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Cover your new purchase with our three (3) year extended parts only contract for \$89.95.

This warranty covers parts only (no labor) against manufacturer defects for an additional three (3) years beyond your original two (2) year warranty. This warranty excludes shrouds, filters and complete air conditioners.

What a great addition to your standard warranty – knowing you have protection for an additional three (3) years should you experience part failure (excluding shrouds, filters and complete air conditioners) on your Coleman-Mach air conditioner. Free replacement parts for three (3) years (excluding shrouds, filters and complete air conditioners) – how can you pass this up!

Apply today by filling out the application below and mailing it with your check or money order to Airxcel, Inc., P.O. Box 4020, Wichita, KS 67204. A contract will be sent to you within a few weeks. You should retain with your paperwork for proof of purchase.

To view the LIMITED 2 YEAR WARRANTY, the OPTIONAL THREE YEAR EXTENDED PARTS WARRANTY, a sample contract, terms, conditions, exceptions and exclusions, please visit www.Airxcel.com and type WARRANTY in the search bar.

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APPLICATION FOR OPTIONAL THREE (3) YEAR PARTS CONTRACT \$89.95

(DOES NOT INCLUDE LABOR. EXCLUDES SHROUDS, FILTERS AND COMPLETE AIR CONDITIONERS) APPLICATION MUST BE MADE WITHIN 90 DAYS OF PURCHASE DATE OF THE AIR CONDITIONER OR THE RECREATIONAL VEHICLE IF THE AIR CONDITIONER IS ORIGINAL EQUIPMENT.

(PLEASE PRINT CLEARLY)

DATE OF PURCHASE: _____
(Heat Pump)

Name of Purchaser: _____

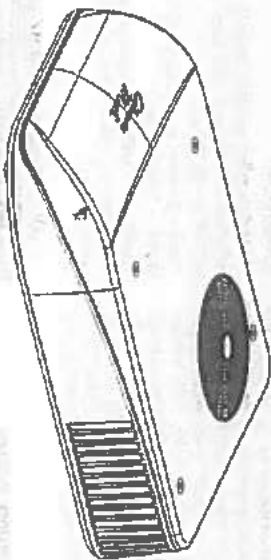
Street: _____

City: _____ State: _____ Zip: _____

BE SURE TO ENCLOSE A CHECK OR MONEY ORDER FOR \$89.95 (U.S. FUNDS)



INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS FOR 47000 SERIES HEAT PUMPS



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These instructions are a general guide for installing the 47000 Series Coleman-Mach roof top Heat Pump. For specific Heat Pump details, it will be necessary to refer to ALL printed documents supplied with this conditioner.

IMPORTANT NOTICE

These instructions are for the use of qualified individuals specially trained and experienced in installation of this type equipment and related system components. Installation and service personnel are required by some states to be licensed. PERSONS NOT QUALIFIED SHALL NOT INSTALL NOR SERVICE THIS EQUIPMENT.

NOTE: The words "Shall" or "Must" indicate a requirement which is essential to satisfactory and safe product performance. The words "Should" or "May" indicate a recommendation or advice which is not essential and not required but which may be useful or helpful.

WARNING! - SHOCK HAZARD To prevent the possibility of severe personal injury or equipment damage due to electrical shock, always be sure the electrical power source to the appliance is disconnected.

CAREFULLY FOLLOW ALL INSTRUCTIONS AND WARNINGS IN THIS BOOKLET TO AVOID DAMAGE TO THE EQUIPMENT, PERSONAL INJURY OR FIRE.

WARNING! Improper installation may damage equipment, can create a hazard and will void the warranty. The use of components not tested in combination with these units will void the warranty, may make the equipment in violation of state codes, may create a hazard and may ruin the equipment.

I. GENERAL INFORMATION

OEM - Please make sure all documentation accompanies the Heat Pump.

INSTALLER AND/OR DEALER - Please make sure all documentation is presented to the product consumer.

The product consumer should also be afforded the opportunity to purchase the OPTIONAL THREE (3) YEAR PARTS REPLACEMENT CONTRACT available from Airxcel, Inc.

For more information about the contract, please review the sample contract located at www.Airxcel.com. Use the application on the back of this document to apply for the extended parts contract.

INQUIRIES ABOUT THE HEAT PUMP - Inquiries to your Airxcel, Inc. representative or to Airxcel, Inc. pertaining to product installation should contain both the model and serial numbers of the roof top Heat Pump. All roof top heat pump units have model and serial number identification in two locations; (1) Rating Plate sticker - may be viewed by removing the rooftop unit shroud. The rating plate is on top of the evaporator cover. (2) Model/Serial number sticker located on the return air flange on the rooftop unit base pan. If the Heat Pump is installed, the sticker may be viewed by lowering the ceiling assembly shroud.

II. HEAT PUMP SIZING

Heat Pumps should be rated primarily by their ability to cool. The ability of a Heat Pump to provide a comfortable environment for the consumer is dependant upon the following conditions.

The ability of a heat pump in the cooling mode to cool a vehicle or maintain a consumer desired temperature is dependent on the heat gain of the vehicle.

The physical size of the vehicle, the amount of window area, the quality and amount of insulation, the position exposure to sunlight, the number of people using the vehicle and the outside temperature may increase the heat gain to such an extent that the capacity of the Heat Pump is exceeded.

As a general rule, air supplied (discharge air) from the Heat Pump will be 15 to 20 degrees cooler than the air entering (return air) the ceiling assemblies bottom air grilles.

For example, if the air entering the Heat Pump is 80° (degrees F) - (return air), the supply air (discharge air) into the vehicle will be 60° to 65° (degrees F). As long as this temperature difference (15 to 20 degrees) is being maintained by the Heat Pump, the Heat Pump is operating properly.

Again, give careful consideration to the vehicle heat gain variables. During extreme outdoor temperatures, the heat gain of the vehicle may be reduced by:

- Parking the vehicle in a shaded area
 - Keeping windows and doors closed
 - Avoiding the use of heat producing appliances
 - Using window shades (blinds and/or curtains)
- For a more permanent solution to high heat gain situations, additional vehicle insulation, window awnings and/or window glass lining should be considered. A Heat Pump should not be considered as a total replacement for a furnace. At ambient temperatures below freezing, the Heat Pump will not operate.

III. SELECTING AN INSTALLATION LOCATION

Your Airxcel, Inc. Heat Pump has been designed for use primarily in recreational vehicles.

Is the roof of the vehicle capable of supporting both the roof top unit and ceiling assembly without additional support structures? Inspect the interior ceiling mounting area to avoid interference with existing structural members such as: bunks, curtains, tracks or room dividers. The depth of the ceiling assembly shroud is 3". Be sure to check clearance for doors which must be swung open (refrigerator, closets, cabinets).

Most of the time, roof mount Heat Pumps are installed at existing roof vent locations. If there are no roof vents (existing mounting hole), the following placement locations are recommended.

Motor Homes - a single unit or the forward of two units should be mounted within 9 feet of the driver's compartment.

Travel Trailers or Mini-Homes - a location should be selected that is near the door slightly forward of the vehicle center length.

Vans - location should be in the center of the roof (side to side - front to back).

Truck with Camper - location should be between 4 or 5 feet from the rear of the camper to achieve maximum cooling effect.

IV. INSTALLING THE ROOF TOP UNIT

DANGER! SHOCK HAZARD DISCONNECT ALL POWER TO THE VEHICLE BEFORE PERFORMING ANY CUTTING TO THE VEHICLE CONTACT WITH HIGH VOLTAGE CAN RESULT IN EQUIPMENT DAMAGE, PERSONAL INJURY OR DEATH.

IMPORTANT

TO PREVENT DAMAGE TO THE WIRING AND BATTERY, DISCONNECT THE BATTERY CABLE FROM THE POSITIVE BATTERY TERMINAL BEFORE PERFORMING ANY CUTTING TO THE VEHICLE.

This Heat Pump is to be installed in accordance with NFPA Standard 501C.

If the Heat Pump being installed is on a low friction roof surface such as aluminum, steel or gelcoat fiberglass, it is advisable to order a spring pad kit, part number 8333-3871 to add "spring pads" to maintain bolt tension and retard lateral motion of the Heat Pump which could shear the mounting bolts.

If the Heat Pump being installed is subject to heavy lateral loads, it is advisable to order a "Roughneck" gasket/boil package, part number 48207-3301 to maintain bolt tension, prevent lateral movement of the Heat Pump and guard against bolt shear.

Once the location for your Heat Pump has been determined (See Section III), a reinforced and framed roof hole opening must be provided (may use existing roof vent opening). Before cutting into the vehicle roof, verify that the cutting action will clear all structural members and crossbeams. Additionally, the location of any inner roof plumbing and electrical supplies must be considered.

A. If a roof vent is already present in the desired mounting location for the Heat Pump, the following steps must be taken:

1. Remove all screws which secure the roof vent to the vehicle. Remove the vent and any additional trim materials. Carefully remove all caulking from around the roof vent opening to obtain clean exterior roof surface.

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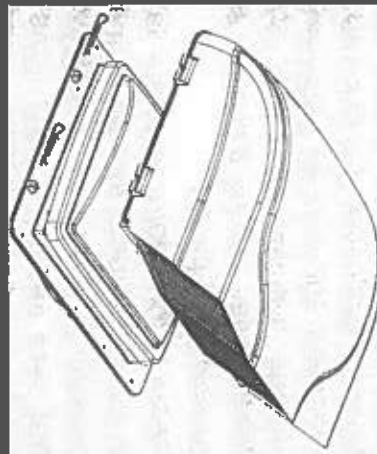
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Coleman® Mach®, MAXXAIR®, Suburban, Marvair® and Industrial Climate Engineering™. Together as AIRXCEL, INC., we're proud to bring the RV industry innovative, reliable, powerful and efficient comfort products. We're committed to expanding our capabilities and expertise and we take that responsibility seriously!

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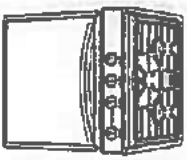
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Suburban Q Series furnaces are designed to be significantly QUIETER with increased efficiency and lower motor RPM for substantially lower sound levels.



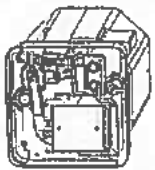
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2. It may be necessary to seal some of the old roof vent mounting screw holes which may fall outside of the Heat Pump basepan gasket.

3. Examine the roof opening. If the opening is smaller than 14" x 14", the opening must be enlarged. If the opening exceeds 15" x 15", a mounting frame must be field fabricated to reduce the opening size (See Figure 1).

B. If a roof vent opening is not used, a new opening (See Figure 1) will have to be cut into the vehicle roof. A matching opening will also have to be cut into the interior vehicle ceiling. Be careful when cutting the ceiling opening. If the ceiling opening is carpentered, snagging could occur. After the opening in the roof and interior ceiling are the correct size, a framed support structure must be provided between exterior roof top and interior ceiling. The reinforced framed structure must provide the following guidelines:

1. Capable of supporting both the weight of the roof top Heat Pump and the interior ceiling assembly.
2. Capable of holding or supporting the roof outer surface and interior ceiling apart, so that when the roof top Heat Pump and ceiling assembly are bolted together, no collapsing occurs.

Aircel's 47000 series requires that the spacing from the vehicle roof top to the interior ceiling be no less than 1". A typical support frame is shown in Figure 1. The frame must provide an opening to allow passage for the power supply wiring. Route the supply wiring through the frame at the same time the support frame is being installed.

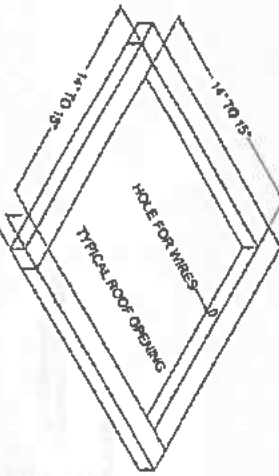


FIGURE 1

IMPORTANT - Allow 24" of supply wiring through the support frame (working length).

After the support frame is installed, seal off all gaps between the frame and both the roof exterior and the interior ceiling of the vehicle (ceiling walls). Additionally, seal the gap around the electrical supply wiring.

C. The roof top Heat Pump must be mounted as near level from front to rear and side to side as is possible when the vehicle is parked on a level plane. Figure 3 shows maximum allowable degree deviations (mounting degree from total surface flat plane). If the roof of the vehicle is sloped (not level) such that the roof top Heat Pump cannot be mounted within the maximum allowable degree deviations, an exterior leveling shim will need to be added to make the roof top Heat Pump level. A typical leveling shim is shown in Figure 2.

D. After the mounting hole area is properly prepared, remove the carton and stripping pads from the roof top Heat Pump. Carefully fit the unit to the top of the vehicle. Do not use the outer plastic strud for fitting. Place the roof top Heat Pump over the prepared mounting hole. The straps (and nose) of the strud must face towards the front of the vehicle. Pull the electrical conduit down from the Heat Pump through the mounting opening and let hang.

E. Securing the heat pump to the roof - A mounting frame is supplied with the ceiling assembly. Follow the steps below to secure the Heat Pump to the roof. Refer to Figure 4.

1. Locate the Heat Pump mount gasket over the 14" to 15" square opening in the roof.
2. Install the ceiling assembly mount frame using the four bolts found with the ceiling assembly.
3. Proper tension has been achieved for each bolt when any portion of each gasket indicating tab has been pulled down even with the roof. See Figure 4. The upper unit has now been properly installed with optimum gasket compression.

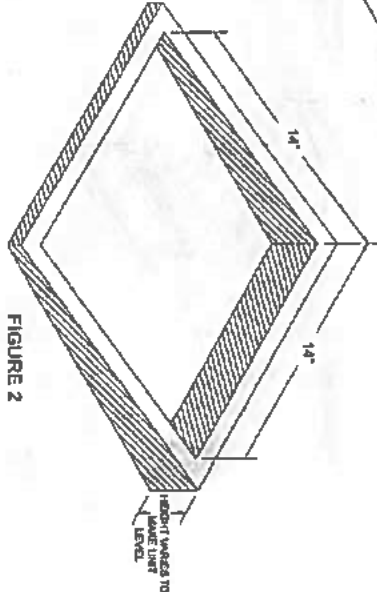


FIGURE 2

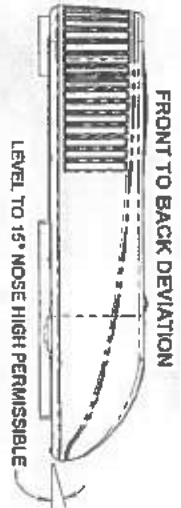
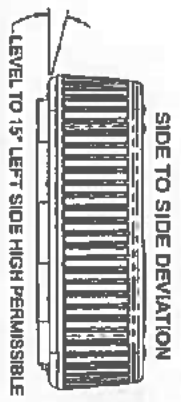


FIGURE 3

4. If the heat pump is equipped with an optional evaporator condensate pump, a 1/2" I.D. hose must be provided that runs from the 14" square opening through the vehicle ceiling and down the side wall to allow water to drain under the vehicle. The hose must not be allowed to kink shut while making a bend. Connect the top end of the drain hose to the barbed fitting shown in Figure 4

V. ELECTRICAL WIRING ROUTING 115 VAC WIRING

Following Airxel's high voltage wiring specifications and all local and national electrical codes, route the rooftop unit 115 VAC supply wiring from its power source to the wirebox. High Voltage Wiring Specifications based on Minimum Overcurrent Protection Device Amperage - (see upper unit nameplate)

1. U.L. requires copper conductors only with minimum #12 AWG when using the minimum recommended overcurrent protection device. Higher rated devices or longer wiring runs will require #10 AWG or greater copper conductors.
 2. To prevent voltage drops greater than 10% during starting loads, adhere to the following guideline:
 - a. For lengths greater than 50', use #10 AWG or larger copper conductors. Match to the overcurrent protection device provided.
 - b. Circuit Protection - Refer to upper unit nameplate.
- High Voltage Wiring Specification is based on Overcurrent Protection Device rated higher than the minimum required (see upper unit nameplate). Follow all local and NEC (National Electrical Code) for proper sizing of wire AWG based on Overcurrent Protection Device selected and the length of the wiring run to the Heat Pump.

DANGER - SHOCK HAZARD!

MAKE SURE THAT ALL POWER SUPPLY TO THE UNIT IS DISCONNECTED BEFORE PERFORMING ANY WORK ON THE UNIT TO AVOID THE POSSIBILITY OF SHOCK INJURY OR DAMAGE TO THE EQUIPMENT.

WHEN USING NON-METALLIC SHEATH CABLES (ROMEX, ETC.), STRIP SHEATH BACK TO EXPOSE 4-6 INCHES OF THE SUPPLY LEADS.

STRIP THE INDIVIDUAL WIRE LEAD ENDS FOR WIRE CONNECTION (ABOUT 3/4" BARE WIRE). INSERT THE SUPPLY WIRES INTO THE ELECTRICAL CONNECTOR CLAMP. SHEATH MUST PROTRUDE PAST THE CLAMP BUSHING INSIDE THE BOX AS ILLUSTRATED. MAKE SURE SHEATH CABLE IS CENTERED IN CLAMP BEFORE TIGHTENING CLAMP ON SHEATH CABLE! DO NOT OVERTIGHTEN!

THIS COULD RESULT IN PINCHING THROUGH THE PLASTIC WIRE INSULATION AND CAUSE SHORTING OR "HOT" WIRES TO GROUND (SHOCK HAZARD). THE CLAMP IS INTENDED FOR STRAIN RELIEF OF THE WIRES. SLIGHT PRESSURE IS USUALLY SUFFICIENT TO ACCOMPLISH THIS.

IF OTHER THAN NONMETALLIC CABLES ARE USED FOR SUPPLY CONDUCTORS, APPROPRIATE STRAIN RELIEF CONNECTORS OR CLAMPS SHOULD BE USED. IN NO CASE SHOULD CLAMPING OR PINCHING ACTION BE APPLIED TO THE INDIVIDUAL SUPPLY LEADS (NEUTRAL AND "HOT" WIRES).

X. GARANTIE PROLONGÉE OFFRE

Couvrez votre nouvel achat avec nos parties étendues de trois (3) ans seulement contractuels.

Cette garantie couvre les pièces seulement (pas de travail) contre les défauts de fabrication pour une période de trois (3) années supplémentaires au-delà de votre (2) la garantie initiale de deux ans. Cette garantie exclut les haubans, les filtres et les pompes à chaleur s complets.

Qu'est-ce un excellent ajout à votre garantie standard - sachant que vous avez la protection d'un trois (3) ans, si vous rencontrez défaillance d'une pièce supplémentaire (à l'exclusion des linceuls, des filtres et des pompes à chaleur s complets) sur votre air Coleman Mach-conditionneur. Pièces de rechange gratuites pour trois (3) ans (à l'exclusion des linceuls, des filtres et des pompes à chaleur s complets) - comment pouvez-vous passer cette place!

Postulez dès aujourd'hui en remplissant le formulaire situé sur la couverture arrière de cette installation et d'utilisation et en l'envoyant dans le long avec votre chèque ou mandat à Airxel, Inc., PO Box 4020, Wichita, KS 67204. Un contrat sera envoyé à vous dans quelques semaines. Vous devez conserver vos documents avec preuve d'achat.

Pour voir l'AN GARANTIE LIMITÉE 2, l'option à trois ans, pièces garantie prolongée, un exemple de contrat, les conditions, les exceptions et les exclusions, s'il vous plaît visitez www.Airxcel.com et le type GARANTIE dans la barre de recherche.

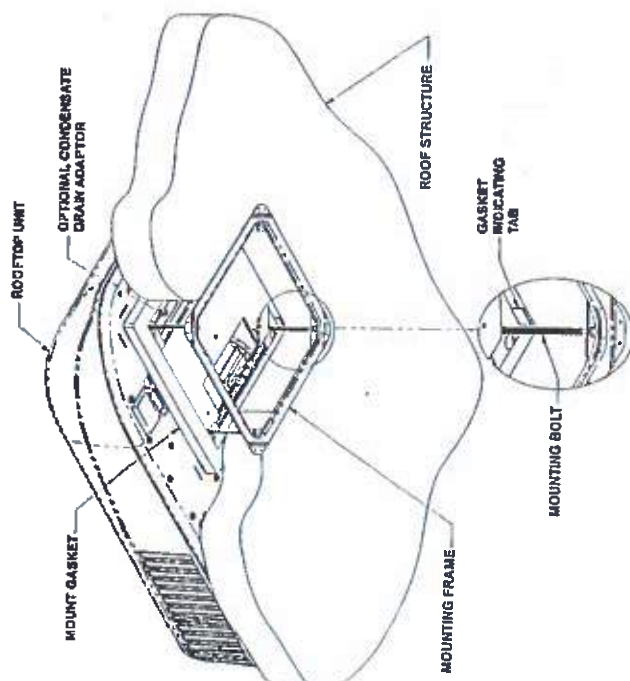


FIGURE 4



RV Products Division

AIRXCEL, INC. - RV Products Division • 3050 N. St. Francis St. • Wichita, KS 67219

316.832.3400 • WWW.AIRXCEL.COM

Coleman est une marque déposée de The Coleman Company, Inc., utilisée sous licence. March est une marque déposée.

Nettoyage ou changement des filtres:

1. Retirer les deux grilles de l'assemblage de plafond en tirant les languettes sur les grilles.
2. Retirer et nettoyer ou remplacer les deux filtres.
3. Réinstaller les filtres et les grilles dans le montage de plafond, comme illustré dans la figure 2.
4. Si le véhicule est équipé d'un assemblage bords de montage au plafond, retirez les quatre rebord grille d'air vifs. Retirer l'âme de la grille et soit propre ou échanger avec de nouveaux filtres.

REMARQUE: Si des filtres de remplacement sont nécessaires, on peut se les procurer de la plupart des centres de service autorisés Airxcel, Inc. Il est recommandé de toujours avoir des filtres de rechange dans votre VR en tous temps pour remplacer les filtres défectueux, usés ou déchirés.

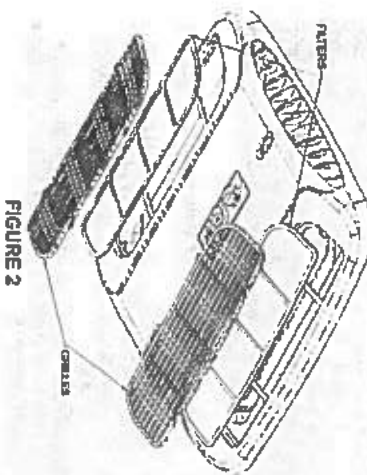


FIGURE 2

- II. Réparateur
 - A. Electricien - Toute inspection et/ou modification du circuit électrique devrait être effectuée par des techniciens qualifiés seulement. Contactez votre centre de service de Airxcel, Inc. le plus proche en cas d'anomalies électriques.
 - B. Point de vérification - Échec de démarrage ou pour refroidir l'air sont parfois des problèmes avec pompe à chaleur unifiés. Le conditionneur d'air RV de Coleman-Mach est conçu pour s'alimenter d'une source de 115 V. Si le compresseur de la pompe à chaleur ne parvient pas à démarrer, vérifier avec votre Airxcel, Inc. Centre de Services pour déterminer que la bonne taille de fil est connecté à l'unité. La bonne les disjoncteurs sont installés en tant que dispositifs de protection sur le circuit électrique et la taille appropriée d'une rallonge est utilisée pour la distance parcourue depuis l'utilitaire sortie à la RV. Le calibre de fil minimal requis est de 12 AWG pour les longueurs jusqu'à 25 pi (7,62 cm) (un calibre de fil plus gros pour les distances supérieures). Chaque pompe à chaleur unifié doit être protégée par un 20 amp délégal fusible ou le disjoncteur.

Si la pompe à chaleur continue à se déclencher sur les disjoncteurs, demandez à un électricien vérifier le démarrage intensité et exécutant l'initiale sur l'unité. Si le disjoncteur continue de se déclencher et que la consommation d'électricité s'avère normale, il faudra remplacer le disjoncteur défectueux. Si toute l'alimentation électrique de la pompe à chaleur est normale mais qu'il le vérifieur ou le compresseur fonctionnent, le connecteur plus situé derrière la plaque boîtier de commande doit être vérifié pour déterminer si elle est défectueuse. Sur les groupes de chauffage-refroidissement pompe à la chaleur modèles, si toute l'alimentation électrique de l'appareil est normale et que le

ventilateur fonctionne, mais vous n'obtenez jamais tout l'air chauffé, puis la prise électrique de l'appareil de chauffage doit être vérifiée pour une connexion sécurisée. Si cela ne résout pas le problème, le thermostat de chauffage ou la fin de course est peut-être en dérangement.

C. Intégrité mécanique - Le pompe à chaleur doit être inspectée périodiquement afin de vérifier à ce que les boutons qui fixent l'appareil sur le toit sont serrés et en bon état. Également, l'examen du carterage en plastique qui recouvre la pompe à chaleur sur le toit doit être faite régulièrement. Assurez-vous que les cinq vis de fixation et les rondelles sont bien ajustées et à la tenue du carterage sur le châtelet. Étudiez aussi la coiffe pour vous assurer qu'elle ne craque pas ou qu'elle n'a pas subi de dommages sur impact.

V. EXPLOITATION DU THERMOSTAT MURAL
Si votre Coleman-Mach unité est contrôlé par un thermostat, référer via le livre d'opération inclus avec le thermostat.

VI. SERVICE DE GARANTIE
Il convient de le dire, même les produits de la plus haute qualité ont parfois besoin d'être réparés. Pour vous préparer de réparations sous garantie pour votre conditionneur Coleman-Mach, veuillez communiquer avec votre détaillant. Vous pouvez également visiter notre site Web à l'adresse www.airxcel.com pour consulter les réponses aux questions les plus fréquemment posées ainsi que les adresses des centres de service. De même, vous pouvez entrer en contact avec le service de soutien à la clientèle par courrier électronique au RVSupport@Airxcel.com. Toute correspondance écrite doit être envoyée à l'adresse suivante:
AIRXCEL, INC. - RV Products Division
P.O. Box 4020
Wichita, KS 67204 USA

IMPORTANT

1. Lisez attentivement l'AN GARANTIE LIMITÉE 2, l'option à trois ans sur les pièces Garantie prolongée, exemple de contrat, les conditions, les exceptions et les exclusions relatives à votre appareil au www.Airxcel.com.
2. Vous pouvez également vous procurer un contrat prolongé de trois ans couvrant uniquement les pièces détachables moyennant un supplément de 89,95 \$US.
Pour ce faire, remplissez la carte de demande agrément à l'avant de cette enveloppe. Veuillez envoyer la carte et un chèque ou un mandat à l'adresse mentionnée ci-dessus. Les demandes doivent être faites dans les quatre-vingt-dix (90) jours suivant l'achat initial.
3. Pour tout renseignement à propos de votre unité de Coleman-Mach, vous devez indiquer le nom du modèle, les numéros de série et la date d'achat. Le nom du modèle et les numéros de série sont inscrits sur l'étiquette de l'identification placée sur l'arrière de l'unité dans le plateau situé à la partie inférieure du climatiseur de toit. Ces informations figurent aussi sur la plaque signalétique du toit.

DANGER - SHOCK HAZARD!
TO PREVENT THE POSSIBILITY OF SHOCK INJURY, THE WHITE WIRE MUST BE CONNECTED TO NEUTRAL. IN THE SERVICE BOX ENTRANCE AND THE MECHANICAL GROUND MUST BE CONNECTED TO A GROUNDING LUG EITHER IN THE SERVICE BOX OR THE MOTOR GENERATOR COMPARTMENT.

VI. INSTALLING THE OPTIONAL HEATER ACCESSORY

IMPORTANT NOTE

The optional Heater Accessory is intended to take the chill out of the indoor air when the air is a few degrees too cool for comfort. The Heater Accessory is an effective "Cold Chaser". It is not a substitute for a furnace.

If the optional heater is being installed, mount the heater bracket on the weld studs on the channels in the return air opening as shown in Figure 5. Secure the bracket using the wing nuts provided. The heater is then assembled to the heater bracket lining up the weld studs on the heater with the holes on the heater bracket. Secure the heater in place using wing nuts provided (See Figure 6).

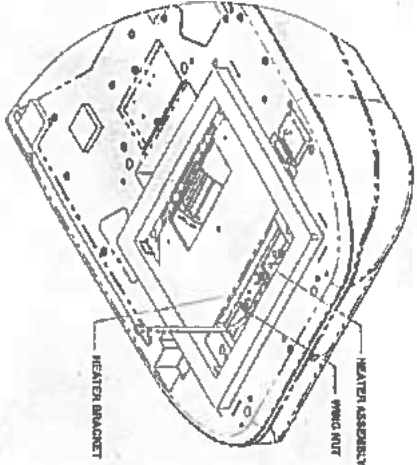


FIGURE 5

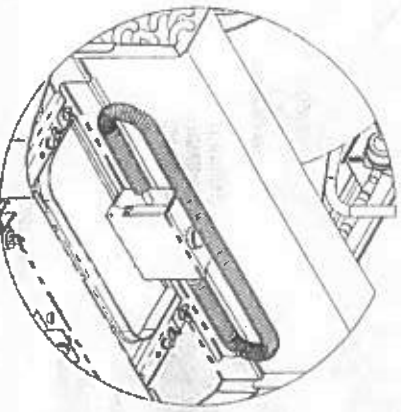


FIGURE 6

VII. INSTALLING THE CEILING ASSEMBLY (9600 SERIES)

Make sure that you have properly matched the roof top Heat Pump and interior ceiling assembly. The following step-by-step instructions must be performed in the following sequence to insure proper installation.

- A. Remove ceiling assembly from carton, separate individual items and remove the two grilles and filters from the ceiling stroud.
- B. Fold and break off the 3 tabs around the inner opening of the duct collar then fasten the duct collar to the heat pump basspan with 3 provided screws (See Figure 9).
- C. Raise the ceiling assembly chute and insert the supply wiring through the cable clamp and into the wiring box so that 4-6" of supply conductor is inside the box. Secure the cable clamp over the supply wire sheath so that no movement is possible (See Figure 7).
- D. Connect the supply power black conductor to the black pigtail wire, the white conductor to the white pigtail wire and the supply ground conductor to the green pigtail wire found in the wiring box using the 3 provided wire nuts. Using a U.L. approved electrical tape, secure the wire nuts to wires in a workmanlike manner (See Figure 8).
- E. Press supply conductors and wire nuts into wiring box and making sure no wires are pinched, secure the wire box cover with 2 provided screws (See Figure 8).
- F. Plug the heat pump electrical conduit into the 9 position receptacle as shown in Figure 7.
- G. If the optional heater accessory package is being installed, remove the cover from the 2 position receptacle and plug the heater cord into receptacle as shown in Figure 7.
- H. Raise the ceiling assembly chute to the unframing frame and secure the chute with 4 provided screws (See Figure 9).
- I. **THE ALL WIRING TO INSURE NO CONTACT WITH ANY SHARP EDGES OR WITH OPTIONAL HEATER IS POSSIBLE. KEEP IN MIND THAT HIGH VELOCITY AIR WILL BE ENCOUNTERED IN THIS AREA.**
- J. Pull the fabric duct material through the ceiling chute discharge opening. Peel the release liner from the adhesive strip around the opening. Press the fabric duct material firmly in place around opening. Cut off excess fabric on inside of ceiling chute with a box knife taking care not to tear the fabric beyond the adhesive strip.
- K. Raise the ceiling stroud and while insuring it meshes with the chute, secure to mounting frame with 4 provided screws (See Figure 9).
- L. Install the control knobs over the switch and thermostat shafts. The thermostat (temperature) control knob installs nearest the "Coleman-Mach" logo.
- M. Re-install the filters and grilles into the ceiling assembly stroud.
- N. Turn the selector switch to OFF position.
- O. Turn ON the power supply to the roof top heat pump.

VIII. SYSTEM CHECKOUT

Airxcel, Inc. manufactures a wide range of roof top Heat Pumps which incorporate different product operation features. To properly evaluate the performance of a newly installed Heat Pump, it is necessary to review the specific unit operation characteristics (features) described in the product OPERATION AND MAINTENANCE INSTRUCTIONS section of this booklet.

III. EXPLOITATION

- I. Pour l'opération de refroidissement (reportez-vous aux figures 1, p 2).
 - A. Tournez le sélecteur vers la position «LOW COOL» ou «HIGH COOL».
 - B. Ajustez le thermostat (commande thermique) à la position la plus confortable pour vous. Le thermostat met le compresseur en marche lorsque la température de l'air pénétrant dans la pompe à chaleur s'élève de quelques degrés au-dessus du paramètre que vous avez sélectionné. Lorsque la température de l'air pénétrant dans la pompe à chaleur est inférieure au réglage sélectionné, le thermostat s'améliore le compresseur. La pompe à chaleur, tandis que dans le mode de refroidissement, va poursuivre le cycle de refroidissement, à l'arrêt dans le cycle de refroidissement, ce que le commutateur-sélecteur est tourné vers un autre mode de fonctionnement.
 - C. Orientez les louvers dans la direction voulue pour l'air soufflé.

II. Exploitation (du refroidissement) pendant les nuits froides.

Quand la température extérieure descend, la soir ou la nuit, sous 75 degrés F (23,9 degrés C), il importe que le thermostat (commande thermique) soit placé entre «Warmer» et «Cooler». Si le réglage est sur «Cooler», le serpentin refroidisseur (évaporateur) peut givrer et cesser de refroidir. Pendant la journée, quand la température a remonté de 75 degrés F, 23,9 degrés C), remettez le thermostat au réglage désiré.

REMARQUE: En cas de givrage, il faut laisser le serpentin refroidisseur (évaporateur) dégivrer avant de reprendre l'exploitation normale du refroidissement. Entre-temps, faites fonctionner l'unité en position «HIGH FAN» débit d'air maximal. Quand vous observez un débit d'air accru ou optimal, le serpentin refroidisseur devrait être de glace.

III. Pompage

Lorsque la pompe à chaleur en fonctionnement, le compresseur de réfrigérant circule sous haute pression. Une fois éteint, il lui faudra deux ou trois minutes pour égaliser la pression.

La pompe à chaleur compresseur est incapable de démarrer contre une haute pression. Par conséquent, une fois que la pompe à chaleur est hors tension, il est important de le laisser pendant deux à trois minutes avant de redémarrer.

Le pompage du compresseur (son démarrage avant que les pressions s'égalisent) va, dans certains cas, déclencher le disjoncteur ou causer une surcharge.

IV. Pour Chauffer d'Opération (reportez-vous aux figures 1, p 16).

REMARQUE: La pompe à chaleur fonctionne sur le chauffage cycle frigorifique inverse à des températures extérieures au-dessus de congélation. Lorsque la température extérieure est inférieure à la congélation, le compresseur de la pompe à chaleur arrêté afin de prévenir serpentin extérieur du gel. A cette époque, si l'option chauffage auxiliaire résistance électrique a été installé, il sera mis sous tension pour prendre le chill-out de l'air intérieur. La résistance électrique n'est pas un substitut pour un four à ces basses températures extérieures.

A. Tournez le sélecteur vers la position «HIGH HEAT». Sur «HIGH HEAT», le ventilateur fonctionne à haute vitesse avec une production de chaleur au maximum.

B. Ajustez le thermostat (commande thermique) à la position la plus confortable pour vous. Le thermostat met le compresseur/chauffage en marche lorsque la température de l'air pénétrant dans la pompe à chaleur tombe en dessous de ce paramètre de quelques degrés, et s'éteint automatiquement lorsque la température de l'air pénétrant dans la pompe à chaleur s'élève de quelques degrés au-dessus de cette valeur. Le compresseur-chauffeur continuera de s'allumer et de s'éteindre ainsi jusqu'à fonctionnement.

C. Orientez les louvers dans la direction voulue pour l'air soufflé.

La température de l'air soufflé peut être contrôlée jusqu'à un certain point en ouvrant ou en fermant les louvres. Quand les louvres sont fermés, l'air de soufflage localisé le plus chaud est émis. Des louvres entièrement ouverts projettent l'air soufflé chaud vers l'arrière et vers l'avant du véhicule pour une circulation accrue et un réchauffement accéléré. Même si la température de de l'air est inférieure avec les louvres entièrement ouverts, la capacité de chauffage est la même.

V. Pour la circulation d'air seulement (reportez-vous aux figures 1, p 2).

- A. Tournez le sélecteur sur «LOW FAN» ou, pour un débit d'air maximal, sur «HIGH FAN».
- B. Orientez les louvres dans la direction voulue pour l'air soufflé.

REMARQUE: Quand le sélecteur est en position «LOW FAN» ou «HIGH FAN», le moteur à soufflerie fonctionne sans arrêt.

IV. ENTRETIEN

I. Propriétaire

L'un des plus grands avantages de votre nouvelle Coleman-Mach pompe à chaleur est que l'entretien nécessaire pour conserver l'unité d'une bonne garde est minime. En fait, le nettoyage et le remplacement des filtres est à peu près la seule chose que vous, le propriétaire, avez besoin de faire.

Les filtres sont faits de fibres naturelles durables non allergènes, qui peuvent être nettoyées et réutilisées et qui filtrent complètement l'air circulé quand le conditionneur d'air fonctionne. Si les filtres ne sont pas nettoyés régulièrement, ils peuvent devenir partiellement bouchés par la peluche, la poussière, la graisse, etc. Un filtre obstrué réduit le volume d'air et risque de causer un givrage du serpentin refroidisseur (évaporateur).

IMPORTANT

Ne pas faire fonctionner votre pompe à chaleur pendant de longues périodes de temps sans le filtre installé.

Une situation encore plus grave se produit lorsque la pompe à chaleur fonctionne sans filtre. La peluche, la poussière, la graisse et tout ce qui s'amèle normalement au filtre s'accumulent alors dans le serpentin refroidisseur. Ce n'est pas seulement conduit à une perte de volume d'air et d'un possible givrage de la batterie de refroidissement, mais pourrait également entraîner des dommages graves aux composants de fonctionnement de la pompe à chaleur.

Nous recommandons que les filtres être nettoyés et change au moins toutes les deux semaines quand la pompe à chaleur est en fonctionnement.

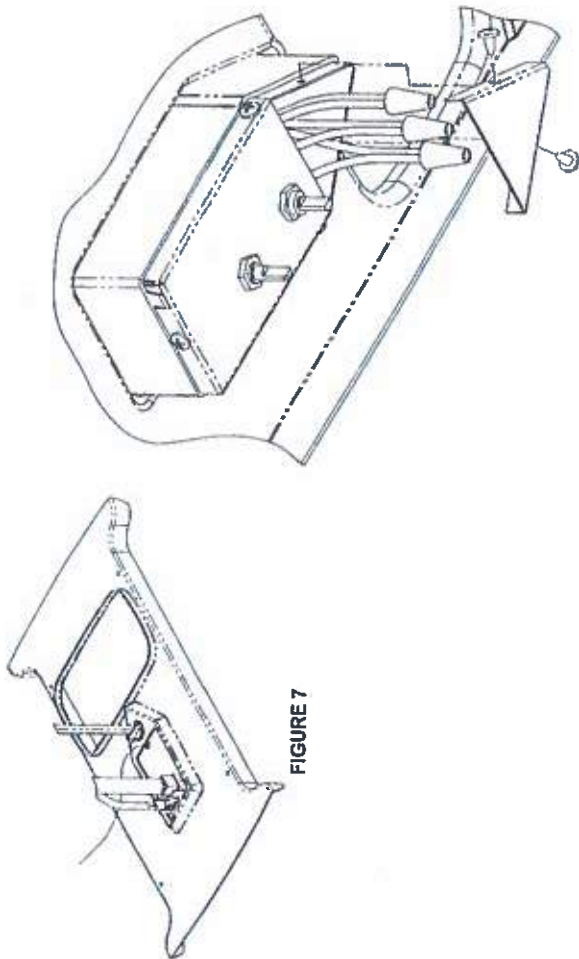


FIGURE 7

FIGURE 8

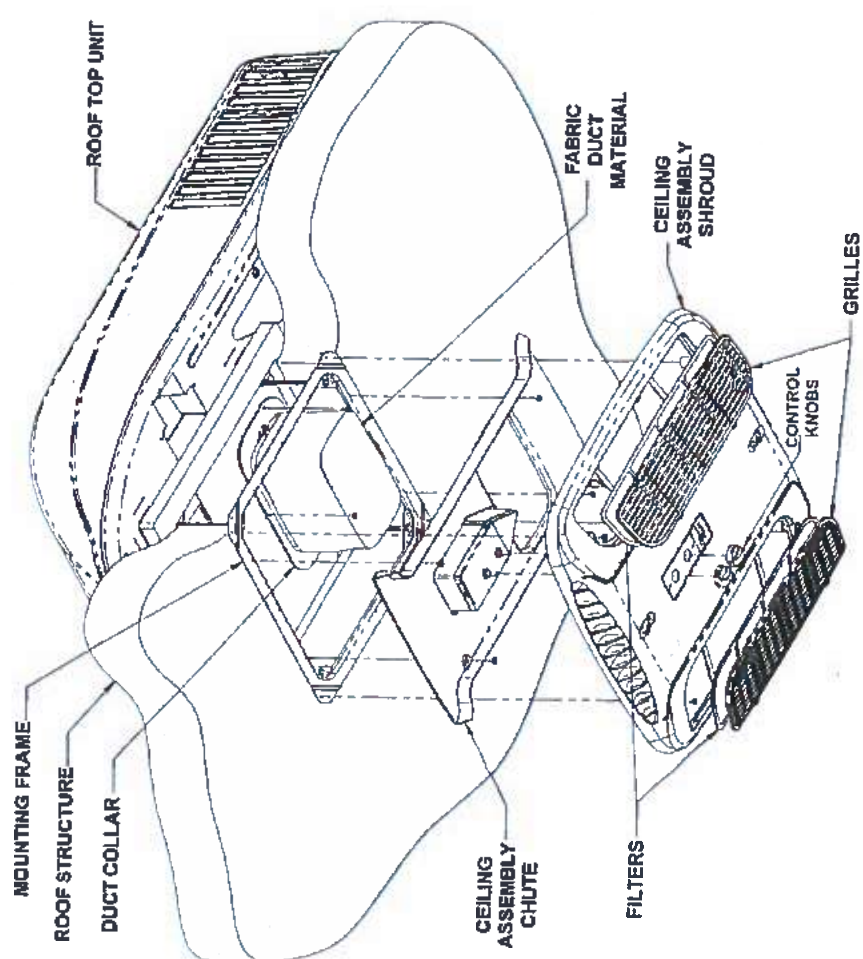


FIGURE 9

IX. MODE D'EMPLOI ET UTILISATION

SÉRIES 47000

DES POMPE À CHALEUR S DE TOIT DES PLÉNUM DE PLAFOND

1. RENSEIGNEMENTS GÉNÉRAUX

NOTE: Un auxiliaire en option résistance électrique chauffage peut être installé pour réchauffer de l'air intérieur quand la pompe ne peut plus fonctionner. La thermopompe s'éteindra dans les conditions qui causeraient un blocage par congélation de l'échangeur extérieur, en général près des températures de congélation.

Cette thermopompe de toit est conçue pour s'alimenter d'une source monophasée de 115 V c.a. et de 60 Hz. Un technicien qualifié doit vérifier que la pompe à chaleur reçoit l'alimentation adéquate.

Au mode refroidissement, la baisse de température de l'air à la sortie sera de 15 à 20 degrés F (-9,4 à -6,6 degrés C). Au mode chauffage, la hausse de température de l'air à la sortie atteindra de 25 à 40 degrés F (-3,8 à 4,4 degrés C), à moins que la température extérieure ne chute suffisamment pour activer l'intermittent antiblocage. Dans ce cas, la température ne s'éleva que de 10 à 20 degrés F (-12,2 à -8,6 degrés C). Tout écrit à ces normes, justifie un examen de l'appareil, à la recherche de fuites à et sales ou d'un échangeur extérieur encrassé.

Le fait de stationner le véhicule à l'ombre, de garder les fenêtres et les portières fermées et d'éviter l'utilisation d'appareils thermogènes dans le véhicule aidera à réduire le gain de chaleur. Si possible, considérez l'ajout d'isolant et de vitres teintées (surtout dans les latitudes non isolées).

R410A toit pompes à chaleur

Circuit de blocage du contacteur haute pression.

Pompes à chaleur utilisant le R410A réfrigérant utiliser une usure installée interrupteur haute pression circuit de sécurité. Dans l'éventualité d'une anomalie (une défaillance du moteur du ventilateur, un serpentín de

condensation sale, des filtres encrassés) le contacteur haute pression empêche le compresseur de revenir en marche. Quand le contacteur haute pression est défectueux, ce circuit de sûreté bloque le compresseur, ce qui empêche ce dernier de redémarrer ou de fonctionner jusqu'à ce que l'alimentation de 115 V c.a. soit coupée puis rétablie de façon à réinitialiser le circuit de sûreté du contacteur haute pression. Si le blocage du contacteur haute pression se détermine à maintes reprises, vous devez faire réparer l'appareil par un technicien compétent.

