TRAVEL TRAILER OWNER'S MANUAL

Airstream

INTRODUCTION

The Owners Manual for your new Airstream trailer is designed to explain the operation, function and care of the many systems that make modern trailering a joy.

Airstream realizes our customers possess varying degrees of expertise in the area of repairing and maintaining the appliances in their trailer. For this reason, the service and trouble-shooting information found in this manual is directed toward those with average mechanical skills. We also realize you may be more familiar in one area than you are in another. Only you know your capabilities and limitations.

We want you to use this manual, and hope you will find the information contained in it useful; however, should you ever feel you may be "getting in over your head" please see your dealer to have the repairs made.

The operation of the appliances such as refrigerator, furnace, water heater and others are explained in this manual. However, you will also find manufacturer's information supplied in a packet included with this manual.

All information, illustrations and specifications contained in the literature is based on the latest product information available at the time of publication approval.

Throughout this manual **CAUTION** and **WARNING** notations are used. Failure to observe "caution" can damage equipment. "Warning" notes the possiblity of personal injury if not observed.

Note: If and when new materials and production techniques are developed which can improve the quality of its product, or material substitutions are necessary due to availability, Airstream reserves the right to make such changes.

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*1000 MILE CHECK OR 60 DAY CHECK OUT

AUTHORIZATION CARD

This card entitles you, under the exclusive Airstream Certified Performance Check Out Program, to a 1000 mile (or 60 day.....whichever comes first) Performance Check of your Airstream trailer.

*After delivery of your trailer.

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LIMITED WARRANTY - AIRSTREAM TRAVEL TRAILERS

Warranty Coverage

When you buy a new AIRSTREAM TRAVEL TRAILER from an authorized Airstream dealer, Airstream, Inc. warrants the trailer from defects in material and workmanship as follows:

Warranty Period

The warranty extends for a period of one year from the date of original retail purchase.

Items Covered

Any part of the trailer or any component equipment installed by the factory is covered by the warranty except the following items which are not covered:

* Tires
* Battery
* Fuses and Light Bulbs
* Radio and Cassette Players
* Microwave Oven

The tire, battery, radio/cassette and microwave oven warranties will be handled by their respective service points and according to their written policy. This limited warranty does not include failure caused by accident, abuse, normal wear, overload or any cause not attributable to a defect in original material or workmanship of the trailer or component equipment as installed by the factory.

Limitation of Implied Warranties

All warranties of merchantability and fitness for a particular purpose, whether written or oral, express or implied, shall extend only for a period of one year from the date of original purchase. There are no other warranties which extend beyond those described on the face thereof and expressly excludes conditions resulting from normal wear, accident, abuse, exposure or overload. Some states to not allow limitation on how long an implied warranty lasts, so the above limitation may not apply to you.

Airstream's Responsibility

The Airstream Limited Warranty applies for a period of one year from the date of original purchase, and the applicable date of all warranties is that indicated on the Owner's Identification Card. Defects in items covered under this warranty will be corrected without cost upon the return at the owner's expense of the trailer or defective part to an authorized Airstream dealer.

Care and Maintenance

This warranty covers only defective material and/or workmanship; adjustments and checking are excluded. All adjustments are made at the factory prior to shipment, and rechecked by the dealer prior to delivery to the customer. An additional check up, including adjustments, is given at the 1,000 mile or 60 day inspection. Adjustments thereafter become a customer responsibility.

Each Airstream exterior (not including the underside) is sprayed with paint or plasticoat to prevent oxidation. This application is covered by the one year warranty against peeling. Prolonged exposure to salt air or industrial fall-out will permit penetration through the coating material causing damage to the exterior finish. Since Airstream, Inc. has no control over these conditions, it is necessary for the owner to wash and maintain his trailer as instructed in the Owner's Manual.

The owner is also responsible for following all recommendations, instructions and precautions contained in the Airstream Owner's Manual and the individual manuals furnished by the appliance manufacturers.

Installations not Covered

Airstream, Inc. cannot, however, and does not accept any responsibility in connection with any of its travel trailers for additional equipment or accessories installed at any dealership or other place of business, or by any other party. Such installation of equipment or accessories by any other party will not be covered by the terms of this warranty.

