

IMPORTANT INSTRUCTIONS

OILLESS SERIES CORO-VAC MODEL CYLINDER/TANK PURGING SYSTEMS



CPS1V




CPS6R






CPS4V

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IX

This is the hazard alert symbol:  When you see this symbol, be aware that personal injury or property damage is possible. The hazard is explained in the text following the symbol. Read the information carefully before proceeding.

The following is an explanation of the three different types of hazards:

-  **DANGER** Severe personal injury or death will occur if hazard is ignored.
-  **WARNING** Severe personal injury or death can occur if hazard is ignored.
-  **CAUTION** Minor injury or property damage can occur if hazard is ignored.

ASSEMBLY INSTRUCTIONS

1. Carefully remove the Corken Coro-Vac Cylinder Purge System from the shipping container and inspect for any damaged components. Any loose or damaged components should be reported to Corken, Inc. immediately.
2. Your Corken Coro-Vac Cylinder Purge System includes one vacuum pump. One inlet hose assembly with fittings and vacuum gauge will be included loose with the vacuum pump assembly.
3. Install inlet filter and muffler assemblies on CPS6R models only. Refer to exploded view.
4. Apply pipe thread sealant to the male pipe threads on the inlet hose assembly. Remove the plastic plug over the inlet and install the inlet hose.
5. If necessary, install motor and coupling guard on CPS6R models only. Ensure that the unit operates satisfactorily. If the unit does not operate properly, see the troubleshooting guide.

CYLINDER PURGING INSTRUCTIONS

This Corken Coro-Vac Cylinder Purge System may be used on multiple cylinders. The following instructions apply regardless of the number of cylinders being purged. However, the inlet hose of the Coro-Vac should be connected to a cylinder manifold instead of a single cylinder valve for multiple cylinder purging.

1. **Do not attach to any cylinder that contains LP Gas. This unit is to be used to purge air only.**
2. Carefully read all instructions contained in this booklet before use. All warnings should be fully understood before operation of this unit. Failure to comply with these warnings could result in severe injury or death.
3. Vent any positive pressure through the cylinder outage or bleed valve before connection of inlet hose. Retighten after pressure is vented.
4. Connect the inlet hose to the cylinder valve and tighten securely by hand.
5. Open the cylinder valve and switch on the Coro-Vac and allow the unit to pull 2 psia (see chart).
6. Close the cylinder valve and switch off the Coro-Vac.
7. Disconnect the inlet hose from the cylinder valve. The cylinder is now ready to be filled by authorized personnel.

The following guide can be used to estimate required purge times for multiple cylinders:

Number of Cylinders	Coro-Vac Model	Estimated Purge Time*
1-3	CPS1V/1X	2- 6 minutes
1-15	CPS4V/CPS4X	1 -15 minutes
500 Gallon Tank	CPS6R	20 minutes

*Purge times may vary depending upon cylinder valve manufacturer and other restrictive fittings.

ATMOSPHERIC PRESSURE BY ALTITUDE
FOR CYLINDER PURGING

Reference City	Altitude Above Sea Level (ft)	Atmospheric Pressure (psia)	Barometer Reading (in. Hg)	Gauge Reading at 2 psia	Gauge Reading at 5 psia
Boston, PA	0	14.69	29.92	25.85	19.74
	500	14.43	29.38	25.31	19.20
	1000	14.17	28.86	24.78	18.68
	1500	13.91	28.34	24.26	18.16
	2000	13.66	27.82	23.75	17.64
Tucson, AZ	2500	13.41	27.32	23.24	17.13
	3000	13.17	26.82	22.74	16.64
	3500	12.92	26.32	22.25	16.14
	4000	12.69	25.84	21.77	15.66
	4500	12.45	25.36	21.29	15.18
Albuquerque, NM	5000	12.22	24.89	20.82	14.71
	5500	11.99	24.43	20.35	14.25
	6000	11.77	23.97	19.90	13.79
	6500	11.55	23.52	19.45	13.34
	7000	11.33	23.08	19.01	12.90
Mexico City, Mex	7500	11.12	22.65	18.57	12.46
	8000	10.91	22.22	18.15	12.04
	8500	10.70	21.80	17.73	11.62
	9000	10.50	21.38	17.31	11.20
	9500	10.30	20.98	16.91	10.80
Kenosha Pass, CO	10000	10.10	20.58	16.51	10.40

