# Operation and Maintenance Manual
# SONIC 85 & SONIC 85C
## Centrifugal Blower with Motor




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# 1. SAFETY INSTRUCTIONS & WARNINGS

**ELECTRICAL** 

- Always use qualified electrical and mechanical personnel for installation and maintenance of Sonic air blowers.
- 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.
- 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. See section 7 for motor and electrical devices.

**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.

# 2. EQUIPMENT INSPECTION

After un-packing your Sonic Air Centrifugal Blower, make sure that all components listed on the packing slip are present. Check to see that the serial number on the blower housing matches the packing slip (**See Figure 2**). 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 you have any shortages, discrepancies, or shipping damage, please call your Sonic Distributor or Sonic Air Systems immediately.




**Figure 1 - Sonic Blower Label**

Writing down the original blower serial number makes any future parts and technical questions easier for Sonic to assist you with. Please use this number for any correspondence with the Sales / Customer Service Department at Sonic Air Systems.

| | |
|---|---|
| **Write 10 Digit Blower Serial Number (For future references)** | _ _ _ _ _ _ _T_ _ |

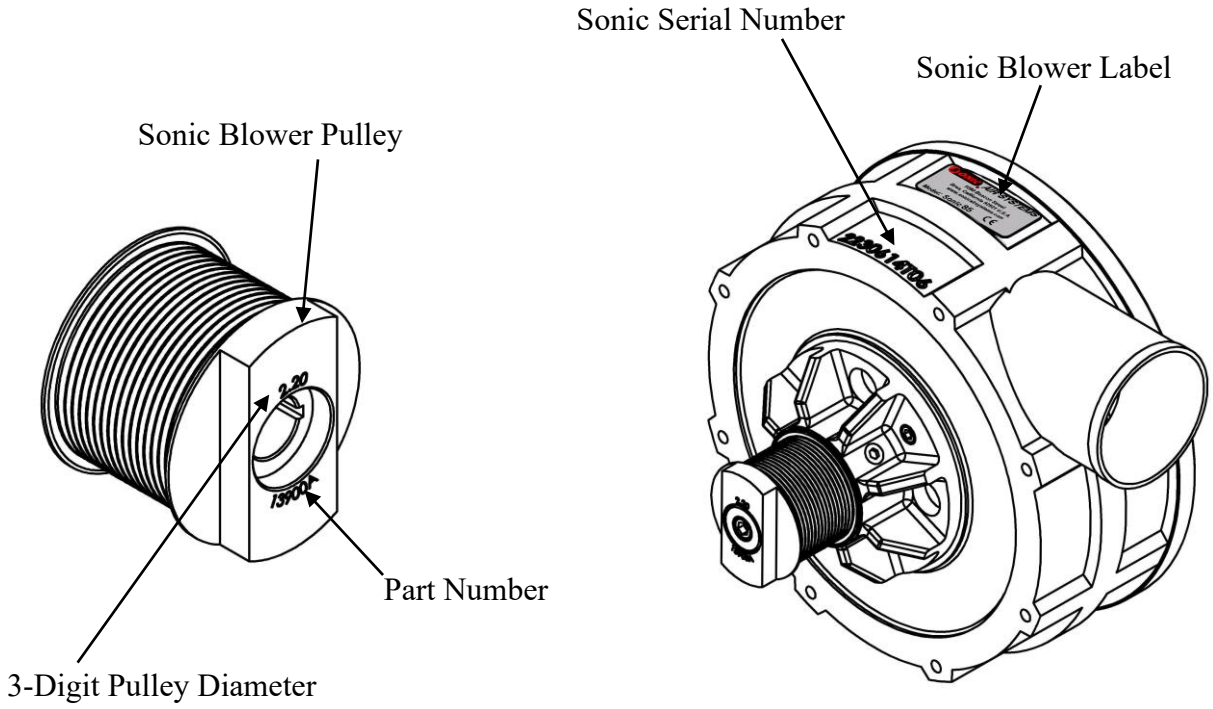



**Figure 2 – Blower Serial Number**

# 2.A BLOWER/MOTOR DIMENSIONS SHEET NEMA MOTOR




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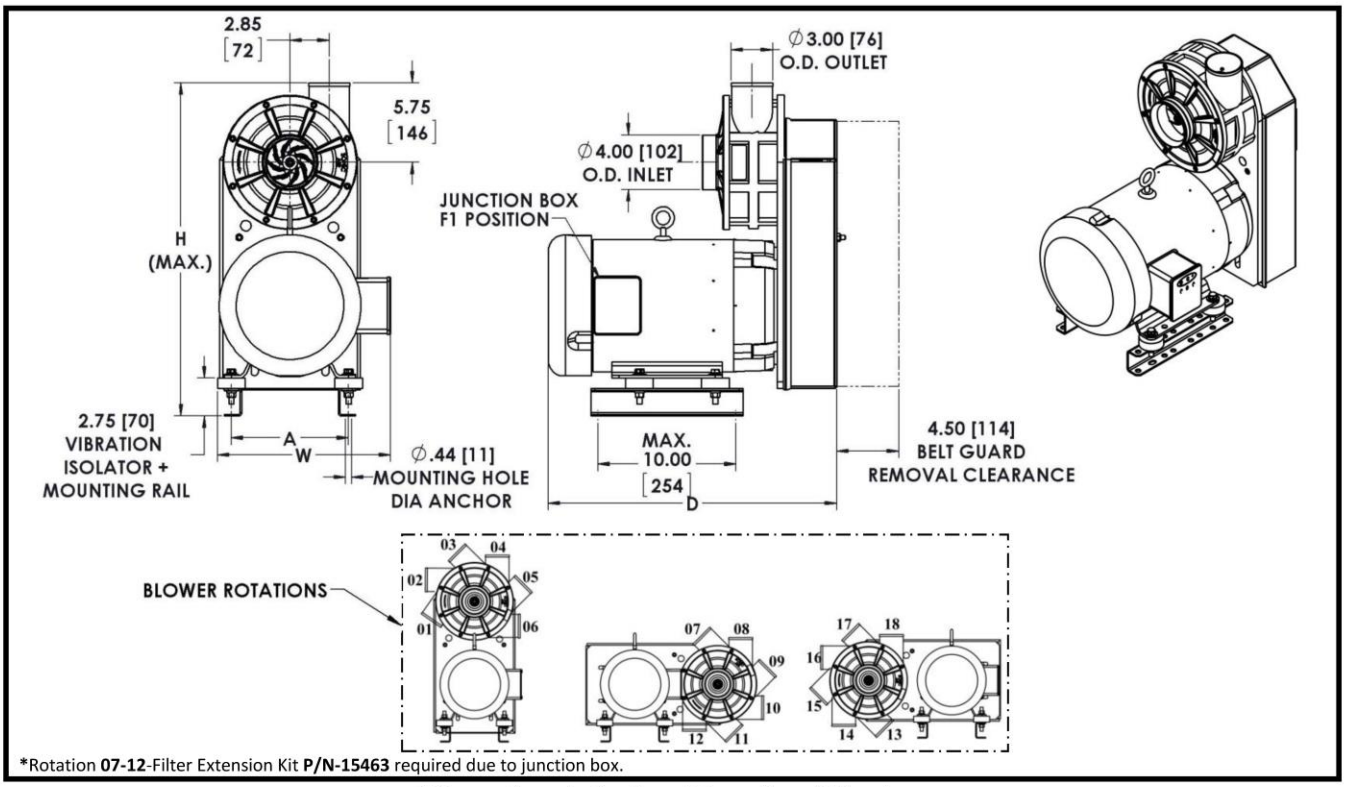
**Product Specification Sheet**

# SONIC 85

## CENTRIFUGAL BLOWER

### NEMA / BALDOR MOTORS

### 60 HZ, 230/460V TEFC, 3600 RPM




Dimensions in Inches, [ ] are in millimeters

| **Model / Description** | Sonic 85 / Air Cooled | | Sonic 85C / Water Cooled | |
|---|---|---|---|---|
| **Assembly Part Number** | Call Sonic | | Call Sonic | |
| **Output Flow Rate** | 85 cfm to 850 cfm (144 $m^3$/hr to 1,445 $m^3$/hr) | | 85 cfm to 850 cfm (144 $m^3$/hr to 1,445 $m^3$/hr) | |
| **Ambient Temperature** | 32°F to 105°F (0°C to 40°C) | | 32°F to 105°F (0°C to 40°C) | |
| **Inlet Air Temperature Range** | 32°F to 125°F (0°C to 52°C) | | 125°F to 400°F (52°C to 205°C) | |
| **Motors/ Frames** | 10 Hp/ 215 | 15 Hp/ 254 | 10 Hp/ 215 | 15 Hp/ 254 |
| **Width (W)** | 12.53 in [318mm] | 14.98 in [380mm] | 12.53 in [318mm] | 14.98 in [380mm] |
| **Depth (D)** | 20.87 in [530mm] | 24.06 in [611mm] | 20.87 in [530mm] | 24.06 in [611mm] |
| **Height (H)** | 25.19 in [640mm] | 26.38 in [670mm] | 25.19 in [640mm] | 26.38 in [670mm] |
| **Mounting Pattern (A)** | 8.50 in [216mm] | 10.0 in [254mm] | 8.50 in [216mm] | 10.0 in [254mm] |
| **Approximate Weight** | 184 lbs (83 Kg) | 280 lbs (127 Kg) | 184 lbs (83 Kg) | 280 lbs (127 Kg) |

# 2.B BLOWER/MOTOR DIMENSIONS SHEET IEC MOTOR



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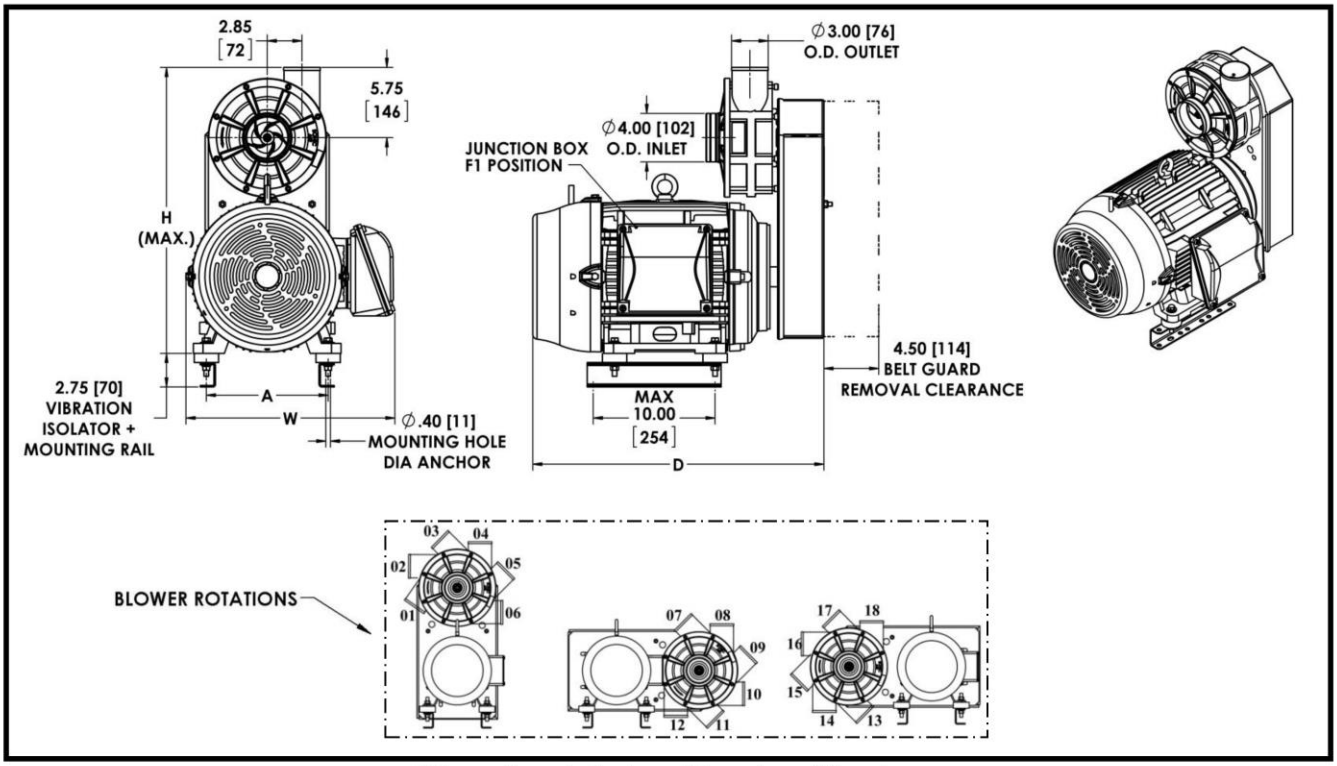
**Product Specification Sheet**

