

INSTALLATION INSTRUCTIONS

MODELS

WERV-A5A

WERV-C5A

WALL MOUNT ENERGY RECOVERY VENTILATORS WITH EXHAUST

**FOR USE WITH BARD 3-1/2 THRU 5 TON
WALL MOUNT AIR CONDITIONERS
AND HEAT PUMPS**

DATE: 02-08-96

MANUAL 2100-236 REV. B
SUPERSEDES REV. A
FILE VOL. III, TAB 19

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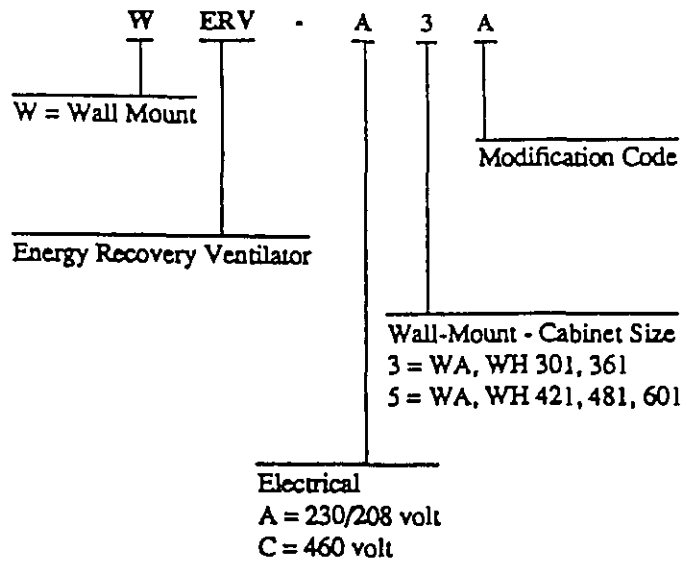
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Manufactured under the following U.S. patent numbers:
 5,301,744; 5,002,116; 4,924,934; 4,875,520; 4,825,936; 4,432,409.
 Other patents pending.

MODEL NOMENCLATURE LEGEND



ELECTRICAL SPECIFICATIONS

Model	Voltage	Amps	Control Voltage
WERV-A3A	230/208	2.2	24V
WERV-C3A	460	1.2	24V
WERV-A5A	230/208	2.2	24V
WERV-C5A	460	1.2	24V

GENERAL DESCRIPTION

The Wall Mount Energy Recovery Ventilator was designed to provide energy efficient, cost effective ventilation to meet I.A.Q. (Indoor Air Quality) requirements while still maintaining good indoor comfort and humidity control for a variety of applications such as schools, classrooms, lounges, conference rooms, beauty salons and others. It provides a constant supply of fresh air for control of airborne pollutants including CO₂, smoke, radon, formaldehyde, excess moisture, virus and bacteria.

The ventilator incorporates patented rotary heat exchange state-of-the-art technology to remove both heat and moisture.

It is designed as a single package which can be easily factory or field installed for new installations or retrofit to the new Bard WA and WH series wall mounted units. The package consists of a unique rotary Energy Recovery Cassette that can be easily removed for cleaning or maintenance. It has two 13 inch diameter heat transfer wheels for efficient heat transfer. The heat transfer wheels use a permanently bonded dry desiccant coating for total heat recovery.

Ventilation is accomplished with (2) blower/motor assemblies each consisting of a drive motor and dual blowers for maximum ventilation at low sound levels. Air is exhausted at the same rate that fresh air is brought into the structure thus not pressuring the building. The rotating energy wheels provides the heat transfer effectively during both summer and winter conditions. Provides required ventilation to meet the requirements of ASHRAE 62-1989 standard.

NOTE: Operation is not recommended below 5 degrees F outdoor temperature because freezing of moisture in the heat transfer wheel can occur.

PERFORMANCE & APPLICATION DATA

Summer Cooling Performance
(Indoor Design Conditions 75°DB/62°WB)

Ambient O.D.	VENTILATION RATE -- 450 CFM 65% Efficiency						VENTILATION RATE -- 375 CFM 66% Efficiency						VENTILATION RATE -- 300 CFM 67% Efficiency						
	DB/WB°F	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL	VLT	VLS	VLL	HRT	HRS	HRL
105	75	21465		6884	13952		4475	17887		5737	11805		3786	14310		4590	9587		3075
	70	14580	14580	0	9477	9477	0	12150	12150	0	8018	8018	0	9720	9720	0	6512	6512	0
	65	14580		0	9477		0	12150		0	8018		0	9720		0	6512		0
100	80	31590		19440	20533		12635	26325		16200	17374		10692	21060		12960	14110		8683
	75	21465		9314	13952		6054	17887		7762	11805		5123	14310		6210	9587		4160
	70	12352	12150	202	8029	7897	131	10293	10125	168	6793	6682	111	8235	8100	135	5517	5427	90
	65	12150		0	7897		0	10125		0	6682		0	8100		0	5427		0
	60	12150		0	7897		0	10125		0	6682		0	8100		0	5427		0
95	80	31590		21870	20533		14215	26325		18225	17374		12028	21060		14580	14110		9768
	75	21465		11744	13952		7634	17887		9787	11805		6459	14310		7830	9587		5246
	70	12352	9720	2632	8029	6318	1711	10293	8100	2193	6793	5345	1447	8235	6480	1755	5517	4341	1175
	65	9720		0	6318		0	8100		0	5345		0	6480		0	4341		0
	60	9720		0	6318		0	8100		0	5345		0	6480		0	4341		0
90	80	31590		24300	20533		15794	26325		20250	17374		13365	21060		16200	14110		10854
	75	21465		14175	13952		9213	17887		11812	11805		7796	14310		9450	9587		6331
	70	12352	7290	5062	8029	4738	3290	10293	6075	4218	6793	4009	2784	8235	4860	3375	5517	3256	2261
	65	7290		0	4738		0	6075		0	4009		0	4860		0	3256		0
	60	7290		0	4738		0	6075		0	4009		0	4860		0	3256		0
85	80	31590		26730	20533		17374	26325		22275	17374		14701	21060		17820	14110		11939
	75	21465		16605	13952		10793	17887		13837	11805		9132	14310		11070	9587		7416
	70	12352	4860	7492	8029	3159	4870	10293	4050	6243	6793	2672	4120	8235	3240	4995	5517	2170	3346
	65	4860		0	3159		0	4050		0	2672		0	3240		0	2170		0
	60	4860		0	3159		0	4050		0	2672		0	3240		0	2170		0
80	75	21465		19035	13952		12372	17887		15862	11805		10469	14310		12690	9587		8502
	70	12352	2430	9922	8029	1579	6449	10293	2025	8268	6793	1336	5457	8235	1620	6615	5517	1085	4432
	65	4252		1822	2764		1184	3543		1518	2338		1002	2835		1215	1899		814
	60	2430		0	1579		0	2025		0	1336		0	1620		0	1085		0
	70	12352		12352	8029		8029	10293		10293	6793		6793	8235		8235	5517		5517
75	65	4252	0	4252	2764	0	2764	3543	0	3543	2338	0	2338	2835	0	2835	1899	0	1899
	60	0		0	0		0	0		0			0	0		0	0		0

Winter Heating Performance
(Indoor Design Conditions 70°F DB)

Ambient O.D.	VENTILATION RATE					
	450 CFM 80% Eff		375 CFM 81% Eff		300 CFM 82% Eff	
DB°F	WVL	WHR	WVL	WHR	WVL	WHR
65	2430	1944	2025	1640	1620	1328
60	4860	3888	4050	3280	3240	2656
55	7290	5832	6075	4920	4860	3985
50	9720	7776	8100	6561	6480	5313
45	12150	9720	10125	8201	8100	6642
40	14580	11664	12150	9841	9720	7970
35	17010	13608	14175	11481	11340	9298
30	19440	15552	16200	13122	12960	10627
25	21870	17496	18225	14762	14580	11955
20	24300	19440	20250	16402	16200	13284
15	26730	21384	22275	18042	17820	14612

LEGEND

VLT = Ventilation Load - Total
VLS = Ventilation Load - Sensible
VLL = Ventilation Load - Latent
HRT = Heat Recovery - Total
HRS = Heat Recovery - Sensible
HRL = Heat Recovery - Latent
WVL = Winter Ventilation Load
WHR = Winter Heat Recovery

NOTE: Sensible performance only is shown for winter application.

GENERAL INFORMATION

The ventilator should only be installed by a trained heating and air conditioning technician. These instructions serve as a guide to the technician installing the ventilator package. They are not intended as a step by step procedure with which the mechanically inclined owner can install the package.

The ventilator housing is shipped in one carton which contains the following:

1. Ventilator and exhaust blower assembly
2. Service Door
3. Rain Hood and Mist Eliminator
4. Installation Instructions

UNPACKING

Upon receipt of the equipment, be sure to compare the model number found on the shipping label with the accessory identification information on the ordering and shipping document to verify that the correct accessory has been shipped.

