

# Installation Instructions

Fan Coil Units

FG3A

**NOTE:** Read the entire instruction manual before starting the installation.

This symbol → indicates a change since the last issue.

## SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause personal injury or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and National Electrical Code (NEC) for special requirements.

It is important to recognize safety information. This is the safety-alert symbol . When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **would** result in minor personal injury or product and property damage.

→ NOTE is used to highlight suggestions which will result in enhanced installation, reliability, or operation.

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 **WARNING:** Before performing service or maintenance operations on system, turn off main power switches to indoor unit and outdoor unit to avoid possible personal injury or death.

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## INTRODUCTION

The FG3A Fan Coil Unit is designed for horizontal configuration in light commercial applications. It is available in sizes 024, 036, 048, and 060. See Product Data literature for available accessory kits.

## INSTALLATION

Optional Equipment:

1. Two-row, hot-water heating coil.
2. Thermostatic-expansion valve (for replacing refrigerant flow-control device, if desired).

### PROCEDURE 1—INSPECT EQUIPMENT

File claim with shipper if shipment is damaged or incomplete. Move unit to installation location. Before operating unit, remove the 2 red shipping bolts and steel spacers from blower rails (located in rails midway between rubber-blower mountings).

### PROCEDURE 2—MOUNT FAN COIL

1. Suspend unit, or support it from floor. Four 3/8–16 weld nuts are provided on top of unit for suspension by 3/8–16 threaded suspension rods.
2. Be careful that suspension rods are located so they do not block access panels, nor interfere with electrical, mechanical, or drain functions of unit. Unit must be level within 1/8 in. in all directions for proper condensate disposal.

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 **WARNING:** Before suspending unit, determine whether unit weight can be safely supported by the floor joists, rafters, ceiling, etc., to which suspended unit is connected, or possible personal injury and damage may result.

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### PROCEDURE 3—AIR DUCTS

Connect supply and return air duct over outside of flange provided. Secure duct to flange, using proper fasteners for type of duct used and tape duct-to-unit joint.

Use of flexible connectors between ductwork and unit will prevent transmission of vibration. Ductwork passing through unconditioned space must be insulated and covered with vapor barrier.

## Ductwork Acoustical Treatment

Metal duct systems that do not have one 90° elbow and 10 ft of main duct to first branch takeoff may require internal, acoustical-insulation lining. Line the inside of plenum, branch runs, and main duct with acoustical insulation in accordance with the latest edition of Sheet Metal and Air Conditioning Contractors National Association (SMACNA) application standard for duct liner. Duct liners should be UL-classified batts and blankets with a fire-hazard classification working of FHC-25/50 or less. Ensure main-duct lining is extended 6 to 8 ft down the duct from the plenum.

As an alternative to above, fibrous ductwork may be used if constructed and installed in accordance with the latest edition of SMACNA construction standard on fibrous-glass ducts. Both acoustical lining and fibrous ductwork shall comply with the National Fire Protection Association as tested in accordance with UL Standard 181 for Class I air ducts.

## PROCEDURE 4—INSTALL CONDENSATE DRAIN

Condensate drain must consist of a minimum of 7/8-in. OD copper tubing or 3/4-in. galvanized-iron pipe or PVC-type plastic pipe. Be sure drain pitches downward at a slope of 1 in. to every 10 ft.

Install a 3- to 4-in. trap in condensate line as close to unit as possible. Make sure top of trap is level beneath connection to unit to prevent condensate from overflowing the drain pan. There are two condensate drain connections provided. Ensure that unused connection is plugged.

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**⚠ CAUTION:** If unit is located above a living space, or where damage can result from condensate overflow, install watertight pan of corrosion-resistant metal beneath unit to catch any overflow due to clogged drains or other reasons. A separate 3/4-in. condensate drain must be provided for this added pan.

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**NOTE:** Be sure to consult local codes for additional precautions before installing condensate drain.

## PROCEDURE 5—INSTALL REFRIGERANT LINES

Connect refrigerant lines to refrigerant-line connections. See Fig. 1 and Table 1 for line-connection sizes, type, and location. Tubing must be refrigerant grade and must be clean, undamaged, and uncontaminated. Tubing and indoor coil should be evacuated prior to charging system.

