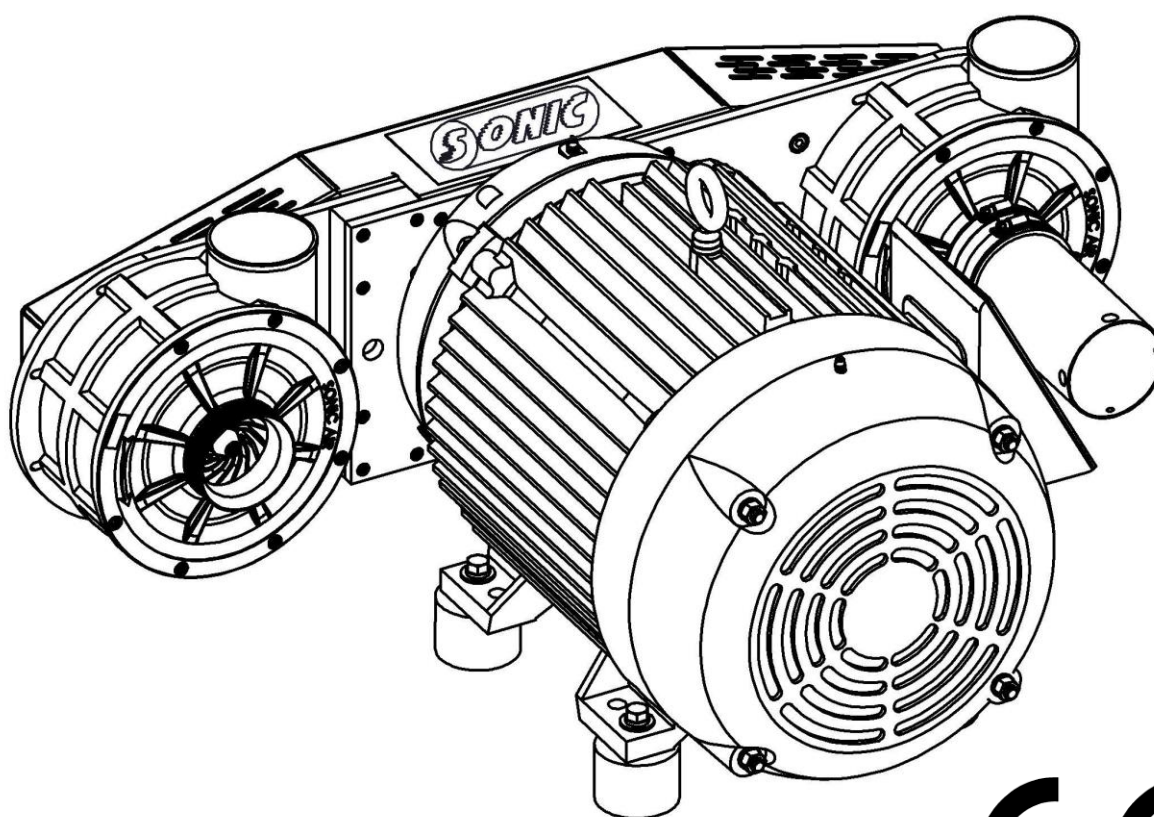


OPERATION AND MAINTENANCE MANUAL

SONIC 200 / 200C



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Saving Energy Worldwide...one PSI at a time™

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1 Sonic 200 / Sonic 200C Introduction

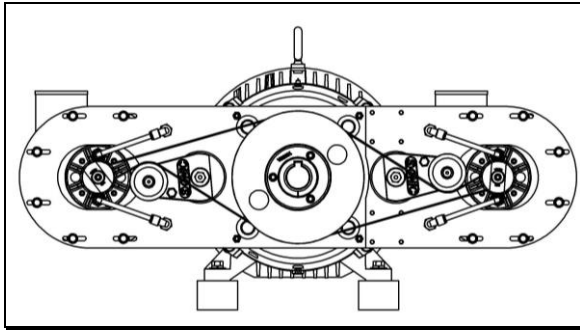


Figure 1 - Sonic 200C (Front View)

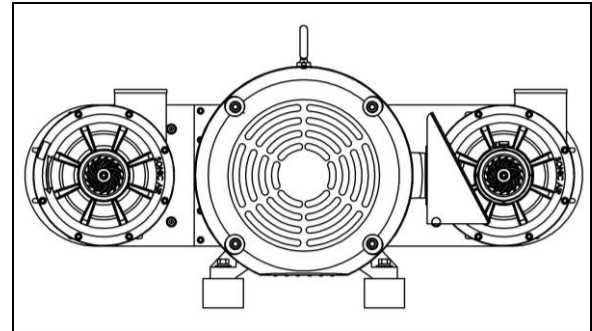


Figure 2 - Sonic 200C (Back View)

1.1 Introduction

Thank you for the recent purchase of a Sonic 200 or Sonic 200C centrifugal blower or retro-kit. Sonic Air Systems is confident that the blower unit is the best available in this performance range. Sonic manufactures blowers using the finest components available, assembles using only highly trained and qualified personnel, and inspects each unit 100% for quality and performance.

The following manual is intended to:

- Identify safety hazards
- Familiarize personnel with the equipment performance
- Demonstrate typical installation and usage
- Identify maintenance schedule and typical spare components
- Provide Sonics' Performance Guarantee and Warranty information

1.2 Typical Applications

The following is a list of typical applications for using a Sonic 200 centrifugal blower assembly. This is only a partial list of the possible uses for supplying low cost, clean air to a particular application. Please consult a Sonic Application engineer to design a system to meet any request.

Parts drying	Engine exhaust sampling
Hydrocarbon vapor recovery	Environmental test chambers
Gas boosting	Tank / Pond aeration
Concrete grinding vacuum	Gas meter testing
Cooling	Vacuum hold down
Oil spill containment booms	Air bearings

Special applications and options are available for the Sonic 200 blower unit:

Corrosion resistant electroplating	Air flow control valves
316 Stainless Steel Material Option	Acoustical enclosure
Welded inlet and outlet flanges	In-Line filters and water separators
Water cooling of the bearing housing	Filter Silencers
Operation to 400°F inlet air temperature	Explosion Proof motors
Thermocouple monitoring of bearings	Wash Down duty motors

Discharge silencers	Premium Efficiency (PE) motors
IEC motor compatibility	Hydraulic motors

Sonic also provides a full line of air / gas handling accessories:

Complete drying systems	Air wipe collars
Air blowers from 3 to 50 horsepower	HEPA filters to 1,000 CFM
High efficiency aluminum air knives	Acoustical enclosures
High efficiency stainless steel air knives	Piping accessories

Sonic services four main industries:

Food and Beverage	Wire and Cable
Electronics	Metal and Sheet Fabricators

Please contact a local Sonic representative or a Sonic application engineer to discuss any special considerations or applications.

2 Initial Inspection

Upon receipt of your Sonic Air Centrifugal Blower, make sure that all components listed on the packing slip are present. Check to see that the nameplate and serial number on the blower housing matches the packing slip (See Figure 4). Inspect the blower / motor to ensure that they are mounted with the correct outlet position and that the motor is the correct horsepower, voltage and enclosure (If Applicable). If you have any shortages, discrepancies, or shipping damage, please call your Sonic Representative/ Distributor or Sonic Air Systems immediately.



Figure 3 - Sonic Nameplate

Record the serial number of the blower identifies the blower model, pulley size, belt size, mounting position, and the motor specifications. Please use this number for any correspondence with the Sales / Customer Service Department at Sonic Air Systems.

Blower Serial Number	
-----------------------------	--

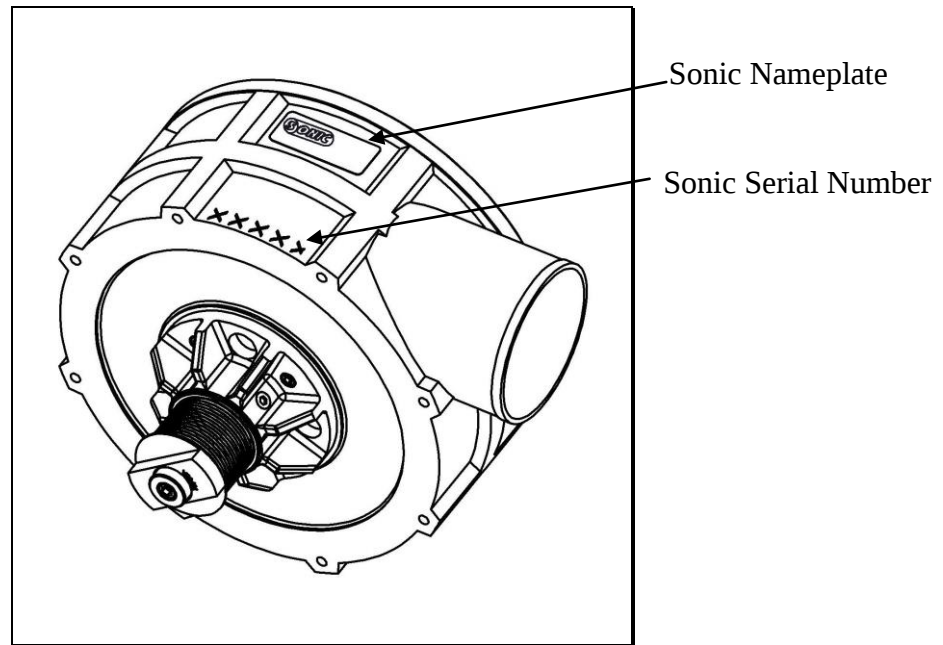


Figure 4 – Blower Serial Number

3 Safety Instructions

3.1 Electrical

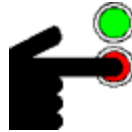
- Always use qualified electrical and mechanical personnel for installation and maintenance of Sonic air blowers.
- Use proper electrical installation, wiring, and controls consistent with local and national electrical codes. A lockable isolation switch should be provided.
- Refer to the motor nameplate data for the proper power supply requirements. Be sure the junction box connections are tight and well insulated to prevent shorts and to assure maximum protection against moisture.
- No work should be performed on a Sonic air blower until the power has been turned off and an isolation device has been applied. Disconnect the electrical power at the motor starter, fuse box, or circuit breaker before working on the blower / motor. Double check to be sure that the power is off and that it cannot be turned on while you are working on the blower / motor assembly.



3.2 Mechanical

- Never run the Sonic air blower without the belt guard installed.
- Never run the Sonic air blower with the outlet open to atmosphere as this can cause the motor to overload.
- Never run the Sonic air blower with the inlet open to atmosphere. Always connect your system piping, Sonic inlet filter, or Sonic Inlet safety screen to the blower inlet to prevent personal injury or damage to the blower.

- Keep tools, clothing and hands away from rotating or moving parts while the unit is running.
- Use safety glasses when working around the blower / motor and / or air knife assembly while the system is running.
- Always use proper lifting techniques and equipment.
- Observe good safety habits at all times and use care to avoid injury to personnel and damage to the equipment.



4 Installation and Adjustments

The following steps and procedures detail the installation and setup of a typical blower assembly. Disassembly of a blower unit is the opposite of the assembly procedure.

4.1 Lifting and Handling

Due to the weight of the blower / motor assembly, it should be lifted by a hoist or forklift using the single eyebolt on the top middle of the motor. See Section 1 - Component Specification Sheet for weight and dimension details.

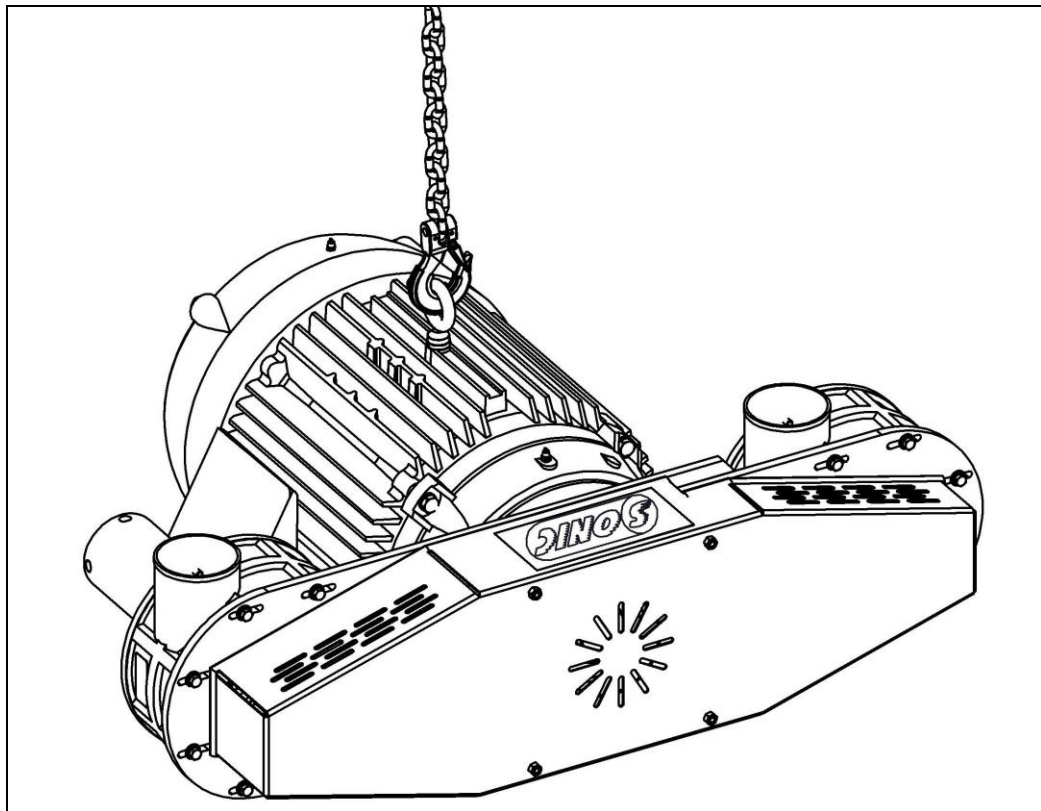


Figure 5 - Lifting Point

4.2 Blower Location

4.2.1 Access

Make certain to allow room for proper ventilation and accessibility to remove the belt guard for belt replacement as well as filter servicing. Never block the ventilation holes in the belt guard. Mount the blower / motor assembly in a well ventilated area to prevent motor overheating and premature belt and / or blower head failure.