Inspect the carton housing of each ventilator as it is received, and before signing the freight bill, verify that all items have been received and that there is no visible damage. Note any shortages or damage on all copies of the freight bill. The receiving party must contact the last carrier immediately, preferably in writing, requesting inspection by the carrier's agent. Concealed damage not discovered until after loading must be reported to the carrier within 15 days of its receipt.

BASIC INSTALLATION (Field Installation)

1. Unpack the ventilator assembly which includes the integral ventilator with attached electrical harness and miscellaneous hardware.

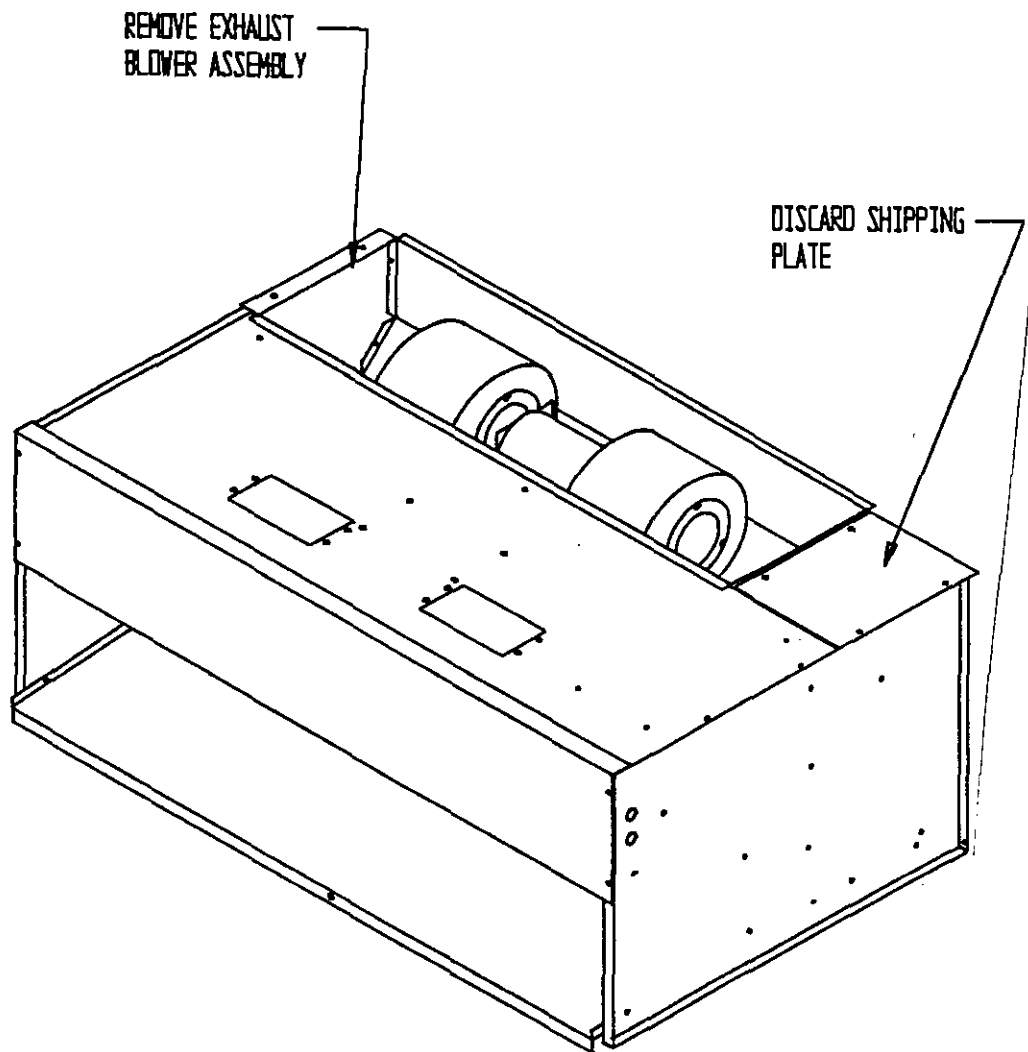
WARNING	
Open and lock unit disconnect switch before installing this accessory to prevent injury or death due to electrical shock or contact with moving parts. Turn thermostat to off.	

<u>MODEL</u>	<u>For Use With Following Units</u>		<u>Electrical</u>
MERV-A5A	WA421-A,-B	WH421-A,-B	230/208-1 or 3 phase
	WA481-A,-B	WH481-A,-B	
	WA601-A,-B	WH601-A,-B	
MERV-C5A	WA421-C	WH421-C	460-3 phase
	WA481-C	WH481-C	
	WA601-C	WH601-C	

CAUTION: Be sure the correct model and voltage Energy Recovery Ventilator is used with the correct air conditioner or heat pump to insure correct voltage compatibility.

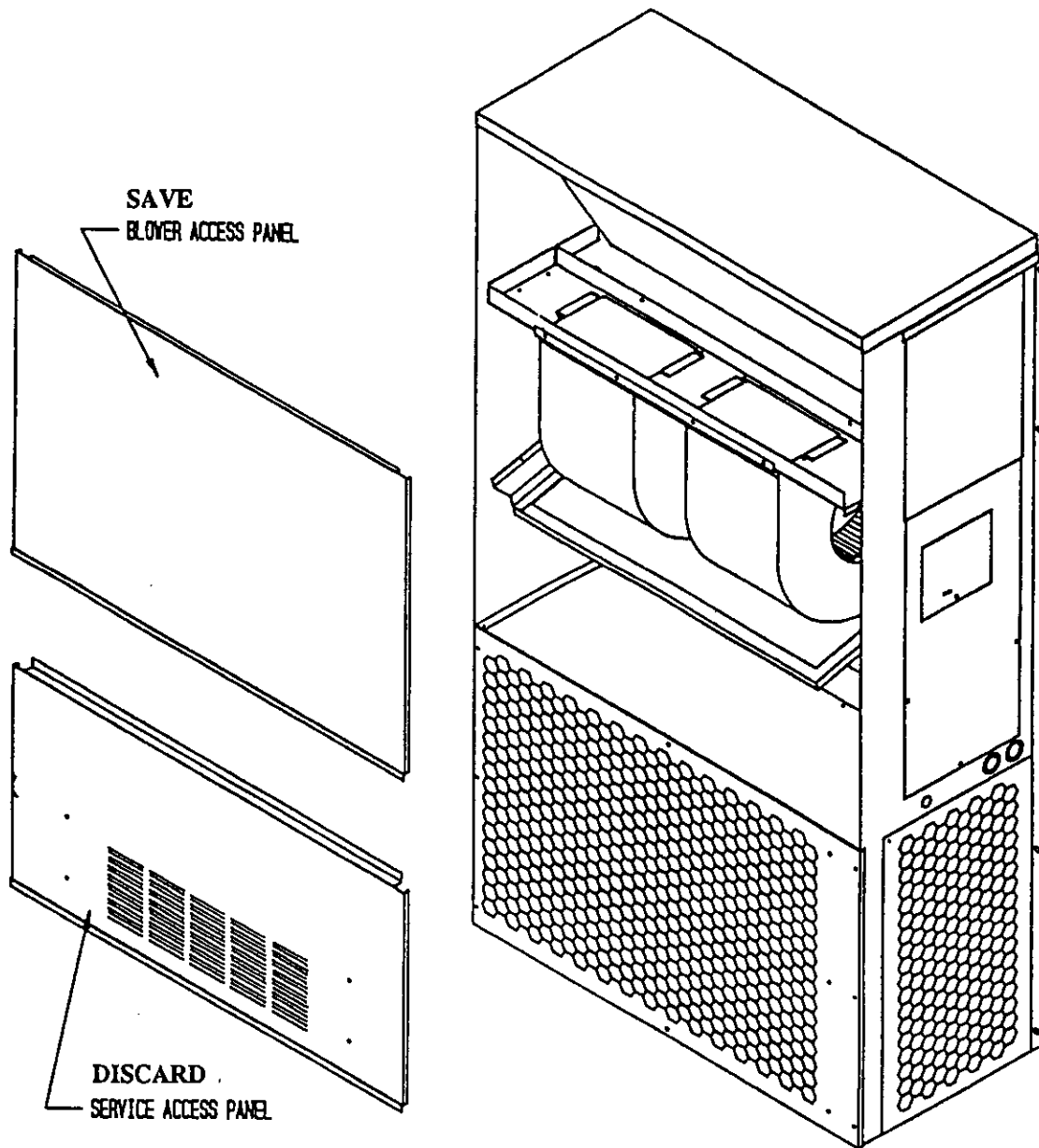
2. Remove exhaust blower assembly from back of ventilator and discard shipping plate. See Figure 1.