# SONIC 85

## CENTRIFUGAL BLOWER

### IEC / WEG MOTORS

### 50 HZ, 400/690V TEFC, 3000 RPM




Dimensions in Inches, [ ] are in millimeters

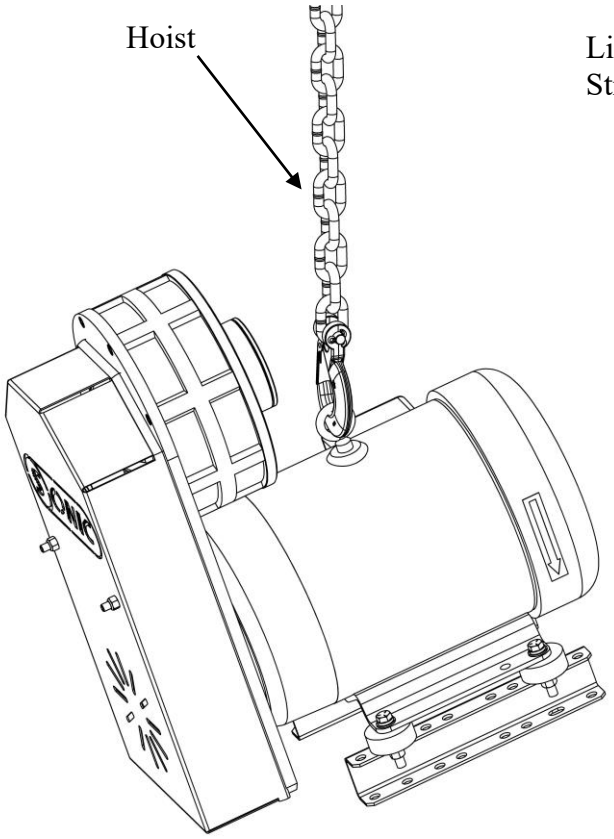
| **Model / Description** | Sonic 85 / Air Cooled | | Sonic 85C / Water Cooled | |
|---|---|---|---|---|
| **Assembly Part Number** | Call Sonic | | Call Sonic | |
| **Output Flow Rate** | 85 cfm to 850 cfm (144 $m^3$/hr to 1,445 $m^3$/hr) | | 85 cfm to 850 cfm (144 $m^3$/hr to 1,445 $m^3$/hr) | |
| **Ambient Temperature** | 32°F to 105°F (0°C to 40°C) | | 32°F to 105°F (0°C to 40°C) | |
| **Inlet Air Temperature Range** | 32°F to 125°F (0°C to 52°C) | | 125°F to 400°F (52°C to 205°C) | |
| **Motors / Frames** | 7.5 kW / 132 | 11 kW / 132 | 7.5 kW / 132 | 11 kW / 132 |
| **Width (W)** | 12.51 in [317mm] | 13.54 in [343mm] | 12.51 in [317mm] | 13.54 in [343mm] |
| **Depth (D)** | 20.57 in [522mm] | 20.57 in [522mm] | 20.57 in [522mm] | 20.57 in [522mm] |
| **Height (H)** | 24.13 in [613mm] | 26.13 in [664mm] | 24.13 in [613mm] | 26.13 in [664mm] |
| **Mounting Pattern (A)** | 8.50 in [216mm] | 8.50 in [216mm] | 8.50 in [216mm] | 8.50 in [216mm] |
| **Approximate Weight** | 223 lbs (101 Kg) | 258 lbs (117 Kg | 223 lbs (101 Kg) | 258 lbs (117 Kg) |

# 3. HANDLING & HOISTING

The following steps and procedures detail the installation and setup of a typical blower assembly.

**LIFTING AND HANDLING**

- See weights on blower dimension sheets
- Motor blower assemblies should be lifted by a hoist or forklift
- As shown in Figure 3A, using the single eyebolt on the top middle of the motor or using two lifting straps under the motor as shown in Figure 3B



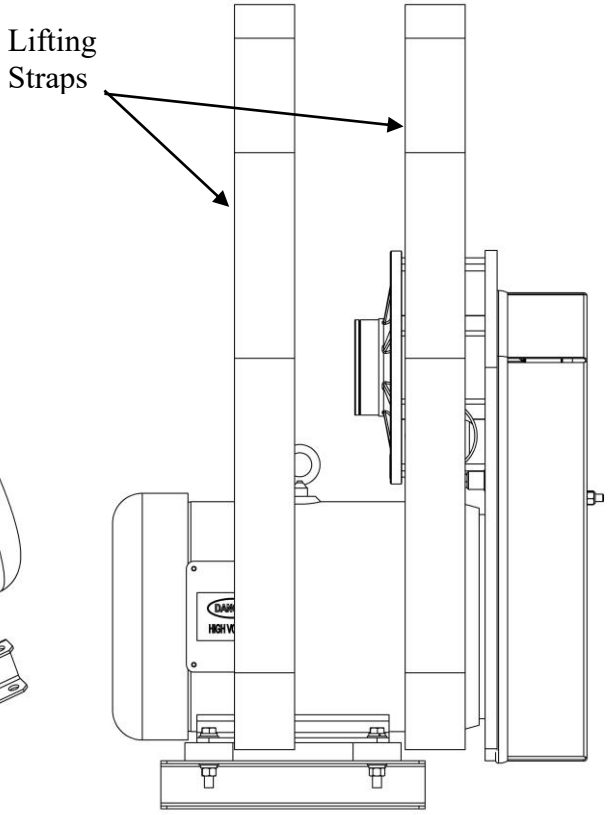




**Figure 3A - Blower lifting with motor eyebolt** **Figure 3B - Blower lifting with two straps**

# 4.A RETRO KIT INSTALLATION

**(ASSEMBLE SONIC 85 BLOWER TO EXISTING MOTOR) (See 4.B Diagrams)**

**Tools Required**

| Description | Qty. |
|---|---|
| 3/8 inch ratchet driver | 1 |
| 9/16 inch deep socket | 1 |
| ¾ inch deep socket | 1 |
| 5/16 inch allen socket | 1 |
| Calipers | 1 |
| 242 Loctite | 1 |
| ½ inch socket | 1 |

| Description | Qty. |
|---|---|
| 9/16 inch box-end wrench | 1 |
| 7/32 inch allen wrench | 1 |
| Flat head screwdriver | 1 |
| Rubber mallet | 1 |
| 24 inch Straight edge | 1 |
| #3 Drive Extension | 1 |
| 9/16 inch open end wrench | 1 |

**Retro Kit Installation Steps**

1. Wipe oil or dirt from used motor shaft and remove any rust.
2. Using a 9/16 inch open-end wrench, mount the vibration isolators and uni-mounts to the motor. (See Figure 3)
3. Mount and fasten the bracket assembly to the motor and then tighten only one screw using the 3/4 inch deep socket temporarily for belt gap adjustment. (See Figure 4)
4. Using a flat head screwdriver and a rubber mallet, gently tap to wedge the screwdriver into the front split face of the bushing to open slightly and then slide it onto the motor shaft. (See Figure 5) **[USE CAUTION TO PREVENT FRACTURING BUSHING]**
5. Follow bushing & pulley install and alignment instructions on page 16
6. Tighten the bushing set screw using the 7/32 inch allen wrench
7. Before installing the motor pulley, double check the bushing setting and then install the three pulley screws using Loctite and the 5/16 inch allen socket. Tighten the three pulley screws to the required torque specifications.
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.
9. Slowly rotate the motor pulley to make sure the belt is seated in the grooves.
10. Using the rubber mallet, adjust the belt gap to ¾ inch ±1/16 inch.
11. Using the 3/4 inch deep socket tighten the bracket hardware. (See Section 12.A - Torque Specifications For All Sonic Blower)
12. 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 ±1/32 inch.
13. Using the ½ inch socket, install the belt guard.

# 4.B SONIC 85 RETRO-KIT ASSEMBLY

**(BLOWER INSTALLED ONTO CUSTOMER MOTOR)**
**SEE SECTION 9.BLOWER PULLEY TO MOTOR PULLEY ALIGHNMENT FOR MORE INSTRUCTIONS.**