4.2.2 Temperature

The blower / motor assembly must be placed in an area that prevents hard freezes or overheating. Ambient temperature conditions should range from a low of +10°F (-12°C) to +110°F (43°C). The blower / motor assembly is suitable for outdoor locations, but care should be taken to protect the equipment from temperature extremes, direct exposure to the sun, rain, snow, and dust so as to extend the service life of the blower, motor, and filter.

The blower / motor assembly, while running, can increase the ambient temperature above 110°F (43°C). Always check the running ambient temperature and do not operate above 110° (43°C).

4.2.3 Moisture and Debris

Sonic air blowers have a high-speed belt drive, close tolerance components and precision bearings. Do not put the blower where it will be sprayed from a washing / rinsing zone, from over-spray from an air knife or where dust, dirt, or other debris will attack the drive belt or clog the filter. If the filter needs cleaning or replacing more than one time each month, the blower or filter should be moved to a cleaner, dryer area. A Sonic acoustical blower enclosure will also ensure safe operation.

4.2.4 Wash Down

In factory locations subject to high-pressure water or caustic wash down cycles, the blower / motor unit must be protected or relocated to prevent damage. Raising the blower 1-2 feet (0.3 to 0.6 meters) above the wash zone is recommended. Wash down duty motors and corrosive resistant blower coatings are available to allow full exposure should it be needed.

4.2.5 Explosive Environments

The Sonic 200 centrifugal blower is made from non-sparking aluminum and therefore is suitable for explosive gases and explosive environments. Special explosion proof motors can also be included for hazardous duty.

4.2.6 Corrosive Environments

The Sonic 200 blower can be protected with special coatings for protection in corrosive environments. Protection level and life of blower is dependent on type of chemical and the concentration level.

4.2.7 Vibration

Due to the low vibration level of the Sonic air blowers, they can be bolted to any type of foundation or framework without transmitting any significant vibration. Sonic provides four rubber isolation mounts on most assemblies to prevent other equipment vibration from damaging the blower bearings.

4.2.8 Water Cooling Circuit

If the inlet air / gas is piped directly to the blower inlet, and the temperature is over 125°F (52°C), a water-cooled blower head must be used to protect the shaft bearings. The exact water temperature and flow required in the cooling circuit will vary with each blower configuration and application. Although water demand for the blower head varies, the common design point in all applications is that the water exiting from the cooling circuit should never exceed 100°F (38°C). Typical water demand per head will range from ¼ to ¾ gallons per minute (1 to 3 liters per minute) if using tap water (approximately 65°F (18°C)) and will be significantly lower if chilled water is used.

4.2.9 Thermocouple Option

All Sonic blower heads can be ordered with a thermocouple option. The thermocouple is in direct contact with the shaft bearing and continuously monitors the temperature of the bearing. Continuous monitoring of the blower head bearing temperature can indicate an imminent bearing failure (See Section 13 for Sonics' repair policy). Predicting and anticipating a bearing failure may save costly equipment and / or line down time.

4.3 Belt Installation

Sonic ships all new systems with the drive belt removed. This is to assure that the electrical starter, soft start and wiring is correct before the blower is started. See Section 5 for motor wiring instructions and verify that the wiring and blower rotation is correct before installation of the drive belt.

4.3.1 Tools Required

Description	Qty.
½ inch box-end wrench	1
9/16 inch box-end wrench	1

Description	Qty.
Rubber Mallet (optional)	1

4.3.2 Belt Installation Procedure

1. Remove the belt guard using the ½ inch box-end wrench and remove the (4) nuts. (See Figure 6)
2. Using the 9/16 inch box-end wrench, rotate the belt tensioner counter clockwise (CCW). At the same time wrap the belt around the blower pulley, then along the right side of the idler pulley, and finally around the motor pulley. (See Figure 7 & Figure 9)
3. Slowly rotate the motor pulley to make sure the belt is seated in the grooves.
4. Verify that the belt gap is approximately ¾ inch ±1/16 inch (Factory Set). (See Figure 11)
5. If a ¾ inch belt gap was not achieved, use a ½ inch box-end wrench to loosen the blower head screws and slide the head. (See Figure 8 and Figure 10)
6. Using the ½ inch box-end wrench, reinstall the belt guard and add the (4) nuts.

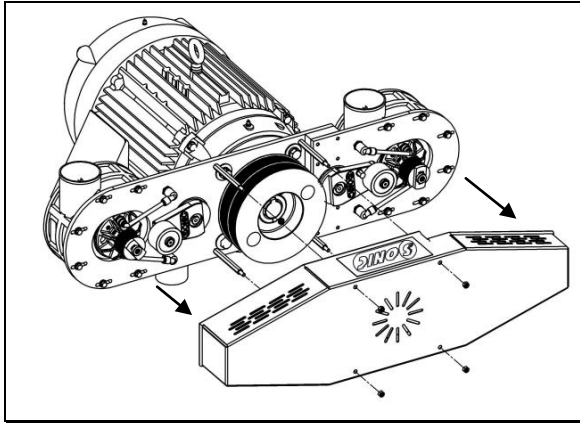


Figure 6 - Remove Belt Guard

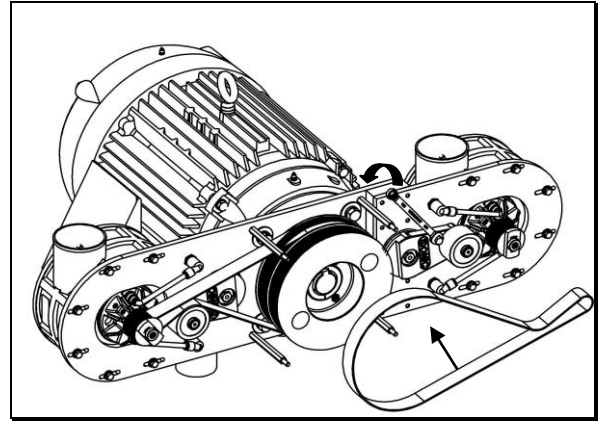


Figure 9 – Install Belt

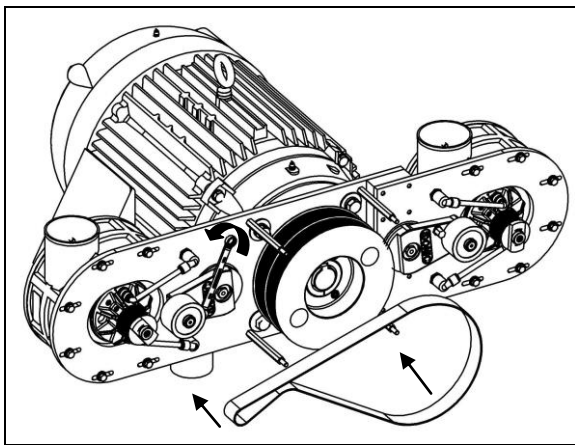


Figure 7 - Install Belt

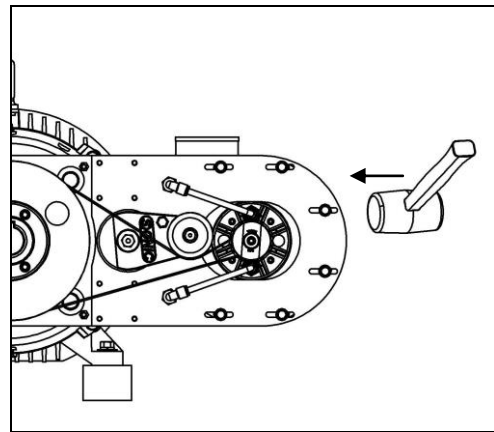


Figure 10 – Adjust Belt Gap

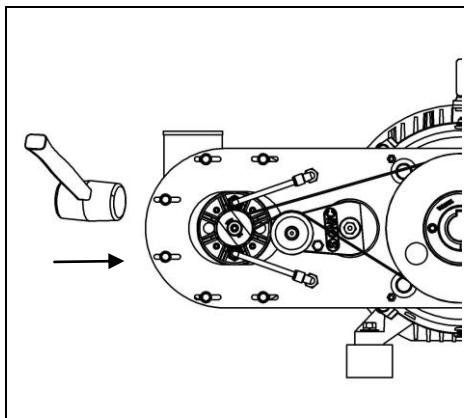


Figure 8 – Adjust Belt Gap

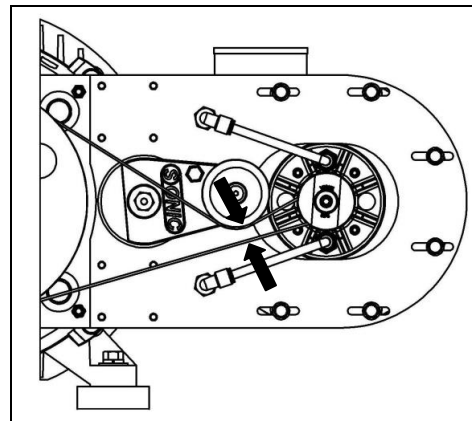


Figure 11 – Verify Belt Gap

4.4 Blower Head Mounting Adjustment

The blower head position was adjusted at the factory to the application specifications. Therefore, it should not be necessary to change the position of the blower head outlet unless the application specifications have changed or the unit is relocated. See Figure 12 for blower head rotation options. Use the following procedure to modify or adjust the blower head rotation.

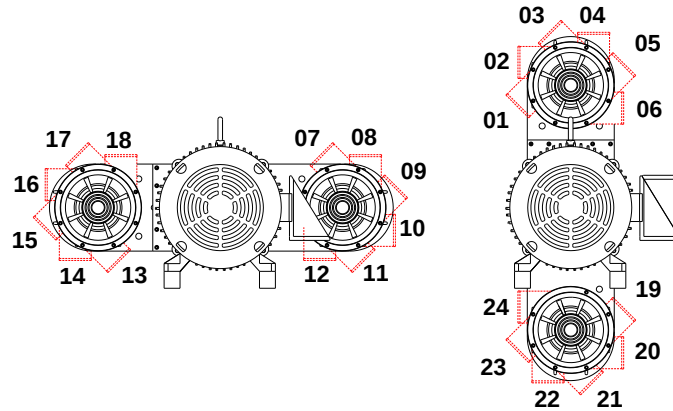


Figure 12 - Blower Rotations

4.4.1 Required Tools

Description	Qty.
½ inch box-end wrench	1
9/16 inch box-end wrench	1
3/8 inch ratchet driver	1

Description	Qty.
Rubber Mallet (optional)	1
½ inch socket	1

4.4.2 Blower Head Adjustment Procedure

1. Remove the belt guard using the ½ inch box-end wrench. (See Figure 13)
2. Using the 9/16 inch box-end wrench, rotate the belt tensioner counter clockwise (CCW) and remove the belt. (See Figure 14)
3. Disconnect the water-cooling lines at the quick disconnect on the blower head. (See Figure 15) (If Applicable)
4. Using the ½ inch socket, remove the eight screws from the bracket that secure the blower head. (See Figure 16)
5. Remove the water-cooling plugs from the blower head and rotate as necessary. (See Figure 17)(If Applicable)
6. Rotate the blower head to desired rotation and reinstall the eight screws to the proper torque specifications. (See Section 7.2 - Torque Specifications) (See Figure 18)
7. Reinstall the water-cooling lines. (See Figure 19) (If Applicable)
8. Using the 9/16 inch box-end wrench, rotate the belt tensioner counter clockwise (CCW). At the same time wrap the belt around the blower pulley, then along the right side of the idler pulley, and finally around the motor pulley. (See Figure 20)

9. Slowly rotate the motor pulley to make sure the belt is seated in the grooves.
10. Verify that the belt gap is approximately $\frac{3}{4}$ inch $\pm 1/16$ inch. (See Figure 21)
11. If a $\frac{3}{4}$ inch belt gap was not achieved, use a $\frac{1}{2}$ inch socket to loosen the blower head screws and slide the head. (See Figure 22)
12. Using the $\frac{1}{2}$ inch box-end wrench, reinstall the belt guard.