If Repairs are Needed

If your trailer needs repairs under the terms of the Airstream Limited Warranty, you should:

1. Take your trailer to your selling dealer or other Authorized Airstream dealer.

2. If the dealer is incapable of making the repair, request that he contact the Service Administration Department at Airstream, Inc. for technical assistance.

3. If repairs are still not made, the customer should contact Airstream, Inc., 419 W. Pike Street, Jackson Center, Ohio 45334, Attention: Owner Relations Department and furnish the following information:

* The complete serial number of the trailer.
* Date of original purchase.
* Selling dealer
* Nature of service problem and steps or service which have been performed. (The owner may be directed to another dealer at the owner's expense.)

4. If, after taking the above steps, repairs are still not complete, the Airstream owner may request the trailer be allowed to be brought to the Factory Service Center at the owner's expense.

Dealer Representation Excluded

The full extent of Airstream's Limited Warranty is set forth in detail in this folder, and in the Explanation of Airstream Limited Warranty covered in the Airstream Trailer Owner's Manual. Airstream, Inc. will not be responsible for additional representations or implied warranties made by any of its dealers to the extent those representations are not a part of, or are contrary to, the terms and conditions of the Airstream Limited Warranty.

Consequential and Incidental Damages

Airstream, Inc. will not be responsible for any consequential or incidental expenses or damages resulting from a defect. Incidental expenses include, but are not limited to, travel expenses, gasoline, oil, lodging, meals, telephone tolls, loss of work and loss of use of the trailer. Some examples of consequential damages would be: stained curtains due to rain leaks or delaminated floor caused by a plumbing leak. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Warranty Transfer

This limited warranty is transferable to subsequent owners for the duration of the warranty period. Warranty transfer application forms are available from your dealer or the Airstream, Inc. Service Administration Department.

Changes in Design

Airstream, Inc. reserves the right to make changes in design and improvements upon its product without imposing any obligation upon itself to install the same upon its products theretofore manufactured.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Thor Industries
Airstream, Inc.
419 West Pike
Jackson Center, Ohio 45334

EXPLANATION OF AIRSTREAM LIMITED WARRANTY

The Airstream Limited Warranty is detailed in a separate folder. A plastic WARRANTY IDENTIFICATION CARD is sent to you after Airstream receives notification from your dealer of the sale. Since this I.D. card is necessary to obtain warranty, it should be kept in the trailer or on your person during the warranty period.

EXCLUSIONS:

Normal Wear

Items such as tires, water purifier packs, curtains, upholstery, floor coverings, window, door and vent seals will show wear or may even wear out within the one year warranty period depending upon the amount of usage, weather, and atmospheric conditions.

Accident

We strongly urge our dealers and customers to inspect the trailer upon receipt of delivery for any damage caused by accident while being delivered to the dealer, or while it is on the dealer's lot. Damage of this nature becomes the dealer's or customer's responsibility upon acceptance of delivery, unless Airstream is notified and the damage is verified by the person making the delivery. Glass breakage, whether obviously struck or mysterious, is always accidental and covered by most insurance policies.

Abuse

Lack of customer care and/or improper maintenance will result in early failure for which Airstream cannot be held responsible.

Exposure

Not unlike a car, the steel parts of a trailer can and will rust if subjected to prolonged exposure to moisture, salt air, or corrosive air-borne pollutants without repainting. Aluminum oxidizes when unprotected under similar conditions, and refinery chemicals of a sulfurous nature are harmful to finishes if not washed off periodically. Extremely hot or direct sunlight will deteriorate rubber and fade curtains and upholstery. Conditions of this nature, although they may be normal for the area, are beyond Airstream's control and become the responsibility of the owner.

Although it is our obligation to correct a rain or plumbing leak within the terms of the limited warranty, it is the owner's responsibility to use reasonable, prudent care to minimize foreseeable secondary damage, such as a delaminated floor, stained upholstery, carpeting, drapes etc.

Overload

Damage due to loading, either beyond capacity or to cause improper towing because of improper balance, is beyond Airstream's responsibility. The Airstream trailer is engineered to properly handle the gross vehicle load rating on the certification label. Load distribution has a definite effect upon the towing characteristics and attitudes of the trailer. Level hitch installations are a necessity, and very important on a tandem axle trailer. There are limits to the amount of load that can be safely transported depending upon speed and road conditions, and reasonable cause to believe these factors have been exceed could void the Airstream warranty. For additional information on the loading of your trailer, consult your Owner's Manual or gross vehicle weight rating plate.