## PROCEDURE 6—MAKE ELECTRICAL CONNECTIONS

See Fig. 2 for diagram of internal wiring for blower-coil assembly. The standard 4-in. junction box is mounted on refrigerant-connection side of unit. All leads pass through strain relief where they enter control box. Wiring inside cabinet is located so it does not come in contact with moving parts or sharp edges.

→ **⚠ WARNING:** According to NEC, ANSI/NFPA 70, and local codes, the cabinet must have an uninterrupted or unbroken ground, to minimize personal injury if an electrical fault should occur. The ground may consist of electrical wire or metal conduit when installed in accordance with existing electrical codes. Use UL-listed conduit and conduit connector for connecting supply wires to unit to obtain proper grounding. If the conduit connection uses reducing washers, a separate ground wire must be used. Grounding may also be accomplished by using grounding lugs provided in control box. Failure to follow this warning could result in electrical shock, fire, or death.

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## Install Fan Control-Center Relay:

Part No. P211-4014 transformer-and-relay kit fits 4-in. junction box. Refer to circuit-diagram label affixed to part.

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**⚠ CAUTION:** Be sure to check unit-rating plate for correct line voltage before making electrical connections. Voltage to unit must be within +/- 10 percent of voltage indicated on nameplate. Contact local power company for correction of improper line voltage. Operation of unit on improper line voltage constitutes abuse and could affect warranty.

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## 24-Volt Control-System Connections:

Refer to unit-wiring instructions for recommended wiring procedures. (See Fig. 2.) Use No. 18 AWG color-coded, insulated (35°C minimum) wire to make low-voltage connections between thermostat and unit. If the thermostat is located more than 100 ft from unit (as measured along low-voltage wire), use No. 16 AWG color-coded, insulated (35°C minimum) wire.

**NOTE:** Where local codes require thermostat wiring be routed through conduit or raceways, splices can be made inside fan-coil unit. All wiring must be NEC Class 1 and must be separated from incoming power leads.

## Branch Disconnect:

Install branch-circuit disconnect(s) (60 Hz per NEC) of adequate size to handle unit current. Locate disconnect switch(es) within sight and readily accessible from unit (60 Hz per Section 440-14 of NEC).

**IMPORTANT:** Remove red-headed shipping bolts at blower base and blower outlet before operating unit.

## START-UP

Before starting unit, check the following:

1. Unit is mounted securely to floor- or ceiling-support rods.
2. Unit is properly leveled to permit condensate drainage.
3. Ductwork connections are secure.
4. Coil connections are leak-tight.
5. Condensate drain pan and plug connection are secure and leak-tight.