FIGURE 1



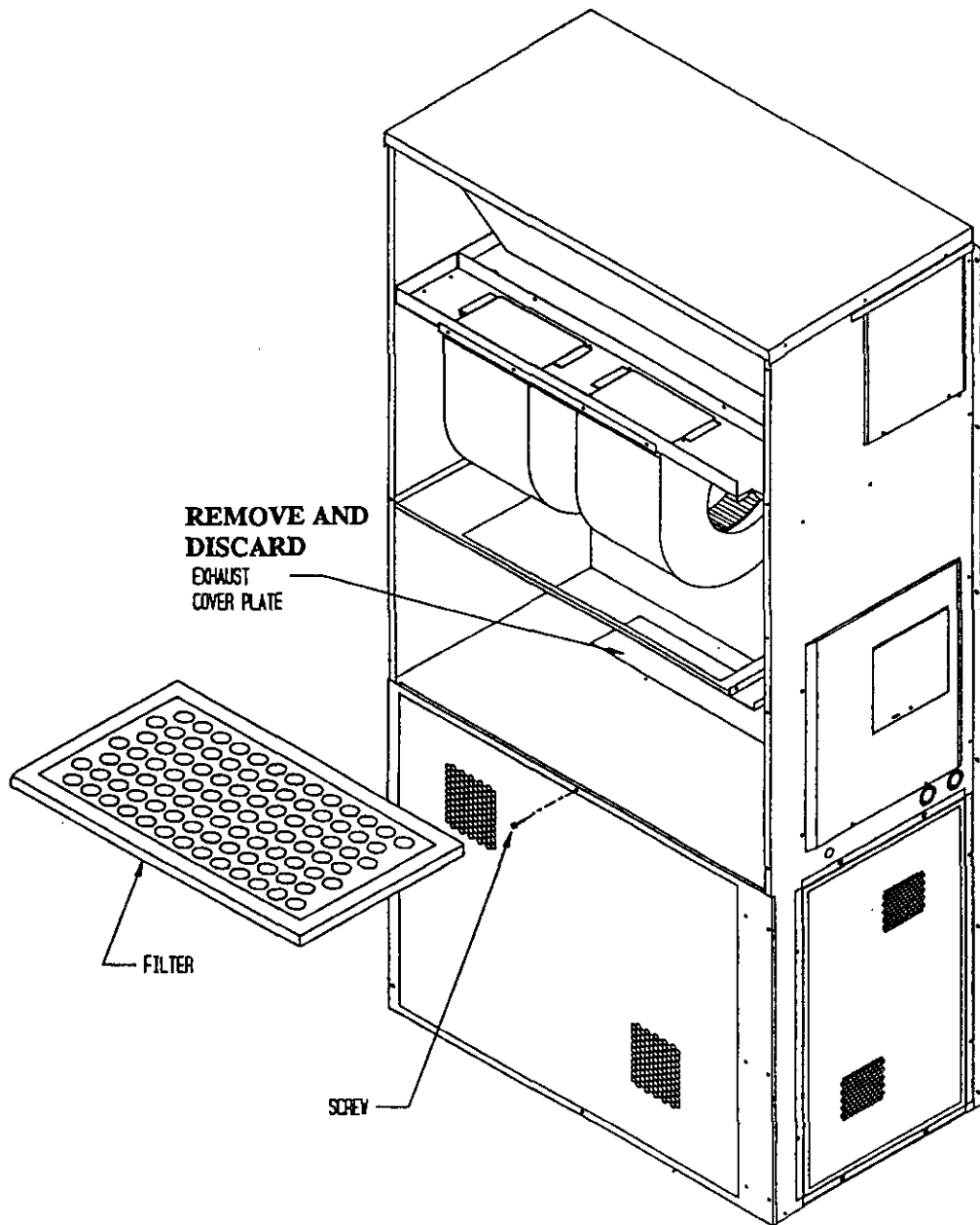
3. Remove the existing exterior blower access and service access panels on the Bard wall mount units. Save the blower access panel and discard service access panel. (See Figure 2)

FIGURE 2



4. Remove and save existing unit air filter. Remove and discard the exhaust cover plate and remove center screw from condenser grill. (See Figure 3)

FIGURE 3

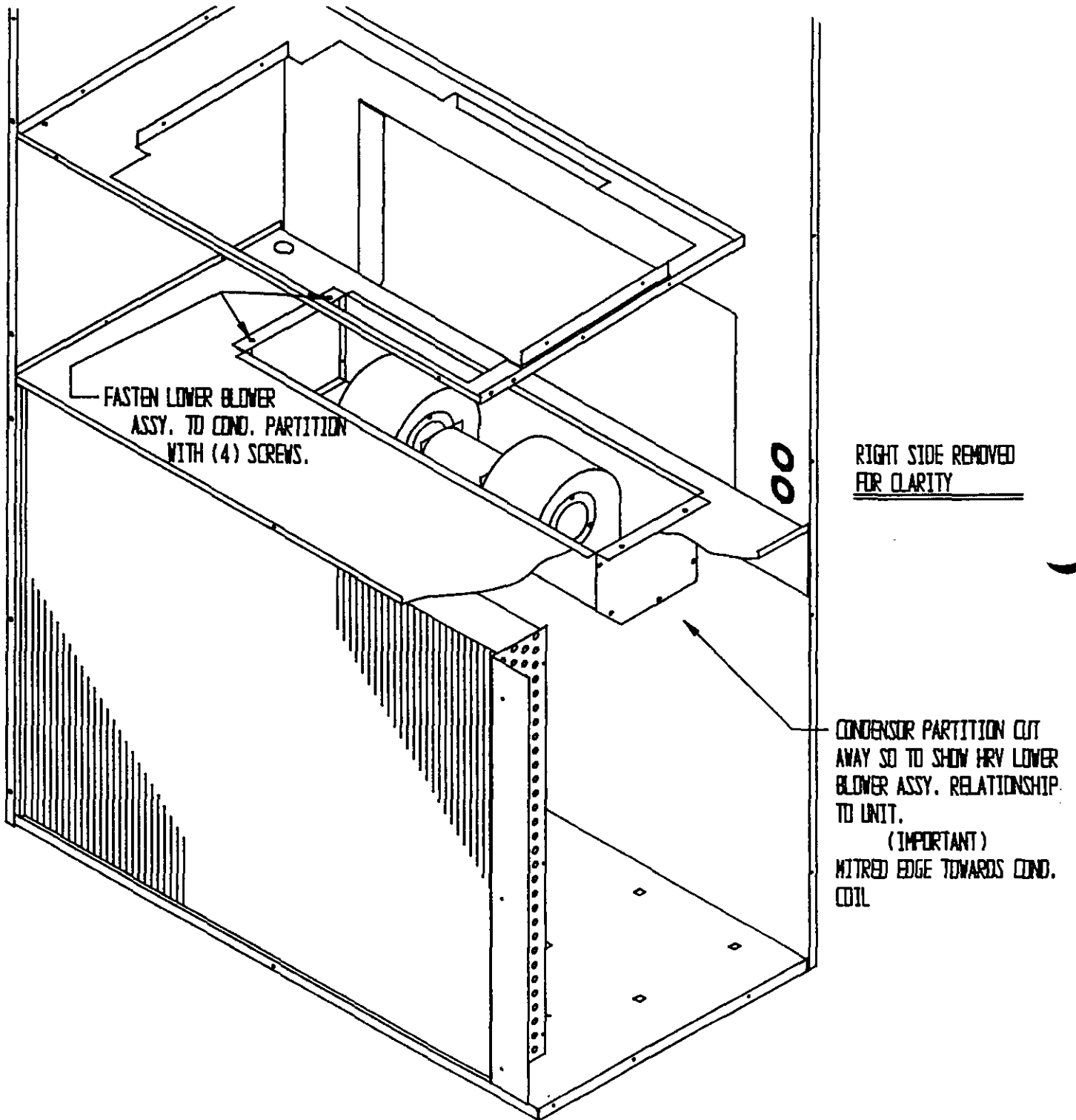


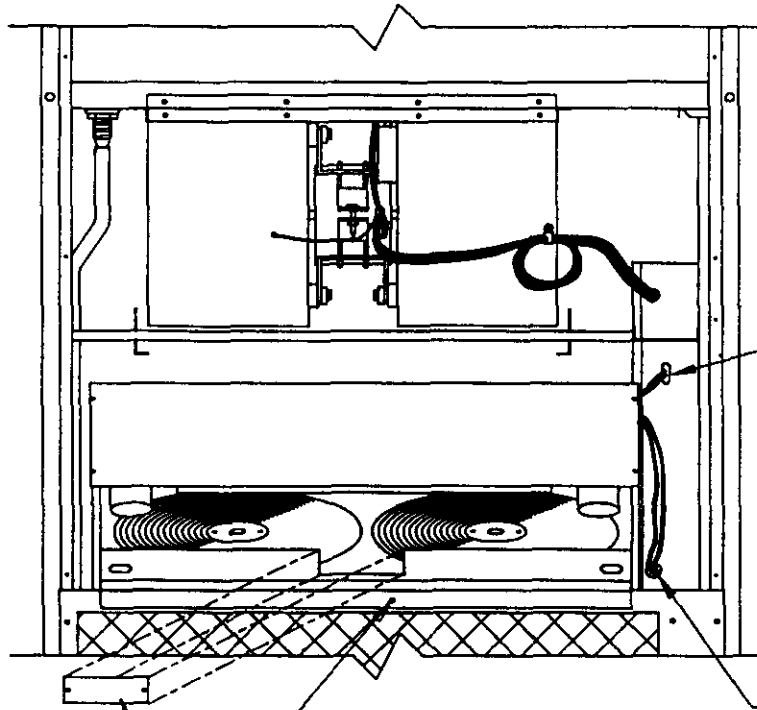
5. Install exhaust blower assembly in exhaust opening and secure with four (4) screws. Position 4 pin connector so it is accessible. See Figure 4, page 8.
6. Install ventilator into the unit to the left side. Once the ventilator is fully inserted, slide the ventilator to the right until it is tight against the back of the control panel. (Figure 5, page 9)

IMPORTANT: Position front lip of ventilator over front grille and on top of condenser partition. (See Figure 5 inset) This is important to ensure proper drainage of any water entering damper assembly.
7. Open control panel to gain access to unit low voltage terminal block. (Insure all power is off prior to opening the control panel.)
8. Route electrical harness leads thru the 7/8" bushing in control panel (Figure 5) into low voltage box.
9. Temporarily connect leads with fork terminal to corresponding points on terminal strip to terminals C and G. (See Figure 6, page 10 and wiring diagram.)