AIR CONTENT

Container Pressure psig	Container Evacuated to 2 psia Percentage Air Content %	Container Evacuated to 5 psia Percentage Air Content %
0	13.3%	34.2%
25	4.9%	12.7%
50	3.0%	7.8%
60	2.6%	6.7%
75	2.2%	5.6%
100	1.7%	4.4%
125	1.4%	3.6%
150	1.2%	3.1%
175	1.0%	2.7%
200	0.9%	2.3%

The approximate container air content as a percentage of the total gas vapor mixture at standard conditions using Dalton's and Amagat's Laws at two points with the empty container's air volume evacuated to 2 and 5 psia before being filled with propane vapor to gauge pressure is as follows:

*Dalton's Law states that the total pressure of a mixture of gases is equal to the sum of the partial pressures and each component of the mixture at its partial pressure occupies the total volume.

*Amagat's Law states that if each component in a mixture of gases could be segregated at the same temperature and pressure as the mixture, the sum of the separate volumes would equal that of the original, and the partial pressure of each component would equal the total pressure.

GENERAL INFORMATION

This pump is only to be used for the purpose of pumping air and under no circumstances be used with any other gases. The pump must not be used for the pumping of fluids, particles, solids or any substance mixed with air, particularly combustible substances likely to cause explosions.

▲ DANGER Do not pump flammable or explosive gases, or operate the unit in an atmosphere containing them without appropriate motor and electrical connection.

▲ CAUTION The exhaust air of this pump can become very hot. Do not direct exhaust air towards property that is temperature sensitive.

▲ CAUTION This pump is designed for air only. Do not allow corrosive gases or particulate material to enter the pump. Water vapor, oil-based contaminants, or other liquids must be filtered out.

Ambient temperature should not exceed 40°C (104°F). For operation at higher temperatures, consult the factory.

Performance is reduced by lower atmospheric pressure found at high altitudes. Consult a Corken distributor for details (see chart).

Never lubricate this oil-less air pump. The sealed bearings are grease packed, and the service life of the rings or vanes will be reduced by petroleum or hydrocarbon products.

INSTALLATION

▲ WARNING To avoid risk of electrocution do not use this product in an area where it could come in contact with water or other liquids. If exposed to the elements it must be weather protected.

▲ WARNING Beware of any exposed moveable parts. Proper guards should be in place to prevent personal injury or death.

▲ CAUTION Do not block the flow of cooling air over the pump in any way.

▲ CAUTION Do not lift the unit by the fan shroud, filters or mufflers.

MOUNTING

This pump may be installed in any orientation as long as the flow of cool, ambient air over the pump is not blocked. To reduce noise and vibration, mount to a stable, rigid operating surface. If mounted outside, cover or shield from the elements.

PLUMBING

To prevent air flow restriction, use pipe and fittings that are the same size or larger than the threaded ports of the pump. The ports are marked "IN" and "OUT". Be sure to remove port plugs before operating unit.

ACCESSORIES

Intake and exhaust filters are external to the pump and will provide adequate filtration for most applications. Check filters periodically and replace when necessary. Consult a Corken representative for additional filter recommendations. Install relief valves

and gauges at the inlet or outlet, or both, to monitor performance. Check valves may be required to prevent backstreaming through the pump.

WIRING

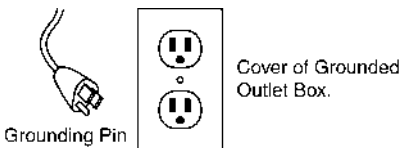
⚠ WARNING Incorrect wiring can result in electric shock. Wiring must conform to all required safety codes and be installed by a qualified person. Grounding is required. All power to the motor must be de-energized and disconnected when servicing.

ELECTRIC MOTOR CONTROL

The motor must be protected against short circuit, overload and excessive temperature rise. Fuses, motor protective switches and thermal protective switches provide the necessary protection in these circumstances. Fuses only serve as a short circuit protection of the motor (wiring fault). Fuses in the incoming line should be chosen so as to be able to withstand the starting current of the motor, not as a protection against overload. Motor starters, incorporating thermal magnetic overload, or circuit breakers protect the motor from overload or reduced voltage conditions. Selection of the correct overload setting is required to provide the best possible protection. Refer to the motor starter manufacturer's recommendations.

GROUNDING INSTRUCTIONS

Check with a qualified electrician or serviceman if the grounding instructions are not completely understood, or if in doubt as to whether the product is properly grounded.