The Airstream axle is manufactured to a tolerance of 1° camber and 1/8" toe-in. These tolerances will only change if the trailer is subjected to abuse, such as dropping off a sharp berm, striking a curb, or hitting a deep hole in the road. Such damage could be considered as resulting from an accident which risks are not covered under the warranty. Abnormal tire wear and/or wheel alignment resulting from such damage is not covered under the terms of the warranty.

SERVICE:

The Airstream Silver Key Delivery Program is an exclusive Airstream program. Before leaving the factory, each and every vital part of the trailer is tested for performance. Each test is signed and certified by an inspector. After the trailer arrives on your dealer's lot all of these vital parts and systems are again tested. When you take delivery of your new trailer you will receive a complete check out.

Silver Key Delivery does not stop here. After you have traveled with your trailer for 1,000 miles or 60 days (whichever comes first) you can make an appointment with any one of the Airstream dealers for still another check out of your trailer. At that time a specified list of performance checks on your trailer equipment will be conducted and any deficiencies you have experienced since taking delivery will be corrected.

Please contact your dealer if you need service. Major service under your Airstream Limited Warranty is available through our nationwide network of Airstream Dealer Service Centers. An up-to-date list of Dealer Service Centers has been provided with your new trailer. This list is current as of the date of publication.

Occasionally dealerships change, or new dealers are added who may not appear on this list. For this reason, it is suggested that you contact your local dealer from time to time and bring your list up to date. He can also provide you with additional copies if you need them. ALL CENTERS OPERATE ON AN APPOINTMENT BASIS FOR THE UTMOST EFFICIENCY.

When you require service from the Airstream Factory Service Center, or a Certified Dealer Service Center, please contact the service manager for an appointment, and kindly inform him if you are unable to keep the appointment date or wish to change it.

Service may be arranged at the Factory Service Center by contacting the Service Coordinator at:

Airstream Factory
Service Center
419 W. Pike Street
Jackson Center, Ohio 45334
513-596-6111

MAINTENANCE SCHEDULE

Note: See appliance manufacturer's literature for further information.

EVERY 1,000 MILES OR 60 DAYS

Escape Window	Check operation of latches and upper hinge.
Battery	Check water level.
Smoke Alarm	Test and replace battery as required.
Tires	Check tire pressure (50 psi).
Hitch	Check for loose bolts or unusual wear.
GFI Circuit Breaker	Test and record.
Auto Fill Valve	Check operation.

WARNING: On new trailers check lug bolts at 200 miles and 1,000 miles. Torque 90-95 ft. lbs.

EVERY 5,000 MILES OR 90 DAYS

Exterior Door locks	Lubricate with dry graphite.
Exterior Hinges	Lubricate with light household oil.
LPG Hold Down	Lubricate with light household oil.
LPG Regulator	Check bottom vent for obstructions.
Main Door Striker Pocket	Coat with paraffin.
Wheel Lug Bolts	Torque to 90-95 ft. lbs.
Break Away Switch	Pull pin and lubricate with household oil.
7-Way Plug	Spray with contact cleaner.
Hitch Ball Latch	Lubricate with non-detergent motor oil.
Hitch Ball	Lubricate with hitch ball lube or wheel bearing grease.
Range Exhaust Hood	Clean fan blades and wash filter.
Roof Vent Elevator Screws	Lubricate with light household oil.
Main Door Step	Lubricate moving parts and check.

EVERY 10,000 MILES OR 6 MONTHS

Brakes	Inspect, adjust or replace as necessary.
Wheel Bearings	Clean and repack.
Tires	Inspect and rotate.
Spare Tire Carrier	Lubricate moving parts.
Seals, Windows & Door	Clean with mild detergent and coat with "Slipicone".
TV Antenna	Lubricate all moving parts with WD-40.
Exterior	Wax.
Escape Window	Lubricate latches with WD-40.
Hitch Jack (Manual)	Lubricate with light household oil. (Put oil can spout up under handle.)

EVERY YEAR

Battery	Clean, neutralize and coat terminals with petroleum jelly.
A-Frame, Step	Wire brush and paint A-frame, step, rear frame.
LP Bottles	Have purged by LP supplier.
Seams	Check and reseal exterior seams, windows, lights and vents if necessary. Use Kool Seal or equivalent.