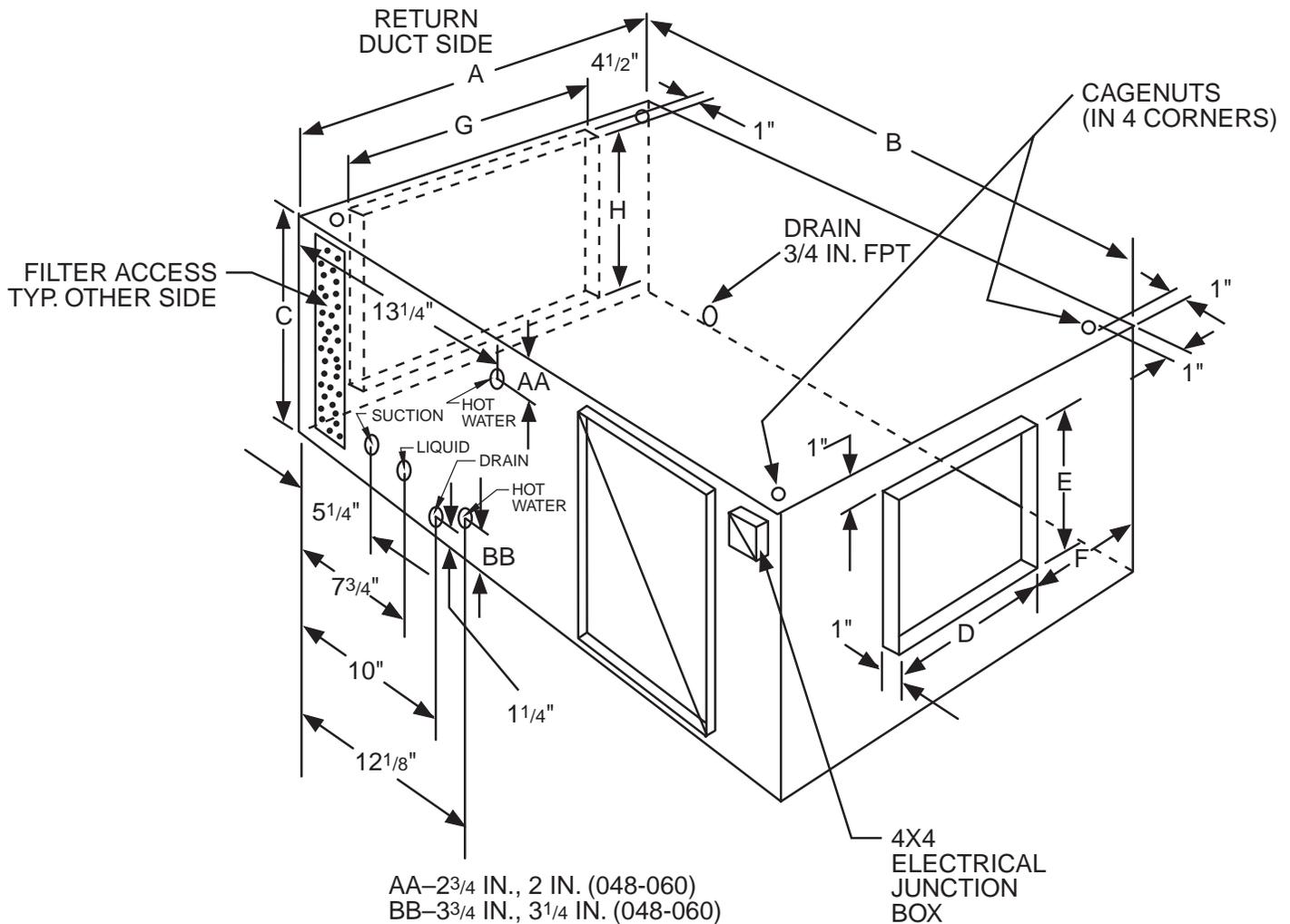


Fig. 1—FG3A Dimensional Drawing

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6. Electrical connections are secure at terminals.
7. Filters and unit panels are in place.

**NOTE:** Save all wiring diagrams and instructions that come with controls for future reference.

#### HOT-WATER COIL INSTALLATION INSTRUCTIONS (IN REHEAT POSITION)

1. Remove access panel from both sides of unit cabinet. (See Fig. 3.)
2. Remove knockouts for hot-water coil stubouts. Coils stub out the cabinet for left-hand connections (facing airflow) when installed in unit.
3. Remove 2 galvanized strips from hot-water coil package. Install angle strip with notches resting in drain pan, and 1/2-in. flange pointing toward blower. Secure this angle strip to end plate of cooling coil with clips supplied in package. (See Fig. 4.) Place clips at each end of strip as close as possible to flange.
4. Install other angle strip at top of cooling coil, with 1/2-in. flange resting on top of cooling coil, pointing to rear of unit. Place clip as high as possible on this strip. Secure it to end plate of cooling coil. Metal strips prevent air from bypassing heating coil and serve as support for coil.
5. After strips are secured, install coil inside unit through access door opposite side where connections stub out. Raise coil slightly above drain pan and line up stubouts with knockout holes in cabinet. When stubouts are extended through holes, hot-water coil should rest on flange of bottom-angle strip with hot-water coil and cooling-coil end plates lined up evenly.
6. Secure hot-water coil to cooling coil by fastening 2 clips over cooling-coil and hot-water-coil end plates. (See Fig. 5.)

**NOTE:** When used in reheat position, install a freeze-stat in system to prevent freeze-up.

Table 1—FG3A Physical Data — Dimensions (In.)