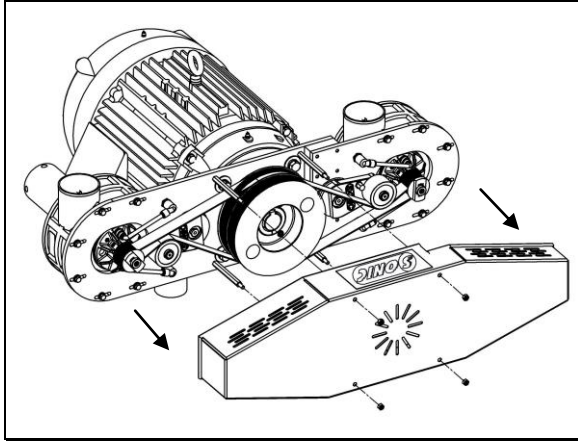


Figure 13 - Remove Belt Guard

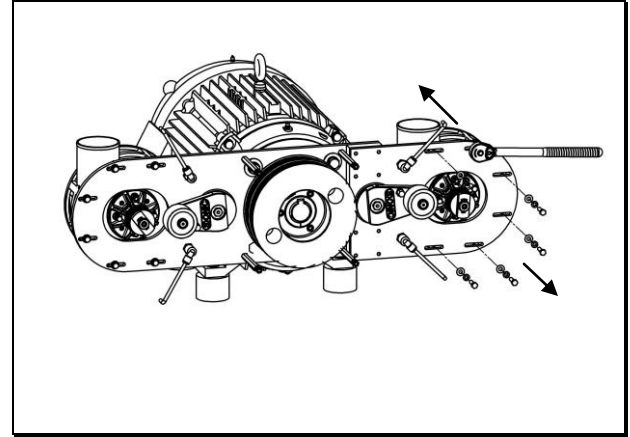


Figure 16 – Remove Blower Head

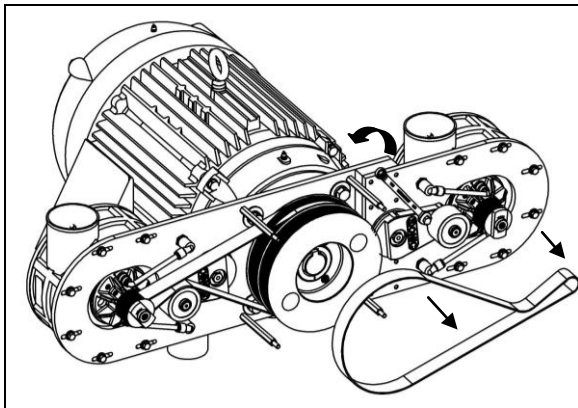


Figure 14 – Remove Belt

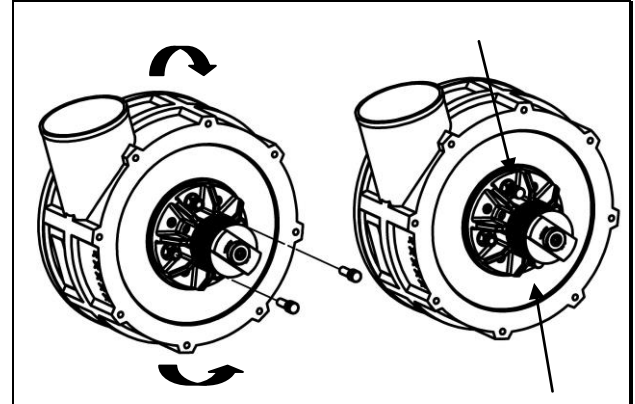


Figure 17 – Move Water-Cooling Plugs

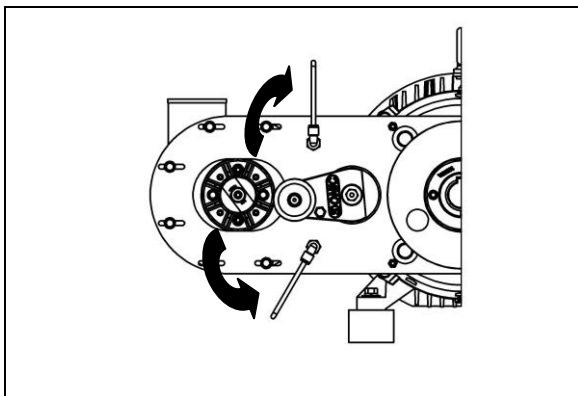


Figure 15 – Disconnect Water-Cooling Lines

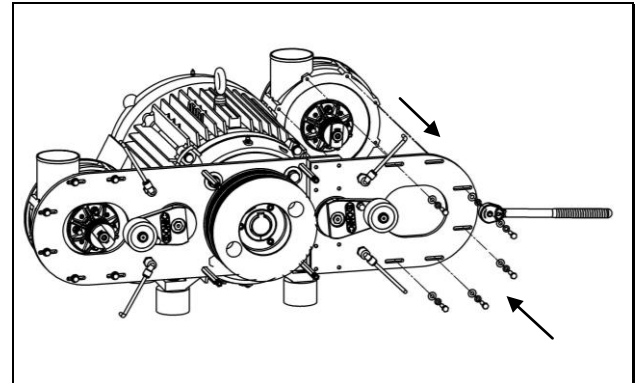


Figure 18 - Reinstall Blower Heads

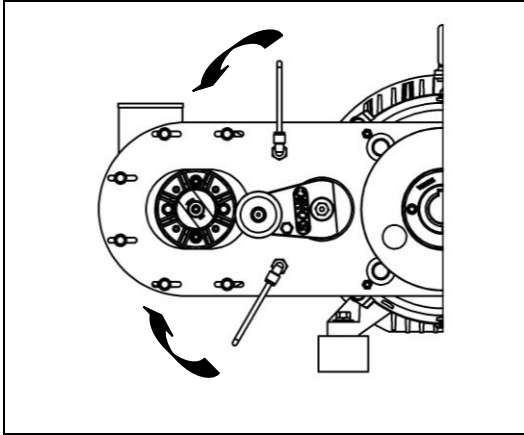


Figure 19 – Reconnect Water-Cooling Lines

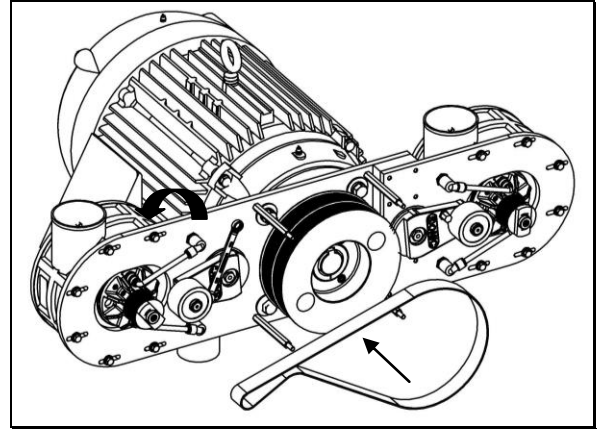


Figure 20 – Reinstall Belt

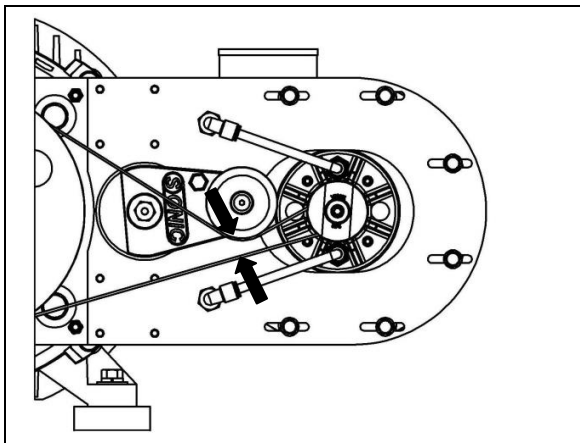


Figure 21 – Verify Belt Gap

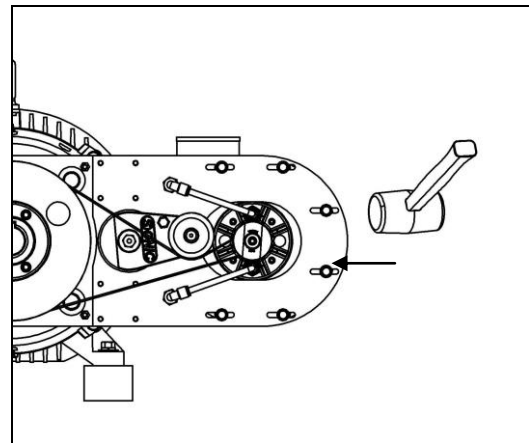


Figure 22 - Adjust Belt Gap

5 Electrical Wiring, and Start-Up

5.1 Motor Wiring

- Only qualified personnel should perform motor wiring. Review motor nameplate for wiring diagram and wiring information. Many Sonic motors are dual rated for 50 and 60 hertz operation and therefore will have two nameplates. Every motor is supplied with a sticker indicating the hertz set up of the blower unit.

50 HZ

60 HZ

+

- Never run a Sonic blower open to the atmosphere as this can cause overloading and damage to the motor.
- All Sonic blowers must rotate clockwise (CW) when viewing the pulley or counter clockwise (CCW) when viewing the cooling fan end of the motor. See the arrow mounted on the motor housing for direction of rotation.



- Sonic blowers are shipped with the drive belt removed. This is because the motor rotation should be checked before installing the belt. Running the blower / motor assembly backwards will cause the blower to under perform by 20%. Running backwards for prolonged periods will cause premature failure of the belts and permanent damage to the belt tensioner assembly. Refer to the Motor Rotation Sticker located on the mounting bracket for correct motor rotation and belt installation. (See Figure 23)

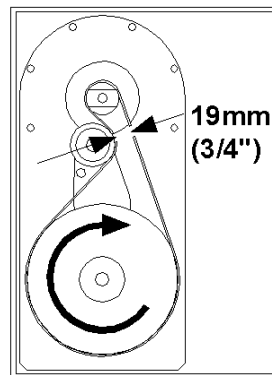
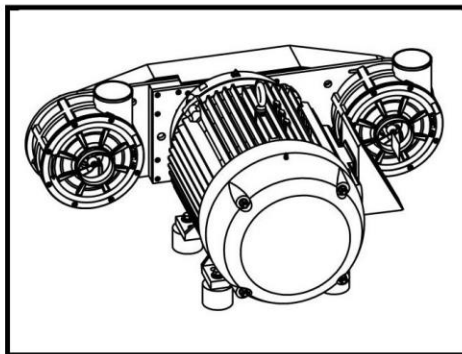


Figure 23 - Motor Rotation Sticker

- Soft Start VFD or Sonic Air Diverter (**Y-Verter™ Valve**) is Required.

6 Blower Specifications

6.1 Blower Specification Sheet


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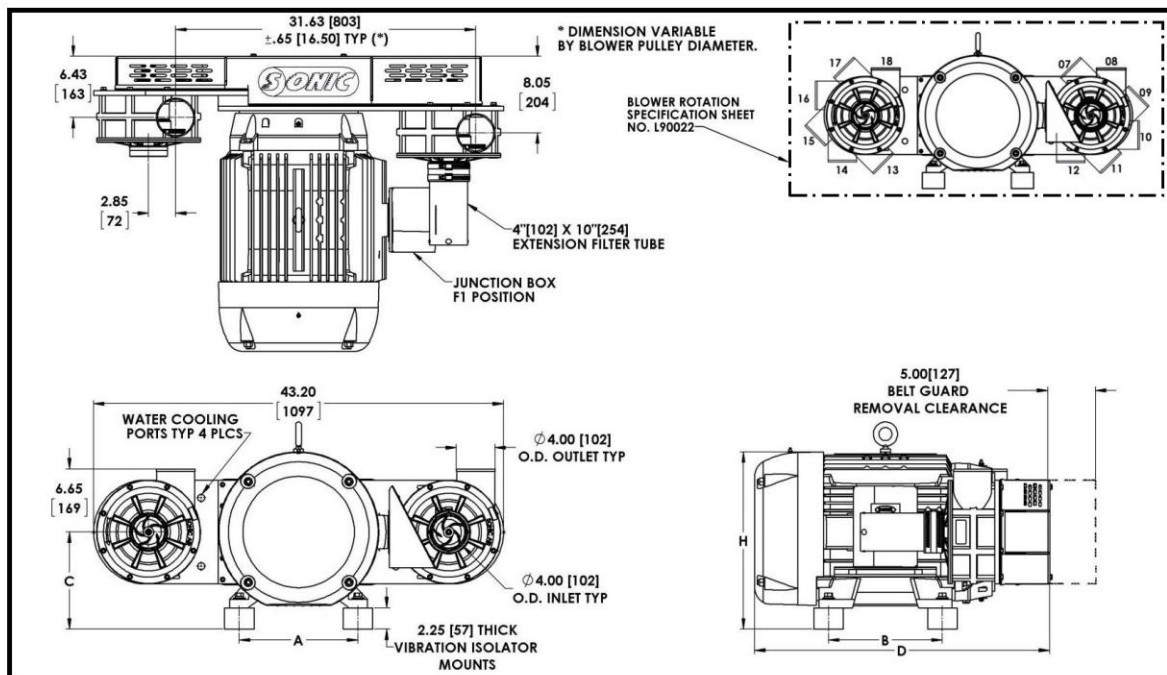