SUGGESTED MAINTENANCE PARTS AND LUBRICANTS

BULBS, EXTERIOR

Taillight	#1157
Back Up	#1156
License Plate	# 67
Clearance Light	# 194
Flood Light	#1156
Step Light, Upper	#1141
Step Light, Lower	# 53
Convenience Light (Dump Valve)	# 53
Convenience Light (Hitch)	# 194

BULBS, INTERIOR

Ceiling Light (Incandescent)	#1141
Ceiling Light (Fluorescent)	#F14T8-CW
Ceiling Light (Small Fluorescent, Thin Lite)	#F8T5-CW
Indirect, Dining & Bedroom (Fluorescent)	#F18T8-CW
Bath Mirror, Excella & Limited	Jensen J12B-Small Base, Large Bulb
Reading & Wardrobe Light	#1141
Oven	Standard Screw-in Base 12 Volt - 15 Watt
Refrigerator	E5

FUSES

Entertainment Center (Excella)	SOV 3 Amp
Entertainment Center (Excella, Limited)	SOV 3.5 Amp and SOV 1 Amp

MISCELLANEOUS

Water Hose Gaskets

Extra Hair Pin Clips for Hitch

Dry Graphite

Touch-Up Paint (DuPont Centari #44146A - Metallic Gray)
(Airstream #28174W - Clear Acrylic Spray)

Oil Can with 30 Weight Non-Detergent Oil

Light Household Type Oil

Hitch Ball Lube (May use wheel bearing grease.)

Wheel Bearing Grease

Grease Seals

WD-40 or Equivalent Aerosol Lubricant

Spray Contact Cleaner

Sealer - Kool Seal

MAINTENANCE RECORD

Date	Dealer	Service Performed

NOTES

TOWING YOUR AIRSTREAM

TOW CAR EQUIPMENT

If you plan to buy a new vehicle to tow your trailer we suggest that you include in your purchase the trailer towing options offered by most automobile manufacturers. These include such things as heavy duty alternator and radiator, heavy duty springs (**See Note:**) and shock absorbers, automatic transmission cooler, heavy duty fan and flasher unit and others, depending upon the make of the vehicle.

Transmissions may be manual or automatic, but an automatic transmission may prolong your car's engine life and generally does a better job of controlling engine loads than the average driver using a manual shift.

Having adequate power is very important when considering the purchase of a new vehicle or the trailer towing capability of your present one. Emission controls that are required by the Federal Government have reduced overall engine power.

American manufacturers realize more than 30% of the vehicles they sell will be used for towing some type of trailer. The dealers are provided with guidelines to use when helping a customer decide on a tow vehicle. The guidelines are not just determined by the power output of the engine. The gear ratio of the differential is also a very important part of the guideline.

Inspect your vehicle's hitch regularly for loose bolts or nuts, cracked welds, loose ball mounts, worn parts, etc.

New trailerists often carry more food and other supplies than really needed. Remember that every item you take along is one more thing to stow and adds weight to the total load you must pull. Consolidate items in shelves, lockers, and in the refrigerator. It is better to have one full and one empty locker than two half empty ones. Special care must be taken not to overload the front and rear ends of the trailer.

Note: Be realistic when ordering heavy duty springs. Only springs heavy enough to support your loaded vehicle (not including trailer) are necessary. Too harsh of spring rate will only shorted the life of the tow vehicle and trailer, and will make your journeys less enjoyable.

ELECTRIC BRAKES

The brakes are operated by 12 volt current from your tow vehicle and MUST BE HOOKED UP SO THAT YOU HAVE AN INTEGRAL SYSTEM WITH YOUR TOW VEHICLE BRAKES. To prevent problems and insure satisfactory braking action, install a Kelsey Hayes Controller (or equivalent) in line with the controller in your tow vehicle.

A Kelsey Hayes Controller (or equivalent) installed in your tow vehicle will synchronize the trailer brakes with your tow vehicle brakes. It is designed to apply the trailer brakes with your tow vehicle brakes.