MODEL FG3A	024	036	048	060
<b>ELECTRICAL (50-60 Hz)</b>				
Volts-Ph-Hz	115-1-60			
	220-1-50			
<b>BLOWER MOTOR</b>				
Amp - 60 Hz Amp - 50 Hz	4.8	6.2	8.9	
	2.5	3.4	4.0	
NOMINAL CAPACITY (Btuh)	24,000	36,000	48,000	60,000
OPERATING WEIGHT (Lb)	143	172	204	235
<b>DIMENSIONS</b>				
Length A	27	36-1/2	38	45
Width B	37		39	42
Height C	18		22	
<b>BLOWER OUTLET</b>				
D	14	15	16	18
E	14	15	16	18
<b>RETURN DUCT</b>				
F	6-1/2	10-3/4	11	13-1/2
G	18	27-1/2	29	36
H	16		20	
<b>COOLING COIL</b>				
3/8-in. OD Copper Tube				
Rows	3			
Fins/In.	13			
Area (Sq ft)	2.00	3.05	4.03	5.00
Face (In.)	16 X 18	16 X 27-1/2	20 X 29	20 X 36
<b>HOT-WATER COIL</b>				
1/2-in. OD Copper Tube				
Rows	2			
Fins/In.	10			
Area (Sq ft)	1.56	2.38	3.52	4.37
Face (In.)	12-1/2 X 18	12-1/2 X 27-1/2	17-1/2 X 29	17-1/2 X 36
CONNECTIONS (OD)	5/8	7/8	7/8	1-1/8
FILTER DIMENSIONS	16 X 25		16 X 20 (2)	20 X 20 (2)
	2-in. Thick			
REFRIGERANT	R-22			
PISTON	59	70	84	90
<b>CONNECTION (OD)</b>				
Liquid (Flare)	3/8			
Suction (Sweat)	3/4		7/8	1-1/8

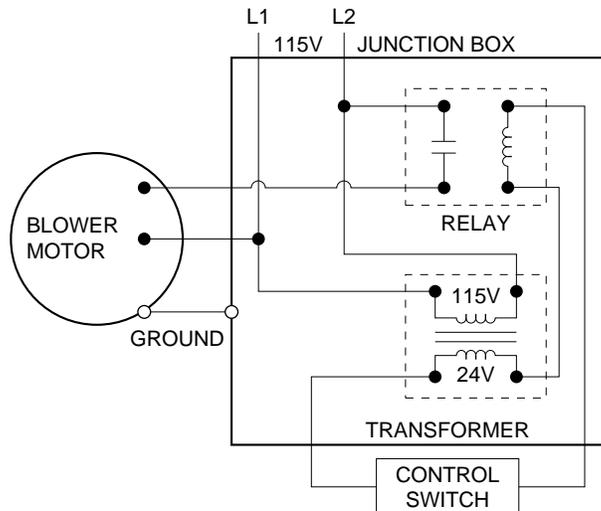
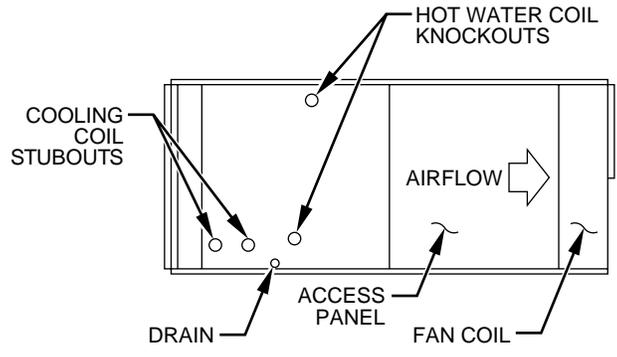
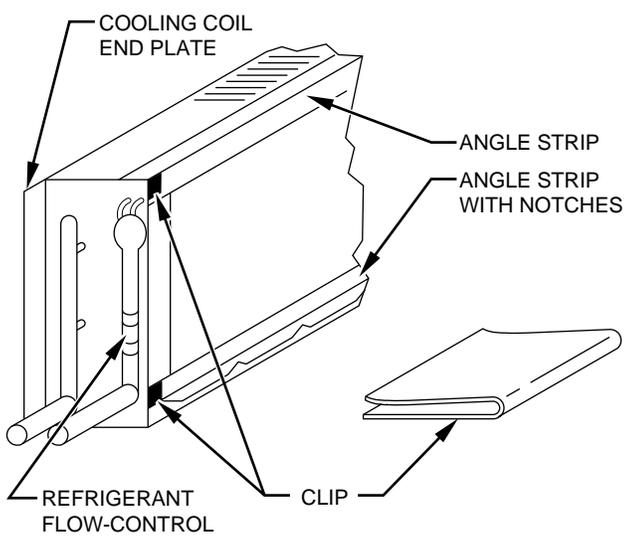


