

Scroll Air Compressor Service and Maintenance

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

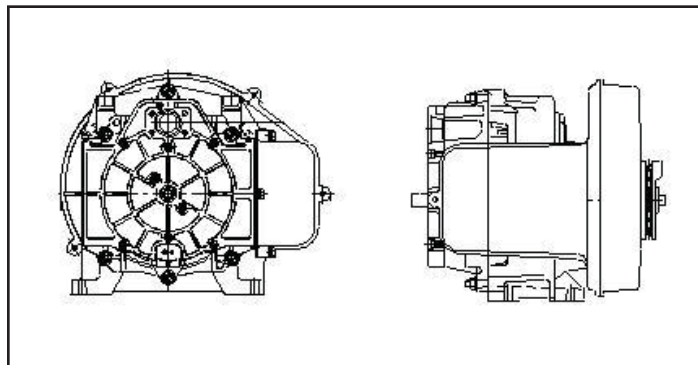
Description

The Powerex Oilless Rotary Scroll Air Compressor has advanced scroll compressor technology through the development of a completely oilless unit.

The Powerex Scroll Compressor offers a dynamically balanced air end which insures vibration-free operation. The rotary design permits a continuous 100% duty cycle. No oil separation, oil filtration, or inlet valves are required on the Powerex Scroll air compressor.

The Powerex oilless rotary scroll air compressor is based on the theory of scroll compression. A scroll is a free standing, intricate spiral bounded on one side by a solid, flat plane or base. A scroll set, the basic compression element of a scroll compressor, is made up of two identical spirals which form right and left hand parts. One of these scroll components is indexed or phased 180° with respect to the other so the scrolls can mesh.

Crescent-shaped gas pockets are formed and bounded by the spirals and the base plate of both scrolls. As the moving scroll is orbited around the fixed scroll, the pockets formed by the meshed scrolls follow the spiral toward the center and diminish in size. The moving scroll is prevented from rotating during this process so the 180° phase relationship of the scrolls is maintained. The compressor's inlet is at the outer boundary of the scrolls. The compressed gas is discharged through the outlet at the center of the fixed scroll so no valves are needed.



Specifications

Product	SLAE03E, SLAE05E, SLAE05HP
Discharge Pressure	95-115 (125-145 optional)
Compression Cycle	Scroll
Motor Overload Protection	IEC Magnetic Starter
Maximum Operating Ambient Temperature	104° F

Safety Guidelines

This manual contains information that is very important to know and understand. This information is provided for SAFETY and to PREVENT EQUIPMENT PROBLEMS. To help recognize this information, observe the following symbols.

⚠ DANGER

Danger indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

⚠ WARNING

Warning indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

⚠ CAUTION

Caution indicates a potentially minor or moderate injury.

NOTE: This provides information that requires special attention.

⚠ DANGER

Breathable Air Warning

This compressor/pump is not equipped and should not be used "as is" to supply breathing quality air. For any application of air for human consumption, the air compressor/pump will need to be fitted with suitable in-line safety and alarm equipment. This additional equipment is necessary to properly filter and purify the air to meet minimal specifications for Grade D breathing as described in Compressed Gas Association Commodity Specification for air, OSHA, ANSI and/or Canadian Standards Associations (CSA).

DISCLAIMER OF WARRANTIES

In the event the compressor is used for the purpose of breathing air application and proper in-line safety and alarm equipment is not simultaneously used, existing warranties shall be voided, and Powerex disclaims any liability whatsoever for any loss, personal injury or damage.

Scroll Air Compressor Service and Maintenance

GREASE DELIVERY

Bearing	SLAE03E		SLAE05E		SLAE05EHP	
	1st Time	2nd Time	1st Time	2nd Time	1st Time	2nd Time
Orbit Scroll Bearing	5 Times	4 Times	7 Times	6 Times	7 Times	6 Times
Pin Crank Bearing Orbit Scroll Side	4 Times	4 Times	5 Times	5 Times	7 Times	7 Times
Pin Crank Bearing Housing Side	Do Not Have to Grease		Do Not Have to Grease		Do Not Have to Grease	

NOTE: Each pump of the grease gun equals 0.65 grams of grease.