II. PANNÉAU DE COMMANDE

Si votre RV pompe à chaleur est actionné à partir du panneau de commande situé dans le plafond, puis il y a trois commandes sur le plafond qui vous aident à contrôler la pompe à chaleur. Ce sont les suivantes:

- A. Le sélecteur - Le commutateur de sélection détermine le mode de fonctionnement la pompe à chaleur doit être. En tournant le sélecteur, l'utilisateur peut obtenir toute fonction de l'appareil désirée. Les fonctions du dispositif varient selon les options de l'unité de toit et celles du plafonnier. Le figure 1 illustrant l'emplacement du sélecteur et les fonctions offertes. La section « Exploitation » explique les caractéristiques de chaque mode de fonctionnement.
- B. Le thermostat (commande thermique) - Le thermostat fixe le réglage de température de « ON » et « OFF » auquel le compresseur va fonctionner (voir la figure 1).
- C. Les louverns - Les louverns se situent aux deux extrémités de la coiffe du plafonnier et servent à diriger l'air soufflé par l'unité.

IX. OPERATION AND MAINTENANCE

INSTRUCTIONS FOR 47000 SERIES

ROOF TOP HEAT PUMPS AND CEILING PLENUMS

1. GENERAL INFORMATION

NOTE: An optional auxiliary electric resistance heating assembly can be installed to take the chill out of the indoor air when the heat pump can no longer operate. The heat pump will shut down at conditions which would cause outdoor coil freeze-up, generally near freezing temperatures.

This roof mount heat pump is designed to operate from a 115 VAC, 60 HZ, 1 Phase power supply. A qualified technician should verify that the heat pump is receiving the proper power.

In the cooling mode, the temperature drop from inlet to supply will be 15 to 20 degrees. In the heating mode, the temperature rise from inlet to supply will be 25 to 40 degrees unless the outdoor temperature has dropped sufficiently to cause the freeze switch to activate. In that case, the rise will be only 10 to 20 degrees. Any deviations from these norms are cause to examine the system for dirty air filters or dirty outdoor coil.

Parking the vehicle in a shaded area, keeping windows and doors shut and avoiding the use of heat producing appliances in the vehicle will help to reduce the heat gain. When possible, the addition of insulation and tinted glass (especially in unheated vans) should be considered.

R410A Roof Top Heat pumps

High Pressure Switch Lockout Circuit

Heat pumps using R410A refrigerant may utilize a factory installed High Pressure Switch Safety Circuit. In the event of an abnormal condition (failure of fan motor, dirty condenser coil, dirty filters), the high pressure switch will prevent the compressor from continuing to

run. Once the high pressure switch has tripped, this safety circuit will "Lock Out" the compressor preventing it from trying to restart or run until the 115 VAC supply power has been turned off and then back on to reset the High Pressure Switch Safety Circuit. If repeated trips of the high pressure switch lock out occur, then you must have the unit serviced by a qualified technician.

II. CONTROL PANEL

If your RV heat pump is operated from the control panel located in the ceiling assembly, then there are three controls on the ceiling assembly that help you control the heat pump. They are as follows:

- A. The Selector Switch - The selector switch determines which mode of operation the heat pump will be in. By rotating the selector switch, the operator can obtain any system function desired. System functions vary depending upon options of both the roof top unit and ceiling assembly. Figure 1 shows selector switch location and lists all available functions by model. The "Operator" section explains the operational characteristics of each mode of operation.
- B. The Thermostat (temperature control) - The thermostat regulates the "ON" and "OFF" temperature setting at which the compressor will operate. See Figure 1.
- C. Louvers - The louverns are located at both ends of the ceiling assembly shroud and are used in directing the discharge air from the unit.

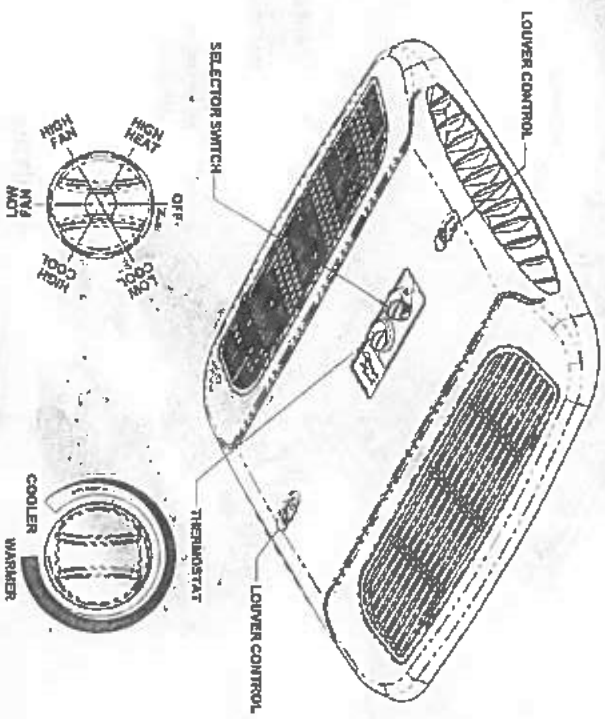


FIGURE 1

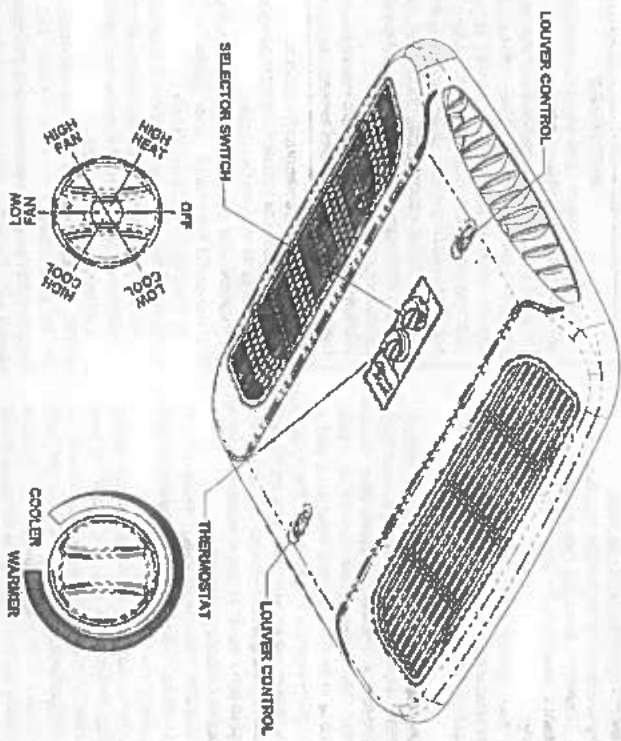


FIGURE 1

III. OPERATION

1. For Cooling (Refer to Figure 1, page 9).
 - A. Turn the selector switch to the "LOW COOL" or "HIGH COOL" position.
 - B. Rotate the thermostat (temperature control) to the position that is the most comfortable to you. The thermostat will turn the compressor on when the temperature of the air entering the heat pump rises a few degrees above the setting you have selected. When the temperature of the air entering the heat pump drops below the selected setting, the thermostat will turn the compressor off. The heat pump, while in the cooling mode, will continue to cycle the compressor on and off in the above mentioned fashion until the selector switch is turned to another mode of operation.
 - C. Position the louvers to the desired direction the discharge air is to flow.

II. Operation During Cooler Nights (Cooling Operation).

It is important, when the outdoor temperature drops in the evening or during the night to below 75 degrees F., that the thermostat (temperature control) be set at a midpoint between "Warmer" and "Cooler". If the setting is at "Cooler", the evaporator coil may become ice-up and stop cooling. During the day when the temperatures have risen above 75 degrees F., reset the thermostat switch to the desired setting.

NOTE: Should icing-up occur, it is necessary to let the cooling (evaporator) coil defrost before normal cooling operation is resumed. During this time, operate the unit in the "HIGH FAN" position with the system at maximum air flow. When increased or full air flow is observed, the cooling coil should be clear of ice.

III. Short Cycling

When a heat pump is in operation, its compressor circulates refrigerant under high pressure. Once off, it will take two to three minutes for this high pressure to equalize. The heat pump compressor is unable to start against high pressure. Therefore, once the heat pump is turned off, it is important to leave it off for two to three minutes before restarting.

Short cycling the compressor (or starting it before pressures have equalized), will in some instances, kick the circuit breaker or overload.

IV. For Heating Operation (Refer to Figure 1, page 2).

NOTE: The heat pump will operate on reverse cycle refrigerant heating at outdoor temperatures above freezing. When the outdoor temperature is below freezing, the heat pump compressor will shut down to prevent outdoor coil freeze-up. At this time, if the optional auxiliary electric resistance heater has been installed, it will be energized to take the chill out of the indoor air. The electric resistance heater is not a substitute for a furnace at these low outdoor temperatures.

- A. Turn the selector switch to the "HIGH HEAT" position. At "HIGH HEAT", the fan operates on high speed with heat output at maximum.
- B. Rotate the thermostat (temperature control) switch to the position that is the most comfortable to you. The thermostat will turn the compressor/heater on when the temperature of the air entering the heat pump unit drops below the setting a few degrees and automatically turns off when the temperature of the air entering the heat pump rises a few degrees

above this setting. The compressor/heater will continue to cycle on and off in this fashion until the selector switch is turned to another mode of operation.

- C. Position the louvers to the desired direction the discharge air is to flow. Discharge air temperature can be controlled to some extent by opening or closing the louvers. When the louvers are closed, the warmest localized discharge air is achieved. Fully opened louvers will throw the warm discharge air to the back and front of the vehicle for more efficient circulation and faster warm-up. Although the air temperature is lower with the louvers fully opened, the heating capacity is still the same.

V. For Air Circulation Only (Refer to Figure 1, page 2).

- A. Turn the selector switch to "LOW FAN" or for maximum air flow, to "HIGH FAN".
- B. Position the louvers to the desired direction the discharge air is to flow.

NOTE: When the selector switch is in the "LOW FAN" or "HIGH FAN" position, the blower motor will operate continuously.

iv. MAINTENANCE

1. Owner - One of the biggest advantages to your new Coleman-Mach heat pump is that the maintenance needed to keep the unit in good working order is minimal. In fact about the only thing you, the owner, must take care of is the cleaning and replacement of the filters.

Filters are made from long life non-antigenic natural fibers which can be cleaned and reused, and which completely filter the circulated air when the heat pump is in operation. If the filters are not cleaned at regular intervals, they may become partially clogged with lint, dirt, grease, etc. A clogged filter will produce a loss of air volume and may eventually cause an icing-up of the cooling (evaporator) coil.

IMPORTANT

Do not operate your heat pump for extended periods of time without the filter installed. An even more serious condition occurs when the heat pump is operated without a filter. When this happens the lint, grease, etc. that are normally stopped by the filter are now accumulating in the cooling coil. This not only leads to a loss of air volume and a possible icing-up of the cooling coil, but could also result in serious damage to the operating components of the heat pump.

We recommend that the filters be cleaned and changed at least every two weeks when the heat pump is in operation.

Cleaning and/or changing the filters:

1. Remove the two grilles from the ceiling assembly by pulling the tabs on the grilles.
2. Remove and clean or replace the two filters.
3. Re-install the filters and grilles in the ceiling assembly as shown in Figure 2.
4. If the vehicle is equipped with a flush mount ceiling assembly, remove the four return air grille screws. Remove filter from the grille and either clean or exchange with new filters.

NOTE: If replacement filters are necessary, the filters can be purchased from most Alnico, Inc. Authorized Service Centers. It is recommended that spare filters be carried with the RV at all times to replace worn, torn or deteriorated filters.

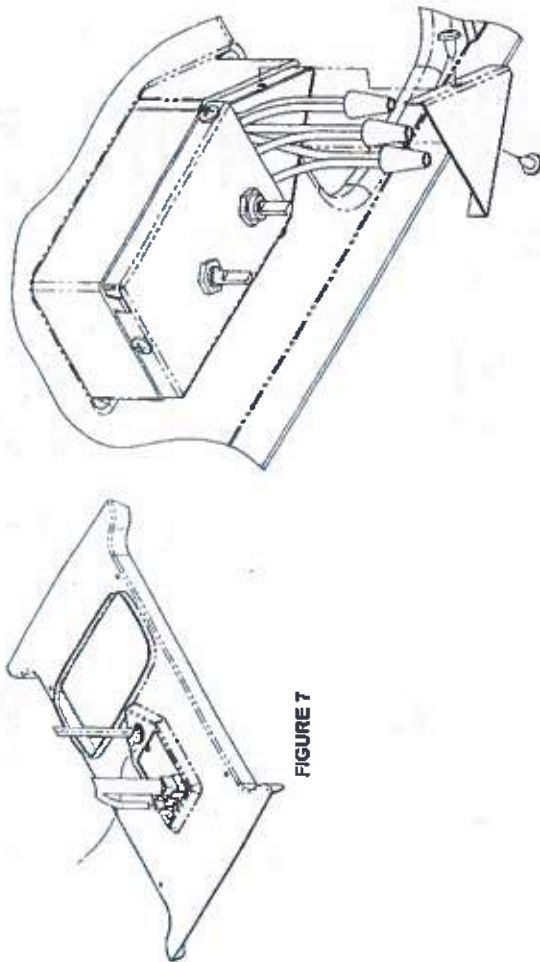


FIGURE 7

FIGURE 8

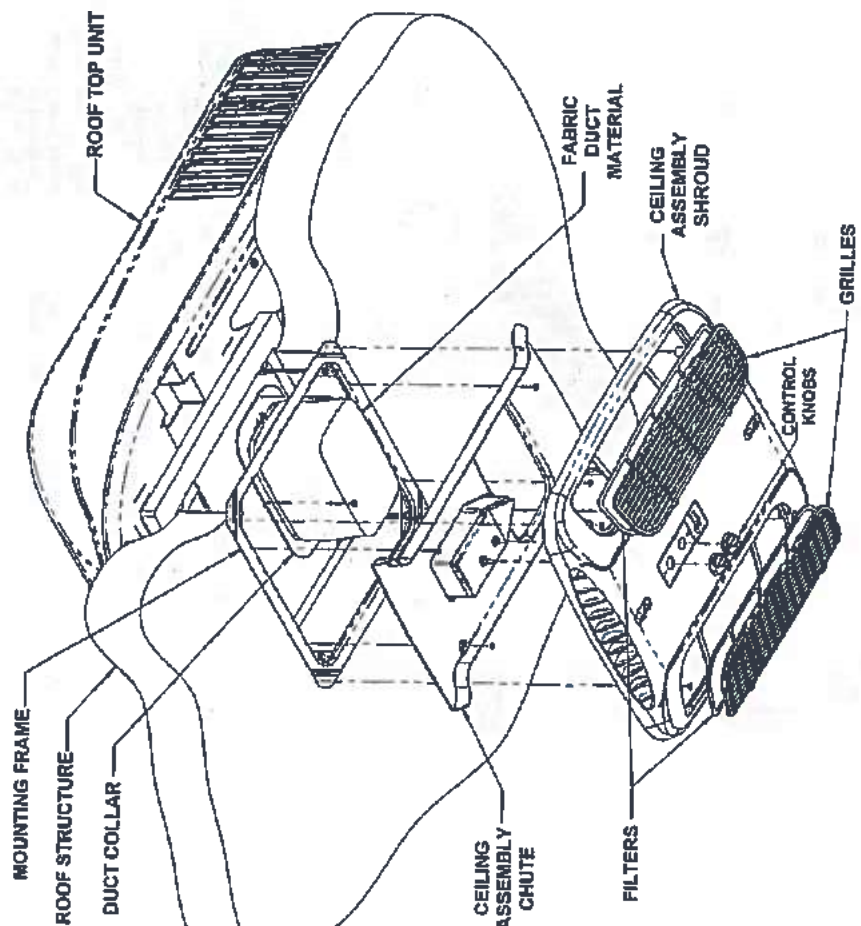


FIGURE 9

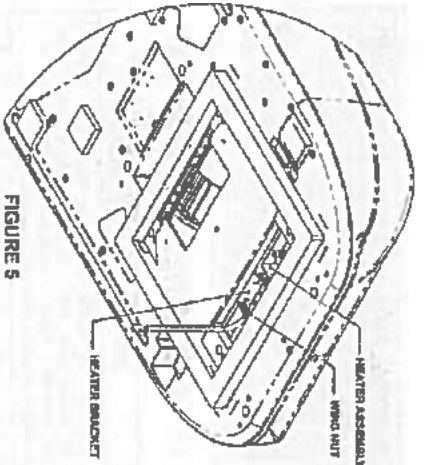


FIGURE 5

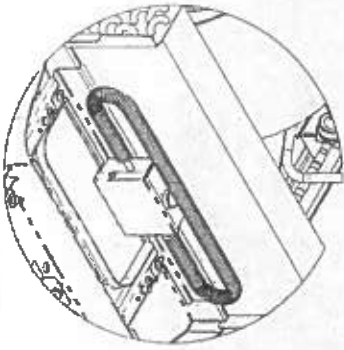


FIGURE 6

VII. INSTALLATION DE L'ENSEMBLE DE PLAFOND (SERIE 9600)

- Confirmez que vous avez correctement apparié la pompe à chaleur de toit et l'ensemble de plafond. Vous devez exécuter les instructions pas à pas dans l'ordre qui suit afin d'assurer une installation appropriée.
- Détachez l'ensemble de plafond, séparez les éléments individuels et retirez les deux grilles et fibres du carénage de plafond.
 - Remplacez et retirez les 3 languettes situées autour de l'ouverture inférieure du collet de gaine, puis forcez le collet au bac à condensation de la pompe à chaleur avec les 3 vis fournies (voir Figure 9).
 - Soulevez la chute de l'ensemble de plafond et insérez le câblage d'alimentation à travers le serre-câble et dans la boîte de connexion de façon à ce que 10 à 15 cm (4 à 6 po.) de câblage se situe dans la boîte. Serrez le serre-câble sur la gaine du câble d'alimentation afin d'en limiter le mouvement (voir Figure 7).
 - Ratournez le fil d'alimentation noir à la queue de cochon noire, le fil d'alimentation blanc à la queue de cochon blanche et le fil de mise à la masse d'alimentation à la queue de cochon verte soudée dans la boîte de connexion avec les 3 manilles fournies. Fixez les manilles aux fils de façon professionnelle avec du ruban isolant homologué UL. (Voir Figure 8).
 - Enforcez les fils d'alimentation et les manilles dans la boîte de connexion en évitant de pincer les fils. Fixez la boîte de connexion avec les 2 vis fournies (voir Figure 9).

- Brancher la conduite électrique de la pompe à chaleur de toit dans la prise à 9 positions de la façon illustrée dans la Figure 7.
- Si vous installez l'ensemble de chauffage facultatif, retirez le couvercle de la prise à 2 positions et branchez le cordon d'alimentation du réchauffeur dans la prise de la façon illustrée dans la Figure 7.
- Soulevez la chute de l'ensemble de plafond jusqu'au cadre de montage et fixez-la avec les 4 vis de montage fournies (voir Figure 9).
- RATTACHEZ TOUJOURS LE CÂBLAGE AFIN D'ÉVITER TOUTE POSSIBILITÉ DE CONTACT AVEC DES ARÊTES VIVES OU AVEC LE RÉCHAUFFEUR. MOUBLEZ PAS QUE CETTE ZONE SERA ASSUJETTIE À DE L'AIR CIRCULANT À GRANDE VITESSE.**
- Tirez le tissu de gaine à travers l'ouverture de déchargement de la chute de plafond. Piquez le pélicule de protection de la bande adhésive installée autour de l'ouverture. Poussez le tissu de gaine fermement en position tout le tour de l'ouverture. Découpez l'excédent de tissu à l'intérieur de la chute de l'ensemble de plafond avec un couteau universel en prenant soin de ne pas déchirer le tissu au-delà de la bande adhésive.
- Soudez le carénage de plafond, et en vous assurant qu'il s'engage correctement dans la chute, fixez-le au cadre de montage avec les 4 vis fournies (voir Figure 8).
- Installez les boutons de commande sur les lignes de sélecteur et de thermostat. Le bouton de commande de thermostat (température) s'installe irrésistiblement à côté du logo « Coleman-Mach ».
- Réinstallez les fibres et les grilles dans le carénage de l'ensemble de plafond.
- Tournez le sélecteur à la position OFF (arrêt).
- Alimenez la pompe à chaleur de toit.

VIII. VÉRIFICATION FONCTIONNELLE DU SYSTÈME

Airconel, Inc. fabrique une gamme étendue de pompe à chaleur s de toit qui incorporent différentes caractéristiques de fonctionnement de produit. Afin de correctement évaluer la performance d'une pompe à chaleur nouvellement installée, vous devez examiner les caractéristiques de fonctionnement propres à l'unité décrites dans les instructions d'utilisation et d'entretien du produit (ensemble d'enveloppe client).

- Service Patron
 - Electrical - All electrical work and/or inspection should be performed only by qualified service personnel. Contact your nearest Airconel, Inc. Service Center if electrical problems should arise.
 - Check Points - Failure to start or to cool the air can sometimes problems with heat pump units. The Coleman-Mach RV heat pump is designed to operate on 115 volt electrical power. If the compressor on the heat pump fails to start, check with your Airconel, Inc. Service Center to determine that the proper wire size is connected to the unit, the proper circuit breakers are installed as protection devices on the electrical circuit and the proper sized extension cord is being used for the distance covered from the utility outlet to the RV. The required minimum wire size is #12 AWG for lengths up to 25 feet (larger wire size for greater distances). Each heat pump unit must be protected with a 20 amp time delay fuse or circuit breaker.

If the heat pump continues to trip off the circuit breakers, have an electrician check the starting amperage and running amperage on the unit. If the circuit breaker continues to trip off and the electrical consumption is found to be normal, it will require the replacement of the faulty circuit breaker.

If all electrical power to the heat pump is normal but neither the fan or the compressor will operate, the connector plug located behind the ceiling assembly control box should be checked to determine whether it is faulty.

On the heating-cooling heat pump models, if all electrical power to the unit is normal and the fan runs but you never get any heated air, then the electrical plug to the heating unit should be checked for a secure connection. If this does not correct the malfunction, the heating thermostat or limit switch may be faulty.

C. Mechanical Integrity - The heat pump should be inspected periodically to be sure that the bolts which secure the unit to the roof are tight and in good shape. Also, an examination of the plastic should covering the heat pump on the top of the roof should be made periodically. Be sure the four mounting screws and washers are snug and holding the shroud to the heat pump. Also examine the shroud to be sure it is not developing cracks or has suffered damage from impact.

9. WALL THERMOSTAT OPERATION

If your Coleman-Mach roof top unit is controlled by a wall thermostat, refer to the operation manual that was included with the thermostat.

10. WARRANTY SERVICE

Let's face it. Sometimes even the best products may need service. To obtain warranty service on your Coleman-Mach heat pump, please contact your selling dealer, or you may access our web site at www.Airconel.com for answers to the most frequently asked questions and service center locations.

Airconel, Inc. support help may be accessed by e-mail at RVPSupport@Airconel.com. All written correspondence should be directed to:

AIRXCEL, INC. - RV Products Division
 P.O. Box 4020
 Wichita, KS 67204

IMPORTANT

- Carefully read the **LIMITED 2 YEAR WARRANTY, the OPTIONAL THREE YEAR EXTENDED PARTS WARRANTY**, sample contract, terms, conditions, exceptions and exclusions regarding your unit at www.Airconel.com.
- An optional three year extended parts only contract is available at an additional cost of \$89.95. To obtain this optional three year parts contract, fill out the application located on the back of this manual. Once completed, cut along the dotted lines and mail the application and your check or money order to the address above. Applications must be made within ninety (90) days of the original purchase.
- Inquiries about your Coleman-Mach unit must include the model and serial numbers and the date of purchase. The model and serial numbers can be found on the I.D. label located on the unit basepan return air opening at the bottom of the roof unit. This information may also be found on the unit rating plate.

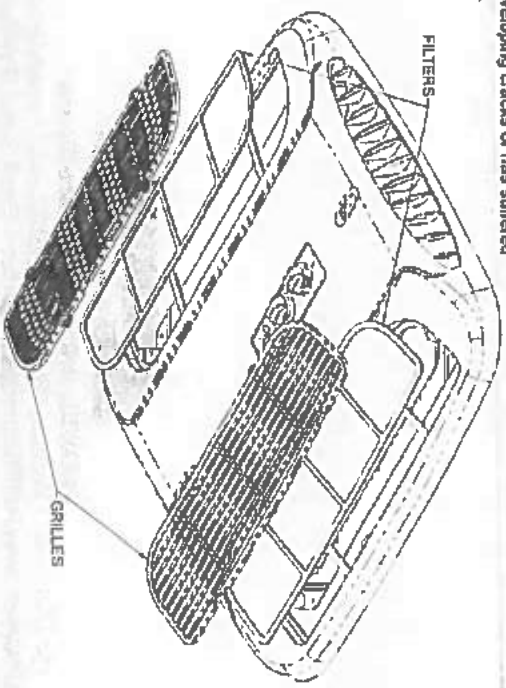


FIGURE 2

X. OPTIONAL EXTENDED WARRANTY OFFER

Cover your new purchase with our three (3) year extended parts only contract.

This warranty covers parts only (no labor) against manufacturer defects for an additional three (3) years beyond your original two (2) year warranty. This warranty excludes shrouds, filters and complete Heat Pumps.

What a great addition to your standard warranty – knowing you have protection for an additional three (3) years should you experience part failure (excluding shrouds, filters and complete Heat Pumps) on your Coleman-Mach Heat Pump. Free replacement parts for three (3) years (excluding shrouds, filters and complete Heat Pumps) – how can you pass this up!

Apply today by filling out the application located on the back cover of this Installation and Operation Manual and mailing it in along with your check or money order to Airxcel, Inc., P.O. Box 4020, Wichita, KS 67204. A contract will be sent to you within a few weeks. You should retain with your paperwork for proof of purchase.

To view the LIMITED 2 YEAR WARRANTY, the OPTIONAL THREE YEAR EXTENDED PARTS WARRANTY, a sample contract, terms, conditions, exceptions and exclusions, please visit www.Airxcel.com and type WARRANTY in the search bar.



AIRXCEL, INC. - RV Products Division

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DANGER - RISQUE DE CHOC ÉLECTRIQUE!

AFIN D'ÉVITER TOUTE BLESSURE PAR CHOC ÉLECTRIQUE ET TOUT DOMMAGE À L'ÉQUIPEMENT, CONFIRMEZ QUE TOUTES LES SOURCES D'ALIMENTATION DE L'UNITÉ SONT DÉBRANCHÉES AVANT D'ENTREPRENDRE QUELQUE TRAVAIL QUE CE SOIT SUR L'APPAREIL.

DANGER!

LORSQUE VOUS EMPLOYEZ DES CÂBLES À GAINE NON MÉTALLIQUE (ROMEX, ETC.), DERNIÈRES LES CÂBLES D'ALIMENTATION SUR UNE LONGUEUR DE 10 À 16 CM (4 À 6 PO). DERNIÈRES EN SUITE LES EXTRÉMITÉS DES FILS INDIVIDUELS AUX FINS DE RACCORDEMENT (ENVIRON 18 MM (3/4 PO) DE FIL NU). INSÉREZ LES FILS D'ALIMENTATION DANS LE SERRÉ-CÂBLE DU CONNECTEUR ÉLECTRIQUE. LA GAINÉ DOIT PÉNÉTRER AU-DELA DE LA DOUILLE DU SERRÉ-CÂBLE À L'INTÉRIEUR DE LA BOÎTE, TEL QU'ILLUSTRÉ. ASSUREZ-VOUS QUE LE CÂBLE GAINÉ EST CENTRÉ DANS LE SERRÉ-CÂBLE AVANT DE LE SERRER. NE SERREZ PAS TROP!

CECI POURRAIT ENTRAÎNER UN PINCEMENT À L'INTÉRIEUR DE LA GAINÉ ISOLANTE EN PLASTIQUE ET PROVOQUER LA PRÉSENCE D'UN COURT-CIRCUIT OU DE FILS CHARGÉS À LA MASSE (DANGER DE CHOC ÉLECTRIQUE). LE SERRÉ-CÂBLE SERT À RÉDUIRE LA TENSION SUR LES FILS. UNE LÈGÈRE PRESSION SUFFIT GÉNÉRALEMENT À CETTE FIN. SI VOUS UTILISEZ DES CÂBLES AUTRES QU'À GAINÉ NON MÉTALLIQUE, EN TANT QUE CONNECTEURS D'ALIMENTATION, VOUS DEVEZ UTILISER DES CONNECTEURS OU DES SERRÉ-CÂBLE RÉDUCTEURS DE TENSION APPROPRIÉS.

LES FILS D'ALIMENTATION INDIVIDUELS NE DOIVENT JAMAIS ÊTRE SERRÉS OU PINCÉS (FILS NEUTRES ET FILS CHARGÉS).

DANGER - RISQUE DE CHOC ÉLECTRIQUE!

AFIN DE PRÉVENIR LA POSSIBILITÉ DE BLESSURE PAR CHOC ÉLECTRIQUE LE FIL BLANC DOIT ÊTRE RACCORDE AU CONDUCTEUR NEUTRE DANS L'ENTRÉE DE LA BOÎTE DE RACCORDEMENT, ET LA MISE À LA MASSE MÉCANIQUE DOIT ÊTRE RACCORDEE À UNE COSSE DE MASSE DANS LA BOÎTE DE RACCORDEMENT OU DANS LE COMPARTIMENT DU GROUPE ÉLECTROGÈNE.

VI. INSTALLATION DE L'ACCESSOIRE DE CHAUFFAGE FACULTATIF

IMPORTANT REMARQUE :

L'accessoire de chauffage facultatif est à éliminer le brûleur de l'air intérieur quand celui-ci est quelques degrés trop frais pour être confortable. L'accessoire de chauffage est un « éliminateur de brûleur » efficace. Il ne remplace pas une fournaise.

Si vous installez un réchauffeur facultatif, positionnez le réchauffeur dans l'ouverture de remplissage d'air du pompe à chaleur, tel qu'illustré dans la Figure 5. Le support de réchauffeur doit être installé par-dessus le bac à condensation métallique existant et positionné entre le bac à condensation et le bac de récupération en plastique (voir Figure 6). Serrez la vis de fixation afin de fixer fermement l'ensemble et éviter qu'il ne se déplace. Remplacez le bouton de commande du sélecteur sur l'ensemble de plafond par celui fourni avec le réchauffeur facultatif.

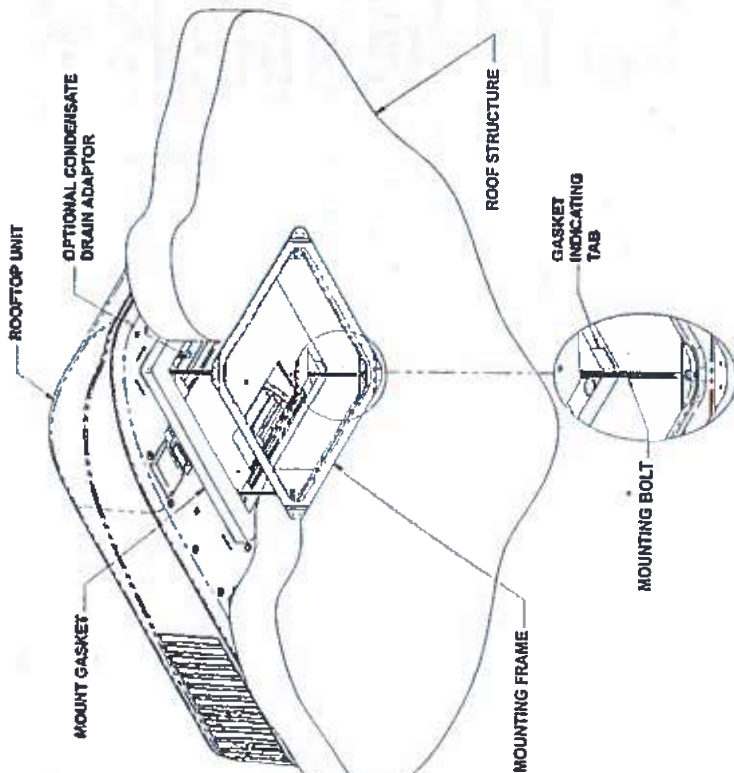


FIGURE 4

C. La pompe à chaudière de toit doit être installée le plus à niveau gauche-droite et avant-arrière que possible avec le véhicule stationné sur une surface plane. La Figure 3 illustre les degrés de déviation maximum permis (degrés de montage relativement à la surface plane totale).

Si le toit du véhicule est incliné (non plat) de telle façon à empêcher que la pompe à chaudière ne soit installée à l'intérieur des degrés de déviation permis, une cale de nivellement extérieure devra être ajoutée pour niveler la pompe à chaudière de toit. Une cale de nivellement type est illustrée dans la Figure 2.

D. Suivant la préparation appropriée de l'ouverture de montage, nettoyez l'emballage et les temps d'expiration de la pompe à chaudière de toit. Soufflez soigneusement l'intérieur du toit du véhicule. Ne la soulevez pas à l'aide du câblage en plastique. Positionnez la pompe à chaudière de toit au-dessus de l'ouverture de montage préparée. L'écrou à inciter (nez) du câblage doit être orientée vers l'avant du véhicule. Tirez le conduit électrique de la pompe à chaudière de toit à travers l'ouverture de montage et laissez-le pendre.

E. Fixation du pompe à chaudière au toit - L'ensemble de plafond comprend un cadre de montage. Forcez la pompe à chaudière au toit à l'aide des écrous ci-dessous. Reportez-vous à la Figure 4.

1. Positionnez le point de montage de pompe à chaudière sur l'ouverture carrée de 35,56 cm à 30,1 cm (14 po à 15 po) dans le toit.

2. Installez la cadre de montage de l'ensemble de plafond à l'aide des quatre boulons inclus dans l'ensemble de plafond.

3. La tension appropriée de chaque boulon est atteinte quand toute partie de chaque languette indicatrice du joint vient en contact avec le toit. Voir Figures 4. L'unité supérieure est maintenant correctement installée avec la compression optimale du joint.

4. Si la pompe à chaudière est dotée d'une pompe de condensation d'évaporateur facultative, vous devez

installer un boyau à diamètre intérieur de 13 mm (1/2 po) de l'ouverture carrée de 35,56 cm (14 po), à travers le plafond du véhicule et descendre le long de la cloison latérale afin de permettre à l'eau d'être évacuée sous le véhicule. Validez à ce que le boyau ne forme aucun pli fatal aux endroits où il tourne. Raccordez le haut du boyau d'évacuation au raccord à entailles illustré dans la Figure 4.

V. CÂBLAGE ÉLECTRIQUE
ACHEMINEMENT DU CÂBLAGE 115 V CC

En respectant les spécifications d'Alurcal, Inc. pour le câblage haute tension et l'ensemble des codes de l'électricité locaux et nationaux, achetez le câblage d'alimentation 115 V CC de l'unité de toit de sa source à la boîte de connexion.

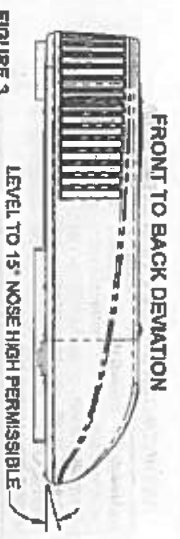
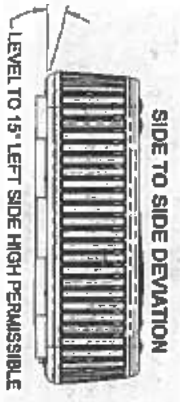
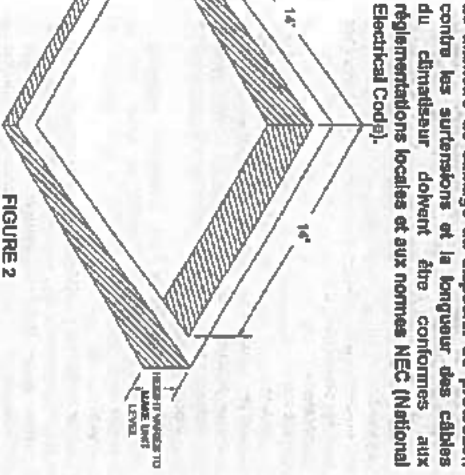
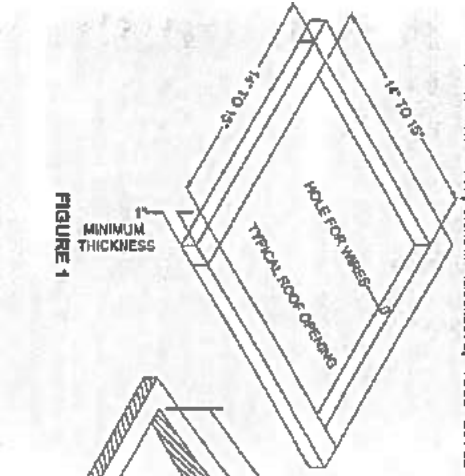
Spécifications de câblage haute tension pour un dispositif de protection contre les surtensions possédant l'intensité minimale requise - (voir la plaque d'identification sur la partie supérieure de l'appareil)

1. U.L. exige l'utilisation exclusive de conducteurs en cuivre 12 AWG minimum lors de l'utilisation du dispositif minimal recommandé de protection contre les surtensions. Les dispositifs de calibre supérieur ou les installations de câblage plus longues engendrent des conducteurs en cuivre 10 AWG ou plus.

2. Afin d'éviter des chutes de tension supérieures à 10 % lors charges de démarrage, respectez la ligne directrice suivante : Pour des longueurs de plus de 15 mètres (50 pi), utilisez des conducteurs en cuivre 10 AWG ou plus. Appuyez les au dispositif de protection contre les surtensions fourni. Protection du circuit : reportez-vous à la plaque d'identification sur la partie supérieure de l'appareil.

Spécifications de câblage haute tension pour un dispositif de protection contre les surtensions dépassant l'intensité minimale requise (voir la plaque d'identification sur la partie supérieure de l'appareil)

Le diamètre de câblage du dispositif de protection contre les surtensions et la longueur des câbles du climatiseur doivent être conformes aux réglementations locales et aux normes NEC (National Electrical Code).



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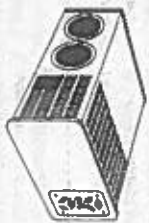
OTHER GREAT PRODUCTS FROM AIRXCEL

MAXXAIR VENTILATION SOLUTIONS

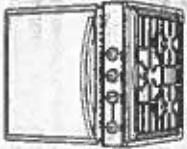
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THE NEW FANMATE® FEATURING EZClip™ HARDWARE FOR QUICK, EASY and TOOL-FREE INSTALLATION FOR HIGH POWERED CEILING FANS. The FANMATE® simply fits over the built-in, waterproof mounting tabs on the MAXXFAN® and MAXXIFAN®. Plus, simply slide the included clip through the tab to secure the FANMATE® cover. (Hardware with clips included for mounting on other fan models.)

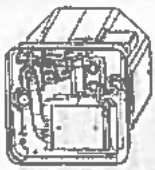
Suburban



Q SERIES FURNACES
Suburban Q Series furnaces are designed to be significantly **QUIETER** with increased efficiency and lower motor RPM for substantially lower sound levels.



COOKING APPLIANCES
Give your Caravan Galley the same Style and Sophistication as home with Suburban's **PROFESSIONAL, RESIDENTIAL STYLE** Cooking Appliances and Accessories!



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More options, and more convenience with Suburban's durable, porcelain-lined steel tank water heaters. Fast recovery, tank capacities and features to match the requirements of almost any Caravan.

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INSTALLATION, D'UTILISATION ET D'ENTRETIEN POUR 47000 POMPES SÉRIE DE CHALEUR

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Les présentes instructions sont un guide général pour l'installation des pompes à chaleur s de la série Coleman-Mach Série 47000. Pour plus de précisions sur la pompe à chaleur, veuillez vous reporter à l'ensemble d'enveloppe client livré avec chaque pompe à chaleur.

AVIS IMPORTANT

Ces instructions sont conçues pour être utilisées par un installateur qualifié spécialement formé et expérimenté dans l'installation de ce type d'équipement et des éléments s'y rattachant. Dans certains États, on exige que le personnel d'installation et d'entretien détienne une licence. AUCUNE PERSONNE NON QUALIFIÉE NE DOIT INSTALLER OU ENTRETIENIR CET ÉQUIPEMENT.

REMARQUE: Les mots « doivent » ou « doit », ou d'autres formes de ceux-ci, identifient une exigence qui est essentielle à la performance satisfaisante et sécuritaire du produit. Les mots « devrait/peuvent » ou « peut/peuvent » identifient une recommandation ou un conseil qui n'est pas essentiel(le) ou exigé(e), mais qui peut être pratique ou utile.

AVERTISSEMENT : RISQUE DE CHOC ÉLECTRIQUE! Afin de prévenir la possibilité de graves blessures corporelles ou des dommages à l'équipement dus à un choc électrique, assurez-vous de toujours débrancher le câble d'alimentation de l'appareil.

SUIVEZ ATTENTIVEMENT TOUTES LES INSTRUCTIONS ET LES MISES EN GARDE DE CE FASCICULE AFIN D'ÉVITER LES RISQUES DE DOMMAGES À L'ÉQUIPEMENT, DE BLESSURES CORPORELLES OU D'INCENDIE.

MISE EN GARDE! L'installation inappropriée peut endommager l'équipement et créer un danger, et annuler la garantie. L'utilisation de composants non testés en combinaison avec ces appareils annulera la garantie, peut contrevenir aux codes d'état ou provinciaux, peut créer un danger et peut abîmer l'équipement.

I. INFORMATIONS GÉNÉRALES

OEM : Veuillez assurer que l'ensemble d'enveloppe client est livré avec la pompe à chaleur.

INSTALLATEUR ET/OU MARCHAND : S'il vous plaît faire que toute la documentation est présentée au consommateur du produit. Le consommateur de produits devrait également avoir la possibilité d'acheter l'option à trois (3) parties ANNÉE DE REMPLACEMENT CONTRAT disponibles à partir de Airxcel, Inc.

Pour plus d'informations sur le contrat, s'il vous plaît examiner le contrat de l'échantillon situé www.airxcel.com/Warranty. Utilisez l'application sur le dos de fonctionnement et d'entretien instructions pour appliquer pour le contrat de pièces étendu.

DEMANDES D'INFORMATIONS SUR LE Pompe à chaleur : Les demandes d'informations sur l'installation du produit présentées à votre représentant Airxcel ou à Airxcel devraient contenir le nom et le numéro de série du modèle de pompe à chaleur. Le nom et le numéro de série se situent à deux endroits sur tous les modèles de pompe à chaleur de toit : (1) vous pouvez visualiser l'autocollant de puissance nominale en regardant par

surface des fenêtres, la quantité et la qualité de l'isolation, l'isolement direct, le nombre de personnes dans le véhicule et la température extérieure peuvent augmenter l'apport de chaleur dans une mesure qui dépasse la capacité de la pompe à chaleur.

En règle générale, l'air soufflé (air de décharge) par la pompe à chaleur sera de 15 à 20 degrés Fahrenheit (9 à 11 degrés Celsius) plus frais que l'air entrant (air repris) dans les grilles à air inférieures de l'ensemble de toit.

Par exemple, si la température de l'air entrant (air repris) dans la pompe à chaleur est 80 degrés Fahrenheit (27 degrés Celsius), l'air soufflé (air de décharge) dans le véhicule sera de 60 à 65 degrés Fahrenheit (16 à 18 degrés Celsius). Tant et aussi longtemps que la pompe à chaleur maintient cet écart de températures (15 à 20 degrés Fahrenheit/9 à 11 degrés Celsius), elle fonctionnera correctement.

N'oubliez pas, songez soigneusement aux variables d'apport de chaleur du véhicule. En périodes de températures ambiantes extrêmes, vous pouvez réduire l'apport de chaleur du véhicule en :

- stationnant le véhicule à l'ombre,
- gardant les fenêtres et les portes fermées,
- évitant d'utiliser des appareils producteurs de chaleur, en utilisant des stores étroit des rideaux.

Pour une solution plus durable aux situations d'apport de chaleur élevé, songez à une meilleure isolation du véhicule, à installer des survents au-dessus des fenêtres ou à les faire tamiser.

Une pompe à chaleur ne devrait pas être prise en considération pour le remplacement intégral d'une fournaise. La pompe à chaleur ne fonctionnera pas à des températures ambiantes sous le niveau de congélation.

III. SÉLECTION DE L'EMPLACEMENT D'INSTALLATION

Voire pompe à chaleur Airxcel, Inc. est principalement conçu à l'intention de véhicules récréatifs. Le toit du véhicule peut-il accueillir l'unité de toit et l'ensemble de plafond sans être renforcés? Inspectez la zone de montage du plafond afin d'éviter d'interférer avec des éléments structuraux tels que les superposés, rideaux, tringles à rideaux ou séparations. Le carénage de l'ensemble de plafond à une épaisseur de 7,6 cm (3 po). Assurez-vous de confirmer la suffisance de dégageement pour les portes (réfrigérateur, garde-robes, armoires). Généralement, les pompes à chaleur s de toit sont installés à l'emplacement des événements de toit existants. En absence d'un événement de toit (ouverture d'installation existante), nous recommandons les endroits ci-dessous.

Autocaravanes : une unité unique ou l'unité avant de deux devrait être installée à moins de 2,7 mètres (9 pi) du siège du conducteur.

Caravanes classées ou maisons mobiles : l'emplacement sélectionné devrait se situer près de la porte, légèrement en avant de la ligne centrale de longueur du véhicule.