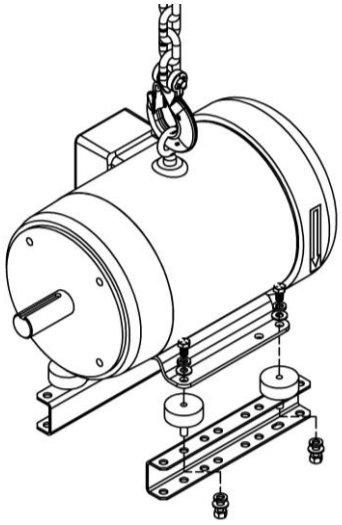


**Figure 3 - Install Uni-mounts**

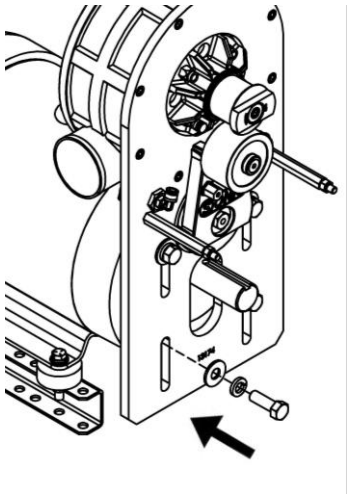


**Figure 4 - Mount Bracket to Motor**

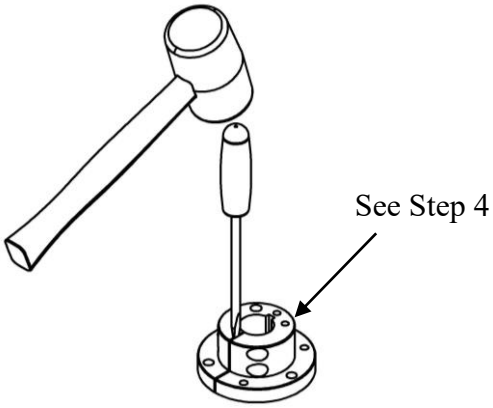



**Figure 5 - Prepare Bushing**

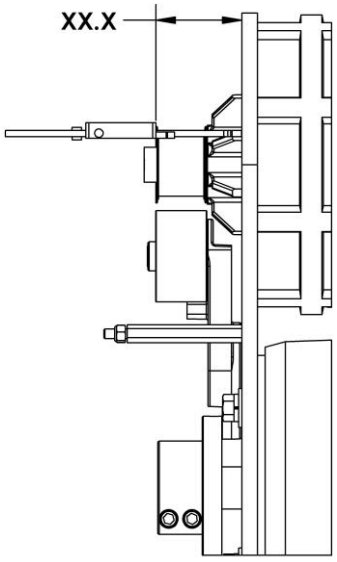



**Figure 6 - Install Bushing**

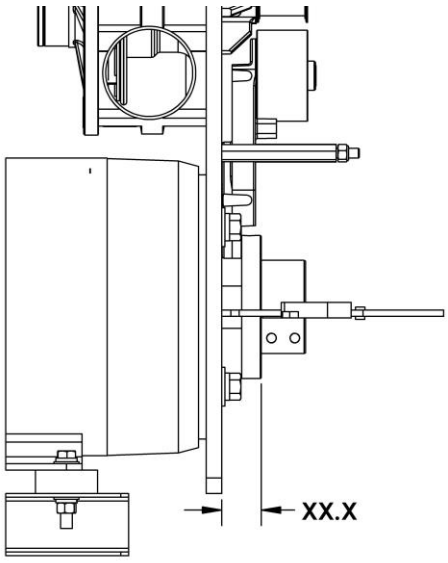
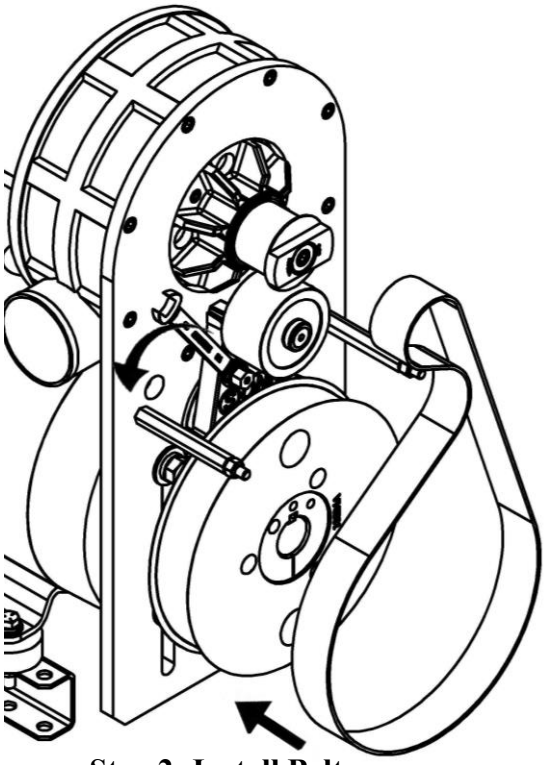


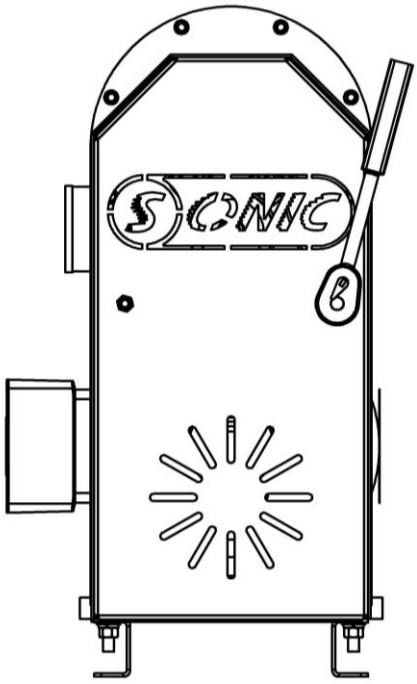

**Figure 7 - Install Bushing**

# 5. DRIVE BELT INSTALLATION

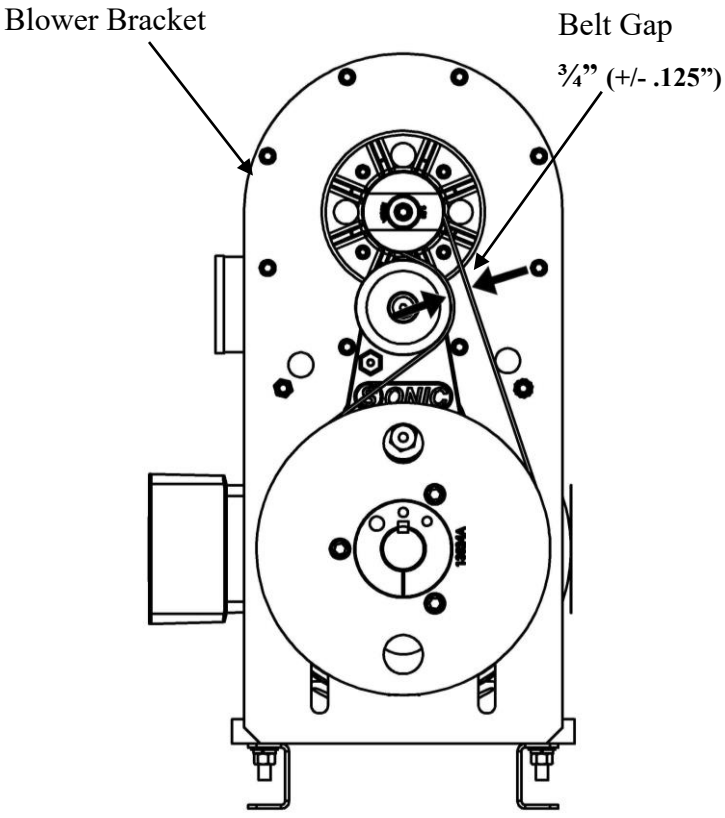
- Disconnect electric service whenever belt guard is removed.
- Sonic blower / motor units are shipped without the drive belt installed. This is to ensure that the motor rotation has been checked before installing the belt. Running the blower / motor assembly backwards will cause the blower to underperform by 20%. Running backwards for prolonged periods will cause premature failure of the belts and damage to the belt tensioner and blowers.
- Use a 1/2" wrench (Box or Ratchet) to remove belt guard hex nuts and a 9/16" wrench to rotate tension arm.
- Adjust blower bracket if belt gap not in tolerance using (4) hex bolds behind motor pulley.
- The ¾"(19mm) belt gap is required.



**Step 2- Install Belt**




**Step 1- Remove Nylon Nuts**




**Step 3 – Verify Belt Gap- ¾"(19mm)**

# 6. DESIGN, INSTALLATION AND OPERATING GUIDELINES

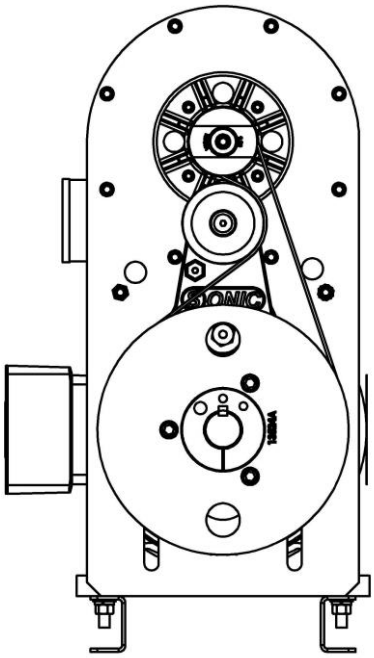


**Figure 9 - SONIC 85-Air Cooled**

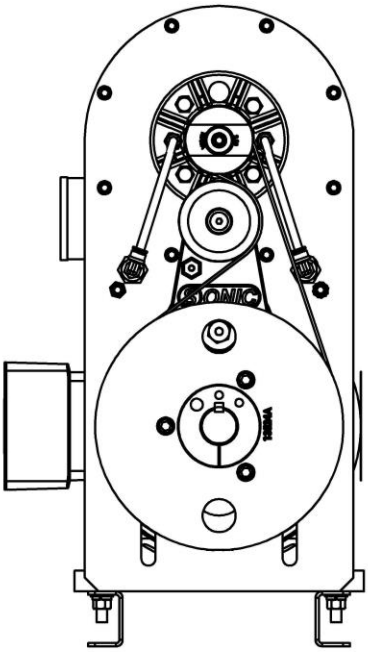


**Figure 10 - SONIC 85C-Water Cooled**

**INTRODUCTION**

- A SONIC 85 or SONIC 85C centrifugal blower and motor assembly or retro-kit for assembly onto an existing motor.

Sonic manufactures all of our blowers using the finest components available. Using highly trained and qualified personnel, Sonic conducts a full speed quality assurance test on each and every blower head and blower/motor assembly prior to shipping.

This manual is intended to:

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

## 6.A MATERIALS OF CONSTRUCTION

- Precision machined cast aluminum main housing and cover
- Single stage centrifugal impeller
- Maximum operating speed of 20,000 RPM
- Blower is completely sealed and is available with a variety of Sonic options.
- Each SONIC 85 is suitable for air inert gas, combustible gas or vapor from 0°F to 400°F (-18°C to 204°C).

- Each SONIC 85 has a field replaceable B.C. (bearing cartridge), which is a completely sealed spindle assembly and factory tested. All Sonic bearing cartridges are permanently lubricated and sealed.
- The blower and motor are joined together by an aluminum plate.
- Powder coated steel fully enclosed belt guard.
- Sonic belt drive consist of hard anodized aluminum blower and motor pulleys and Sonic auto tensioner.

**6.B BLOWER PERFORMANCE & DESIGN FEATURES**

- At 10:1, a SONIC'S 85's range from as low as 85 CFM (2.4$m^3$/min) to 850 CFM (24$m^3$/min)
- The maximum differential blower pressure is 4.2 psig/116" $H_2O$ (2946 mm $H_2O$) and vacuum is 6.8 Hg/ 92" $H_2O$ (2337 mm $H_2O$).
- Horsepower demand increases in proportion to increased air volume (motor amperage draw increases). As the air volume decreases (valve closes or filter clogs), the amp draw decreases. **Always check a fully installed system to ensure that the motor is running at or below full load amperage.**

**6.C INLET AIR AND IN-LINE HEPA AIR FILTRATION**

- The blower inlet should be coupled to a Sonic inlet filter-silencer, inlet air safety screen or piped from a clean air source. Sonic standard inlet filters are 2-micron paper elements or 5-micron washable polyester elements.
- Sonic's 2-Stage Panel and Cartridge filter is strongly recommended for very high dust or dirt environments.
- Sonic's In-Line Hepa air filtration of 0.3 microns should be installed after the blower outlet for all systems where blower air is blowing onto food products, food contact surfaces and for any other product or contact surface where maximum hygiene is required.

**6.D BLOWER OUTLET PIPING**

- Pressure blower applications must always have filtered air inlet.
- Vacuum blower application must have the blower inlet piped with filtration to prevent debris being sucked in.
- Outlet air should be silenced to levels as required by applicable occupational safety or corporate standards.
- Minimize pressure drop and noise transmission by using smooth bore tubing (hard plastic or metal) as much as possible.

**6.E FLEXIBLE HOSE**

- Flex hose with heavy internal ribs can cause a large pressure drop, so smooth inner wall flex hose is preferred.
- Flex hose should be rated to handle a pressure of 10 psig (0.7 bar) at a minimum of 200°F (93°C).
- Sonic short rubber sleeves with band clamps are standard for blower and piping connections.

**6.F FLOW CONTROL VALVES**

- Sonic locking butterfly valves are designed to regulate flow but are not designed to provide 100% seal when closed.

## 6.G MOTORS & CONTROLS

- For 50Hz or 60Hz power supplies where U.S. NEMA motors are suitable, SONIC 85 & 85C blowers are supplied with a Sonic premium efficiency motor. These 10Hp & 15Hp, 3-phase, VFD rated, TEFC motors are manufactured by ABB/Baldor with both 50Hz & 60Hz nameplates listing voltages of 190V to 480V. All Sonic motors are suitable for variable torque VFDs or soft starters with 8-10 second start/stop ramp times. Direct on-line magnetic starters should NOT be used.
- For 50Hz IEC metric power supplies the SONIC 85 & 85C blowers come with Weg 7.5kW and 11kW IEC compliance motor and IE3 efficiency, TEFC rated IP54. All Weg motors have star-delta windings and are suitable for variable torque VFDs or star-delta soft starters with 8-10 second start/stop ramp times. Direct on-line magnetic starters should NOT be used.

