

Oil Free Silent Air Compressor

Instruction Manual

Co-Fastening CSF00490 & CSF20240

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Introduction

This Field Service Manual is intended for use ONLY by an authorized service center and properly trained and experienced repair personnel. Who employed by the authorized service center. THIS SERVICE MANUAL SHOULD NOT BE USED OR DISTRIBUTED TO THE PUBLIC.

THE INSTRUCTIONS AND WARNINGS HEREIN PRESUME EXISTING FAMILIARITY WITH THE DESIGN AND FUNCTION OF THESE AND SIMILAR PRODUCTS. AND THEIR COMPONENTS.

Please Note:

The model(s) represented in this manual may have additions and/or modifications made at any time. Pictures represent a standard unit series and an actual unit may vary slightly. This manual is based on the latest products' information available at the time of creation or last revision. It is believed to be generally accurate and reliable. Consult the factory if detailed information is desired, or. Whenever there is a question about a given unit's configuration or performance specifications.

Safety First

It is recommended that you thoroughly read and understand this manual before you attempt to service the GSE series of compressors to which this applies. **PLEASE NOTE THE FOLLOWING CAUTIONS AND WARNINGS FOR YOUR OWN SAFETY.**

Caution

To avoid personal injury and/or property damage, only authorized service personnel should service this unit.

Warning

To avoid the risk of electrical shock, personal injury, or death, disconnect power before servicing this unit.

Caution

To avoid personal injury, do not remove fan guards while unit is connected to power.

Caution

To avoid personal injury, especially to eyes and face, use eye and face protection when servicing this unit.

Caution

To avoid personal injury, especially to eyes and face, never point the exhaust airflow at yourself or other people in the area. Unit is capable of pressures of 600kPa.

Caution

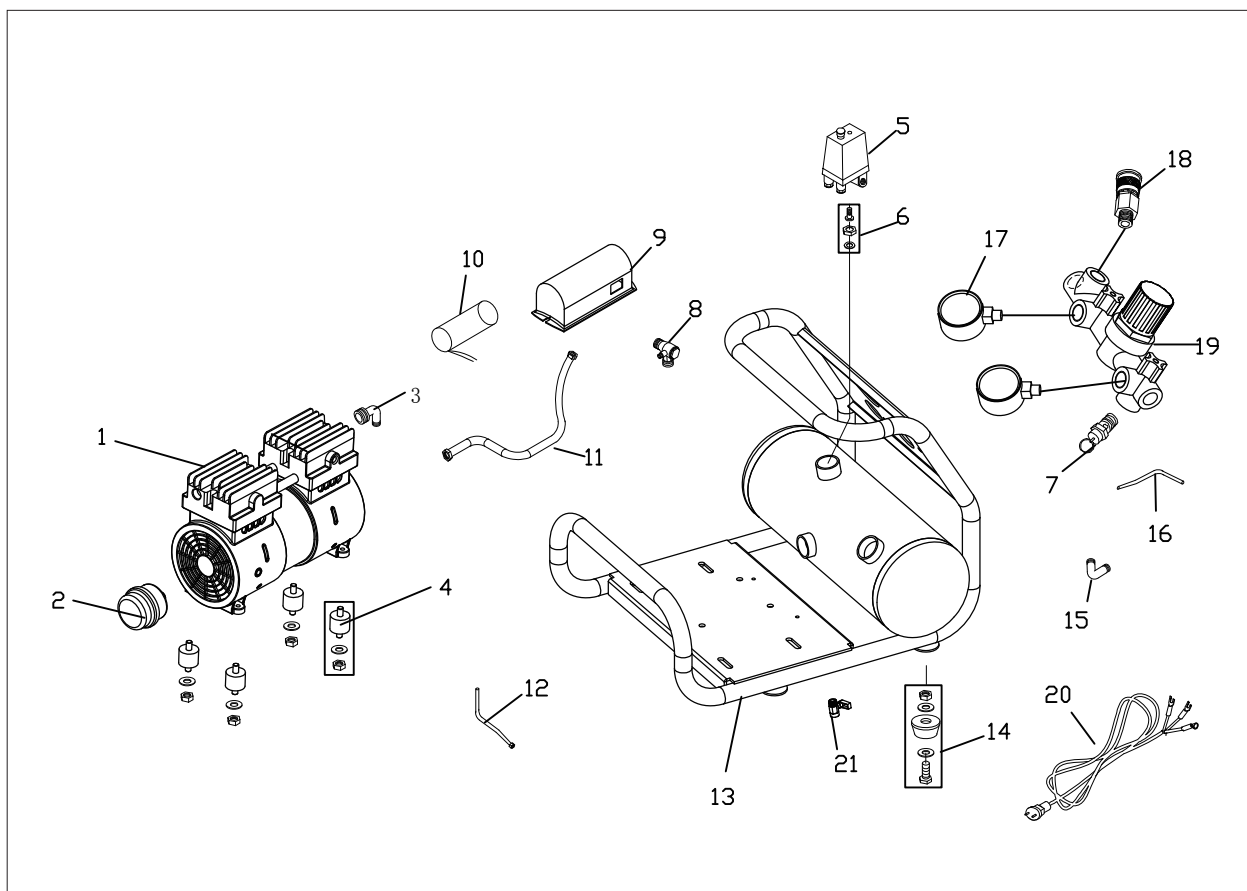
To avoid damage, never lubricate any component in your compressor. All moving parts are permanently lubricated.

Caution

To avoid damage or personal injury, always try rotating the fan by HAND prior to connecting the unit to the power source. Check for suction at the air inlet port by placing your finger over the port and you turn the fan. You should feel a slight suction with each rotation of the fan. If you don't feel suction, or if you feel or hear a thump as you turn the fan, DO NOT CONNECT THE UNIT TO A POWER SOURCE. Review the assembly procedure for possible error.