FOR ALL GROUNDED, CORD-CONNECTED PRODUCTS: This product should be grounded. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current. Some units are equipped with a cord having a grounding wire with an appropriate grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

⚠ DANGER Improper installation of the grounding plug can result in a risk of electric shock. If repair or replacement of the cord or plug is necessary do not connect the grounding wire to either flat blade terminal. The wire with insulation having an outer surface that is green, with or without yellow stripes, is the grounding wire.

FOR A GROUNDED, CORD-CONNECTED PRODUCT RATED LESS THAN 15 AMPERES AND INTENDED FOR USE ON A NOMINAL 120v, or 220-240 VOLT SUPPLY CIRCUIT:

This product is for use on a nominal 120v or 220-240 volt circuit, and has a grounding plug. Make sure that the product is connected to an outlet having the same configuration as the plug. No adapter should be used with the product.

FOR PERMANENTLY CONNECTED PRODUCT:

This product should be connected to a grounded, metallic, permanent wiring system, or an equipment grounding terminal or lead on the product (refer to wiring diagram). Explosion proof versions should be installed per code.

EXTENSION CORDS:

Use only a 3-wire extension cord that has a 3-blade grounding plug, and a 3-slot receptacle that will accept the plug on the product. Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current that your product will draw. For lengths less than 50 feet, 16 AWG extension cords should be used. An under-sized cord will cause a drop in line voltage resulting in loss of power and overheating.

ELECTRIC MOTOR CONNECTION

Refer to the motor nameplate for wiring diagram. If the motor fails to start or slows down under load, shut the pump off and unplug it. Check that the supply voltage agrees with the motor nameplate. Be sure the 3-phase motor turns in the proper direction of rotation after installation. Turning in the wrong direction will drastically reduce vane life, result in overheating and cause unit damage.

OPERATION

Solid or liquid material exiting the unit can cause eye or skin damage. Keep away from air stream.

▲ WARNING Some models are equipped with glass jars. Proper measures should be taken to guard against the fragmenting of breaking glass if an alternate material is not used. If hazard is ignored, severe personal injury of death can occur.

▲ WARNING Always disconnect the power before servicing. The motor may be thermally protected and will restart automatically when it cools if the thermal protection switch is tripped.

▲ WARNING Pump surfaces can become very hot during operation. Do not touch these surfaces until unit has been shut off and allowed to cool.

▲ WARNING Do not operate without both the coupling guard and shroud in place. Failure to do so could result in severe personal injury.

▲ CAUTION Do not operate units above recommended pressures or vacuum duties. To do so will damage the unit.

Starting

If the pump is extremely cold, let it warm up to room temperature before starting. If the pump does not operate properly, see the Troubleshooting Guide.

▲ WARNING Some models may exceed 85 dB(A). When in close proximity to these models, hearing protection is required.

INSPECTION AND MAINTENANCE

Regular inspection can prevent unnecessary damage and repairs. The intake and exhaust filters require periodic inspection and replacement. Initial inspection is suggested at 500 hours, then the user should determine the frequency. Keeping filters clean can prevent most problems. Dirty filters decrease pump performance and can diminish pump service life.

FILTER INSPECTION / REPLACEMENT

The unit may become very hot during operation. Do not touch until the pump has been turned off and allowed to cool.

Refer to exploded view drawing during the following procedure.

Make sure the pump is turned off, isolated from the power supply, and that all pressure and/or vacuum is released from the pump.

Remove filter cover and inspect felt. If the felt is completely contaminated, it must be replaced. Replace felt and install cover.

Before putting the pump back into service, ensure that any external accessories such as relief valves and gauges attached to the cover have not been damaged.

SERVICE KIT INSTALLATION

NOTE: Corken will not guarantee the performance of a field-rebuilt pump. You can return the pump to a Corken authorized service facility, or perform the following rebuild procedures.

Kits contain most or all of the following. Head gasket, Valves, Cylinder gasket, Piston Ring, Piston Seal, Rider Ring, Felts and Vanes. Kits are used for several models and may contain extra parts not applicable for your specific model. Refer to exploded view.

Disconnect the pump from electrical power.

⚠ WARNING You must disconnect the pump from electrical power before you service it. Failure to do so can result in severe personal injury or death.