Fourgonnettes de camping : l'appareil devrait être installé en plein centre du toit (gauche à droite et d'avant à arrière). Carriots avec boîte campeur : afin d'obtenir le redressement maximum, l'emplacment devrait se situer de 1,2 à 1,5 mètre (4 à 5 pi) de l'arrière de la boîte.

IV. INSTALLATION DE L'UNITÉ DE TOIT

DANGER - RISQUE DE CHOC ÉLECTRIQUE! DÉBRANCHEZ TOUTE ALIMENTATION ÉLECTRIQUE DU VÉHICULE AVANT D'EXÉCUTER DU DÉCOUPAGE, TOUT CONTACT AVEC UNE SOURCE DE HAUTE TENSION PEUT PROVOQUER DES BLESSURES CORPORELLES OU LA MORT. ET DES DOMMAGES À L'ÉQUIPEMENT.

IMPORTANT

AFIN D'ÉVITER D'ENDOMMAGER LE CÂBLAGE ET LA BATTERIE, DÉBRANCHEZ LE CÂBLE DE LA BORNE POSITIVE DE LA BATTERIE AVANT D'EXÉCUTER TOUT DÉCOUPAGE DU VÉHICULE.

Cette pompe à chaleur doit être installée en conformité avec la norme NFPA 501C.

Si vous installez la pompe à chaleur sur un toit à coefficient de frottement réduit tel que d'aluminium, d'acier ou de fibre de verre plastifiée, nous vous recommandons de vous procurer et d'installer un ensemble de ressorts temporaires, pièce n° 8333-3871, afin de maintenir la tension sur les boulons et retarder le mouvement latéral du pompe à chaleur, qui pourrait rompre les boulons de fixation.

S'il est prévu que la pompe à chaleur en cours d'installation soit assujéti à d'importantes charges latérales, nous vous conseillons de commander un ensemble joints/boulons « Rougnneck », pièce n° 48207-3301, afin de maintenir la tension sur les boulons, et interdire le mouvement latéral du pompe à chaleur et protéger contre la rupture des boulons.

Une fois l'emplacment de votre pompe à chaleur identifié (voir section III), vous devez préparer une ouverture de toit renforcée et encadrée (une ouverture d'événement étendue peut convenir). Avant de commencer le découpage du toit du véhicule, confirmez qu'aucun élément de structure ou entoilage ne sera touché. De plus, songez à l'emplacment de toute plomberie et alimentation électrique à l'intérieur du toit.

A. Si un événement se situe à l'emplacement d'installation voulu pour la pompe à chaleur, les mesures suivantes doivent être prises :

1. Déposez toutes les vis qui fixent l'événement de toit au véhicule. Retirez l'événement qui tout garnissage supplémentaire. Retirez soigneusement tout ferrage d'about de l'ouverture de l'événement afin d'obtenir une surface extérieure de toit propre.
2. Vous pourriez devoir sceller certains des vieux trous de vis de fixation d'événement situés à l'intérieur du joint ou bec à condensation de la pompe à chaleur.
3. Examinez l'ouverture du toit. Si l'ouverture est plus petite que 35,56 cm x 35,56 cm (14 po x 14 po), vous devez l'agrandir (voir Figure 1).

B. Si vous n'employez pas une ouverture d'événement, vous devez découper une nouvelle ouverture (voir Figure 1) dans le toit du véhicule. Une ouverture correspondante devra aussi être découpée dans le plafond à l'intérieur du véhicule. Découpez l'ouverture du plafond soigneusement. Si le plafond est recouvert de tapis, vous pouvez l'effilocheur. Une fois les ouvertures dans le toit et le plafond découpées à la taille appropriées, vous devez installer un élément de soutien encadré entre le toit (extérieur) et le plafond (intérieur). L'élément de renforcement encadré doit respecter les lignes directrices suivantes :

1. Capacité de supporter à la fois le poids de la pompe à chaleur de toit et l'ensemble de plafond intérieur.
2. Capacité de maintenir la surface portante extérieure de toit et le plafond intérieur séparés, de façon à ce qu'aucun affaissement ne se produise lors du boulonnage de la pompe à chaleur de toit et de l'ensemble de plafond. L'ouverture du cadre doit permettre le passage du câblage d'alimentation. Acheminez le câblage d'alimentation dans le cadre au moment de son installation.

***** OPTIONAL EXTENDED WARRANTY OFFER *****

Cover your new purchase with our three (3) year extended parts only contract for \$89.95.

This warranty covers parts only (no labor) against manufacturer defects for an additional three (3) years beyond your original two (2) year warranty. This warranty excludes shrouds, filters and complete air conditioners.

What a great addition to your standard warranty – knowing you have protection for an additional three (3) years should you experience part failure (excluding shrouds, filters and complete air conditioners) on your Coleman-Mach air conditioner. Free replacement parts for three (3) years (excluding shrouds, filters and complete air conditioners) – how can you pass this up!

Apply today by filling out the application below and mailing it with your check or money order to Airxcel, Inc., P.O. Box 4020, Wichita, KS 67204. A contract will be sent to you within a few weeks. You should retain with your paperwork for proof of purchase.

To view the LIMITED 2 YEAR WARRANTY, the OPTIONAL THREE YEAR EXTENDED PARTS WARRANTY, a sample contract, terms, conditions, exceptions and exclusions, please visit www.Airxcel.com and type WARRANTY in the search bar.

..... CUT ALONG DOTTED LINE - RETURN THIS PORTION

**APPLICATION FOR OPTIONAL THREE (3) YEAR PARTS CONTRACT
\$89.95**

(DOES NOT INCLUDE LABOR, EXCLUDES SHROUDS, FILTERS AND COMPLETE AIR CONDITIONERS)
APPLICATION MUST BE MADE WITHIN 90 DAYS OF PURCHASE DATE OF THE AIR CONDITIONER
OR THE RECREATIONAL VEHICLE IF THE AIR CONDITIONER IS ORIGINAL EQUIPMENT.

(PLEASE PRINT CLEARLY)

DATE OF PURCHASE: _____
(Heat Pump)

Name of Purchaser: _____

Street: _____

City: _____ State: _____ Zip: _____

BE SURE TO ENCLOSE A CHECK OR MONEY ORDER FOR \$89.95 (U.S. FUNDS)



**INSTALLATION, OPERATION AND
MAINTENANCE INSTRUCTIONS
FOR 47000 SERIES HEAT PUMPS**

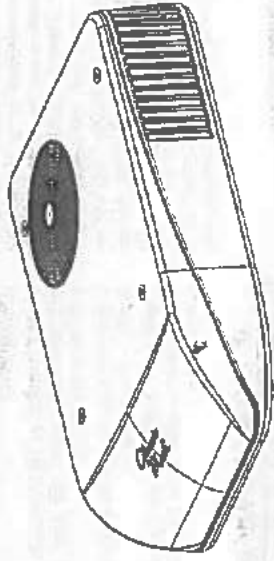


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These instructions are a general guide for installing the 47000 Series Coleman-Mach roof top Heat Pump. For specific Heat Pump details, it will be necessary to refer to ALL printed documents supplied with this conditioner.

IMPORTANT NOTICE

These instructions are for the use of qualified individuals specially trained and experienced in installation of this type equipment and related system components.

Installation and service personnel are required by some states to be licensed. PERSONS NOT QUALIFIED SHALL NOT INSTALL NOR SERVICE THIS EQUIPMENT.

NOTE: The words "Shall" or "Must" indicate a requirement which is essential to satisfactory and safe product performance. The words "Should" or "May" indicate a recommendation or advice which is not essential and not required but which may be useful or helpful.

WARNING! - SHOCK HAZARD To prevent the possibility of severe personal injury or equipment damage due to electrical shock, always be sure the electrical power source to the appliance is disconnected.

CAREFULLY FOLLOW ALL INSTRUCTIONS AND WARNINGS IN THIS BOOKLET TO AVOID DAMAGE TO THE EQUIPMENT, PERSONAL INJURY OR FIRE.

WARNING! Improper installation may damage equipment, can create a hazard and will void the warranty. The use of components not tested in combination with these units will void the warranty, may make the equipment in violation of state codes, may create a hazard and may ruin the equipment.

1. GENERAL INFORMATION

OEM - Please make sure all documentation accompanies the Heat Pump.

INSTALLER AND/OR DEALER - Please make sure all documentation is presented to the product consumer. The product consumer should also be afforded the opportunity to purchase the **OPTIONAL THREE (3) YEAR PARTS REPLACEMENT CONTRACT** available from Airxcel, Inc.

For more information about the contract, please review the sample contract located at www.Airxcel.com. Use the application on the back of this document to apply for the extended parts contract.

INQUIRIES ABOUT THE HEAT PUMP - Inquiries to your Airxcel, Inc. representative or to Airxcel, Inc. pertaining to product installation should contain both the model and serial numbers of the roof top Heat Pump. All roof top heat pump units have model and serial number identification in two locations: (1) Rating Plate sticker - may be viewed by removing the rooftop unit shroud. The rating plate is on top of the evaporator cover. (2) Model/Serial number sticker located on the return air flange on the rooftop unit base pan. If the Heat Pump is installed, the sticker may be viewed by lowering the ceiling assembly shroud.

II. HEAT PUMP SIZING

Heat Pumps should be rated primarily by their ability to cool. The ability of a Heat Pump to provide a comfortable environment for the consumer is dependent upon the following conditions.

The ability of a heat pump in the cooling mode to cool a vehicle or maintain a consumer desired temperature is dependent on the heat gain of the vehicle.

The physical size of the vehicle, the amount of window area, the quality and amount of insulation, the position exposure to sunlight, the number of people using the vehicle and the outside temperatures may increase the heat gain to such an extent that the capacity of the Heat Pump is exceeded.

As a general rule, air supplied (discharge air) from the Heat Pump will be 15 to 20 degrees cooler than the air entering (return air) the ceiling assemblies bottom air grilles.

For example, if the air entering the Heat Pump is 80° (degrees F) - (return air), the supply air (discharge air) into the vehicle will be 60° to 65° (degrees F). As long as this temperature difference (15 to 20 degrees) is being maintained by the Heat Pump, the Heat Pump is operating properly.

Again, give careful consideration to the vehicle heat gain variables. During extreme outdoor temperatures, the heat gain of the vehicle may be reduced by:

- Parking the vehicle in a shaded area
 - Keeping windows and doors closed
 - Avoiding the use of heat producing appliances
 - Using window shades (blinds and/or curtains)
- For a more permanent solution to high heat gain situations, additional vehicle insulation, window awnings and/or window glass tinting should be considered. A Heat Pump should not be considered as a total replacement for a furnace. At ambient temperatures below freezing, the Heat Pump will not operate.

III. SELECTING AN INSTALLATION LOCATION

Your Airxcel, Inc. Heat Pump has been designed for use primarily in recreational vehicles.

Is the roof of the vehicle capable of supporting both the roof top unit and ceiling assembly without additional support structures? Inspect the interior ceiling mounting area to avoid interference with existing structural members such as: bunks, curtains, tracks or room dividers. The depth of the ceiling assembly shroud is 3". Be sure to check clearance for doors which must be swung open (refrigerator, closets, cabinets).

Most of the time, roof mount Heat Pumps are installed at existing roof vent locations. If there are no roof vents (existing mounting hole), the following placement locations are recommended.

Motor Homes - a single unit or the forward of two units should be mounted within 9 feet of the driver's compartment.

Travel Trailers or Mini-Homes - a location should be selected that is near the door slightly forward of the vehicle center length.

Vans - location should be in the center of the roof (side to side - front to back).

IV. INSTALLING THE ROOF TOP UNIT

DANGEROUS SHOCK HAZARD DISCONNECT ALL POWER TO THE VEHICLE BEFORE PERFORMING ANY CUTTING TO THE VEHICLE. CONTACT WITH HIGH VOLTAGE CAN RESULT IN EQUIPMENT DAMAGE, PERSONAL INJURY OR DEATH.

IMPORTANT

TO PREVENT DAMAGE TO THE WIRING AND BATTERY, DISCONNECT THE BATTERY CABLE FROM THE POSITIVE BATTERY TERMINAL BEFORE PERFORMING ANY CUTTING TO THE VEHICLE.

This Heat Pump is to be installed in accordance with NFPA Standard 501C.

If the Heat Pump being installed is on a low friction roof surface such as aluminum, steel or galvalot fiberglass, it is advisable to order a spring pad kit, part number 8333-3871 to add "spring pads" to maintain bolt tension and retard lateral motion of the Heat Pump which could shear the mounting bolts.

If the Heat Pump being installed is subject to heavy lateral loads, it is advisable to order a "Roughneck" gasket/foam package, part number 48207-3301 to maintain bolt tension, prevent lateral movement of the Heat Pump and guard against bolt shear.

Once the location for your Heat Pump has been determined (See Section III), a reinforced and framed roof hole opening must be provided (may use existing roof vent opening). Before cutting into the vehicle roof, verify that the cutting action will clear all structural members and crossbeams. Additionally, the location of any inner roof plumbing and electrical supplies must be considered.

A. If a roof vent is already present in the desired mounting location for the Heat Pump, the following steps must be taken:

1. Remove all screws which secure the roof vent to the vehicle. Remove the vent and any additional trim materials. Carefully remove all caulking from around the roof vent opening to obtain clean exterior roof surface.

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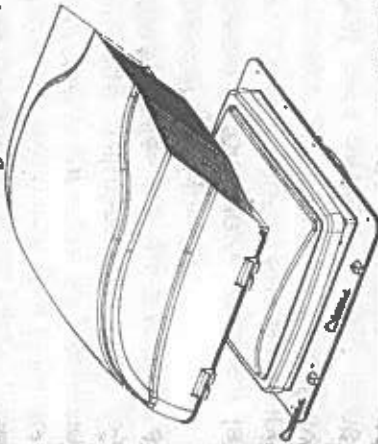
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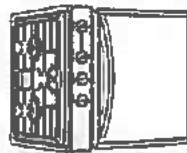
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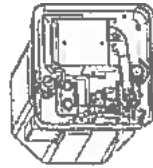
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- It may be necessary to seal some of the old roof vent mounting screw holes which may fall outside of the Heat Pump basepan gasket.
- Examine the roof opening. If the opening is smaller than 14" x 14", the opening must be enlarged. If the opening exceeds 15" x 15", a mounting frame must be field fabricated to reduce the opening size (See Figure 1).

B. If a roof vent opening is not used, a new opening (See Figure 1) will have to be cut into the vehicle roof. A matching opening will also have to be cut into the interior vehicle ceiling. Be careful when cutting the ceiling opening. If the ceiling opening is carpelled, snagging could occur. After the opening in the roof and interior ceiling are the correct size, a framed support structure must be provided between exterior roof top and interior ceiling. The reinforced framed structure must provide the following guidelines:

- Capable of supporting both the weight of the roof top Heat Pump and the interior ceiling assembly.
- Capable of holding or supporting the roof outer surface and interior ceiling apart, so that when the roof top Heat Pump and ceiling assembly are bolted together, no collapsing occurs.

Airxcel's 47000 series requires that the spacing from the vehicle roof top to the interior ceiling be no less than 1". A typical support frame is shown in Figure 1.

The frame must provide an opening to allow passage for the power supply wiring. Route the supply wiring through the frame at the same time the support frame is being installed.

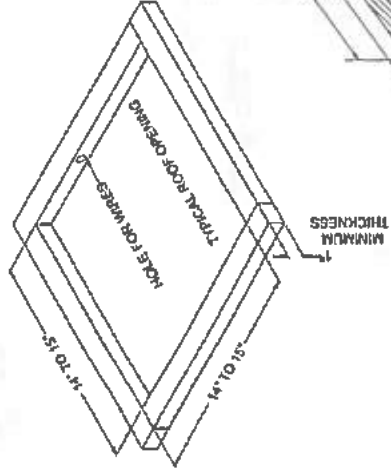


FIGURE 1

IMPORTANT - Allow 24" of supply wiring through the support frame (working length).

After the support frame is installed, seal off all gaps between the frame and both the roof exterior and the interior ceiling of the vehicle (cavity walls). Additionally, seal the gap around the electrical supply wiring.

C. The roof top Heat Pump must be mounted as near level from front to rear and side to side as is possible when the vehicle is parked on a level plane. Figure 3 shows maximum allowable degree deviations (mounting degrees from total surface flat plane). If the roof of the vehicle is sloped (not level) such that the roof top Heat Pump cannot be mounted within the maximum allowable degree deviations, an exterior leveling shim will need to be added to make the roof top Heat Pump level. A typical leveling shim is shown in Figure 2.

D. After the mounting hole area is properly prepared, remove the caisson and slapping pads from the roof top Heat Pump. Carefully lift the unit to the top of the vehicle. Do not use the outer plastic shroud for lifting. Place the roof top Heat Pump over the prepared mounting hole. The sloped end (nose) of the shroud must face towards the front of the vehicle. Pull the electrical conduit down from the Heat Pump through the mounting opening and let hang. Securing the heat pump to the roof - A mounting frame is supplied with the ceiling assembly. Follow the steps below to secure the Heat Pump to the roof. Refer to Figure 4.

- Locate the Heat Pump mount gasket over the 14" to 15" square opening in the roof.
- Install the ceiling assembly mount frame using the four bolts found with the ceiling assembly.
- Proper tension has been achieved for each bolt when any portion of each gasket indicating tab has been pulled down even with the roof. See Figure 4. The upper unit has now been properly installed with optimum gasket compression.

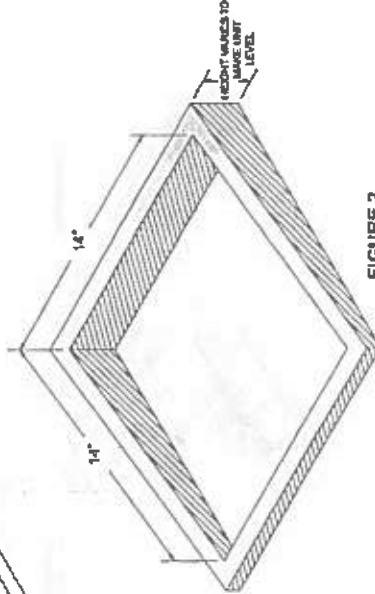
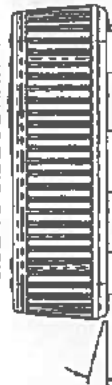


FIGURE 2

SIDE TO SIDE DEVIATION



LEVEL TO 15° LEFT SIDE HIGH PERMISSIBLE

FRONT TO BACK DEVIATION



LEVEL TO 15° NOSE HIGH PERMISSIBLE

FIGURE 3

4. If the heat pump is equipped with an optional evaporator condensate pump, a 1/2" I.D. hose must be provided that runs from the 14" square opening through the vehicle ceiling and down the side wall to allow water to drain under the vehicle. The hose must not be allowed to kink shut while making a bend. Connect the top end of the drain hose to the barbed fitting shown in Figure 4.

V. ELECTRICAL WIRING

ROUTING 115 VAC WIRING

Following Airxcel's high voltage wiring specifications and all local and national electrical codes, route the roof top unit 115 VAC supply wiring from its power source to the workbox. High Voltage Wiring Specifications based on Minimum Overcurrent Protection Device Ampereage - (see upper unit nameplate)

1. U.L. requires copper conductors only with minimum #12 AWG when using the minimum recommended overcurrent protection device. Higher rated devices or longer wiring runs will require #10 AWG or greater copper conductors.
 - a. For lengths greater than 50', use #10 AWG or larger copper conductors. Match to the overcurrent protection device provided.
 - b. Circuit Protection—Refer to upper unit nameplate. High Voltage Wiring Specification is based on Overcurrent Protection Device rated higher than the minimum required (see upper unit nameplate). Follow all local and NEC (National Electrical Code) for proper sizing of wire AWG based on Overcurrent Protection Device selected and the length of the wiring run to the Heat Pump.
2. To prevent voltage drops greater than 10% during standing loads, adhere to the following guideline:
 - a. For lengths greater than 50', use #10 AWG or larger copper conductors. Match to the overcurrent protection device provided.
 - b. Circuit Protection—Refer to upper unit nameplate. High Voltage Wiring Specification is based on Overcurrent Protection Device rated higher than the minimum required (see upper unit nameplate). Follow all local and NEC (National Electrical Code) for proper sizing of wire AWG based on Overcurrent Protection Device selected and the length of the wiring run to the Heat Pump.

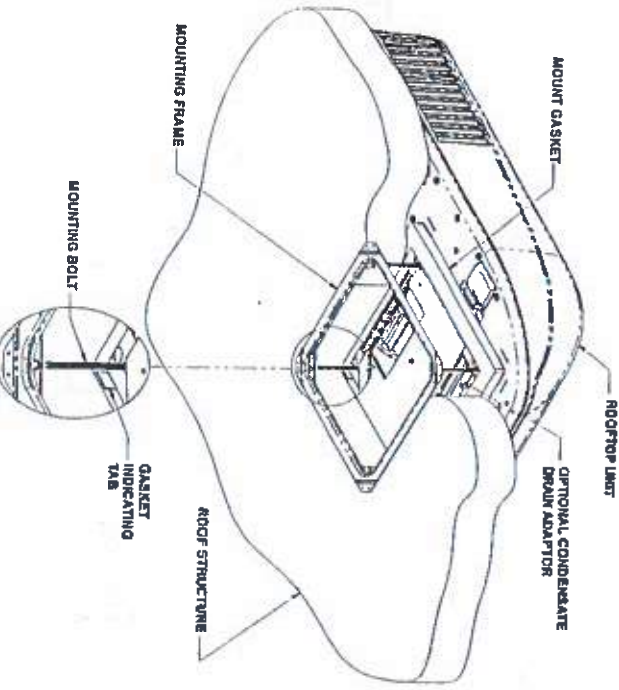


FIGURE 4

DANGER - SHOCK HAZARD!

MAKE SURE THAT ALL POWER SUPPLY TO THE UNIT IS DISCONNECTED BEFORE PERFORMING ANY WORK ON THE UNIT TO AVOID THE POSSIBILITY OF SHOCK INJURY OR DAMAGE TO THE EQUIPMENT.

WHEN USING NON-METALLIC SHEATH CABLES (ROMEX, ETC.) STRIP SHEATH BACK TO EXPOSE 4-6 INCHES OF THE SUPPLY LEADS.

STRIP THE INDIVIDUAL WIRE LEAD ENDS FOR WIRE CONNECTION (ABOUT 3/4" BARE WIRE). INSERT THE SUPPLY WIRES INTO THE ELECTRICAL CONNECTOR CLAMP. SHEATH MUST PROTRUDE PAST THE CLAMP BUSHING INSIDE THE BOX AS ILLUSTRATED. MAKE SURE SHEATH CABLE IS CENTERED IN CLAMP BEFORE TIGHTENING CLAMP ON SHEATH CABLE. DO NOT OVERTIGHTEN!

THIS COULD RESULT IN PINCHING THROUGH THE PLASTIC WIRE INSULATION AND CAUSE SHORTING OR "HOT" WIRES TO GROUND (SHOCK HAZARD). THE CLAMP IS INTENDED FOR STRAIN RELIEF OF THE WIRES. SLIGHT PRESSURE IS USUALLY SUFFICIENT TO ACCOMPLISH THIS. IF OTHER THAN NON-METALLIC CABLES ARE USED FOR SUPPLY CONDUCTORS, APPROPRIATE STRAIN RELIEF CONNECTORS OR CLAMPS SHOULD BE USED. IN NO CASE SHOULD CLAMPING OR PINCHING ACTION BE APPLIED TO THE INDIVIDUAL SUPPLY LEADS (NEUTRAL AND "HOT" WIRES).

X. GARANTIE PROLONGÉE OFFRE

Couvrez votre nouvel achat avec nos parties étendues de trois (3) ans seulement contractuels.

Cette garantie couvre les pièces seulement (pas de travail) contre les défauts de fabrication pour une période de trois (3) années supplémentaires au-delà de votre (2) la garantie initiale de deux ans. Cette garantie exclut les haubans, les filtres et les pompe à chaleur s complets.

Qu'est-ce un excellent ajout à votre garantie standard - sachant que vous avez la protection d'un trois (3) ans, si vous rencontrez défaillance d'une pièce supplémentaire (à l'exclusion des lincoeurs, des filtres et des pompe à chaleur s complets) sur votre air Coleman Mach-conditionneur. Pièces de rechange gratuites pour trois (3) ans (à l'exclusion des lincoeurs, des filtres et des pompe à chaleur s complets) - comment pouvez-vous passer cette place!

Postulez dès aujourd'hui en remplissant le formulaire situé sur la couverture arrière de cette installation et d'utilisation et en l'envoyant dans le long avec votre chèque ou mandat à Airxcel, Inc., PO Box 4020, Wichita, KS 67204. Un contrat sera envoyé à vous dans quelques semaines. Vous devez conserver vos documents avec preuve d'achat.

Pour voir l'AN GARANTIE LIMITÉE 2, l'option à trois ans, pièces garantie prolongée, un exemple de contrat, les conditions, les exceptions et les exclusions, s'il vous plaît visitez www.Airxcel.com et le type GARANTIE dans la barre de recherche.



RV Products Division

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DANGER - SHOCK HAZARD!

TO PREVENT THE POSSIBILITY OF SHOCK INJURY, THE WHITE WIRE MUST BE CONNECTED TO NEUTRAL IN THE SERVICE BOX ENTRANCE AND THE MECHANICAL GROUND MUST BE CONNECTED TO A GROUNDING LUG EITHER IN THE SERVICE BOX OR THE MOTOR GENERATOR COMPARTMENT.

VI. INSTALLING THE OPTIONAL HEATER ACCESSORY

IMPORTANT NOTE

The optional Heater Accessory is intended to take the chill out of the indoor air when the air is a few degrees too cool for comfort. The Heater Accessory is an effective "chill chaser". It is not a substitute for a furnace.

If the optional heater is being installed, mount the heater bracket on the weld studs in the channels in the return air opening as shown in Figure 5. Secure the bracket using the wing nuts provided. The heater is then assembled to the heater bracket, lining up the weld studs on the heater with the holes on the heater bracket. Secure the heater in place using wing nuts provided (See Figure 6).

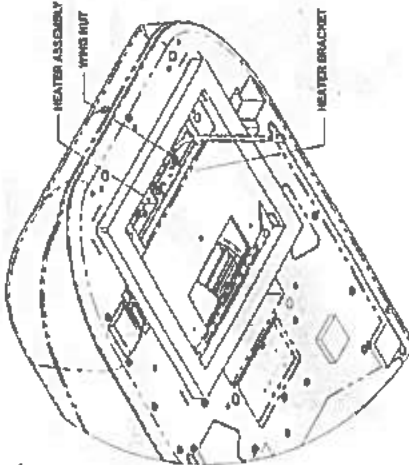


FIGURE 5

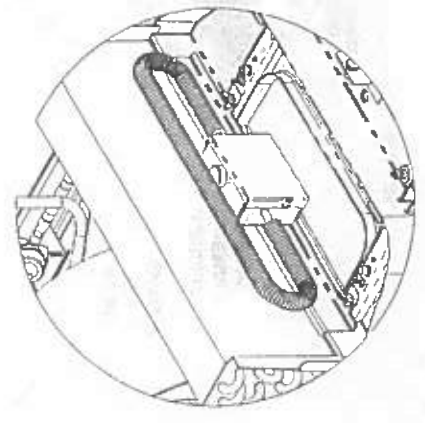


FIGURE 6

ventilateur fonctionne, mais vous n'obtenez jamais tout l'air chauffé, puis la prise électrique de l'appareil de chauffage doit être vérifiée pour une connexion sécurisée. Si cela ne résout pas le problème, le thermostat de chauffage ou la fin de course est peut-être en dérangement.

C. Intégrité mécanique - La pompe à chaleur doit être inspectée périodiquement afin de veiller à ce que les boulons qui fixent l'appareil sur le toit sont serrés et en bon état. Également, l'examen du carénage en plastique qui recouvre la pompe à chaleur sur le toit doit être faite régulièrement. Assurez-vous que les cinq vis de fixation et les rondelles sont bien ajustées et à la tenue du carénage sur le climatiseur. Étudiez aussi la coiffe pour vous assurer qu'elle ne craque pas ou qu'elle n'a pas subi de dommages sur impact.

V. EXPLOITATION DU THERMOSTAT MURAL
Si votre Coleman-Mach unité est contrôlé par un thermostat, referer via le livre d'opération inclus avec le thermostat.

VI. SERVICE DE GARANTIE
Il convient de le dire, même les produits de la plus haute qualité ont parfois besoin d'être réparés. Pour vous procurer de réparations sous garantie pour votre climatiseur Coleman-Mach, veuillez communiquer avec votre détaillant. Vous pouvez également visiter notre site Web à l'adresse www.airxcel.com pour consulter les réponses aux questions les plus fréquemment posées ainsi que les adresses des centres de service. De même, vous pouvez entrer en contact avec le service de soutien à la clientèle par courriel électronique au RVPSupport@airxcel.com. Toute correspondance écrite doit être envoyée à l'adresse suivante:

AIRXCEL, INC. - RV Products Division
P.O. Box 4020
Wichita, KS 67204 USA

IMPORTANT

1. Lisez attentivement l'AN GARANTIE LIMITÉE 2, l'option à trois ans sur les pièces Garantie prolongée, exemple de contrat, les conditions, les exceptions et les exclusions relatives à votre appareil au www.airxcel.com.

2. Vous pouvez également vous procurer un contrat prolongé de trois ans couvrant uniquement les pièces détachables moyennant un supplément de 89,95 \$US.

Pour ce faire, remplissez le carte de demande agrafée à l'avant de cette enveloppe. Veuillez envoyer la carte et un chèque ou un mandat à l'adresse mentionnée ci-dessus. Les demandes doivent être faites dans les quatre-vingt-dix (90) jours suivant l'achat initial.

Pour tout renseignement à propos de votre unité de Coleman-Mach, vous devez indiquer le nom du modèle, les numéros de série et la date d'achat. Le nom du modèle et les numéros de série sont inscrits sur l'étiquette de l'identification placée sur l'orifice de reprise dans le plateau situé à la partie inférieure du climatiseur de toit. Ces informations figurant aussi sur la plaque signalétique du unité.

Nettoyage ou changement des filtres:
1. Retirez les deux grilles de l'assemblage de plafond en tirant les languettes sur les grilles.
2. Retirer et nettoyer ou remplacer les deux filtres.
3. Réinstaller les filtres et les grilles dans le montage de plafond, comme illustré dans la figure 2.
4. Si le véhicule est équipé d'un assemblage bords de montage au plafond, retirez les quatre retour grille d'air vis. Retirer filtre de la grille et soit propre ou échange avec de nouveaux filtres.

REMARQUE: Si des filtres de remplacement sont nécessaires, on peut se les procurer de la plupart des centres de service autorisés Airxcel, Inc. Il est recommandé de toujours avoir des filtres de rechange dans votre VR en tous temps pour remplacer les filtres détériorés, usés ou déchirés.

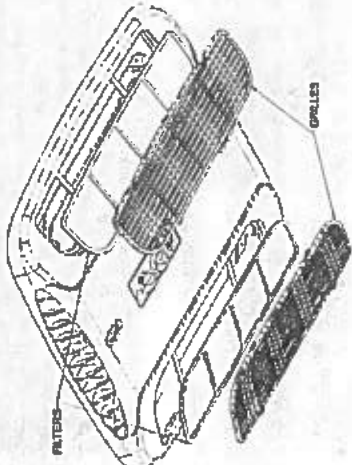


FIGURE 2

ii. Réparateur Electricien - Toute inspection et/ou modification du circuit électrique devrait être effectuée par des techniciens qualifiés seulement. Contactez votre centre de service de Airxcel, Inc. le plus proche en cas d'anomalies électriques.

B. Point de vérification - Échec de démarrage ou pour refroidir l'air sont parfois des problèmes avec la pompe à chaleur unifiés. Le conditionneur d'air RV de Coleman-Mach est conçu pour s'alimenter d'une source de 115 V. Si le compresseur de la pompe à chaleur ne parvient pas à démarrer, vérifiez avec votre Airxcel, Inc. Centre de Service pour déterminer que la bonne taille de fil est connecté à l'unité, la bonne les disjoncteurs sont installés en tant que dispositifs de protection sur le circuit électrique et la taille appropriée d'une rallonge est utilisée pour la distance parcourue depuis l'unité à la RV. Le calibre de fil minimal requis est de 12 AWG pour les longueurs jusqu'à 25 pi (762 cm) (un calibre de fil plus gros pour les distances supérieures). Chaque pompe à chaleur unité doit être protégée par un 20 amp décalé le fusible ou le disjoncteur.

Si la pompe à chaleur continue à se déclencher sur les disjoncteurs, demandez à un électricien vérifier le démarrage intensifié et exécutant l'intensité sur l'unité. Si le disjoncteur continue de se déclencher et que la consommation d'électricité s'avère normale, il faudra remplacer le disjoncteur défectueux.

Si toute l'alimentation électrique de la pompe à chaleur est normale mais le ventilateur ou le compresseur fonctionne, le connecteur plus situé derrière le plafond boîtier de commande doit être vérifiée pour déterminer si elle est défectueuse. Sur les groupes de chauffage-refroidissement pompe à la chaleur modèles, si toute l'alimentation électrique de l'appareil est normale et que le

VII. INSTALLING THE CEILING ASSEMBLY (9600 SERIES)
Make sure that you have properly matched the roof top Heat Pump and interior ceiling assembly. The following step-by-step instructions must be performed in the following sequence to insure proper installation.

A. Remove ceiling assembly from carton, separate individual items and remove the two grilles and filters from the ceiling shroud.
B. Fold and break off the 3 tabs around the inner opening of the duct collar then fasten the duct collar to the heat pump basepan with 3 provided screws (See Figure 8).
C. Raise the ceiling assembly chute and insert the supply wiring through the cable clamp and into the wiring box so that 4-6" of supply conductor is inside the box. Secure the cable clamp over the supply wire sheath so that no movement is possible (See Figure 7).

D. Connect the supply power black conductor to the black pigtail wire, the white conductor to the white pigtail wire and the supply ground conductor to the green pigtail wire found in the wiring box using the 3 provided wire nuts. Using a U.L. approved electrical tape, secure the wire nuts to wires in a workmanlike manner (See Figure 8).
E. Press supply conductors and wire nuts into wiring box and making sure no wires are pinched, secure the wire box cover with 2 provided screws (See Figure 8).
F. Plug the heat pump electrical conduit into the 9 position receptacle as shown in Figure 7.

G. If the optional heater accessory package is being installed, remove the cover from the 2 position receptacle and plug the heater cord into receptacle as shown in Figure 7.
H. Raise the ceiling assembly chute to the unit mounting frame and secure the chute with 4 provided screws (See Figure 9).

I. THE ALL WIRING TO INSURE NO CONTACT WITH ANY SHARP EDGES OR WITH OPTIONAL HEATER IS POSSIBLE. KEEP IN MIND THAT HIGH VELOCITY AIR WILL BE ENCOUNTERED IN THIS AREA.
J. Pull the fabric duct material through the ceiling chute discharge opening. Peel the release liner from the adhesive strip around the opening. Press the fabric duct material firmly in place around opening. Cut off excess fabric on inside of ceiling chute with a box knife taking care not to tear the fabric beyond the adhesive strip.

K. Raise the ceiling shroud and while insuring it meshes with the chute, secure to mounting frame with 4 provided screws (See Figure 9).
L. Install the control knobs over the switch and thermostat shafts. The thermostat (temperature) control knob installs nearest the "Coleman-Mach" logo.

M. Re-install the filters and grilles into the ceiling assembly shroud.
N. Turn the selector switch to OFF position.
O. Turn ON the power supply to the roof top heat pump.

VIII. SYSTEM CHECKOUT
Airxcel, Inc. manufactures a wide range of roof top Heat Pumps which incorporate different product operation features. To properly evaluate the performance of a newly installed Heat Pump, it is necessary to review the specific unit operation characteristics (features) described in the product OPERATION AND MAINTENANCE INSTRUCTIONS section of this booklet.

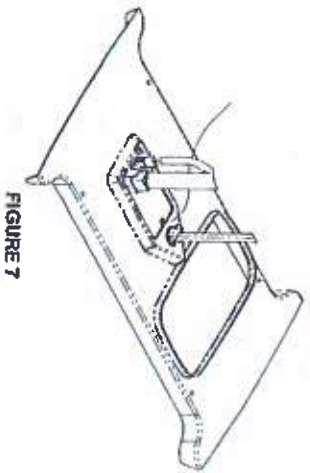


FIGURE 7

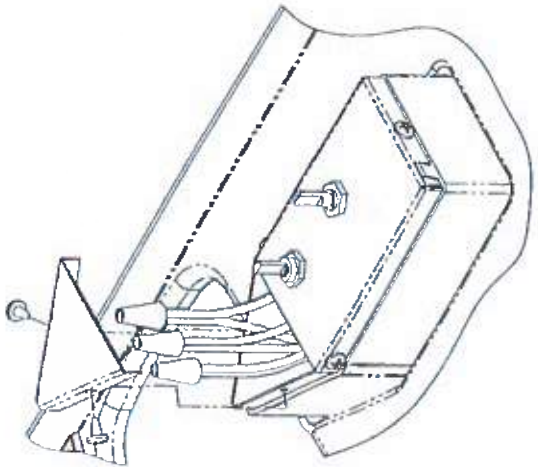


FIGURE 8

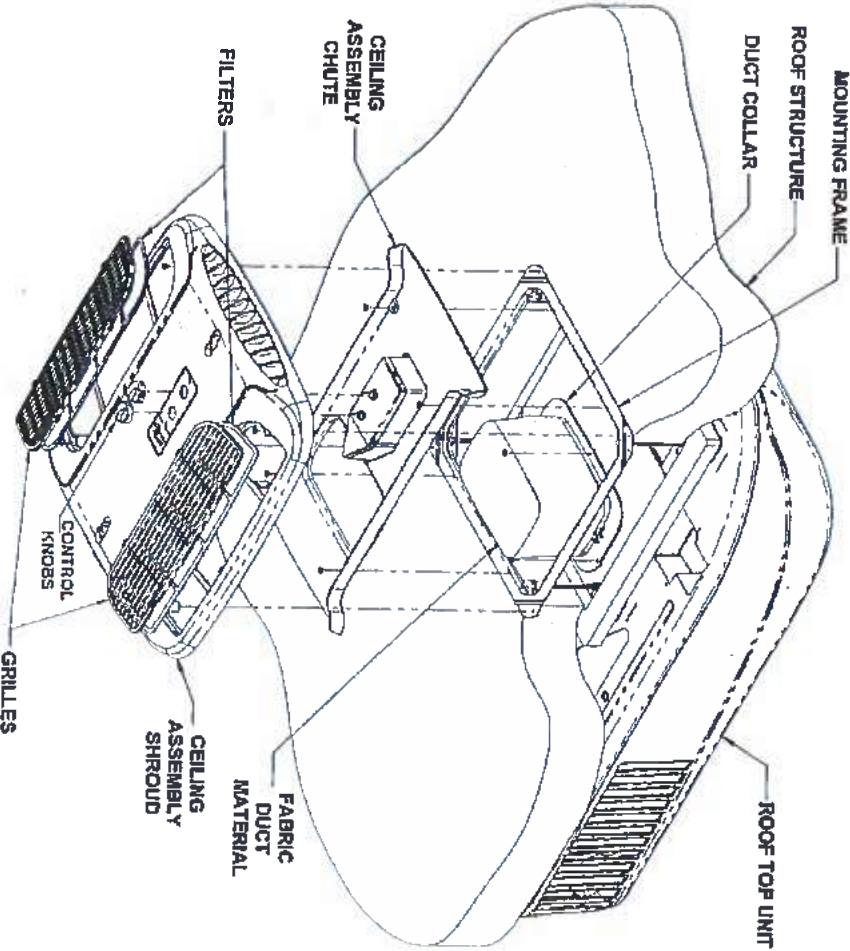


FIGURE 9

III. EXPLOITATION

1. Pour l'opération de refroidissement (reportez-vous aux figures 1, p 21).
 - A. Tournez le sélecteur vers la position «LOW COOL» ou «HIGH COOL».
 - B. Ajustez le thermostat (commande thermique) à la position la plus confortable pour vous. Le thermostat met le compresseur en marche lorsque la température de l'air pénétrant dans la pompe à chaleur s'élève de quelques degrés au-dessus du point de saturation que vous avez sélectionné. Lorsque la température de l'air pénétrant dans la pompe à chaleur est inférieure au réglage sélectionné, le thermostat s'arrête le compresseur. La pompe à chaleur, tandis que dans le mode de refroidissement, va poursuivre le cycle le compresseur en marche ou à l'arrêt dans le ci-dessus mentionnée jusqu'à ce que le commutateur-sélecteur est tourné vers un autre mode de fonctionnement.
 - C. Orientez les louveres dans la direction voulue pour l'air soufflé.
- II. Exploitation (du refroidissement) pendant les nuits froides.

Quand la température extérieure descend, le soir ou la nuit, sous 75 degrés F (23,9 degrés C), il importe que le thermostat (commande thermique) soit placé entre «Winter» et «Cooler». Si le réglage est sur «Cooler», le serpentin refroidisseur (évaporateur) peut geler et casser de refroidir. Pendant la journée, quand la température a remonté de 75 degrés F, 23,9 degrés C), remettez le thermostat au réglage désiré.

REMARQUE: En cas de givrage, il faut laisser le serpentin refroidisseur (évaporateur) dégivrer avant de reprendre l'exploitation normale du refroidissement. Entre-temps, faites fondre l'unité en position «HIGH FAN» à débit d'air maximal. Quand vous observez un débit d'air accru ou optimal, le serpentin refroidisseur devrait être de glace.

III. Pampage
 Lorsque la pompe à chaleur en fonctionnement, le compresseur de réfrigérant circule sous haute pression. Une fois éteint, il lui faudra deux ou trois minutes pour égaliser la pression.
 La pompe à chaleur compresseur est incapable de démarrer contre une haute pression. Par conséquent, une fois que la pompe à chaleur est hors tension, il est important de ne laisser pendant deux à trois minutes avant de redémarrer.
 Le pompage du compresseur (son démarrage) avant que les pressions s'égalisent) va, dans certains cas, déclencher le disjoncteur ou causer une surcharge.

IV. Pour Chaudier d'Opération (reportez-vous aux figures 1, p 18).

REMARQUE: La pompe à chaleur fonctionne sur le chauffage cycle frigorifique inverse à des températures extérieures au-dessus de congélation. Lorsque la température extérieure est inférieure à la congélation, le compresseur de la pompe à chaleur a été prévu pour empêcher le givrage. A cette époque, si l'option chauffage auxiliaire résistance électrique a été installée, il sera mis sous tension pour prendre la charge de l'air intérieur. La résistance électrique n'est pas un substitut pour un four à ces basses températures extérieures.
 A. Tournez le sélecteur vers la position «HIGH HEAT». Sur «HIGH HEAT», le ventilateur fonctionne à haute vitesse avec une production de chaleur au maximum.

B. Ajustez le thermostat (commande thermique) à la position la plus confortable pour vous. Le thermostat met le compresseur chauffage en marche lorsque la température de l'air pénétrant dans la pompe à chaleur tombe en dessous de ce paramètre de quelques degrés, et s'arrête automatiquement lorsque la température de l'air pénétrant dans la pompe à chaleur s'élève de quelques degrés au-dessus de cette valeur. Le compresseur-chauffeur continuera de s'allumer et de s'éteindre ainsi jusqu'à ce que le sélecteur soit réglé sur un autre mode de fonctionnement.

C. Orientez les louveres dans la direction voulue pour l'air soufflé.
 La température de l'air soufflé peut être contrôlée jusqu'à un certain point en ouvrant ou en fermant les louveres. Quand les louveres sont fermées, l'air de soufflage localisé le plus chaud est obtenu. Des louveres entièrement ouvertes projettent l'air soufflé chaud vers l'arrière et vers l'avant du véhicule pour une circulation accrue et un réchauffement accéléré. Même si la température de de l'air est inférieure avec les louveres entièrement ouvertes, la capacité de chauffage est la même.

V. Pour la circulation d'air seulement (reportez-vous aux figures 1, p 21).
 A. Tournez le sélecteur sur «LOW FAN» ou pour un débit d'air maximal, sur «HIGH FAN».
 B. Orientez les louveres dans la direction voulue pour l'air soufflé.
REMARQUE: Quand le sélecteur est en position «LOW FAN» ou «HIGH FAN», le moteur à soufflerie fonctionne sans arrêt.

IV. ENTRETIEN

1. Propriétaire
 L'un des plus grands avantages de votre nouvelle Coleman-Mach pompe à chaleur est que l'entretien nécessaire pour conserver l'unité d'une bonne manière est minime. En fait, le nettoyage et le remplacement des filtres est à peu près la seule chose que vous, le propriétaire, avez besoin de faire.
 Les filtres sont faits de fibres naturelles durables non allergènes, qui peuvent être nettoyés et réutilisés et qui filtrent complètement l'air circulé quand le conditionneur d'air fonctionne. Si les filtres ne sont pas nettoyés régulièrement, ils peuvent devenir partiellement bouchés par la peluche, la poussière, la graisse, etc. Un filtre obstrué réduira le volume d'air et causera de causer un givrage du serpentin refroidisseur (évaporateur).