## 6.H LUBRICATION

- SONIC 85 blower bearings are lubricated with specialty grease and sealed for life by the Sonic factory.
- Any attempt to lubricate the bearings will result in mismatched grease and excess grease insertion which will hasten bearing failure.
- Sonic private labeled Baldor motors 10Hp (7.5kW) have sealed bearings requiring no lubrication.
- Motors of 15Hp (11kW+) contain grease fittings which require periodic grease injection per each manufacturer's recommendations.

## 6.I 85 AIR COOLED BLOWER TEMPERATURES

- The standard SONIC 85 air cooled blower is designed for an inlet air or gas temperature range of 35°F to 125°F (2°C to 52°C). For any inlet air temp above or below this range, please consult with Sonic for any blower options or operating criteria needed to handle extreme inlet temperatures.

## 6.J 85C WATER COOLED BLOWER TEMPERATURES

- The standard SONIC 85C water cooled blower is designed for inlet air or gas temperatures of 125°F to 400°F (52°C to 206°C). The 85C is hydrostatically leak tested to guarantee a sealed water jacket cavity between the bearing chamber and the heated air or gas stream where cooling water must flow at <0.5 GPM (1.9 ltr/min) to allow for normal blower operation. Consult Sonic for cooling equipment options and operating criteria.

## 6.K PREDICTIVE MAINTENACE MONITOR

- All SONIC 85 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 15 for Sonic's repair policy). Predicting and anticipating a bearing failure may save costly equipment and / or line down time.

## 6.L MOISTURE AND DEBRIS

- Do not place the blower in areas exposed to spray from washing or rinsing zones, air knife overspray, or dust, dirt, and other debris.

- Frequent filter cleaning or replacing may require the filter to be moved to a cleaner, dryer area.
- A Sonic acoustical blower enclosure or other sonic filter options are available.

**6.M BELT INSTALLATION**

- Sonic ships all new systems with the drive belt removed to ensure that the motor rotation is correct before the blower is started. **(SEE SECTION 4, PG 8 FOR DETAILS)**

**6.N WASH DOWN**

- In factory locations subject to direct high-pressure water or caustic wash down cycles, the blower / motor unit must be protected or relocated to prevent damage.
- Wash down duty motors and corrosive resistant blower coatings are available.

**6.O GAS HANDLING**

- The SONIC 85 is made with non-sparking aluminum and can be ordered with welded 4" pipe flanges and other treatments for gas handling.

**6.P 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.

**6.Q WATER COOLING CIRCUIT**

- When air or gas piped to the blower inlet is between the range of 125°F to 400°F (52°C to 204°C), each Sonic blower head must include Sonic's water cooled bearing cartridge, a 5/16" x 6"L water input & drain hose from the blower head to the blower brackets with SS push-to-connect fittings and external push-to-connect bulkhead fittings between the blower head and the drive motor for the 5/16" water input and drain lines from a closed loop cooling system. Sonic offers a self-contained 10 gallon cooling system when customer plant cooling water is not available.
- The average cooling water demand is 0.5 GPM (1.9 L/min) which varies based on the inlet air/gas temp to the blower and the temperature of the cooling water itself. The most efficient water usage is determined by regulating the flow and pressure to the minimum needed to achieve a drain water temperature of 100°F (38°C) plus/minus 5%.

# 7. ELECTRICAL CONNECTING, MOTOR ROTATION & CONTROLS

### 7.A MOTOR WIRING

- Only qualified personnel should perform motor wiring. Review motor nameplate for wiring diagram and wiring information. Review the motor manufacture's website for electrical specifications. 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 and correct pulley ratio of the blower unit. **(SEE SECTION 8.B, PG 15 FOR DETAILS)**




- Never run a Sonic blower open to the atmosphere as this can cause overloading and damage to the motor and it is dangerous to do.
- If the blower is required to have multiple Starts/Stops, installation of a Soft Starter, VFD motor controller or Sonic Air Diverter **(Y-Verter™ Valve)** is required to prevent premature failures.
- Sonic blower/ motor assemblies are a variable torque design, so variable torque controls are suitable.

### 7.B ROTATION

- 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.

### 7.C CONTROLS

- Sonic centrifugal blowers are a low torque starting design for which electrical overload devices (fuse or circuit breakers) can be sized for as low as 15% above most full load amp motor ratings. All Sonic supplied motors are 2-pole A/C inverter duty rated, but a soft (star-delta) reduced voltage motor starter is also suitable for all Sonic motors. Direct On-Line (full voltage) motor starters are suitable for all motors of 7.5Hp (5.5kW) or lower.

### 7.D COMFIRM MOTOR ROTATION

The easiest method for confirming motor or blower rotation direction, which can only be done when the blower/motor is running, is to first have a 4"-6" long semi-rigid plastic strip (drinking straw, flat twist-tie or an open zip-tie).

<u>From The Belt Guard Side</u>

- Do not remove the belt guard. With the motor running, slowly insert one end of the strip into one of the air vent slots in the face of the belt guard at approx. 4" from the centerline of the motor shaft. As the strip is inserted against the motor pulley, the strip will bend with the direction of rotation. From the belt guard side the motor pulley should only be rotating clockwise (CW).

From The Motor Cooling Fan Side

- With the motor running, slowly insert one end of the strip into one of the air vent slots in the cooling fan cover at approx. 4” from the centerline of the motor shaft. As the strip is inserted into the path of the cooling fan, the strip will bend with the direction of rotation. From the cooling fan cover side the motor should only be rotating counter-clockwise (CCW).

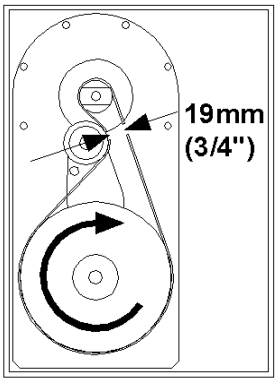



**Figure 11 – Belt Drive Rotation Sticker**

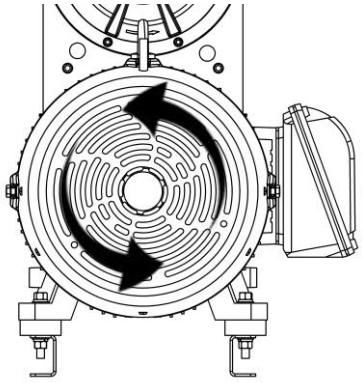
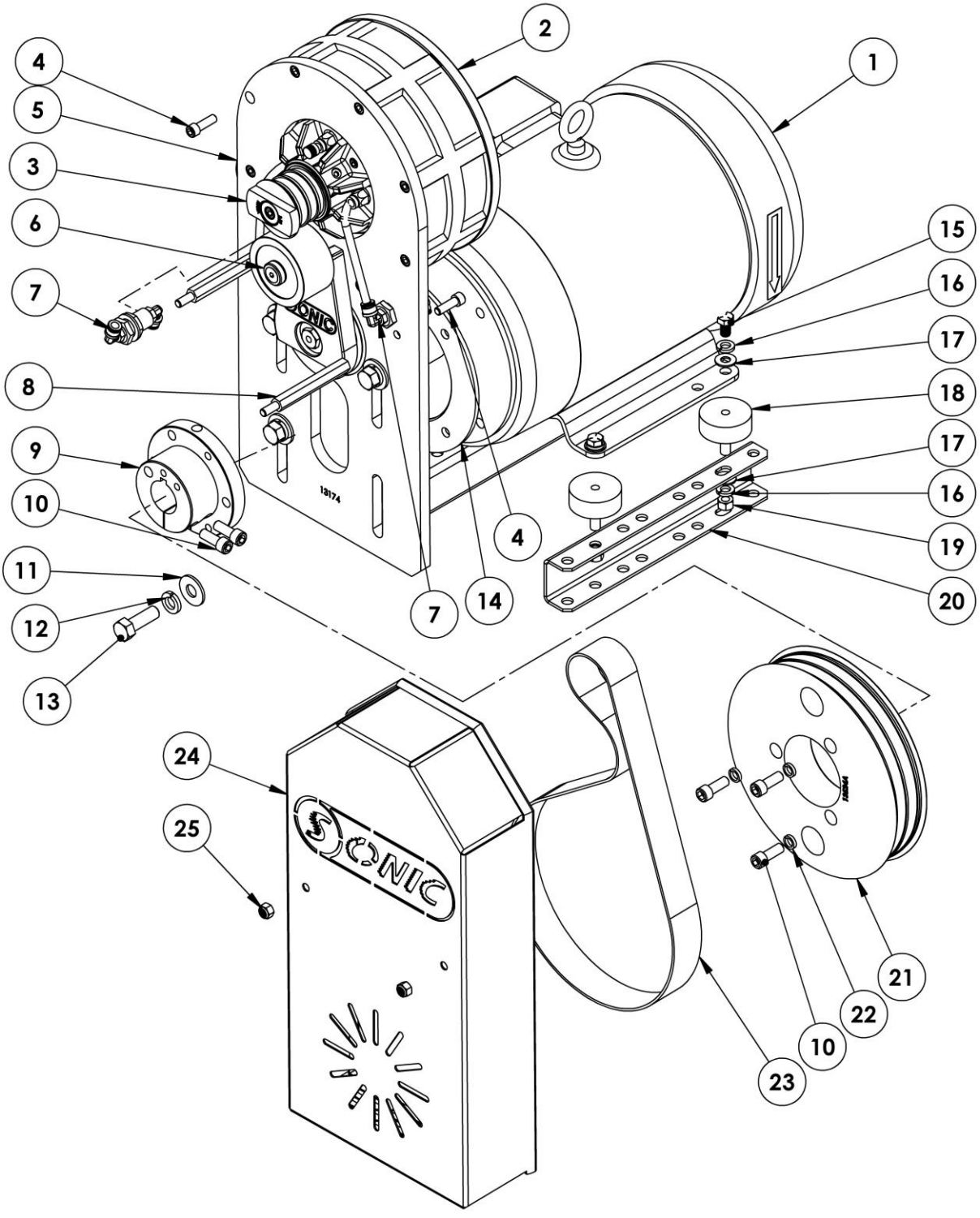