Pump Disassembly CPS1V, CPS1X, CPS4V, CPS4X

Remove the shroud, cylinder head, and valve components. DO NOT re-arrange the valve components. Remove the cylinder and rings. Make sure all parts are clean before reassembling. DO NOT

use any chlorinated solvents to clean valves, or any liquids to flush units, THE STAINLESS STEEL VALVES MAY BE CLEANED WITH WATER. All parts, except the valves, can be cleaned with any industrial, nonflammable, nontoxic, non-petroleum based cleaning solvent.

Assembly:

- Install piston seals, piston rings, and rider rings on the piston.
- Locate ring joints approximately opposite each other.
- Attach cylinder to bracket with the cylinder screws and washers.
- Tighten screws finger tight. Move pistons to top dead center position.
- Adjust each cylinder flush with top of piston and Torque cylinder screws to 150-160 inch lbs.. Retorque second time.

- Stack the valve components in order as originally assembled.
- Install the cylinder head and head screws.

NOTE: The exhaust ports in the cylinder heads have been marked by omitting the ends of two of the fins.

- Do not tighten head screws at this time, Install manifold nuts and seals on the manifold and assemble into the other cylinder head and manifold.
- Torque all head screws to 150-160 inch lbs.
- Turn fan by hand at this point to ensure that the rod assembly is not hitting the head.

NOTE: If rod assembly does hit head, loosen cylinders and re-adjust.

- Position manifold and tighten Manifold nut 1/2 to 3/4 turns beyond hand tight.
 - Retorque head screws again after running for 10 minutes.
9. Install and tighten the pump body bolts. Install the belleville springs with the washer between them, and the snap ring.

CPS6R

3. Remove the shroud and fan.
4. Use a wheel puller to remove the dead-end plate and bearing from the pump body; note the direction of the bevel edge on the vane. Do not damage the dowel pins between the end plate and the body. Save the bearing spacer on the dead-end of the shaft for reassembly. Remove the snap ring from the end plate. Save the snap ring, belleville springs, and washer for reassembly.
5. Remove the bearing from the dead-end plate.
6. Check the exposed surfaces of the rotor, body, and end plate for scoring.

If you find no scoring, you can perform a Minor Rebuild to replace only the vanes and the deadend bearing.

If you find severe damage, perform the Major Rebuild.

Minor Rebuild

7. Install the new vanes supplied with the kit. Be careful to face the vane bevels in the proper direction (as noted in step 4).
8. Place end plate over the shaft with dowel pins aligned. Place bearing spacer on dead end of shaft. Place the new bearing in its bore in the dead end plate. Be careful to press only on the inner bearing race.
9. Install the new vanes supplied with the kit. Be careful to face the vane bevels in the proper direction (as noted in step 4).
10. Perform step #8 from Minor Rebuild.
11. Install the belleville springs with the washer between them, and the snap ring. Install and tighten the pump body bolts.
12. Apply a thread-lock adhesive and start the drive-end cap into its thread in the drive-end plate, but do not tighten it.
13. Place a dial indicator against the dead-end of the shaft to measure axial movement. Tighten the drive-end cap until the indicator shows .002".
14. Clean and reinstall filters.

Major Rebuild

7. Remove the drive end cap, Use a wheel puller to remove the drive-end plate and bearing from the body. Do not remove or damage the dowel pins in the body. Save the deflector and endplate gasket for reassembly.
8. Place one of the new bearings in its seat in the drive-end plate, then place one of the shoulder rings on the drive-end of the shaft. Using an arbor press, press the bearing onto the shaft. Be careful to press only on the inner bearing race. Tighten the pump body bolts.
9. Install the new vanes supplied with the kit. Be careful to face the vane bevels in the proper direction (as noted in step 4).
10. Perform step #8 from Minor Rebuild.
11. Install the belleville springs with the washer between them, and the snap ring. Install and tighten the pump body bolts.
12. Apply a thread-lock adhesive and start the drive-end cap into its thread in the drive-end plate, but do not tighten it.
13. Place a dial indicator against the dead-end of the shaft to measure axial movement. Tighten the drive-end cap until the indicator shows .002".
14. Clean and reinstall filters.