IMPORTANT

Ne pas faire fonctionner votre pompe à chaleur pendant de longues périodes de temps sans le filtre installé.
 Une situation encore plus grave se produit lorsque la pompe à chaleur fonctionne sans filtre. La peluche, la poussière, la graisse et tout ce qui s'arrête normalement au filtre s'accumulent alors dans le serpentin refroidisseur. Ce n'est pas seulement conduit à une perte de volume d'air et d'un possible givrage de la batterie de refroidissement, mais pourrait également entraîner des dommages graves aux composants de fonctionnement de la pompe à chaleur.
 Nous recommandons que les filtres être nettoyés et changés au moins toutes les deux semaines quand la pompe à chaleur est en fonctionnement.

IX. MODE D'EMPLOI ET UTILISATION SÉRIE 47000

DES POMPE À CHALEUR S DE TOIT DES PLÉNUM DE PLAFOND

1. RENSEIGNEMENTS GÉNÉRAUX

NOTE: Un auxiliaire en option résistance électrique chauffage peut être installé pour réchauffer de l'air intérieur quand la pompe ne peut plus fonctionner. La thermopompe s'éteindra dans les conditions qui causeraient un blocage par congélation de l'échangeur extérieur, en général près des températures de congélation.

Cette thermopompe de toit est conçue pour s'alimenter d'une source monophasée de 115 V.c.a. et de 60 Hz. Un technicien qualifié doit vérifier que la pompe à chaleur reçoit l'alimentation adéquate.

Au mode réfrigérant, la baisse de température de l'entrée à la sortie sera de 15 à 20 degrés F (-8,4 à -6,5 degrés C). Au mode chauffage, la hausse de température de l'entrée à la sortie atteindra de 25 à 40 degrés F (-3,8 à 4,4 degrés C), à moins que la température extérieure ne chute suffisamment pour activer l'interrupteur antiblocage. Dans ce cas, la température ne s'élèvera que de 10 à 20 degrés F (-12,2 à -6,6 degrés C). Tout écart à ces normes justifie un examen de l'appareil, à la recherche de filtres à air sales ou d'un échangeur extérieur encrassé.

Le fait de stationner le véhicule à l'ombre, de garder les fenêtres et les portières fermées et d'éviter l'utilisation d'appareils thermogènes dans le véhicule aidera à réduire le gain de chaleur. Si possible, considérez l'ajout d'isolant et de vitres teintées (surtout dans les fourgonnettes non isolées).

R410A toit pompes à chaleur

Circuit de blocage du contacteur haute pression
Pompes à chaleur utilisant la R410A réfrigérant utiliser une usine installée interrupteur haute pression circuit de sécurité. Dans l'éventualité d'une anomalie (une défaillance du moteur du ventilateur, un serpentín de

condensation sale, des filtres encrassés), le contacteur haute pression empêche le compresseur de rester en marche. Quand le contacteur haute pression est déclenché, ce circuit de sécurité bloque le compresseur, ce qui empêche ce dernier de redémarrer ou de fonctionner jusqu'à ce que l'alimentation de 115 V.c.a. soit coupée puis rétablie de façon à réinitialiser le circuit de sécurité du contacteur haute pression. Si le circuit du contacteur haute pression se déclenche à maintes reprises, vous devez faire réparer l'appareil par un technicien compétent.

II. PANNEAU DE COMMANDE

Si votre RV pompe à chaleur est actionné à partir du panneau de commande situé dans le plafond, puis il y a trois commandes sur le plafond qui vous aident à contrôler la pompe à chaleur. Ce sont les suivantes:

A. Le sélecteur - Le commutateur de sélection détermine le mode de fonctionnement la pompe à chaleur doit être. En tournant le sélecteur, l'utilisateur peut obtenir toute fonction de l'appareil désirée. Les fonctions du dispositif varient selon les options de l'unité de toit et celles du plafonnier. Le figure 1 illustre l'emplacement du sélecteur et les fonctions offertes. La section « Exploitation » explique les caractéristiques de chaque mode de fonctionnement.

B. Le thermostat (commande thermique) - Le thermostat fixe le réglage de température de « ON » et « OFF » auquel le compresseur va fonctionner (voir la figure 1).

C. Les louveres - Les louveres se situent aux deux extrémités de la coiffe du plafonnier et servent à diriger l'air soufflé par l'unité.

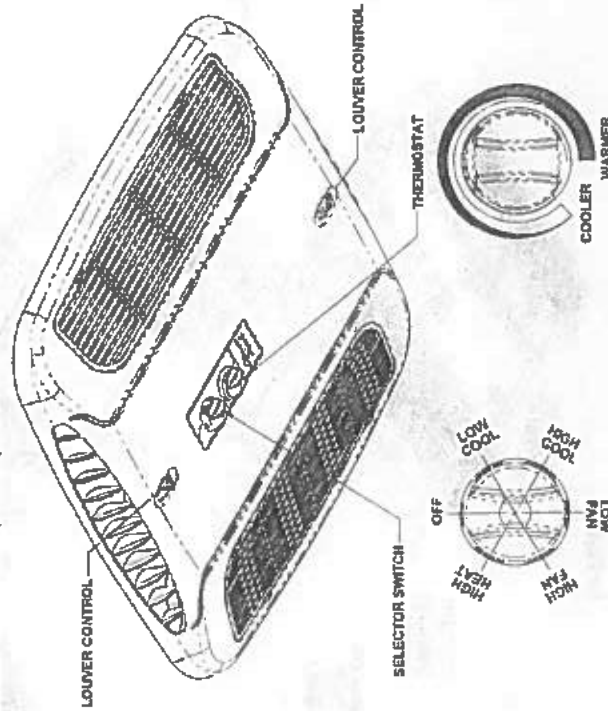


FIGURE 1

IX. OPERATION AND MAINTENANCE INSTRUCTIONS FOR 47000 SERIES ROOF TOP HEAT PUMPS AND CEILING PLENUMS

I. GENERAL INFORMATION

NOTE: An optional auxiliary electric resistance heating assembly can be installed to take the chill out of the indoor air when the heat pump can no longer operate. The heat pump will shut down at conditions which would cause outdoor coil freeze-up, generally near freezing temperatures.

This roof mount heat pump is designed to operate from a 115 VAC, 60 HZ, 1 Phase power supply. A qualified technician should verify that the heat pump is receiving the proper power.

In the cooling mode, the temperature drop from inlet to supply will be 15 to 20 degrees. In the heating mode, the temperature rise from inlet to supply will be 25 to 40 degrees unless the outdoor temperature has dropped sufficiently to cause the freeze switch to activate. In that case, the rise will be only 10 to 20 degrees. Any deviations from these norms are cause to examine the system for dirty air filters or dirty outdoor coil.

Parking the vehicle in a shaded area, keeping windows and doors shut and avoiding the use of heat producing appliances in the vehicle will help to reduce the heat gain. When possible, the addition of insulation and tinted glass (especially in uninsulated vans) should be considered.

R410A Roof Top Heat pumps

High Pressure Switch Lockout Circuit
Heat pumps using R410A refrigerant may utilize a factory installed High Pressure Switch Safety Circuit. In the event of an abnormal condition (failure of fan motor, dirty condenser coil, dirty filters), the high pressure switch will prevent the compressor from continuing to

run. Once the high pressure switch has tripped, this safety circuit will "Lock Out" the compressor preventing it from trying to restart until the 115 VAC supply power has been turned off and then back on to reset the High Pressure Switch Safety Circuit. If repeated trips of the high pressure switch lock out occur, then you must have the unit serviced by a qualified technician.

II. CONTROL PANEL

If your RV heat pump is operated from the control panel located in the ceiling assembly, then there are three controls on the ceiling assembly that help you control the heat pump. They are as follows:

A. The Selector Switch - The selector switch determines which mode of operation the heat pump will be in. By rotating the selector switch, the operator can obtain any system function desired. System functions vary depending upon options of both the roof top unit and ceiling assembly. Figure 1 shows selector switch location and lists all available functions by model. The "Operation" section explains the operational characteristics of each mode of operation.

B. The Thermostat (temperature control) - The thermostat regulates the "ON" and "OFF" temperature setting at which the compressor will operate. See Figure 1.

C. Louvers - The louvers are located at both ends of the ceiling assembly shroud and are used in directing the discharge air from the unit.

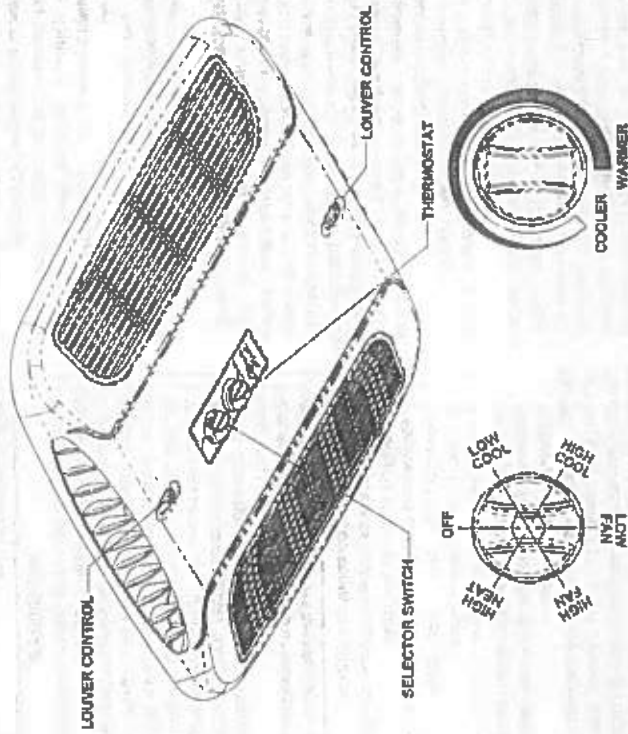


FIGURE 1

III. OPERATION

1. For Cooling (Refer to Figure 1, page 9).
 - A. Turn the selector switch to the "LOW COOL" or "HIGH COOL" position.
 - B. Rotate the thermostat (temperature control) to the position that is the most comfortable to you. The thermostat will turn the compressor on when the temperature of the air entering the heat pump rises a few degrees above the setting you have selected. When the temperature of the air entering the heat pump drops below the selected setting, the thermostat will turn the compressor off. The heat pump, while in the cooling mode, will continue to cycle the compressor on and off in the above mentioned fashion until the selector switch is turned to another mode of operation.
 - C. Position the louvers to the desired direction the discharge air is to flow.

II. Operation During Cooler Nights (Cooling Operation)

It is important, when the outdoor temperature drops in the evening or during the night to below 75 degrees F., that the thermostat (temperature control) be set at a midpoint between "Warmer" and "Cooler". If the setting is at "Cooler", the evaporator coil may become iced-up and stop cooling. During the day when the temperatures have risen above 75 degrees F., reset the thermostat switch to the desired setting.

NOTE: Should icing-up occur, it is necessary to let the cooling (evaporator) coil defrost before normal cooling operation is resumed. During this time, operate the unit in the "HIGH FAN" position with the system at maximum air flow. When increased or full air flow is observed, the cooling coil should be clear of ice.

III. Short Cycling

When a heat pump is in operation, its compressor circulates refrigerant under high pressure. Once off, it will take two to three minutes for this high pressure to equalize. The heat pump compressor is unable to start against high pressure. Therefore, once the heat pump is turned off, it is important to leave it off for two to three minutes before restarting.

Short cycling the compressor (or starting it before pressures have equalized), will in some instances, kick the circuit breaker or overload.

IV. For Heating Operation (Refer to Figure 1, page 2).

NOTE: The heat pump will operate on reverse cycle refrigerant heating at outdoor temperatures above freezing. When the outdoor temperature is below freezing, the heat pump compressor will shut down to prevent outdoor coil freeze-up. At this time, if the optional auxiliary electric resistance heater has been installed, it will be energized to take the chill out of the indoor air. The electric resistance heater is not a substitute for a furnace at these low outdoor temperatures.

A. Turn the selector switch to the "HIGH HEAT" position. At "HIGH HEAT", the fan operates on high speed with heat output at maximum.

B. Rotate the thermostat (temperature control) switch to the position that is the most comfortable to you. The thermostat will turn the compressor/heater on when the temperature of the air entering the heat pump unit drops below the setting a few degrees and automatically turns off when the temperature of the air entering the heat pump rises a few degrees

above this setting. The compressor/heater will continue to cycle on and off in this fashion until the selector switch is turned to another mode of operation.

- C. Position the louvers to the desired direction the discharge air is to flow. Discharge air temperature can be controlled to some extent by opening or closing the louvers. When the louvers are closed, the warmest localized discharge air is achieved. Fully opened louvers will throw the warm discharge air to the back and front of the vehicle for more efficient circulation and faster warm-up. Although the air temperature is lower with the louvers fully opened, the heating capacity is still the same.
- V. For Air Circulation Only (Refer to Figure 1, page 2).
 - A. Turn the selector switch to "LOW FAN" or for maximum air flow, to "HIGH FAN".
 - B. Position the louvers to the desired direction the discharge air is to flow.

NOTE: When the selector switch is in the "LOW FAN" or "HIGH FAN" position, the blower motor will operate continuously.

V. MAINTENANCE

1. Owner - One of the biggest advantages to your new Coleman-Mach heat pump is that the maintenance needed to keep the unit in good working order is minimal. In fact about the only thing you, the owner, must take care of is the cleaning and replacement of the filters.
- Filters are made from long life non-allergenic natural fibers which can be cleaned and reused, and which completely filter the circulated air when the heat pump is in operation. If the filters are not cleaned at regular intervals, they may become partially clogged with lint, dirt, grease, etc. A clogged filter will produce a loss of air volume and may eventually cause an icing-up of the cooling (evaporator) coil.

IMPORTANT

Do not operate your heat pump for extended periods of time without the filter installed. An even more serious condition occurs when the heat pump is operated without a filter. When this happens the lint, grease, etc. that are normally stopped by the filter are now accumulating in the cooling coil. This not only leads to a loss of air volume and a possible icing-up of the cooling coil, but could also result in serious damage to the operating components of the heat pump. We recommend that the filters be cleaned and changed at least every two weeks when the heat pump is in operation.

Cleaning and/or changing the filters:

1. Remove the two grilles from the ceiling assembly by pulling the tabs on the grilles.
2. Remove and clean or replace the two filters.
3. Re-install the filters and grilles in the ceiling assembly as shown in Figure 2.
4. If the vehicle is equipped with a flush mount ceiling assembly, remove the four return air grille screws. Remove filter from the grille and either clean or exchange with new filters.

NOTE: If replacement filters are necessary, the filters can be purchased from most Airco, Inc. Authorized Service Centers. It is recommended that spare filters be carried with the RV at all times to replace worn, torn or deteriorated filters.

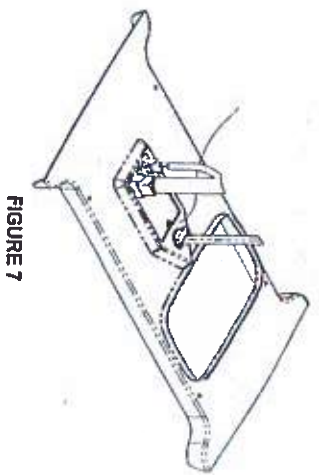


FIGURE 7

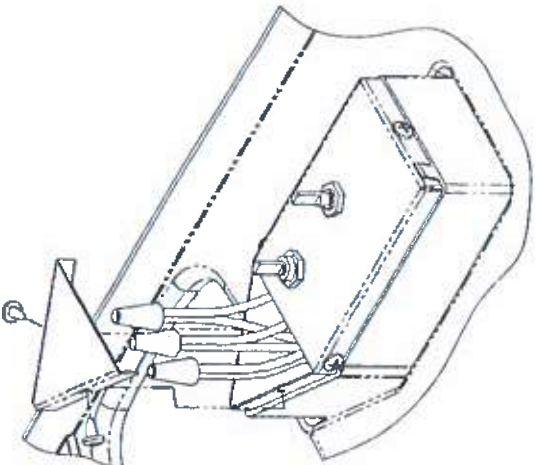


FIGURE 8

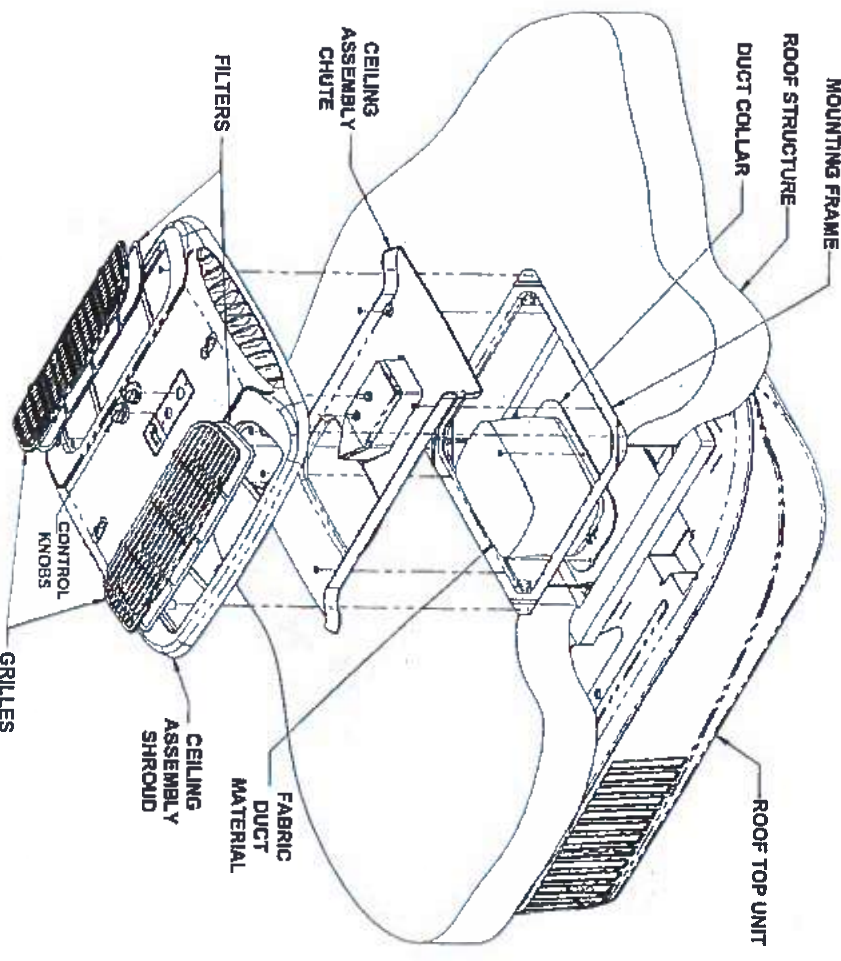


FIGURE 9

V. WALL THERMOSTAT OPERATION
If your Coleman-Mach roof top unit is controlled by a wall thermostat, refer to the operation manual that was included with the thermostat.

vi. WARRANTY SERVICE
Let's face it. Sometimes even the best products may need service. To obtain warranty service on your Coleman-Mach heat pump, please contact your selling dealer, or you may access our web site at www.Airxcel.com for answers to the most frequently asked questions and service center locations.

Airxcel, Inc. support help may be accessed by e-mail at RVSupport@Airxcel.com. All written correspondence should be directed to:
AIRXCEL, INC. - RV Products Division
P.O. Box 4820
Wichita, KS 67204

IMPORTANT

1. Carefully read the **LIMITED 2 YEAR WARRANTY**, the **OPTIONAL THREE YEAR EXTENDED PARTS WARRANTY**, sample contract, terms, conditions, exceptions and exclusions regarding your unit at www.Airxcel.com.

2. An optional three year extended parts only contract is available at an additional cost of \$89.95. To obtain this optional three year parts contract, fill out the application located on the back of this manual. Once completed, cut along the dotted lines and mail the application and your check or money order to the address above. Applications must be made within ninety (90) days of the original purchase.

3. Inquiries about your Coleman-Mach unit must include the model and serial numbers and the date of purchase. The model and serial numbers can be found on the I.D. label located on the unit basepan return air opening at the bottom of the roof unit. This information may also be found on the unit rating plate.

ii. Service Person
A. Electrical - All electrical work and/or inspection should be performed only by qualified service personnel. Contact your nearest Airxcel, Inc. Service Center if electrical problems should arise.

B. Check Points - Failure to start or to cool, the air are sometimes problems with heat pump units. The Coleman-Mach RV heat pump is designed to operate on 115 volt electrical power. If the compressor on the heat pump fails to start, check with your Airxcel, Inc. Service Center to determine that the proper wire size is connected to the unit, the proper circuit breakers are installed as protection devices on the electrical circuit and the proper sized extension cord is being used for the distance covered from the utility outlet to the RV. The required minimum wire size is #12 AWG for lengths up to 25 feet (larger wire size for greater distances). Each heat pump unit must be protected with a 20 amp time delay fuse or circuit breaker.

If the heat pump continues to trip off the circuit breakers, have an electrician check the starting amperage and running amperage on the unit. If the circuit breaker continues to trip off and the electrical consumption is found to be normal, it will require the replacement of the faulty circuit breaker.

If all electrical power to the heat pump is normal but neither the fan or the compressor will operate, the connector plug located behind the ceiling assembly control box should be checked to determine whether it is faulty.

On the heating-cooling heat pump models, if all electrical power to this unit is normal and the fan runs but you never get any heated air, then the electrical plug to the heating unit should be checked for a secure connection. If this does not correct the malfunction, the heating thermostat or limit switch may be faulty.

C. Mechanical Integrity - The heat pump should be inspected periodically to be sure that the bolts which secure the unit to the roof are tight and in good shape. Also, an examination of the plastic shroud covering the heat pump on the top of the roof should be made periodically. Be sure the four mounting screws and washers are snug and holding the shroud to the heat pump. Also examine the shroud to be sure it is not developing cracks or has suffered damage from impact.

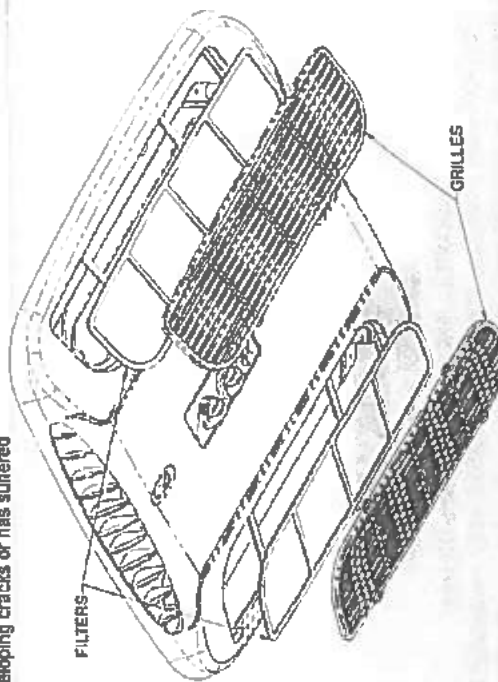


FIGURE 2

F. Branchez la conduite électrique de la pompe à chaleur de toit dans la prise à 3 positions de la façon illustrée dans la Figure 7.

G. Si vous installez l'ensemble de chauffage facultatif, retirez le couvercle de la prise à 2 positions et branchez le cordon d'alimentation du réchauffeur dans la prise de la façon illustrée dans la Figure 7.

H. Soulevez la chute de l'ensemble de plafond jusqu'au cadre de montage et fixez-la avec les 4 vis de montage fournies (voir Figure 9).

I. RATTACHEZ TOUT LE CÂBLAGE AFIN D'ÉVITER TOUTE POSSIBILITÉ DE CONTACT AVEC DES ARETES VIVES OU AVEC LE RÉCHAUFFEUR. N'OUBLIEZ PAS QUE CETTE ZONE SERA ASSUJETTIE À DE L'AIR CIRCULANT À GRANDE VITESSE.

J. Tirez le tissu de gaine à travers l'ouverture de décharge de la chute de plafond. Pêchez la pellicule de protection de la bande adhésive installée autour de l'ouverture. Pressez le tissu de gaine fermement en position tout le tour de l'ouverture. Découpez l'excédent de tissu à l'intérieur de la chute de l'ensemble de plafond avec un couteau universel en prenant soin de ne pas déchirer le tissu au-delà de la bande adhésive.

K. Soulevez le carénage de plafond, et en vous assurant qu'il s'engage correctement dans la chute, fixez-le au cadre de montage avec les 4 vis fournies (voir Figure 8). Installez les boutons de commande sur les lignes de sélecteur et de thermostat. Le bouton de commande de thermostat (température) s'installe immédiatement à côté du logo « Coleman-Mach ».

L. Réinstallez les fibres et les grilles dans le carénage de l'ensemble de plafond.

M. Tournez le sélecteur à la position OFF (arrêt).

N. Allumez la pompe à chaleur de toit.

VIII. VÉRIFICATION FONCTIONNELLE DU SYSTÈME

Airxcel, Inc. fabrique une gamme étendue de pompes à chaleur s de toit qui incorporent différentes caractéristiques de fonctionnement de produit. Afin de correctement évaluer la performance d'une pompe à chaleur nouvellement installée, vous devez examiner les caractéristiques de fonctionnement propres à l'unité décrites dans les instructions d'utilisation et d'entretien du produit (ensemble d'enveloppe client).

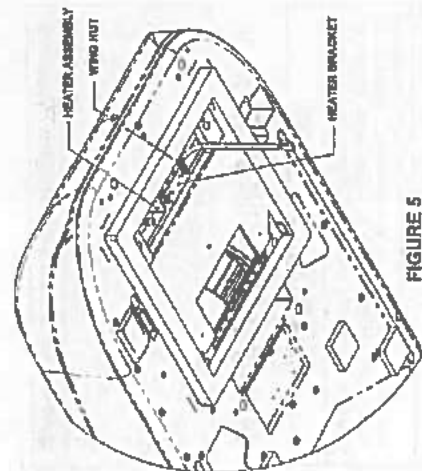


FIGURE 5

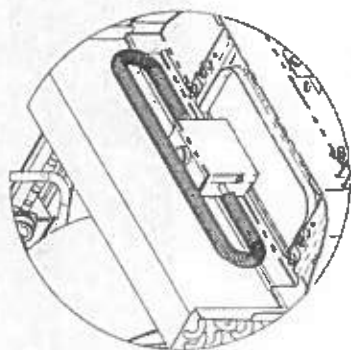


FIGURE 6

VII. INSTALLATION DE L'ENSEMBLE DE PLAFOND (SÉRIE 9600)

Confirmez que vous avez correctement apparié la pompe à chaleur de toit et l'ensemble de plafond. Vous devez exécuter les instructions pas à pas dans l'ordre qui suit afin d'assurer une installation appropriée.

A. Débranchez l'ensemble de plafond, séparez les éléments individuels et retirez les deux grilles et filtres du carénage de plafond.

B. Remplacez et retirez les 3 languettes sautées autour de l'ouverture interne du collet de gaine, puis fixez le collet au bac à condensation de la pompe à chaleur avec les 3 vis fournies (voir Figure 8).

C. Soulevez la chute de l'ensemble de plafond et installez le câblage d'alimentation à travers le serre-câble et dans la boîte de connexion de façon à ce que 10 à 15 cm (4 à 6 po) de câblage se situe dans la boîte. Serrez le serre-câble sur la gaine du câble d'alimentation afin d'en interdire le mouvement (voir Figure 7).

D. Raccordez le fil d'alimentation noir à la queue de cochon noire, le fil d'alimentation blanc à la queue de cochon blanche et le fil de mise à la masse d'alimentation à la queue de cochon verte situées dans la boîte de connexion avec les 3 marelles fournies. Fixez les marelles aux fils de façon professionnelle avec du ruban isolant homologué U.L. (voir Figure 8).

E. Enfoncez les fils d'alimentation et les marelles dans la boîte de connexion en évitant de pincer les fils, fixez la boîte de connexion avec les 2 vis fournies (voir Figure 8).

X. OPTIONAL EXTENDED WARRANTY OFFER

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DANGER - RISQUE DE CHOC ÉLECTRIQUE!
 AFIN D'ÉVITER TOUTE LESURE, REPAREZ CHOC ÉLECTRIQUE ET TOUT DOMMAGE À L'ÉQUIPEMENT, CONFIRMEZ QUE TOUTES LES SOURCES D'ALIMENTATION DE L'UNITÉ SONT DÉBRANCHÉES AVANT D'ENTRER EN DÉMARRAGE. OBLIGÉ TRAVAIL, QUE CE SOIT SUR L'APPAREIL.

DANGER!

LORSQUE VOUS EMPLOYEZ DES CABLES À GAINÉ NON MÉTALLIQUE (RAMEX, ETC.), DÉMONTÉZ LES CABLES D'ALIMENTATION SUR UNE LONGUEUR DE 10 À 16 CM (4 À 6 PO). DÉMONTÉZ EN SUITE LES EXTRÉMITÉS DES FILS INDIVIDUELS AUX FINS DE RACCORDEMENT (ENVIRON 10 MM (3/4 PO) DE FIL NU), INSÉREZ LES FILS D'ALIMENTATION DANS LE SERRÉ-CÂBLE OU CONNECTEUR ÉLECTRIQUE. LA GAINÉ DOIT PÉNÉTRER AU-DELA DE LA DOUILLE DU SERRÉ-CÂBLE À L'INTÉRIEUR DE LA BOÎTE. TEL QU'ILLUSTRE, ASSUREZ-VOUS QUE LE CÂBLE GAINÉ EST CENTRÉ DANS LE SERRÉ-CÂBLE AVANT DE LE SERRER. NE SERRÉZ PAS TROP!

CECI POURRAIT ENTRAINER UN PINCEMENT À L'INTÉRIEUR DE LA GAINÉ ISOLANTE EN PLASTIQUE ET PROVOQUER LA PRÉSENCE D'UN COURT-CIRCUIT OU DE FILS CHARGÉS À LA MASSE (DANGER DE CHOC ÉLECTRIQUE). LE SERRÉ-CÂBLE SERAIT À RÉDUIRE LA TENSION SUR LES FILS, UNE LÈGÈRE PRESSION SUFFIT GÉNÉRALEMENT À CETTE FIN. SI VOUS UTILISEZ DES CABLES AUTRES QU'À GAINÉ NON MÉTALLIQUE EN TANT QUE CONDUCTEURS D'ALIMENTATION, VOUS DEVEZ UTILISER DES CONNECTEURS OU DES SERRÉ-CÂBLE RÉDUCTEURS DE TENSION APPROPRIÉS.

LES FILS D'ALIMENTATION INDIVIDUELS NE DOIVENT JAMAIS ÊTRE SERRÉS OU PINCÉS (FILS NEUTRES ET FILS CHARGÉS).

DANGER - RISQUE DE CHOC ÉLECTRIQUE!
 AFIN DE PRÉVENIR LA POSSIBILITÉ DE MESURE PAR CHOC ÉLECTRIQUE, LE FIL BLANC DOIT ÊTRE RACCORDE AU CONDUCTEUR NEUTRE DANS L'ENTRÉE DE LA BOÎTE DE RACCORDEMENT ET LA MISE À LA MASSE MÉCANIQUE DOIT ÊTRE RACCORDEE À UNE COSSE DE MASSE DANS LA BOÎTE DE RACCORDEMENT OU DANS LE COMPARTIMENT DU GROUPE ÉLECTROGÈNE.

VI. INSTALLATION DE L'ACCESSOIRE DE CHAUFFAGE FACULTATIF

IMPORTANT REMARQUE :

L'accessoire de chauffage facultatif sert à éliminer la chaleur de l'air intérieur quand celui-ci est quelque degrés trop finit pour être confortable. L'accessoire de chauffage est un « distributeur de chaleur » efficace. Il ne remplace pas une fournaise.

Si vous installez un réchauffeur facultatif, positionnez le réchauffeur dans l'ouverture de reprise d'air du pompe à chaleur. Tel qu'illustré dans la Figure 5. Le support de réchauffeur doit être installé par-dessus le bac à condensation métallique attaché et positionné entre le bac à condensation et le bac de récupération en plastique (voir Figure 6). Serrez la vis de fixation afin de fixer fermement l'ensemble et éviter qu'il ne se déplace. Remplacez le bouchon de commande du sélecteur sur l'ensemble de plafond par celui fourni avec le réchauffeur facultatif.

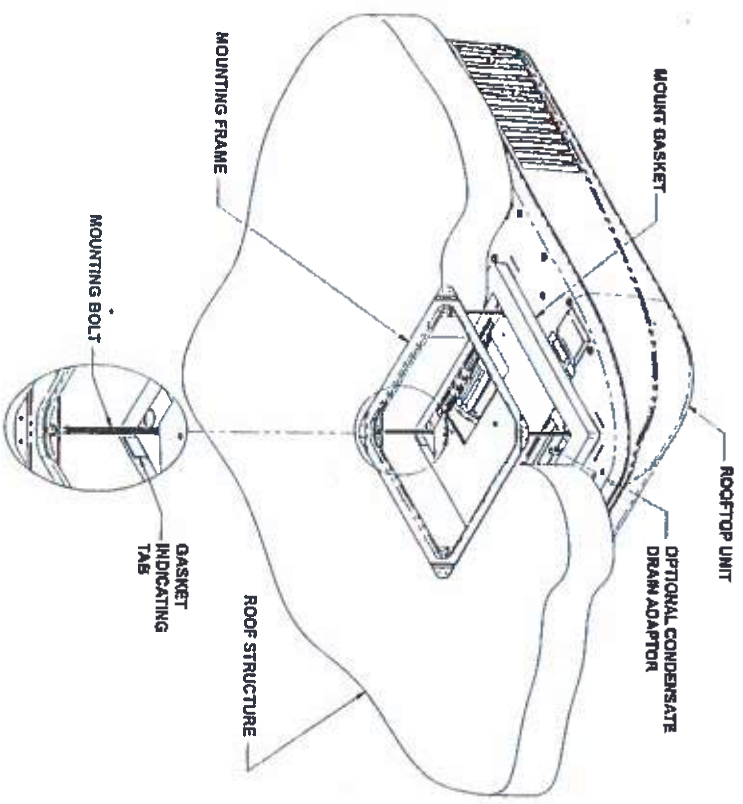


FIGURE 4

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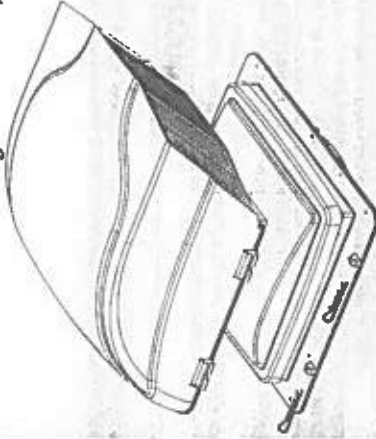
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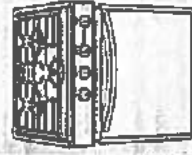
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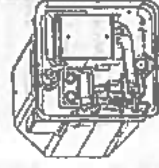


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installer un boyau à diamètre intérieur de 13 mm (1/2 po) de l'ouverture carrée de 35,56 cm (14 po), à travers le plafond du véhicule et descendant le long de la cloison latérale afin de permettre à l'eau d'être évacuée sous le véhicule. Veillez à ce que le boyau ne forme aucun pli fermé aux endroits où il tourne. Raccordez le haut du boyau d'évacuation au raccord à entailles illustré dans la Figure 4.

V. CÂBLAGE ÉLECTRIQUE

ACHEMINEMENT DU CÂBLAGE 115 V CC

En respectant les spécifications d'Airxcel, Inc. pour le câblage haute tension et l'ensemble des codes de l'électricité locaux et nationaux, acheminez le câblage d'alimentation 115 V CC de l'unité de toit de sa source à la boîte de connexion.

Spécifications de câblage haute tension pour un dispositif de protection contre les surtensions possédant l'intensité minimale requise - (voir la plaque d'identification sur la partie supérieure de l'appareil)

1. U.L. exige l'utilisation exclusive de conducteurs en cuivre 12 AWG minimum lors de l'utilisation du dispositif minimal recommandé de protection contre les surtensions. Les dispositifs de calibre supérieur ou les installations de câblage plus longues exigeront des conducteurs en cuivre 10 AWG ou plus.

2. Afin d'éviter des chutes de tension supérieures à 10 % lors de charges de démarrage, respectez la ligne directrice suivante : Pour des longueurs de plus de 15 mètres (50 pi), utilisez des conducteurs en cuivre 10 AWG ou plus. Appelez-les au dispositif de protection contre les surtensions fourni. Protection du circuit : reportez-vous à la plaque d'identification sur la partie supérieure de l'appareil.

Spécifications de câblage haute tension pour un dispositif de protection contre les surtensions dépassant l'intensité minimale requise (voir la plaque d'identification sur la partie supérieure de l'appareil) Le diamètre de câblage du dispositif de protection contre les surtensions et la longueur des câbles du climatiseur doivent être conformes aux réglementations locales et aux normes NEC (National Electrical Code).

C. La pompe à chaleur de toit doit être installée le plus à niveau gauche-droit et avant-arrière que possible avec le véhicule stationné sur une surface plane. La Figure 3 illustre les degrés de déviation maximum permis (degrés de montage relativement à la surface plane locale).

Si le toit du véhicule est incliné (non plat) de telle façon à empêcher que la pompe à chaleur ne soit installée à l'intérieur des degrés de déviation permis, une cale de nivellement extérieure devra être rajoutée pour niveler la pompe à chaleur de toit. Une cale de nivellement type est illustrée dans la Figure 2.

D. Suivant la préparation appropriée de l'ouverture de montage, retirez l'emballage et les tampons d'expansion de la pompe à chaleur de toit. Soutenez soigneusement l'unité sur le toit du véhicule. Ne la soulevez pas à l'aide du carénage en plastique. Positionnez la pompe à chaleur de toit au-dessus de l'ouverture de montage préparée. L'extrémité inclinée (nez) du carénage doit être orientée vers l'avant du véhicule. Tirez le conduit électrique de la pompe à chaleur de toit à travers l'ouverture de montage et laissez-le pendre.

E. Fixation du pompe à chaleur au toit - L'ensemble de plafond comprend un cadre de montage. Fixez la pompe à chaleur au toit à l'aide des étapes ci-dessous. Reportez-vous à la Figure 4.

1. Positionnez le joint de montage de pompe à chaleur sur l'ouverture carrée de 35,56 cm à 38,1 cm (14 po à 15 po) dans le toit.

2. Installez le cadre de montage de l'ensemble de plafond à l'aide des quatre boulons inclus dans l'ensemble de plafond.

3. La tension appropriée de chaque boulon est atteinte quand toute partie de chaque languette indicatrice du joint vient en contact avec le toit. Voir Figure 4. L'unité supérieure est maintenant correctement installée avec la compression optimale du joint.

4. Si la pompe à chaleur est dotée d'une pompe de condensation d'évaporateur facultative, vous devez

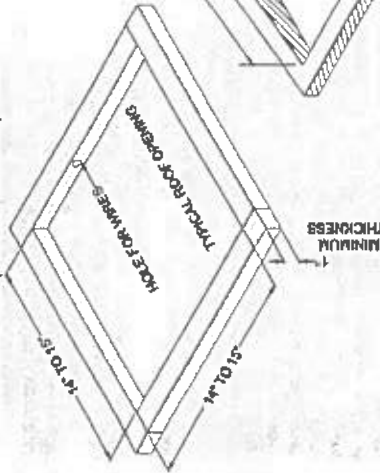


FIGURE 1

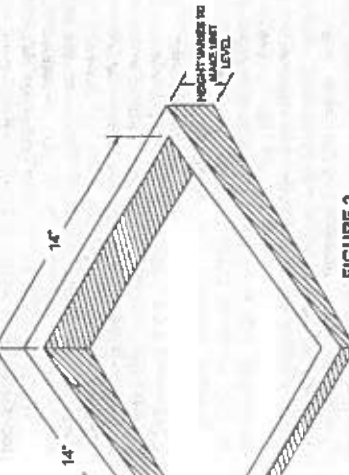


FIGURE 2

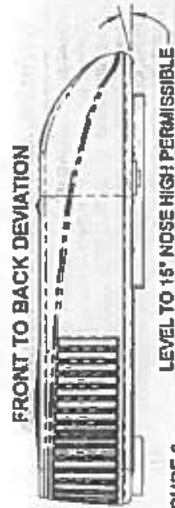
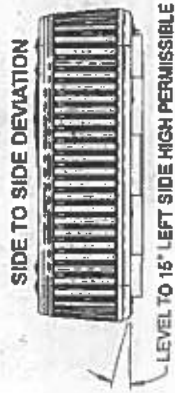


FIGURE 3

INSTALLATION, D'UTILISATION ET D'ENTRETIEN POUR 47000

POMPES SÉRIE DE CHALEUR

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Les présentes instructions sont un guide général pour l'installation des pompes à chaleur a de toit Coleman-Macht Série 47000. Pour plus de précisions sur la pompe à chaleur, veuillez vous reporter à l'ensemble d'emboîtement client livré avec chaque pompe à chaleur.

AVIS IMPORTANT

Ces instructions sont conçues pour être utilisées par un installateur qualifié spécialement formé et expérimenté dans l'installation de ce type d'équipement et des éléments s'y rattachant.

Dans certains États, on exige que le personnel d'installation et d'entretien détiennent une licence. AUCUNE PERSONNE NON QUALIFIÉE NE DOIT INSTALLER OU ENTRETIENIR CET ÉQUIPEMENT.

REMARQUE: Les mots « doit » ou « doit », ou d'autres formes de ceux-ci, identifient une exigence qui est essentielle à la performance satisfaisante et sécuritaire du produit. Les mots « devrait/leverrait » ou « peut/peuvent » identifient une recommandation ou un conseil qui n'est pas essentiel(s) ou exigé(s), mais qui peut être pratique ou utile.

AVERTISSEMENT : RISQUE DE CHOC ÉLECTRIQUE! Afin de prévenir la possibilité de graves blessures corporelles ou des dommages à l'équipement dus à un choc électrique, assurez-vous de toujours débrancher le câble d'alimentation de l'appareil.

SUIVEZ ATTENTIVEMENT TOUTES LES INSTRUCTIONS ET LES MISES EN GARDE DE CE FASCICULE AFIN D'ÉVITER LES RISQUES DE DOMMAGES À L'ÉQUIPEMENT, DE BLESSURES CORPORELLES OU D'INCENDIE.

MISE EN GARDE! L'installation inappropriée peut endommager l'équipement et créer un danger et annuler la garantie. L'utilisation de composants non testés en combinaison avec ces appareils annulera la garantie, peut contrevenir aux codes d'État ou provinciaux, peut créer un danger et peut abîmer l'équipement.

1. INFORMATIONS GÉNÉRALES

OEM : Veuillez assurer que l'ensemble d'emboîtement client est livré avec la pompe à chaleur.

INSTALLATEUR ET/OU MARCHAND : Si l vous plait faire que toute la documentation est présentée au consommateur du produit. Le consommateur de produits devrait également avoir la possibilité d'accéder à l'option à tous (3) parties ANNÉE DE REMPLACEMENT CONTRAT disponibles à partir de Arcoel, Inc.

Pour plus d'informations sur le contrat, s'il vous plait examiner le contrat de réclamation situé www.Arcoel.com/Warranty. Utilisez l'application sur le dos de l'emboîtement et d'entretien instructions pour appliquer pour le contrat en pièces étendues.

DEMANDES D'INFORMATIONS SUR LE POMPE À CHALEUR : Les demandes d'informations sur l'installation du produit présentées à votre représentant Arcoel ou à Arcoel devraient contenir le nom et le numéro de série du modèle du pompe à chaleur. Le nom et le numéro de série se situent à deux endroits sur tous les modèles de pompe à chaleur de toit : (1) vous pouvez visualiser l'autocollant de puissance nominale en regardant par

surface des fenêtres, la quantité et la qualité de l'isolation, l'isolement direct, le nombre de personnes dans le véhicule et la température extérieure peuvent augmenter l'apport de chaleur dans une mesure qui dépasse la capacité de la pompe à chaleur.

En règle générale, l'air soufflé (air de décharge) par la pompe à chaleur sera de 15 à 20 degrés Fahrenheit (9 à 11 degrés Celsius) plus frais que l'air entrant (air repris) dans les grilles à air intérieures de l'ensemble de toit.

Par exemple, si la température de l'air entrant (air repris) dans la pompe à chaleur est 80 degrés Fahrenheit (27 degrés Celsius), l'air soufflé (air de décharge) dans le véhicule sera de 60 à 65 degrés Fahrenheit (16 à 18 degrés Celsius). Tant et aussi longtemps que la pompe à chaleur maintient cet écart de températures (15 à 20 degrés Fahrenheit/9 à 11 degrés Celsius), elle fonctionnera correctement.

N'oubliez pas, songez soigneusement aux variables d'apport de chaleur du véhicule. En périodes de températures ambiantes extrêmes, vous pouvez réduire l'apport de chaleur du véhicule en :

- stationnant le véhicule à l'ombre;
- gardant les fenêtres et les portes fermées;
- évitant d'utiliser des appareils producteurs de chaleur, en utilisant des stores et/ou des rideaux.

Pour une solution plus durable aux situations d'apport de chaleur élevé, songez à une meilleure isolation du véhicule, à installer des au-dessus des fenêtres ou à les faire técher.

Une pompe à chaleur ne devrait pas être prise en considération pour le remplacement inhabituel d'une fourniture. La pompe à chaleur ne fonctionnera pas à des températures ambiantes sous le niveau de congélation.