MAINTENANCE SCHEDULE

Item	Action needed	Operating Hours						Remarks
		500	2500	5000	10,000	15,000	20,000	
Tank	Drain moisture							Daily
Inlet Air Filter	Replace	●	▲					(Every 2,500 hrs or less)
Blower Fan	Clean			●	●	●	●	
Fan Duct	Clean			●	●	●	●	
Compressor Fins	Clean		●					(Every 2,500 hrs or less)
Bearings	Regrease				●		▲	Service Center Only (Every 5,000 hours for 145 psig scroll)
Tip Seal Set	Replace				▲		▲	(Every 5,000 hours for 145 psig scroll)
V-belt	Inspect, replace		●	▲	▲	▲	▲	*Note 3
Pressure Switch	Confirm operation				●		●	
Magnetic Starter	Inspect				●		●	Replace if contact points deteriorate
Safety Valve	Confirm Operation		●					(Every 2,500 hrs or less)
Pressure Gauge	Inspect		●					(Every 2,500 hrs or less)

- Inspect
- ▲ Replace

NOTES:

- Inspect and perform maintenance periodically according to maintenance schedule.
- The maintenance schedule relates to the normal operating conditions. If the circumstances and load condition are adverse, shorten the cycle time and do maintenance accordingly.
- *The tension of the V-belt should be adjusted during the initial stage and inspected every 2,500 hours afterwards. Proper belt tension for 3 HP units is 7 lbs./16" deflection; for 5 HP units, 7 lbs./19" deflection.
- See Compressor Pump Manuals for replacement or service procedures.

Maintenance

DRY TYPE INLET FILTER

2500 Hours - Maintenance

The inlet filter on the scroll compressor assures 99% particulate free air is admitted to the unit. Change every 2,500 hours or more often in dirty locations.

1. Remove filter cover.

⚠ CAUTION

Do not attempt to clean filter. This filter requires replacement and is to be replaced when contaminated.

2. Install new filter element and reassemble cover.

CLEAN COMPRESSOR FINS

2500 Hours - Maintenance

1. Remove the FS cover (see page 6).
2. Clean compressor fins using compressed air.
3. Put the FS cover back.

GREASE COMPRESSOR BEARINGS

10,000 Hours - Maintenance

⚠ WARNING

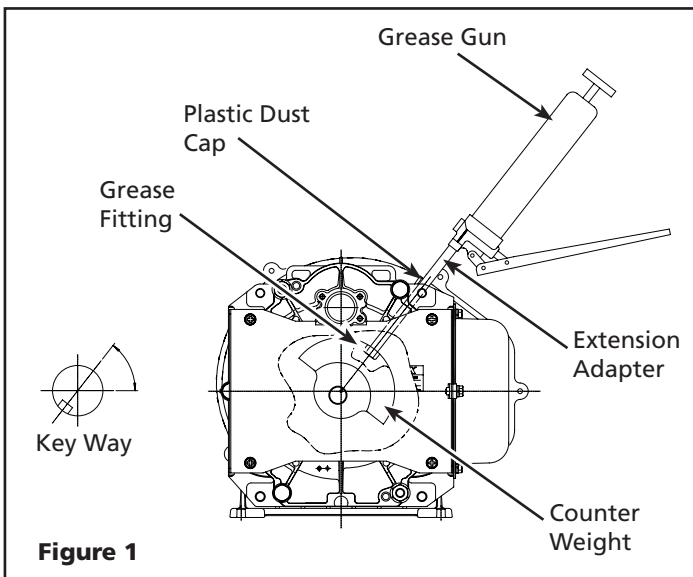
Per OSHA regulations, ALL power must be locked out before performing any maintenance.

⚠ CAUTION

This service should be performed by an authorized Powerex Service Center to avoid failure.

OS Bearing

1. Remove the plastic dust cap (See Figure 1).
2. Rotate the compressor pulley until the grease fitting is visible through the dust cap hole (See Figure 1). This will allow regreasing of the OS bearing.



3. Use a grease gun extension adaptor to engage the grease fitting and supply the proper volume of grease as indicated on the grease delivery chart (See Grease Delivery chart below and Figure 1).