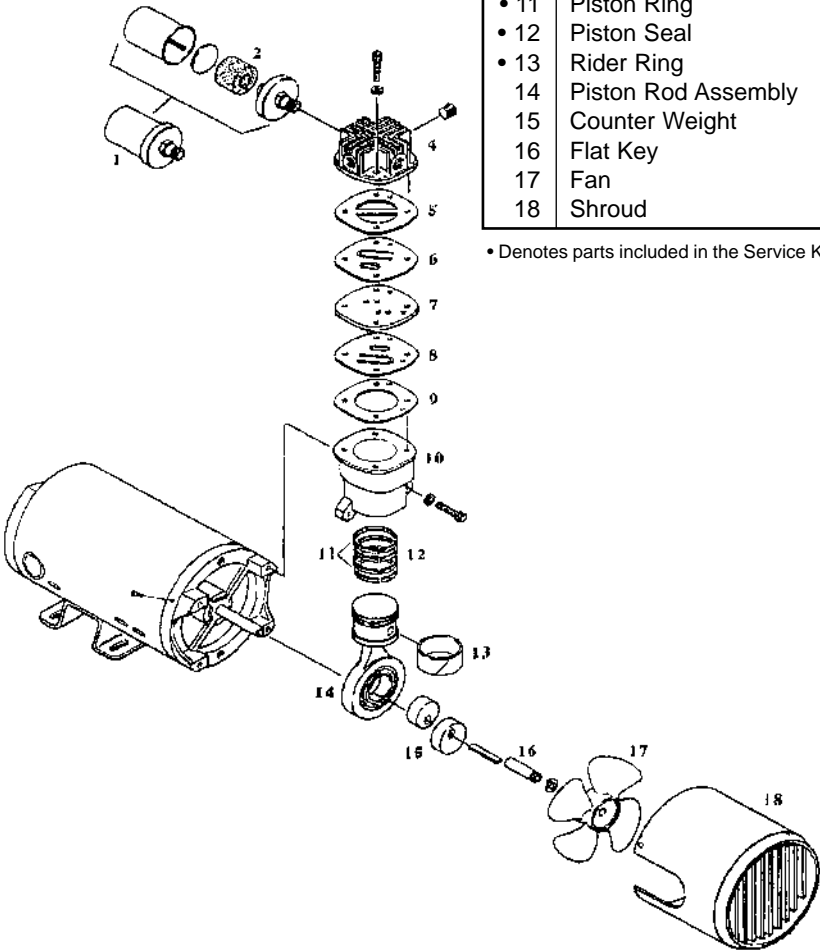
TROUBLESHOOTING GUIDE

Possible Reason	Vacuum		Overheating	Motor Overload	Excessive Noise	Won't Start
	Low	High				
Dirty Filter	X	at pump	X	X	X	
Dirty Muffler			X	X	X	
Plugged Vacuum Line	X	at pump	X	X		
Vanes Sticking	X					X
Running at Too High RPM		X	X	X	X	
Rings / Vanes Worn	X				X	
Shaft Seal Worn (Replace)	X					
Particulate Material in Pump	X		X	X	X	
Motor Not Wired Correctly	X		X			X
Damaged / Dirty Valves	X					X
Improper Cylinder Alignment			X		X	

CPS1V, CPS1X EXPLODED VIEW AND PARTS ORDERING INFORMATION

NO.	DESCRIPTION	QTY.
1	Muffler Assembly	1
• 2	Felt	1
3	Inline Filter (not shown)	1
4	Cylinder Head	1
• 5	Head Gasket	1
• 6	Valve, Outlet	1
7	Valve Plate	1
• 8	Valve, Inlet	1
• 9	Cylinder Gasket	1
10	Cylinder	1
• 11	Piston Ring	2
• 12	Piston Seal	2
• 13	Rider Ring	1
14	Piston Rod Assembly	1
15	Counter Weight	1
16	Flat Key	1
17	Fan	1
18	Shroud	1