NOTE: These 24 volt control wires control the starting and stopping of the Energy Recovery Ventilator and can be independently controlled by an energy management control or timer. See separate section on Control Wiring for suggested control schemes.
10. Remove female plug section of high voltage wiring harness and snap into unit control panel. Wire to terminal block. See Figure 6 and wiring diagram.
11. Plug male plug into female at side of control panel. (See Figure 5)
12. Close control panel cover.
13. Replace filter and one (1) screw in condenser grille. (See Figure 3)
14. Ventilator Checkout
 - A. Resupply power to unit.
 - B. Energize the evaporator blower by switching thermostat to the manual fan position with heat/cool in off position.
 - C. Ventilator heat transfer wheels should rotate slowly (49 RPM). Intake and exhaust blowers should run. (See Figure 8)
 - D. De-energize evaporator blower. Energy Recovery wheels and fresh air and exhaust air blowers should stop.
15. Disconnect the wires temporarily connected in step 9.
16. Reinstall the blower access panel at top of unit and secure with sheet metal screws. (See Figure 2)
17. Replace the lower service access panel with the new panel provided. Attach air intake hood with screws provided. (See Figure 7) Be sure to insert the top flange of the air intake hood into and thru the slot in the service door and between the door and insulation to prevent bowing of the door.

FIGURE 4





HIGH VOLTAGE WIRES
TO PLUG IN SIDE
OF CONTROL PANEL.

ROUTE THE WERV WIRES
THROUGH HOLE AND IN
TO CONTROL PANEL.

REMOVE ACCESS PANEL
AND PLUG IN EXHAUST
BLOWER. REPLACE ACCESS
PANEL

WHEN INSTALLING WERV POSITION
SO THAT HOLE IN FRONT LIP IS
CENTERED OVER HOLE IN CONDENSER
GRILLE TO INSERT A SELF DRILLING
SCREW.

CAUTION: HOLE IN WERV MUST
BE USED TO INSURE CLEARANCE
FROM CONDENSER COIL TUBING.

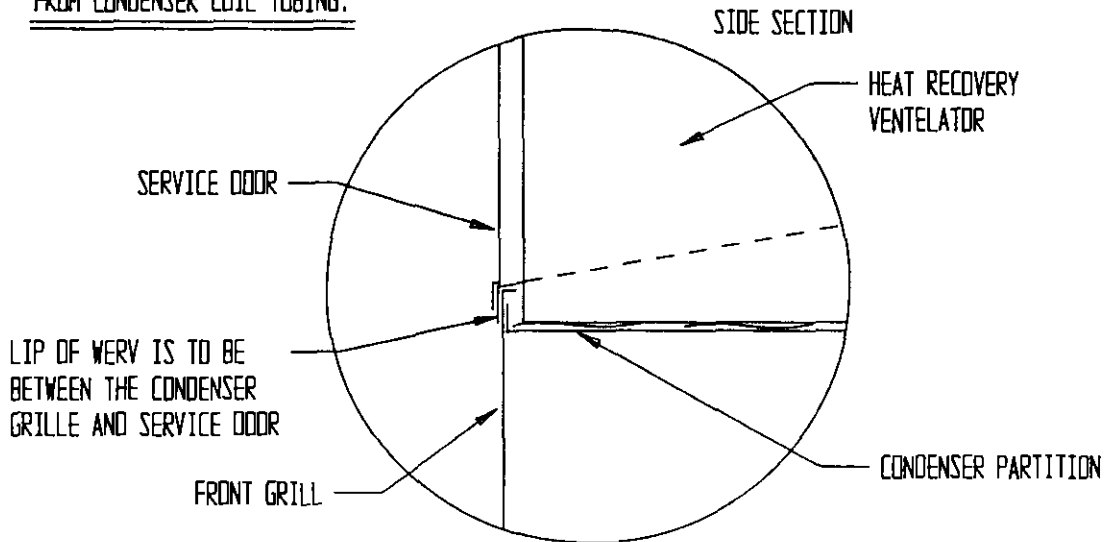
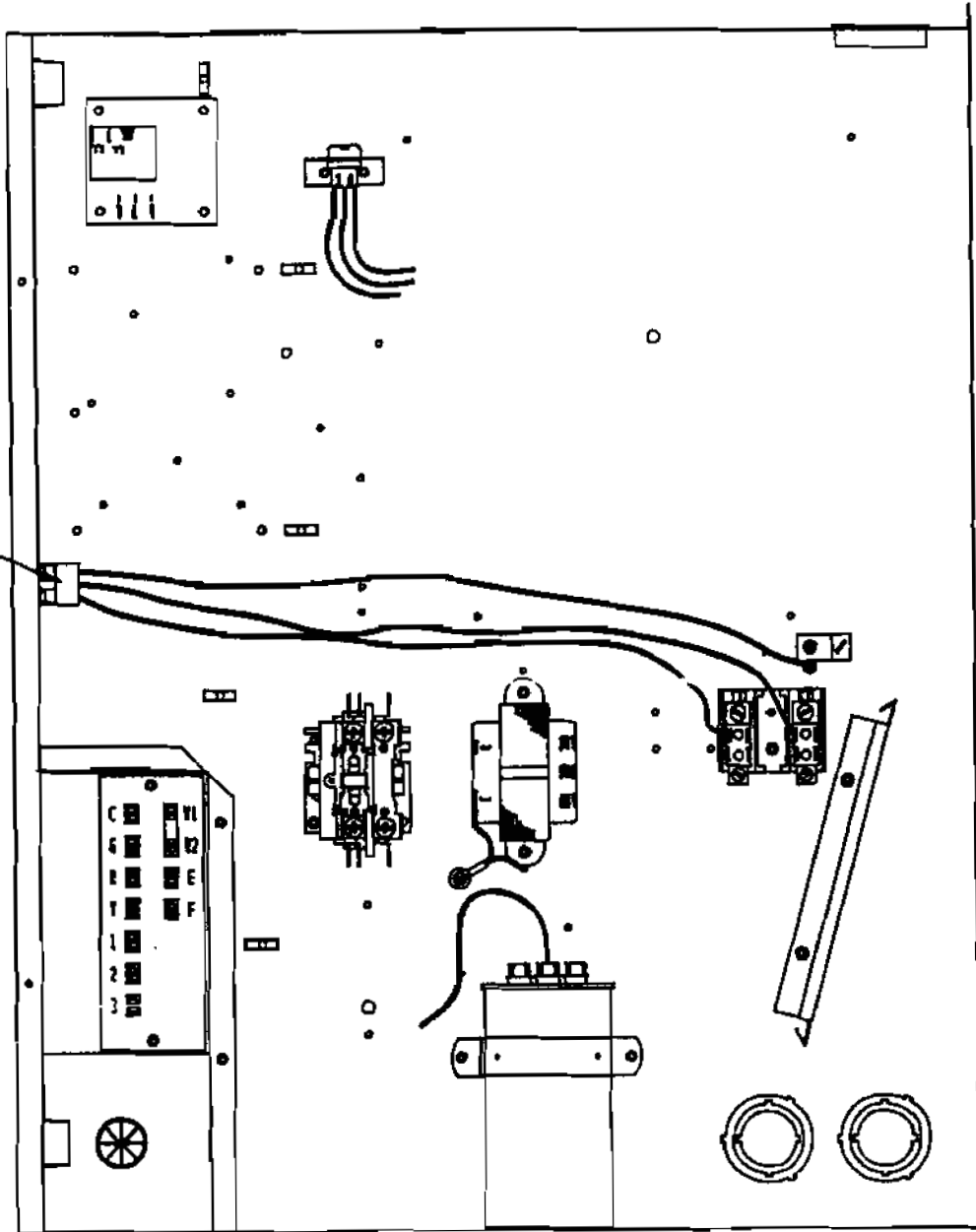