The controller handle adjustment affects the rate of application of the trailer brakes. This adjustment has no bearing on the maximum braking capacity of the trailer brakes. Because of the wide variety of tow vehicles and trailers it is necessary to balance the trailer brakes with the towing vehicle brakes to provide for a safe, comfortable stop. This adjustment should be made to provide for a slight lead of the trailer brakes over the tow vehicle brakes. Turning the handle clockwise will decrease the rate of application of the trailer brakes, while counterclockwise will increase the rate of application. When the desired setting is reached, the controller will hold the adjustment, but may be varied at any time by rotating the handle as described above. After this adjustment there should be no sensation of the trailer pushing the tow vehicle during a stop, nor should there be an excessive sensation of the trailer pulling the tow vehicle during a stop.

Due to normal brake lining wear, the brakes and the controller setting should be checked and readjusted, if necessary, during the trailer manufacturer's recommended inspection intervals.

Note: Brake lining adjustment should be periodically checked (fully) to be sure trailer brakes are in the same adjustment as the tow vehicle's.

Properly set these adjustments will provide for safe comfortable stops. They will also help assure optimum brake and tire life for both the tow vehicle and the trailer.

In THE EVENT OF AN ACCIDENTAL SEPARATION of the tow vehicle and the trailer, the BREAKAWAY SWITCH will set and lock the trailer brakes for a sufficient length of time to stop the trailer. The switch is activated when the small pin in the front of the unit is pulled out by the wire attached to it and to the tow vehicle. THIS PIN SHOULD BE PULLED OUT, LUBRICATED WITH LIGHT HOUSEHOLD OIL, AND REPLACED EVERY 90 DAYS.

LOADING

There are two important factors to keep in mind when loading your trailer. Total weight and balance.

On the roadside front corner of your trailer is a manufacturing data plate listing two weights.

G.V.W.R.	Gross Vehicle Weight Rating	Total Weight Capacity
G.A.W.R. (Ea. Axle)	Gross Axle Weight Rating	For Each Axle

WARNING: The gross weight rating is the maximum load carrying capacity allowed by the vehicle or axles. DO NOT overload your vehicle.

At first glance it does not seem logical for the carrying capacity of the axles. The other weight bearing member, besides the axles, is the tongue.

To find the actual weight (See Note) of the trailer it must be weighed on scales. Scales capable of weighing your trailer may be found at grain elevators, stone quarries or at a state operated truck scales along the highway. If you are not sure of the location of scales in your area contact your local state highway patrol post for assistance.

The total cargo you can safely carry in the trailer is the difference between the weight of the trailer and the Gross Vehicle Weight Rating. For instance, if the GVWR on your trailer is 6,200 lbs. and the total weight of your trailer is 4,5000 lbs., you could carry an additional 1,700 lbs. of water, clothes, utensils etc.

Note: The dry weight is listed in the Specifications Section.

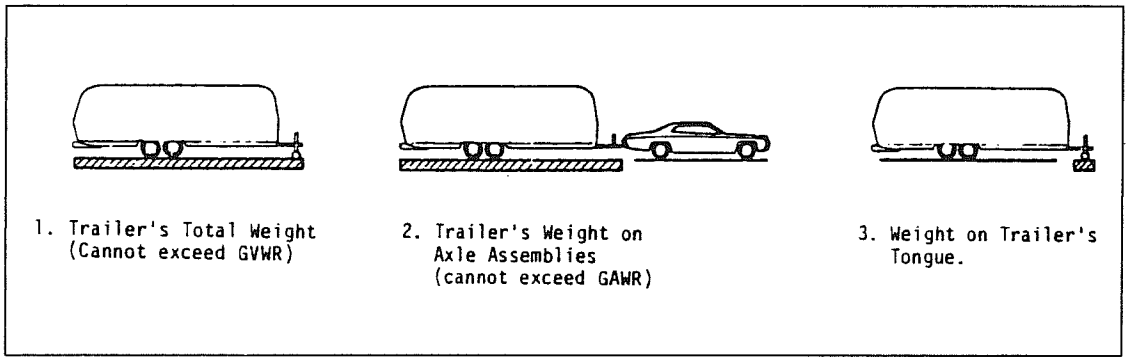
When loading heavy objects such as tools, skillets, irons, boxes of canned goods, etc. keep them as low as possible - preferably on the floor. Try to hold additional weight behind the axle to a minimum.