Fig. 2—Typical Wiring Diagram



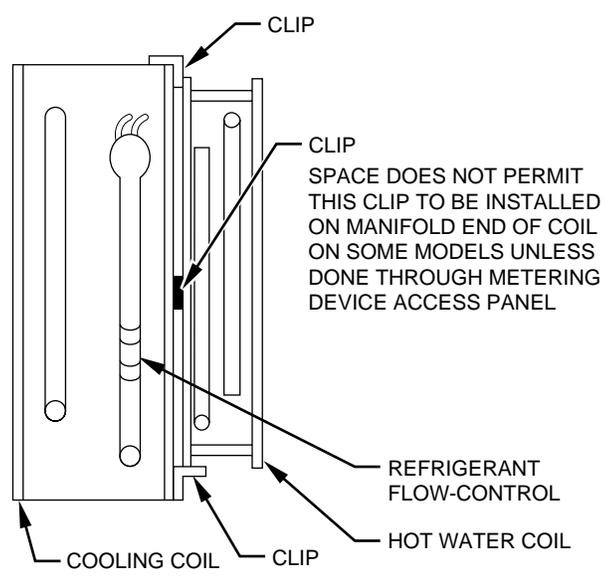
**Fig. 3—Unit Cabinet**

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**Fig. 4—Installing Angle Strips**

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**Fig. 5—Securing Hot-Water Coil**

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**Table 2—Hot-Water Coil Dimensions (In.)**

MODEL	HOT WATER COIL PART NO.	OVERALL WIDTH	OVERALL HEIGHT	OVERALL LENGTH*	FINNED WIDTH	FINNED HEIGHT	FINNED LENGTH	HEADER OD	UNIT STUBOUT†	WT (LB)
FG3AAA/ASA024	KFCHW2401HWC	3-11/16	13-5/8	19-1/2	2-3/16	12-1/2	18	5/8	9	13
FG3AAA/ASA036	KFCHW3601HWC			29			27-1/2	7/8		16
FG3AAA/ASA048	KFCHW4801HWC		17-7/8	30-1/2		17-1/2	29	8-1/4	25	
FG3AAA/ASA060	KFCHW6001HWC			37-1/2			36		1-1/8	28

\*Does not include headers or stubouts. Ten fins/in. waffle fins and 1/2-in. tube on all models. 1/4-in. vent with cap 12 in. long.

†Distance from coil-tube sheet to end of stub tube.

### CARE AND MAINTENANCE

#### EACH MONTH:

1. Remove unit-access panel(s) for cleaning, lubrication, and parts replacement.
2. Inspect unit air filters. Clean or replace as necessary.
3. Check drain pan to be sure it is clean and free to carry flow of condensate through drain lines.
4. Check fan belt for wear and alignment. Replace or adjust as required.

**⚠ WARNING: Disconnect electrical power to all circuits before servicing unit. Failure to do so may result in personal injury from electrical shock or moving parts.**

#### EACH YEAR:

1. Oil blower motor.
2. Inspect unit casing for chips or corrosion. Clean or repair to protect unit.
3. Inspect blower motor, wheel, and housing for cleanliness and damage. Rotate fan wheel manually to be sure no obstructions block its movement.
4. Check motor pulley and blower pulley for alignment. Check setscrews. Adjust or tighten as necessary.
5. Check cooling coil, drain pan, and condensate drain at all connections for leaks. Inspect for excessive dirt or damage. Remove dirt and repair fins.
6. Clean and tighten all electrical connections. Check controls for proper operation. Service as necessary.

