

# Maintenance

## ⚠ WARNING

### Hazardous Service Procedures!

Failure to follow all precautions in this manual and on the tags, stickers, and labels could result in death or serious injury.

Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, **MUST** follow precautions in this manual and on the tags, stickers, and labels, as well as the following instructions: Unless specified otherwise, disconnect all electrical power including remote disconnect and discharge all energy storing devices such as capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. When necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been trained in handling live electrical components perform these tasks.

## Fan Belt Adjustment - Belt Drive Units

## ⚠ WARNING

### Live Electrical Components!

Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury. When necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks.

## ⚠ WARNING

### Rotating Components!

Failure to follow all safety precautions below could result in rotating components cutting and slashing technician which could result in death or serious injury. During installation, testing, servicing and troubleshooting of this product it may be necessary to work with live and exposed rotating components. Have a qualified or licensed service individual who has been properly trained in handling exposed rotating components, perform these tasks.

The fan belts must be inspected periodically to assure proper unit operation.

Replacement is necessary if the belts appear frayed or worn. Units with dual belts require a matched set of belts to ensure equal belt length.

When removing or installing the new belts, do not stretch them over the sheaves. Loosen the belts using the belt tension adjustment bolts on the motor mounting base.

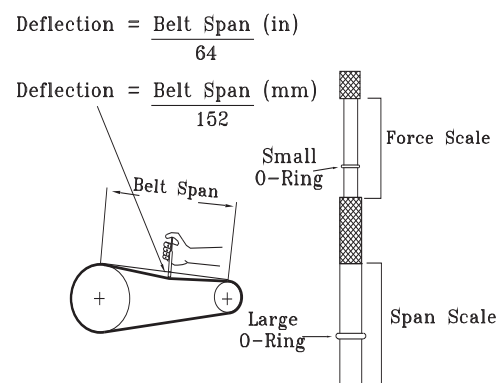
Once the new belts are installed, using a Browning or Gates tension gauge (or equivalent) illustrated in [Figure 73, p. 67](#), adjust the belt tension as follows;

- To determine the appropriate belt deflection;
  - Measure the center-to-center shaft distance (in inches) between the fan and motor sheaves.
  - Divide the distance measured in Step 1a by 64; the resulting value represents the amount of belt deflection that corresponds to the proper belt tension.
- Set the large O-ring on the belt tension gauge at the deflection value determined in Step 1b.
- Set the small O-ring at zero on the force scale of the gauge plunger.
- Place the large end of the gauge at the center of the belt span, then depress the gauge plunger until the large O-ring is even with the top of the next belt or even with a straightedge placed across the fan and motor sheaves. Refer to [Figure 73, p. 67](#).
- Remove the belt tension gauge. The small O-ring now indicates a number other than zero on the plunger's force scale. This number represents the force (in pounds) required to give the needed deflection.
- Compare the "force" scale reading ([Step 5](#)) with the appropriate "force" value listed in [Table 23, p. 68](#). If the "force" reading is outside the range, readjust the belt tension.

**Note:** Actual belt deflection "force" must not exceed the maximum "force" value shown in [Figure 73, p. 67](#).

- Recheck the belt tension at least twice during the first 2 to 3 days of operation. Belt tension may decrease until the new belts are "run in".

**Figure 73. Belt tension gauge**



## Maintenance

**Table 23. Belt tension measurement and deflection**

| Belts Cross Section | Small P.D Range | Deflection Force (Lbs.) |       |           |        |                       |       |
|---------------------|-----------------|-------------------------|-------|-----------|--------|-----------------------|-------|
|                     |                 | Super Gripbelts         |       | Gripnotch |        | Steel Cable Gripbelts |       |
|                     |                 | Min.                    | Max.  | Min.      | Max.   | Min.                  | Max   |
| A                   | 3.0 - 3.6       | 3                       | 4 1/2 | 3 7/8     | 5 1/2  | 3 1/4                 | 4     |
|                     | 3.8 - 4.8       | 3 1/2                   | 5     | 4 1/2     | 6 1/4  | 3 3/4                 | 4 3/4 |
|                     | 5.0 - 7.0       | 4                       | 5 1/2 | 5         | 6 7/8  | 4 1/4                 | 5 1/4 |
| B                   | 3.4 - 4.2       | 4                       | 5 1/2 | 5 3/4     | 8      | 4 1/2                 | 5 1/2 |
|                     | 4.4 - 5.6       | 5 1/8                   | 7 1/8 | 6 1/2     | 9 1/8  | 5 3/4                 | 7 1/4 |
|                     | 5.8 - 8.8       | 6 3/8                   | 8 3/4 | 7 3/8     | 10 1/8 | 7                     | 8 3/4 |

## Monthly Maintenance

### WARNING

#### **Hazardous Voltage!**

**Failure to disconnect power before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized.**

Before completing the following checks, turn the unit OFF and lock the main power disconnect switch open.