WARNING: Never add items such as generators, heavy tool boxes or motorcycle racks to the back of the trailer. Weight behind the axle will tend to magnify any sway that may occur when passing trucks or in gusty wind. If a heavy generator is mounted on the rear bumper what may have been an almost unnoticeable sway turns into a severe sway you may not be able to control.

CAUTION: Damage to your trailer caused by mounting heavy objects on the rear is considered abuse, and is not covered by warranty.

WEIGHING YOUR TRAILER

The diagram below shows how to weigh the trailer on scales.



The allowable personal cargo, determined above, must be distributed in your trailer in such a manner that the Gross Axle Weight Rating is not exceeded.

To determine this it is necessary to load all of your allowable personal cargo (example above 1,700 lbs. total) and variable weights. Then hitch the trailer to the tow vehicle with load equalizing hitch properly adjusted as shown on the following pages.

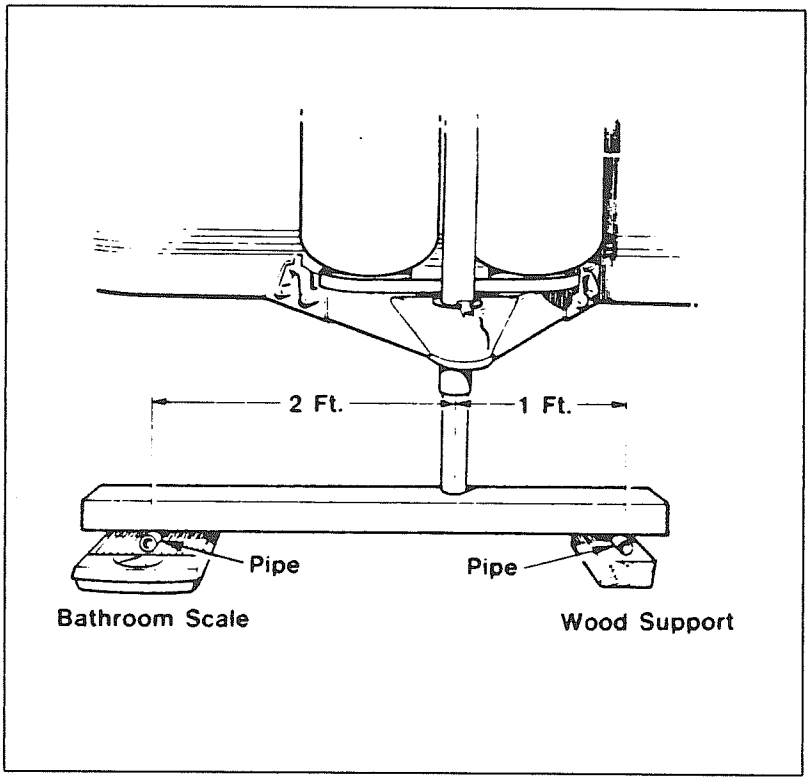
Place trailer on scale with both axles only on scale (see 2). If the weight on the axles exceeds the axle system G.A.W.R. then some of the personal cargo must be redistributed forward in order to place some of this weight on the tongue.

The tongue weight should be between 10% - 15% of the trailer's total weight, but must not exceed 1,000 lbs. Some tow vehicle manufacturers may restrict the amount of tongue load to a lower valve. To determine tongue load, unhitch tow vehicle and place tongue hitch post on scale (see 3). The trailer must be properly loaded as determined above, with your allowable personal cargo and variable weights.

A scale which has a lower weight limit than your tongue load, such as a bathroom scale, may be used to check the tongue weight by using the following method (see illustration).

Place a piece of wood of approximately the same thickness as the bathroom scales on the ground in line with the trailer hitch jack as shown. It should be so spaced that a short piece of pipe or other round piece will lay exactly one foot from the center line of the jack extension. Place the scales so that another round piece can be exactly two feet from the center line of the jack extension in the other direction. Place a 4 x 4 on the two round pieces and screw the jack extension down on the top of the 4 x 4 until the tongue of the trailer is supported by it. Multiply the scale reading by three. This will be the tongue weight of your trailer. If you exceed the capacity of the bathroom scales, increase the two foot dimension to three or four more feet, but always multiply the scale reading by the total number of feet between the wood and scales.