**⚠ WARNING: As with any mechanical equipment, personal injury can result from sharp metal edges, etc.; therefore, be careful when moving parts.**

#### PROCEDURE 1—RETURN-AIR FILTER

To clean or replace air filter, remove screws and filter-access door. Slide out filter and, for washable-type filters, clean with hot, soapy water. Rinse clean and let dry.

New filters are available from a local dealer. Place filter in slot with filter arrow facing in direction of airflow. Replace filter-access door with screws previously removed.

**⚠ CAUTION: Never operate unit without a filter or with filter-access door removed. Damage to blower motor may result.**

#### PROCEDURE 2—COIL, DRAIN PAN, AND CONDENSATE DRAIN

**⚠ WARNING: Disconnect electrical power before removing any access panels, or electrical shock may result.**

The coil is easily cleaned when dry. To check or clean coil, remove coil-access panel. If coil is coated with dirt or lint, vacuum with a soft-brush attachment.

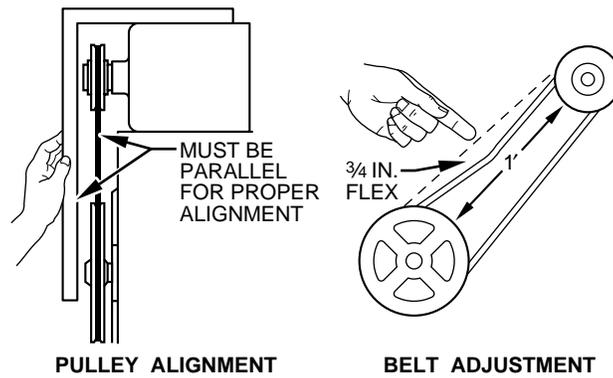
Be careful not to bend fins. If coil is coated with oil or grease, it may be cleaned with mild detergent and water solution. Rinse coil with clean water. Be careful not to splash water on insulation or filter.

Check drain pan and condensate drain at the same time cooling coil is checked. Clean drain pan and condensate drain by removing any foreign matter from pan. Check for rust and holes. Flush pan and drain tube with clear water. If drain is restricted, clean with high-pressure water. If this does not work, use a plumber's snake or similar probe device. Re-pitch drain to promote proper drainage.

**NOTE:** The following steps should be performed by a qualified service person.

#### PROCEDURE 3—PULLEY AND BELTS

Check belt tension and pulley alignment. (See Fig. 6.) Belt tension is adjusted by the motor tailpiece bolt. A deflection of about 3/4- to 1-in. per ft of span should be obtained by pressing the belt firmly. Lock adjusting bolt in position after adjustment is made. Align pulley grooves by locating motor pulley on motor shaft, or by moving entire motor along motor-mounting bracket. Adjust blower speed by loosening setscrew in outer (moveable) pulley face and turning this face (half or full turns, so that adjusting setscrew is positioned precisely over the flat on pulley hub). Speed is reduced by adjusting pulley faces so they are further apart; speed is increased with faces closer together. Check pulley setscrews and bolts.



**Fig. 6—Checking Pulley Alignment and Tightness**

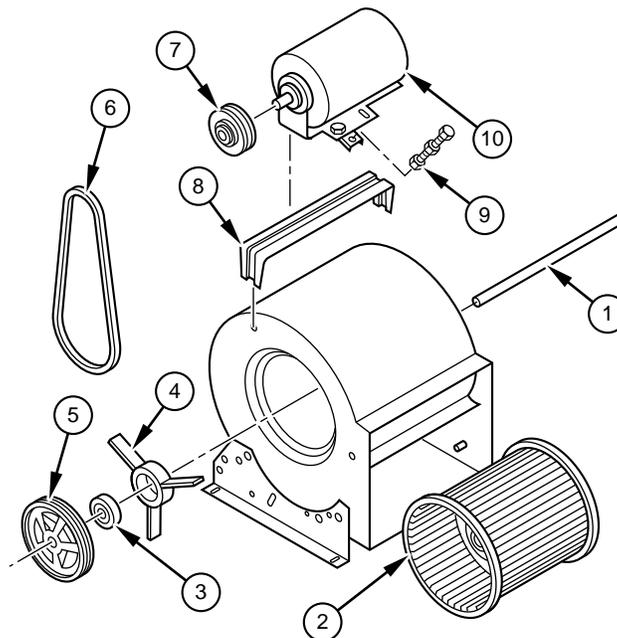
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**PROCEDURE 4—MOTOR**