FIGURE 6

INSTALL 1-480701-0 CAP
AS SHOWN AND WIRE
PER WIRING DIAGRAM



INSERT FLANGE THRU
SLOT IN DOOR & PUSH
FLANGE UNDER THE INSULATION

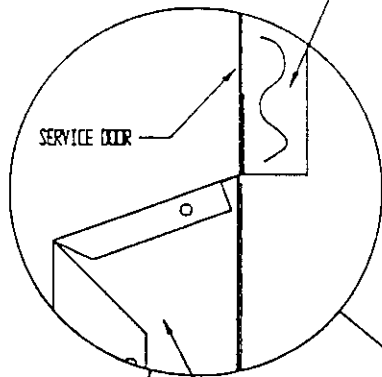


FIGURE 7

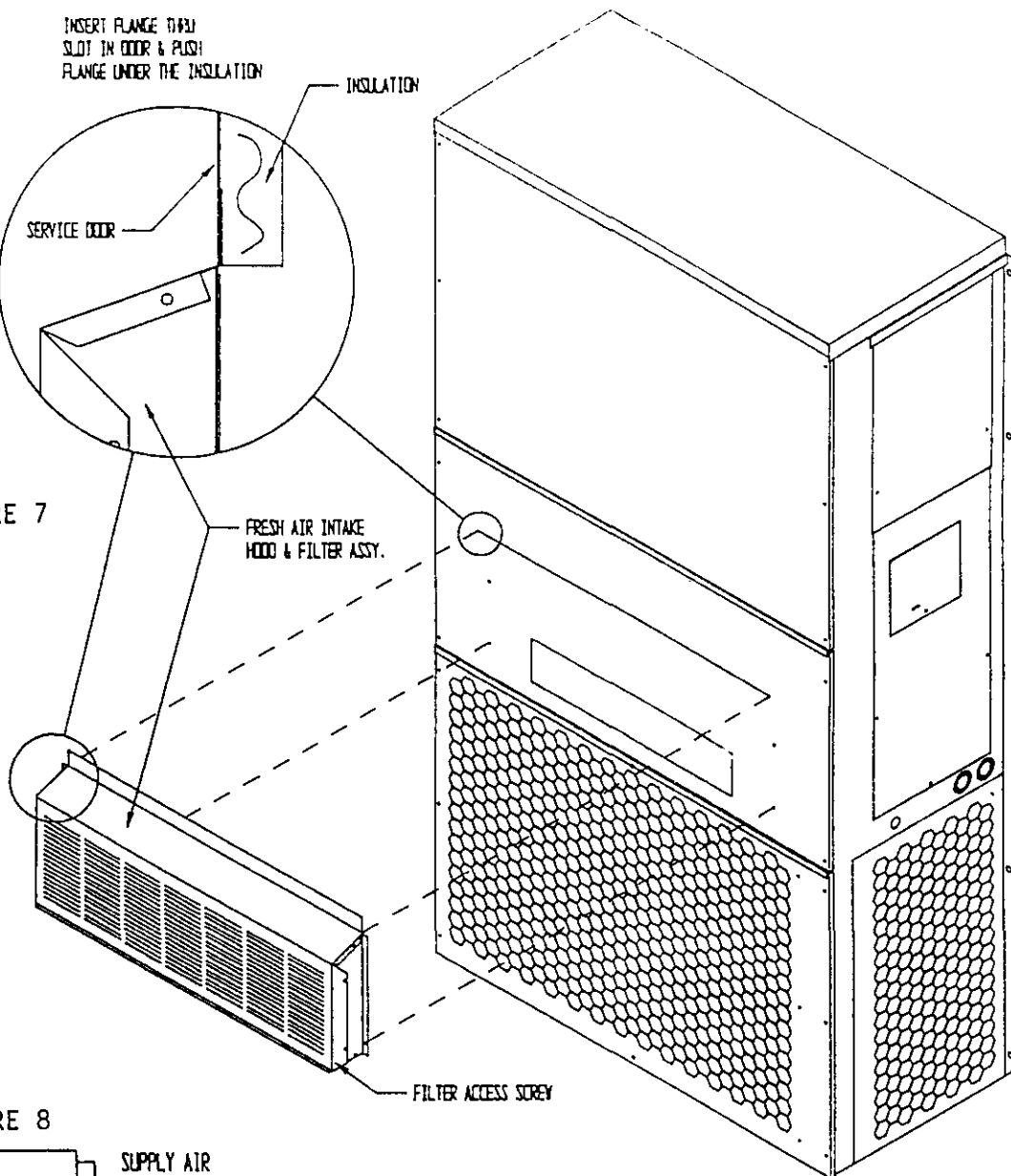
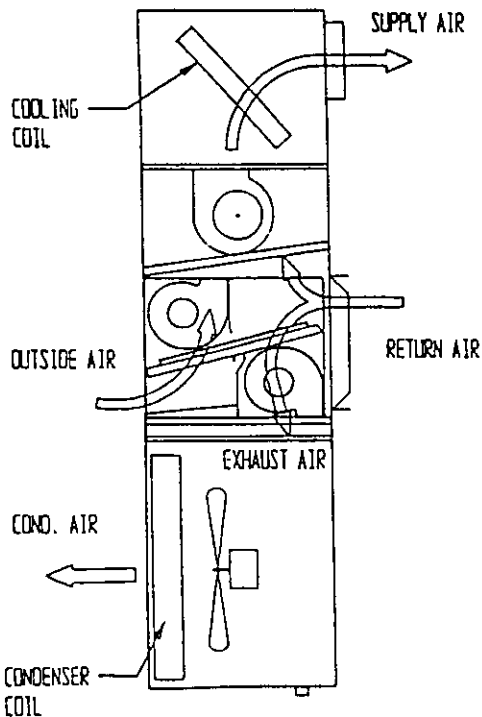


FIGURE 8



REPLACE SERVICE ACCESS PANEL
AND INSTALL FRESH AIR INTAKE
HOOD ASSY. AS SHOWN.

BASIC INSTALLATION (FACTORY INSTALLED VERSIONS)

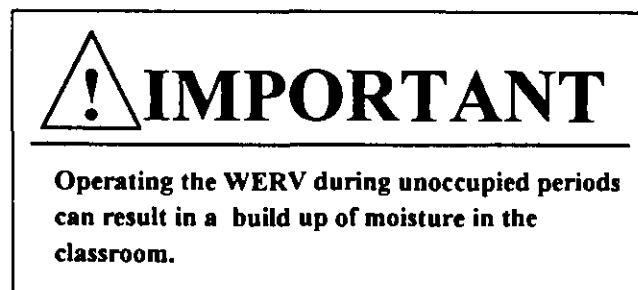
1. Remove blower access door and service door. Room filter located above air circulation blowers. Install filter.
2. Remove and install air intake hood -- refer to item 16 of Basic Installation (Field installation).
3. Refer to Control Wiring section for suggested control schemes for the WERV.
4. After wiring, replace all panels.

CONTROL WIRING

The WERV comes from the factory with the low voltage control wires not wired into the wall-mount low voltage terminal strip. Care must be taken when deciding how to control the operation of the ventilator. When designing the control circuit for the ventilator the following requirements must be met.

CONTROL REQUIREMENTS

1. Indoor blower motor must be run when ever the WERV is run.
2. Select the correct motor speed tap in the WERV. Using Table 1 of the WERV Installation Instructions determine the motor speed needed to get the desired amount of ventilation air needed. For instance, do not use the high speed tap on a WERV-A3A if only 200 CFM of ventilation air is needed. Use the low speed tap. Using the high speed tap would serve no useful purpose and significantly effect the overall efficiency of the air conditioning system. System operating costs would also increase.
3. Run the WERV only during periods when the conditioned space is occupied. Running the WERV during unoccupied periods wastes energy, decreases the expected life of the WERV, and can result in a large moisture buildup in the structure. The WERV removes 60 to 70% of the moisture in the incoming air, not 100% of it. Running the WERV when the structure is unoccupied allows moisture to build up in the structure because there is little or no cooling load. Thus, the air conditioner is not running enough to remove the excess moisture being brought in. Use a control system that in some way can control the system based on occupancy.



RECOMMENDED CONTROL SEQUENCES

Several possible control scenarios are listed below:

1. Use a programmable electronic thermostat with auxiliary terminal to control the WERV based on daily programmed occupancy periods. Bard markets and recommends the White-Rodgers 1F95-80 (Bard Part No. 8403-035), programmable electronic thermostat for air conditioner applications and the White-Rodgers 1F94-80 (Bard Part No. 8403-036), programmable electronic thermostat for heat pump applications. See Figure 9.
2. Use a motion sensor in conjunction with a mechanical thermostat to determine occupancy in the classroom. Bard markets the CS2000 for this use. See Figure 10 and Figure 11.
3. Use a DDC control system to control the WERV based on a room occupancy schedule to control the WERV.
4. Tie the operation of the WERV into the light switch. The lights in a room are usually on only when occupied.
5. Use a manual timer that the occupants turn to energize the WERV for a specific number of hours.
6. Use a programmable mechanical timer to energize the WERV and indoor blower during occupied periods of the day.