III. SÉLECTION DE L'EMPLACEMENT D'INSTALLATION

Votre pompe à chaleur Arcoel, Inc. est principalement conçu à l'intention de véhicules récréatifs.

Le toit du véhicule peut-à accueillir l'unité de toit et l'ensemble de plafond sans être renforcé? Inspectez la zone de montage du plafond afin d'éviter d'interférer avec des éléments structurels tels que des supports, rideaux, tringles à rideaux ou séparations. Le caractère de l'ensemble de plafond à une épaisseur de 7,6 cm (3 po). Assurez-vous de confirmer la suffisance de dégageement pour les portes (frigorifère, garde-robe, armoires).

Généralement, les pompes à chaleur a de toit sont installés à l'emplacement des événements de toit existants. En absence d'un événement de toit (ouverture d'installation existante), nous recommandons les endroits ci-dessous. Auto-caravanes : une unité unique ou l'unité avant de deux devrait être installée à moins de 2,7 mètres (9 pi) du siège du conducteur.

Caravanes récréatives ou maisons mobiles : l'emplacement sélectionné devrait se situer près de la porte. Légèrement en avant de la ligne centrale de longueur du véhicule.

Fourgonnettes de camping : l'appareil devrait être installé en plein centre du toit (gauche à droite et à l'avant à l'arrière). Camion avec boîte remorque : afin d'obtenir le refroidissement maximum, l'emplacement devrait se situer de 1,2 à 1,5 mètres (4 à 5 pi) de l'arrière de la boîte.

IV. INSTALLATION DE L'UNITÉ DE TOIT

DANGER - RISQUE DE CHOC ÉLECTRIQUE! DÉBRANCHEZ TOUTE ALIMENTATION ÉLECTRIQUE DU VÉHICULE AVANT D'ÉCARTER DU DÉCOUPAGE TOUT CONTACT AVEC UNE SOURCE DE HAUTE TENSION PEUT PROVOQUER DES BLESSURES CORPORELLES OU LA MORT. ET DES DOMMAGES À L'ÉQUIPEMENT.

IMPORTANT

AFIN D'ÉVITER D'ENDOMMAGER LE CÂBLAGE ET LA BATTERIE, DÉBRANCHEZ LE CÂBLE DE LA BORNE POSITIVE DE LA BATTERIE AVANT D'ÉCARTER TOUT DÉCOUPAGE DU VÉHICULE.

Cette pompe à chaleur doit être installée en conformité avec la norme NFPA 501C.

Si vous installez la pompe à chaleur sur un toit à coefficient de frottement réduit tel que d'aluminium, d'acier ou de fibre de verre plastifiée, nous vous recommandons de vous procurer et d'installer un ensemble de ressorts tampons, pièce n° 8333-3871, afin de maintenir la tension sur les boulons et retarder le mouvement latéral du pompe à chaleur, qui pourrait rompre les boulons de fixation.

S'il est prévu que le pompe à chaleur en cours d'installation soit assujéti à d'importantes charges latérales, nous vous conseillons de commander un ensemble joints/boulons « Rougnneck », pièce n° 48207-3301, afin de maintenir la tension sur les boulons, interdire le mouvement latéral du pompe à chaleur et protéger contre la rupture des boulons.

Une fois l'emplacemnt de votre pompe à chaleur identifié (voir section III), vous devez préparer une ouverture de toit renforcée et écartée (une ouverture d'évent existante peut convenir). Avant de commencer le découpage du toit du véhicule, confirmez qu'aucun élément de structure ou entrelaqué ne sera touché. De plus, songez à l'emplacemnt de toute plomberie et alimentation électrique à l'intérieur du toit.

A. Si un événement se situe à l'emplacemnt d'installation voulu pour la pompe à chaleur, les mesures suivantes doivent être prises :

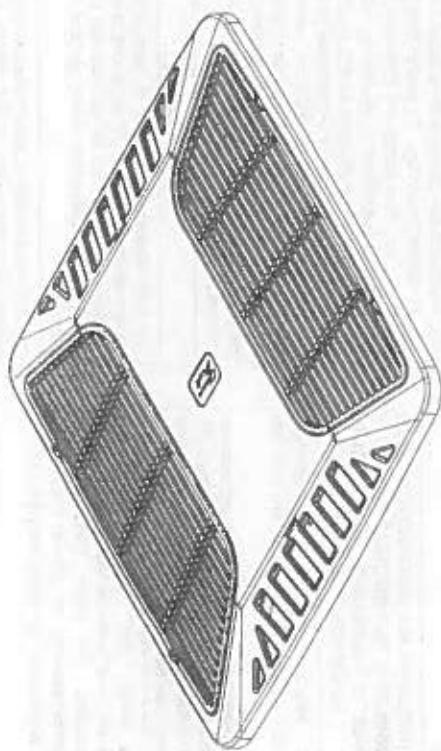
1. Déposez toutes les vis qui sont l'événement de toit au véhicule. Retirez l'événement ainsi que tout garnissage supplémentaire. Retirez soigneusement tout garnage d'air du toit et l'ouverture de toit propre d'obtenir une surface extérieure de toit propre.
2. Vous pourriez devoir sceller certains des vides tous de vue de fixation d'évent situés à l'extérieur du joint du bec à condensation de la pompe à chaleur.
3. Examinez l'ouverture du toit. Si l'ouverture est plus petite que 35,56 cm x 35,56 cm (14 po x 14 po), vous devez l'agrandir (voir Figure 1).

B. Si vous n'empêchez pas une ouverture d'évent, vous devrez découper une nouvelle ouverture (voir Figure 1) dans le toit du véhicule. Une ouverture correspondante devra aussi être découpée dans le plafond à l'intérieur du véhicule. Découpez l'ouverture du plafond soigneusement. Si le plafond est recouvert de tapis, vous pourriez l'effilocheur. Une fois les ouvertures dans le toit et le plafond découpées à la taille appropriées, vous devez installer un élément de soutien encadré entre le toit (extérieur) et le plafond (intérieur). L'élément de renforcement encadré doit respecter les lignes directrices suivantes :

1. Capacité de supporter à la fois le poids de la pompe à chaleur de toit et l'ensemble de plafond intérieur du toit et le plafond inférieur séparés, de façon à ce qu'aucun affaissement ne se produise lors du boulonnage de la pompe à chaleur de toit et de l'ensemble de plafond. L'ouverture du cadre doit permettre le passage du câblage d'alimentation. Achetez le câblage d'alimentation dans le cadre ou montrez de son installation.
2. Capacité de maintenir la surface portante extérieure du toit et le plafond inférieur séparés, de façon à ce qu'aucun affaissement ne se produise lors du boulonnage de la pompe à chaleur de toit et de l'ensemble de plafond. L'ouverture du cadre doit permettre le passage du câblage d'alimentation. Achetez le câblage d'alimentation dans le cadre ou montrez de son installation.



INSTALLATION INSTRUCTIONS FOR
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8430*635* HEAT READY A/C
8630*63 HEAT PUMP**



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P/N: 1980A004

12-05-2016

I. WARNINGS

IMPORTANT NOTICE

These instructions are for the use of qualified individuals specially trained and experienced in installation of this type equipment and related system components.

Installation and service personnel are required by some states to be licensed. PERSONS NOT QUALIFIED SHALL NOT INSTALL NOR SERVICE THIS EQUIPMENT.

WARNING! - SHOCK HAZARD To prevent the possibility of severe personal injury or equipment damage due to electrical shock, always be sure the electrical power source to the appliance is disconnected.

CAREFULLY FOLLOW ALL INSTRUCTIONS AND WARNINGS IN THIS BOOKLET TO AVOID DAMAGE TO THE EQUIPMENT, PERSONAL INJURY OR FIRE.

WARNING! Improper installation may damage equipment, can create a hazard and will void the warranty.

The use of components not tested in accordance with these units will void the warranty, may make the equipment in violation of state codes, may create a hazard and may ruin the equipment.

NOTE: The words "Shall" or "Must" indicate a requirement which is essential to satisfactory and safe product performance. The words "Should" or "May" indicate a recommendation or advice which is not essential and not required but which may be useful or helpful.

II. PACKAGE CONTENTS

- 1) Wirebox Assembly
- 1) Duct Divider Board - Some models do not have Divider Boards (boards are provided bulk packed)
- 1) Mount Frame
- 1) Chilled Assembly Consisting of:
 - 1) Chute/Supply Air Plate
 - 1) Shimrod Assembly
 - 2) Filters
 - 2) Grilles
- 1) Small Parts Package Consisting of:
 - 4) Bolts
 - 8) Screws - 3/8" Length
 - 1) Strain Relief
 - 2) Metal Wing Nuts
 - 3) Wire Nuts
 - 1) Evaporator Freeze Sensor

III. GENERAL INFORMATION

The flush mount ceiling plenum is designed for application in systems that utilize field fabricated (OEM supplied) cold air ducting. The ducting must be routed through the ceiling cavity (between the interior ceiling and roof). Ducting specifications are given in the section labeled "Supply Ducting and Registers". This system utilizes a single, non-ducted centrally located return air opening. The return air opening is contained within the ceiling plenum. The ceiling plenum must be located directly below the roof opening used for mounting the roof top unit.

All manual controls have been removed from the ceiling plenum. They have been replaced with control relays. The relays are mounted in the electrical box of the ceiling plenum. The relays contain 12 VDC coils (which may be energized by a wall mounted thermostat), with contacts that control the 115 VAC used to power the roof top unit. All air conditioning functions are controlled by the low voltage wall mounted thermostat. The thermostat controls a 12 VDC electrical circuit, which is used to energize the relays in the ceiling plenum. The thermostats that Aircoel, Inc. provides for the system are a combination (Heat/Cool) thermostats. These thermostats are capable of operating both the roof top air conditioner and any furnace with a 12 VDC control circuit of 1 amp or less (continuous current).

All air conditioning equipment is subject to freeze up when evaporator air flow is sufficiently reduced. Ducting of any length creates potential for reduced evaporator air flow and system freeze up. To protect both the installer and Aircoel, Inc. from conditions that promote reduced air flow and system freeze up, Aircoel, Inc. has equipped the ceiling plenum compressor control circuit with a low temperature probe. The low temperature probe monitors the temperature of the air conditioner evaporator coil. When the temperature of the evaporator coil drops below 28 degrees F, the switch will open, stopping compressor operation. Compressor operation will resume once the evaporator warms to 55 degrees F.

IMPORTANT

The low temperature sensor is part of the ceiling plenum electrical circuit. The probe must be inserted into the evaporator coil of the roof top unit by the installer when bolting the ceiling plenum to the roof top unit.

The 8430 series ceiling assemblies will mount to and operate all 115V 45000, 47200, 48200, and 49200 series roof top air conditioners.

The 8630 series ceiling assemblies will mount to and operate all 115V 45000, 47000, 48000 or 49000 series roof top heat pumps.

IV. CEILING PLENUM INSTALLATION REQUIREMENTS

1. The ceiling plenum must be installed under the roof opening.
The ceiling plenum bolts below the roof top unit. Compression of the framed ceiling cavity between the roof top unit and the ceiling plenum is what holds both components in place.
2. Ceiling cavity depth (the measurement from the ceiling to the roof - maximum 6").
3. The 115 VAC service for the roof top unit must be routed into the ceiling plenum. To prevent wire pinching and to promote ease of installation, allowances must be made for routing the 115 VAC supply wiring into the front of the roof opening.
4. Thermostat wiring must be run from the wall thermostat mounting location to the wirebox low voltage terminals. To prevent wire pinching and to promote ease of installation, allowances must be made for routing the low voltage wiring into the front of the opening.
5. The wirebox has a 9 pin receptacle extending from the front. This mates with the roof unit 115 volt electrical conduit. When making this connection, verify that the plugs are properly aligned and have snapped together securely.

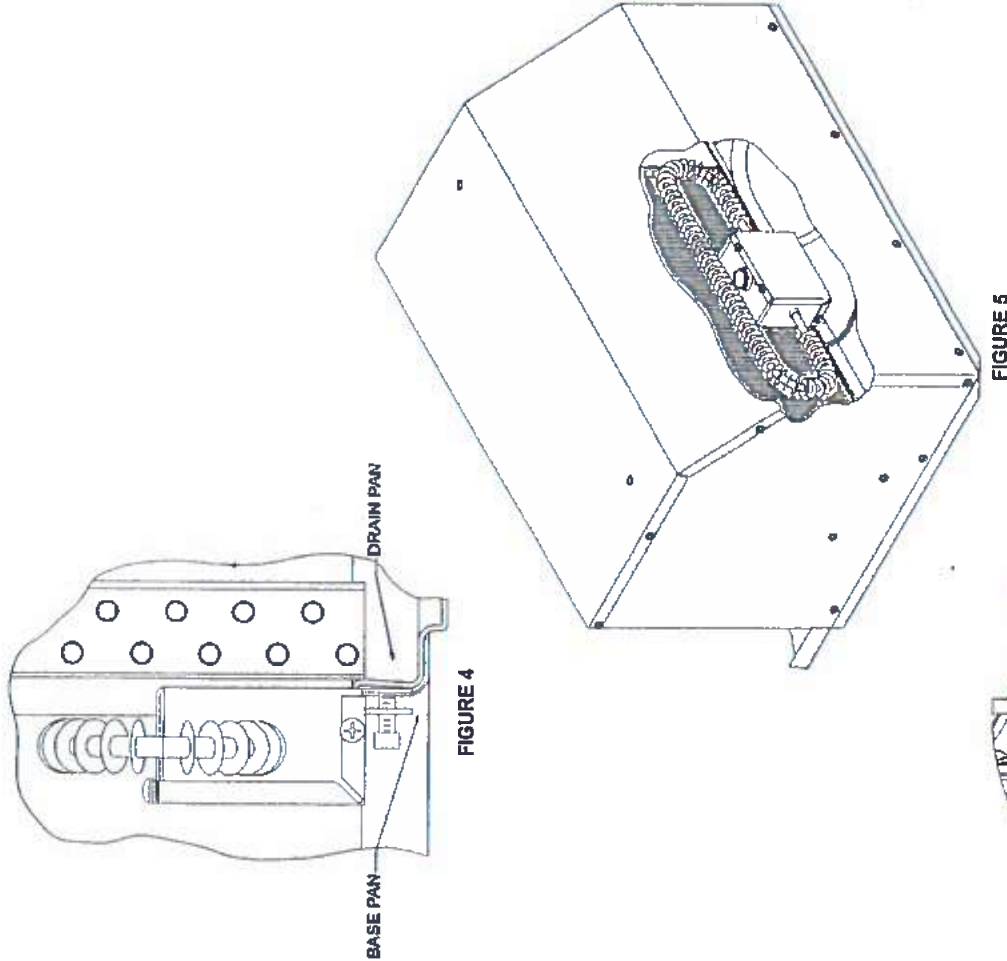


FIGURE 5

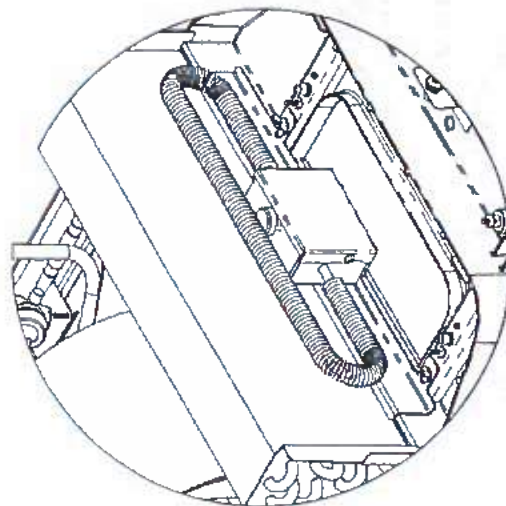


FIGURE 6

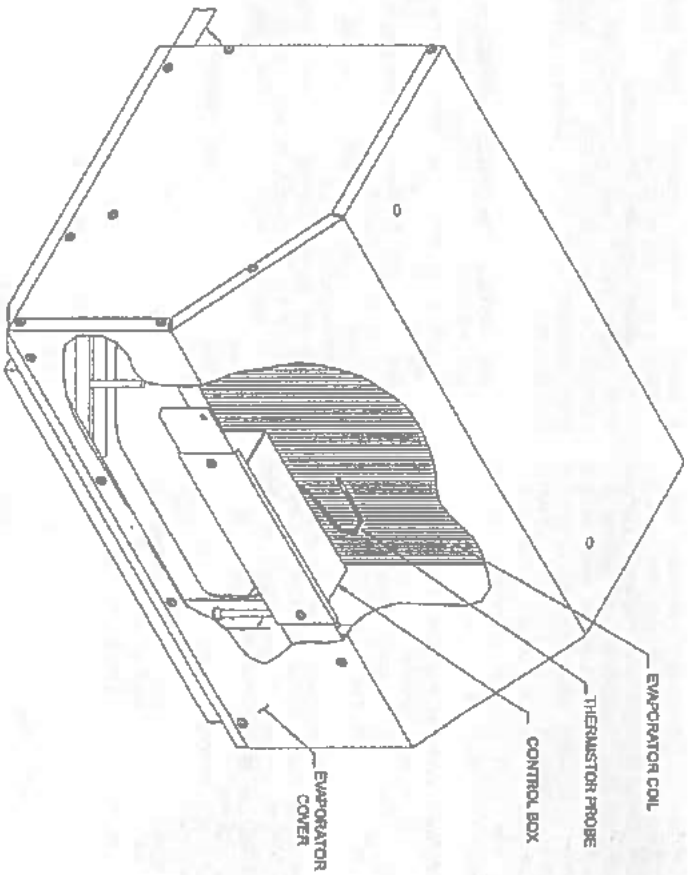


FIGURE 2

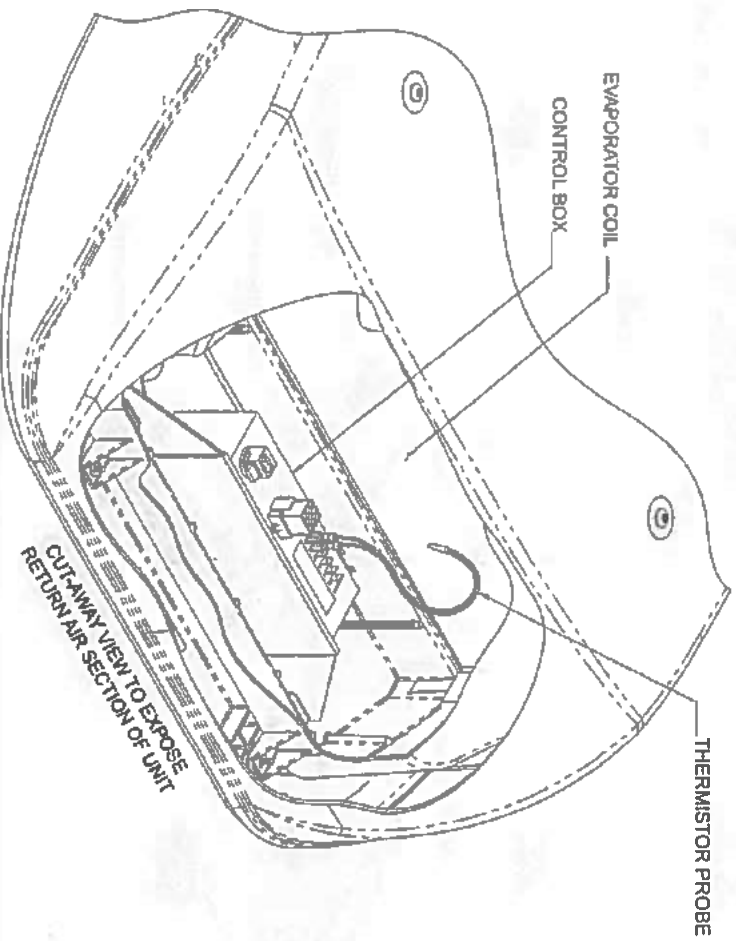


FIGURE 3

PLENUM TERMINAL DESIGNATION	THERMOSTAT WIRE CONNECTION	FUNCTION OF LOW VOLTAGE TERMINAL EXTENDING FROM CEILING ASSEMBLY
B Y GL FREEZE	BLUE YELLOW GREEN GRAY	Completes -12 VDC circuit for all relays Energizes Coil on Compressor Relay Energizes Coil on High Fan Relay Energizes Coil on Low Fan Relay Evaporator Freeze Sensor Connection
W	WHITE	Energizes coil on Heat Relay
COOL ONLY BOXES		HEAT READY and HEAT PUMP BOXES

- A low voltage terminal strip on the front of the box connects to the thermostat wires. The wires attach by 1/4" quick connects.

V. SUPPLY DUCTING AND REGISTERS

A. DUCTING

- The field fabricated supply ducting must attach to both sides of the ceiling plenum. A minimum of two ducts are required, with one duct attached to each side of the plenum (See Figure 1).
- Each duct must have a minimum height of 1'-1 1/2". Maximum height cannot exceed 4 inches. Total free area inside each duct must be no less than 10 square inches.

NOTE: To decrease restriction and increase air-flow, the ducting should make as few bends and turns as possible. When corners or turns are required, we recommend that you radius the corners to keep air flow at a maximum.

Ten (10) square inches of free area per duct is the minimum requirement, larger ducting will improve air flow and system performance.

- Where ducting secures to the ceiling plenum, maximum width is 7 inches.
- All field fabricated cold air supply ducting must be insulated and must have a vapor barrier.

IMPORTANT
Insulation reduces cooling loss and helps prevent water staining of the vehicle ceiling due to moisture condensation.

B. REGISTERS

- Supply (cold air) registers should have a minimum discharge area of 48 square inches per system, or 24 square inches per duct. A minimum of 8 is recommended.

VI. ROUTING THERMOSTAT WIRING

- Following the instructions packed with the thermostat, determine a location for the thermostat mounting.

- Following Airceel, Inc. low voltage wiring specifications and all local and national electrical codes: For 12 VDC thermostats, it is required that the thermostat 12 volt negative connection be routed directly from the converter or battery. It is highly desirable to provide 12 volt control power from the battery side of the converter. These precautions should prevent control problems.

FUNCTION OF LOW VOLTAGE TERMINAL EXTENDING FROM CEILING ASSEMBLY

- Route the thermostat 12 VDC supply wiring from the power source to the thermostat mounting location. Two wires are required:
One supply lead must be +12 VDC and red in color.
The second supply lead must be -12 VDC and blue in color.

- To protect the wall mount thermostat from over-current damage, a 2 amp fuse has been provided with the thermostat.

- Route the thermostat control wiring from the ceiling plenum opening.

- Four (4) wires are required (5 wires for Heat Ready/Heat Pump boxes). These wires are as follows:
(1) Blue wire for -12 VDC circuit
(2) Yellow wire for compressor circuit
(3) Green wire for high fan circuit
(4) Gray wire for low fan circuit
(5) White wire for heat circuit - Heat Ready/Heat Pump only

- Airceel, Inc. low voltage wiring specifications:
A. All low voltage wiring should be 18 gauge minimum.
B. Low voltage wiring must be routed into the front side of the ceiling plenum opening

- Following Airceel, Inc. high voltage wiring specifications and all local and national electrical codes, route the roof top unit 115 VAC supply wiring from its power source to the wirebox.

- High Voltage Wiring Specifications based on Minimum Overcurrent Protection Device Amperage - (see upper unit nameplate)

- UL requires copper conductors only with minimum #12 AWG when using the minimum recommended overcurrent protection device. Higher rated devices or longer wiring runs will require #10 AWG or greater copper conductors.

- To prevent voltage drops greater than 10% during starting, adhere to the following guideline:
For lengths greater than 50', use #10 AWG or larger copper conductors. Match to the overcurrent protection device provided.

- Circuit Protection - Refer to upper unit nameplate.

- Circuit Protection - Refer to upper unit nameplate.

- Circuit Protection - Refer to upper unit nameplate.

- Circuit Protection - Refer to upper unit nameplate.

High Voltage Wiring Specifications based on Overcurrent Protection Device rated higher than the minimum required (see upper unit nameplate).

Follow all local and NEC (National Electrical Code) for proper sizing of wire AWG based on Overcurrent Protection Device selected and the length of the wiring run to the air conditioner.

VIII. CEILING PLENUM MOUNTING

- Place the air conditioner over the roof opening.
- Position the mount frame into the ceiling opening (See Figure 1).
- Using the four bolts provided, secure the mount frame to the roof top unit. The four mounting bolts are to be applied up through the bottom of the mount frame and into the bottom of the roof top unit (See Figure 1). Tighten each bolt until the indicators of the gasket are at roof level.
- Measure the distance between the ceiling and the upper unit basepan, add $\frac{1}{2}$ " to this measurement and cut the duct divider to this height if necessary. **ALWAYS CUT OFF THE BOTTOM EDGE (THE EDGE WITHOUT FOAM STRIP).**
- Carefully wedge this divider between the walls of the roof opening and up against the upper unit basepan with the silver side facing forward.

IX. CONNECT 115 VAC WIRING

WARNING - SHOCK HAZARD!

To prevent the possibility of severe personal injury or equipment damage due to electrical shock, always be sure the electrical power is disconnected or off before beginning installation.

- Complying with the "DANGER" notice below, bring the 115 VAC supply wiring previously routed into the frame of the roof opening, through the strain relief atop the electrical box and into the high voltage wiring area.

DANGER

WHEN USING NON-METALLIC SHEATH SUPPLY CABLES (ROMEX, ETC.), STRIP SHEATH BACK TO EXPOSE 4-6 INCHES OF THE SUPPLY LEADS. STRIP THE INDIVIDUAL WIRE LEAD ENDS FOR WIRE CONNECTION (ABOUT 3/4" BARE WIRE). INSERT STRAIN RELIEF INTO ELECTRICAL BOX. INSERT THE SUPPLY WIRES THROUGH THE STRAIN RELIEF.

IF OTHER THAN NON-METALLIC CABLES ARE USED FOR SUPPLY CONDUCTORS, APPROPRIATE STRAIN RELIEF CONNECTORS OR CLAMPS SHOULD BE USED. IN NO CASE SHOULD CLAMPING OR PINCHING ACTION BE APPLIED TO THE INDIVIDUAL SUPPLY LEADS (NEUTRAL AND "HOT" WIRES).

- Connect high voltage supply leads to the control box wire leads with provided wire nuts. "Hot" connects to black lead, "neutral" to white lead and "ground" to green lead.
- Gently fold all wiring into the electrical box while verifying that it is not either pinched or cut.

- Complying with the warnings listed below, connect the 115 VAC supply wiring to its power source. Be sure all power remains off until beginning checkout procedure.

DANGER!

TO PREVENT THE POSSIBILITY OF SHOCK INJURY FROM APPLIANCE OPERATION: THE WHITE WIRE MUST BE CONNECTED TO NEUTRAL IN THE SERVICE BOX ENTRANCE AND THE MECHANICAL GROUND MUST BE CONNECTED TO A GROUNDING LUG IN THE SERVICE BOX OR THE MOTOR GENERATOR COMPARTMENT.

IMPORTANT

When connecting the 115V electrical conduit: Make any adjustments required to relieve pinched or stressed wiring. Verify that the "ridged" side of both plugs are properly aligned. Verify that the connectors have snapped together on both sides. Do not use excessive force when joining the connectors.

X. CONNECT THERMOSTAT WIRING

- Bring the thermostat wiring previously routed into the roof opening from the front of the ceiling plenum extending from the front of the plenum electrical box.

These low voltage ceiling plenum designations complete the following circuits:

- B -12 VDC for all relay coils
- Y +12 VDC for compressor relay coil
- GH +12 VDC for fan relay coil
- GL +12 VDC for low fan relay coil
- W +12 VDC for heat relay - found on heat ready and heat pump boxes.

CEILING PLENUM LOW VOLTAGE WIRE DESIGNATIONS	WALL THERMOSTAT CONTROL WIRING	MATES WITH
B	Blue	
Y	Yellow	
GH	Green	
GL	Gray	
W	White	

After completion of high and low voltage wiring, replace the wirebox cover

XI. MOUNT THE WIREBOX

- Two machine screws are in the upper unit for mounting the control box. The control box will be mounted by positioning over the screws and using the wing nuts to fasten the control box to the upper unit. For 45000, 48000 or 49000 series upper units, see Figure 2. Installation in a 47000 series unit will require mounting the control box with the wires exiting upwards (See Figure 3).
- Insert the evaporator freeze sensor between evaporator fins near the bottom center of the evaporator and between the bottom two tubes

(See Figure 2). Insert straight in until contacting the staggered tube directly in back of the insertion point. When contact has been made, elevate the exposed end of the sensor approximately 45 degrees, then continue insertion at a 45 degree angle until the sensor is completely embedded into the evaporator. **TIE ALL WIRING TO INSURE NO CONTACT WITH THE HEATER OR ANY SHARP EDGES. KEEP IN MIND THAT HIGH VELOCITY AIR WILL BE ENCOUNTERED IN THIS AREA.**

XII. INSTALL OPTIONAL HEATER ASSEMBLY

- The optional heater assembly may now be installed. Refer to Figure 5 for the 45000, 48000 and 49000 series units. Refer to Figure 6 for the 47000 series units.
- Position the heater assembly into the return air opening as shown. For 45000, 48000 and 49000 series units, the heater bracket must be installed between the basepan and the plastic drain pan. See Figure 4.
- For 45000, 48000 and 49000 series units, tighten set screw to secure the assembly so as to prevent movement. For the 47000 series installation, the heater bracket assemblies to weld studs on the bracket and is secured in place with wing nuts.

- Insert the two-pin connector of the heater umbilical into the receptacle on the control box. Insure that the connector snap-locks into position. **TIE ALL WIRING TO INSURE NO CONTACT WITH THE HEATER OR ANY SHARP EDGES. KEEP IN MIND THAT HIGH VELOCITY AIR WILL BE ENCOUNTERED IN THIS AREA.**

XIII. INSTALL AIR GRILLE ASSEMBLY

- Raise the chute/supply air plate to the mount frame and ensure the plenum duct divider is positioned between the two ribs. Install the chute/supply air plate to the mount frame with 4 screws provided in the parts package (See Figure 1).
- Temporarily remove the return air grilles and fillers from the shroud assembly.
- Raise the shroud assembly so that it properly nests with the chute/supply air plate and attach the shroud assembly to the mount frame with 4 provided screws.
- Reinstall the filters and return air grilles in the shroud assembly.
- Installation is now complete.

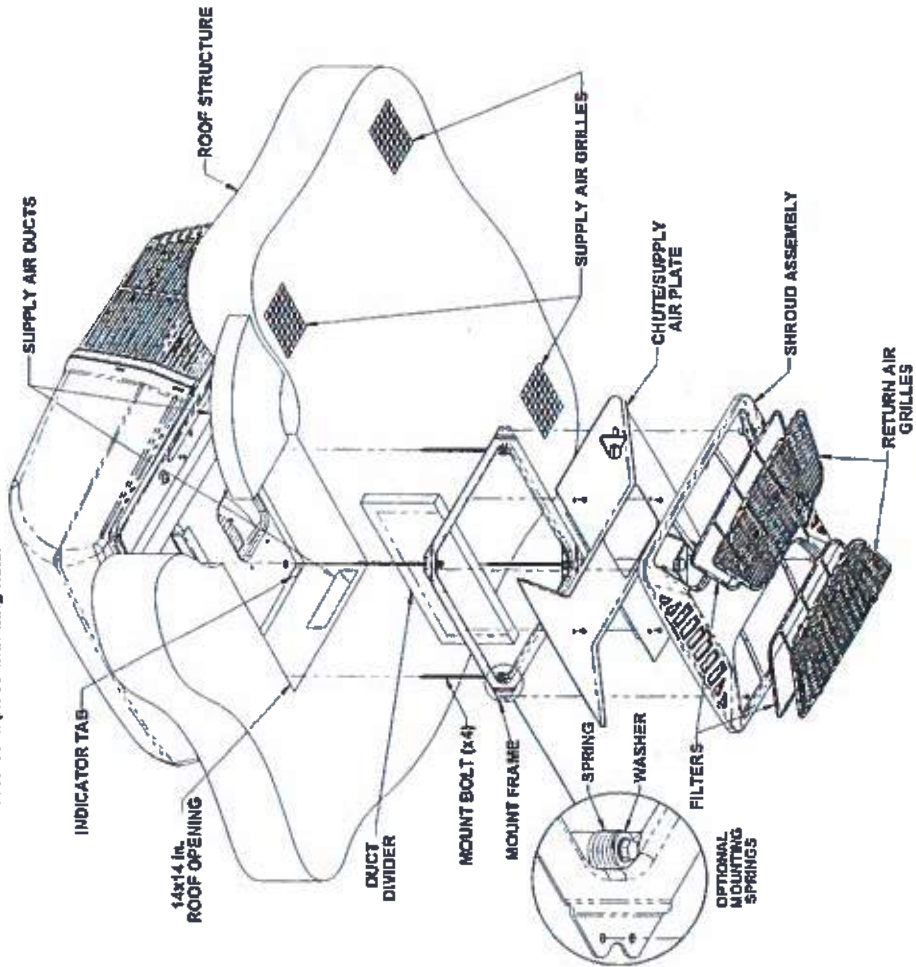


FIGURE 1

How does the Heat Pump Thermostat Work

The RvComfort.HP, the RvComfort.PHP, the Coleman True-Air, and the RvComfort.ZC thermostats by RvProducts Inc are all capable of running not only an Air Conditioning unit, but also an Electric Heat Pump. Frequently we receive calls from customers who do not understand the functions of the Heat Pump Thermostats. This guide is a quick run through of the information already provided in the Thermostat Operation Manual, included with each thermostat.

The Heat Pump is an electric source for heat. It will supply and maintain heat assuming the outside (ambient) temperature is above 40 degrees. This number of course can be slightly higher or lower depending on the humidity. Higher humidity can cause a heat pump to lose efficiency at a slightly higher ambient temperature, while lower humidity can cause a heat pump to lose efficiency at a lower ambient temperature.

Since no one wants to wake up to find that the outside temperature dropped below forty degrees and it is now 50 degrees inside the coach, the Heat Pump thermostats are programmed internally to recognize when the temperature drops five degrees or more from the set temperature to the actual inside room temperature. When the temperature exceeds five degrees or more between the two, the thermostat will default to the next available heat source.

The thermostat, upon sensing a temperature split of five degrees or more in the electric heat mode will bring the gas heat on to assist the electric heat. This is the first strike. A strike is created by the thermostat having to change modes (or run dual modes to sustain a temperature split). The electric heat and the gas heat will continue to run together until the thermostat reaches the set temperature and satisfies. When the electric heat comes back on, it will be in electric heat only at that point. If the temperature again drops five degrees or more from the set point, the thermostat will again bring the gas heat on to assist. This is strike two. The system will then go through the above stated procedures. If the temp should drop five degrees from set point for a third time, the thermostat will give up on the electric heat, lock the electric heat out for two hours (showing either DIFF on the display or FLASHING GAS HEAT on the display) and default to Gas heat only. You WILL NOT be able to run any Electric heat during this two hour lockout.

This is the normal operation for these thermostats. We can also cause the thermostat to lock out in a few ways. If we set the Electric heat set point five degrees or more higher than the room temperature the thermostat will default the same as it would if the temperature dropped five degrees or more. If at any time the differential between the set temperature and actual temperature is five degrees or more, the thermostat will go into a strike point regardless of whether it is caused by raising the temperature too far, or the temperature falling inside the coach.

The other way the thermostat will receive a strike is if the system runs for twenty minutes and cannot reach the set temperature (satisfy). Again the thermostat senses that something is wrong with the system and defaults to the next available heat source to assist. These strikes are the same as the strikes mentioned above and any combination of three strikes will result in a two hour lockout.

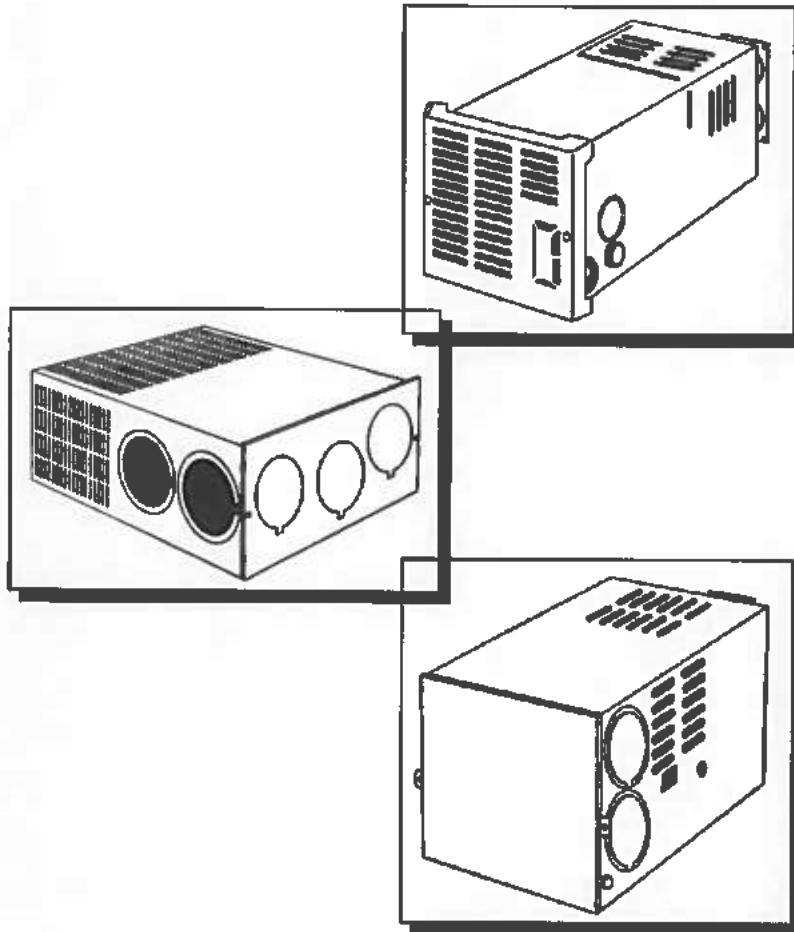
Once the system comes out of lockout, it will only require 1 strike to go back into lockout. So keep in mind, if you are coming out of a two hour lockout, be careful to keep the set and room temperature within four degrees otherwise you will lock the system out again.

To summarize:

- 1). There is no outside ambient sensor to shut down the heat pump. The heat pump will shut down only if the system is locked out. Ambient temperature does affect the performance of the electric heat.
- 2). If the thermostat set point and actual room temperature are FIVE degrees or greater the system will default to the next heat source for assistance and obtain a strike. Three consecutive strikes and the electric heat will be locked out for two hours.
- 3). If the electric heat runs for twenty minutes and cannot satisfy and shut the compressor off, the system will also default to the next heat source for assistance and obtain a strike. Three consecutive strikes and the electric heat will be locked out for two hours.
- 4). Once the thermostat is locked out, it is a hard lockout. There is no reset that will bypass the lockout. Pulling the fuse will not reset the thermostat lockout.

Suburban RV FURNACES SERVICE MANUAL

DD-17DSI • DD-17DSIW
NT-12S/SE • NT-16S/SE • NT-20S/SE
NT-24SP • NT-30SP • NT-34SP
NT-40
P-30S/40
SF-20 • SF-25 • SF-30 • SF-35 • SF-42
SF-20F • SF-25F • SF-30F • SF-35F • SF-42F
SH-35 • SH-42
SH-35F • SH-42F
SHD-2542
SFV-35 • SFV-42
SFV-35F • SFV-42F



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NOTE: Our service technicians are available to assist you in making repairs or parts replacements from 8:00 a.m. to 5:00 p.m. Eastern Standard Time, Monday through Friday (except holidays), by calling 423-775-2131 extension 7102. E-mail address: Info1@suburbanmfg.com

GENERAL SERVICE INFORMATION

Suburban DYNATRIL furnaces installed in recreational vehicles are classified as Direct Vent Sealed Combustion Furnaces. A forced draft furnace utilizes a sealed combustion chamber which is vented to the outside atmosphere. The intake air for combustion is also taken from outdoors and is completely isolated from the room air. A motor is used to drive an impeller wheel to draw intake air into the chamber to support combustion and force the exhaust gases through the furnace chamber to the outside atmosphere. A second impeller wheel (driven by the same motor yet totally isolated from the combustion air) is used to circulate room air across the furnace chamber where it is heated. The blower then forces the hot air into the living area either through a duct system or through a front grille on the furnace cabinet on direct discharge models.

Suburban furnaces operate on 12-volt DC power which is supplied either by a 12-volt battery or a converter system. A recreational vehicle furnace that is specifically designed for "park model" trailers operates on 120 volts AC. These are designed and tested under the same standards as the 12-volt models.

Suburban forced draft combustion furnaces used in recreational vehicles are designed for use with Propane gas. Although a few recreational vehicle furnaces are approved for use with natural gas, one should never attempt to convert such a unit to natural gas unless the conversion is approved by the manufacturer of the furnace.

Gas Supply Pressure Requirements

Line Pressure:

**Minimum 11" WC*, Maximum 14" WC
*WC - water column**

Voltage Requirements

Voltage DC: 12 volt D.C.

Minimum 10.5 volts D.C., Maximum 13.5 volts D.C.

Service Tools Required

Manometer gauge/ U-Tube

Volt ohm meter capable of testing above 15 amps

Module board tester #641511

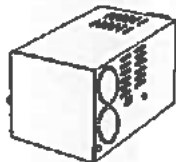
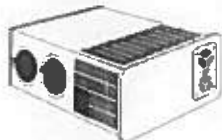
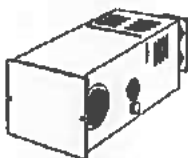
Gas leak detector OR approved leak check liquid

Assorted wrenches

Assorted hand tools

Safety glasses

Suburban RV FURNACES



12 VDC Direct Discharge	BTU/h Input	Height	Width	Depth	Ignition	Shipping Weight
NT-12SE	12,000	9 3/8"	9 3/8"	21-27 3/4"	Electronic	27
NT-16SE	16,000	9 3/8"	9 3/8"	21-27 3/4"	Electronic	27
NT-20SE	19,000	9 3/8"	9 3/8"	21-27 3/4"	Electronic	27
DD-17DSI	17,000	12"	10 1/2"	22-29"	Electronic	25
Accessories	Description					
260197	Vent Kit 2" - 4" DD Models					
260198	Vent Kit 4" - 6" DD Models					
260199	Vent Kit 6" - 9" DD Models					
12 VDC Ducted Furnaces	BTU/h Input	Height	Width	Depth	Ignition	Shipping Weight
NT-12S	12,000	9 3/8"	9 3/8"	22 3/4-29 1/2"	Electronic	27
NT-16S	16,000	9 3/8"	9 3/8"	22 3/4-29 1/2"	Electronic	27
NT-20S	19,000	9 3/8"	9 3/8"	23 3/8-30 1/8"	Electronic	27
NT-24SP	24,000	12 1/2"	12"	23"	Electronic	40
NT-30SP	30,000	12 1/2"	12"	23"	Electronic	40
NT-34SP	34,000	12 1/2"	12"	23"	Electronic	40
NT-40	40,000	12 1/2"	12"	23"	Electronic	42
SF-20F	20,000	7 1/2"	17"	20"	Electronic	35
SF-25F	25,000	7 1/2"	17"	20"	Electronic	35
SF-30F	30,000	7 1/2"	17"	20"	Electronic	35
SF-35F	35,000	7 1/2"	17"	20"	Electronic	35
SF-42F	40,000	7 1/2"	17"	20"	Electronic	35
SH-35F	35,000	9 1/4"	17"	20"	Electronic	40
SH-42F	40,000	9 1/4"	17"	20"	Electronic	42
SF-20"	20,000	7 1/2"	17"	20"	Electronic	35
SF-25"	25,000	7 1/2"	17"	20"	Electronic	35
SF-30"	30,000	7 1/2"	17"	20"	Electronic	35
SF-35"	35,000	7 1/2"	17"	20"	Electronic	35
SF-42"	40,000	7 1/2"	17"	20"	Electronic	35
SH-35"	35,000	9 1/4"	17"	20"	Electronic	40
SH-42"	40,000	9 1/4"	17"	20"	Electronic	42
SHD-2542	25/40,000	9 1/4"	17"	20"	Electronic	44
Accessories	Description					
6258ACW	*Door, Optional Access, Colonial White, Standard SF Models					
6258APW	*Door, Optional Access, Polar White, Standard SF Models					
6267ACW	*Door, Optional Access, Colonial White, Standard SH Models					
120 VAC Park Model Furnaces	BTU/h Input	Height	Width	Depth	Ignition	Shipping Weight
P-40	40,000	12 1/2"	12"	23"	Electronic	46
Accessories	Description					
050733	Duct Cover					
050715	Duct Collar 4"					
051240	Duct Collar 2"					
280552	Rain Shield					
062164	Bottom Duct Gasket, NT-24/30/34SP, NT-40, P40					
070853	Bottom Duct Gasket, SF Models Except SF-42, (F)					
520009	Bottom Duct Kit W/Gasket, NT-24/30/34SP, NT-40, P40					
520576	Bottom Duct Kit W/Gasket, SF Models Except SF-42, (F), SH35 (F)					
520753	Bottom Duct Kit W/Gasket and Door, SF-42, (F)					
520864	Bottom Duct Kit W/Gasket SH-42 (F) SHD-2542					

Wall Thermostats are included with All Models, except SF.
Vent Assemblies are included with all units, except DD.

