

## 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 orbiting 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 orbiting 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.

### Safety Guidelines

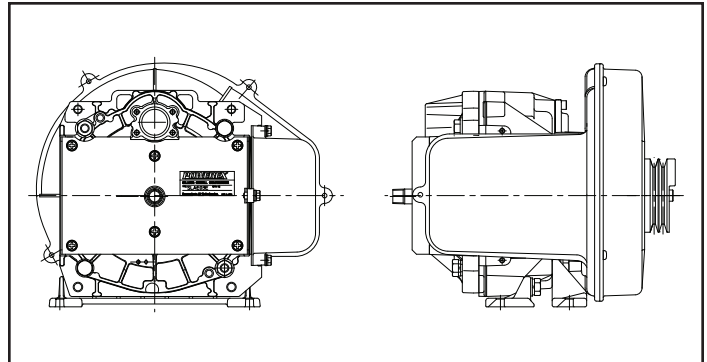
This manual contains information that is very important to know and understand. This information is provided for SAFETY and to PREVENT EQUIPMENT PROBLEMS. To help recognize this information, observe the following symbols.

**⚠ 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.



### Specifications

Product	SLAE03EB, SLAE05E, SLAE05EHP
Discharge Pressure	95-115 psi (125-145 psi optional)
Compression Cycle	Scroll
Operating Temperature Range	32°F to 104°F

#### **⚠ 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, you must fit the air compressor/pump 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 G 7.1 - 1966, OSHA 29 CFR 1910. 134, 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 ARE VOIDED, AND POWEREX DISCLAIMS ANY LIABILITY WHATSOEVER FOR ANY LOSS, PERSONAL INJURY OR DAMAGE.***

## 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

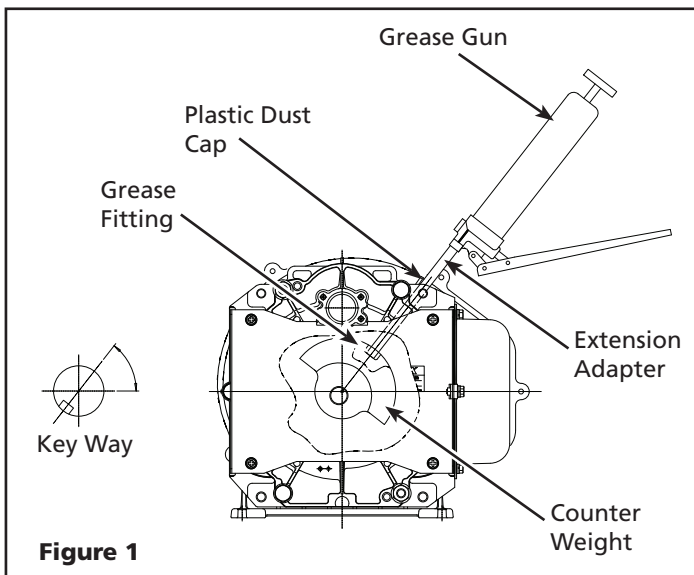
#### 10,000 Hours - Maintenance

**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 on Page 2 and on Figure 1).

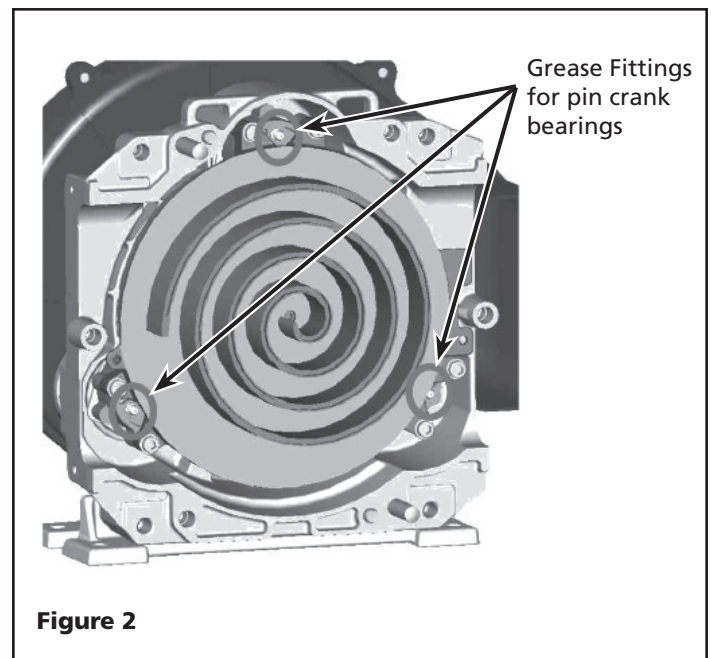
**CAUTION** Use only Powerex genuine grease. Pump grease gun before feeding. This eliminates air from the grease passage of the extension adapter.