VENTILATION AIR FLOW

The WERV-A5A and WERV-C5A is equipped with a 3 speed motor to provide the capability of adjusting the ventilation rates to the requirements of the specific application by simply changing motor speeds.

TABLE 1

VENTILATION AIR (CFM)			
	High Speed (Black)	Medium Speed (Blue)	Low Speed (Red)
CFM	450	375	300

The units are wired from the factory on high speed. The speed can be changed by disconnecting the black wire and reconnecting the blue or red wire on the intake or exhaust blower motor. If desired, the fresh air motor can be wired on one speed and the exhaust motor on another if needed for a specific requirement.

WARNING

Open disconnect to shut all power off before doing this. Failure to do so could result in injury or death due to electrical shock.

FIGURE 9

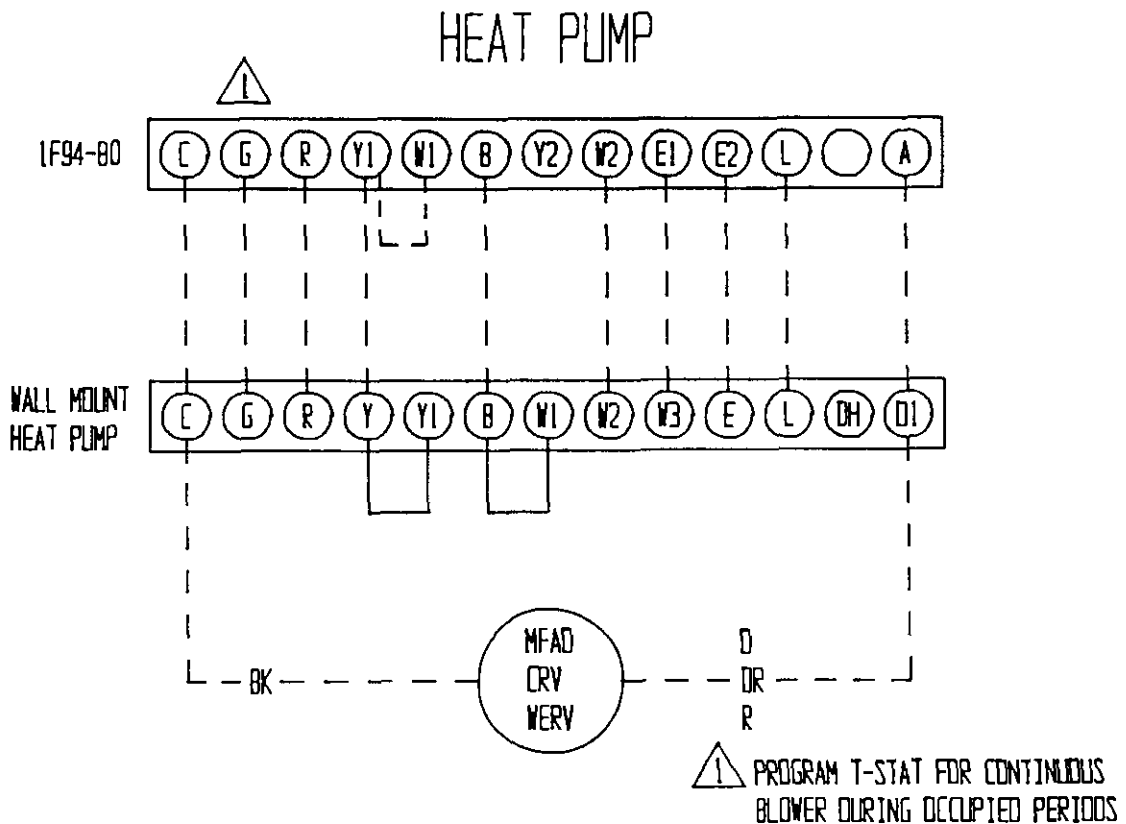
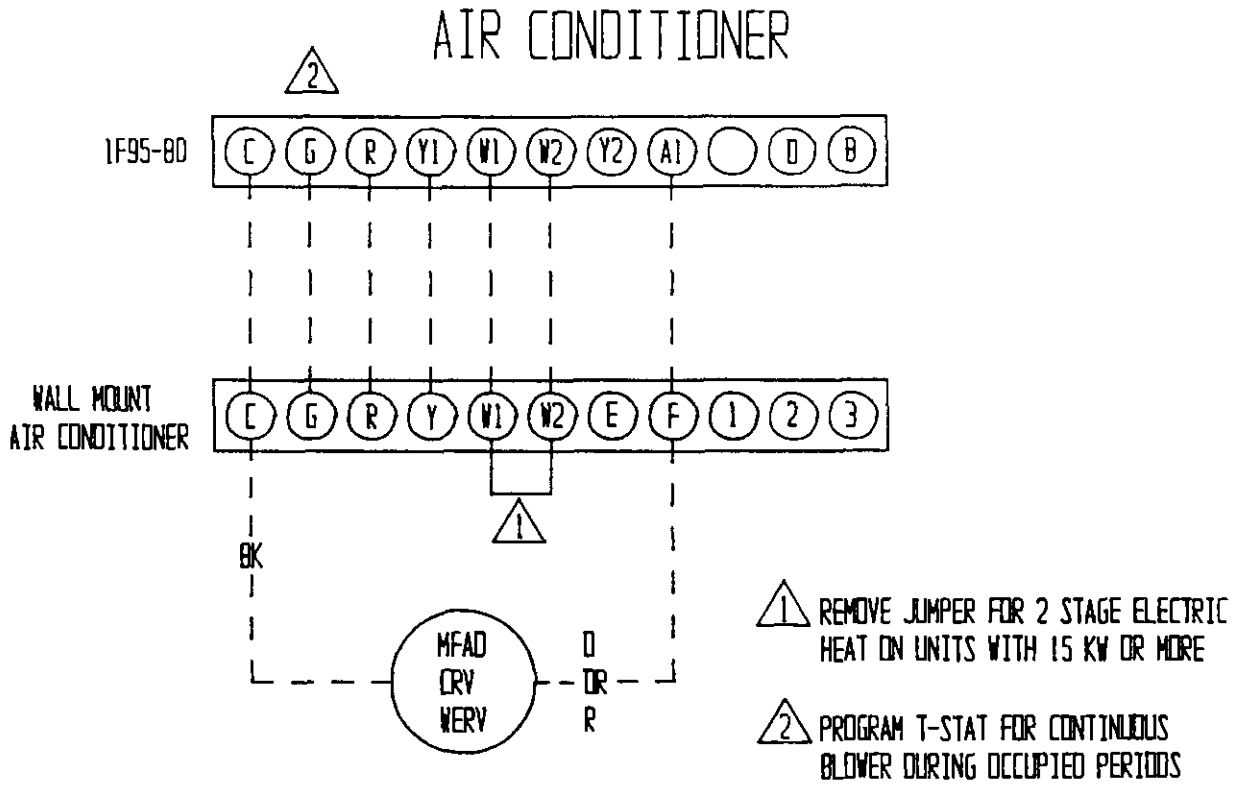
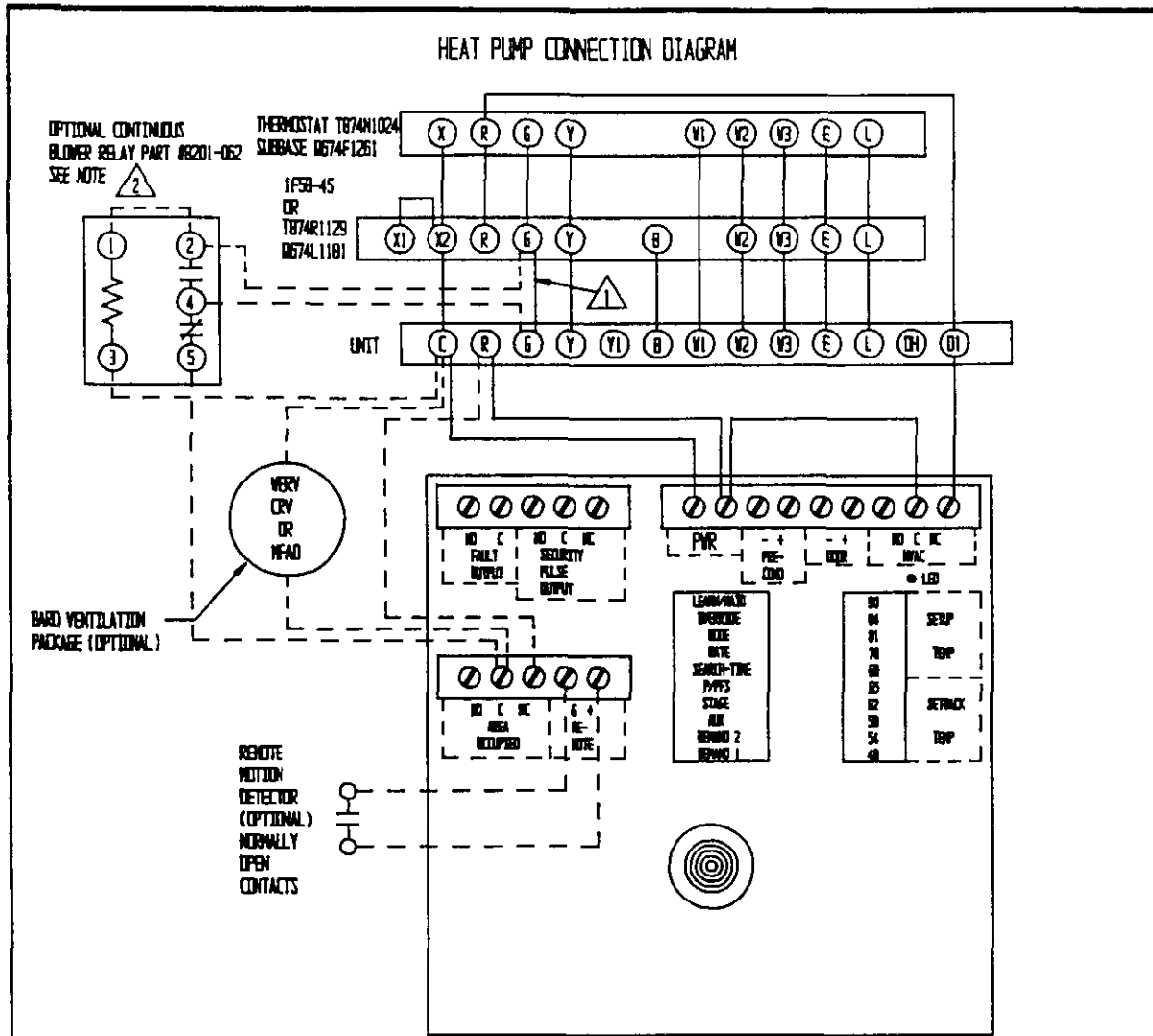


