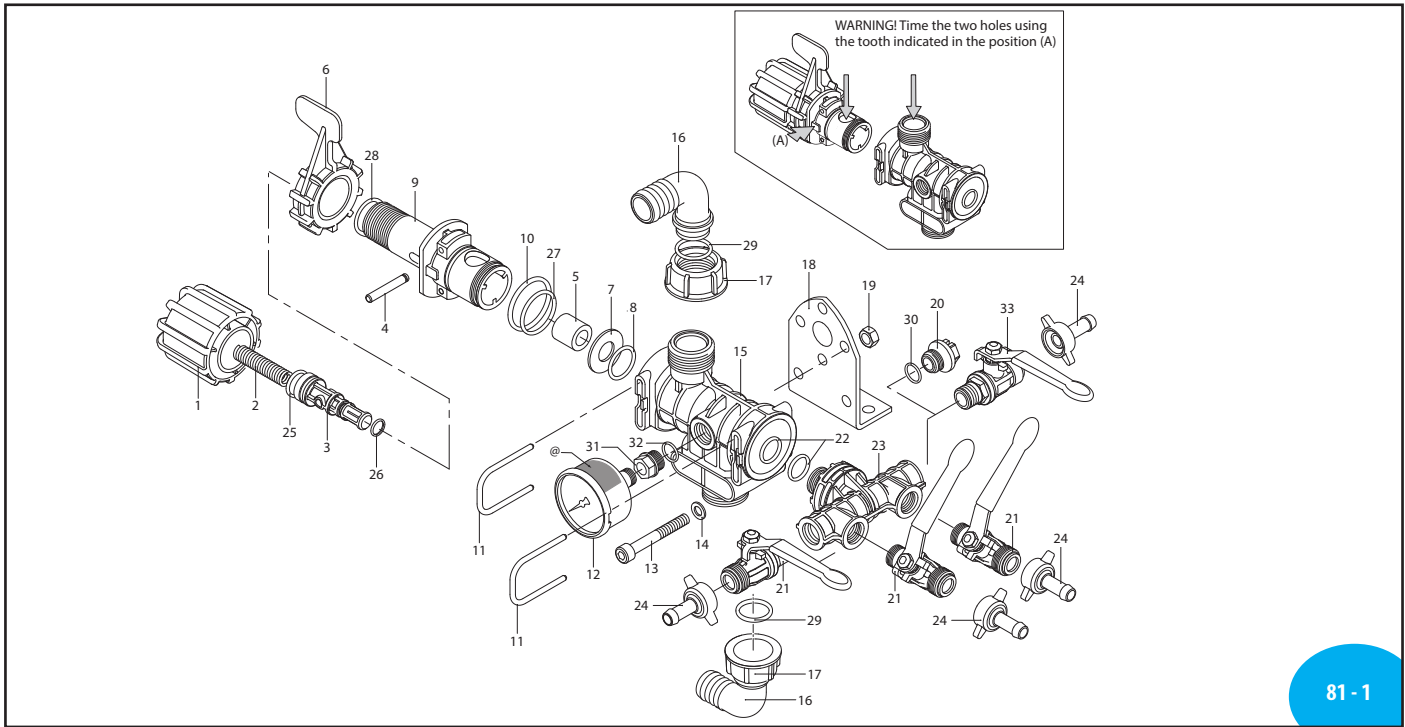


Suggested Oil	
Type	Oz
AR64532D	32
Crankcase Oil Capacity 13 oz	



# A.R. NORTH AMERICA GS35 S

GS35S	915
GS35SV	916



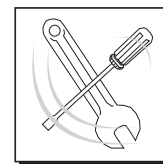
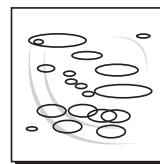
81 - 1