**Figure 12 – Motor Cooling Fan Rotation**

# 8. BLOWER & MOTOR EXPLODED VIEW DETAIL

## 8.A EXPLODED VIEW AND COMPONENT LIST



**Component List**

| Item NO. | Part NO. | Description | QTY. |
|---|---|---|---|
| 1 | Sec. | MOTOR, ELECTRIC-10-15 HP (7.5-11 KW) C-FACE | 1 |
| 2 | 14454 | BLOWER HEAD-SONIC 85 | 1 |
| | 14455 | BLOWER HEAD-SONIC 85C **WATER-COOLED** | |
| 3 | 13900A-XXX | PULLEY-BLOWER X.XX" DIA 16 GROOVE HARD ANODIZED ALUMINUM | 1 |
| 4 | | SCREW-5/16"-18 X 1" SHC FULLY THREADED SS | 8 |
| 5 | | BRACKET-SONIC 70/85 NEMA FRAME 182TC-184TC 213TC-215TC C-FACE WITH A 7 1/4" DIAMETER BOLT CIRCLE | 1 |
| | | **BRACKET-SONIC 70/85 IEC FRAME 132 B14 FACE WITH A 165MM DIAMETER BOLT CIRCLE (WITH IEC MOTOR ONLY)** | |
| 6 | 13455 | KIT-BELT TENSIONER REPLACEMENT | 1 |
| 7 | 18350 | KIT-WATER COOLED FITTINGS DRIVE ASSEMBLY **(SONIC 85C WATER COOLED ONLY)** | 2 |
| 8 | | STANDOFF-3.68" LG | 2 |
| 9 | | BUSHING-1 3/8" | 1 |
| | | BUSHING-1 5/8" | |
| | | **BUSHING-38 MM (WITH IEC MOTOR ONLY)** | |
| 10 | | SCREW-3/8"-16 X 1" SHC FULLY THREADED ZINC PLATED | 5 |
| 11 | | WASHER-1/2" ZINC PLATED | 4 |
| | | **WASHER-M8 ZINC PLATED (WITH IEC MOTOR ONLY)** | |
| | | **WASHER-M10 ZINC PLATED (WITH IEC MOTOR ONLY)** | |
| 12 | | LOCKWASHER-1/2" ZINC PLATED | 4 |
| | | **LOCKWASHER-M8 ZINC PLATED (WITH IEC MOTOR ONLY)** | |
| | | **LOCKWASHER-M10 ZINC PLATED (WITH IEC MOTOR ONLY)** | |
| 13 | | SCREW-1/2"-13 X 1 1/2" HHC FULLY THREADED ZINC PLATED | 4 |
| | | **SCREW-M8-1.25 x 40MM HHC FULLY THREADED ZINC PLATED (WITH IEC MOTOR ONLY)** | |
| | | **SCREW- M10-1.25 x 40MM HHC FULLY THREADED ZINC PLATED (WITH IEC MOTOR ONLY)** | |
| 14 | | **SPACER-IEC 132 B14 FACE (WITH IEC MOTOR ONLY)** | 1 |
| 15 | | SCREW-3/8"-16 X 5/8" LG HHC FULLY THREADED ZINC PLATED STEEL | 4 |
| 16 | | LOCKWASHER-3/8" SPLIT ZINC PLATED | 8 |
| 17 | | WASHER-3/8" X .812"OD ZINC PLATED | 8 |
| 18 | | ISOLATOR-RUBBER VIBRATION 2" DIA X 0.75" HIGH WITH 3/8"-16 X 1-1/8" LG BOLT ONE SIDE X TAPPED HOLE | 4 |
| 19 | | NUT-3/8"-16 HEX ZINC PLATED | 4 |
| 20 | | UNIMOUNT-MOTOR | 2 |
| 21 | 13524A | PULLEY-MOTOR SONIC 70/85 SERIES 8.75" DIAMETER 16 GROOVE HARD ANODIZED ALUMINUM | 1 |
| 22 | | LOCKWASHER-3/8" HIGH COLLAR SS | 3 |
| 23 | 13514 | BELT DRIVE | 1 |
| 24 | | GUARD ASSY-SONIC 70/85 CRS | 1 |
| 25 | | NUT-5/16"-18 NYLON INSERT LOCK HEX ZINC PLATED | 2 |

# 8.B BLOWER PULLEY /DRIVE BELT CROSS REFERENCE

| Blower Pulley | Pulley Part No. | Motor 8.75" DIA Pulley | Drive Belt Part No. |
|---|---|---|---|
| 1.52 in DIA | 13450A-152 | 13524A<br>50/60HZ | 13514 |
| 1.62 in DIA | 13450A-162 | | |
| 1.70 in DIA | 13450A-170 | | |
| 1.75 in DIA | 13450A-175 | | |
| 1.80 in DIA | 13450A-180 | | |
| 1.85 in DIA | 13450A-185 | | |
| 1.90 in DIA | 13450A-190 | | |
| 1.95 in DIA | 13450A-195 | | |
| 2.00 in DIA | 13450A-200 | | |
| 2.15 in DIA | 13450A-215 | | |

# 9. BLOWER PULLEY TO MOTOR PULLEY ALIGNMENT

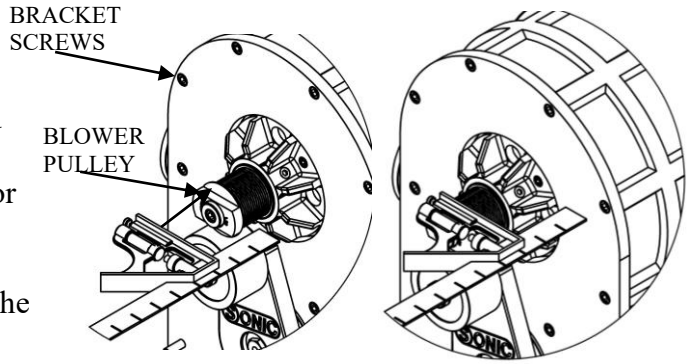
For Sonic blower & motor assembly models **SONIC 70 thru 150**. These field services alignment procedures ensure the highest life expectancy for drive belt and pulleys.

**Tools Required:**

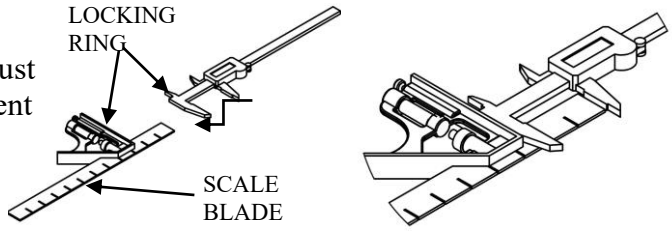
● Combination Square ● Caliper (.001" accuracy) ● Allen Wrench ● Torque Wrench

**Alignment Sequence:**

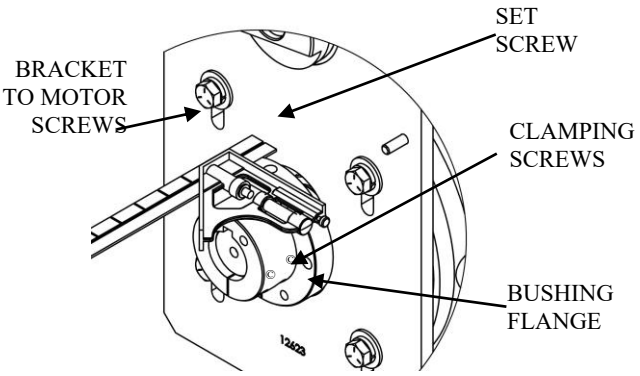
1. Remove belt guard, belt and motor pulley. See manual for instructions.
2. Clean/remove any dirt from pulleys, bracket and bushing.
3. Check/tighten the hardware for the blower, motor and blower pulley. See manual for torque specifications.
4. Hold the 90° flat of the square against either of the blower pulley recessed faces.
5. Slide the scale blade until the end presses firmly against the blower bracket and lock the scale in place.



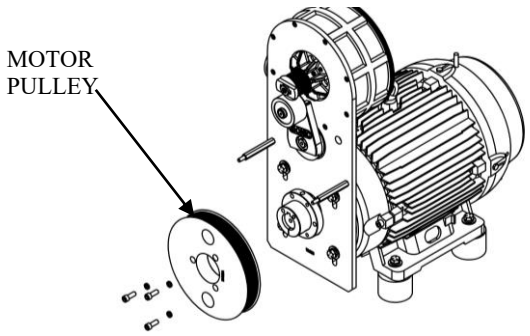

6. Use the caliper to measure the scale blade length.
7. Now deduct 1.491" from the caliper reading. Adjust caliper to this measurement and apply measurement to square and lock it in place.




8. Loosen the hardware on the bushing.
9. Place the square on top of the bushing flange area. Move the bushing and square until the scale sits flat with the bracket. Tighten the (2) clamping screws. Check bushing placement with square.
   Torque bushing screws:
   **1-1/8"** (20 ft/lbs.) **1-3/8"** (30 ft/lbs.)
   **1-5/8"** (25 ft/lbs.) **1-7/8" (**15 ft/lbs.)
   **38mm** (25 ft/lbs.) **42mm** (25 ft/lbs.)
10. Tighten set screw and torque to 10 ft/lbs.

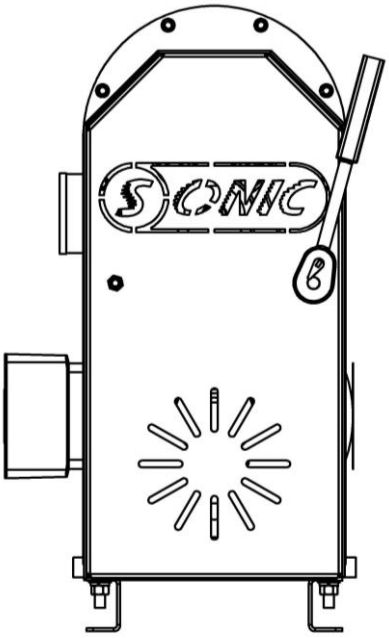



11. Install the motor pulley with (3) screws and Lock-washer. Torque to 30 ft/lbs.
12. Install the belt and confirm the belt to idler pulley gap is 3/4" (±1/8") and loosen (4) bracket screws to slide bracket until to ¾" belt gap is achieved. Torque screws see manual for torque specifications.
13. Install the belt per instructions on page 5.

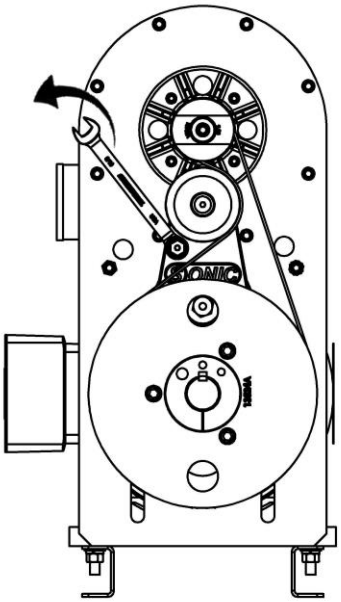


# 10.A BLOWER HEAD OR BRACKET POSITION CHANGE

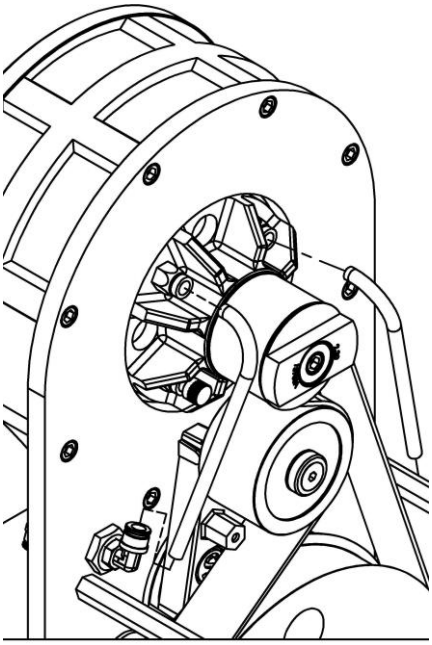
- All blower head and mounting bracket positions can be changed to suit customer needs without voiding warranty. Please refer to the blower rotations on page 2A & 2B for future orders.