FIGURE 10



- 1 REMOVE THIS WIRE WHEN EMPLOYING OPTIONAL CONTINUOUS BLOWER RELAY.
- 2 THIS RELAY ENERGIZES THE INDOOR BLOWER RELAY WHEN THE ROOM IS OCCUPIED TO PROVIDE CONTINUOUS FRESH AIR THROUGH THE HARD VENTILATION PACKAGE.

RECOMMENDED SWITCH SETTINGS SHOWN BELOW

THIS SYSTEM MAY BE CUSTOMIZED TO INDIVIDUAL INSTALLATIONS. REFER TO CS2000 TECHNICAL REFERENCE MANUAL FOR CUSTOMIZATION OPTIONS.

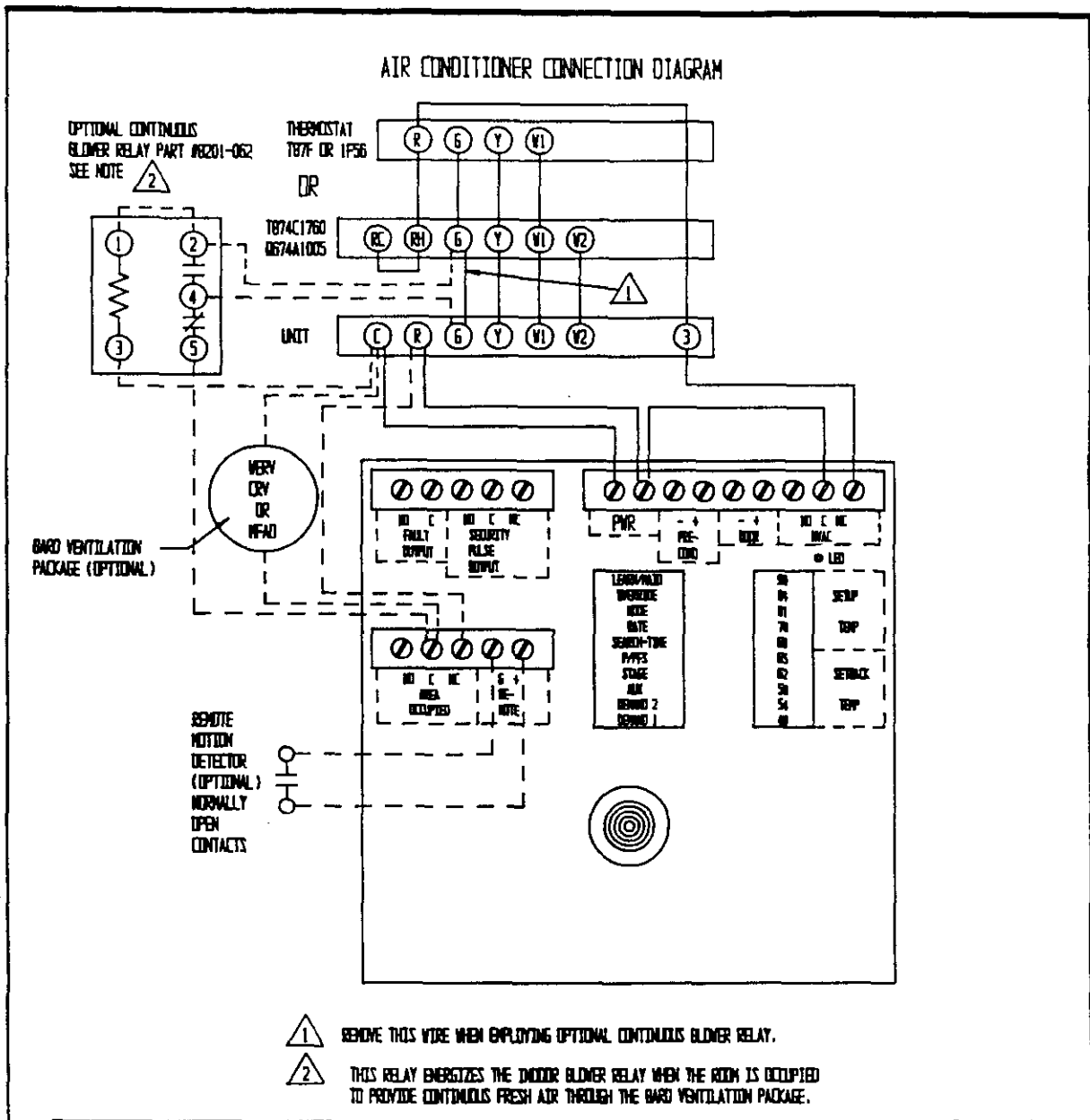
FUNCTION SWITCHES

LEARN/MAID	<input type="checkbox"/>
OVERRIDE	<input type="checkbox"/>
MODE	<input checked="" type="checkbox"/>
RATE	<input type="checkbox"/>
SEARCH-TIME	<input type="checkbox"/>
P/PFS	<input checked="" type="checkbox"/>
STAGE	<input type="checkbox"/>
AUX	<input checked="" type="checkbox"/>
DEMAND 2	<input type="checkbox"/>
DEMAND 1	<input checked="" type="checkbox"/>

TEMPERATURE SWITCHES

<input type="checkbox"/>	90
<input checked="" type="checkbox"/>	84
<input type="checkbox"/>	81
<input checked="" type="checkbox"/>	78
<input type="checkbox"/>	68
<input checked="" type="checkbox"/>	65
<input type="checkbox"/>	62
<input checked="" type="checkbox"/>	58
<input type="checkbox"/>	54
<input checked="" type="checkbox"/>	48

FIGURE 11



RECOMMENDED SWITCH SETTINGS SHOWN BELOW

THIS SYSTEM MAY BE CUSTOMIZED TO INDIVIDUAL INSTALLATIONS. REFER TO CS2000 TECHNICAL REFERENCE MANUAL FOR CUSTOMIZATION OPTIONS.

FUNCTION SWITCHES

LEARN/MAID	<input type="checkbox"/>
OVERRIDE	<input type="checkbox"/>
MODE	<input checked="" type="checkbox"/>
RATE	<input checked="" type="checkbox"/>
SEARCH-TIME	<input type="checkbox"/>
P/PFS	<input checked="" type="checkbox"/>
STAGE	<input type="checkbox"/>
AUX	<input checked="" type="checkbox"/>
DEMAND 2	<input checked="" type="checkbox"/>
DEMAND 1	<input checked="" type="checkbox"/>

TEMPERATURE SWITCHES

<input type="checkbox"/>	90
<input checked="" type="checkbox"/>	84
<input type="checkbox"/>	81
<input type="checkbox"/>	78
<input type="checkbox"/>	68
<input type="checkbox"/>	65
<input type="checkbox"/>	62
<input type="checkbox"/>	58
<input type="checkbox"/>	54
<input type="checkbox"/>	48

**BARD WALL-MOUNT
WITH ENERGY RECOVERY VENTILATOR
MAINTENANCE PROCEDURES**

MONTHLY

1. Inspect mist eliminator/prefilter and clean if necessary. This filter is located in the fresh air intake hood on the front of the unit. This is an aluminum mesh filter and can be cleaned with water and any detergent not harmful to aluminum.
2. Inspect wall-mount unit filter and clean or replace as necessary. This filter is located either in the unit or in a return air filter grille assembly. If in the unit it can be accessed by removing the lower service door on the front of the unit. If in a return air filter grille, by hinging the grille open to gain access.