INSTALLATION

There are several important aspects of the installation which will pertain to all Suburban forced draft furnaces, regardless of the model or the method in which they are installed. They are:

1. Selecting a Location
2. Venting
3. Return Air
4. Ducting

Refer to the furnace installation manual for all installation requirements.

Location and Installation- Locate the furnace near lengthwise center of the coach. Choose a location for installation out of the way of wires, pipes, etc. which might interfere with the installation. Adhere to the minimum clearances from cabinet to combustible construction as listed in the installation manual for your specific furnace model. Secure furnace cabinet to the floor of the coach using the holes provided in the furnace cabinet.

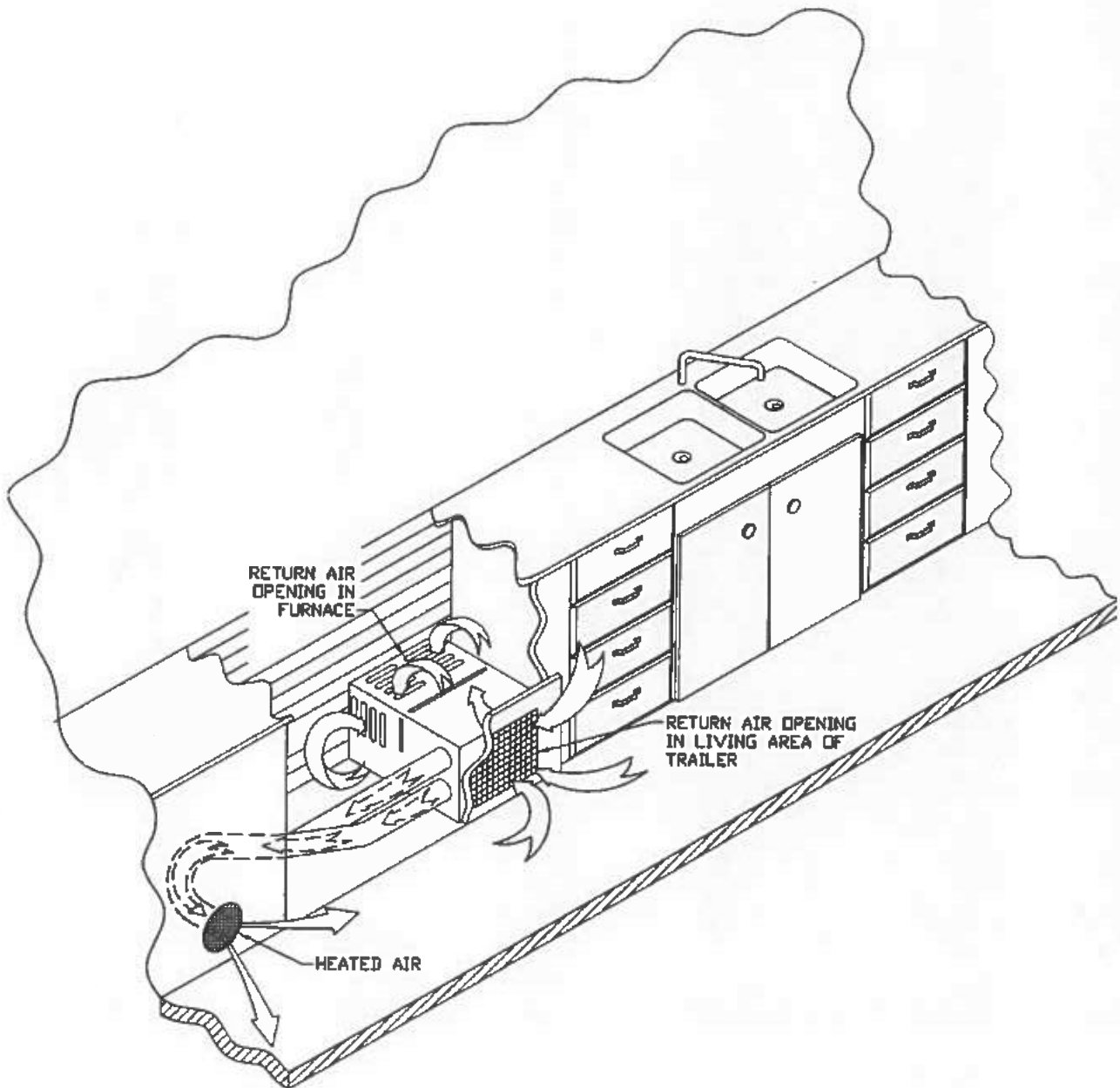


Figure 1

VENTING

Venting- By definition of a Direct Vent Sealed Combustion Furnace, it must be vented to the outside atmosphere and also draw combustion air from outdoors. Therefore, it is imperative that the vent be unobstructed and there must be a seal between the exhaust and intake (caulking). Refer to the vent assembly installation in the manual. The vent must be straight. There can be no offsets or turns in the vent. All vent tubes which connect to the furnace exhaust and intake must overlap a minimum of 1/2" on intake, and 1 1/4" on exhaust. Check your furnace model number for vent installation procedures. Vents cannot be altered as supplied from the factory.

VENT ASSEMBLY INSTALLATION (SF and SH SERIES)

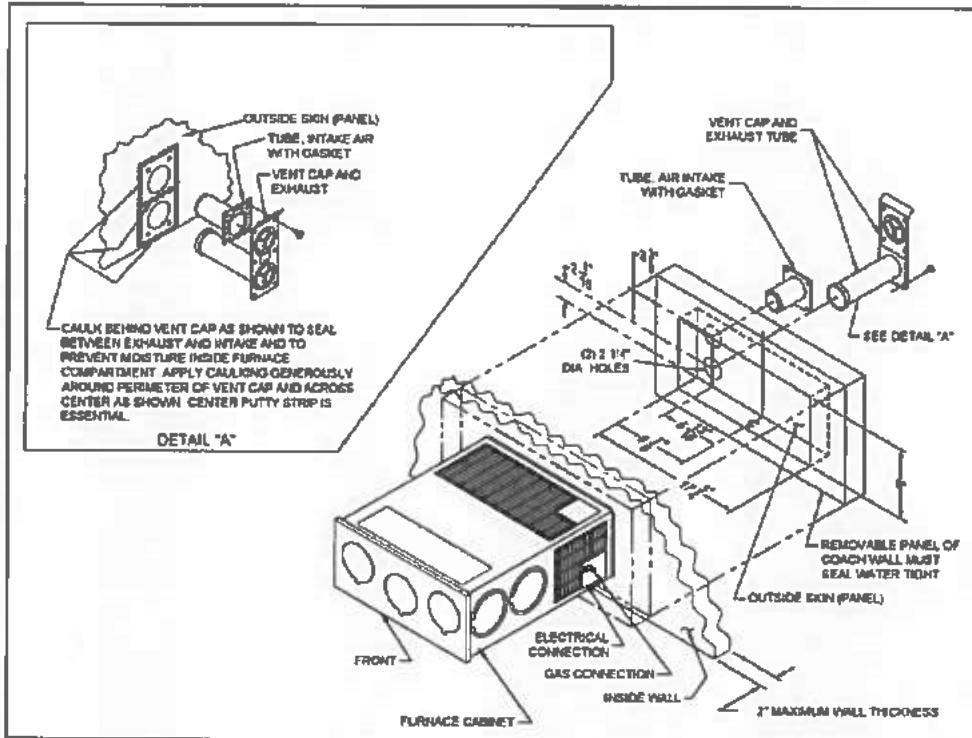


Figure 2
SF

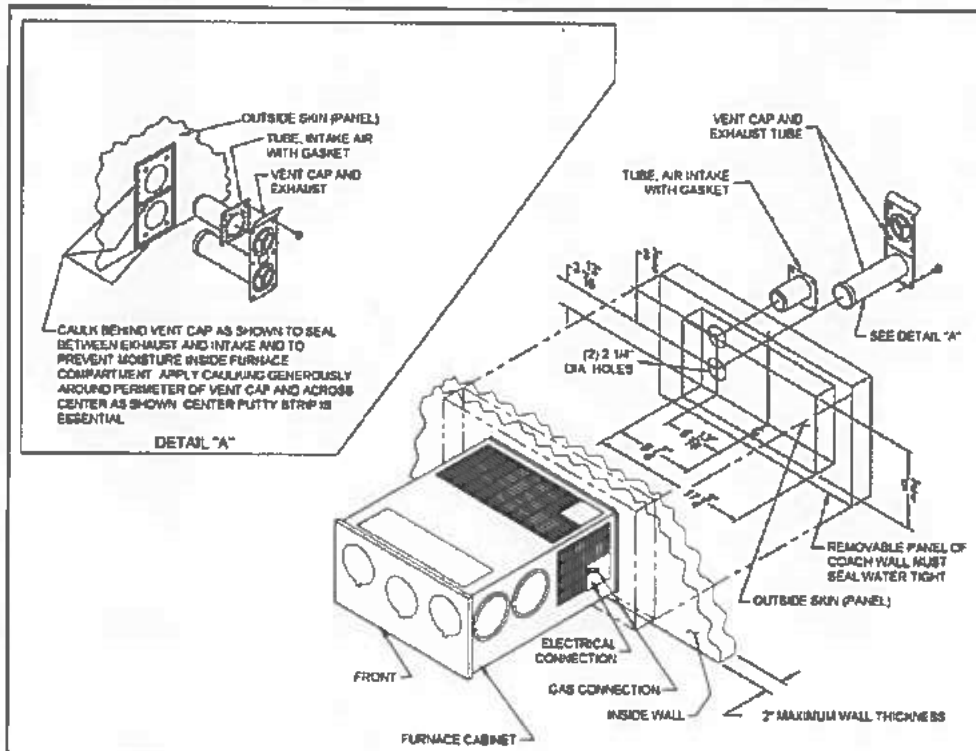


Figure 2A
SH

VENT ASSEMBLY INSTALLATION (SF and SH SERIES)

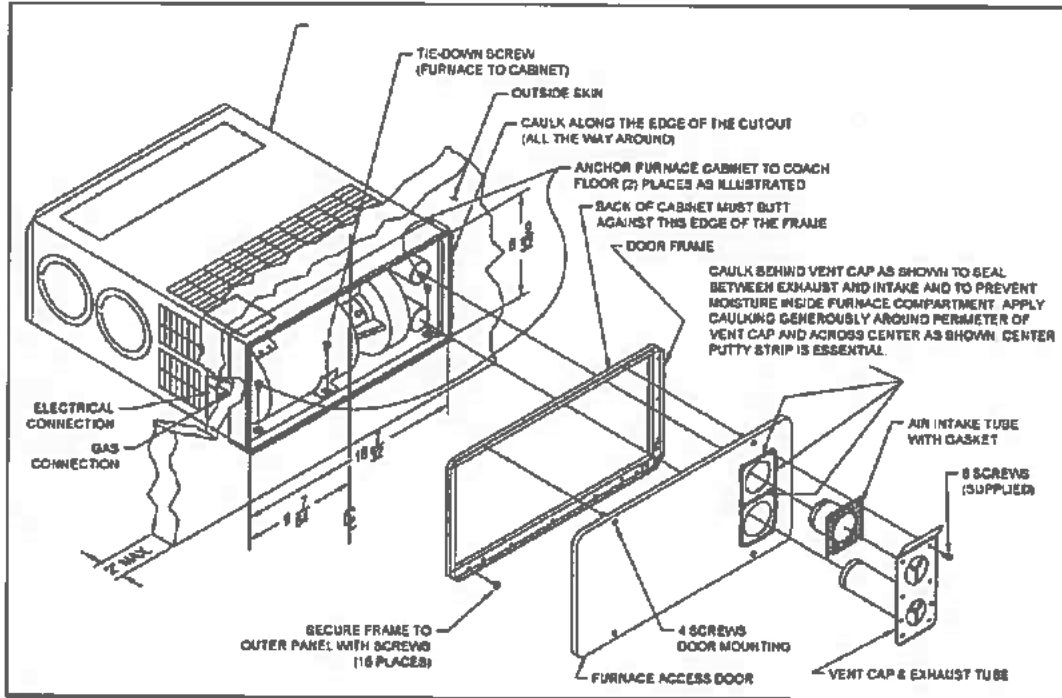


Figure 3
SF

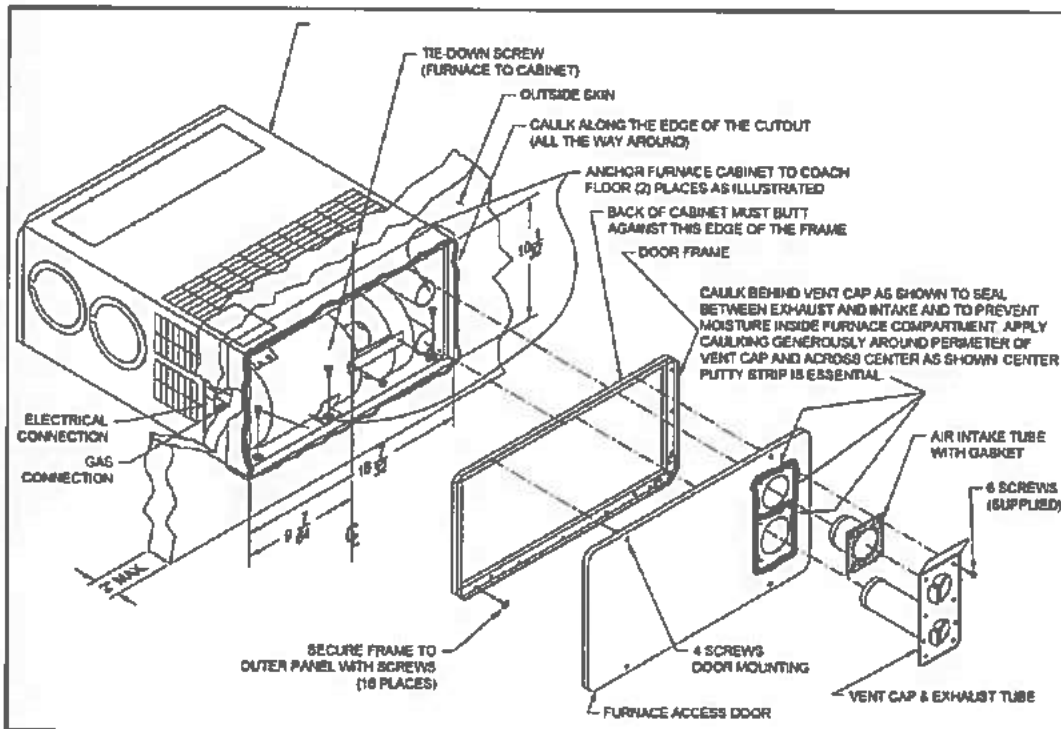


Figure 3A
SH and SHD-2542

VENT ASSEMBLY INSTALLATION (SF and SH SERIES)

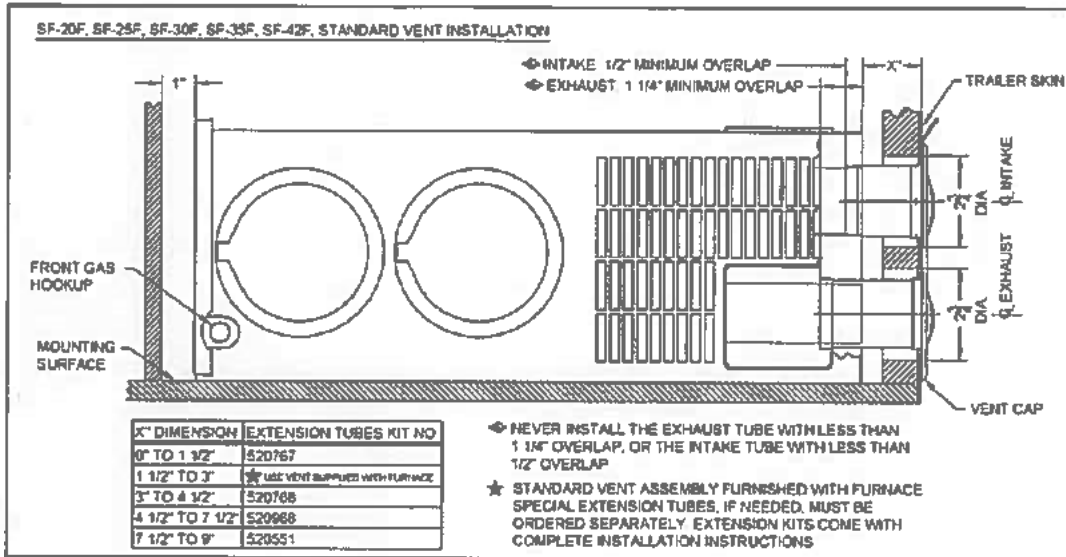


Figure 4
SF

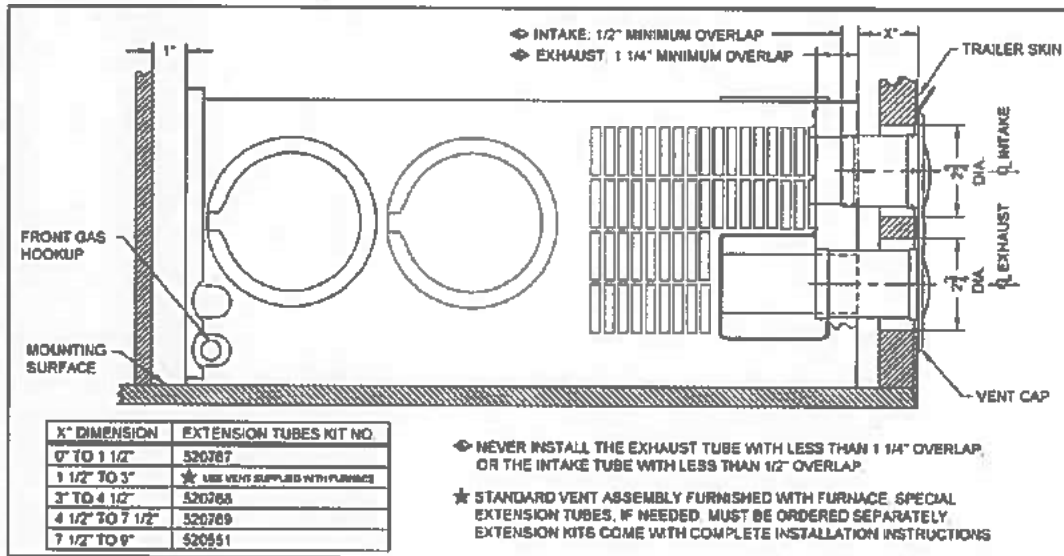


Figure 4A
SH

VENT ASSEMBLY INSTALLATION (SFV)

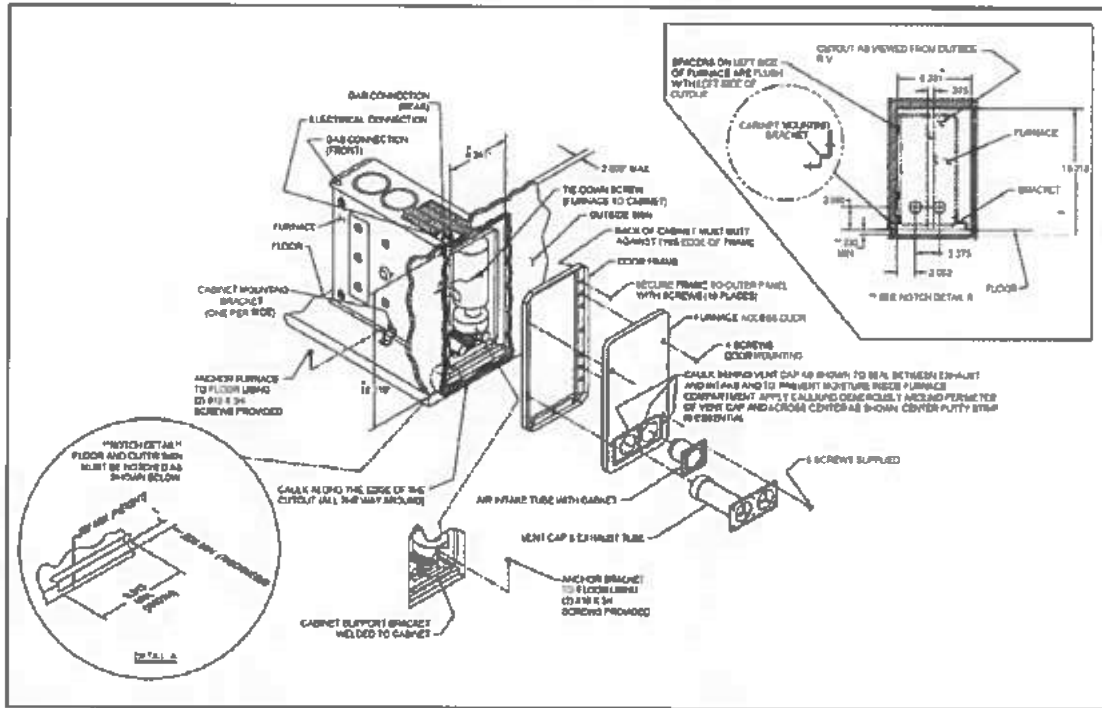


Figure 5

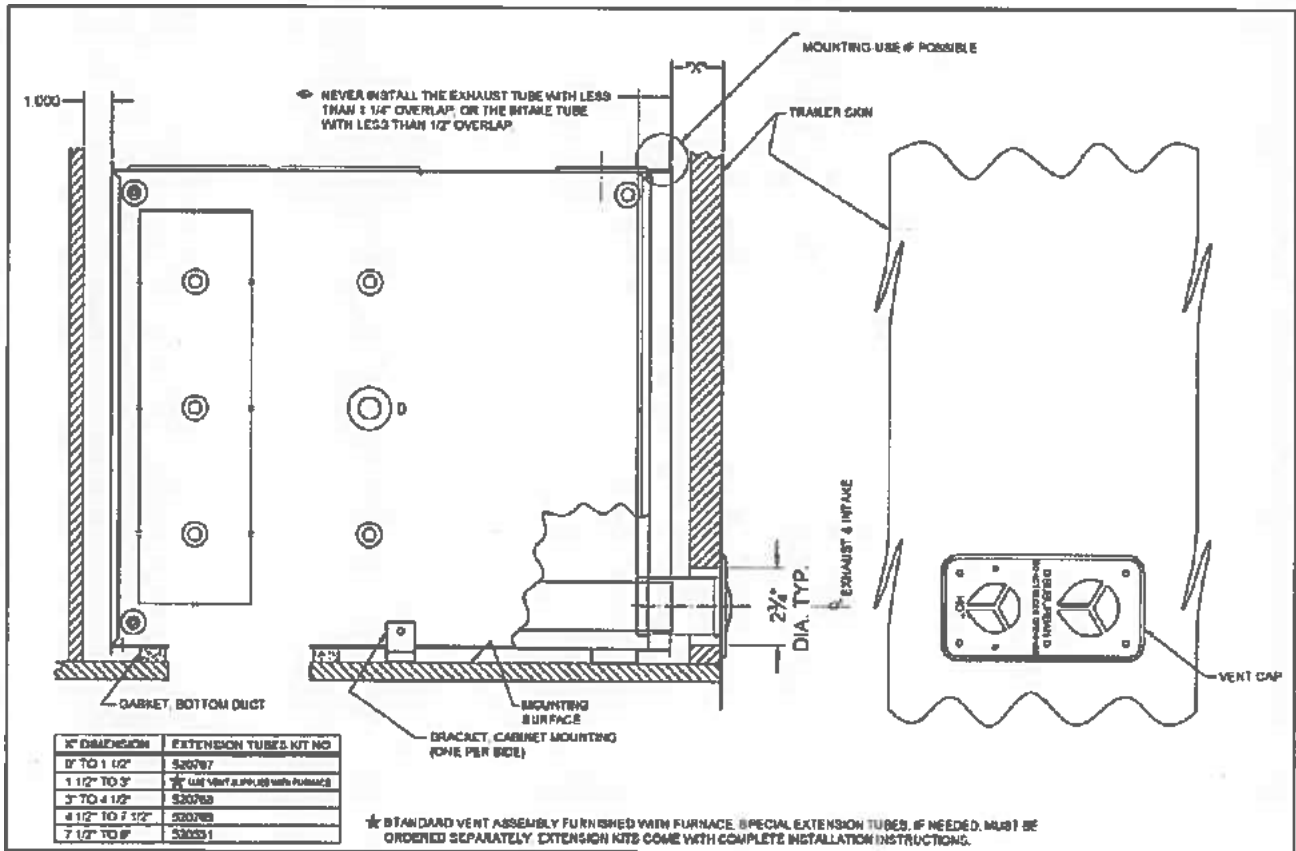


Figure 5A

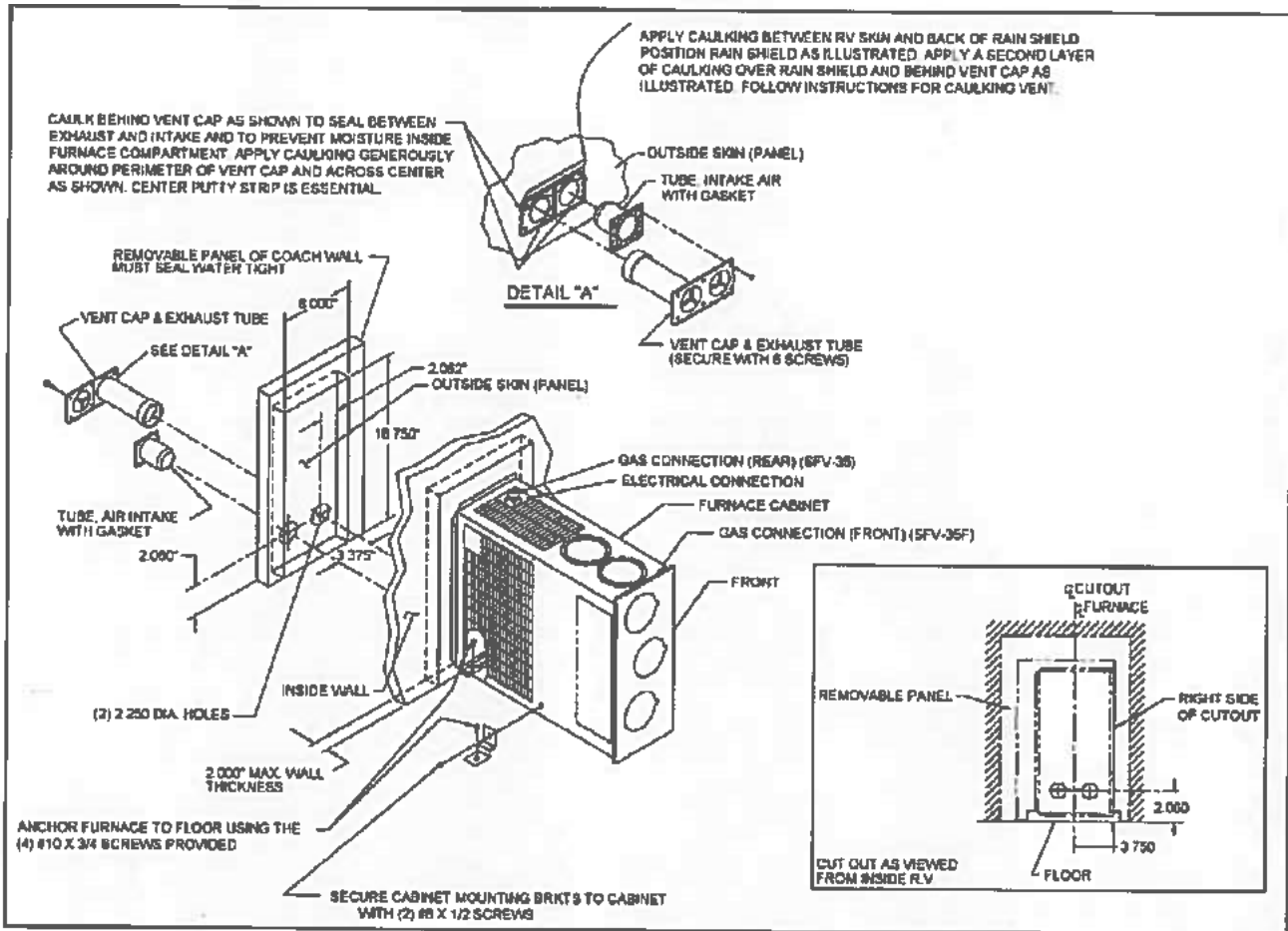


Figure 6

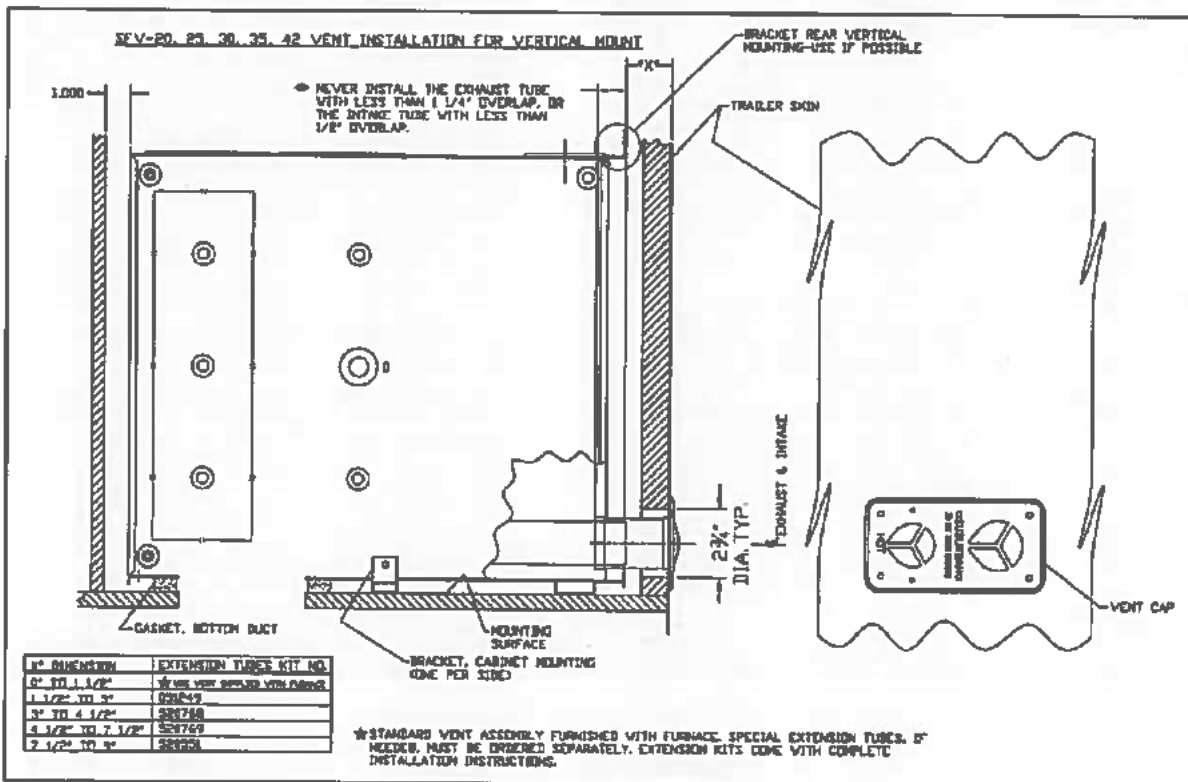
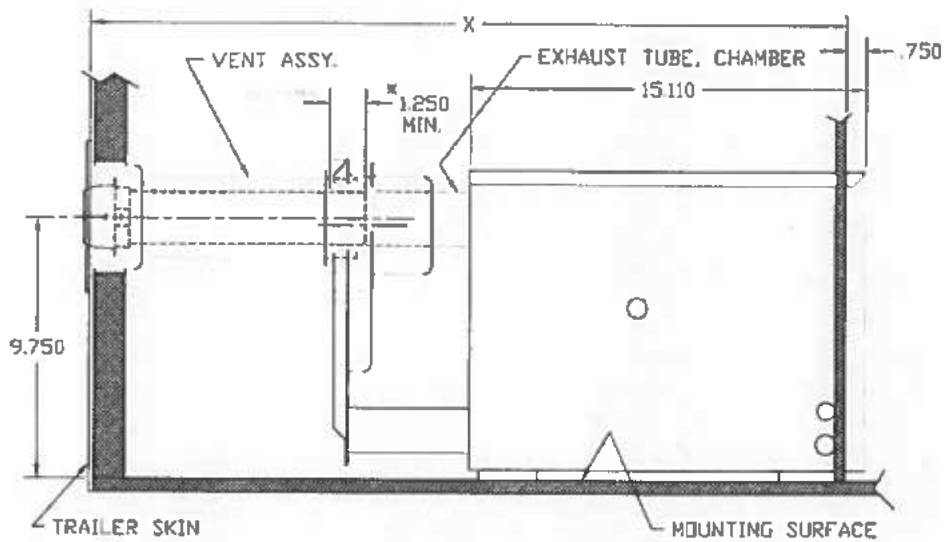


Figure 6A

VENT ASSEMBLY INSTALLATION (DD SERIES)

Note: Vent cap must be installed on DD furnace when bench testing.



PART NO	VENT LENGTH	X DIMENSIONS
260197	5 7/8"	22" - 24 3/8"
260198	8 3/16"	24 3/8" - 26 5/8"
260199	10 1/2"	26 5/8" - 29"

* NOTE:
NEVER INSTALL VENT WITH LESS THAN 1.250" OVERLAP
BETWEEN CHAMBER EXHAUST TUBE & VENT ASSY.
EXHAUST TUBE.

Figure 7

VENT ASSEMBLY INSTALLATION (NT SERIES)

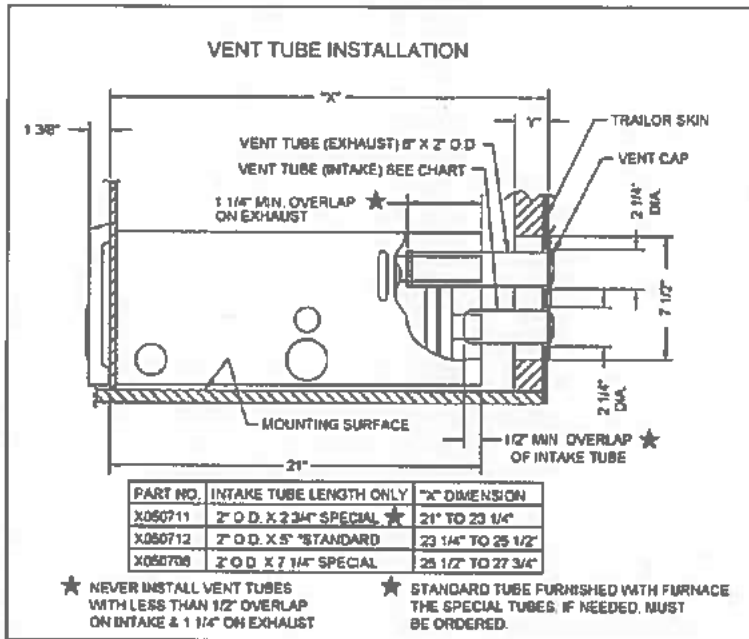


Figure 8
NT-12/18/20SE

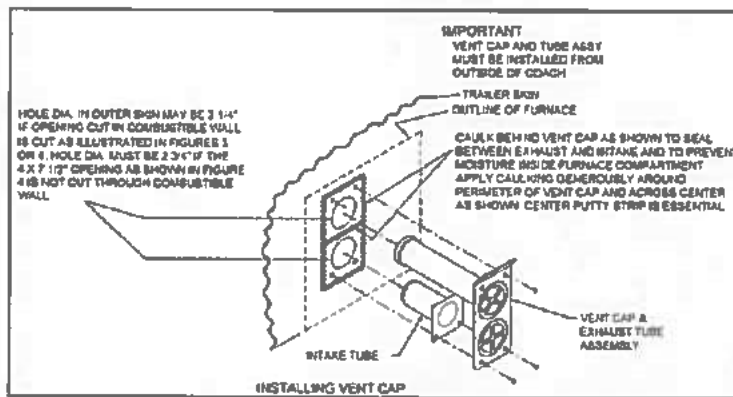


Figure 9
NT-12/18/20S and SE

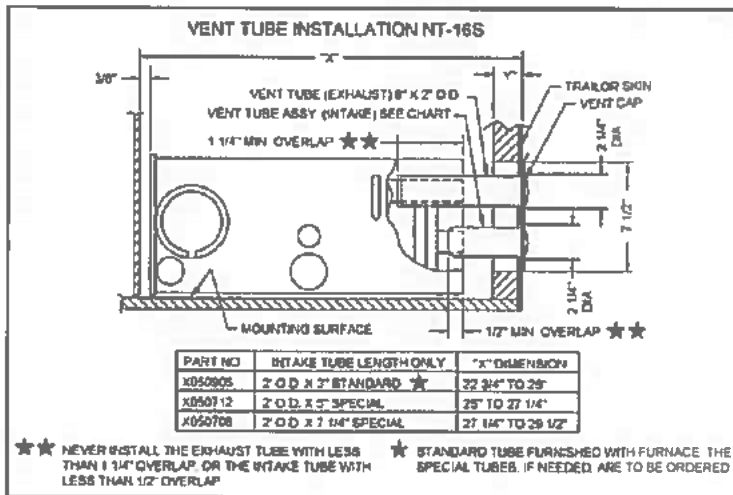


Figure 10
NT-12/16S

VENT ASSEMBLY INSTALLATION (NT SERIES)

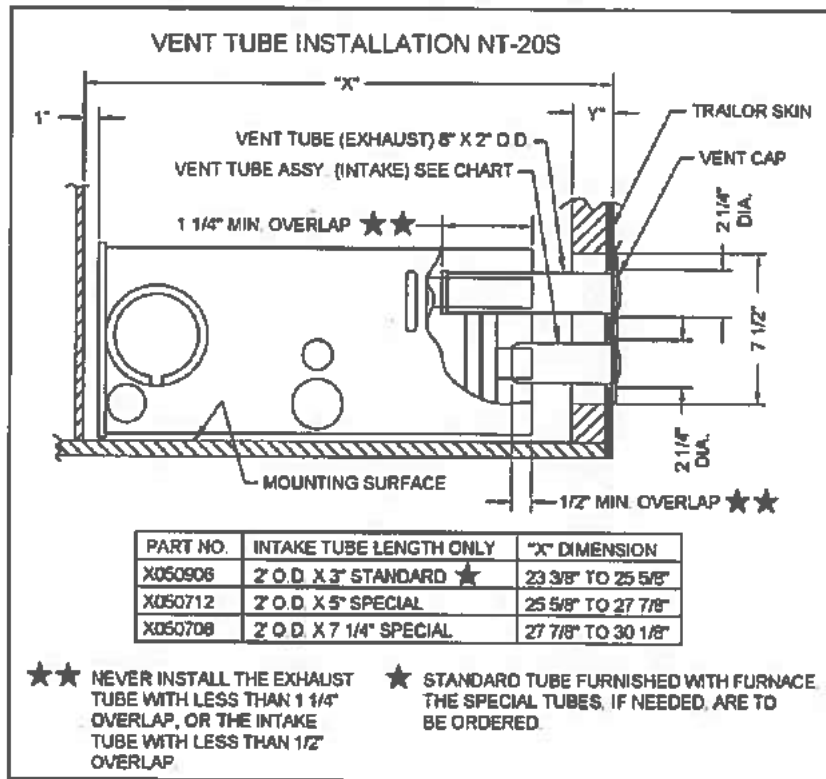


Figure 11
NT-20S

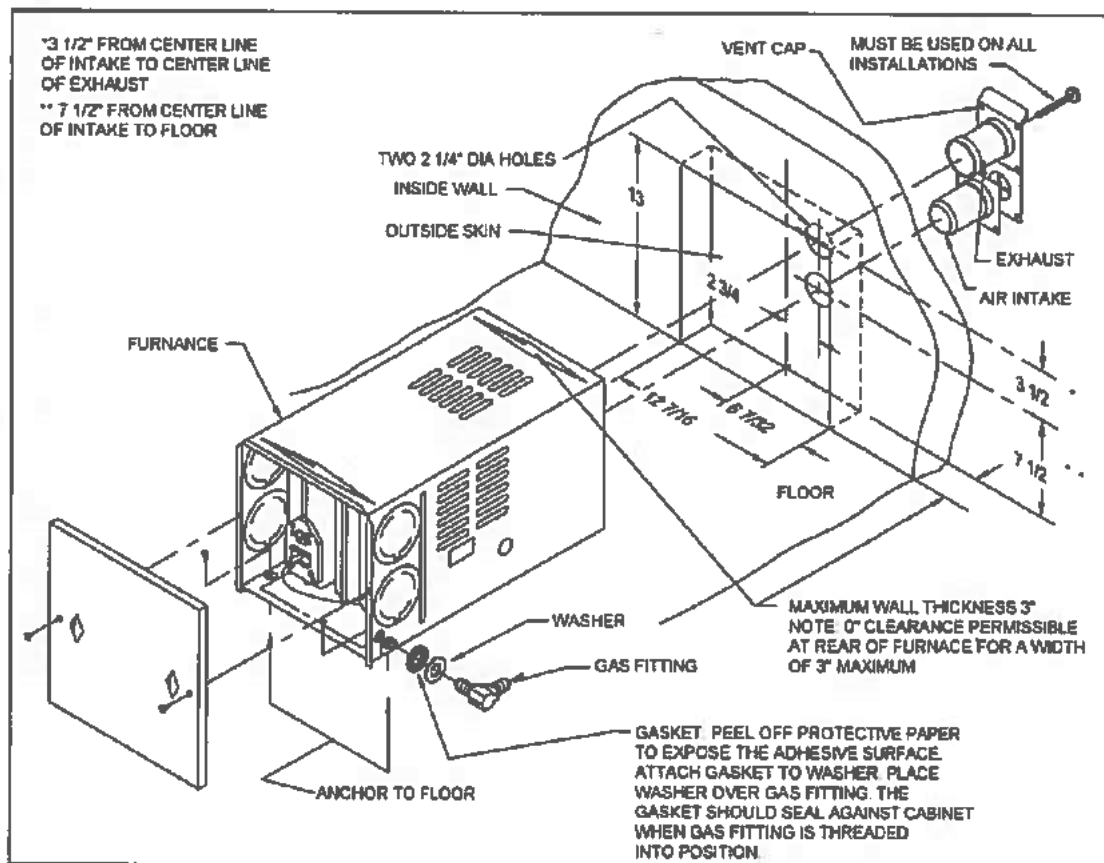


Figure 12
NT-24/30/34SP
P-383

VENT ASSEMBLY INSTALLATION (NT SERIES)

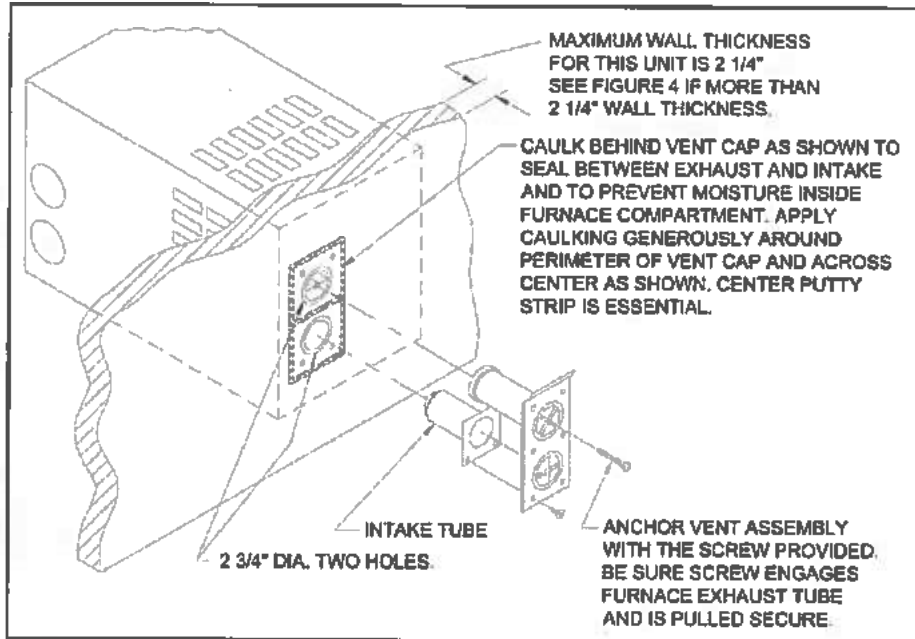


Figure 13
NT-24/30/34SP
P-39

EXTENSION TUBE KIT NUMBER	MIN./MAX. LENGTH (Extension Tube Range)
520498	2-1/4" to 3-1/8"
520499	3-1/8" to 4-7/8"
520500	4-7/8" to 7"
520501	7" to 9"

Figure 14
NT-24/30/34SP
P-39S

EXTENSION TUBE KIT NUMBER	MIN./MAX. LENGTH (Extension Tube Range)
520593	2-1/4" to 3-1/8"
520594	3-1/8" to 4-7/8"
520595	4-7/8" to 7"
520596	7" to 9"

Figure 15
NT-40
P-40

VENT ASSEMBLY INSTALLATION (NT-40 and P-40)