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 according to the Maintenance Schedule on Page 2.

1. Remove the fan duct (2), part number 5 on Pages 6 and 7.
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

#### 5,000/10,000 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 SLAE03EB, SLAE05E, and SLAE05EHP air ends. Please read these instructions thoroughly and carefully to ensure correct replacement.

## Maintenance (continued)

**NOTE:** Replace tip seal on SLAE03EB 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 operating @ 115 psig.

### Confirmation of the Parts

1. Confirm if the tip seal set you purchased is correct for the air end you are repairing. See part number 12 on Page 7 for tip seal set and corresponding pump model number. One tip seal set contains all of the items in Figure 3 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).

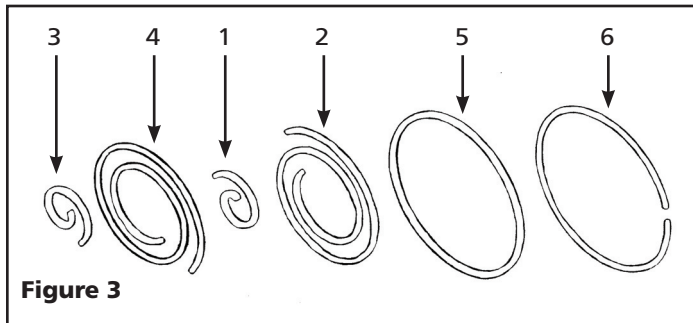
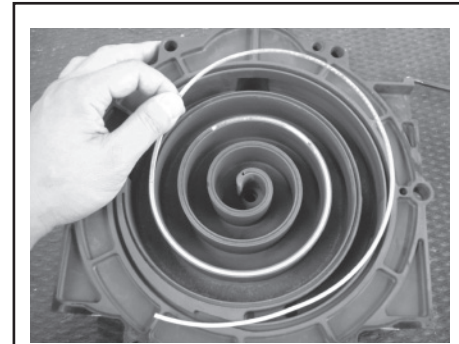


Figure 3

### Replacement

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

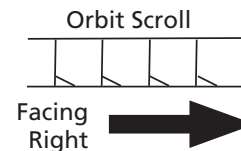
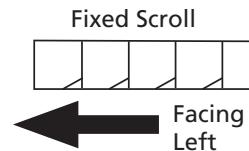
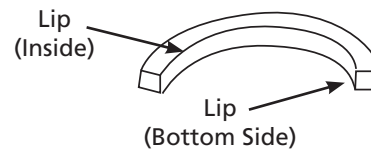


Tip Seal Removal

Figure 4

3. Remove all dust from the Scroll wraps and tip seal groove with clean cloth or compressed air before inserting the new 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.

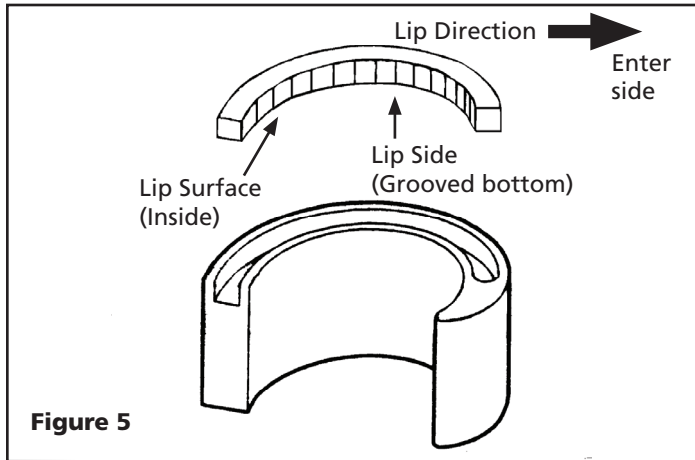


**Maintenance (continued)**

**Inserting tip seals**

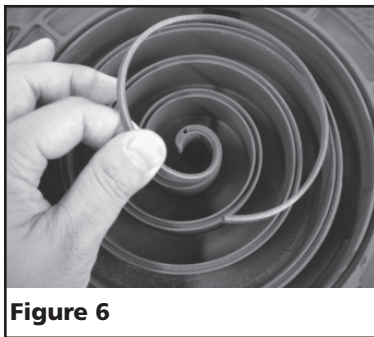
**NOTE:** Tip seals for Fixed Scroll and Orbit Scroll have opposing seal cut angles (See NOTE and explanatory diagram below).