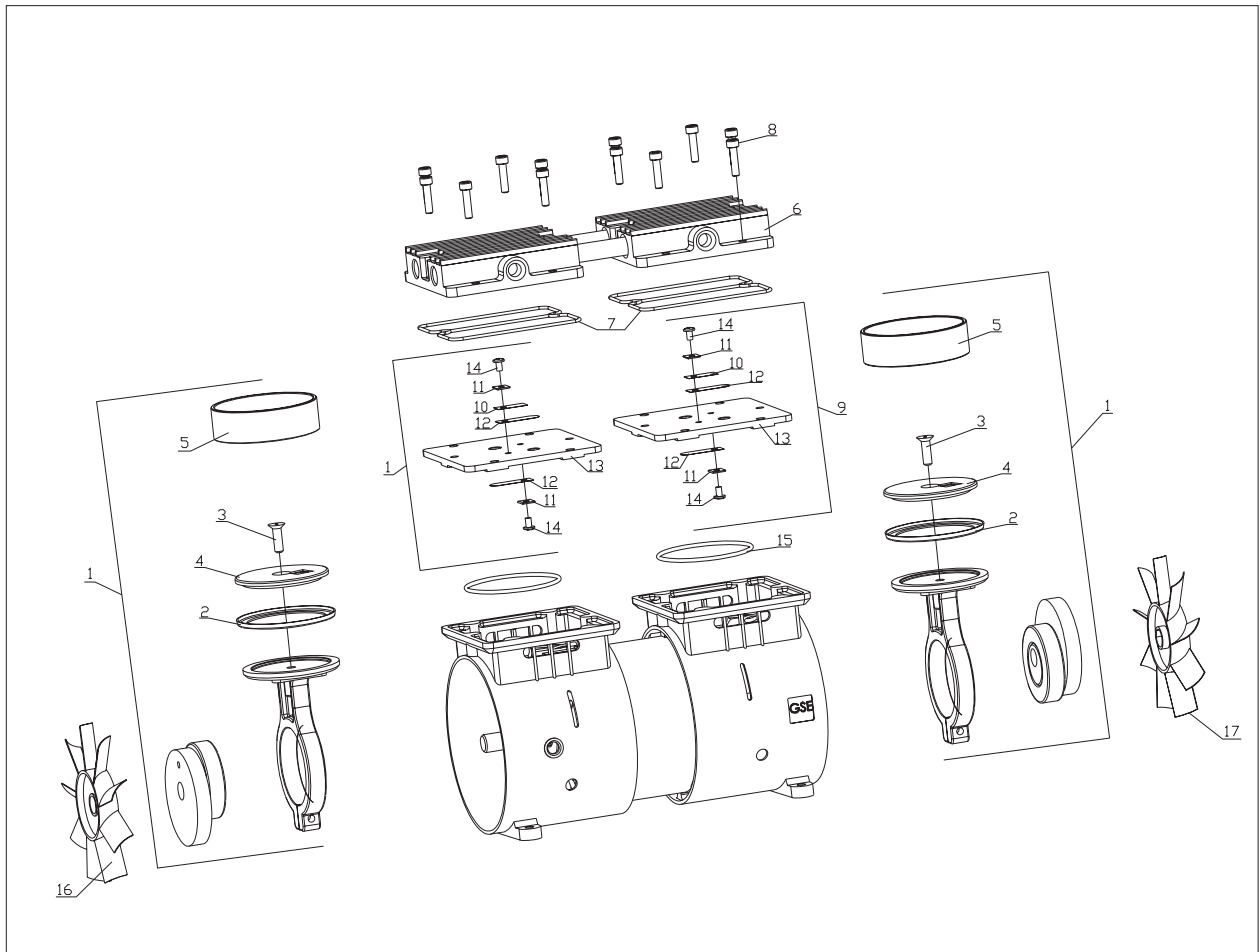
Exploded View and Parts List

Model No: **CSF00490**



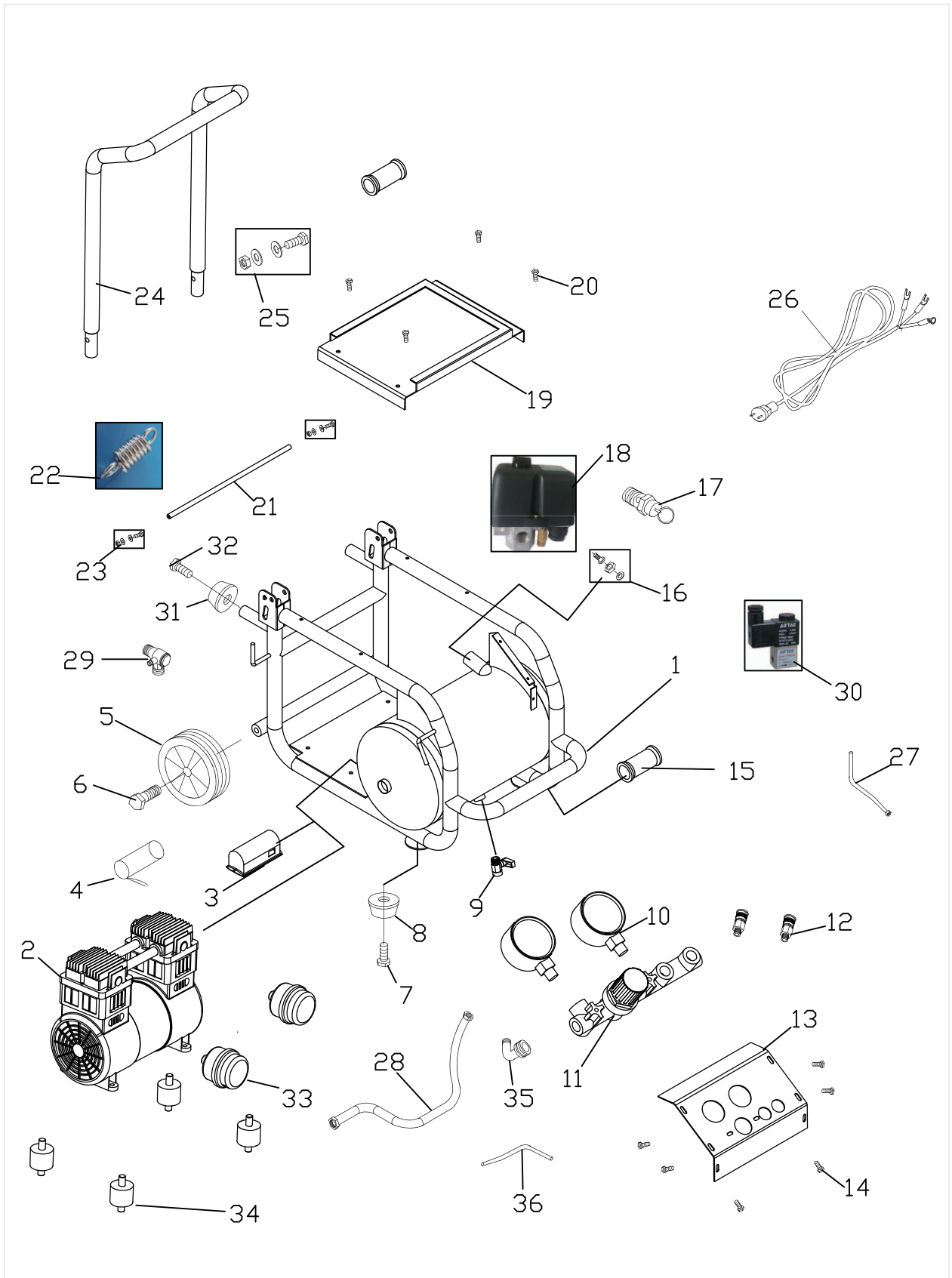
NO.	DESC.	SPEC.	UNIT	QTY.
1	OIL FREE AIR PUMP&MOTOR	230V/50Hz/400W/4POLE	pcs	1
2	AIR FILTER		pcs	1
3	ELBOW	G1/4	pcs	1
4	SHOCK PAD	M6	pcs	4
5	PRESSURE SWITCH		pcs	1
6	CONNECTION	G3/8-G1/4	pcs	1
7	SAFETY VALVE	CE8.8kg	pcs	1
8	CHECK VALVE	G3/8	pcs	1
9	CAPACITOR SHELL		pcs	1
10	CAPACITOR		pcs	1
11	EXHAUST PIPE		pcs	1
12	RELIEF PIPE		pcs	1
13	TANK		pcs	1
14	RUBBER FOOT	M6	pcs	4
15	HOSE ELBOW	G1/4Xφ10	pcs	2
16	CONNECTION HOSE	φ10	pcs	1
17	PRESSURE GAUGE	φ50	pcs	2
18	QUICK COUPLER		pcs	1
19	REGULATOR		pcs	1
20	POWERCORD	VDE 16A 10METER WITH PLUG	pcs	1
21	DRAIN VALVE	G1/4	pcs	1