⚠ CAUTION

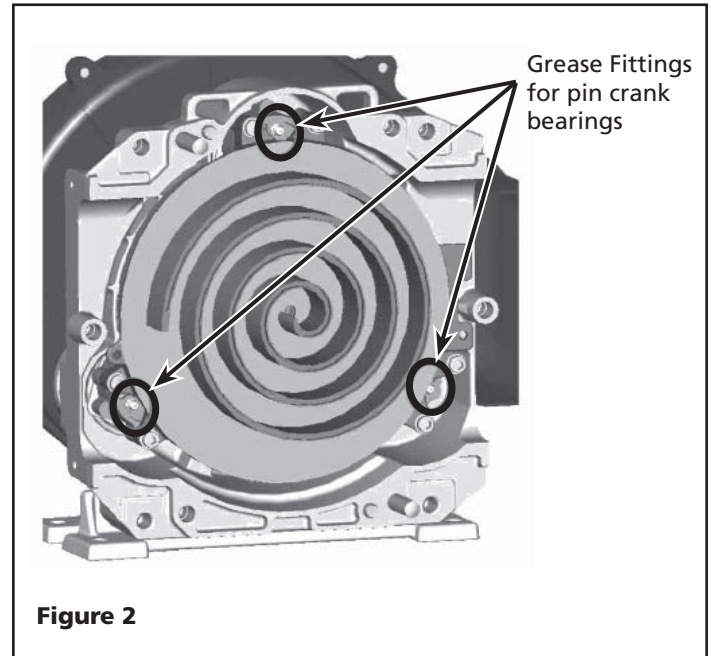
Use only Powerex genuine grease. Pump grease gun before feeding. This eliminates air from the grease passage of the extension adapter.

4. Replace plastic dust cap.

Greasing Pin Crank Bearings

The bearings on the scroll compressor are regreaseable to allow extended compressor life. Service should be performed every 10,000 hours of operation.

1. Remove the fan duct (2).
2. Remove the nuts and bolts and then the fixed scroll (FS) from the air end.
3. Grease all three pin crank bearings (See Figure 2 below and Grease Delivery Chart on page 2).



4. Replace the fixed scroll and fan duct (2). See the Bolt Torques chart on page 5.

TIP SEAL SET REPLACEMENT

10,000 hours - Maintenance

⚠ WARNING

Per OSHA regulations, ALL power must be locked out before performing any maintenance.

The "Tip Seal Set" is a replacement part for SLAE03E and SLAE05E air ends. Please read these instructions thoroughly and carefully to ensure correct replacement.

Maintenance (continued)

NOTE: Replace tip seal on SLAE03E and SLAE05EHP at 5,000 hours when operated at 145 psig.

The tip seal on the scroll compressor is self-lubricated and allows the unit to operate efficiently without oil and expensive filtration. The tip seal should be replaced every 10,000 hours of operation.

Confirmation of the Parts

1. Confirm if the tip seal you purchased is correct for the air end you are repairing (See Parts Listing below).

Item No.	Description	Qty.
1	HP tip seal for FS	1
2	LP tip seal for FS	1
3	HP tip seal for OS	1
4	LP tip seal for OS	1
5	Dust Seal	1
6	Backup Tube	1

HP= High Pressure
FS= Fixed Scroll

LP= Low Pressure
OS= Orbital Scroll

2. Confirm if the following parts are included (See Figure 3).

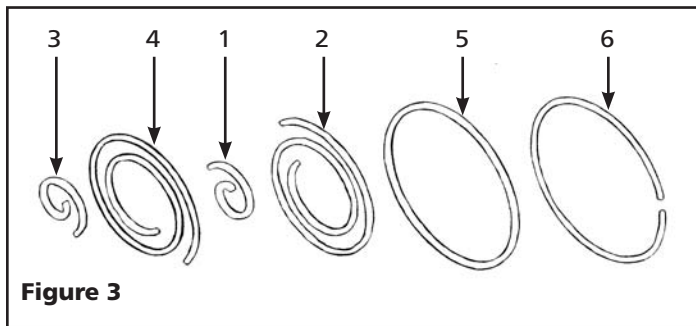


Figure 3

Replacement

1. Remove nuts and bolts and then FS set from air end.
2. Remove LP and HP tip seals from Fixed Scroll set and Orbit set. Using the tip of a ball-point pen at the start will make it much easier (See Figure 4).

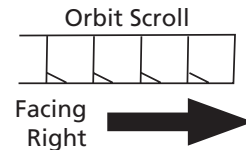
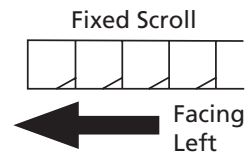
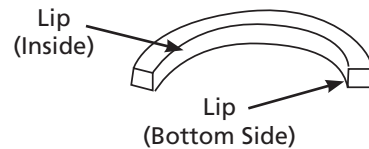


Tip Seal Removal

Figure 4

3. Remove dust from Scroll with clean cloth or air before inserting tip seals.

NOTE: In order to distinguish between the tip seal for Fixed Scroll and the tip seal for Orbit Scroll place the tip seal as shown below then view from the arrow direction and refer to the figure below.