Pos	Code	Description	Qty	Note
1	3240440	Knob	1	
2	3240410	Spring	1	
3	3240380	Piston upper	1	
4	1880240	Pin	1	
5	3240390	Piston lower	1	
6	1880210	Ring nut	1	
7	3240420	Plug	1	
8	720030	O-ring	1	
	720031	O-ring	1	Viton
9	3240360	Body regulator	1	
10	660170	O-ring	1	
	660171	O-ring	1	Viton
11	3460210	Fork	2	
12	3240470	Pressure gauge	1	0-725 PSI
13	280080	Screw	2	TCEI M8x60
14	380241	Washer	2	
15	3240430	Body	1	
16	3120460	Elbow	2	Ø 25
17	3120440	Ring nut	2	1" G
18	320406	Bracket	1	
19	390270	Nut	2	T90*
20	3120690	Plug	1	
21	1880492	Ball valve	3	3/8" G - 1/2" G M-M SX
22	480440	O-ring	2	Ø 17.13x2.62
	480441	O-ring	2	Ø 17.13x2.62 Viton
23	3240450	Body regulator	1	
24	110131	Ring nut / HB	4	1/2" x 3/8"
24	110130	Ring nut / HB	4	Optional 1/2" x 1/2"
25	480440	O-ring	1	Ø 17.13x2.62
	480441	O-ring	1	Ø 17.13x2.62 Viton
26	391000	O-ring	1	Ø 9.13x2.62
	391001	O-ring	1	Ø 9.13x2.62 Viton
27	1520650	O-ring	1	Ø 29.82x2.62
	394211	O-ring	1	Ø 29.82x2.62
28	961240	O-ring	1	Ø 31.47x1.78
29	1140450	O-ring	2	Ø 20.24x2.62
	1140451	O-ring	2	Ø 20.24x2.62 Viton

Pos	Code	Description	Qty	Note
30	2840890	O-ring	1	Ø 14x2
	2840891	O-ring	1	Ø 14x2 Viton
31	1880250	Fitting	1	
32	2840890	O-ring	1	Ø 14x2
	2840891	O-ring	1	Ø 14x2 Viton
33	1880491	Ball valve	1	3/8" G - 1/2" G M-M DX
34	3249006	Direct mount assembly	1	complete Not shown

(A) Holes datum rib  
 @ Pump and manufacturer identification.  
 \* Torque: in-lbs +/- 10%

Control units



AR 42833 O-Rings			
Pos.	Qty	Pos.	Qty
8	1		
10	1		
22	2		
25	1		
26	1		
27	1		
28	1		
29	2		
30	1		

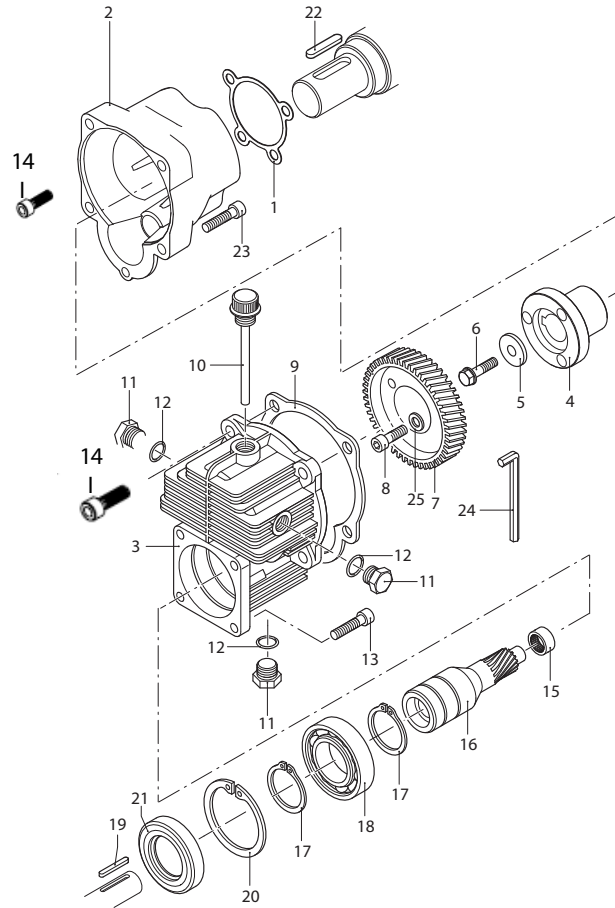
AR 42834 Maintenance repair			
Pos.	Qty	Pos.	Qty
4	1	26	1
5	1	27	1
7	1	28	1
8	1	29	2
10	1	30	1
11	2		
16	2		
17	2		
22	2		
25	1		