Model No: **CSF00490**



Item No.	Part No.	Qty. Per Amply	Qty. Per Unit	Description
1	040300	—	2	Connecting Rod, Eccentric & Bearing Assembly
2	040303	1	2	Piston Cup
3	M5×8	1	2	Screw-Piston Cup Retainer
4	040301	1	2	Piston Cup Retainer
5	040604	1	2	Cylinder Sleeve
6	040501 040502	—	1	Left Head/Right Head
7	010506	—	2	O-Ring-Head Gasket
8	M5×20	—	12	Screw-Head
9	040100	—	2	Valve Plate Assembly
10	040103	1	2	Valve Restraint
11	040109	2	4	Valve Keeper Strip
12	070102	2	4	Valve Flapper-Intake & Exhaust
13	040101	1	2	Valve Plate
14	010105	2	4	Screw-Valve Flapper
15	470107	—	2	O-Ring Valve Flapper
16	040607	—	1	Left Fan
17	040608	—	1	Right Fan

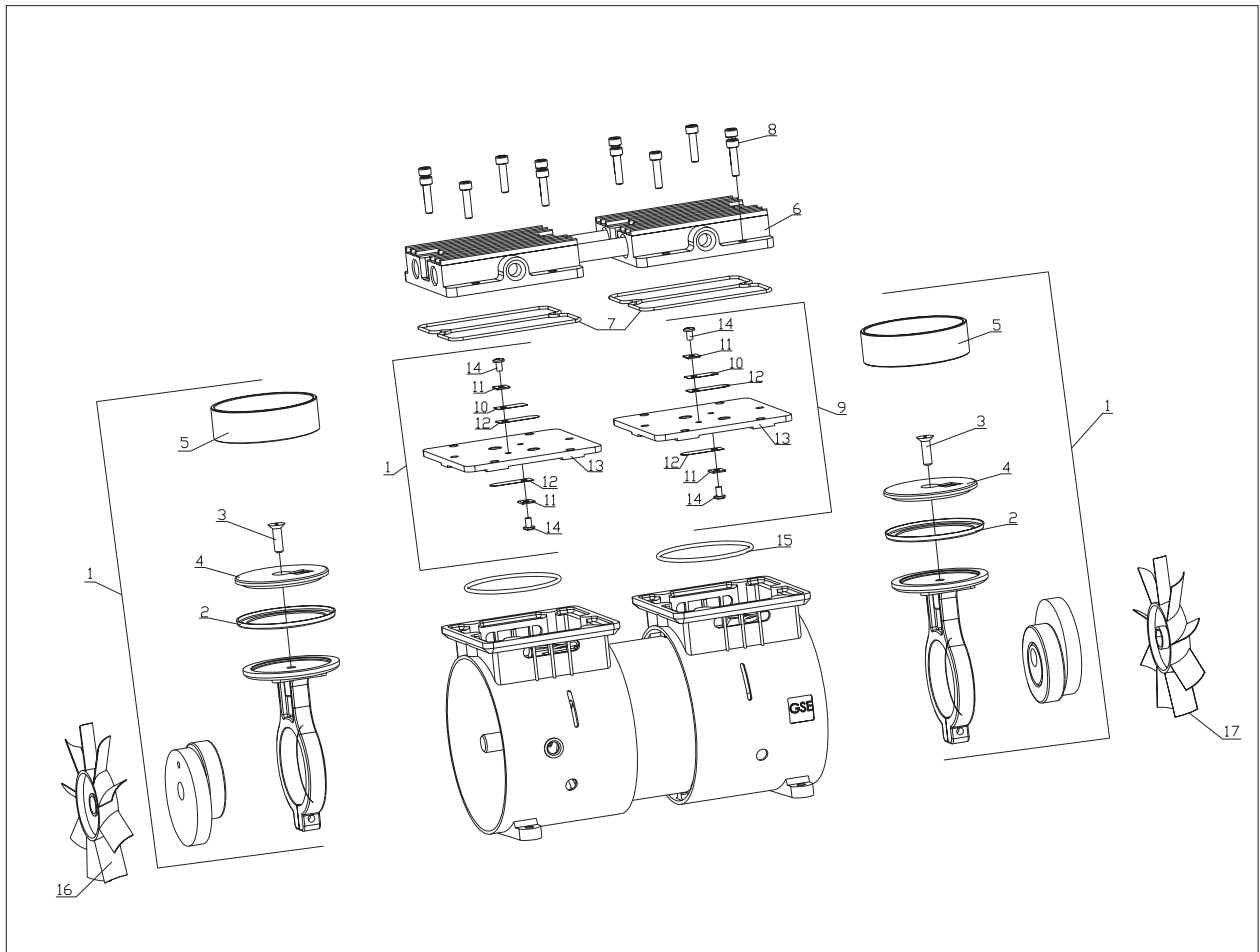
Model No: **CSF20240**



Model No: CSF20240

NO.	DESC.	SPEC.	UNIT	QTY.
1	TANK	20L	pcs	1
2	OIL FREE AIR PUMP & MOTOR	230V/50HZ/1500W/4POLE	pcs	1
3	CAPACITOR SHELL		pcs	1
4	CAPACITOR		pcs	1
5	WHEEL	8" SOLID RUBBER WHEEL	pcs	2
6	wheel shaft	M14	pcs	2
7	SCREW	M8*30	pcs	2
8	RUBBER FOOT	φ8	pcs	2
9	DRAIN COCK	G1/4 AIR COCK	pcs	1
10	PRESSURE GAUGE	50	pcs	2
11	REGULATOR		pcs	1
12	QUICK COUPLER		pcs	2
13	PANEL		pcs	1
14	SCREW	M5X16	pcs	6
15	HANDLE SLEEVE	φ32x120	pcs	3
16	CONNECTOR	G3/8-G1/4	pcs	1
17	SAFETY VALVE	CE 10kg	pcs	1
18	PRESSURE SWITCH	7.5-9.5kg	pcs	1
19	PANEL FOR TOOLS		pcs	1
20	SCREW	M5X16	pcs	4
21	PRESSURE BAR		pcs	1
22	SPRING		pcs	2
23	SCREW GROUP	M4X20	pcs	2
24	HANDLE		pcs	1
25	SCREW GROUP	M10X50	pcs	2
26	POWERCORD	VDE 16A 10METERS	pcs	1
27	RELIEF PIPE		pcs	1
28	EXHAUST PIPE		pcs	1
29	CHECK VALVE	PT3/8	pcs	1
30	SOLENOID VALVE	230V/50Hz	pcs	1
31	RUBBER FOOT	φ6	pcs	2
32	SCREW	M6X30	pcs	2
33	AIR FILTER		pcs	2
34	SHOCK PAD		pcs	4
35	HOSE COUPLING	G1/4Xφ10	pcs	2
36	CONNECTION HOSE	φ10	pcs	1

Model No: **CSF20240**



Item No.	Part No.	Qty. Per Amply	Qty. Per Unit	Description
1	040300	—	2	Connecting Rod, Eccentric & Bearing Assembly