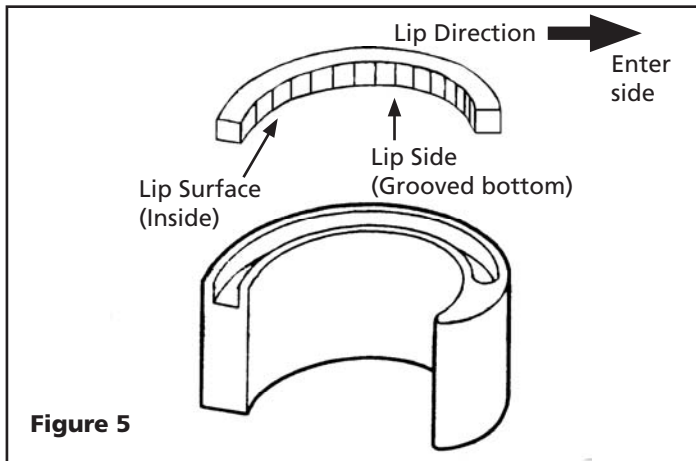


Maintenance (continued)

Inserting tip seals

NOTE: Tips seals for Fixed Scroll and Orbit Scroll have opposing seal cut angles (See NOTE and explanatory diagram below).

Insert tip seal so that the lip of tip seal is on the bottom of seal groove and inner side of involute and the direction of lip faces the center of involute (curving spiral). See Figure 5. This is to be done for both FS and OS sets.



Use caution not to tear or distort lip.

1. Insert new HP tip seal from the center section for OS or Orbit Scroll so that there will be no clearance at the tip (start) section (See Figure 5 and 6).
2. Insert so that new LP tip seal will contact closely with HP tip seal inside Scroll Groove (See Figure 4 on page 4).

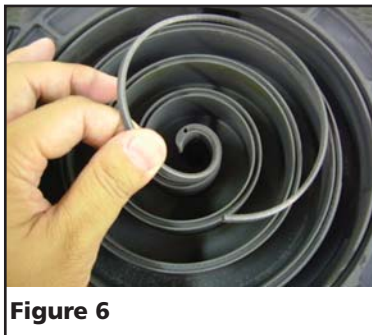


Figure 6

CAUTION Insert approximately half of the LP tip seal and remove the tip seal to confirm that a notch in the tip seal has been created. This will prevent movement during installation (See Figure 7).

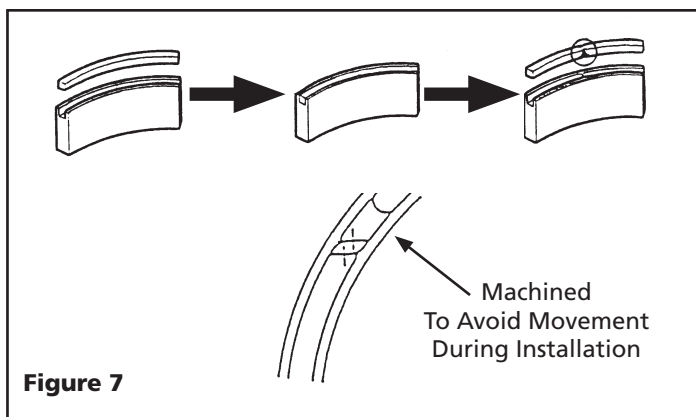


Figure 7

3. Repeat the same procedure for FS or Fixed Scroll tip seal set, remove both the dust seal and backup tube located on outermost side FS set.
4. Insert new backup tube in the FS Scroll in the 6 o' clock position (See Figure 8).