Engineered Blowers & Air Knife Solutions

Product Specification Sheet

SONIC 200 CENTRIFUGAL BLOWER

NEMA / BALDOR MOTORS

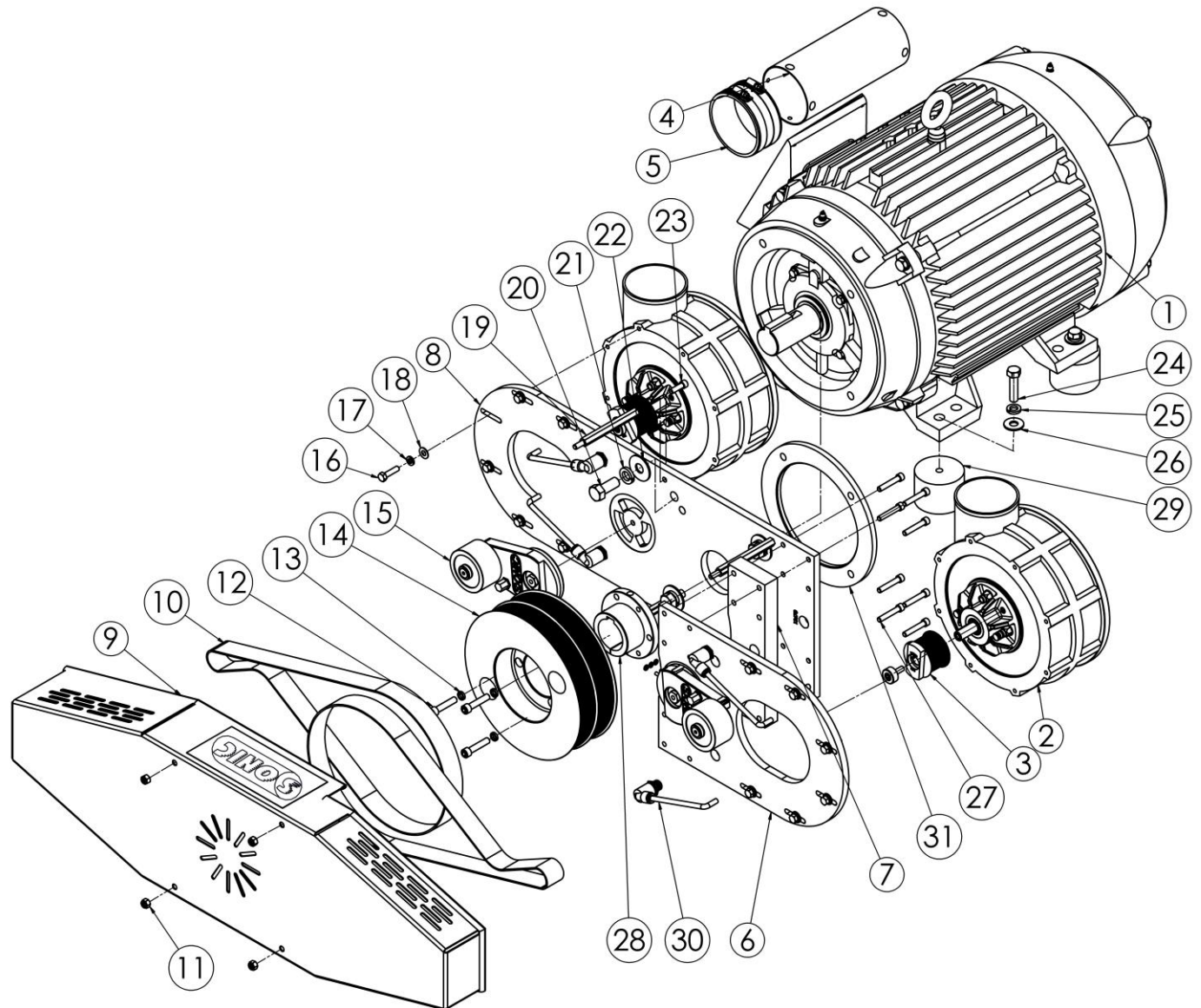
60 HZ, TEFC, 3600 RPM



Dimensions in Inches, [] are in millimeters

Mode / Description	Sonic 200 / Air Cooled			Sonic 200 / Water Cooled		
Assembly Part Number	Call Sonic			Call Sonic		
Output Flow Rate	1,000 cfm to 2,000 cfm (1,700 m ³ /hr to 3398 m ³ /hr)			1,000 cfm to 2,000 cfm (1,700 m ³ /hr to 3398 m ³ /hr)		
Ambient Temp.	10°F to 105°F (-12°C to 40°C)			10°F to 105°F (-12°C to 40°C)		
Inlet Air Temp. Range	<125°F (52°C)			125°F to 400°F (52°C to 205°C)		
Motors / Frames	25 Hp / 284	30 Hp / 286	40 Hp / 324	25 Hp / 284	30 Hp / 286	40 Hp / 324
Depth (D)	27.34 (694mm)	29.01 (737mm)	30.91 (785mm)	27.34 (694mm)	29.01 (737mm)	30.91 (785mm)
Height (H)	15.60 (396mm)	16.51 (419mm)	18.69 (475mm)	15.60 (396mm)	16.51 (419mm)	18.69 (475mm)
Mounting Pattern (A)	11.00 (279mm)	11.00 (279mm)	12.50 (318mm)	11.00 (279mm)	11.00 (279mm)	12.50 (318mm)
Mounting Pattern (B)	11.00 (279mm)	11.00 (279mm)	12.00 (305mm)	11.00 (279mm)	11.00 (279mm)	12.00 (305mm)
Drive Center-Line (C)	9.13 (232mm)	9.13 (232mm)	10.25 (260mm)	9.13 (232mm)	9.13 (232mm)	10.25 (260mm)
Approximate Weight	436.5 lbs (198 Kg)	477 lbs (216 Kg)	628.5 lbs (285 Kg)	436.5 lbs (198 Kg)	477 lbs (216 Kg)	628.5 lbs (285 Kg)

6.2 Assembly Drawing



6.3 Parts List

6.3.1 Sonic 200 Blower Unit

Item No.	Part No.	Description	Qty.
1	Section 0	Motor, Electric	1
2	14457	Blower Head, Sonic 100	2
3	13900A-XX	Pulley, Blower	1
4	12934	Tube SS	1
5	10040	Sleeve & Clamp	1
6	13459	Bracket, Sonic 200/300 16.25"	1
7	13454	Bracket, Sonic 200/300 Joining	1
8	13670	Bracket, Sonic 200/300 30.25"	1
8a	14403	Bracket, Sonic 200/300 30.25" (IEC 160 B14 Face ONLY)	1
9	17301	Belt Guard	1
10	13451	Belt	2
11	12342	Nut, 5/16-18 Hex SS w/ Nylock	4
12	13676	Screw-3/8"-16 X 1 3/4" SHC 1 1/4" Threaded Length ZN PL	3
13	14786	Lock Washer, 3/8" High Collar SS	3
14	13597A	Pulley, Motor	1
15	13455	Belt Tensioner Assembly	2
16	12540	Screw- 5/16"-18 x 1 1/4" SHC Fully Threaded SS	12
17	12542	Lock Washer, 5/16" SS	12
18	12543	Washer, 5/16" SS	12
19	13507	Standoff Assembly	4
20	12538	Screw- 5/8"-11 x 1 1/2" HHC Fully Threaded ZN PL (40Hp & 50HP Only)	4
21	12539	Lock Washer, 5/8" ZN PL (40Hp & 50HP Only)	4
22	12573	Washer, 5/8" ZN PL (40Hp & 50HP Only)	4
23	10454	Screw- 5/16"-18 x 1" SHC Fully Threaded SS	6
24	12601	Screw-1/2"-13 x 2" HHC 2" LG, Partially Threaded ZN PL (40Hp & 50HP Only)	4
24a	12654	Screw- M12 x 40mm HHC Fully Thrd. ZN PL(IEC 160 B14 Face ONLY)	4
25	12364	Lock Washer, 1/2" ZN PL	8
25a	12771	Lock Washer, M12 ZN PL (IEC 160 B14 Face ONLY)	4
26	10263	Washer, 1/2" ZN PL	8
26a	12770	Washer, M12 ZN PL (IEC 160 B14 Face ONLY)	4
27	13476	Screw-5/16"-18 x 1 3/4" SHC 1 1/8" Threaded Length SS	8
28	11415	Bushing Kit (25Hp & 30HP Only)	1
28a	12652	Bushing Kit (IEC 160 B14 Face ONLY)	1
28b	12495	Bushing Kit (40Hp & 50HP Only)	1
29	15137	Vibration Isolators	4
29a	12548	Vibration Isolators (IEC 160 B14 Face ONLY)	4
30		Feed-Thru Assembly, Water-Cooled	4
31	10338	Spacer (IEC 160 B14 Face ONLY)	1

6.3.2 Sonic 200C Blower Unit

Item No.	Part No.	Description	Qty.
1	Section 0	Motor, Electric	1
2	14457	Blower Head, Sonic 100C	2
3	13900A-XX	Pulley, Blower	1
4	12934	Tube SS	1
5	10040	Sleeve & Clamp	1
6	13459	Bracket, Sonic 200/300 16.25"	1
7	13454	Bracket, Sonic 200/300 Joining	1
8	13670	Bracket, Sonic 200/300 30.25"	1
8-a	14403	Bracket, Sonic 200/300 30.25" (IEC 160 B14 Face ONLY)	1
9	17301	Belt Guard	1
10	13451	Belt	2
11	12342	Nut, 5/16-18 Hex SS w/ Nylock	4
12	13676	Screw-3/8"-16 X 1 3/4" SHC 1 1/4" Threaded Length ZN PL	3
13	14786	Lock Washer, 3/8" High Collar SS	3
14	13597A	Pulley, Motor	1
15	13455	Belt Tensioner Assembly	2
16	12540	Screw- 5/16"-18 x 1 1/4" SHC Fully Threaded SS	12
17	12542	Lock Washer, 5/16" SS	12
18	12543	Washer, 5/16" SS	12
19	13507	Standoff Assembly	4
20	12538	Screw- 5/8"-11 x 1 1/2" HHC Fully Threaded ZN PL (40Hp & 50HP Only)	4
21	12539	Lock Washer, 5/8" ZN PL (40Hp & 50HP Only)	4
22	12573	Washer, 5/8" ZN PL (40Hp & 50HP Only)	4
23	10454	Screw- 5/16"-18 x 1" SHC Fully Threaded SS	6
24	12601	Screw-1/2"-13 x 2" HHC 2" LG, Partially Threaded ZN PL (40Hp & 50HP Only)	4
24-a	12654	Screw- M12 x 40mm HHC Fully Threaded ZN PL (IEC 160 B14 Face ONLY)	4
25	12364	Lock Washer, 1/2" ZN PL	8
25-a	12771	Lock Washer, M12 ZN PL (IEC 160 B14 Face ONLY)	4
26	10263	Washer, 1/2" ZN PL	8
26-a	12770	Washer, M12 ZN PL (IEC 160 B14 Face ONLY)	4
27	13476	Screw-5/16"-18 x 1 3/4" SHC 1 1/8" Threaded Length SS	8
28	11415	Bushing Kit (25Hp & 30HP Only)	1
28-a	12652	Bushing Kit (IEC 160 B14 Face ONLY)	1
28-b	12495	Bushing Kit (40Hp & 50HP Only)	1
29	15137	Vibration Isolators	4
29-a	12548	Vibration Isolators (IEC 160 B14 Face ONLY)	4
30		Feed-Thru Assembly, Water-Cooled	4
31	10338	Spacer (IEC 160 B14 Face ONLY)	1

6.4 Motor Reference

6.4.1 Nema Motor Specifications

Baldor Motor Specifications

HP	Part No.	Weight	Hertz (Standard)	Voltage (Standard)	Full Load Amps	RPM
25 hp (18 kW)	13894	323 lbs (146 kg)	60	208-230 / 460	61-57/28.5	3500
30 hp (22 kW)	13902	363.5 lbs (165kg)	60	230 / 460	66 / 33	3500
40 hp (30 kW)	12505	515 lbs (233 kg)	60	230 / 460	92 / 46	3500
50 hp (37 kW)	13903	591 lbs (268 kg)	60	230 / 460	112 / 56	3500

IEC Motor Specifications

HP	Part No.	Weight	Hertz (Standard)	Voltage (Standard)	Full Load Amps	RPM
25 hp (18 kW)	14870	309 lbs (140 kg)	50	400 / 690	33.3 / 19.3	2950

All standard Sonic supplied motors are equipped with C-face, foot mounted, and are for 3 phase power only. Special motors are available from Sonic Air Systems and are not included in the above table.

7 Periodic Maintenance

7.1 Maintenance Schedule

Sonic 200 series blowers are designed for 24 hour / 365 day operation with periodic service and / or replacement of the belts and filters.

The following inspection and service intervals are listed as hours of operation or elapsed time from blower installation, whichever comes first. It is always preferable to perform maintenance earlier than recommended, especially in hot, cold, wet, dirty, or otherwise hostile environments.