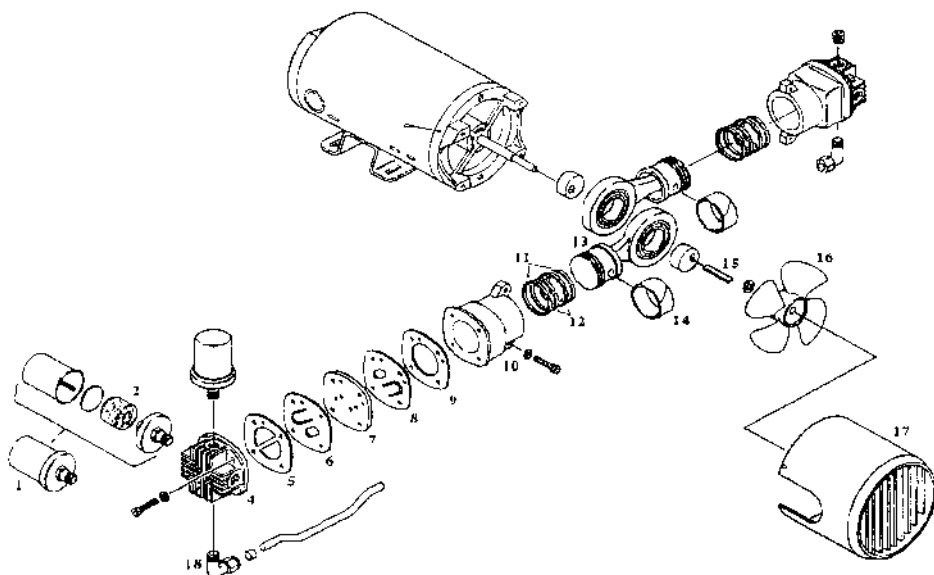
• Denotes parts included in the Service Kit #5217.



CPS4V AND CPS4X EXPLODED VIEW
AND PARTS ORDERING INFORMATION

NO.	DESCRIPTION	QTY.
1	Muffler Assembly	1
• 2	Felt	1
3	Inline Filter (not shown)	1
4	Cylinder Head	2
• 5	Head Gasket	2
• 6	Valve, Outlet	2
7	Valve Plate	2
• 8	Valve, Inlet	2
• 9	Cylinder Gasket	2
10	Cylinder	2
• 11	Piston Ring	4
• 12	Piston Seal	4
13	Piston Rod Assembly	2
• 14	Rider Ring	2
15	Flat Key	1
16	Fan	1
17	Shroud	1
18	Manifold Sleeve	2

• Denotes parts included in the Service Kit #5218.

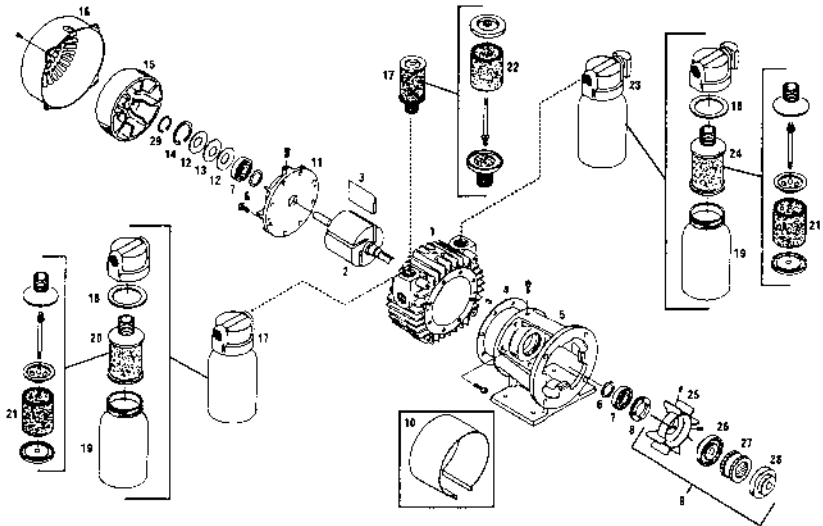


CPS6R EXPLODED VIEW AND PARTS ORDERING INFORMATION

NO.	DESCRIPTION	QTY.
1	Body	1
2	Rotor Assembly	1
• 3	Vane	4
• 4	Body Gasket	1
5	Foot Bracket	1
• 6	Deflector	2
• 7	Ball Bearing (Drive & Dead)	2
8	End Cap, Drive	1
9	Fan Coupling Assembly	1
10	Fan Guard	1
11	End Plate, Dead	1
12	Belleville Springs	2
13	Washer	1
14	Snap Ring	1
15	Fan	1

NO.	DESCRIPTION	QTY.
16	Fan Guard	1
17	Intake Filter Assembly	1
18	Gasket	2
19	Jar	2
20	Filter Assembly	1
• 21	Cartridge	2
• 22	Filter Felt	1
23	Muffler	1
24	Muffler Assembly	1
25	Fan	1
26	Flange	1
27	Sleeve	1
28	Flange	1
29	Retainer Ring	1
	Service Kit	1

• Denotes parts in Service Kit.



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