CAUTION: **Be sure trailer is level when you read scales.**



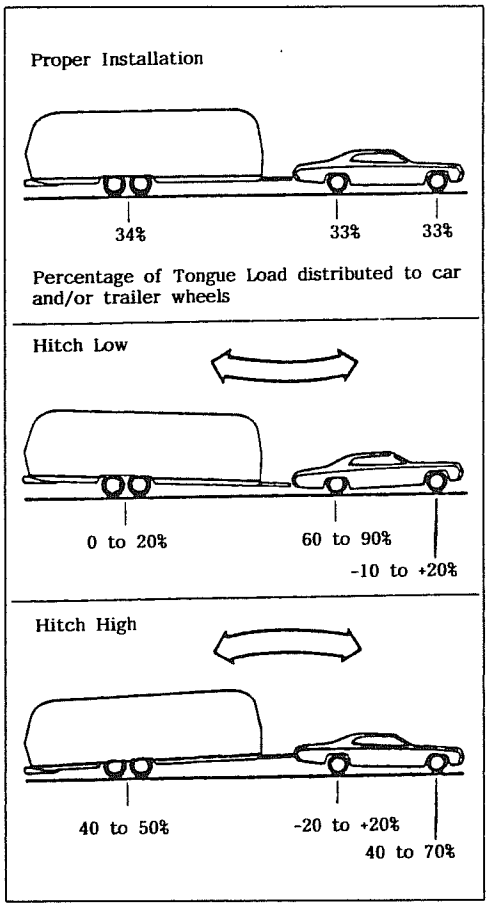
HITCHING UP

Hitching up your trailer is something that will become almost second nature with practice. The following section includes proper hitch load distribution and a procedure for hitching up.

The electric jack is strongly recommended for anyone who, for any reason, should not physically exert himself. Available as an option, the electric jack makes hitching and unhitching a much easier operation. On Limited model trailers be sure that the front jacks are used in unison.

Equalizing Hitch Load Distribution

When a trailer is hitched up properly to a tow vehicle with a load equalizing hitch, approximately 1/3 of the trailer's tongue weight will be on the trailer's axles and 2/3 will be transferred to the tow vehicle. 1/3 of this weight transfer will be carried by the front wheels and 1/3 by the rear wheels of the tow vehicle (See diagram). Thus, the tire load of each wheel on the tow vehicle will be increased by 1/6 of the trailer's tongue weight. The tire air pressure of the tow vehicle should be increased to compensate for this additional weight. Refer to the vehicle's owners manual for this information.



CAUTION: The tongue weight should be approximately 10% - 15% of the trailer's total weight, but MUST NOT EXCEED 1,000 lbs. And, under no condition should it exceed the hitch rating. Your hitch rating information should be provided to you by your hitch installer.

Steps for Hitching Up

Jack up the trailer hitch until there is clearance for the HITCH BALL to slide under. Remove safety pin and raise the LOCKING LEVER. Back the tow vehicle straight back to the hitch. (See Fig. 2). This can best be accomplished through the use of prearranged hand signals with the help of another person; but, if you are hitching up by yourself we recommend the use of a HOOK-UP VIEW MIRROR.

Lower the trailer hitch onto the hitch ball. Then close the locking lever and insert safety pin. (See Fig. 3)

Now raise the trailer and tow vehicle to the full height of the hitch jack (See Fig. 7) and then attach the LEVELING BARS. (See Fig. 4, 5 & 6). Lower the tow vehicle and trailer (See Fig. 7). The hitch ball should be level to slightly higher. Readjust leveling bars until this condition is correct by increasing or decreasing the length of chain engaged in "A" frame saddle bracket. Short chain raises hitch ball, longer chain lowers it. A level condition will result in the best balance for towing and steering control as the weight equalizing hitch distributes the hitch load. A low hitch ball increases tail wagging tendencies by lowering the nose of the trailer, thus changing the center of support for the trailer and reducing the weight on the front wheels of the tow vehicle. With proper hitch installation and hitching up, the bar should have a noticeable amount of deflection or bending. (See Fig. 8) A little practice with your rig will teach you how far to pull the bar, and you may wish to mark the chain links that match your rig.