Inspection or Task	Frequency
Inspect belt for wear	3 Months / 1,000 Hours
Replace belt	12 Months / 4,000 Hours
Inspect belt tensioner	3 Months / 1,000 Hours

Replace belt tensioner	3 Years / 12,000 Hours
Inspect filter / Replace or Clean filter element	Monthly
Inspect motor and grease bearings	12 Months / 4,000 Hours
Replace motor	5 Years / 20,000 Hours
Bearing cartridge bearings	Sealed – No Service Required
Replace bearing cartridge	4 Years / 16,000 Hours
Inspect blower and motor pulley	3 Months / 1,000 Hours
Inspect hardware torque	12 Months / 4,000 Hours

7.2 Torque Specifications

Bolt Description	Recommended Torque Value
1/4-20 SHCS	12 ft-lbs (16 N-m)
5/16-18 HHS or SHCS	25 ft-lbs (34 N-m)
5/16-24 HHS or SHCS	20 ft-lbs (27 N-m)
3/8-16 HHS or SHCS	30 ft-lbs (41 N-m)
1/2-13 HHS	45 ft-lbs (61 N-m)
5/8-11 HHS	60 ft-lbs (81 N-m)

7.3 Belt Replacement Procedure

7.3.1 Tools Required

Description	Qty.	Description	Qty.
9/16 inch box end wrench	1	½ inch box-end wrench	1
Rubber mallet (optional)	1		

7.3.2 Belt Replacement Procedure

1. Remove the belt guard using the ½ inch box-end wrench. (See Figure 23)
2. Using the 9/16 inch box-end wrench, rotate the belt tensioner arm counter clockwise (CCW) and remove the belt.
3. Clean any belt debris or dust from blower and pulleys. Do not use any abrasive materials on the pulley grooves as this will damage the grooves and cause subsequent belt failures.
4. Using the 9/16 inch box-end wrench, rotate the belt tensioner counter clockwise (CCW). At the same time wrap the belt around the blower pulley, then along the right side of the idler pulley, and finally around the motor pulley. (See Figure 24)
5. Slowly rotate the motor pulley to make sure the belt is seated in the grooves.
6. Verify that the belt gap is approximately ¾ inch ±1/16 inch (Factory Set). (See Figure 25)
7. If a ¾ inch belt gap was not achieved, use a ½ inch box-end wrench to loosen the blower head screws and slide the head. (See Figure 26)(See Section 7.2 - Torque Specifications)
8. Using the ½ box-end wrench, reinstall the belt guard.

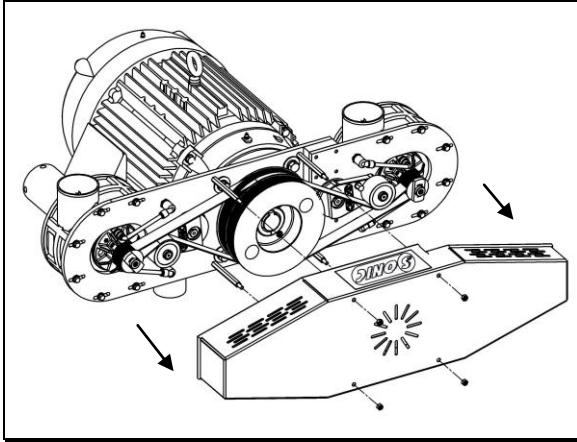


Figure 23 - Remove Belt Guard

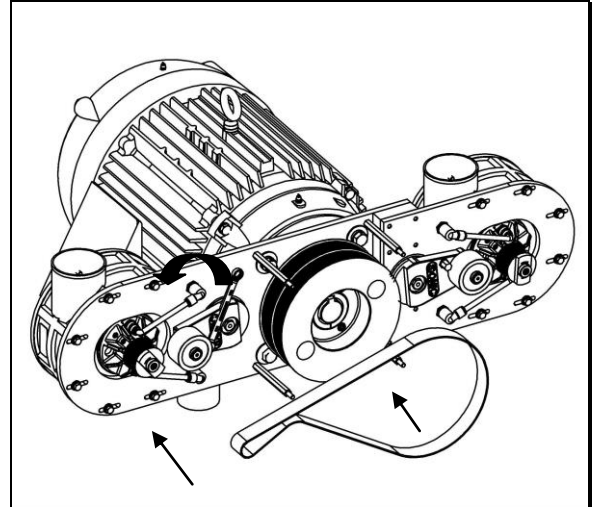


Figure 24 - Install New Belt

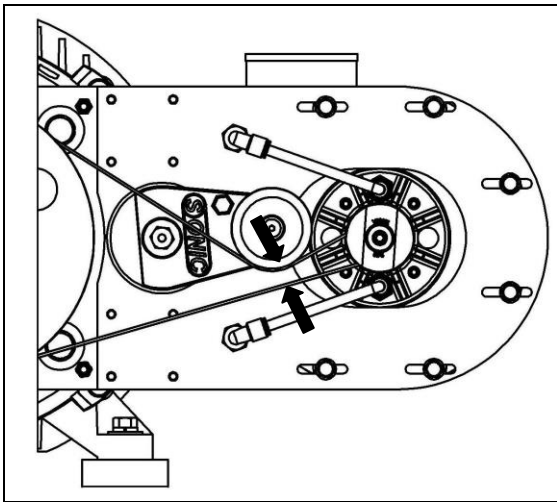


Figure 25 - Set Belt Gap to $\frac{3}{4}$ inch

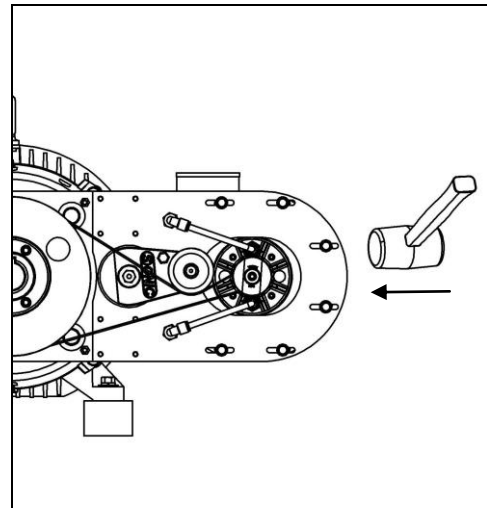


Figure 26 - Adjust Gap

7.4 Belt Tensioner Service

7.4.1 Tools Required

Description	Qty.
1/2 inch box-end wrench	1
9/16 inch box end wrench	1

Description	Qty.
3/16 inch allen wrench	1
Rubber mallet (optional)	1

7.4.2 Belt Tensioner Service Procedure

1. Remove the belt guard using the 1/2 inch box-end wrench. (See Figure 27)
2. Using the 9/16 inch box-end wrench, rotate the belt tensioner arm counter clockwise (CCW) and remove the belt. (See Figure 28)
3. Using the 3/16 inch allen wrench, secure the flat head screw from the back of the bracket while loosening the nylon-insert locknut with a 1/2 inch socket. This will allow the removal of the belt tensioner.
4. **Caution:** After removing belt tensioner, the compression springs will be exposed. Remove these springs temporarily if the new belt tensioner is not installed immediately. Wear safety glasses to prevent potential eye injury.
5. At reassembly, the static position should be approximately 25 degrees to the right of blower pulley. Install a new nylon-insert locknut to 20 ft-lbs when installing the new belt tensioner.
6. Using the 9/16 inch box-end wrench, rotate the belt tensioner arm counter clockwise (CCW). At the same time wrap the belt around the blower pulley, then along the right side of the idler pulley, and finally around the motor pulley.
7. Slowly rotate the motor pulley to make sure the belt is seated in the grooves.
8. Verify that the belt gap is approximately 3/4 inch $\pm$ 1/16 inch (Factory Set). (See Figure 29)
9. If a 3/4 inch belt gap was not achieved, use a 1/2 inch box-end wrench to loosen the blower head screws and slide the head. (See Figure 30)
10. Using the 1/2 inch box-end wrench, reinstall the belt guard.

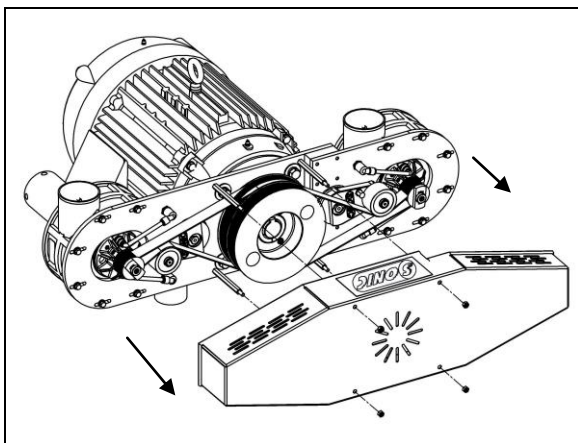


Figure 27 - Remove Belt Guard

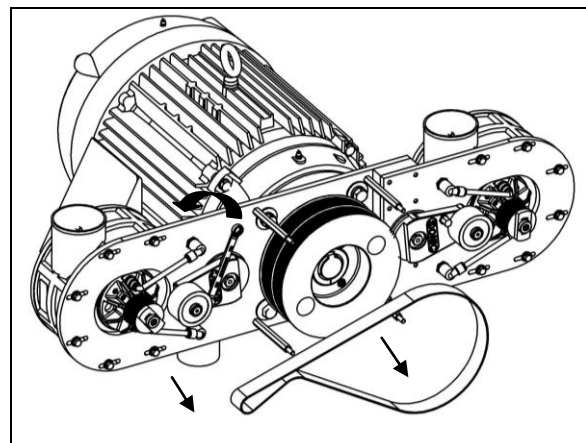


Figure 28 – Remove Belt

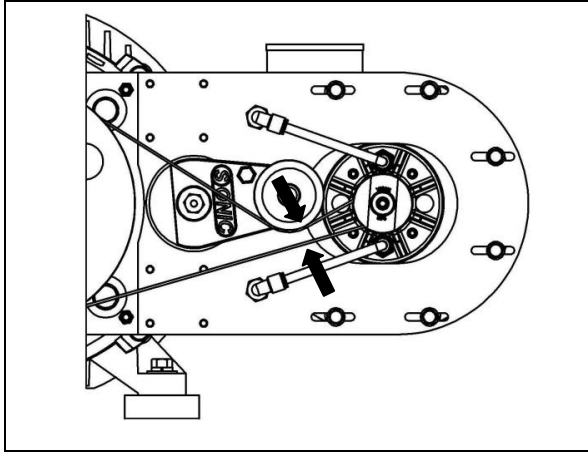


Figure 29 – Verify Belt Gap

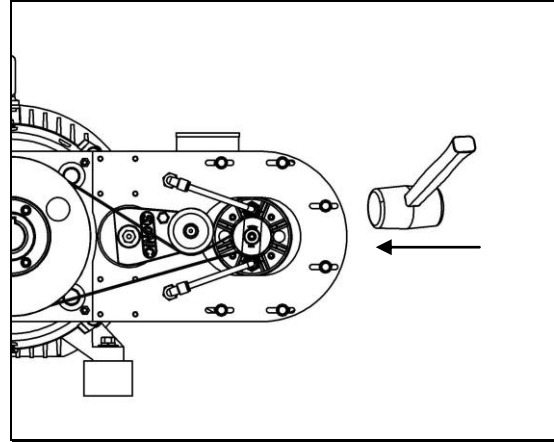
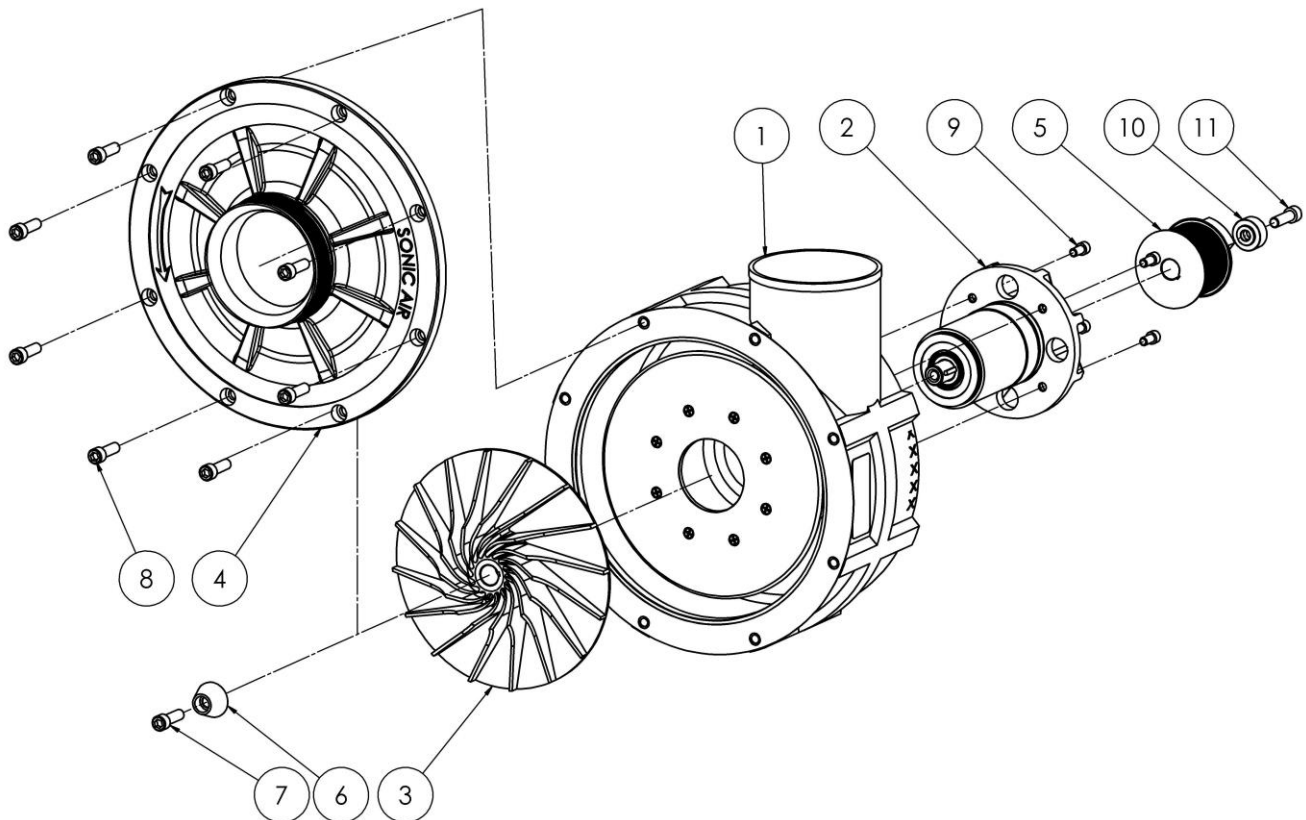