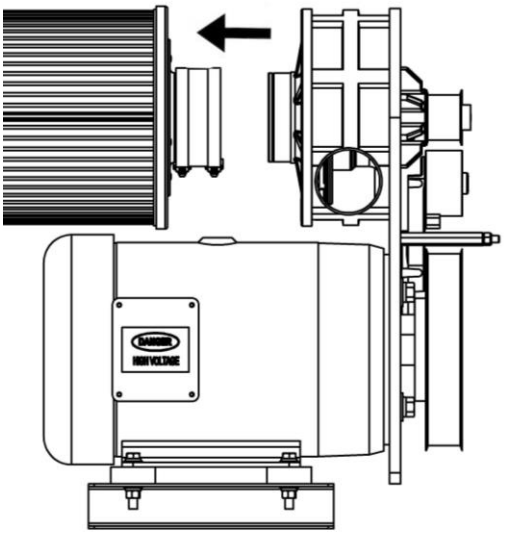

**Step 1 - Remove Belt Guard**




**Step 3- Remove Belt**

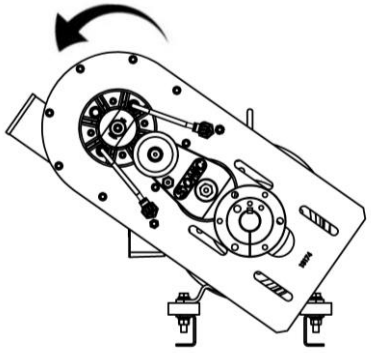


**Step 2– If SONIC 85C, otherwise skip to step 3. Remove Water Cooling Tubing**

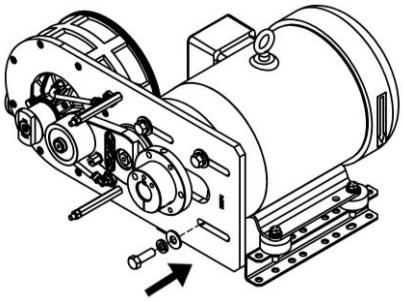


**Step 4– Remove Filter or Inlet Screen**

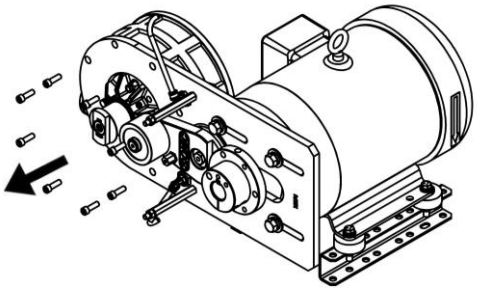
# 10.B BLOWER HEAD OR BRACKET POSITION CHANGE



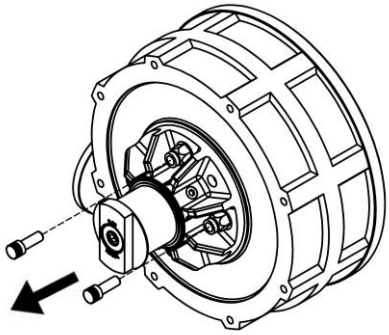
**Step 9– Rotate Bracket**



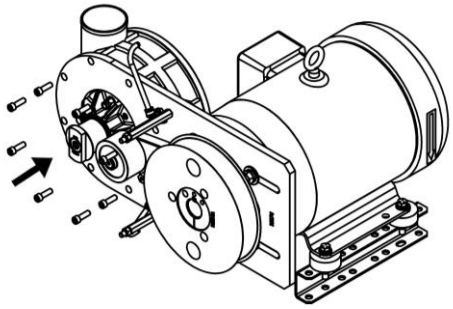
**Step 10– Install Bracket Hardware**



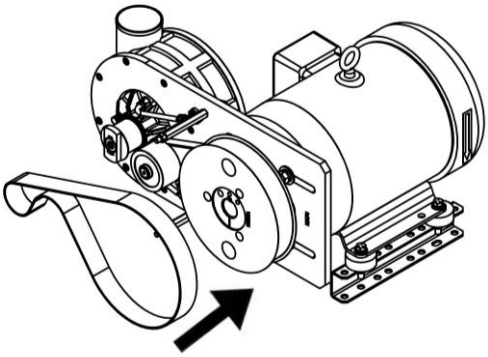
**Step 11- Remove Blower Hardware**



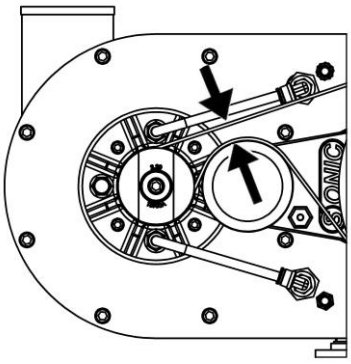
**Step 12- Relocate Water-Cooling Hoses to 3& 9 O'clock**



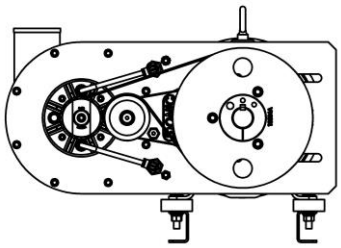
**Step 13- Reinstall Blower Head**



**Step 14– Reinstall Belt**

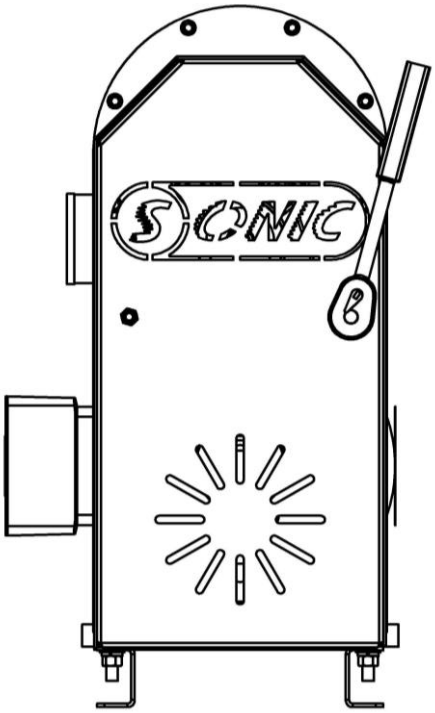



**Step 15– Set Belt Gap to 3/4"**

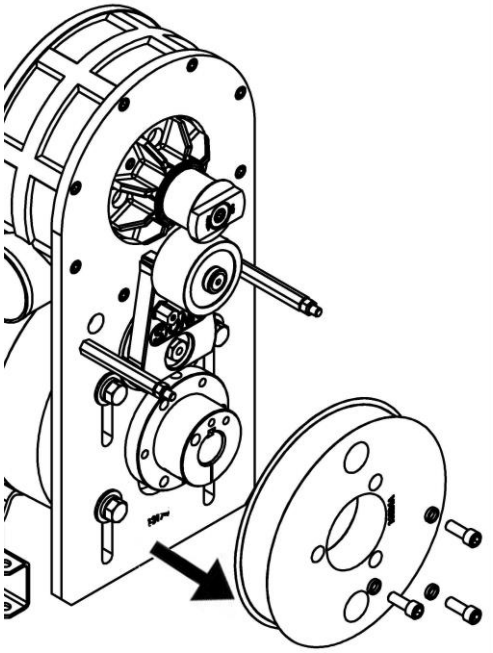


**Step 16– Final Position**

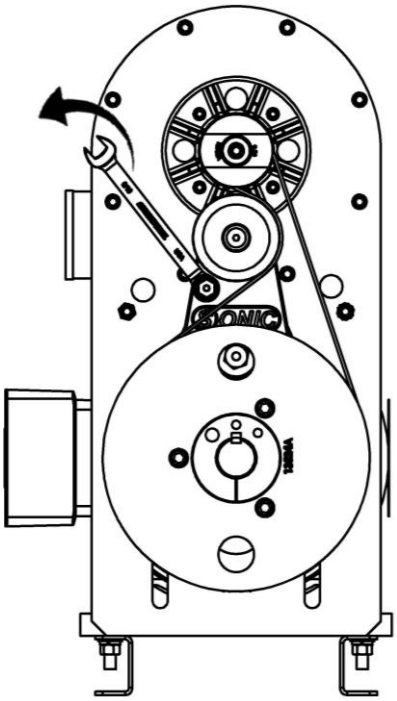
# 11.A BELT TENSIONER SERVICE



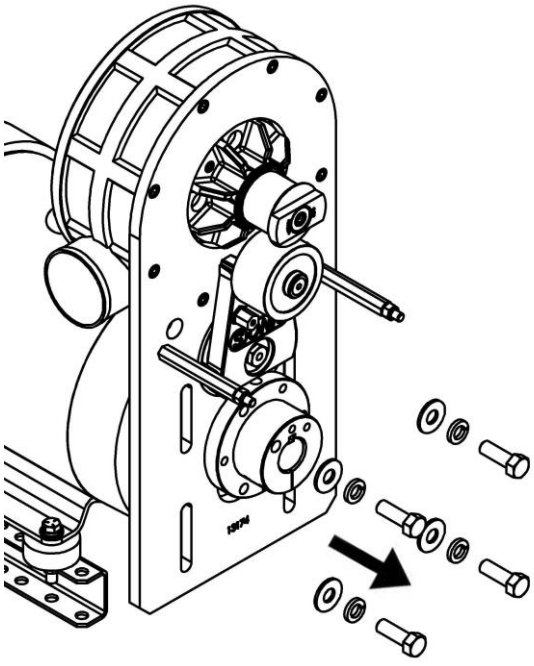

**Step 5- Remove Belt Guard**



**Step 7- Remove Motor Pulley**



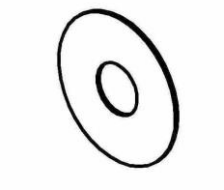
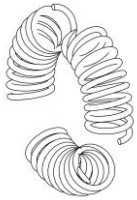
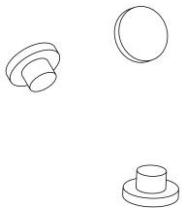
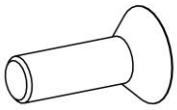

**Step 6- Remove Belt**



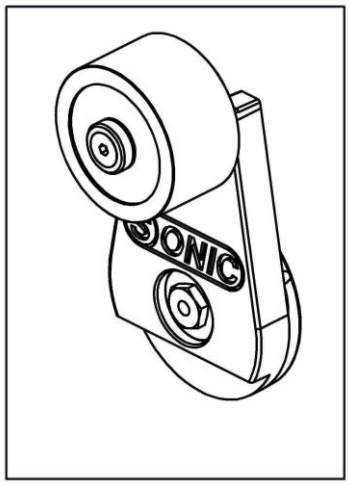
**Step 8- Remove Bracket Hardware**

# 11.B BELT TENSIONER SERVICE

- Replace Spring Kit or Replace Tensioner Assembly. (SEE PAGE 22)

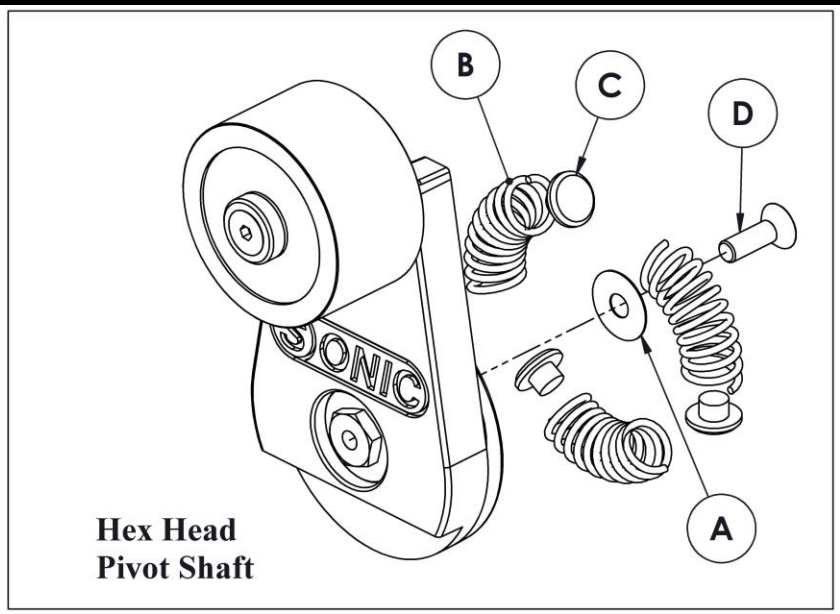
| MATERIALS SUPPLIED | | | |
|---|---|---|---|
|  |  |  |  |
| Quantity – 2 pieces<br>Precision Washer<br>#5/16 X .020" thick (A) | Quantity – 3 pieces<br>Spring (B) | Quantity – 3 pieces<br>Cap-Spring (C) | Quantity – 1 piece<br>Pivot Screw (D) |