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.



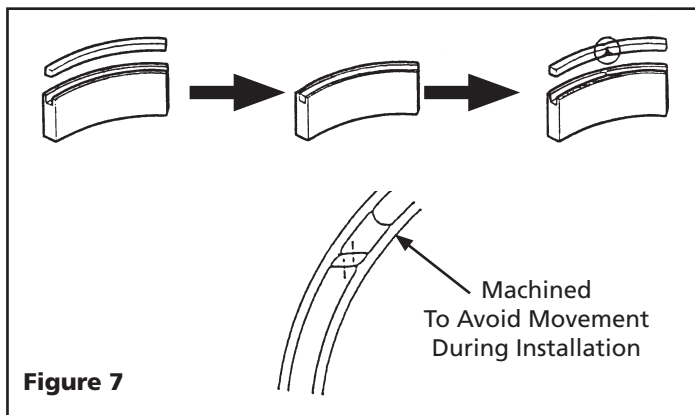
Use caution not to tear or distort lip.

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).



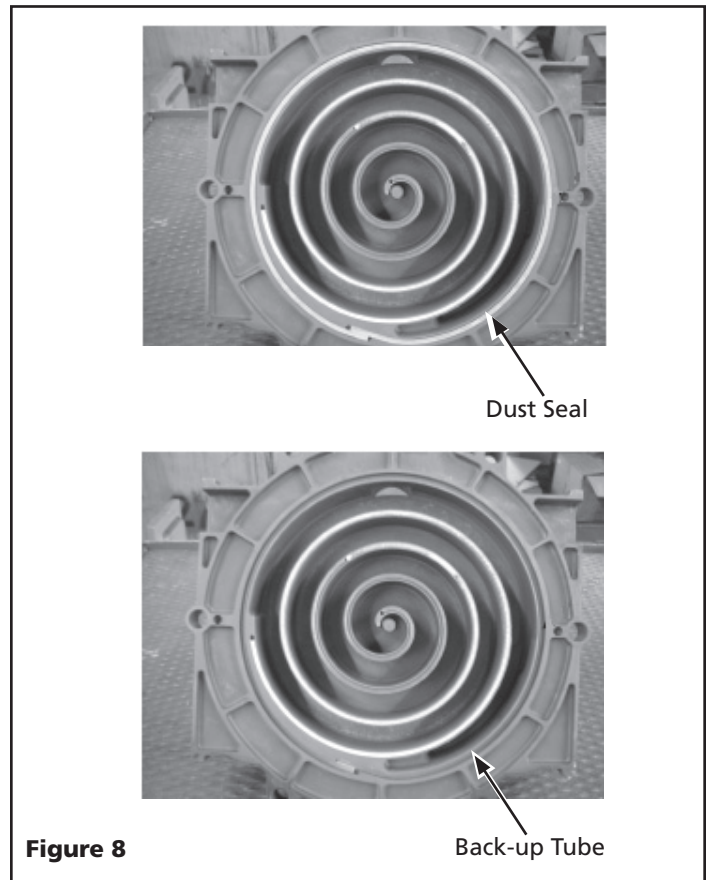
**Figure 6**

**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
SLAE03EB	17 in lb.	265 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.

## Scroll Air Compressor Service and Maintenance

### GREASE DELIVERY

Bearing	SLAE03EB		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	
Inlet Air Filter	Clean, 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)
Heat Insulation Pipe	Replace				▲		▲	(Every 5,000 hours for 145 psig scroll)