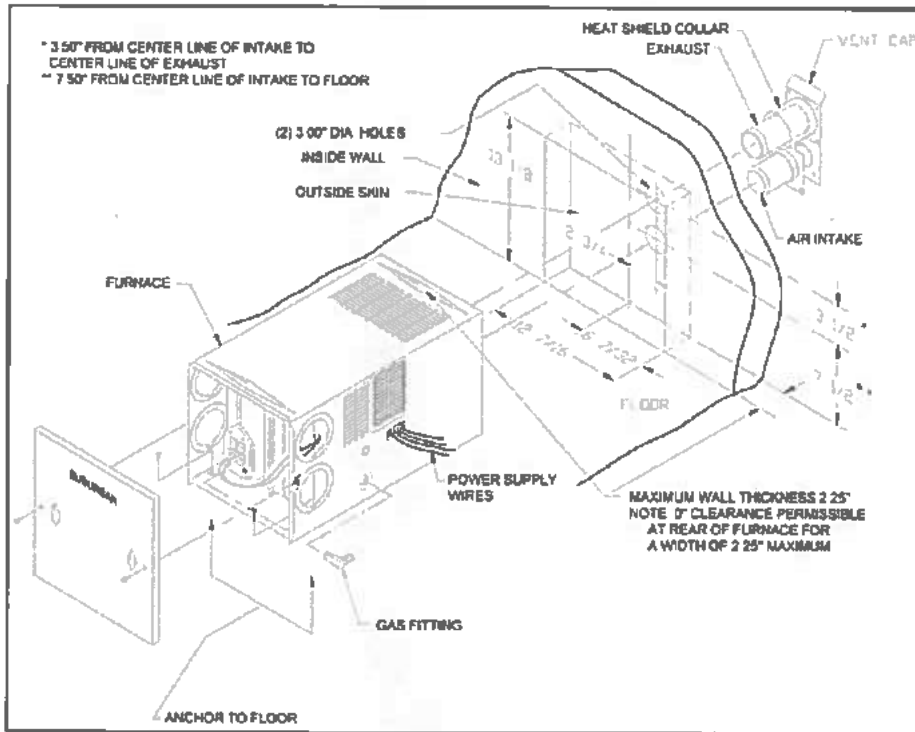


Figure 16
NT-40

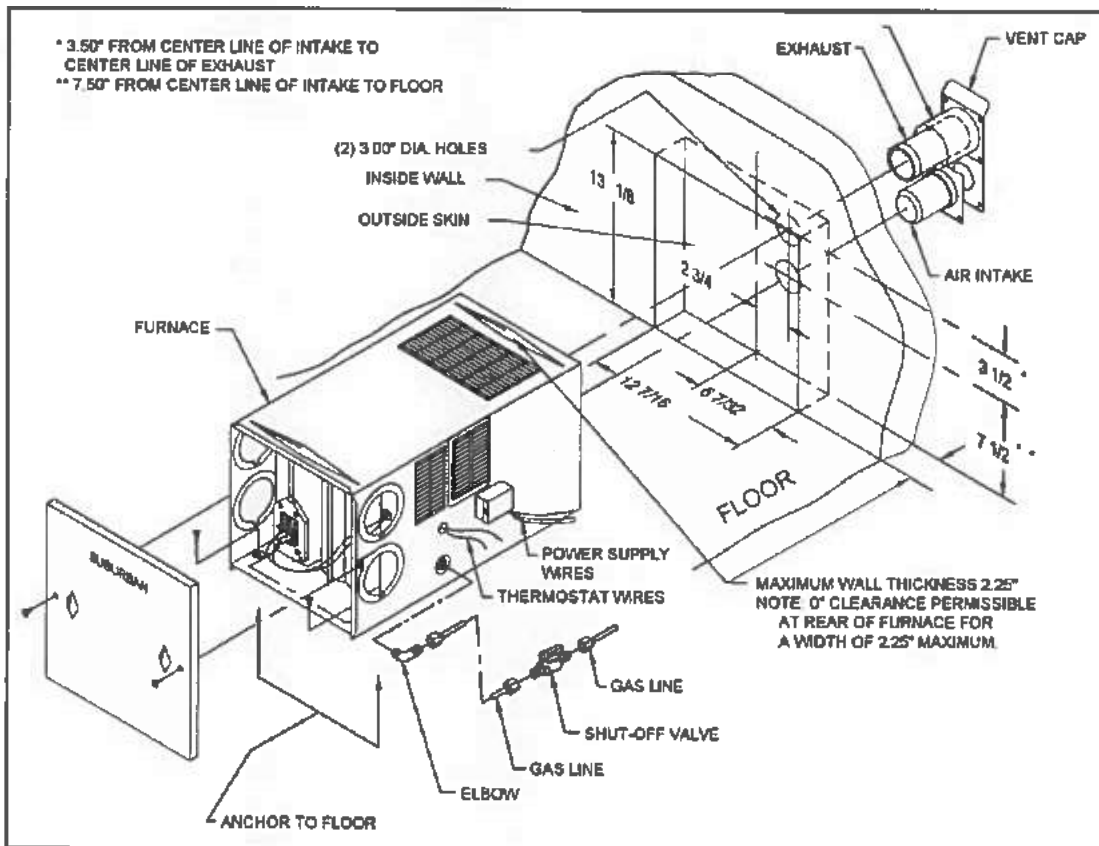


Figure 17
P-40

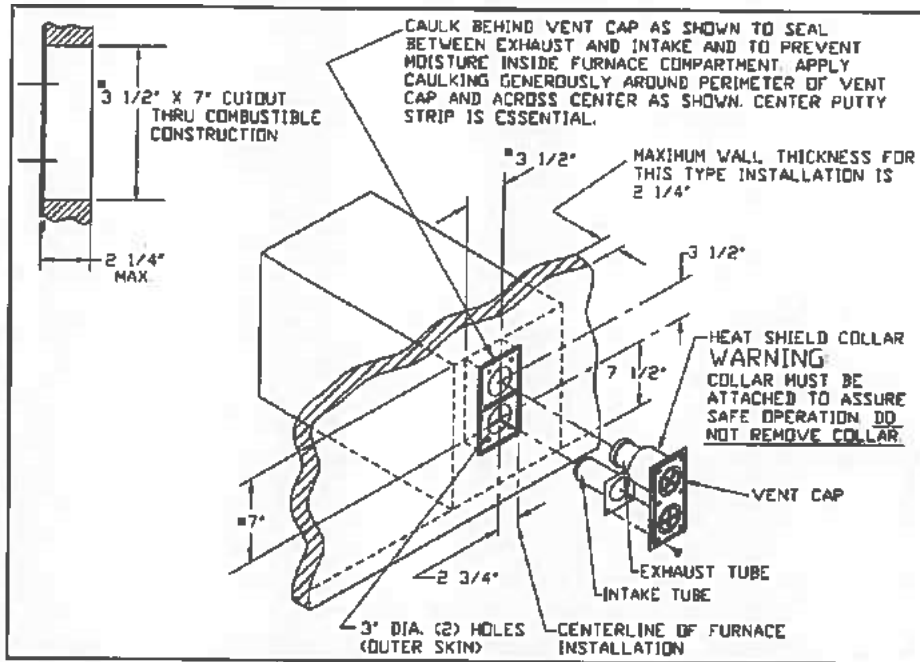


Figure 18
NT-48
P-40

RETURN AIR

Return Air - The cabinet that the furnace may be installed in will have louvers or openings for the return air back to the furnace. When the furnace is installed, it is imperative that the return air louvers on the furnace cabinet opening are not obstructed.

Usually, these furnaces are installed under a counter, sofa or bed in order to be out of the way. A grille or opening must be built into the cabinetry or into the base area of the sofa or bed. Return air from the living area of the trailer is drawn in through the grille and into the return air openings in the furnace cabinet. Figure 19 illustrates the return air circulation of the furnace. **Note:** Refer to the installation manual for the minimum return air area for your specific furnace model.

Insufficient return air will cause the furnace to overheat and cycle on limit. Another symptom of a return air problem is:

1. Furnace seems to run continuously in an effort to satisfy the thermostat.

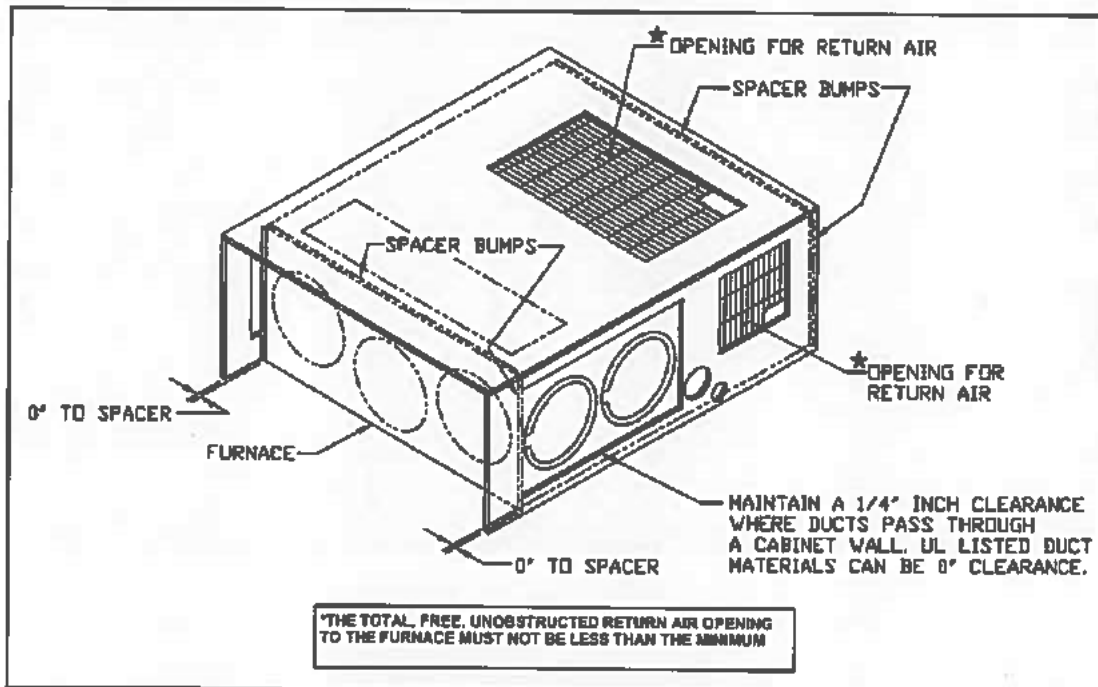


Figure 19

DUCTING

Ducting - Suburban furnaces require that a minimum duct area be maintained throughout entire duct system including through the register. It is very important to adhere to the minimum duct area in order to keep the furnace from cycling on high limit and to assure proper operation of the sail switch (sometimes referred to as a microswitch.) **NOTE:** (Refer to the installation manual for the minimum ducted square inches area for each model.)

NOTE: Ducts terminating in a dead air space (like holding tank compartments or cargo areas (Toy Boxes) with no means for return air recirculation should not be counted in the required duct area. Also, ducts 2" in diameter or smaller should not be counted in the required duct area.

When installing a duct system, avoid making a lot of turns. The straighter the duct system, the less the resistance to air flow and the better the performance of the furnace.

Avoid making sharp turns in the duct system. Sharp turns will increase the static pressure in the plenum area of the furnace and could cause the furnace to cycle on limit.

The duct connections to the furnace cabinet should be tight to eliminate any heat loss which could result in overheating of the component parts on the furnace as well as a reduction in the heated air flow through the ductwork.

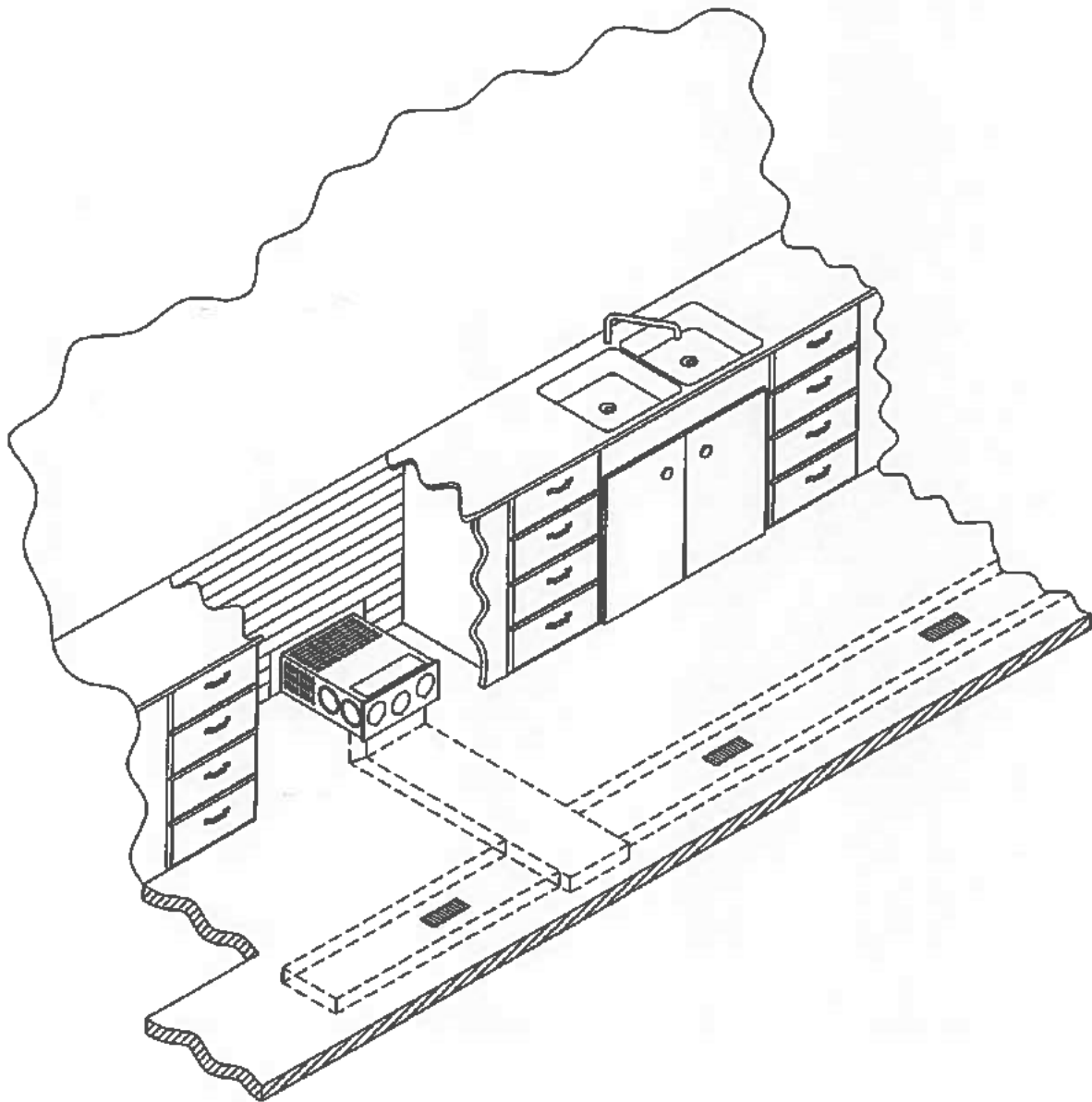


Figure 20

INSTALLATION REQUIREMENTS

Models	Clr Front	Clr Top	Clr Btm	Clr Back	Clr Left	Clr Right	Ducts Req'd	Btm Duct Sq Inch	Top Duct Sq Inch	L & R Side Duct Sq Inch	Return Air Sq Inch
DD-17DSI	See *1	0"	0"	0"	0"	0"	n/a	n/a	n/a	n/a	n/a
NT-12S	3/8"	1"	0"	0"	1"	1"	2-4"	n/a	n/a	25"	55"
NT-16S	3/8"	1"	0"	0"	1"	1"	2-4"	n/a	n/a	25"	55"
NT-20S	1"	1"	0"	0"	1"	1"	2-4"	n/a	n/a	25"	55"
NT-12SE	See *1	5/8"	0"	0"	5/8"	5/8"	n/a	n/a	n/a	n/a	n/a
NT-16SE	See *1	5/8"	0"	0"	5/8"	5/8"	n/a	n/a	n/a	n/a	n/a
NT-20SE	See *1	5/8"	0"	0"	5/8"	5/8"	n/a	n/a	n/a	n/a	n/a
NT-24SP	0"	0"	0"	0"	1"	1"	3-4"	48"	n/a	38"	55"
NT-30SP	0"	0"	0"	0"	1"	1"	3-4"	48"	n/a	38"	55"
NT-34SP	0"	0"	0"	0"	2"	2"	4-4"	48"	n/a	48"	55"
NT-40	1"	1"	0"	0"	2"	2"	4-4"	48"	n/a	48"	113"
P-30	0"	0"	0"	0"	1"	1"	4-4"	48"	n/a	48"	55"
P-40	1"	1"	0"	0"	2"	2"	4-4"	48"	n/a	48"	113"

*1 - Special clearances for discharge grills. Refer to Installation and Instruction Manual.

*2 - Return air should be 142" if 4 ducts are used. May be reduced to 88" if 5 ducts are used.

NOTE: 0" clearance is to spacer (flanges)

INSTALLATION REQUIREMENTS

Models	Clr Front	Clr Top	Clr Btm	Clr Back	Clr Left	Clr Right	Ducts Req'd	Btm Duct Sq Inch	Top Duct Sq Inch	L & R Side Duct Sq Inch	Return Air Sq Inch
SF-20/20F	1"	0"	0"	0"	0"	0"	2-4"	56"	56"	25"	55"
SF-25/25F	1"	0"	0"	0"	0"	0"	3-4"	56"	56"	36"	55"
SF-30/30F	1"	0"	0"	0"	0"	0"	3-4"	56"	56"	36"	55"
SF-35/35F	1"	0"	0"	0"	0"	0"	4-4"	56"	56"	48"	55"
SF-42/42F	1"	1"	0"	0"	2"	2"	4-4"	72" SEE *3	56"	48"	SEE *2
SH-35	1"	0"	0"	0"	1"	1"	4-4"	56"	56"	48"	55"
SH-42	1"	1"	0"	0"	2"	2"	4-4"	72" SEE *3	56"	48"	See *2
SHD-2542	1"	1"	0"	0"	2"	2"	4-4"	72" SEE *3	56"	48"	SEE *2

NOTE: 0" clearance is to spacer (flanges)

*1 - Special clearances for discharge grills. Refer to Installation and Instruction Manual.

*2 - Return air should be 142" if 4 ducts are used. May be reduced to 88" if 5 ducts used.

*3 - Bottom duct required. SF42 uses kit # 520753, SH-42 and SHD-2542 uses kit # 520864.

INSTALLATION REQUIREMENTS

Models	Cir Front	Cir Top	Cir Blm	Cir Back	Cir Left	Cir Right	Ducts Req'd	Blm Duct Sq Inch	Top Duct Sq Inch	L & R Side Duct Sq Inch	Return Air Sq Inch
SFV-20/20F	1"	1"	0"	0"	1"	1"	SEE *4	52"	SEE *4	SEE *4	55"
SFV-25/25F	1"	1"	0"	0"	1"	1"	SEE *4	52"	SEE *4	SEE *4	55"
SFV-30/30F	1"	1"	0"	0"	1"	1"	SEE *4	52"	SEE *4	SEE *4	55"
SFV-35/35F	1"	1"	0"	0"	1"	1"	SEE *4	52"	SEE *4	SEE *4	55"
SFV-42/42F	1"	2"	0"	0"	1"	1"	SEE *4	52"	SEE *4	SEE *4	142"

NOTE: 0" clearance is to spacer (flanges)

- *1 - Special clearances for discharge grills. Refer to Installation and Instruction Manual.
- *2 - Return air should be 142" if 4 ducts are used. May be reduced to 88" if 5 ducts used.
- *3 - Bottom duct required. SFV-42 uses kit # 520753, SM-42 and SHD-25/42 uses kit # 520864.
- *4 - Vertical mount furnace review table below for ducting requirements. The duct requirements must be followed in order to assure proper operation of the furnace. The minimum open duct areas listed below must be maintained through the entire duct system including through register.

MODEL	TOP AND FRONT DUCTS (4" Round)	BOTTOM	LEFT DUCT	RIGHT DUCT
	Minimum Duct Area	Minimum Duct Area	Minimum Duct Area	
SFV-20(F)	*Optional	Required 52 SQ. IN.	*Optional	*Optional
SFV-25(F)	*Optional	Required 52 SQ. IN.	*Optional	*Optional
SFV-30(F)	*Optional	Required 52 SQ. IN.	*Optional	*Optional
SFV-35(F)	48 SQ. IN. (Bottom Front Duct Not To be Used)	52 SQ. IN.	58 SQ. IN.	
SFV-42(F)	48 SQ. IN. (Top Front Duct Not To Be Used.)	52 SQ. IN.	58 SQ. IN.	72 SQ. IN.

*Use of these ducts are in addition to the required use of the bottom duct.

FURNACE SPECIFICATIONS

12 VDC Model	Description	Input BTU/hr	Type Gas	Voltage	Motor Diameter	Amp Draw	Static Pressure	C.F.M. Max.
DD-17DSI	Direct Discharge	17,000	PROPANE	12 VDC	3"	2.9	n/a	145
NT-12S NT-12SE	Ducted Direct Discharge	12,000	PROPANE	12 VDC	3"	2.8	S - .1" wc SE - n/a	S - 122 SE - 140
NT-16S NT-16SE	Ducted Direct Discharge	16,000	PROPANE	12 VDC	3"	2.8	S - .1" wc SE - n/a	S - 165 SE - 140
NT-20S NT-20SE	Ducted Direct Discharge	19,000	PROPANE	12 VDC	3"	2.8	S - .1" wc SE - n/a	S - 165 SE - 150
NT-24SP	Ducted	24,000	PROPANE	12 VDC	2.5"	3.5	.2" wc	265
NT-30SP	Ducted	30,000	PROPANE	12 VDC	2.5"	5.5	.2" wc	345
NT-34SP	Ducted	34,000	PROPANE	12 VDC	2.5"	7.5	.1" wc	373
NT-40	Ducted	40,000	PROPANE	12 VDC	2.5"	9.5	.155"/.20B	441
Park Models P-30S	Ducted	30,000	PROPANE	120 VAC	3"	2.5	.15" wc	345
P-40**	Ducted	40,000	PROPANE	120 VAC	3"	2.0	.15" wc	441

NOTES

**P-40 Park Model Furnace and valve is convertible to Natural Gas. Instructions on converting unit to Natural Gas are on sticker on side of cabinet.

FURNACE SPECIFICATIONS

12 VDC Model	Description	Input BTU/hr	Type Gas	Voltage	Motor Diameter	Amp Draw	Static Pressure	C.F.M. Max.
SF-20/20F	Ducted	20,000	PROPANE	12 VDC	3"	6.5=2.5 in. Motor 8.5=3 in. Motor	.2" wc	300
SF-25/25F	Ducted	25,000	PROPANE	12 VDC	3"	6.5=2.5 in. Motor 8.5=3 in. Motor	.2" wc	300
SF-30/30F	Ducted	30,000	PROPANE	12 VDC	3"	6.5=2.5 in. Motor 8.5=3 in. Motor	.2" wc	300
SF-35/35F	Ducted	35,000	PROPANE	12 VDC	3"	8.5=2.5 in. Motor 9.4=3 in. Motor	.2" wc	375
SF-42/42F	Ducted	40,000	PROPANE	12 VDC	3"	11.5	.25" wc	430
SFV-20/20F	Ducted	20,000	PROPANE	12 VDC	3"	8.5	.2" wc	300
SFV-25/25F	Ducted	25,000	PROPANE	12 VDC	3"	8.5	.2" wc	300
SFV-30/30F	Ducted	30,000	PROPANE	12 VDC	3"	8.5	.2" wc	300
SFV-35/35F	Ducted	35,000	PROPANE	12 VDC	3"	9.4	.2" wc	375
SFV-42/42F	Ducted	40,000	PROPANE	12 VDC	3"	11.5	.25" wc	430
SH-35/35F	Ducted	35,000	PROPANE	12 VDC	3"	8.2	.2" wc	375
SH-42/42F	Ducted	40,000	PROPANE	12 VDC	3"	10.6	.25" wc	430
SHD-2542	Ducted	25,000 42,000	PROPANE	12 VDC	3"	8.8 (Low) 12 (High)	.25" wc	430

SEQUENCE OF OPERATION For Furnaces Equipped With Time Delay

The thermostat controls the operating circuit to the furnace by reacting to room temperature to open and close a set of contact points which allows current to flow to the ON and OFF switch then to the relay.

The relay receives the power and allows power to pass through to the switch within the relay. This is done by a heater coil within the relay which actuates a bi-metal disc closing the relay circuit.

The power then flows to the motor and allows the blower to operate. One end of the motor shaft drives the room air wheel. The other end of the motor shaft drives the combustion air wheel that delivers the required air to the burner for combustion.

The limit switch is an in-line device which protects the furnace from over heating conditions. The contacts in the limit switch open at a given temperature setting, shutting off power to the ignition system which controls the gas valve.

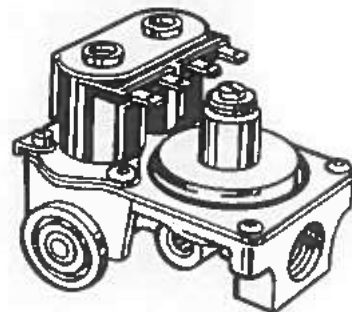
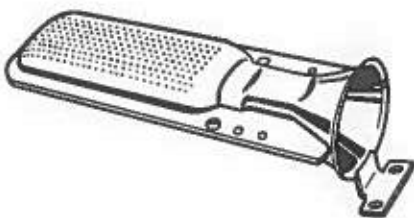
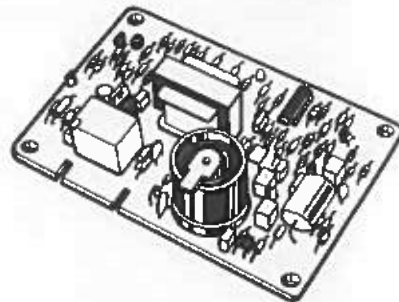
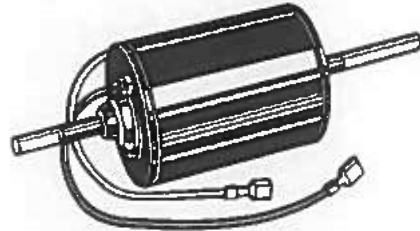
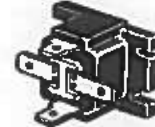
As the room air wheel comes up to speed, air flow closes the sail switch completing the circuit. The sail switch is placed into the system as a safety to prove there is adequate air for combustion.

The next operation is controlled by the Direct Spark Ignition, (DSI) system as power is applied to the DSI board. The system will do the following.

1. The board has a timing circuit which allows the blower to purge the chamber of any products of combustion or gas.
2. The board will then apply power to the gas valve. At the same time it produces a high voltage power supply to the electrode producing spark at the burner.
3. The board will also confirm the presence of a flame. If the flame is not sensed after 7 seconds, the module will try two (2) more times and then go into lock-out. The flame is sensed through the spark wire and electrode.

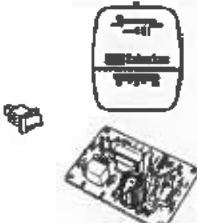
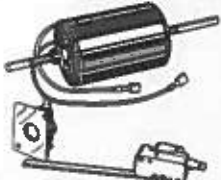
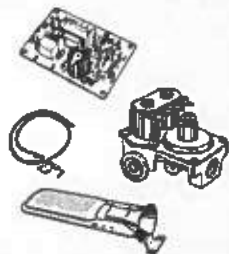

When the thermostat has reached the set point with the room air temperature, the contacts will open removing power from the controls. The blower will remain on until the relay opens and stops the motor.

NOTE: On some models, sail switch is before limit switch.

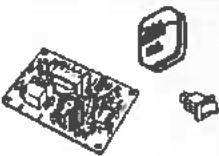
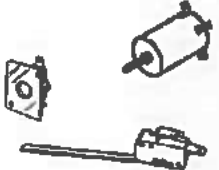
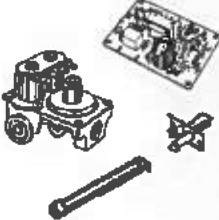



Sequence of Operation for Fan Control Module Board

Part Number 520820

Time Line	Description - Sequence of Events	
<p>Start</p> <p>Thermostat Calls for Heat</p>	<p>The wall thermostat controls the operation of the furnace by reacting to room temperature, this allows current to flow through the On/Off switch to the module board.</p> <p>The module board constantly checks for a minimum 9.5 volts. If there is not 9.5 volts, the module board will go into a stand by mode until adequate power is supplied. It will then resume normal operation.</p> <p>Upon a call from the thermostat, the module board thermostat circuit will go active. The sail switch circuit is verified as being open. The blower output is energized. Blower motor starts.</p>	
<p>15 Seconds Purge Cycle</p>	<p>The module board will then verify that the sail switch circuit is closed and motor is up to speed. If this circuit remains open for 30 seconds after the blower motor starts, the module board will go into lock out and shut down the blower motor.</p> <p>The module board checks that the gas valve relay contacts (which are located on the module board) are open before the ignition sequence starts.</p> <p>The board has a pre-purge timing circuit of (approximately 15 seconds). This allows the chamber to purge.</p>	
<p>7 Seconds Ignition Cycle and Flame Sense</p>	<p>The module board will energize the gas valve and enable the high voltage spark output to the electrode for 7 seconds of ignition time.</p> <p>The module board will then check for flame sense to verify successful lighting of the main burner flame. Sparking will then be terminated and the gas valve and blower outputs will remain energized.</p> <p>If ignition is successful the module board will monitor the flame sense, sail switch and limit switch circuits, and the thermostat inputs during the heating period.</p> <p>The flame is sensed through the spark wire and electrode. Therefore, it is essential that the electrode is properly positioned in the burner flame.</p>	
<p>2nd and 3rd Ignition Cycles If Required</p>	<p>3 Try Ignition Board</p> <p>If the flame is not sensed after seven (7) seconds, a second 15 second purge cycle will begin followed by a second Trial-For-Ignition sequence. After three (3) Trial-For-Ignition attempts with no ignition of the main burner, the module board will de-energize the gas valve immediately and blower will run for 3 minutes and then shutdown in lockout.</p>	
<p>Heating Cycle</p>	<p>If during the heating cycle, the limit switch circuit opens and remains open for 5 minutes, the module board will go into lock out and shut down the blower motor. If this occurs, the thermostat will need to be reset for the furnace to operate.</p>	
<p>90 Second Shut Down</p>	<p>When the thermostat has reached its set point and the demand for heat ends, the gas valve will be de-energized and the flame will go out. The post purge period of 90 seconds begins. When it times out, the blower motor output is removed, and the blower stops.</p>	

**Sequence of Operation for 24 VAC Fan Control Module Board
Part Number 520947**

Time Line	Description - Sequence of Events	
<p>Start</p> <p>Thermostat Calls for Heat</p>	<p>The wall thermostat controls the operation of the furnace by reacting to room temperature, this allows current to flow through the On/Off switch to the module board.</p> <p>The module board must have a minimum 18 volts for normal operation.</p> <p>Upon a call from the thermostat, the module board thermostat circuit will go active. The sail switch circuit is verified as being open. The blower output is energized. Blower motor starts.</p>	
<p>15 Seconds Purge Cycle</p>	<p>The module board will then verify that the sail switch circuit is closed and motor is up to speed. If this circuit remains open blower motor will run continuously until sail switch closes.</p> <p>The module board checks that the gas valve relay contacts (which are located on the module board) are open before the ignition sequence starts.</p> <p>The board has a pre-purge timing circuit of (approximately 15 seconds). This allows the chamber to purge.</p>	
<p>7 Seconds Ignition Cycle and Flame Sense</p>	<p>The module board will energize the gas valve and enable the high voltage spark output to the electrode for 7 seconds of ignition time.</p> <p>The module board will then check for flame sense to verify successful lighting of the main burner flame. Sparking will then be terminated and the gas valve and blower outputs will remain energized.</p> <p>If ignition is successful the module board will monitor the flame sense, sail switch and limit switch circuits, and the thermostat inputs during the heating period.</p> <p>The flame is sensed through the flame sense electrode. Therefore, it is essential that the electrode is properly positioned in the burner flame.</p>	
<p>2nd and 3rd Ignition Cycles if Required</p>	<p><u>3 Try Ignition Board</u></p> <p>If the flame is not sensed after seven (7) seconds, a second 15 second purge cycle will begin followed by a second Trial-For-Ignition sequence. After three (3) Trial-For-Ignition attempts with no ignition of the main burner, the module board will de-energize the gas valve immediately and blower will run for 90 seconds and then shutdown in lockout.</p>	
<p>Heating Cycle</p>	<p>If during the heating cycle, the limit switch circuit opens and remains open the gas valve will close and the blower motor will continue to run.</p>	
<p>90 Second Shut Down</p>	<p>When the thermostat has reached its set point and the demand for heat ends, the gas valve will be de-energized and the flame will go out. The post purge period of 90 seconds begins. When it times out, the blower motor output is removed, and the blower stops.</p>	

Sequence of Operations for SHD-2542

1st Stage Call for Heat

The wall thermostat controls the operation of the dual stage furnace by reacting to room temperature. This allows current to flow through the On/Off switch to the Blower Speed Control Board then to the Module Board.

The module board constantly checks for a minimum 9.5 volts. If there is not 9.5 volts, the module board will go into a standby mode until adequate power is supplied. It will then resume normal operation.

Upon a call from the thermostat the first stage will be activated. The module board thermostat circuit will go active and the sail switch is verified as being open. The blower output is energized. The blower motor starts.

15 Second Purge Cycle

The module board will then verify that the sail switch circuit is closed and motor is up to speed. If this circuit remains open for 30 seconds after the blower motor starts, the module board will go into lockout and shut down the blower motor.

The module board checks that the gas valve relay contacts (located on the module board) are open before the igniting sequence starts.

The board has a pre-purge timing circuit of approximately 15 seconds. This allows the combustion chamber to purge.

7 Second Ignition Cycle and Flame Sense

The module board will energize the gas valve and enable the high voltage spark output to the electrode for a seven second ignition period.

The module board will then check for flame sense to verify successful lighting of the main burner flame. Sparking of the igniter is then terminated. The gas valve and blower outputs will remain energized.

If ignition is successful the module board will monitor the flame sense, sail switch, and the limit switch circuits. The flame is sensed through the spark wire and electrode therefore, it is essential that the electrode is properly positioned in the burner flame.

3 try Ignition Board

If the flame is NOT sensed after seven (7) seconds, or if the unit fails to ignite, a second fifteen (15) purge cycle will begin followed by second trial for ignition sequence. After three (3) trial for ignition attempts with no ignition of the main burner, the module board will de-energize the gas valve immediately and the blower will run for three (3) minutes and then go into lockout mode.

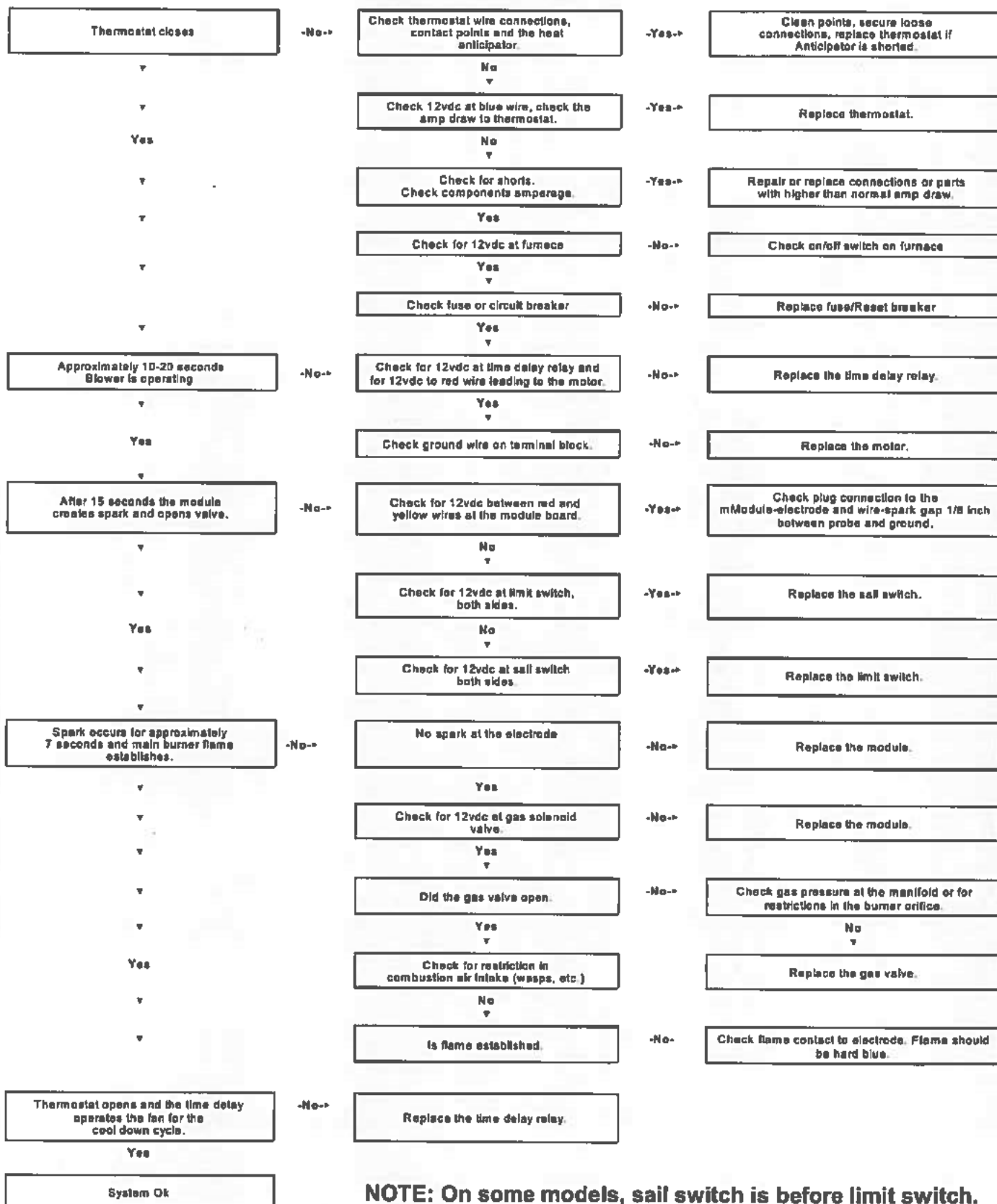
2nd Stage Heating

If during the thermostat cycle the demand for heat drops below the second stage thermostat setting (3 to 5 degrees variance depending on thermostat manufacturer), the blower speed control board will be energized. The blower speed control board will energize the additional gas valve solenoid and increase motor speed to the high position. Furnace will remain in the second stage operation until thermostat is satisfied.

90 Second Shut Down

When the thermostat has reached its set point and the demand for heat ends, the gas valve will be de-energized and the flame will go out. The post combustion purge period of 90 seconds begins. When it times out, the blower motor output is removed, and the blower stops.

TROUBLE SHOOTING GUIDE SUBURBAN RV FURNACES with TIME DELAY 12 VDC HEATING SECTION

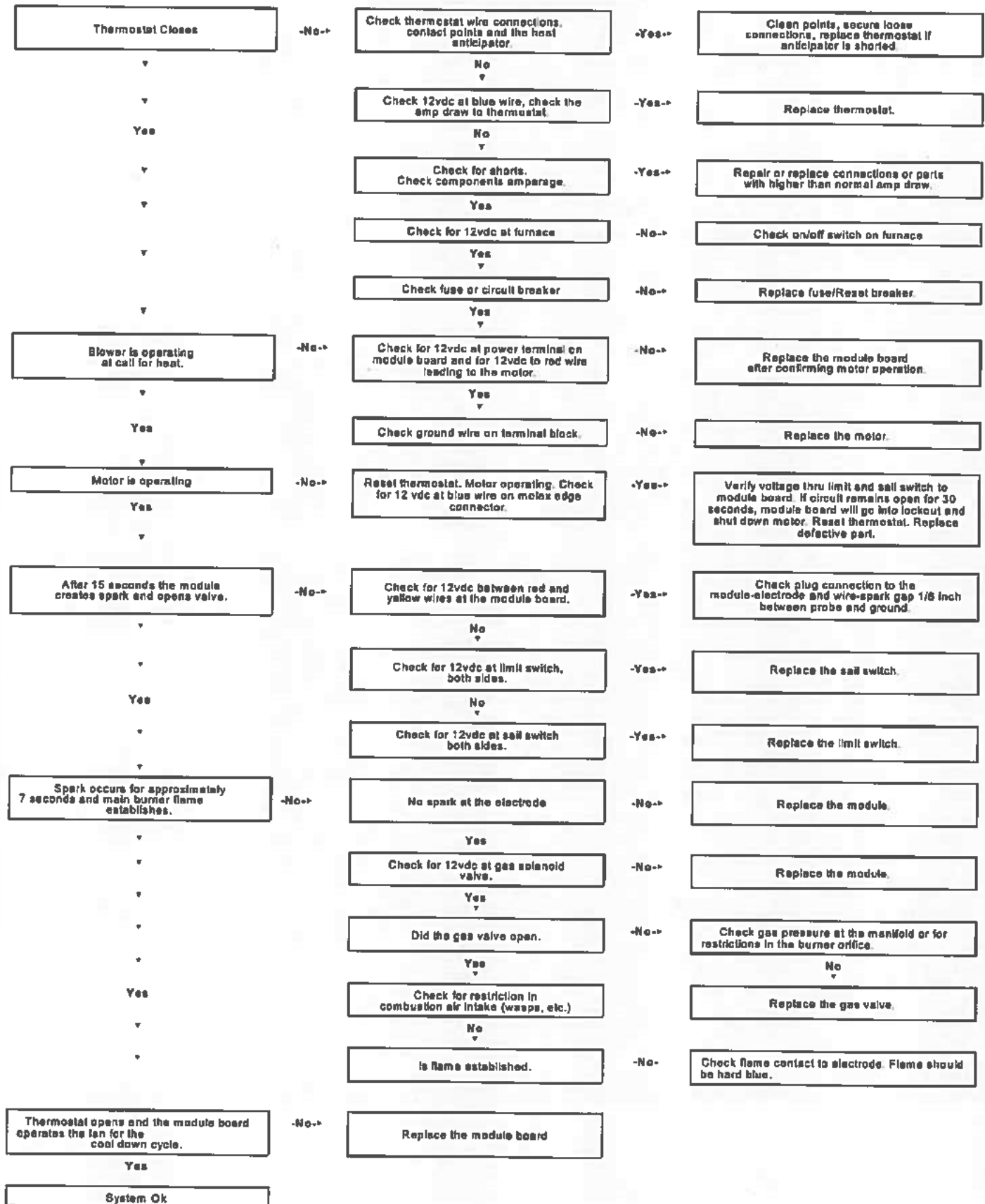


NOTE: On some models, sail switch is before limit switch.

TROUBLE SHOOTING GUIDE

SUBURBAN RV FURNACE with FAN CONTROL MODULE BOARDS

12 VDC HEATING SECTION



SERVICE HINTS, DIAGNOSIS, AND CORRECTIVE MEASURES

FOR THE IGNITION SYSTEMS OF
SUBURBAN 24 VOLT ELECTRONIC IGNITION GAS FURNACES
WITH TIME DELAY

CAUTIONS:

1. Never operate the furnace with the electrode wire disconnected nor with the electrode assembly removed from the furnace.
2. Never use a screwdriver on any part of the electrode assembly while the furnace is in operation.
3. Be certain that the spark from the electrode never reaches the flame sensor portion of the electrode assembly.

4. Be sure the electrode assembly screws are snug at all times, especially after the electrode has been removed and reinstalled.
5. If the module board is found to be defective, it must be replaced - it is not field repairable. Any attempts to repair the board may alter the board and cause it to operate in an unsatisfactory manner.
6. Insure that the gap between electrode and ground is always 1/8". The gap between the flame sensor should be approximately twice the gap between electrode and ground to insure no sparking to sensor. Sparking to sensor will damage the module board.

The electronic ignition system is made up of three main parts; the module board, the electrode assembly, and the electrode wire. The module board is the brain of the electronic ignition system and it has several functions.

1. When the blower reaches approximately 75% of the normal r.p.m. and sufficient air flow is established, the sail switch engages and completes a 24 volt circuit through the limit switch to the module board.
2. After a 12 - 18 second delay, 24 volt current will pass through the module board to the solenoid valve. The current to the valve opens it and allows gas to the main burner; simultaneously, the module board sends high voltage through the electrode wire to the electrode assembly. The voltage seeks a ground between electrode and ground probe and a spark occurs. The spark then ignites the main burner.

3. The module board also performs the lockout function in cases where the spark fails to light the burner. When lockout occurs, the spark stops, the voltage from the module board to the gas valve is discontinued, and the valve closes. The unit will remain in lockout and the blower will continue to run until the thermostat is turned off. Turning the thermostat off disengages the lockout function of the module board. After the blower has stopped, the ignition sequence can be started again. The module will try three times for ignition before lockout.