2	040303	1	2	Piston Cup
3	M5×8	1	2	Screw-Piston Cup Retainer
4	040301	1	2	Piston Cup Retainer
5	040604	1	2	Cylinder Sleeve
6	040501 040502	—	1	Left Head/Right Head
7	010506	—	2	O-Ring-Head Gasket
8	M5×20	—	12	Screw-Head
9	040100	—	2	Valve Plate Assembly
10	040103	1	2	Valve Restraint
11	040109	2	4	Valve Keeper Strip
12	070102	2	4	Valve Flapper-Intake & Exhaust
13	040101	1	2	Valve Plate
14	010105	2	4	Screw-Valve Flapper
15	470107	—	2	O-Ring Valve Flapper
16	040607	—	1	Left Fan
17	040608	—	1	Right Fan

Preventive Maintenance and Troubleshooting Guide

GSE® recommends that you perform the following service to minimize unexpected downtime for your compressor:

- Replace the connecting rods or piston cups and sleeves
- Replace the flapper valves
- Replace the head O-ring Head gasket.
- Replace the valve plate O-rings

If you are having a problem with your compressor, use this table to help determine the cause(s):

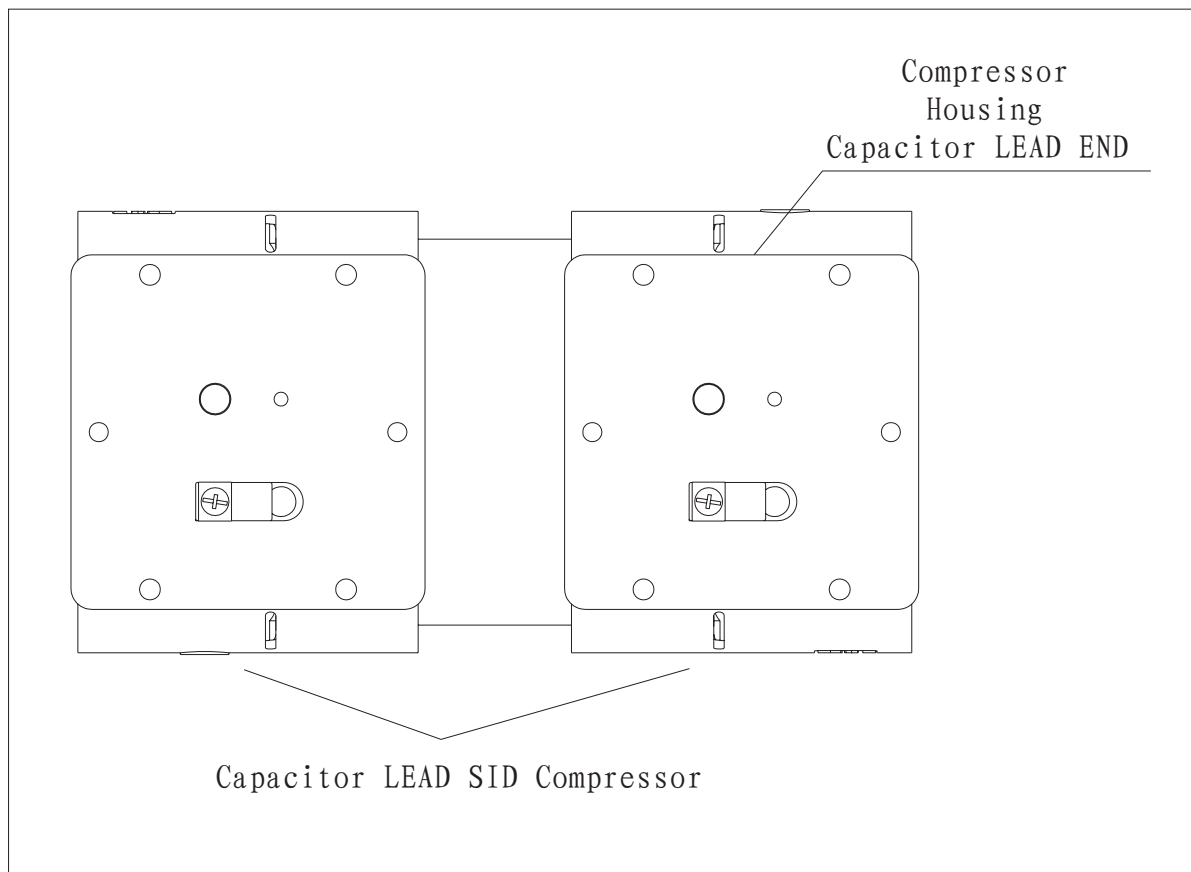
Problem					Possible Cause	Corrective Action
Low Flow	Low Pressure	Unit Will Not Start	Motor ① Overheats	Loud Unit		
			×		High voltage at compressor	Reduce voltage
×	×	×	×		Low voltage at compressor	Increase voltage
×	×			×	Damaged valves	Replace flapper valves
×	×			×	Debris in valves	Remove debris and check for valve damage
×	×			×	Damaged gaskets	Replace gaskets
×	×			×	Worn Cup	Replace connecting rod
×	×			×	Loose head screws	Tighten head screws
			×		Broken fan	Replace fan
		×	×	×	Bent motor shaft	Replace entire unit
		×	×		Damaged capacitor	Replace capacitor
×					Loose fittings	Tighten fittings
×			×		Insufficient ventilation in enclosure	Increase air circulation to enclosure
		×		×	Worn bearings	Replace Eccentric Bearing assembly

① Thermal protector in motor will interrupt current when motor overheats.