- Clean
- ▲ Replace, regrease

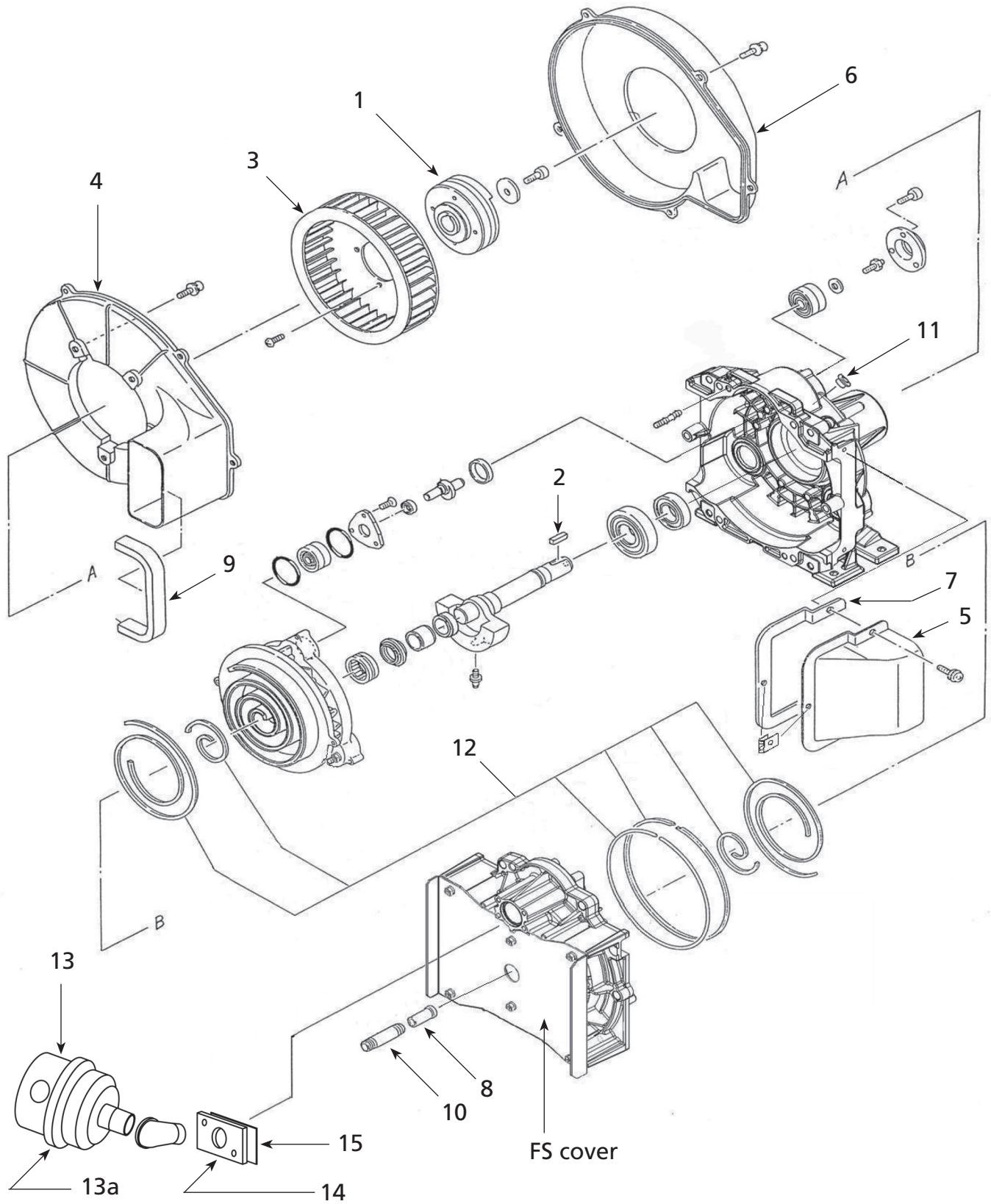
#### NOTES:

1. Inspect and perform maintenance periodically according to maintenance schedule.
2. 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.









**Figure 9 - Compressor Parts**



## Scroll Air Compressor Service and Maintenance

Ref. No.	Description	Part Number for Model			Quantity
		SLAE03EB	SLAE05E	SLAE05EHP	
1	Air End Pulley	92721100	92549110	92549110	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	92519042	92519042	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	ST073925AV	ST073925AV	ST073925AV	1
13a	Filter Element	ST073921AV	ST073921AV	ST073921AV	1
14	Adaptor Plate	IP088400AV	IP088400AV	IP088400AV	1
15	Intake Gasket	IP088200AV	IP088200AV	IP088200AV	1
*	Grease Gun Kit (Grease gun, Grease, and 2 Nozzles	IP616201AJ	IP616201AJ	IP616201AJ	
*	Grease Gun with 2 Nozzles	IP616101AJ	IP616101AJ	IP616101AJ	
*	Grease (80g.)	IP600000AV	IP600000AV	IP600000AV	