# A.R. NORTH AMERICA

## AR 31185 : Gear Reduction

Use of engine :  
**31185:**  
 B&S Vanguard 6.5  
 Kohler SH265 - CH270  
 Subaru E17 - 21  
 Honda GP160 - GX160

Ø 3/4" Straight Keyed Shaft



93 - 1

Pos	Cod.	Description	Q.ty	Note
1	3120360	Gasket	1	
2	3120340	Flange	1	
3	620960	Body	1	
4	3120350	Shaft	1	AR45bp-AR80bp
5	780230	Washer	1	
6	880280	Bolt	1	TCEI M6x18 T90*
7	651620	Gear	1	Z=64
8	620470	Screw	3	TCEI M10x20 T180*
9	620950	Gasket	1	
10	1140370	Plug	1	
11	1980740	Plug	3	3/8" Gottonone T180*
12	740290	O-ring	3	Ø 14x1,78
13	651000	Bolt	4	TCEI 5/16" 24 UNF 1" Geomet T220*
14	540300	Bolt	8	TCEI M10x30 T220*
15	620990	Bearing	1	
16	621660	Pinion	1	Z=11
17	320240	Ring	2	seeger Øe 40
18	961780	Bearing	1	
19	881090	Key	1	
20	961790	Ring	1	seeger Øi 68
21	961800	Ring	1	tenuta
22	3120350	Key	1	AR45bp-AR80bp
23	180030	Screw	1	TCEI M8x20 T220*
24	1380630	Key	1	di manovra
25	200231	Washer	3	



**Suggested Oil**

**Type**

90 W Gear Lube

For gas engine with Ø3/4" shaft, flange SAE J609a

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

1. Lubricate the gasket (Ref. 1) on the pump adapter flange (Ref. 2). Slip the flange over the machined surface of the casting, shaft end of pump. Install (4) mounting bolts (Ref. 14) through the adapter flange into the pump body.

2. Install the shaft hub (Ref. 4) on the pump shaft, after inserting the key (Ref. 22). Secure the hub by threading the retaining bolt (Ref. 6) through the retaining washer (Ref. 5) into the pump shaft.

3. Install the pump gear (Ref. 7) with the pilot diameter of the gear inserted into the inner diameter of the pump shaft. Secure firmly onto the shaft using M10 x 25 socket head cap screws (Ref. 8) and lock washers (Ref. 25).

4. Align the holes in the pump adapter flange (Ref. 2) with threaded holes in the gearbox body. Lubricate the gasket (Ref. 9) and place it in position on the gearbox body (Ref. 3). Install the gearbox body (Ref. 3) on the pump adapter flange (Ref. 2) and secure firmly with M10 x 75 socket head cap screws (Ref. 14). Install the M8 x 20 socket head cap screw (Ref. 23) and tighten securely.

5. Insert the long key (Ref. 19) into the engine shaft keyway. Apply anti-seize to the motor shaft. Align the keyway in the gear reducer input shaft (Ref. 16) and slide the pump and gear reducer onto the engine shaft.

6. Align the holes in the gearbox body with threaded holes in engine boss. Insert 5/16"x1"-24 socket head cap screws through the gearbox body (Ref. 3) and thread them into the threaded holes in the engine boss. Securely tighten with the hex wrench provided.

7. The vent plug (Ref. 10) must always be installed in the uppermost threaded hole of the gearbox body (Ref. 3).

8. Fill the gear case with 90W gear lube. To properly fill, first tighten the bottom plug (Ref. 11); then remove one side plug (Ref. 11) and the vent plug (Ref. 10). Fill until the gear lube is no higher than the mark on the dipstick.

9. Replace and tighten the side plug and the vent plug.