Required tools and Materials

To disassemble and reassemble your compressor, you need the following tools and materials:

- Torque wrench that has an N.m scale (for head screws, connecting rod, flapper valve screw, and pipe plugs).
- RTD500CN driver (for head screws).
- S3 Allen wrench attachment for torque wrench (for eccentric screw).
- '+' like attachment for torque wrench (for flapper valve screw).
- screwdriver (for retainer screws).
- Soft, clean cloths.



Reference Drawing: Technology to assist with the following instructions.

Component Repair

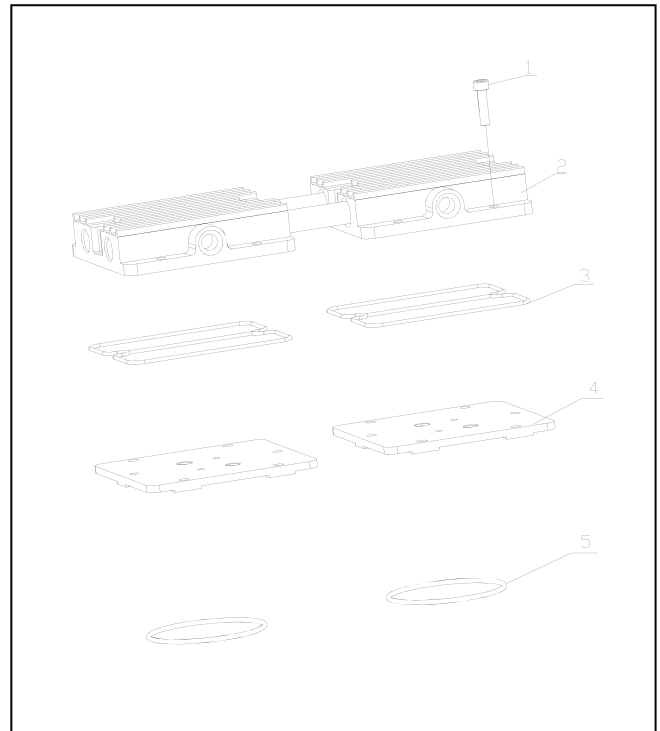
Servicing the Head, Valve Plate Assembly and Connecting Rod and Bearing Assembly

The head would only need to be replaced if it is visibly damaged.

Component Parts Required

You will need:

- Head (if damaged)
- Head gasket
- Valve plate O-ring
- Complete valve plate assembly or individual flapper valves.
- Flapper valve screw(s) if replacing individual flapper valve(s).



Removing the Head

- 1、 Disconnect the power.
- 2、 Disconnect all airlines and remove compressor from the enclosure.
- 3、 Remove all screws (1) that fasten the head (2) to the compressor housing.
- 4、 Carefully separate the head from the compressor body.
- 5、 Carefully separate the valve plate assemblies (4) from the heads.
- 6、 Remove the head gasket O-rings (3) and replace.
- 7、 Turn the valve plates over and replace the valve plate gasket O-rings (5).



Attention

If you are replacing the head and gaskets only, see the assembly instructions on page 21. To replace the Valve flappers and connecting rod assembly, continue to page 12, 16.

Removing the Flapper Valves

Note: We recommend you remove and replace one flapper valve at a time. This will help to simplify the repair process and orient the flapper valve correctly in the valve plate.

1、 If you are replacing a flapper valve on the topside of the valve plate (side facing the head), remove the flapper valve screw (1), with a '+' like screwdriver. Lift off the valve keeper strip (2), lift off the strengthen valve (3), and lift off the flapper valve. (4).

2、 Remove any debris from the valve plate with water-free, alcohol. (Soaps and detergents should not be used due to the potential for corrosion from soap residue.)

3、 Place the valve plate on the compressor housing and orient it as illustrated. Make sure the O-ring head gasket towards the cylinder. Note the orientation of the valve ports.

4、 Orient a new flapper valve (1) over Port 1. Observe the location of at the end of the flapper valve.

5、 Place a valve restraint (3) over the flapper valve.

6、 Place a valve keeper strip (4) over the valve restraint observing that the Restraint's Radium is facing Valve plate and oriented as shown in the illustration.

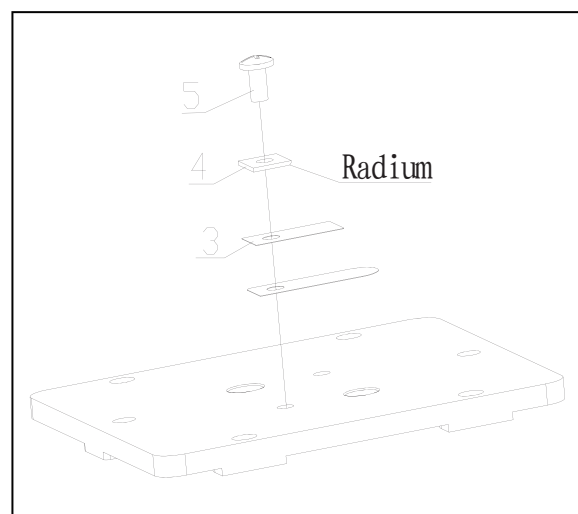
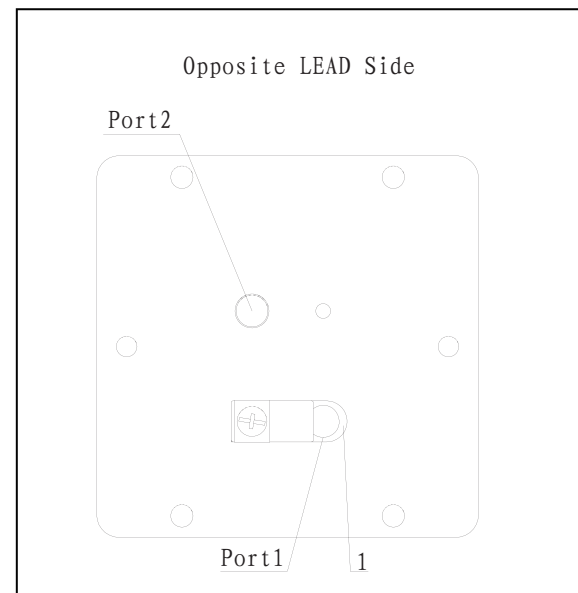
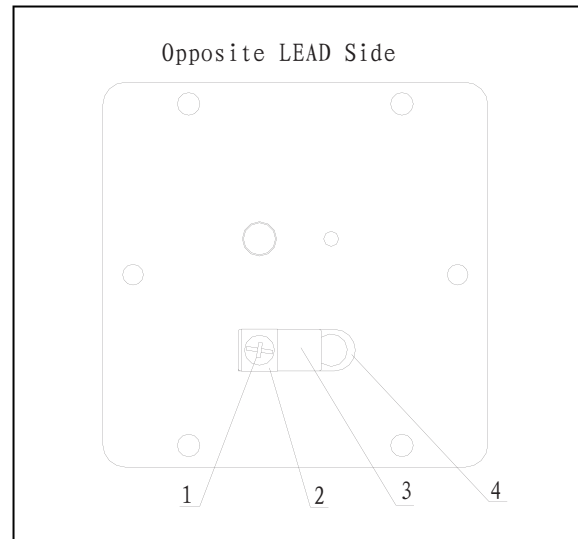
7、 Line up the screw holes in all of the valve components and fix the screw on the valve plate.