\* Not Shown



### Powerex Limited Warranty – Applicable to Non-OEM Customers in the U.S. & Canada Only

#### Warranty and Remedies.

**(a) General.** Powerex warrants each Compressor System, Vacuum System, Vacuum Pump, Compressor Air-End, or Powerex branded Accessory (collectively “Products”, individually each a “Product”) to be free from defects in material and workmanship (“Defects”) at the date of shipment. This warranty shall apply only to Products that are purchased and used in the United States of America and in Canada. EXCEPT AS SET FORTH BELOW, NO OTHER WARRANTY, WHETHER EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL EXIST IN CONNECTION WITH THE SALE OR USE OF SUCH PRODUCTS. TO THE EXTENT PERMITTED BY LAW, ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED. All warranty claims must be made in writing and delivered to Powerex in accordance with the procedures set forth on its website (www.powerexinc.com), or such claim shall be barred. Upon timely receipt of a warranty claim, Powerex shall inspect the Product claimed to have a Defect, and Powerex shall repair, or, at its option, replace, free of charge, any Product which it determines to have had a Defect; provided, however, that if circumstances are such as to preclude the remedying of Defect by repair or replacement, Powerex shall, upon return of the Product, refund to buyer any part of the purchase price of such Products paid to Powerex. Freight for returning Products to Powerex for inspection shall be paid by buyer. The warranties and remedies herein are the sole and exclusive remedy for any breach of warranty or for any other claim based on any Defect, or non-performance of the Products, whether based upon contract, warranty or negligence.

**(b) (i) Standard Period of Warranty – Parts and Labor** - The purchase of any system includes our standard warranty. Powerex warrants and represents all Products shall be free from Defects for the first eighteen (18) months from the date of shipment by Powerex, or twelve (12) months from the documented date of startup, or five thousand (5,000) hours of use, whichever occurs first. During such warranty period, Powerex shall be fully liable for all Defects in the Products (the “Product Defects”), i.e., all costs of repair or replacement, which may include “in and out” charges, so long as the Products are located in the United States or Canada, and the Products are reasonably located and accessible by service personnel for removal. “In and out” charges include the costs of removing a Product from buyer’s equipment for repair or replacement.

**(ii) Premium Period of Warranty – Parts and Labor** - In order to be eligible for premium warranty coverage, a premium warranty for each system must be purchased when order is placed. Powerex warrants and represents all Products shall be free from Defects for the first thirty (30) months from the date of shipment by Powerex, or twenty-four (24) months from the documented date of startup, or seven thousand five hundred (7,500) hours of use, whichever occurs first. During such warranty period, Powerex shall be fully liable for all Defects in the Products (the “Product Defects”), i.e., all costs of repair or replacement, which may include “in and out” charges, so long as the Products are located in the United States or Canada, and the Products are reasonably located and accessible by service personnel for removal. “In and out” charges include the costs of removing a Product from buyer’s equipment for repair or replacement.

**(c) Additional Period of Warranty – Parts Only (No Labor).** In addition to the above, Powerex warrants each Powerex branded Compressor Air- End and Vacuum Pump shall be free of Defects for a period of forty-two (42) months from the date of shipment by Powerex, or thirty-six (36) months from the documented date of startup, or ten thousand (10,000) hours of use, whichever occurs first. Supplier’s repair or replacement of any Product shall not extend the period of any warranty of any Product. This warranty applies to the exchange of part(s) found to be defective by an Authorized Powerex Service Representative only.

**(d) Replacement Pumps – Parts Only (No Labor).** For any replacement Air-End or Vacuum Pumps installed on a Powerex manufactured system or unit after any initial warranty period has expired or where another warranty does not apply for any reason, Powerex warrants that the Air-End or Vacuum Pumps shall be free of Defects for a period of thirty-six (36) months from the date of shipment by Powerex or ten thousand (10,000) hours of use, whichever comes first. For any replacement Air-End or Vacuum Pumps installed on a system that was not manufactured by Powerex after any initial warranty period has expired or where another warranty does not apply for any reason, Powerex warrants that the Air-End or Vacuum Pumps shall be free of Defects for the first twelve (12) months from the date of shipment by Powerex. Supplier’s repair or replacement of any Product shall not extend the period of any warranty of any Product. This warranty applies to the exchange of part(s) found to be defective by an Authorized Powerex Service Representative only.

**(e) Replacement Motors – Parts Only (No Labor).** For any replacement motor installed on a Powerex manufactured system or unit after any initial warranty period has expired or where another warranty does not apply for any reason, Powerex warrants that the replacement motor shall be free of Defects for the first twelve (12) months from the date of shipment by Powerex. For any replacement motor installed on a system or unit that was not manufactured by Powerex after any initial warranty period has expired or where another warranty does not apply for any reason, Powerex warrants that the replacement motor shall be free of Defects for the first ninety (90) days from the date of shipment by Powerex. Supplier’s repair or replacement of any Product shall not extend the period of any warranty of any Product. This warranty applies to the exchange of part(s) found to be defective by an Authorized Powerex Service Representative only.