Washable filter should be cleaned with dish washing soap and water. Shake off excess water and reinstall. Replace if the washable media becomes uncleanable or starts to deteriorate.

Throw away filters should be replaced after they become dirty and is dependent on the application.

3. Inspect energy recovery ventilator for proper wheel rotation and dirt build-up. This can be done in conjunction with item 2 above. Energize the energy recover ventilator after inspecting the filter and observe for proper rotation and/or dirt build-up.

Clean as necessary. Clean as follows: Disconnect all power to unit. Remove the lower service door of the wall-mount unit to gain access to the energy recover ventilator. Remove the front access panel on the ventilator. Unplug Amp connectors to cassette motors. Slide energy recover cassette out of ventilator. Use a shop vacuum with brush attachment to clean both sides of the energy recover wheels.

NOTE: Discoloration and staining of the wheel does not affect its performance. Only excessive build-up of foreign material needs to be removed.

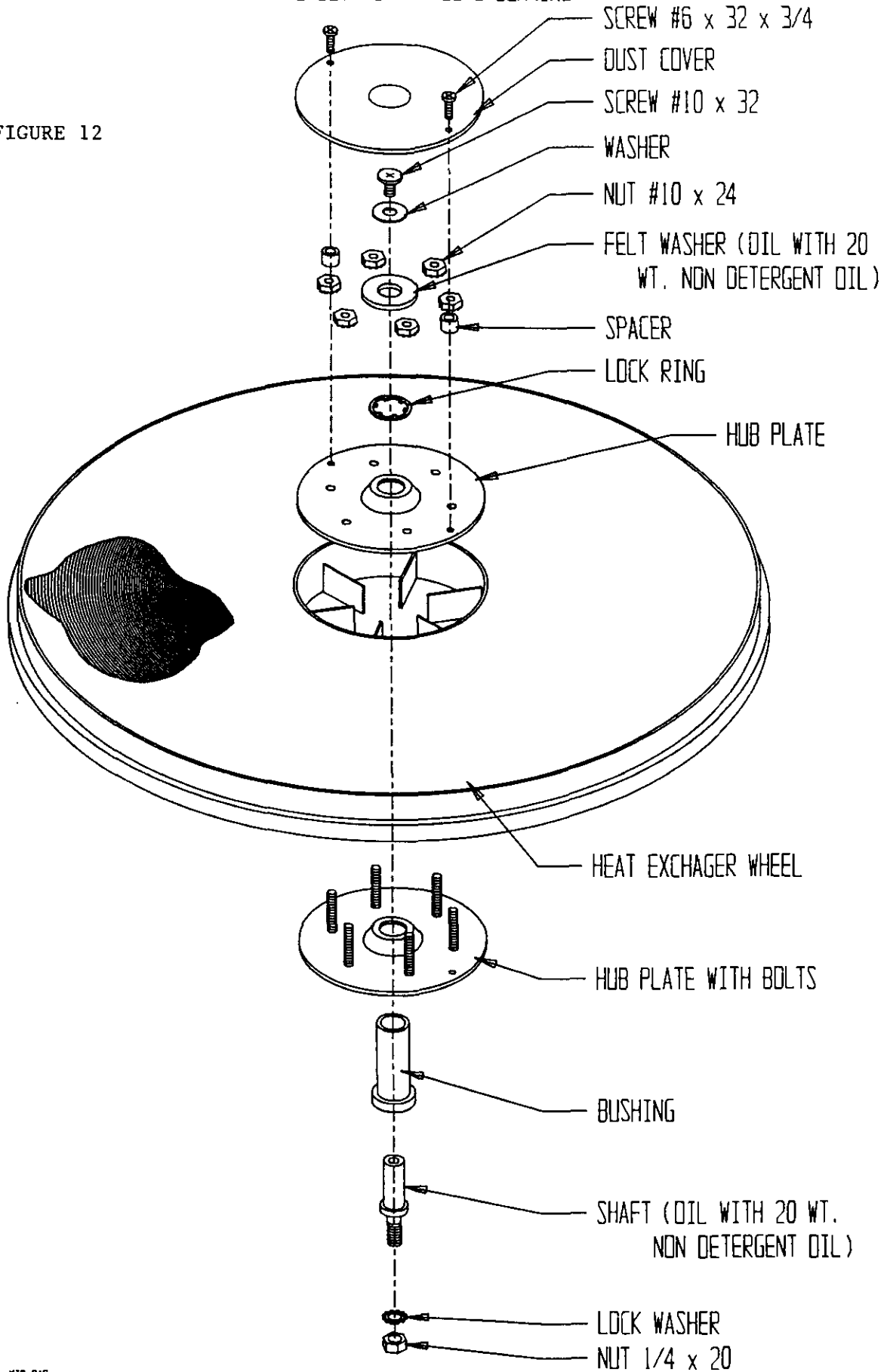
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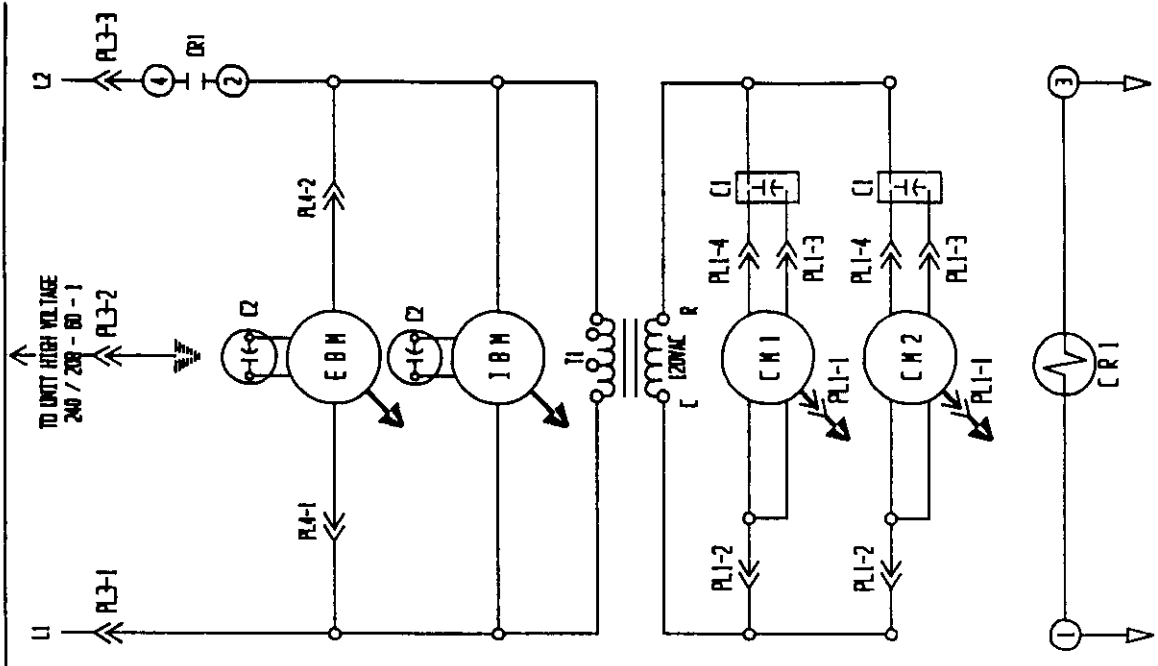
1. Inspect condenser coil for dirt and clean if necessary. Clean all loose dirt, plant matter, cobwebs, and/or insects from both sides of the coil with a shop vacuum. Take care not to damage or bend coil fins. For grease or tough dirt a commercial foaming coil cleaner suitable for use on aluminum fins should be used. Follow instructions on the coil cleaner. Do not use a high pressure hose or power cleaner.
2. Inspect and re-oil center wheel bearing of energy recovery ventilator wheels (sleeve bearing models only).

Inspect as follows: Disconnect all power to unit. Remove the lower service door of the unit to gain access to the energy recover ventilator. Remove the front access panel on the ventilator. Unplug Amp connectors to cassette motors. Slide energy recover cassette out of ventilator. Remove center shaft screw from top of cassette wheel. Remove wheel retaining washer. Push from underneath to slide wheel off shaft. Check for tar-like deposits. If present clean shaft and bearing with rag soaked with 20 weight oil. Lightly oil shaft and bearing and reassemble. Add oil to re-soak felt washer. Use non-detergent 20 weight oil. Reassemble. See Figure 12.

HUB ASSEMBLY WITH SLEEVE BEARING

FIGURE 12





SEE CONTROL WIRING SECTION
OF INSTALLATION INSTRUCTIONS

4055-140 D