It is important to determine the type problem being experienced, then the proper checkout procedure can be made. The following is a list of problems, how to identify in which area the problem is located, and how to correct it.

1. Electrode not sparking - with blower running and micro switch engaged, check the following:

- a. Check for proper voltage at module board after the blower motor reaches full r.p.m. If no voltage, check continuity through micro switch and limit switch. Also check wiring and wire connections.
- b. Voltage is present but no spark at electrode after 12 - 18 second delay, check electrode wire connections.
- c. Wire connections OK, but electrode wire does not show continuity through it - replace electrode wire.
- d. Electrode wire does show continuity through it - check electrode gap to be sure it is 1/8" maximum between electrode and ground. NOTE: Gap between sensor and ground must be twice electrode gap.
- e. Electrode gap OK - check electrode assembly for possible cracks or carbon on tip of electrode.
- f. Electrode OK - replace module board.

2. Electrode sparking, but gas not coming through burner:

- a. Check to see if voltage is coming out of module board to gas valve after the 12 - 18 second delay. Check the wires in the molex connector to be sure they are intact and making contact with the module board. Check wire from the module board to valve for continuity. Wire and connections check OK - replace module board.
- b. Voltage is coming out of module board to gas valve, but gas valve does not open - replace gas valve.

3. Electrode sparking and gas valve opening, but burner will not light:

- a. Check to see if gas is coming through to the burner. This can be accomplished by using a flow meter in the gas supply line. If no gas is coming through the burner, check for obstruction in gas line, in main burner orifice, or in main burner.
- b. Gas is coming through burner, but spark will still not ignite burner - check gas pressure.

Line Pressure - Min. 11" W.C., Max. 14" W.C.

To properly check pressure, first determine the line pressure, cycle furnace and check pressure drop on demand. The drop in pressure should not be more than 1/2" W.C. A drop of more than 1/2" would indicate a faulty regulator, a restriction in the gas line, or a pinched gas line. Excessive pressure drop could also be due to moisture contamination.

- c. Gas pressure OK - check for obstruction in main burner; check to be sure electrode is positioned approximately 1/4" above and directly over slots on the main burner - adjust electrode if necessary.

- d. Remove burner and check burner for obstructions. Clean as required.

4. Burner ignites, but goes off and into lockout:

- a. Check to be certain that flame sensor is over slots in the main burner and that the main burner flame is burning against the tip of the flame sensor - adjust by bending sensor probe. NOTE: Sensor probe should be in the inner blue cone of the burner flame (approximately 1/4" to 5/16" above burner).
- b. Burner still goes off and into lockout - check wire connections at flame sensor and at module board.
- c. Wire connections OK - check continuity through flame sensor wire.
- d. Continuity of flame sensor wire OK - check with micro amp meter in series with flame sensor and flame sensor wire to be certain that the flame sensor is generating at least seven micro amps within seven seconds after the burner is ignited. Connect meter as follows: (+) to sensor wire, (-) to sensor probe. Adjust position of sensor probe, check for carbon deposits on sensor probe if reading is less than seven micro amps.
- e. Flame sensor circuit generating at least seven micro amps, but burner still goes off and into lockout - replace module board.

5. Repeated module board failures:

- a. Check to be certain that the electrode spark is not sparking against the flame sensor portion of the electrode assembly.
- b. Check to be sure module board or high voltage wires are not shorted to the chamber wrapper or other furnace parts.
- c. Be sure insulator covering the electrode wire connection on the coil of the module board is in place and insulator behind module board is in place.
- d. Make certain that the transformer voltage is within 24 - 30 volts A.C.
- e. Be sure duct connections to furnace are airtight. Seal duct collar connections to furnace cabinet with duct tape, if necessary to prevent hot air leakage. No air leakage should exist anywhere in the duct system, especially at connections on furnace cabinet.
- f. Be sure sensor wire terminal is tightly affixed to sensor probe.
- g. Be sure high voltage electrode wire is in good condition and properly positioned onto pierce point electrode.

- e. Customer complains of unit going into lockout only once in a while:
- Thoroughly check electrode and burner relationship.
 - Lockout can occur if the gas pressure fluctuates at the time the thermostat calls for heat. Pressure fluctuations can be caused by a malfunctioning gas bottle regulator, an obstruction or a kink in the gas line, or moisture in the gas bottle regulator or in the gas lines. It is difficult to check for these fluctuations that will not noticeably affect any other appliance in the coach. However, isolating the furnace from the coach gas system will determine if the gas system is responsible. This isolation procedure can be done by connecting a separate upright bottle, regulator and gas line directly to the furnace, eliminating the coach gas system. If the occasional lockout still exists, then the furnace should be thoroughly tested to determine the cause; however, if the furnace works properly on this separate system, then the coach gas system should be checked.
 - Check furnace return air and warm air discharge to be certain sufficient air flow is present to engage micro switch every time.
 - Check micro switch to be sure it moves freely.
 - Remove electrode and burner. Clean thoroughly.

- f. When moisture in the gas system is suspected as being the problem, especially where the horizontal type gas bottle is being used, the following steps should be taken to prepare the gas system against further moisture problems:
- Corrective Measures:
- Disconnect gas bottle and drain it completely dry of all gas and all moisture.
 - Disconnect and blow out all gas lines completely dry.
 - Check pressure regulator on the gas bottle. Replace if necessary.
 - Add the drying agent. One half pint of methanol alcohol per 100 pound bottle capacity is recommended.
- Precautions:
- Never fill the gas bottle over 80%.
 - Do not use the gas bottle completely dry to avoid using up the drying agent.
- We have found the above procedures to be effective in solving most occasional lockout problems, especially where the horizontal type gas bottle is used. All of these steps must be performed as described for the preparation of a contaminated gas system to be 100% effective.

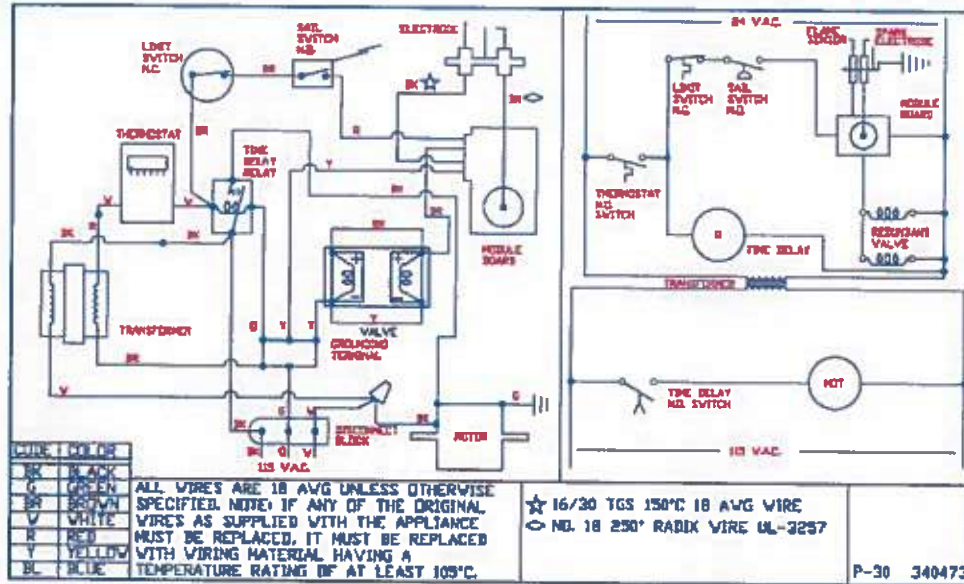


Figure 21
P-30S with Time Delay

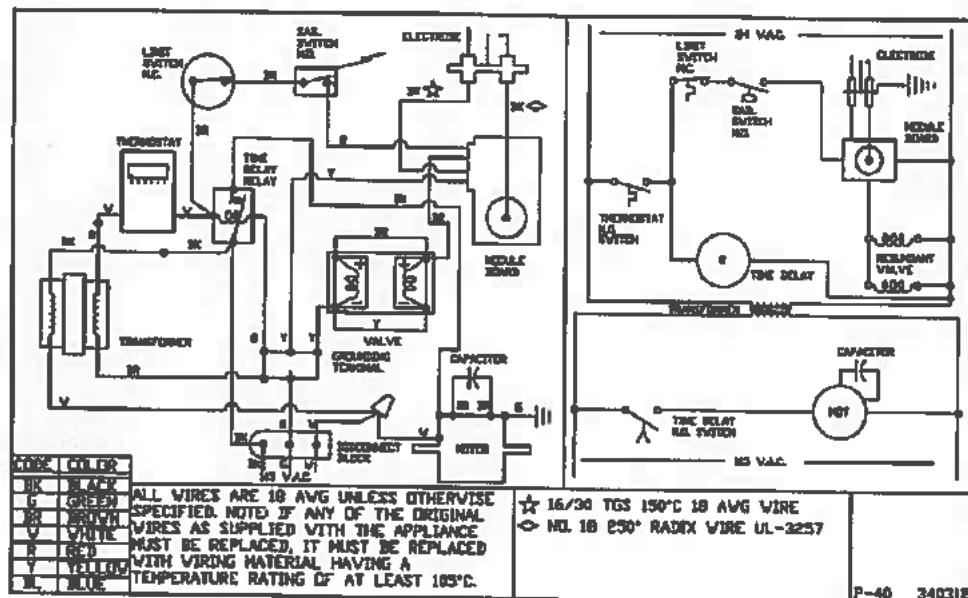


Figure 22
P-40 with Time Delay

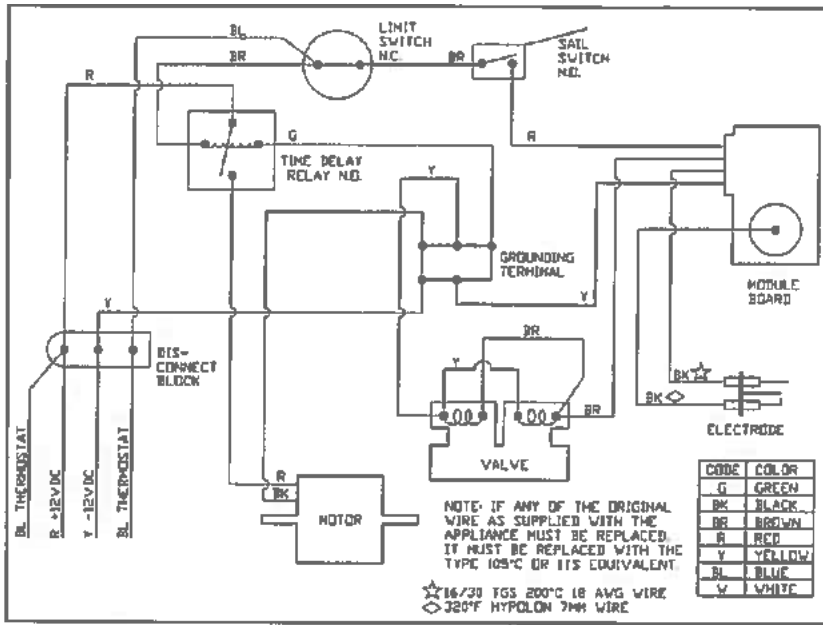


Figure 23
Remote Flame Sense
With Time Delay

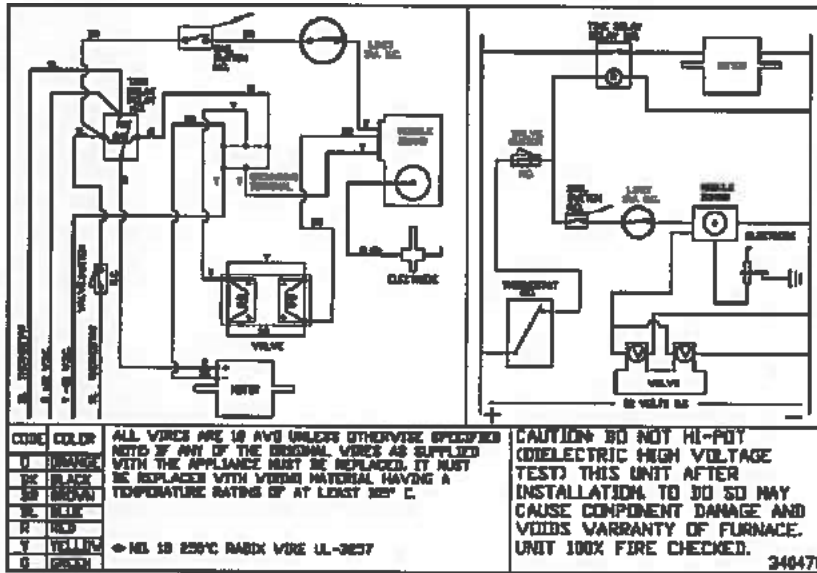


Figure 24
Remote Flame Sense
(NT Models)
With Time Delay

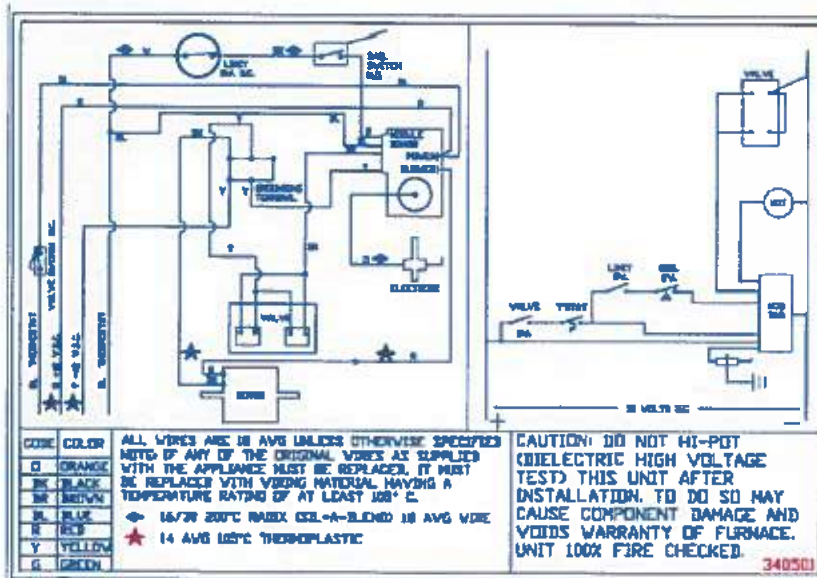


Figure 25
Control Board
(BF-20/25/30/35/42F)

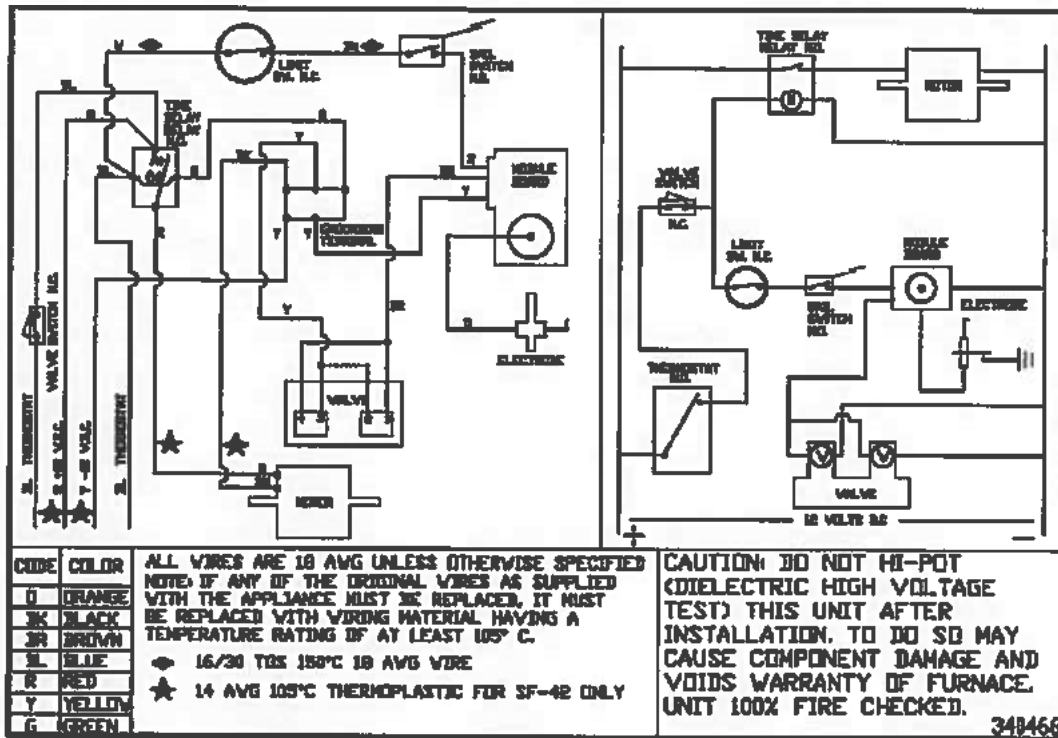


Figure 26
Local Flame Sense
(SF Models)
With Time Delay

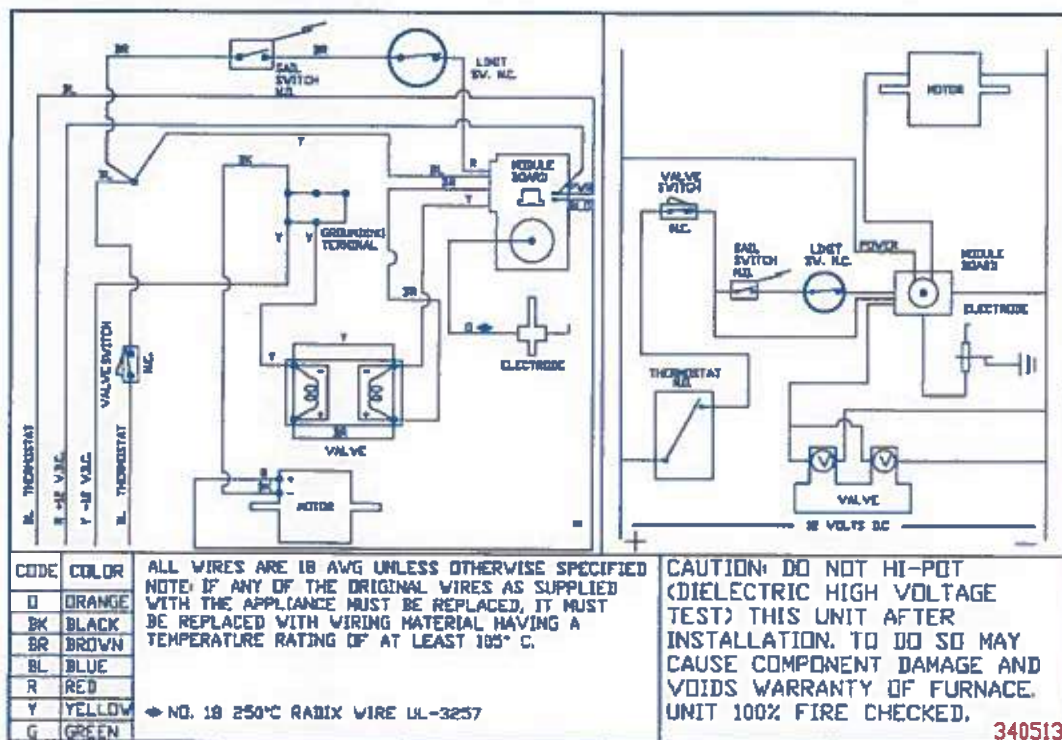


Figure 27
Fan Control Board
(NT-12/18/28S and SE)

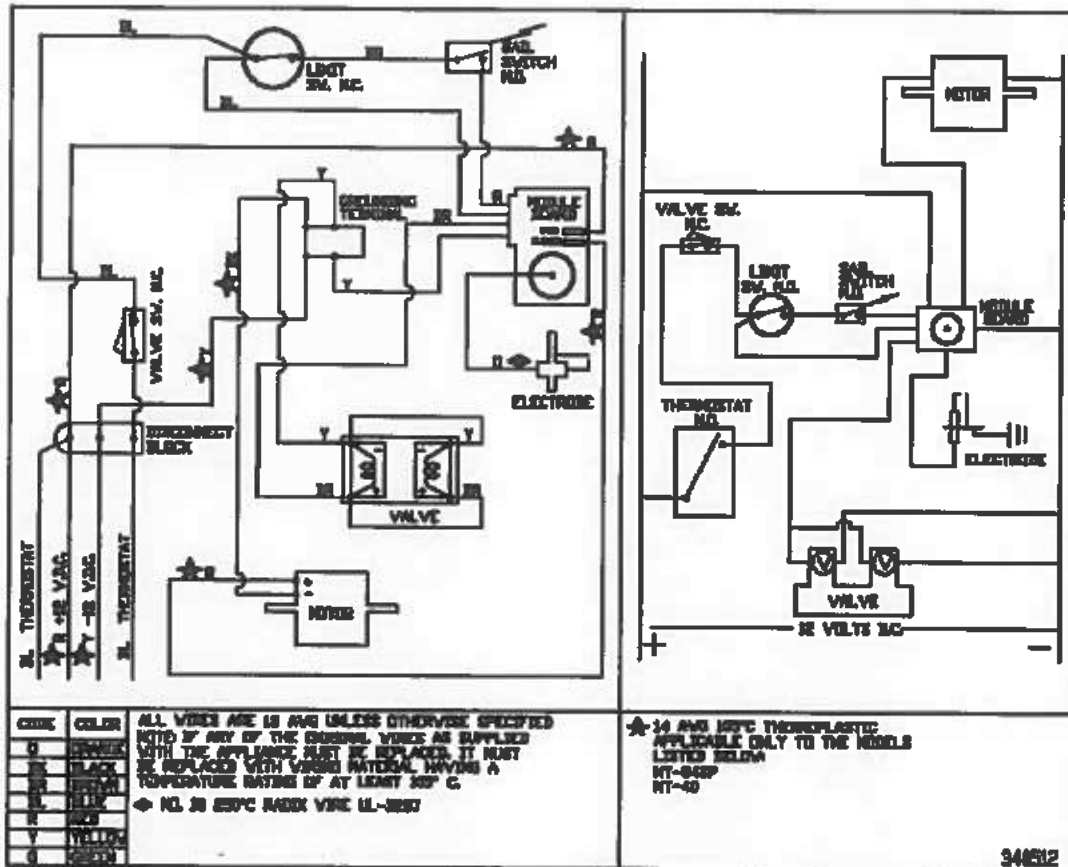


Figure 28
Fan Control Board
(NT-24/30/34SP and NT-40)

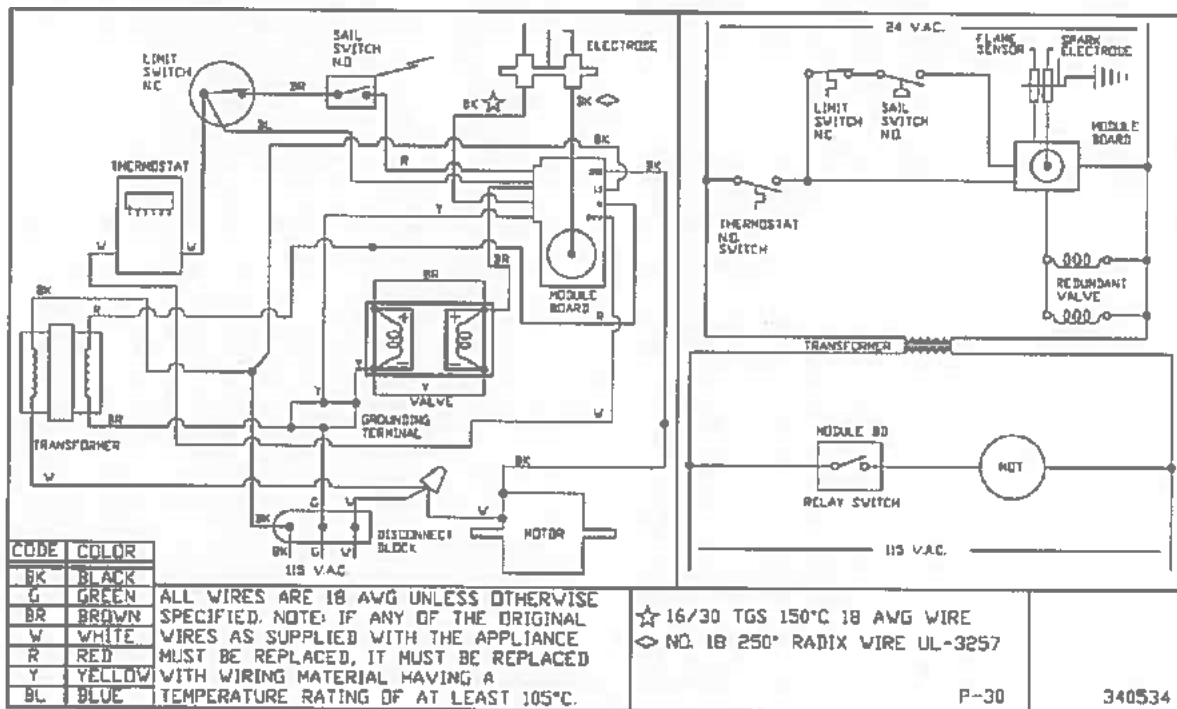


Figure 28
Fan Control
P-30

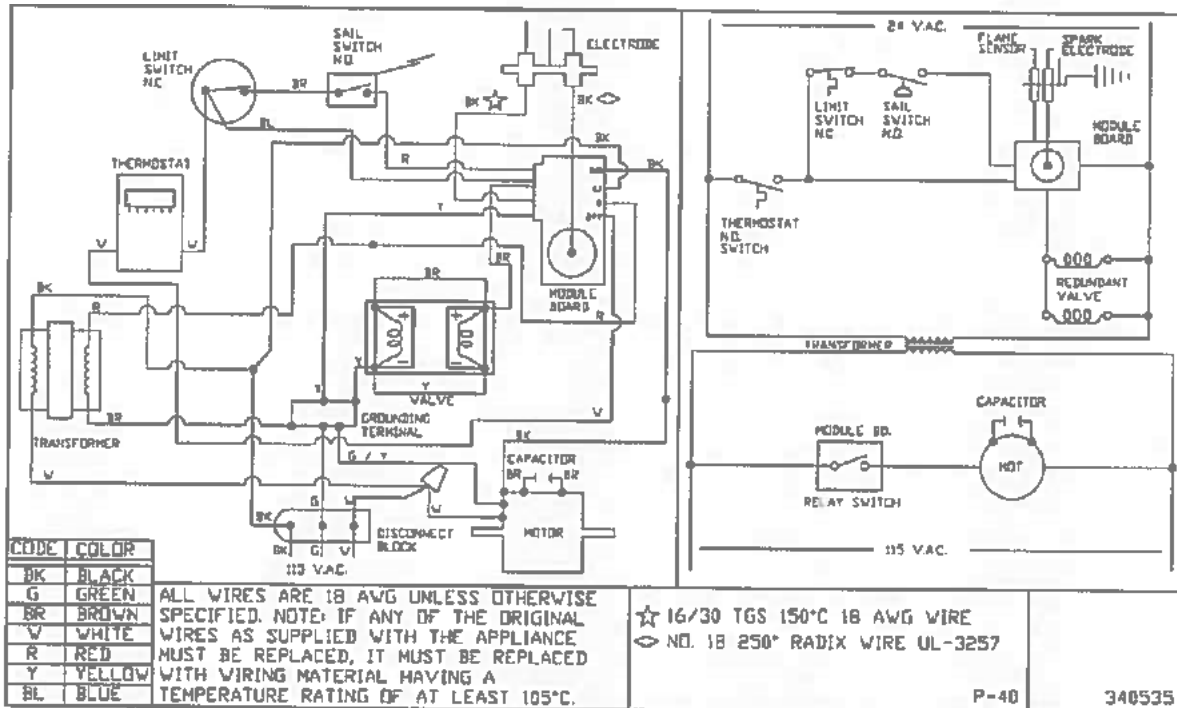


Figure 30
 Fan Control Board
 P-40

FURNACE REMOVAL

To replace parts or service the **SUBURBAN** family of RV furnaces, it is necessary to follow these steps:

DD-17DSI

1. Turn off gas and power, then disconnect gas and power supply at the furnace. Label wires as necessary.
2. Remove the vent cap assembly by removing applicable screws.
3. Remove the cabinet front two (2) screws.
4. Remove the applicable screws securing the furnace to the coach floor.
5. Remove duct from side of furnace, if equipped.
6. Remove the furnace from the cabinet area to gain access to combustion chamber and applicable parts.
7. Some parts can be accessed without removal of the complete furnace.
8. To re-install, reverse this procedure.
9. Rewire applicable wires and perform a leak test on all fittings. Perform a drop pressure test.

NT-12/16/20S

1. Turn off gas and power, then disconnect gas and power supply at the furnace. Label wires as necessary.
2. Remove the vent cap assembly by removing applicable screws.
3. Remove the cabinet front two (2) screws.
4. Remove the (1) one tie down screw securing the chamber to the cabinet.
5. Remove the furnace from the cabinet by pulling chamber outward completely to gain access to all controls and applicable parts.
6. To re-install, reverse this procedure.
7. Rewire applicable wires and perform a leak test on all fittings. Perform a drop pressure test.

NT-12/16/20SE

1. Turn off gas and power, then disconnect gas and power supply at the furnace. Label wires as necessary.
2. Remove the vent cap assembly by removing applicable screws.
3. Remove the cabinet front two (2) screws.
4. Remove the (2) two tie down screws securing the chamber to the cabinet.
5. Remove the furnace from the cabinet by pulling chamber outward completely to gain access to all controls and applicable parts.
6. To re-install, reverse this procedure.
7. Rewire applicable wires and perform a leak test on all fittings. Perform a drop pressure test.

NT-24/30/34SP and NT-40

1. Turn off gas and power, then disconnect gas and power supply at the furnace. Label wires as necessary.
2. Remove the vent cap assembly by removing applicable screws and one (1) flue retaining screw. Not applicable to NT-40.
3. Remove the cabinet front two (2) screws.
4. Remove the (2) two tie down screws securing the chamber to the cabinet.
5. Remove the furnace from the cabinet by pulling chamber outward completely to gain access to all controls and applicable parts.
6. To re-install, reverse this procedure.
7. Rewire applicable wires and perform a leak test on all fittings. Perform a drop pressure test.

FURNACE REMOVAL

SF-20/25/30/35/42, SFV-20/25/30/35/42, SH-35/42 and SHD-2542

1. Remove the vent cap assembly from the outside access door by removing applicable screws, also the four (4) screws retaining the door to the frame. Remove the door to gain access to the furnace.
2. Turn off gas and power, then disconnect gas and power supply at the furnace. Label wires as necessary.
3. Remove the (1) one tie down screw securing the chamber to the cabinet.
4. Remove the furnace from the cabinet by pulling chamber outward completely to gain access to all controls and applicable parts.
5. To re-install, reverse this procedure.
6. Rewire applicable wires and perform a leak test on all fittings. Perform a drop pressure test.

SF-20/25/30/35/42F, SFV-20/25/30/35/42F and SH-35/42F

1. Turn off gas and power, then disconnect gas and power supply at the furnace. Label wires as necessary.
2. Remove the vent cap assembly by removing applicable screws.
3. Remove the cabinet front two (2) screws.
4. Remove the (1) one tie down screw securing the chamber to the cabinet.
5. Remove the furnace from the cabinet by pulling chamber outward completely to gain access to all controls and applicable parts.
6. To re-install, reverse this procedure.
7. Rewire applicable wires and perform a leak test on all fittings. Perform a drop pressure test.

P-30S and P-40

1. Turn off gas and power, then disconnect gas and power supply at the furnace. Label wires as necessary.
2. Remove the vent cap assembly by removing applicable screws and one (1) flue retaining screw. (Not applicable to P40.)
3. Remove the cabinet front two (2) screws.
4. Remove the (2) two tie down screw securing the chamber to the cabinet.
5. Remove the furnace from the cabinet by pulling chamber outward completely to gain access to all controls and applicable parts.
6. To re-install, reverse this procedure.
7. Rewire applicable wires and perform a leak test on all fittings. Perform a drop pressure test.

SF, SH AND SHD-2542 ELECTRODE GAP SPECIFICATIONS AND POSITIONING

To assure consistent ignition of the burner, it is important for the electrode to be positioned properly over the top of the burner. When replacing the electrode, or should you be experiencing ignition type problems, the electrode should be positioned as outlined in the drawing.

1. Remove the furnace chamber assembly from the furnace cabinet following instructions listed in the installation manual.
2. Remove the burner access door. Manifold assembly will have to be removed at the valve. Remove the burner from the combustion chamber by removing six (6) screws which attach the burner to the chamber and air baffles (plates). Remove top air baffle and clip.
3. Locate the lance in relation to the burner ports for electrode positioning by:
 - a. Shine a flashlight into the burner venturi as illustrated (be sure the flashlight lens is against the end of the burner).
 - b. Light will reflect off the lance in the venturi of the burner and shine through a position of the two (2) rows of burner ports in the top of the burner.
 - c. Using a black felt-tip pen, mark a line along top of burner $3/16"$ from back of lance and parallel with lance. Make an additional mark indicating center line of the lance. (See illustration). Both marks will be used later as reference marks; therefore, keep lines thin.
4. Reassemble the burner into the chamber. Be sure the air baffles (plates) are positioned as removed. Mount center clip in place.
5. Adjust electrode so the electrode probe is positioned along the marked center line of the burner lance and the tip of the electrode terminates $3/16"$ from the back of the lance (at the line marked in Step 3C). (See illustration).
6. **IMPORTANT:** Be sure electrode probe maintains a $1/8"$ spark gap over the burner as illustrated.
7. Reinstall burner access door and reconnect manifold. Manifold must be checked for leaks with unit operating, before installing in cabinet. Reinstall furnace into the cabinet following the instructions in the installation manual. Check all gas connections for leaks using proper leak test solution.

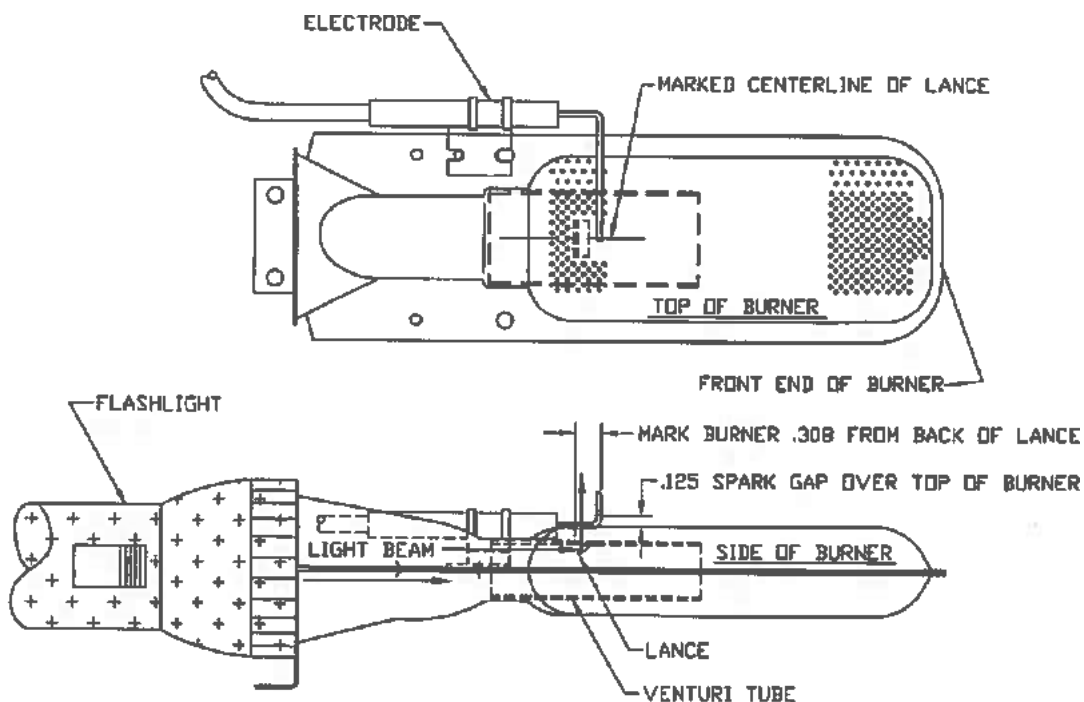
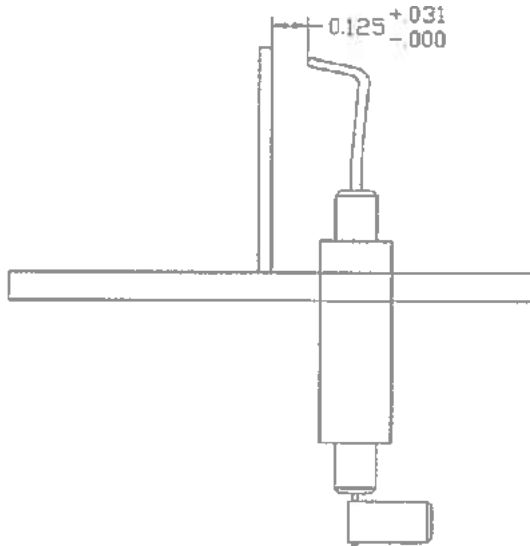


Figure 31

NT ELECTRODE GAP SPECIFICATIONS AND POSITIONING

To assure consistent ignition of the burner, it is important for the electrode to be positioned properly over the top of the burner. When replacing the electrode, or should you be experiencing ignition type problems, the electrode should be positioned as outlined in the drawing.

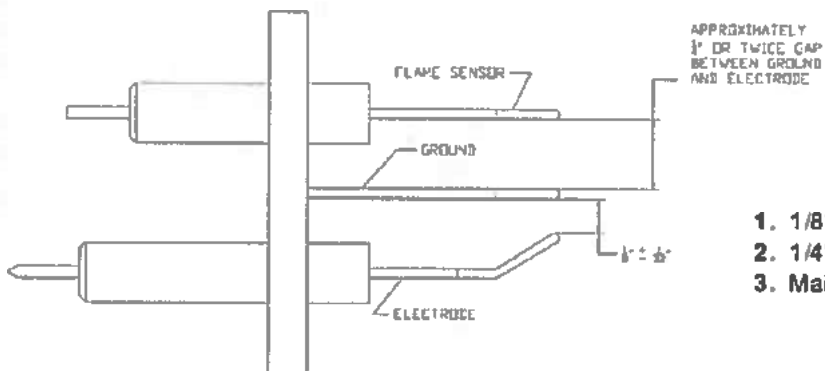


1. 1/8" spark gap between electrode and ground.
2. Maintain electrode position of 3/16" over burner ports.

Figure 32
LOCAL FLAME SENSE

PARK MODEL ELECTRODE GAP SPECIFICATIONS AND POSITIONING

To assure consistent ignition of the burner, it is important for the electrode to be positioned properly over the top of the burner. When replacing the electrode, or should you be experiencing ignition type problems, the electrode should be positioned as outlined in the drawing.



1. 1/8" spark gap between electrode and ground.
2. 1/4" spark gap between ground and flame sensor.
3. Maintain electrode position of 3/16" over burner ports.

Figure 33
REMOTE FLAME SENSE

MAINTENANCE

Preventative maintenance is essential if an RV owner is to have reliable, safe operation of his furnace. Two important areas to watch closely in order to assure safe, reliable operation are the venting and the main burner.

An obstruction in the vent or main burner will reduce the combustion air which results in incomplete combustion. Whenever incomplete combustion occurs, the by-products are carbon monoxide (CO) and soot. If the furnace outside exhaust vent shows black soot forming, the furnace should not be operated until the problem is corrected. Two common causes are:

1. Restriction in the vent or furnace intake (screens, wasp nests, tape).
2. Dirty burner.

If operation of the furnace continues under these conditions, it could result in serious injury to the occupants of the RV or even death.

Cleaning of the main burner and an inspection of the venting system should be done at least once a year, preferably just before the beginning of the heating season. Some RV owners and service personnel have the false assumption that if a furnace has not been used, it will not require cleaning. **NOT SO!** A furnace which has not been used for some time could be more in need of cleaning than a furnace which has been used extensively.

Dust and lint should be removed from the room air blower wheel and sail switch. A build up of dust and lint on the blower wheel can cause the motor to drag and not generate enough air flow to engage the sail switch. Dust accumulation on the sail switch will restrict the travel of the actuator arm to where the air flow across the paddle will not sail it in and complete the valve circuit.

A yearly inspection should be made of all gaskets on the furnace. If any gaskets show signs of leakage or deterioration, they must be replaced.

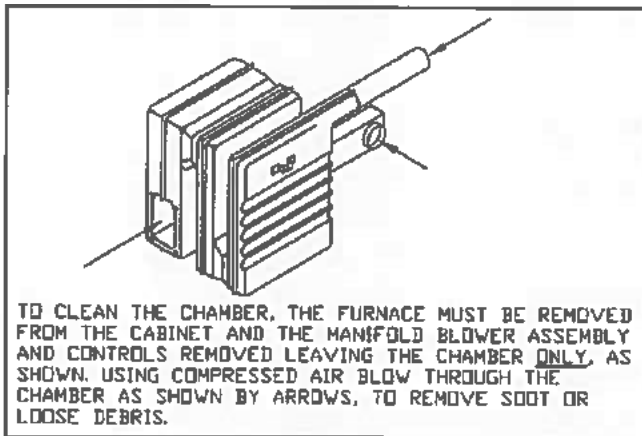


Figure 34

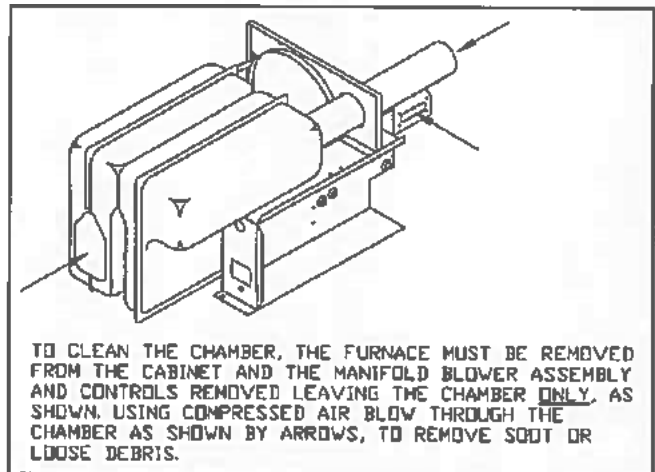


Figure 35

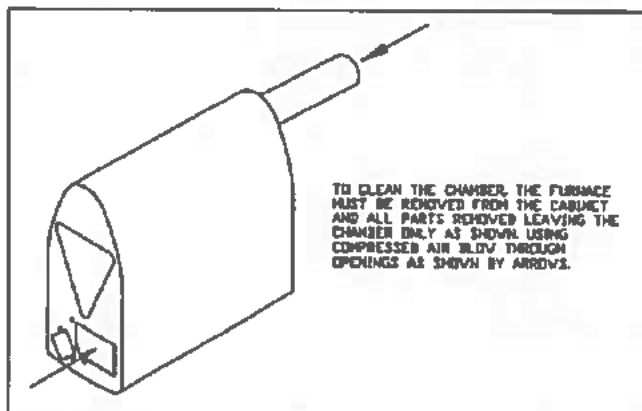


Figure 36

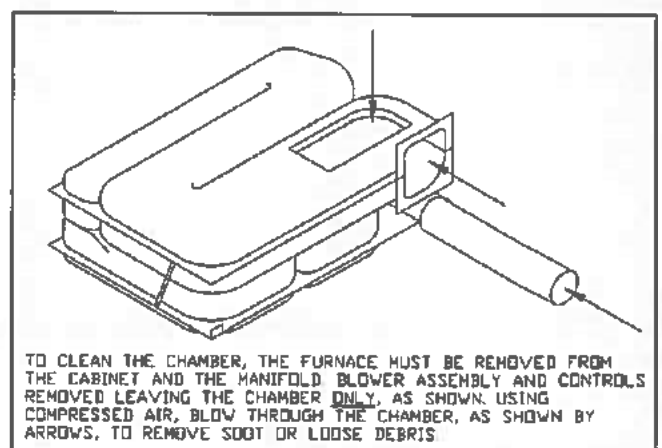


Figure 37

CAUTIONS & SAFETY INFORMATION

1. Never use a battery charger to power or test an electronic ignition furnace as they sometimes provide more than 14.5 DC Volts that could damage the module board.
2. Never operate the furnace with the electrode wire disconnected nor with the electrode assembly removed from the furnace.
3. Never use a screwdriver on any part of the electrode assembly while the furnace is in operation.
4. Be certain that the spark from the electrode never reaches the flame sensor portion of the electrode assembly on remote sense units.
5. Install the furnace so electrical components and connections are protected from water.
6. Wire the furnace direct to the battery when possible.
7. Use two wrenches on gas fittings when tightening gas connections.
8. Verify voltage of furnace, do not use 120 volt AC with 12 volt DC.
9. Do not modify the furnace in any way.
10. Do not vent the furnace to an outside enclosed porch area or where the vent is covered or obstructed.
11. Always meet or exceed minimum duct requirements. Also meet the minimum return air requirements.
12. Furnace must be installed and vented correctly. Refer to the Installation Manual for the specific model furnace.
13. Do not install aftermarket components.



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