**Spring Kit-P/N: 17707**



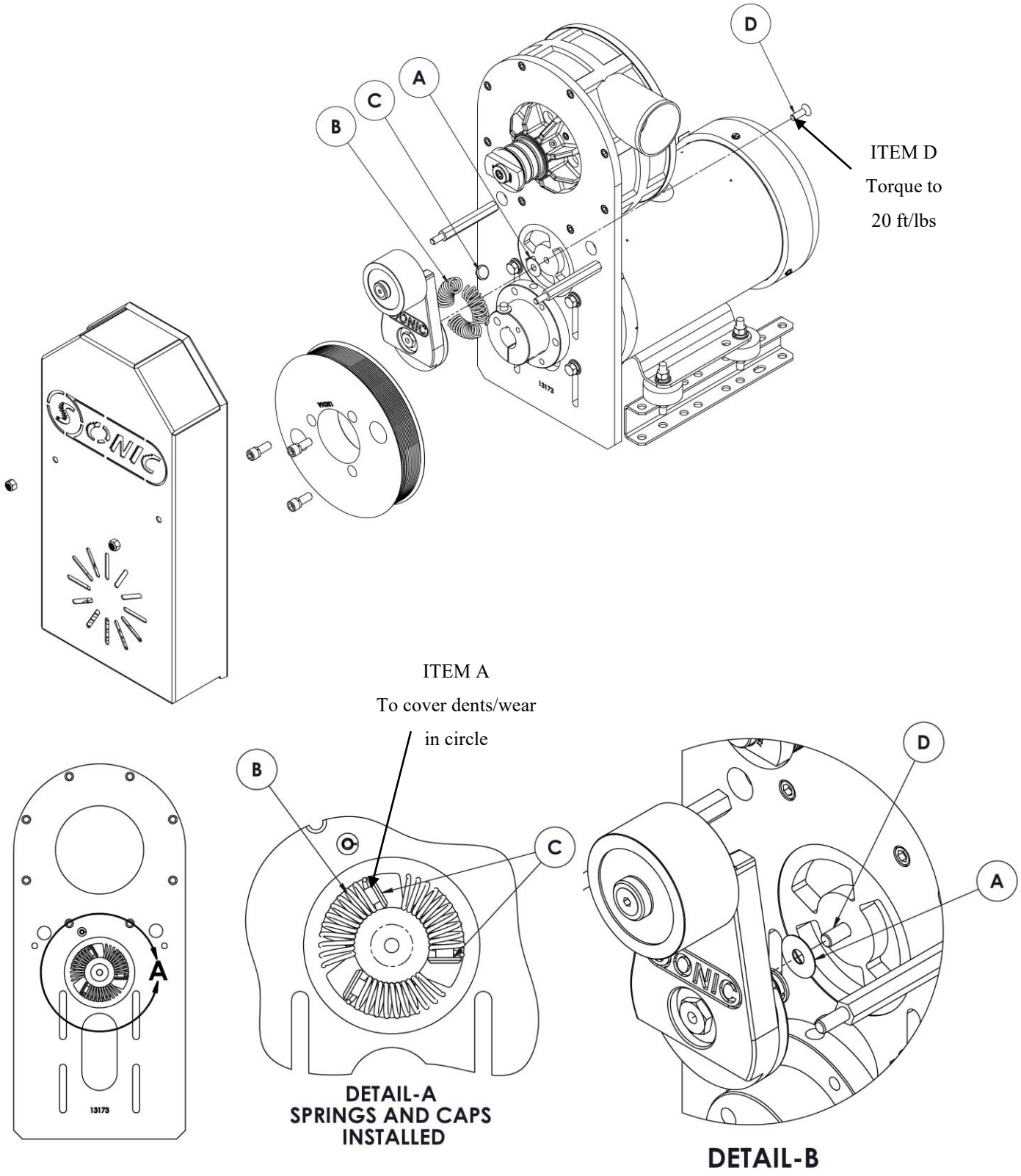

- SPRING KIT P/N-17707
- TENSIONER ASSEMBLY INCLUDING SPRINGS KIT P/N:13455

## EXPLODED DIAGRAM



# 11.C BELT TENSION SERVICE

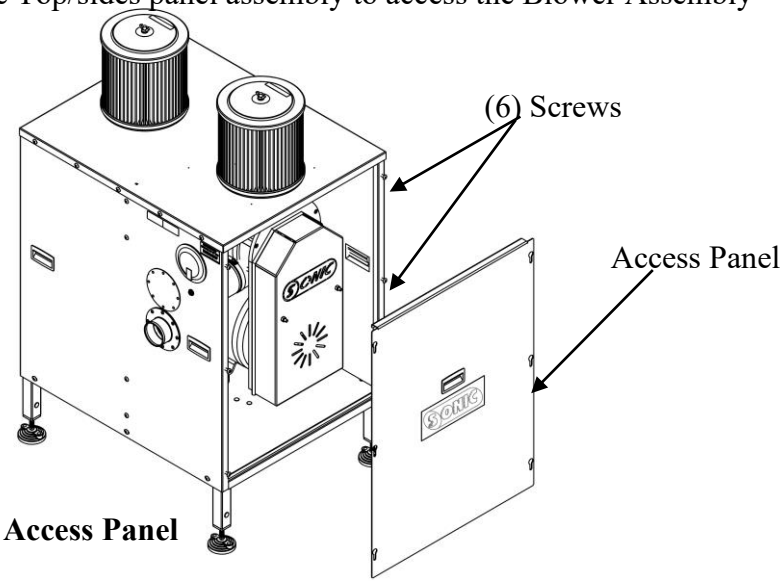
(SEE 11.A DETAIL)



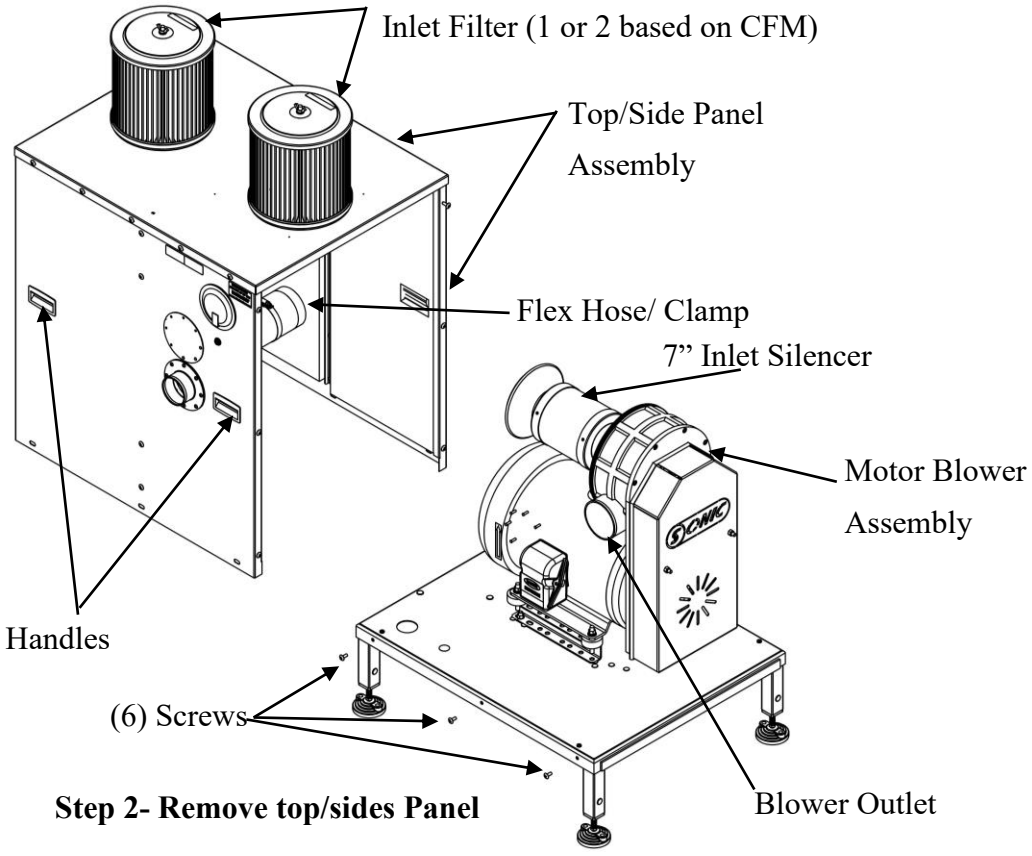
# 12. STAINLESS STEEL BLOWER ENCLOSURE ASSEMBLY P/N-15150-XXX (OPTIONAL)

(Service a Motor Blower Assembly inside Enclosure)

- Loosen (6) Screws to remove Access Panel
- Loosen the clamp to disconnect the flex hose from the blower head outlet
- Remove (6) base screws
- Use handles to remove Top/sides panel assembly to access the Blower Assembly




**Step 1- Remove Access Panel**




**Step 2- Remove top/sides Panel**

# 12.A PERIODIC MAINTENANCE

Blower models **SONIC 85** & **SONIC 85C**

**MAINTENANCE SCHEDULE, TOOLS & TORQUE SETTINGS**

Sonic blowers are designed for 24 hour/365 day operation with the inspection and service intervals listed below based on ideal steady state continuous operation in "standard ambient breathable air conditions" of 68°F, 14.7 PSIA & 36% RH.

There are many Sonic blowers operating successfully in far less than ideal conditions which, like most other types of rotating equipment, may require more frequent service than those in ideal conditions. With that in mind, Sonic has designed our blowers for maximum durability along the shortest and most economical service cycles.

It is always preferable to perform maintenance proactively to minimize unplanned downtime, especially when the blower is operating in less than ideal conditions.

| Service Item-Task | Frequency of Inspection & Average Replacement Cycle |
|---|---|
| 16G Drive Belt – Look for tears & damage (multiple stress cracks are normal wear) | 6-9 Months & at 6,000 Running Hours or 18 Months |
| Belt Tensioner –Noisy bearings weak spring (rapid belt wear may be tensioner) | 6-9 Months & at 18,000 Running Hours or 36 Months |
| Blower & Motor Pulleys – Inspect Grooves (check pulley alignment if grooves worn) | 6-9 Months & Replace if the Anodizing in Pulley Grooves is Worn Away |
| Inlet Air Filter(s) – Inspect & Replace | 9 Months & at 10" H20 Vac on Filter Gage |
| Blower Bearing Cartridge – Sealed (noise or vibration is the first signal) | 6-9 Months & 18,000 Running Hours or 36 months |
| Drive Motor - Grease Bearings if Fittings | 12 Months & 25,000 Hours or 72 Months |

**Tools Required for maintenance & Repair**

| Description | Qty. |
|---|---|
| 9/16 inch box end wrench | 1 |
| ¾ inch deep socket (10 hp optional) | 1 |
| Rubber mallet (optional) | 1 |
| ½ inch socket | 1 |
| 1-1/8 Open end wrench | 1 |

| Description | Qty. |
|---|---|
| 9/16 inch deep socket (optional) | 1 |
| 3/8 inch ratchet driver+extension | 1 |
| Torque Wrench 50ft/lbs | 1 |
| Dial Caliper 6" | 1 |
| Combination Square 6" | 1 |

**Torque Specifications For All Sonic Blower Screws**

| Bolt Description | Recommended Torque Value |
|---|---|
| 1/4-20 SHCS | 12 ft-lbs (16 N-m) |
| 5/16-18 SHCS | 25 ft-lbs (34 N-m) |
| 5/16-24 SHCS | 20 ft-lbs (27 N-m) |
| 3/8-16 HHCS | 30 ft-lbs (41 N-m) |
| 3/8-16 SHCS | 30 ft-lbs (41 N-m) |
| ½-13 HHCS | 45 ft-lbs (61 N-m) |

# 13.B RECOMMENDED SPARES

Although the Sonic 85 blowers are designed for many years of continued operation, a number of components are worn or consumable items and must be replaced periodically. The following is a list of recommended spare components.