Figure 30 – Adjust Belt Gap

7.5 Bearing Cartridge Replacement Procedure

7.5.1 Assembly Drawing



7.5.2 Bearing Cartridge Assembly Parts List

Item No.	Part No.	Description	Qty.
1		Housing-Blower Head	1
	14450	Housing-Sonic 100 BC	
	13994	Housing-Sonic 100C BC	
2	14453	Spindle-Sonic 100/150 Series Bearing Cartridge	1
	16222	Spindle-Sonic 100/150C Series Bearing Cartridge	
3	10015	Impeller-Sonic 70/100 Series	1
4	10447	Cover-Sonic 150	1
5	13450-%%%	Pulley-Blower 16G	1
6	10766	Retainer-Impeller	1
7 & 11	10769	Screw-5/16-24 x 1.0 lg., SHCS SS	1
8	10454	Screw-5/16-18 x 1.0 lg., SHCS	8
9	13759	Screw-1/4-20 x 1/2 lg., SHCS SS	4
10	15018	Retainer – Blower Pulley	1

7.6 Required Tools

Description	Qty.	Description	Qty.
3/16 inch allen wrench	1	Flat Head Screwdriver (optional)	1
9/16 inch box end wrench	1	1 1/8 open end wrench	1
1/2 inch socket	1	1/4 inch allen wrench	1
3/8 inch ratchet driver	1	5/16 inch nut driver	1
1/2 inch open end wrench	1	1/2 inch deep socket	1

7.7 Bearing Cartridge Replacement Procedure

1. Remove the belt guard using the 1/2 inch socket. (See Figure 31)
2. Using the 9/16 inch box-end wrench, rotate the belt tensioner arm counter clockwise (CCW) and remove the belt. (See Figure 33)
3. Disconnect the water-cooling lines at the quick disconnect on the blower head. (If Applicable)(See Figure 35)
4. Remove the filter or inlet screen using a flat head screwdriver or a 5/16 inch nut driver. (See Figure 32)
5. Remove cover using a 1/4 allen wrench for a Sonic 100/150 or 100/150C Series Blower. (See Figure 34)
6. Remove impeller using a 11/8 inch open end wrench and a 1/4 inch allen wrench. (See Figure 36)
7. Remove blower pulley using a 1 1/8 inch open end wrench and a 3/16 inch allen wrench. (See Figure 37 - Remove Blower Pulley)
8. Remove thermocouple using a 1/2 inch open end wrench. (See Figure 39)
9. Remove compression fitting using a 1/2 inch deep socket. (See Figure 40.)
10. Remove bearing cartridge using a 3/16 inch allen wrench. (See Figure 38 - Remove Bearing Cartridge Hardware, Figure 40 - Remove Bearing Cartridge, and Figure 42 - Blower w/ Bearing Cartridge Removed)

11. Install new bearing cartridge by reversing previous steps.

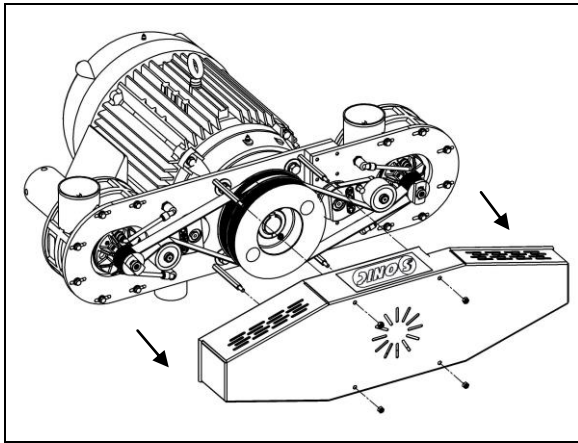


Figure 31 - Remove Belt Guard

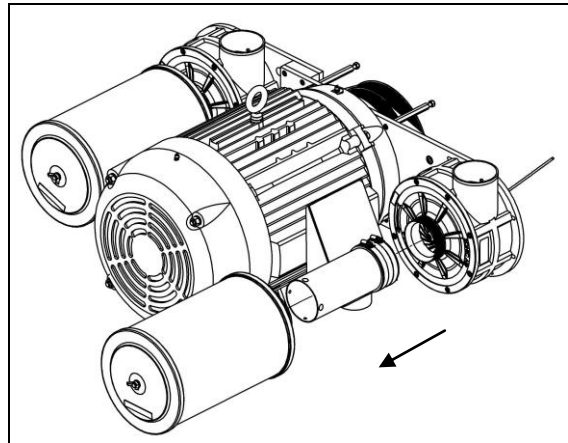


Figure 32 – Remove Filter or Inlet Screen

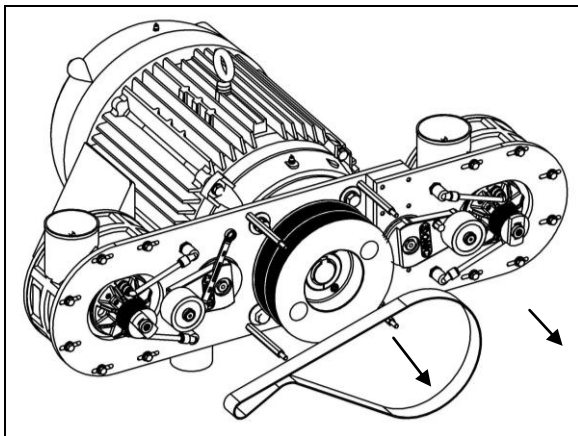


Figure 33 - Remove Belt

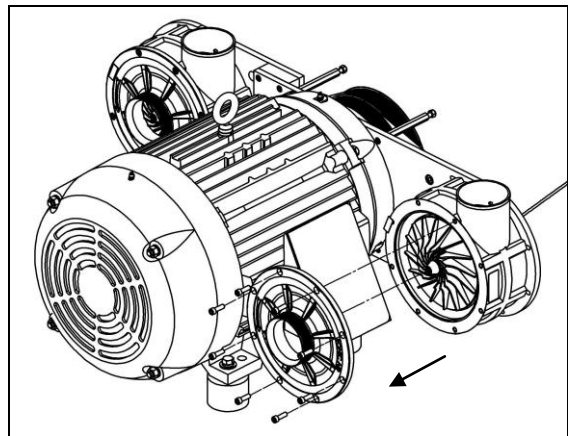


Figure 34 – Remove Cover

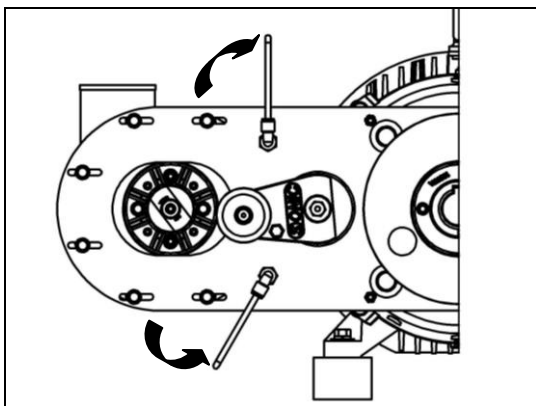


Figure 35 – Remove Water Cooling Tubing

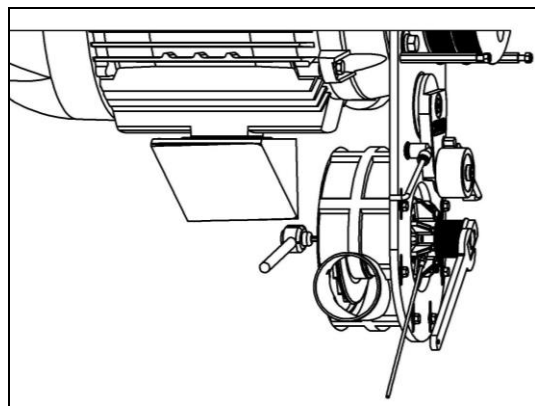


Figure 36 – Remove Impeller

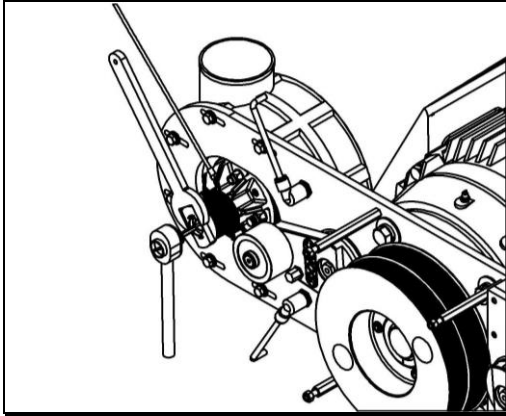


Figure 37 - Remove Blower Pulley

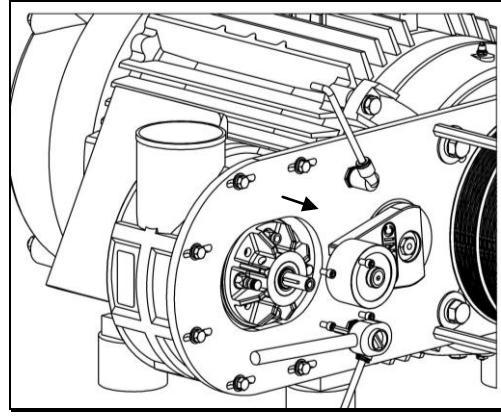


Figure 38 - Remove Bearing Cartridge Hardware

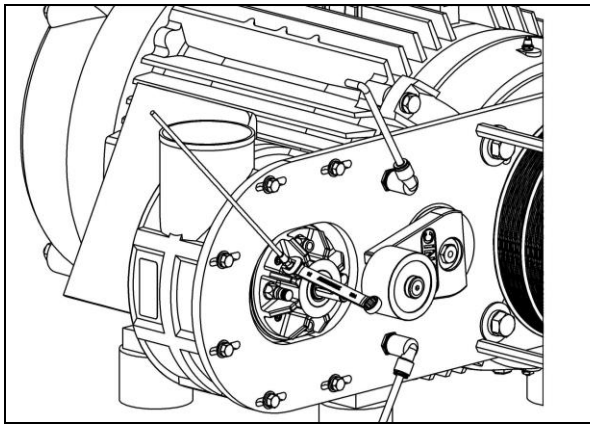


Figure 39 - Remove Thermocouple

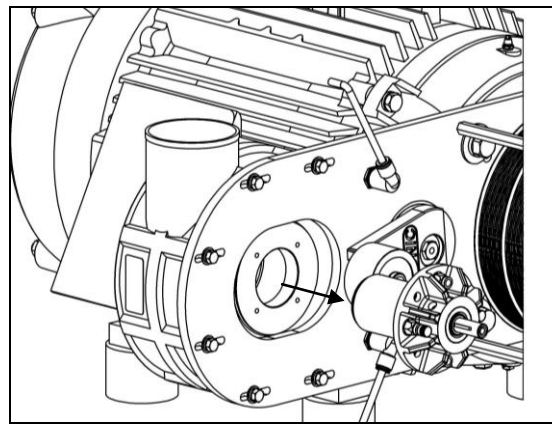


Figure 40 - Remove Bearing Cartridge

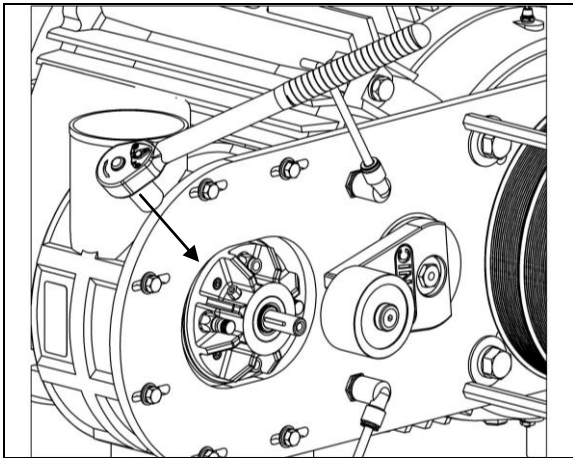


Figure 41 - Remove Compression Fitting

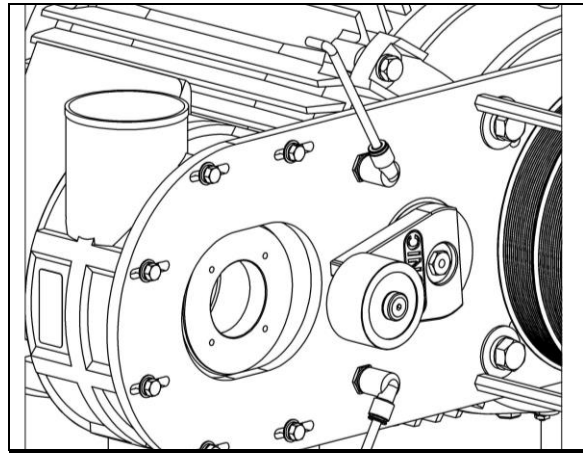


Figure 42 - Blower w/ Bearing Cartridge Removed

7.8 Recommended Spares

Although the Sonic 200 blowers are designed for many years of continued operation, a number of components are wear or consumable items and must be replaced periodically. The following is a list of recommended spare components that should be used to minimize equipment or line down time:

Part No.	Description	Recommended Qty.
14453	Spindle – Sonic 100/150 Series	1
16222	Spindle – Sonic 100/150C Series	1
13450-%%%	Pulley, Blower (16 Groove) (%%% Pulley Diameter, 1.55 to 2.20)	1
13597	Pulley, Motor (16 Groove)	1
13451	Belt, 52" Lg., 16 Groove	2
13455	Belt Tensioner Replacement Kit	1
10316	Filter Element, Paper (Optional)	2
10317	Filter Element, Polyester (Optional)	2
See Section 7	Motor	1

8 Retro Kit Installation (Assemble Sonic Drive to existing motor)

8.1 Tools Required

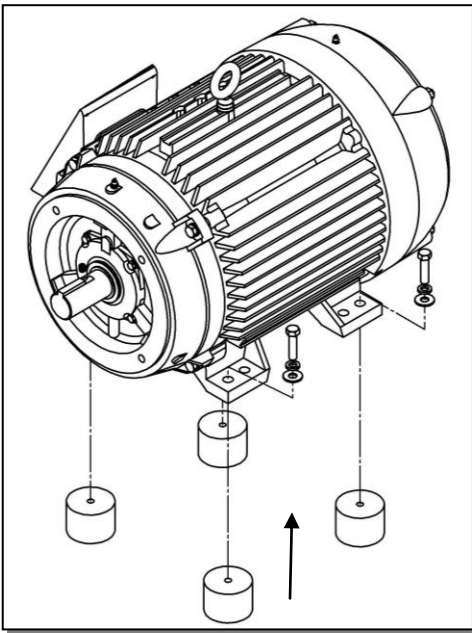
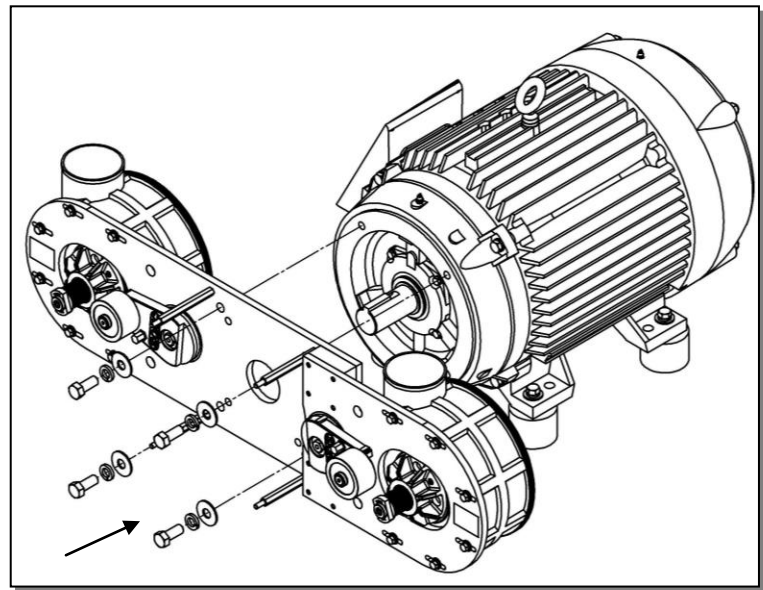
Description	Qty.
3/8 inch ratchet driver	1
¾ inch deep socket	1
9/16 inch open-end wrench	1
5/16 inch allen socket	1
Caliper	1
242 Loctite	1

Description	Qty.
1/2 inch socket	1
¼ inch flat head screwdriver	1
Rubber mallet	1
24 inch Straight edge	1
7/32 inch allen wrench	1
#3 Drive Extension	1

8.2 Retro Kit Installation

- Using a 3/4 inch open-end wrench, mount the vibration isolators and uni-mounts to the motor. (See Figure 43)
- Mount the bracket assembly to the motor and then tighten screws using the ¾ inch socket (See Figure 44)
- Using a flat head screwdriver and a rubber mallet, wedge the screwdriver into the front face of the bushing (Do not wedge in flange area) and then slide it onto the motor shaft. (See Figure 45)
- Set the bushing to $1.330 \pm .005$ (33.7 mm) from the bushing flange to the bracket reference surface and remove the screwdriver. Using the 5/16 inch allen socket and 242 Loctite, install the two bushing screws. Tighten the screws to the

- specified torque, over tightening may damage the bushing. (See Figure 46, Figure 47, Figure 48, and Figure 49)(See Section 7.1 - Torque Specifications)
5. Tighten the bushing set screw using 242 Loctite and the 7/32 inch allen wrench.
 6. Before installing the motor pulley, double check the bushing setting and then install the pulley and the three pulley screws and lock washers using the 5/16 inch allen socket. Tighten the three pulley screws to the required torque specifications. (See Figure 50)(See Section 7.1 - Torque Specifications)
 7. Using a straight edge, check the pulley alignment from the face of the motor pulley to the face on the blower pulley. Verify that there is no gap and the alignment must be within $\pm 1/32$ inch. (See Figure 53)
 8. Using the 9/16 inch box-end wrench, rotate the belt tensioner arm counter clockwise (CCW). At the same time wrap the belt around the blower pulley, then along the right side of the idler pulley, and finally around the motor pulley. Repeat process for the second belt. (See Figure 51)
 9. Slowly rotate the motor pulley to make sure the belts is seated in the grooves.
 10. Using the rubber mallet, adjust the belt gap to $\frac{3}{4}$ inch $\pm 1/16$ inch. (See Figure 52)
 11. Using the 1/2 inch deep socket, tighten the bracket hardware. (See Section 7.1 - Torque Specifications)
 12. Install the belt guard, secure with (4) locknuts.
 13. Refer to Section 5.1 for Startup.

**Figure 43 - Installed Uni-mount****Figure 44 - Mount Bracket to Motor**

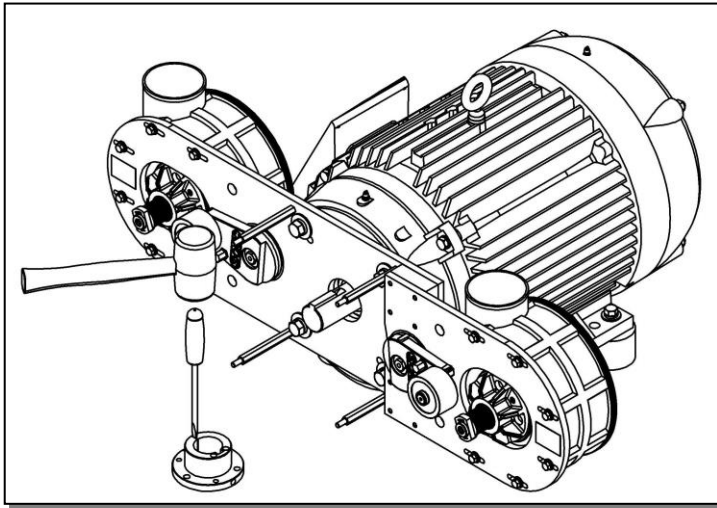


Figure 45-Prepare Bushing

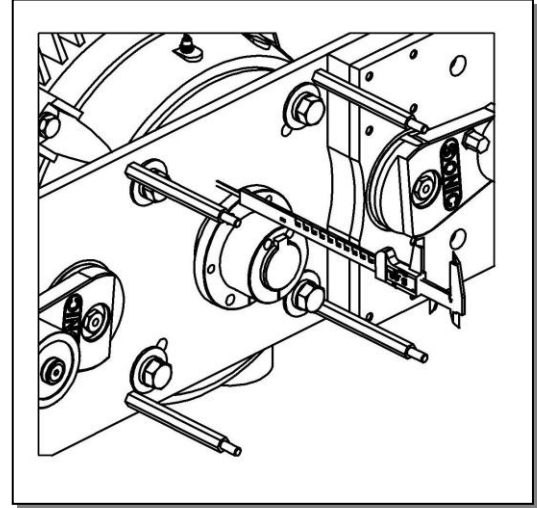


Figure 46-Installed Bushing

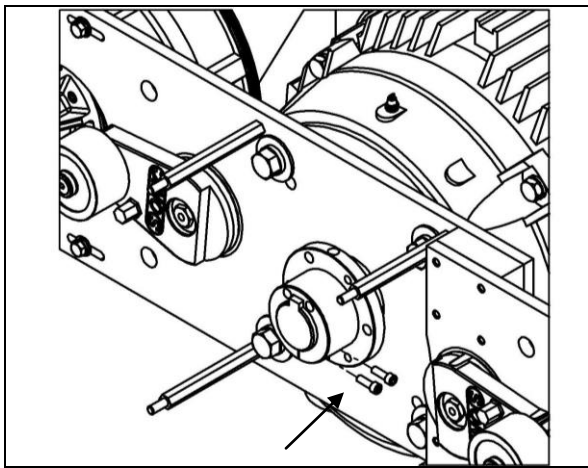


Figure 47-Install Bushing Hardware

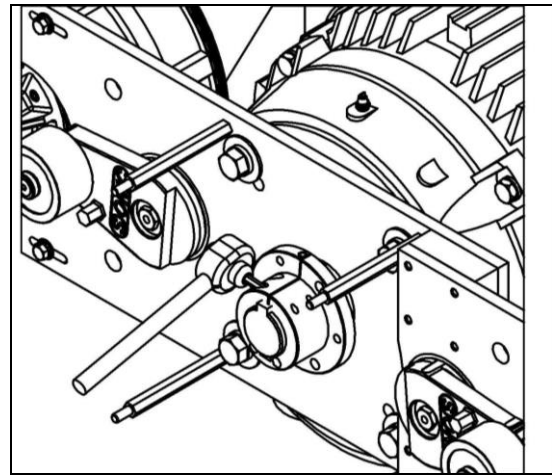


Figure 48-Bushing Installation

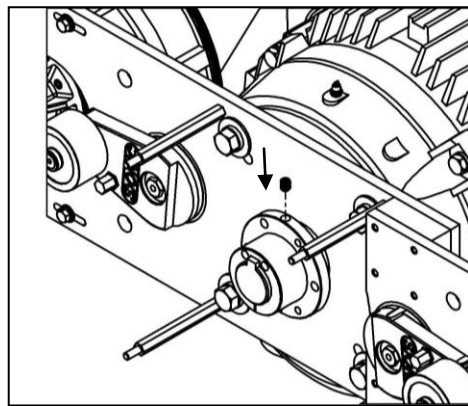


Figure 49-Installed Set Screw

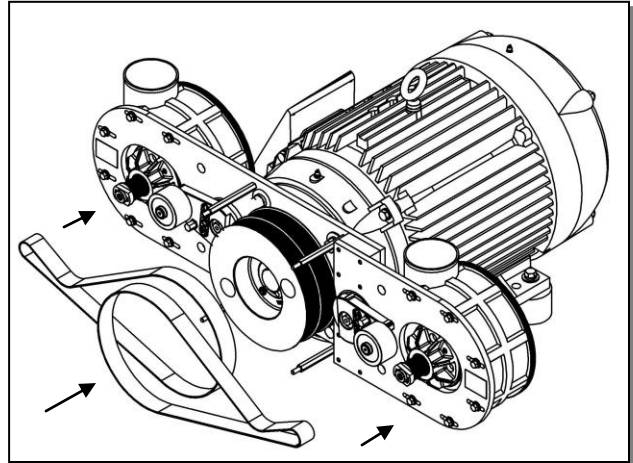
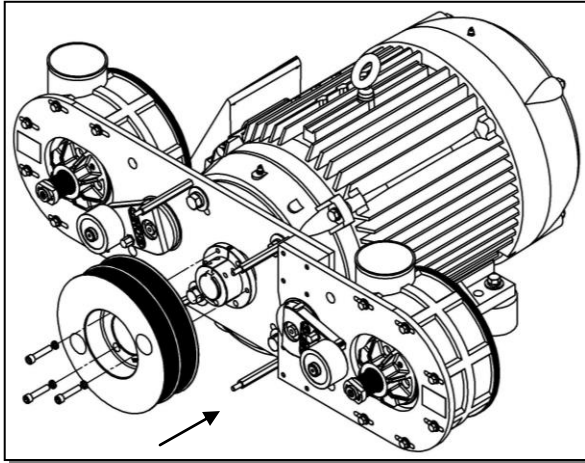