### Filters

Inspect the return air filters. Clean or replace them if necessary. If included, leave filter removal tool in unit. Refer to the unit Service Facts for filter information.

### Return Air Smoke Detector Maintenance

Airflow through the unit is affected by the amount of dirt and debris accumulated on the indoor coil and filters. To insure that airflow through the unit is adequate for proper sampling by the return air smoke detector, complete adherence to the maintenance procedures, including recommended intervals between filter changes, and coil cleaning is required.

Periodic checks and maintenance procedures must be performed on the smoke detector to insure that it will function properly. For detailed instructions concerning these checks and procedures, refer to the appropriate section(s) of the smoke detector Installation and Maintenance Instructions provided with the literature package for this unit.

### Condensate Overflow Switch

During maintenance, the switch float (black ring) must be checked to ensure free movement up and down.

### Cooling Season

- Check the unit's drain pans and condensate piping to ensure that there are no blockages.

- Inspect the evaporator and condenser coils for dirt, bent fins, etc. If the coils appear dirty, clean them according to the instructions described in "Coil Cleaning" later in this section.
- Manually rotate the condenser fan(s) to ensure free movement and check motor bearings for wear. Verify that all of the fan mounting hardware is tight.
- Inspect the F/A-R/A damper hinges and pins to ensure that all moving parts are securely mounted. Keep the blades clean as necessary.
- Verify that all damper linkages move freely; lubricate with white grease, if necessary.
- Check supply fan motor bearings; repair or replace the motor as necessary.
- Check the fan shaft bearings for wear. Replace the bearings as necessary.
- Check the supply fan belt. If the belt is frayed or worn, replace it. Refer to the "Fan Belt Adjustment" section for belt replacement and adjustments.
- Verify that all wire terminal connections are tight.
- Remove any corrosion present on the exterior surfaces of the unit and repaint these areas.
- Generally inspect the unit for unusual conditions (e.g., loose access panels, leaking piping connections, etc.)
- Make sure that all retaining screws are reinstalled in the unit access panels once these checks are complete.
- With the unit running, check and record the: ambient temperature; compressor suction and discharge pressures (each circuit); superheat (each circuit);
- Record this data on an "operator's maintenance log" like the one shown in [Table 24, p. 70](#). If the operating pressures indicate a refrigerant shortage, measure the system superheat. For guidelines, refer to the "Compressor Start-Up" section.

**Important:** *Do not release refrigerant to the atmosphere! If adding or removing refrigerant is required, the service technician must comply with all federal, state and local laws.*

### Heating Season

- Inspect the unit's air filters. If necessary, clean or replace them.
- Check supply fan motor bearings; repair or replace the motor as necessary.
- Inspect both the main unit control panel and heat section control box for loose electrical components and terminal connections, as well as damaged wire insulation. Make any necessary repairs.
- Clean burner area, verify gas heat system operates properly.

## Coil Cleaning

Regular coil maintenance, including annual cleaning, enhances the unit's operating efficiency by minimizing: compressor head pressure and amperage draw, evaporator water carryover, fan brake horsepower due to increase static pressure losses, airflow reduction.

At least once each year, or more often if the unit is located in a "dirty" environment, clean the evaporator and condenser coils using the instructions outlined below. Be sure to follow these instructions as closely as possible to avoid damaging the coils.

**Note:** For units equipped with hail guards follow removal procedure listed below.

### Hail Guard Removal

- Unlatch hail guard.
- Pull the top of the hail guard outward until the fastener studs are free of the retaining nuts.
- Lift the hail guard from the lower retaining bracket and set aside.

### Microchannel (MCHE) Coils

#### NOTICE:

#### Coil Damage!

Failure to follow instructions below could result in coil damage. **DO NOT** use any detergents with microchannel condenser coils. Use pressurized water or air **ONLY**, with pressure no greater than 600psi.

For additional information regarding the proper microchannel coil cleaning procedure, refer to service bulletin RT-SVB83\*-EN.

Due to the soft material and thin walls of the MCHE coils, the traditional field maintenance method recommended for Round Tube Plate Fin (RTPF) coils does not apply to microchannel coils.

Moreover, chemical cleaners are a risk factor to MCHE due to the material of the coil. The manufacturer does not recommend the use of chemical cleaners to clean microchannel coils. Using chemical cleaners could lead to warranty claims being further evaluated for validity and failure analysis.

The recommended cleaning method for microchannel condenser coils is pressurized water or air with a non-pinpoint nozzle and an ECU of at least 180 with pressure no greater than 600 psi. To minimize the risk of coil damage, approach the cleaning of the coil with the pressure washer aimed perpendicular to the face of the coil during cleaning.

**Note:** For more details on Microchannel coil cleaning, please refer to bulletin RT-SVB83\*-EN.

## Round Tube Plate Fin (RTPF) Coils

To clean refrigerant coils, use a soft brush and a sprayer (either a garden pump-up type or a high-pressure sprayer). A high-quality detergent is also required; suggested brands include "SPREX A.C.", "OAKITE 161", "OAKITE 166" and "COILOX". If the detergent selected is strongly alkaline (ph value exceeds 8.5), add an inhibitor.