8、 Make sure the flapper valve is centered over the port of the valve plate and that all of the other components line up with the flapper valve.



Caution:

Do not over tighten the flapper valve screw or it will shear off in the valve plate.



9、 Tighten the flapper valve screw to 1.3N.m. Using a torque wrench with a '+' like attachment.

1、 If you are replacing a flapper valve on the bottom side of the valve plate (side facing the compressor housing), remove the flapper valve screw (1) with a '+' like driver, lift off the valve keeper strip (2).


2、 Clean any debris with a soft, damp cloth. Turn the compressor head upside down and place the valve plate on the compressor head and orient it as illustrated. Note the position of the valve ports and the location of the power leads on the compressor housing.

3、 Orient a flapper valve (1) over Port 2. Observe the location of the notches (2) at the end of the flapper valve.


4、 Place a valve keeper strip (3) over the flapper valve, observing that the radius the valve plate, and oriented as shown in the illustration.

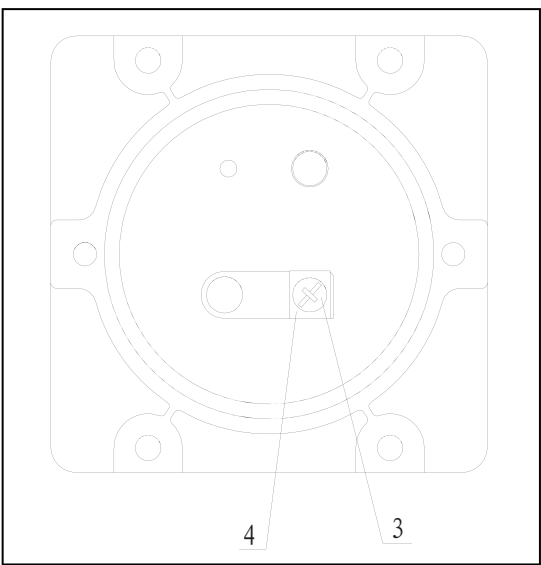
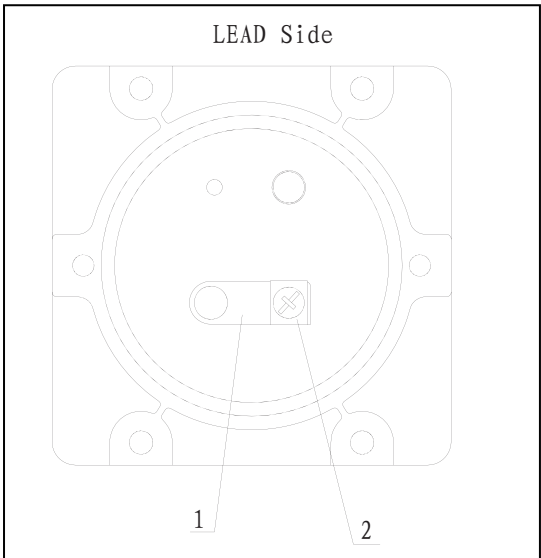
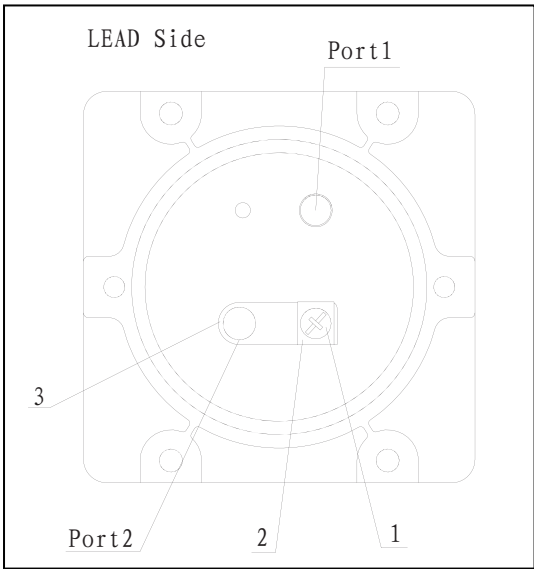
5、 Line up the screw holes in all of the valve components and fix them upon the flapper valve screw by screws.

6、 Make sure the flapper valve is centered over the Port and that the valve keeper strip lines up with the flapper valve.

 **Caution:**
Do not over tighten the flapper valve screw or it will shear off in the valve plate.

7、 Tighten the flapper valve screw to 1.4N.m.
Using a torque wrench with a '+' like attachment.

 **Attention:**
If you are only replacing the valve flappers, see the assembly instructions on page 12.
If you are replacing the cup and sleeve turn to the Rebuilding Connecting Rod Assemblies Section found on page 18.



Servicing the Connecting Rod Assembly and Eccentric Assembly

Refer to the Preventive Maintenance and Troubleshooting Guide in this manual to determine whether a complete connecting rod assembly. Or it's component parts, or an eccentric needs to be serviced.

Component Parts Required

You Will need:

- Connecting rod assembly (ices) or piston cups and sleeves.
- Valve plate gasket O-ring (s).
- Head gasket O-ring (s) (if defective).