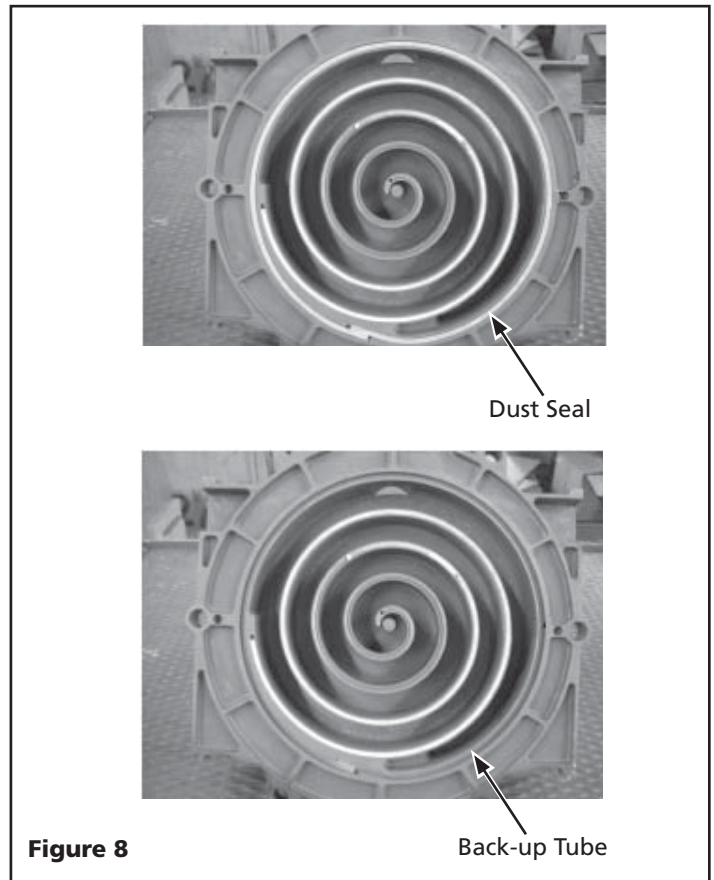


Figure 8

5. Insert new dust seal on the backup tube.
6. After replacing tip seal set, reassemble Fixed Scroll set to the Orbit Scroll. Tighten nuts and bolts temporarily and confirm if crankshaft rotates smoothly by hand and tighten them firmly. Tightening torques are:

Bolt Torque	First	Second
SLAE03E	17 in lb.	175 in lb.
SLAE05E/ SLAE05EHP	17 in lb.	265 in lb.

NOTE: Assemble so that dust seal and tip seal will not drop between Orbit Scroll set and Fixed Scroll set.