Figure 50-Installed Motor Pulley

Figure 51-Installed Belt

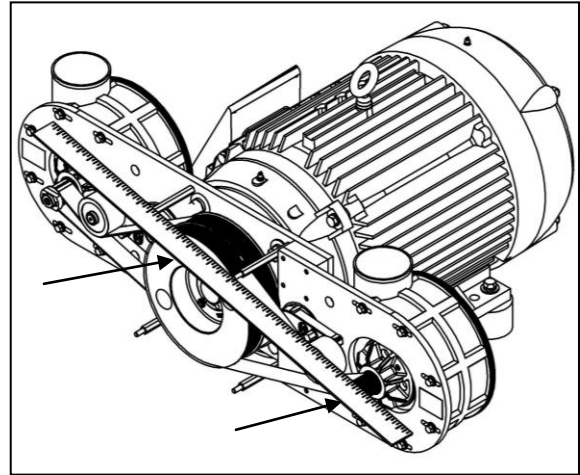
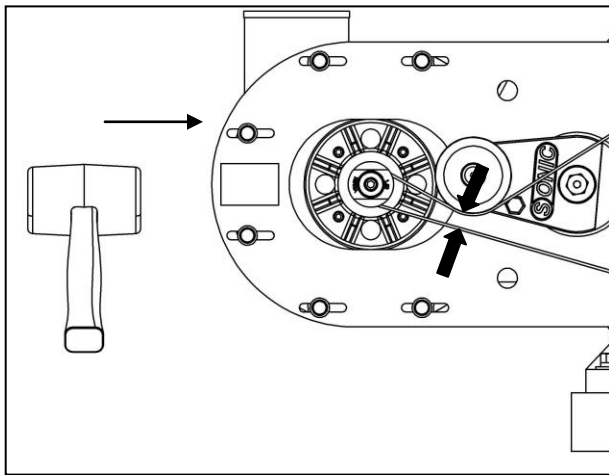


Figure 52-Set Belt Gap to $\frac{3}{4}$ "

Figure 53-Check Alignment

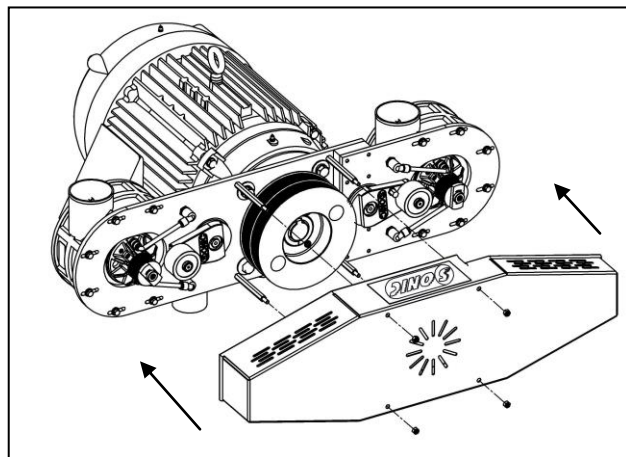


Figure 54-Install Belt Guard

9 Troubleshooting

Trouble	Cause	Remedy	Section
Low Flow / Pressure / Vacuum	• Blower rotating backwards (Incorrect wiring)	• Reverse motor wiring	5
	• Dirty or contaminated filter	• Clean or replace filter element	7.1
	• Air leaks in the system	• Fix leaks	4
	• Drive belt slipping (Contaminated or damaged)	• Replace belt	4.3, 7.3
		• Replace pulleys	7.1
		• Clean pulleys	7.1
	• Worn pulley	• Replace worn pulleys	7.1
	• Wrong pulley size	• Contact Sonic	Cover
Frequent Drive Belt Failure	• Wrong drive belt (Not Sonic approved)	• Use only Sonic supplied belts	4.3, 7.3
	• Incorrect piping design (Too small)	• Increase piping diameter	4 Cover
		• Contact Sonic for design assistance	
	• Improper blower size for application	• Contact Sonic for design assistance	Cover
	• Blower rotating backwards (Incorrect wiring)	• Reverse motor wiring	5
	• Motor pulley wobbling	• Replace motor	5, 7.1
		• Replace motor bushing	7.1
		• Replace motor pulley	7.1
	• Frequent start / stops without soft start controller	• Install soft start motor controller	5
		• Install diverter valve and run continuously	5
	• Motor pulley out of alignment	• Realign motor pulley	7.1
		• Replace mounting bracket if damaged	7.1
	• Pulley grooves worn	• Replace pulley	7.1
	• Hostile environment (belts contaminated)	• Locate blower in safe location	4.2
Electrical Overloading		• Purchase Sonic blower enclosure	4.2
	• Wrong belts (Not Sonic approved)	• Use only Sonic supplied belts	4.3, 7.3
	• Incorrect belt installation method	• Properly install belts	4.3, 7.3
	• Worn belt tensioner	• Replace belt tensioner	7.1
Thermocouple Alarm (Optional)	• Liquid entering blower inlet (impeller stall)	• Locate blower in safe location	4
		• Install inline filters	4
	• Exceeding rated CFM	• Contact Sonic	Cover
	• Blower RPM too high (Blower pulley too small)	• Contact Sonic	Cover
	• Motor has winding or bearing damage	• Replace motor	5
	• Electrical supply problems	• Replace drive controller	5
	• High inlet temperature	• Purchase water cooled blower	4.2.8
		• Reduce inlet temperature	4.2.8
Irregular / Excessive Noise	• Dirty air filter	• Clean or replace filter element	7.1
	• High ambient temperature	• Purchase water cooled blower	4.2.8
	• Water cooling low flow	• Increase flow rate	4.2.8
		• Decrease water temperature	4.2.8
	• Blower speed too high	• Contact Sonic	Cover
	• Broken belt (low temp)	• Replace belt	4.3, 7.3
	• Blockage in air line	• Inspect plumbing and remove blockage	4
	• Leak in air line	• Repair leak	4
Belt Jumping Off	• Inlet silencer damaged	• Replace filter / silencer	7.1
	• Worn drive belt	• Replace belt	4.3, 7.3
	• Bolts loose on blower / motor assembly	• Tighten bolts to proper torque specifications	7.2
	• Motor mounts loose	• Tighten bolts to proper torque specifications	7.2
	• Blower RPM too high	• Contact Sonic	Cover
	• Blower is receiving vibration from nearby equipment	• Install vibration isolators	4.2.7
		• Relocate blower assembly	4.2
	• ¾ inch gap not set	• Adjust belt gap to ¾"	4.3, 7.3
	• Pulleys misaligned	• Realign motor pulley	7.1
		• Replace mounting bracket if damaged	7.1
	• Blower pulley wobbling	• Replace motor	5
		• Replace motor bushing	7.1
		• Replace motor pulley	7.1
	• High motor torque	• Replace motor with low torque equivalent	5
	• Blower rotating backwards (Incorrect wiring)	• Reverse motor wiring	5
	• Belt not set in grooves properly	• Install belt correctly	4.3, 7.3
	• Wrong belt (Not Sonic approved)	• Install Sonic supplied belt	4.3, 7.3

10 Performance Guarantee

Sonic Air Systems, Inc. (SAS) guarantees that each SAS supplied system will meet or exceed the designed level of performance. In the event the system does not achieve the designed performance, SAS will provide additional resources and equipment at no cost or refund 100% of the original purchase price.

- SAS must have quoted the system and supplied the system as quoted
- Buyer pays the original invoice within terms
- Buyer submits notification of system deficiency within 45 days of the original invoice date and allows SAS to remedy the deficiency
- Buyer must obtain written return authorization from SAS for any returns
- Buyer will return the system complete and in like new condition



11 Warranty Policy

Sonic Air Systems, Inc. (SAS) and its employees are proud of our products and are committed to providing our customers with quality, engineered products.

Scope of Warranty: All SAS designed products are warranted against defects in SAS design, workmanship and materials.

Warranty Period:

- Blower motor units are warranted for 18 months commencing on the invoice date from SAS
- Retro-kits and blower heads are warranted for 12 months commencing on the invoice date from SAS
- Repaired blower heads are warranted for 6 months commencing on the invoice date from SAS
- Accessories are warranted for 24 months commencing on the invoice date from SAS

Repairs Within the Scope of the Warranty: If a SAS designed product is defective and the defect occurs during the warranty period, SAS will either repair or replace, whichever SAS believes to be appropriate under the circumstances. SAS is not responsible for removal or reinstallation of product or any incidental or consequential damages resulting from the defect, removal, reinstallation, shipment, or otherwise.

Repairs Outside the Scope of the Warranty: Problems with SAS products can be due to faulty installation, misapplication, inadequate maintenance, non-SAS additions or modifications, or other problems not due to defects in SAS design, workmanship or materials. If SAS determines the warranty consideration is not due to defects in SAS design, workmanship or materials, the buyer will be responsible for the cost of any necessary repairs.

Procedure to Receive Warranty Service:

- Buyer obtains a written return authorization number from SAS
- The authorization number must be noted on the outside of the shipping container
- Buyer will ship F.O.B. destination freight prepaid to SAS factory
- Non-compliance to any of the above procedures, damage resulting from improper packaging, or product exposed to a hazardous substance may result in SAS refusing shipment
- International buyer, please contact SAS for the nearest authorized warranty center

Warranty exclusions:

- Motors shall be warranted under the respective manufacturer's policy
- Product with a tampered warranty seal
- Damage from fire, flood, theft, or vandalism
- Applications not approved by SAS which includes but not limited to product exposed to toxic, flammable, corrosive or other hazardous substance
- Damage resulting from installation or operational error
- Damage resulting from transportation carrier
- Belts, filter elements, or other similar service items
- Blower heads not repaired by factory authorized personnel

No Other Warranties and Liability Limitation:

THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES WHETHER WRITTEN, ORAL OR IMPLIED. SAS' LIABILITY IN ALL CASES WILL BE LIMITED TO THE REPLACEMENT PRICE OF ITS PRODUCT. AT NO TIME SHALL SAS BE LIABLE FOR ANY COSTS TO THE BUYER FOR LABOR, TRANSPORTATION OR DOWNTIME RESULTING FROM EQUIPMENT FAILURES BY SAS OR OUR SUPPLIERS.

12 24/7/365 Service Program

Sonic Air Systems, Inc. (SAS) provides emergency product and shipping service, 24 hours a day, 7 days a week, 365 days a year, to all customers, worldwide. Shipments are made by Federal Express, UPS or UPS' Sonic Air Service or product may be picked up will-call at the SAS facility in Brea, CA USA. Simply call us at (714) 870-2700 during normal business hours or 7:30am to 4:30pm (Pacific Standard Time) for your immediate service needs. After hours number is (714) 473-3694.

- SAS charges Sonic list price to the buyer
- Distributor discounts and commissions are ineligible on this program
- All costs will be charged to the buyer's credit card (Master Card, Visa, or American Express, only) or to their previously established SAS credit line that is currently in good standing
- Payments made in US dollars only
- The cost for UPS' SonicAir Service is approximately \$500.00 for a 25 pound package for next flight delivery within the USA
- International shipments will take additional time due to import regulations within the country of destination
- UPS' SonicAir Service will attempt to have the product(s) clear international customs and import procedures, however, UPS cannot guarantee governmental acceptance
- SAS return authorization procedures and policies apply

13 Sonic Repair Policy

Sonic blower heads are high-speed close tolerance machined components. The Sonic 100 blower head is rated for a 20,000 RPM maximum impeller speed. Sonic uses only the best internal components for the blower head assembly and is confident that the head will perform exceptionally in the application it was designed to perform. As with all moving components, the blower head is subject to wear and eventually will fail. Periodic maintenance and inspections will ensure the longest possible life expectancy for the blower head. The most typical mode of failure will be from the shaft bearings and with periodic inspections; this failure can be predicted to some extent. Sonic can also provide a thermocouple option to monitor the temperature of the bearing housing which is used to predict an imminent bearing failure.

Due to the complexity of the internal assembly, the precision components, and the experience of Sonic assembly and repair technicians; it is not recommended that the unit be serviced or repaired in the field. Any attempt to repair the unit within the warranty period will void the warranty. Sonic does offer a repair program in the event the blower fails outside of the warranty period and the blower head is not severely worn or damaged. Sonic recommends that in the event that a blower failure will cause interrupted production, a replacement blower head be purchased as a spare item.

Follow the below return authorization procedure when requesting a blower head repair:

Sonic Air Systems, Inc. (SAS) recognizes the need to return product in certain circumstances. SAS requests written return authorization to track incoming shipments and to efficiently process any repairs or credit invoices.

Repair Return Authorization Procedure

- Buyer issues a purchase order requesting and authorizing a blower head repair (reference purchase order requirements)
- A repair order number will be communicated by 4:30pm PST
- The blower head must include the blower pulley
- The repair order number must be noted on the outside of the shipping container
- Buyer will ship F.O.B. destination freight prepaid to SAS factory
- Non-compliance to any of the above procedures, damage resulting from improper packaging, or product exposed to a hazardous substance may result in SAS refusing shipment
- Repairs will be shipped within 24 hours of receipt in the USA and within 48 hours of receipt internationally