Removing the Connecting Rod Assembly and Eccentric

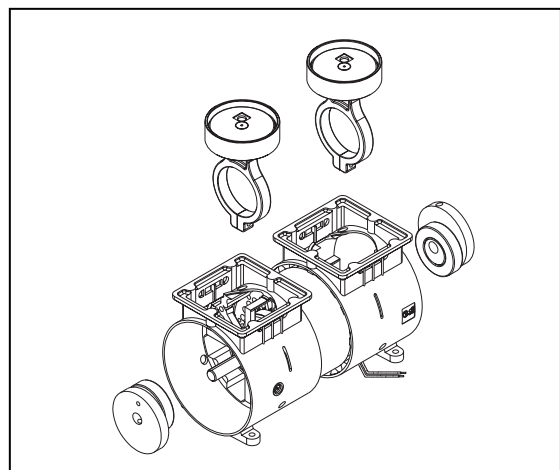
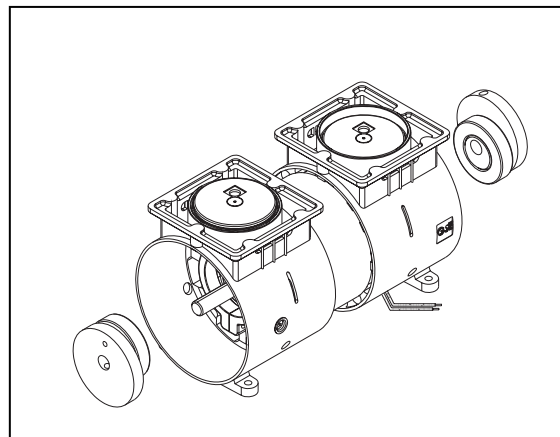
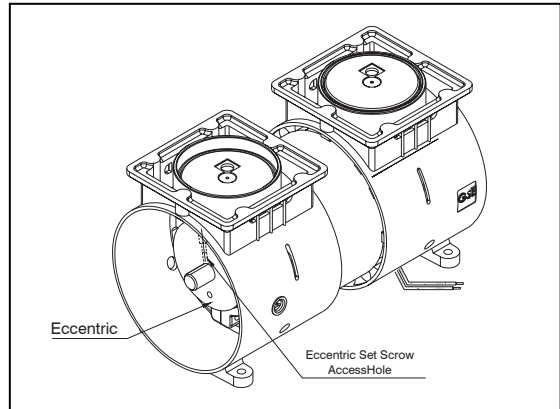
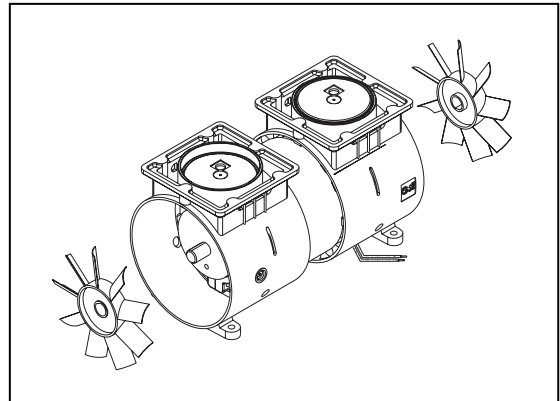
NOTE: ONLY REMOVE ONE CONNECTING ROD ASSEMBLY AT A TIME.

1、 Carefully remove the fan by pulling it straight off the motor shaft. Do not pull the fan blades.

2、 Turn the motor shaft to align the eccentric setscrew, the connecting rod screw separately and with the hole of the housing. (See illustration for location of access hole).

3、 Slide the eccentric bearing assembly straight off the shaft.

4、 Slide and rotation the connecting rod, remove it from the housing.





Attention:

Do not damage the piston cup (4) when you remove the connecting rod assembly from the compressor housing. If the cup is damaged, you must replace it.

Rebuilding Connecting Rod Assemblies

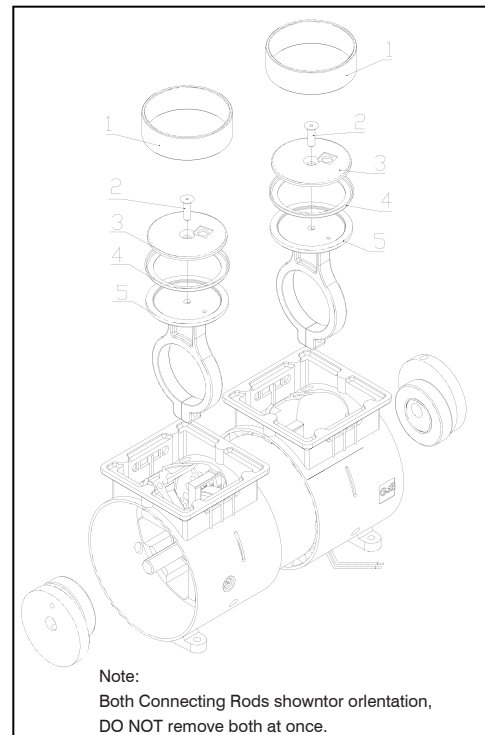
If you are rebuilding the connecting rod assembly using component parts, follow this procedure:

When replacing the piston cup (4), be sure to replace the sleeve (1) at the same time. Place the connecting rod in a fixture before attempting to remove the retainer screw. Heat will help to dissolve the loc tile bond.

- (1) Remove the retainer screw (2) from the cup retainer.
- (2) Remove the retainer (3) from the connecting rod.
- (3) Remove the cup (4) and discard.
- (4) Place the new piston cup (4) on the connecting rod.
- (5) Place a piston cup retainer (3) on the cup/connecting rod making sure the boss of the retainer is seated in the pilot of the rod.
- (6) Insert the retainer screw (2) into the connecting rod (5) and tighten to 3.0 N.m.

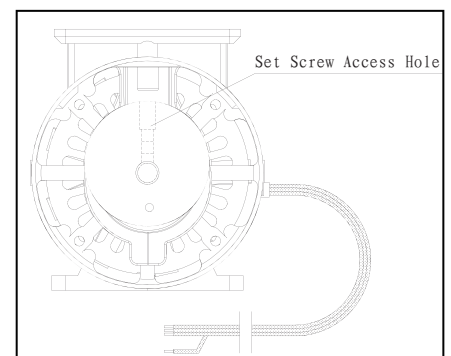
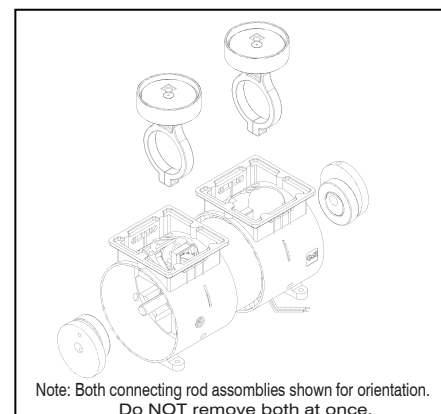
Assembly of the Connecting Rod to the Compressor

- 1、 Put cylinder sleeve into trough of housing keeper and make connecting rod being vertical. Note connecting rod screw to face to housing.
- 2、 Replace eccentric into the shaft and insert bearing into connecting-rod bearing. Rotate eccentric to line up setscrew with access hole in bottom of housing. Move main shaft, let shaft flat and eccentric screen hole vertically. Tighten screw to 4N.m.
- 3、 Rotate shaft with connecting rod moving up and down. Connecting rod can move with out any obstacle at this moment. Then use an Allen to tighten connecting rod screw.



Attention:

To replace the connecting rod and bearing assembly continue to page 19.



Reassembling the Compressor

After the connecting rod assembly and eccentric are correctly assembled, you can assemble the valve plates and bead to the compressor.



Caution:

To prevent damage to the compressor, never apply any sealant or lubrication to the O-rings.

- 1、 Insert the valve plate gasket O-ring into the O-ring groove located on the bottom of the valve plate.

- 2、 Position the compressor housing as shown in the illustration. Notice the orientation of the power leads.