**(f) Replacement Parts – Parts Only (No Labor).** For other replacement parts besides motors, Air-End or Vacuum Pumps installed on a Powerex manufactured system or unit after any initial warranty period has expired or where another warranty does not apply for any reason, Powerex warrants that such replacement parts will be free from Defects for the first twelve (12) months from the date of shipment by Powerex. For other replacement parts besides motors, Air-End or Vacuum Pumps installed on a system or unit that was not manufactured by Powerex after any initial warranty period has expired or where another warranty does not apply for any reason, Powerex makes no warranties. Supplier’s repair or replacement of any Product shall not extend the period of any warranty of any Product. This warranty applies to the exchange of part(s) found to be defective by an Authorized Powerex Service Representative only.

**(g) Coverage.** The warranty provided herein applies to Powerex manufactured units or systems only.

**(h) Exceptions.** Notwithstanding anything to the contrary herein, Powerex shall have no warranty obligations with respect to Products:

- (i) that have not been installed in accordance with Powerex’s written specifications and instructions;
- (ii) that have not been maintained in accordance with Powerex’s written instructions;
- (iii) that have been materially modified without the prior written approval of Powerex; or
- (iv) that experience failures resulting from operation, either intentional or otherwise, in excess of rated capacities or in an otherwise improper manner.

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(i) The warranty provided herein shall not apply to:

- (i) any defects arising from corrosion, abrasion, use of insoluble lubricants, or negligent attendance to or faulty operation of the Products;
- (ii) ordinary wear and tear of the Products;
- (iii) defects arising from abnormal conditions of temperature, dirt or corrosive matter; or
- (iv) any OEM component which is shipped by Powerex with the original manufacturer's warranty, which shall be the sole applicable warranty for such component.

**Limitation of Liability.** NOTWITHSTANDING ANYTHING TO THE CONTRARY HEREIN, TO THE EXTENT ALLOWABLE UNDER APPLICABLE LAW, UNDER NO CIRCUMSTANCES SHALL POWEREX BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, PUNITIVE, SPECULATIVE OR INDIRECT LOSSES OR DAMAGES WHATSOEVER ARISING OUT OF OR IN ANY WAY RELATED TO ANY OF THE PRODUCTS OR GOODS SOLD OR AGREED TO BE SOLD BY POWEREX TO BUYER. TO THE EXTENT ALLOWABLE UNDER APPLICABLE LAW, POWEREX'S LIABILITY IN ALL EVENTS IS LIMITED TO, AND SHALL NOT EXCEED, THE PURCHASE PRICE PAID.

**Warranty Disclaimer.** Powerex has made a diligent effort to illustrate and describe the Products in its literature, including its Price Book, accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the Products are merchantable, or fit for a particular purpose, or that the Products will necessarily conform to the illustrations or descriptions.

**Product Suitability.** Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of Products for certain purposes, which may vary from those in neighboring areas. While Powerex attempts to assure that its Products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a Product, please review the Product applications, and national and local codes and regulations, and be sure that the Product, installation, and use will comply with them.

**Claims.** Any non-warranty claims pertaining to the Products must be filed with Powerex within 6 months of the invoice date, or they will not be honored. Prices, discounts, and terms are subject to change without notice or as stipulated in specific Product quotations. Powerex shall not be liable for any delay or failure arising out of acts of the public enemy, fire, flood, or any disaster, labor trouble, riot or disorder, delay in the supply of materials or any other cause, whether similar or dissimilar, beyond the control of Company. All shipments are carefully inspected and counted before leaving the factory. Please inspect carefully any receipt of Products noting any discrepancy or damage on the carrier's freight bill at the time of delivery. Discrepancies or damage which obviously occurred in transit are the carrier's responsibility and related claims should be made promptly directly to the carrier. Returned Products will not be accepted without prior written authorization by Powerex and deductions from invoices for shortage or damage claims will not be allowed. **UNLESS OTHERWISE AGREED TO IN WRITING, THE TERMS AND CONDITIONS CONTAINED IN THIS LIMITED WARRANTY WILL CONTROL IN ANY TRANSACTION WITH POWEREX.** Any different or conflicting terms as may appear on any order form now or later submitted by the buyer will not control. All orders are subject to acceptance by Powerex.