#### ⚠ WARNING

#### Hazardous Chemicals!

Failure to follow all safety instructions below could result in death or serious injury. Coil cleaning agents can be either acidic or highly alkaline and can burn severely if contact with skin occurs. Handle chemical carefully and avoid contact with skin. **ALWAYS** wear Personal Protective Equipment (PPE) including goggles or face shield, chemical resistant gloves, boots, apron or suit as required. For personal safety refer to the cleaning agent manufacturer's Materials Safety Data Sheet and follow all recommended safe handling practices.

1. Remove enough panels from the unit to gain access to the coil.
2. Protect all electrical devices such as motors and controllers from any over spray.
3. Straighten any bent coil fins with a fin comb.

#### ⚠ WARNING

#### Hazardous Pressures!

Failure to follow safety precautions below could result in coil bursting, which could result in death or serious injury. Coils contain refrigerant under pressure. When cleaning coils, maintain coil cleaning solution temperature under 150°F to avoid excessive pressure in the coil.

4. Mix the detergent with water according to the manufacturer's instructions. If desired, heat the solution **BUT DO NOT EXCEED 150°F** maximum to improve its cleansing capability.
5. Pour the cleaning solution into the sprayer. If a high-pressure sprayer is used:
  - a. do not allow sprayer pressure to exceed 600 psi.
  - b. the minimum nozzle spray angle is 15 degrees.
  - c. maintain a minimum clearance of 6" between the sprayer nozzle and the coil.
  - d. spray the solution perpendicular (at 90 degrees) to the coil face.
6. Spray the leaving-airflow side of the coil first; then spray the opposite side of the coil. Allow the cleaning solution to stand on the coil for five minutes.
7. Rinse both sides of the coil with cool, clean water.

## Maintenance

8. Inspect both sides of the coil; if it still appears to be dirty, repeat [Step 6](#) and [Step 7](#).
9. Reinstall all of the components and panels removed in [Step 1](#) and any protective covers installed in [Step 2](#).

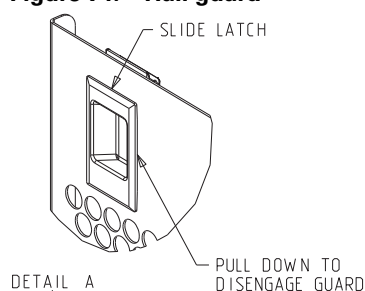
**Note:** For units equipped with hail guards follow reinstallation procedure listed below.

### Hail Guard Reinstallation

10. To reinstall the hail guard, locate the bottom of the hail guard in the lower bracket and secure it to the upper unit bracket with the attached fasteners.

**Note:** Secure hail guard latches.

**Figure 74. Hail guard**



11. Restore the unit to its operational status and check system operation.

## Annual Maintenance

- Clean and repaint any corroded surface.

## Final Process

For future reference, you may find it helpful to record the unit data requested in the blanks provided.

Complete Model Number: \_\_\_\_\_

Unit Serial Number: \_\_\_\_\_

Wiring Diagram Numbers  
(from unit control panel): \_\_\_\_\_

Connections: \_\_\_\_\_

Schematics: \_\_\_\_\_

**Table 24. Sample maintenance log**

| Date | Current Ambient Temp. F/C | Refrigerant Circuit #1 |                       |                        |                        |                |               | Refrigerant Circuit #2 |                       |                        |                        |                |               |
|------|---------------------------|------------------------|-----------------------|------------------------|------------------------|----------------|---------------|------------------------|-----------------------|------------------------|------------------------|----------------|---------------|
|      |                           | Compr. Oil Level       | Suct. Press. Psig/kPa | Disch. Press. Psig/kPa | Liquid Press. Psig/kPa | Super-heat F/C | Sub-cool. F/C | Compr. Oil Level       | Suct. Press. Psig/kPa | Disch. Press. Psig/kPa | Liquid Press. Psig/kPa | Super-heat F/C | Sub-cool. F/C |
|      |                           | - ok<br>- low          |                       |                        |                        |                |               | - ok<br>- low          |                       |                        |                        |                |               |
|      |                           | - ok<br>- low          |                       |                        |                        |                |               | - ok<br>- low          |                       |                        |                        |                |               |
|      |                           | - ok<br>- low          |                       |                        |                        |                |               | - ok<br>- low          |                       |                        |                        |                |               |
|      |                           | - ok<br>- low          |                       |                        |                        |                |               | - ok<br>- low          |                       |                        |                        |                |               |
|      |                           | - ok<br>- low          |                       |                        |                        |                |               | - ok<br>- low          |                       |                        |                        |                |               |

**Note:** Check and record the data requested above each month during the cooling season with the unit running.