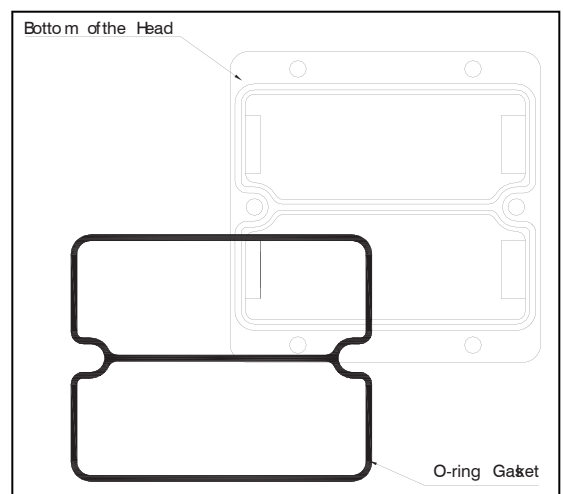
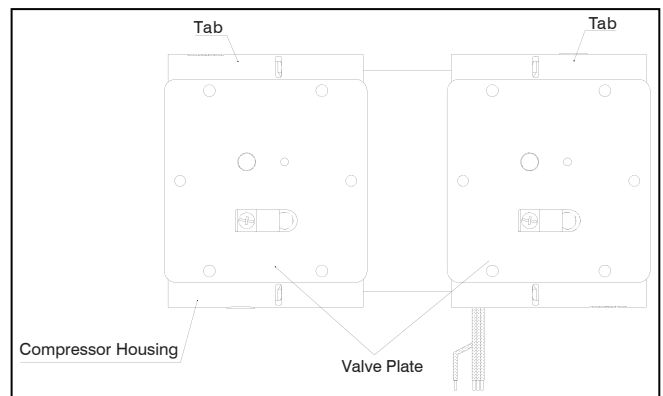
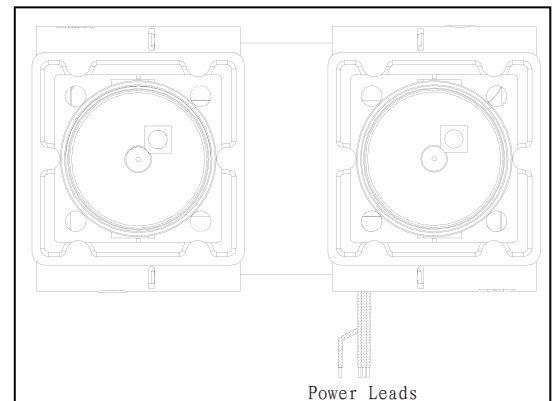
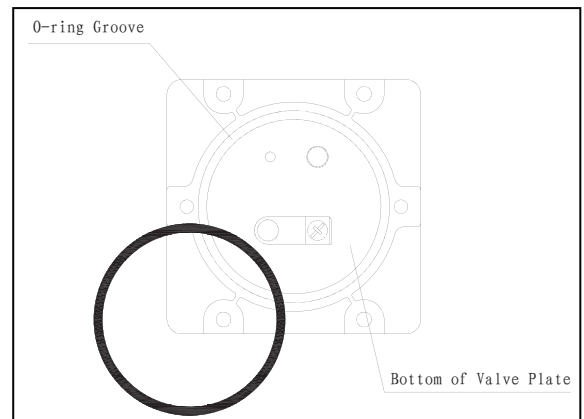
Note: Make sure that the connecting rod sleeves are seated against the compressor housing.

- 3、 Observe the orientation of the valve plate assemblies. Place them on the compressor housing as shown.

- 4、 Inset two new head gasket O-ring into the groove located on the bottom of the Head.

Note: Ensure the valve plate is properly engaged to housing locators.

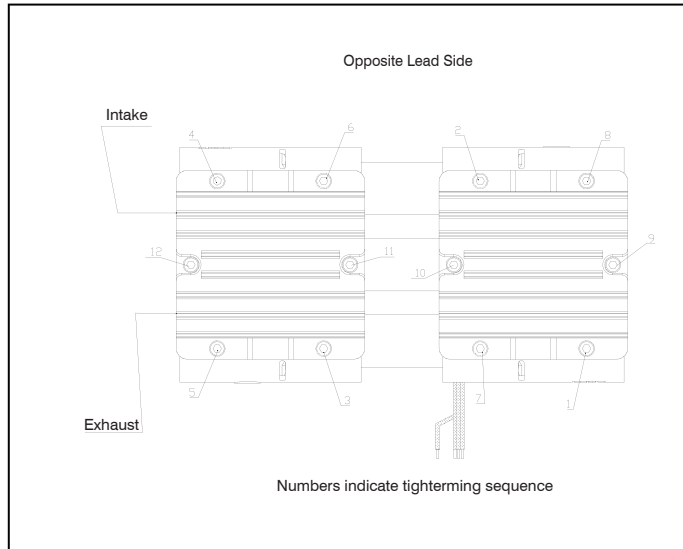
Note: Ensure that O-Rings are fully assembled in grooves and not pinched.



- Place the head on the valve plate assemblies observing the position of the air intake and exhaust ports.

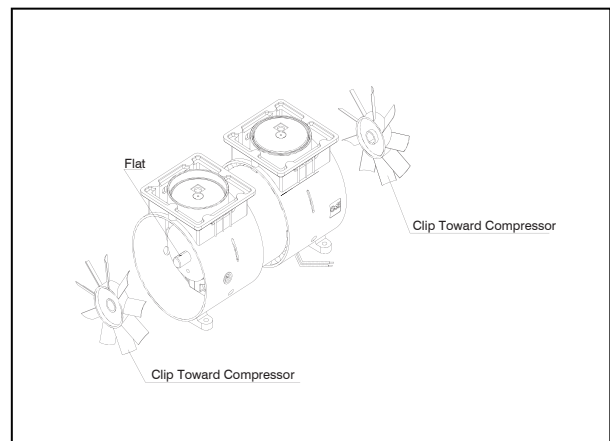
Note: Make sure the head gasket O-rings are not pinched.

- Insert the head screws and tighten strainly each screw until it is snug. Use 3.5N.m in a drive to tighten each head screw.



Caution:

To avoid property damage or personal injury, always try rotating the fan by HAND, prior to connecting the unit to the power source. Check for suction at the air inlet port by placing your finger over the port as you turn the fan. You should feel a slight suction with each rotation of the fan. If you don't feel suction, or if you feel or hear a thump as you turn the fan, DO NOT CONNECT THE UNIT TO A POWER SOURCE; review the assembly procedure for possible error.



Servicing the Fan

If one or both have the fans break use the following procedure:

- Carefully remove the fan by pulling it straight off the motor shaft.
- Align the flat on the motor shaft with the flat on the fan and slide the fan back onto the motor shaft, making sure the fan clip (1) faces as shown.