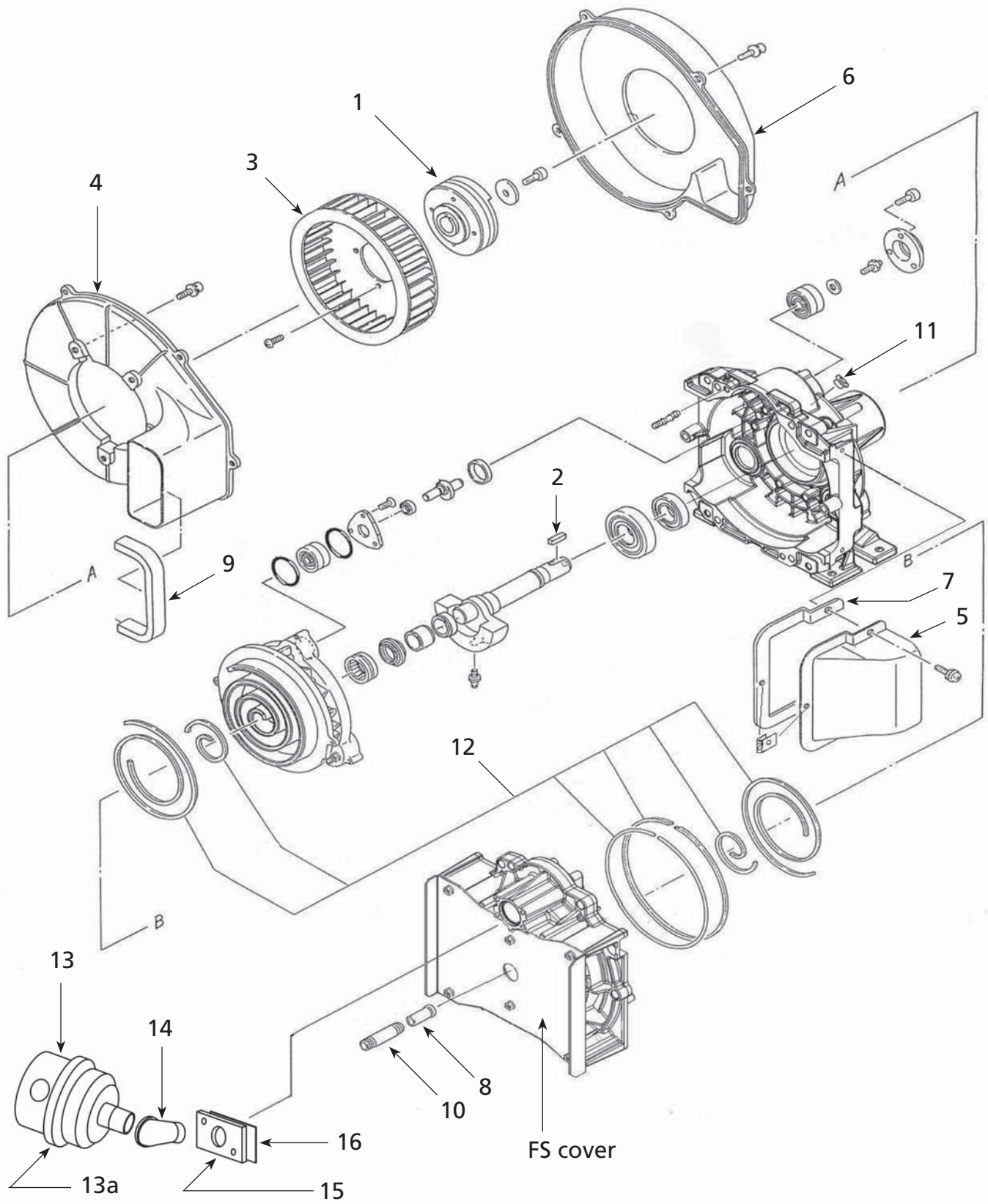


Figure 9 - Compressor Parts

Scroll Air Compressor Service and Maintenance

Ref. No.	Description	Part Number for Model			Quantity
		SLAE03E	SLAE05E	SLAE05EHP	
1	Air End Pulley	02843051	02549110	02549110	1
2	Key	IP600600AV	IP600600AV	IP600600AV	1
3	Centrifugal Fan	IP601300AV	IP601300AV	IP601300AV	1
4	Fan Duct (1)	IP601400AV	IP601400AV	IP601400AV	1
5	Fan Duct (2)	IP601500AV	02519042	02519042	1
6	Fan Cover	IP601700AV	IP601700AV	IP601700AV	1
7	Fan dust Gasket (1)	IP601800AV	IP601900AV	IP601900AV	1
8	Heat Insulation Pipe	IP602000AV	IP602000AV	IP602000AV	1
9	Fan Duct Gasket (2)	IP602400AV	IP602400AV	IP602400AV	1
10	Long Nipple	96647011	96647011	96647011	1
11	Dust Cap	IP603500AV	IP603500AV	IP603500AV	1
12	Tip Seal Set	92834090	92832070	92832080	1
13	Filter Assembly	ST073922AV	ST073922AV	ST073922AV	1
13a	Filter Element	91348550	91348550	91348550	1
14	Street Elbow	RB90SF34	RB90SF34	RB90SF34	1
15	Adaptor Plate	IP086100AV	IP086100AV	IP086100AV	1
16	Intake Gasket	IP088200AV	IP088200AV	IP088200AV	1
*	Grease Gun Kit	IP616201AJ	IP616201AJ	IP616201AJ	
*	Grease Gun	IP616100AJ	IP616100AJ	IP616100AJ	
*	Grease (80g.)	IP600000AV	IP600000AV	IP600000AV	

* Not Shown

Powerex Limited Warranty

Powerex 3 Year / 10,000 Hour Extended Parts Limited Warranty - Powerex warrants each Compressor Pump or Scroll Air-End against defects in material or workmanship from the date of purchase for a period of **Three years or 10,000 hours**, whichever may occur first. This warranty applies to the exchange of part(s) of the compressor pump or air-end found to be defective by an Authorized Powerex Service Center.

Powerex 1 Year / 5,000 Hour Inlet to Outlet Limited Warranty - Powerex warrants each Compressor Unit, System, Pump, or Air-End against defects in material or workmanship from the date of purchase for a period of **One Year or 5,000 Hours**, whichever may occur first. This warranty applies to the exchange of defective component part(s) and labor performed by an Authorized Powerex Service Center.

Coverage. The above mentioned warranty applies to Powerex manufactured units or systems only. Items listed in the operator's manual under routine maintenance are not covered by this or any other warranty. Failure to complete maintenance as stated in the maintenance schedule will void this warranty.

THERE IS NO OTHER EXPRESS WARRANTY. IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO ONE YEAR FROM THE DATE OF PURCHASE: AND TO THE EXTENT PERMITTED BY LAW, ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED. THIS IS THE EXCLUSIVE REMEDY AND LIABILITY FOR CONSEQUENTIAL DAMAGES UNDER ANY AND ALL WARRANTIES IS EXCLUDED TO THE EXTENT EXCLUSION IS PERMITTED BY LAW.

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