Sonic maintains all spare parts listed below ready for shipment on the same day. For customers with multiple Sonic Blowers, we offer pre-assembled and ready to install blower heads or bearing cartridge assemblies and impellers for customers to reduce service cost. (See Section 14)

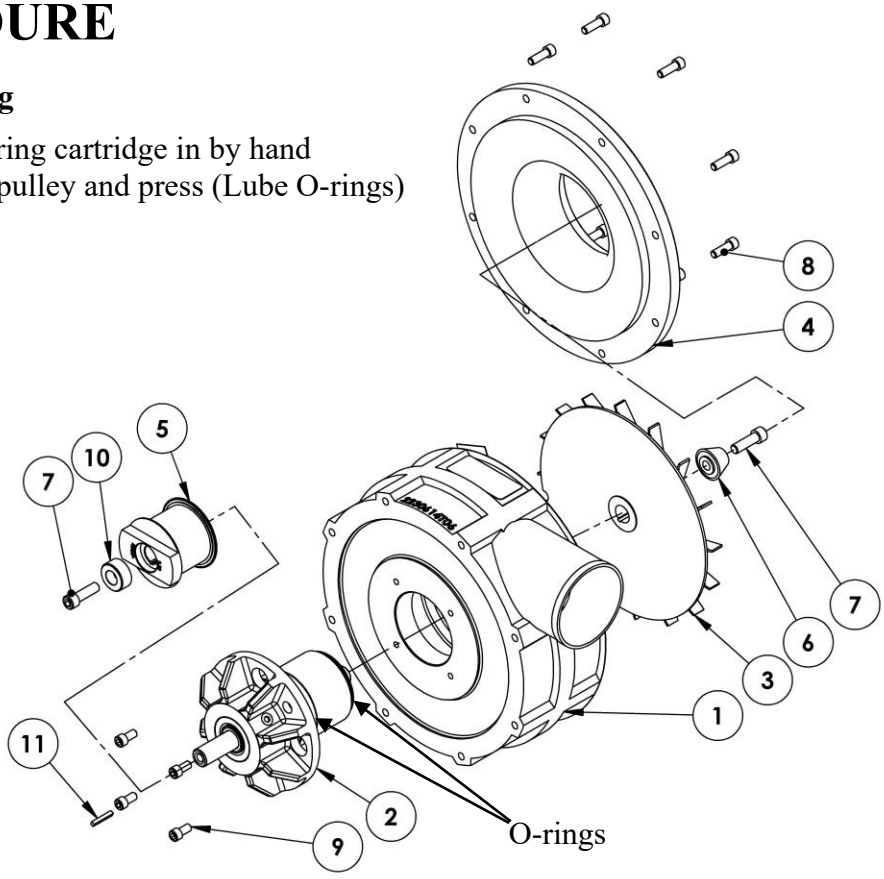
| Part No. | Description | Special Instructions See Notes Below | |
|---|---|---|---|
| *14454 | 85 Blower Head-Assemble & Tested | * | ** |
| *14455 | 85 Water Cooled Blower Head-Assemble & Tested | * | ** |
| 12638 | 85 Impeller | | |
| 14452 | Bearing Cartridge assy. – Sonic 70/85 Series | | ** |
| 16221 | Bearing Cartridge assy. – Sonic 70/85 Water Cooled Series | | ** |
| 13450A-%%% | Pulley, Blower (16 Groove) (%%% Pulley Diameter, 1.52 to 2.15) Contact Sonic with Serial Number (pg. 2 for assistance) | | |
| 13524A | Pulley, Motor (16 Groove) | | |
| 13514 | Belt, Lg., 16 Groove (1.50 to 2.15 Blower Pulley) | | |
| 13455 | Belt Tensioner Replacement Kit | | |
| 10316 | Filter Element, Paper | | |
| 10317 | Filter Element, Polyester | | |
| See Section | Motor | | |

***Sonic also provides factory rebuilt heads. (See Section 15)**
****Sonic spare blower heads and bearing cartridges (B.C.) must always be stored with main shaft horizontal for grease safety. Always run blower and B.C. with 1,000 RPM drill at 3 month intervals.**

# 14.A BEARING CARTRIDGE REPLACEMENT PROCEDURE

**Assembly Drawing**

- Press bearing cartridge in by hand or install pulley and press (Lube O-rings)




**Bearing Cartridge Assembly Parts List**

| Item No. | Part No. | Description | Qty. |
|---|---|---|---|
| 1 | | HOUSING-SONIC 85 | 1 |
| | | HOUSING-SONIC 85C (Water Cooled) | |
| 2 | 14452 | Bearing Cartridge assy. – Sonic 70/85 Series | 1 |
| | 16221 | Bearing Cartridge assy. – Sonic 70/85 Water Cooled Series | |
| 3 | 12638 | IMPELLER-SONIC 85/150 | 1 |
| 4 | | COVER-SONIC 85 | 1 |
| 5 | 13900A-XXX | PULLEY-BLOWER 16 GROOVE | 1 |
| 6 | | RETAINER-IMPELLER | 1 |
| 7 | | SCREW-5/16"-24 X 1" SHC FULLY THREADED ZINC PLATED ALLOY STEEL W/NYLON PATCH PER MIL-DTL-18240, TYPE P, YELLOW | 2 |
| 8 | | SCREW-1/4"-20 X 3/4" SHC FULLY THREADED SS | 8 |
| 9 | | SCREW-1/4"-20 X 1/2" SHC FULLY THREADED SS | 4 |
| 10 | | RETAINER-BLOWER PULLEY | 1 |
| 11 | | KEY-BLOWER | 1 |

***REFER TO PG 24 FOR SCREW TORQUE SPECIFICATIONS AND QUICKGUIDE L10004 FOR INSTRUCTIONS.

# 15. SONIC REPAIR POLICY

All Sonic blower / motor assemblies heads are high-speed and made with precision machined components. Sonic 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 Sonic RMA(Return Material Authorization) number will be sent to the customer.
- The damage blower head must include the blower pulley
- The Sonic RMA(Return Material 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
- Repair exchange blower heads usually in 1 week.

# 16. TROUBLESHOOTING

| Trouble | Cause | Remedy | Section |
|---|---|---|---|
| Low Flow / Pressure / Vacuum | • Blower rotating backwards (Incorrect wiring) | • Reverse motor wiring | 7 |
| | • Dirty or contaminated filter | • Clean or replace filter element | 12 |
| | • Collapsed flexible hose lining | • Use only reinforced flexible hose | 6.E |
| | • Air leaks in the system | • Fix leaks | CALL SONIC |
| | • Closed or damaged valve | • Open or replace valve | CALL SONIC |
| | • Worn or damaged impeller | • Replace impeller and inspect blower housing | 13B |
| | • Drive belt slipping (Contaminated or damaged) | • Replace belt<br>• Replace pulleys<br>• Clean pulleys | 5,12 |
| | • Worn pulley | • Replace worn pulleys | 12 |
| | • Wrong pulley size | • Contact Sonic | CALL SONIC |
| | • Wrong drive belt (Not Sonic approved) | • Use only Sonic supplied belts | 5,8.B |
| | • Incorrect piping design (Too small) | • Increase piping diameter<br>• Contact Sonic for design assistance | 6.D |
| | • Improper blower size for application | • Contact Sonic for design assistance | CALL SONIC |
| Frequent Drive Belt Failure | • Blower rotating backwards (Incorrect wiring) | • Reverse motor wiring | 7 |
| | • Motor pulley wobbling | • Replace motor<br>• Replace motor bushing<br>• Replace motor pulley | 4.B |
| | • Frequent start / stops without soft start controller | • Install soft start motor controller<br>• Install diverter valve and run continuously | CALL SONIC |
| | • Motor pulley out of alignment | • Realign motor pulley<br>• Replace mounting bracket if damaged | 9 |
| | • Pulley grooves worn | • Replace pulley | 11.A,14.A |
| | • Hostile environment (belts contaminated) | • Locate blower in safe location<br>• Purchase Sonic blower enclosure | CALL SONIC |
| | • Wrong belts (Not Sonic approved) | • Use only Sonic supplied belts | 5, 8.B |
| | • Incorrect belt installation method | • Properly install belts | 5, 8B |
| | • Worn belt tensioner | • Replace belt tensioner | 11 |
| | • Liquid entering blower inlet (impeller stall) | • Locate blower in safe location<br>• Install inline filters | 6.C,12 |
| Electrical Overloading | • Exceeding rated blower CFM | • Contact Sonic | CALL SONIC |
| | • Blower RPM too high (Blower pulley too small) | • Contact Sonic | CALL SONIC |
| | • Motor has winding or bearing damage | • Replace motor | 4.B, 7 |
| | • Electrical supply problems | • Replace drive controller | CALL SONIC |

| | | | |
|---|---|---|---|
| Thermocouple Alarm (optional) | • High inlet temperature | • Purchase water cooled blower<br>• Reduce inlet temperature | 6.I, 6.J |
| | • Dirty air filter | • Clean or replace filter element | 13.B |
| | • High ambient temperature | • Purchase water cooled blower | 6.I, 6.J |
| | • Water cooling low flow | • Increase flow rate<br>• Decrease water temperature | CALL SONIC |
| | • Blower speed too high | • Contact Sonic | CALL SONIC |
| | • Broken Belt | • Replace Belt | 5, 8.B |
| Irregular / Excessive Noise | • Blockage in air line | • Inspect plumbing and remove blockage | CALL SONIC |
| | • Leak in air line | • Repair leak | CALL SONIC |
| | • Inlet silencer damaged | • Replace filter / silencer | 6.C, 13B |
| | • Worn drive belt | • Replace belt | 5, 8.B |
| | • Bolts loose on blower / motor assembly | • Tighten bolts to proper torque specifications | 12 |
| | • Motor mounts loose | • Tighten bolts to proper torque specifications | 12 |
| | • Blower RPM too high | • Contact Sonic | CALL SONIC |
| | • Blower is receiving vibration from nearby equipment | • Install vibration isolators<br>• Relocate blower assembly | 3 |
| Belt Jumping Off | • ¾ inch gap not set | • Adjust belt gap to ¾” | 5, 8B |
| | • Pulleys misaligned | • Realign motor pulley<br>• Replace mounting bracket if damaged | 9 |
| | • Blower pulley wobbling | • Replace motor<br>• Replace motor bushing<br>• Replace motor pulley | 3, 7 |
| | • High motor torque | • Replace motor with low torque equivalent | CALL SONIC |
| | • Blower rotating backwards (Incorrect wiring) | • Reverse motor wiring | 7 |
| | • Belt not set in grooves properly | • Install belt correctly | 5, 8B |
| | • Wrong belt (Not Sonic approved) | • Install Sonic supplied belt | 5, 8B |

# 17. WARRANTY POLICY

Sonic Air Systems, Inc. (Sonic) team members are proud of our products and are committed to providing our customers with the highest quality, performance and on time shipment

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

Warranty Period:

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

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 damage resulting from the defect, removal, reinstallation, shipment, or otherwise.

Repairs Outside the Scope of the Warranty: Problems with Sonic products can result from faulty installation, misapplication, inadequate maintenance, non-Sonic additions or modifications, or other factors unrelated to Sonic design, workmanship or materials. If Sonic's inspection of the returned equipment or review of the Sonic equipment at the customer location reveals the failure is not due to defects in Sonic's 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:

- Sonic blower/motor units are routinely sold for use with a variety of inert and combustible gases, but as Sonic is unable to validate any actual operating conditions, Sonic's product warranty is null & void for use with any non-breathable air application.
- Motors shall be warranted under the respective manufacturer's policy
- Product with a tampered warranty seal
- Damage from fire, flood, theft, or vandalism
- Damage in return transit to Sonic resulting from improper packaging

- Sonic's determination that the product has been exposed and/or contaminated by any hazardous substances will result in Sonic refusing to accept the return and no inspection of the Sonic equipment will be conducted
- Operating the Sonic products in applications or environments which were not approved by Sonic in writing at the time of sale
- Damage resulting from installation or operational error
- Using non- Sonic supplied drive belts, filter elements, or other service items
- Blower heads not repaired by Sonic 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. SONIC LIABILITY IN ALL CASES WILL BE LIMITED TO THE REPLACEMENT PRICE OF ITS PRODUCT. AT NO TIME SHALL SONIC BE LIABLE FOR ANY COSTS TO THE BUYER FOR LABOR, TRANSPORTATION, EQUIPMENT DOWNTIME OR COSTS RESULTING FROM EQUIPMENT FAILURES BY SONIC OR OUR SUPPLIERS.