Bearing oilers are provided on blower motor. Use electric-motor oil or SAE 10 or 20 nondetergent oil. Check motor-mount bracket and base bolts. Tighten as required.

**PROCEDURE 5—BLOWER**

Check bearings for wear. Ball bearings are self-aligning and grease-packed. Replace as required. Check thrust collars for end play and alignment of wheel. Check blades for accumulation of dirt. Clean as required. Check mounting brackets, base bolts, and isolation material. (See Fig. 7.)



**DRIVE COMPONENTS**

- |                     |                            |
|---------------------|----------------------------|
| 1 – BLOWER SHAFT    | 6 – V-BELT                 |
| 2 – BLOWER WHEEL    | 7 – MOTOR PULLEY           |
| 3 – BEARING         | 8 – MOTOR MOUNTING BRACKET |
| 4 – BEARING BRACKET | 9 – BELT ADJUSTING BOLT    |
| 5 – BLOWER PULLEY   | 10 – MOTOR                 |

**Fig. 7—Blower Assembly**

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**PROCEDURE 6—LEAKING SWEAT CONNECTION**

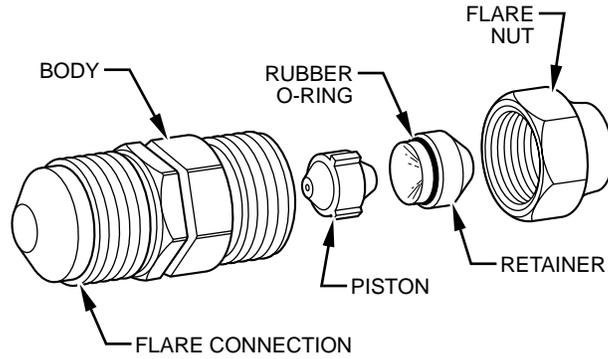
Pumpdown system refrigerant to outdoor unit. Close outdoor unit-service valves and recover refrigerant pressure in tubing and coil. Clean and flux area around leak and apply low-temperature (430°F/221°C) solder.

Evacuate or purge evaporator oil and tubing system. Add refrigerant charge (see charging instructions in outdoor unit Installation Instructions).

**PROCEDURE 7—SERVICING OF REFRIGERANT FLOW-CONTROL DEVICE (BYPASS-TYPE)**

See Fig. 8 for bypass-type, refrigerant-flow-control device components. The piston has a refrigerant-metering orifice through it. The retainer forms a stop for the piston in the refrigerant-bypass mode and sealing surface for liquid-line flare connection. To check, clean, or replace piston:

1. Pumpdown system refrigerant to outdoor unit. Close outdoor unit service valves and recover pressure in tubing and coil.



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**Fig. 8—Refrigerant Flow-Control Device Components (Bypass-Type)**

2. Turn off power to unit.
3. Remove coil liquid-line flare connection from refrigerant flow-control device.
4. Pull retainer out of body, being careful not to scratch flare-sealing surface. If retainer does not pull out easily, carefully use locking pliers to remove retainers. (If retainer flare seat is damaged, replace with new retainer.)
5. Slide piston out by inserting a small, soft wire through metering orifice. Ensure metering orifice-sealing surface around piston cones and fluted portion of piston are not damaged.
6. Clean piston refrigerant-metering orifice or replace piston as required. Replacement pistons are available from parts center.
7. Replace retainer O-ring on retainer before reassembling refrigerant flow-control device.

## SERVICE TRAINING

**Packaged Service Training** programs are an excellent way to increase your knowledge of the equipment discussed in this manual, including:

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- Maintenance
- Installation Overview
- Operating Sequence

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