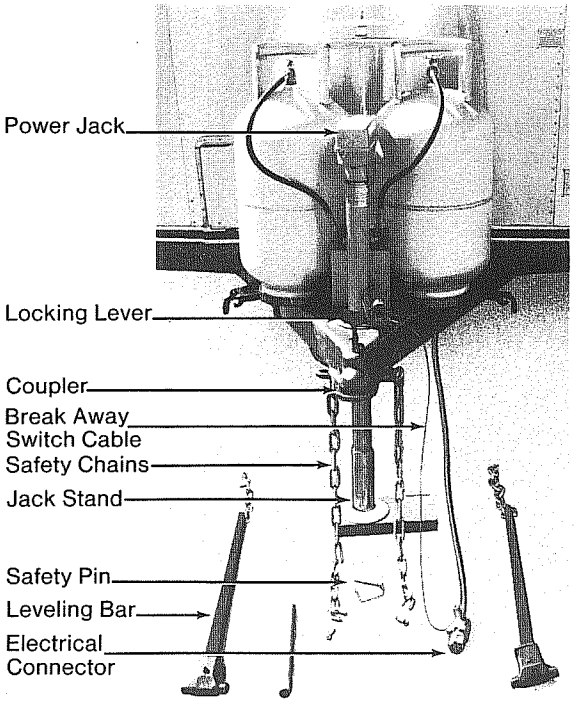


Fig. 1 - Hitching Up Equipment

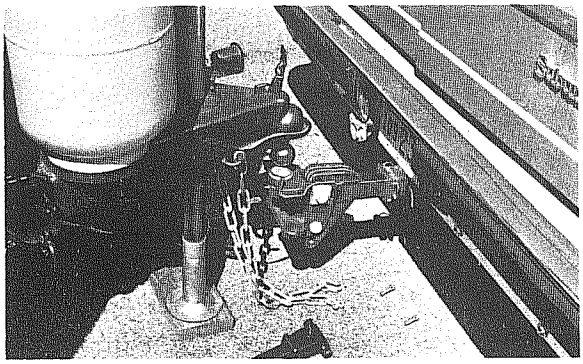


Fig. 2 - Hitching Up

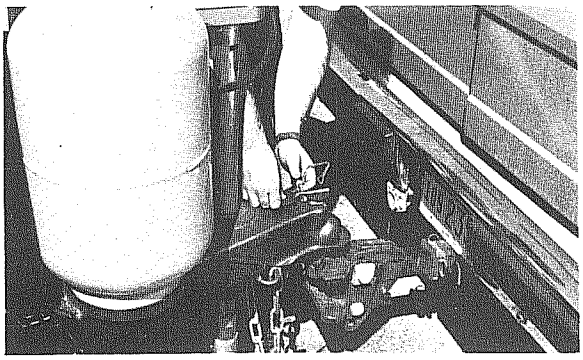


Fig. 3

Always choose level ground for checking correct hook up. For further information see hitch manufacturer's literature.

Note: If your tow vehicle is equipped with adjustable load leveling air shocks, you must load the tow vehicle first with typical luggage and passengers and bring it back to level. Then attach the trailer and adjust the load leveling bars. Otherwise the air shocks on your tow vehicle will overload the rear wheels. DO NOT USE AIR SHOCKS TO LEVEL TOW VEHICLE AND TRAILER AFTER HITCHING UP.

Note: Coupler height on the trailer is determined by leveling the trailer end to end, then measuring from the ground to the top of the ball socket.

Attach the safety chains (See Fig. 10) to the welded portion of the hitch or the tow vehicle's frame, but never to the removable ball mount. Cross the safety chains under the hitch.

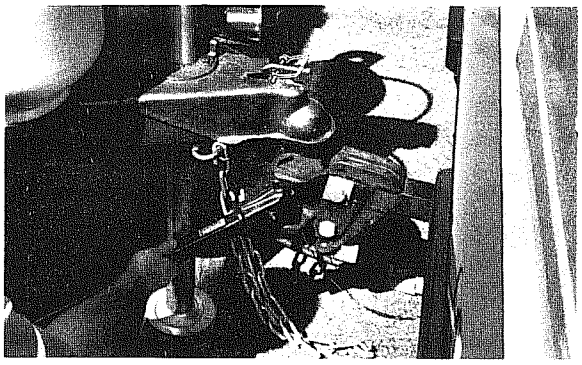


Fig. 4

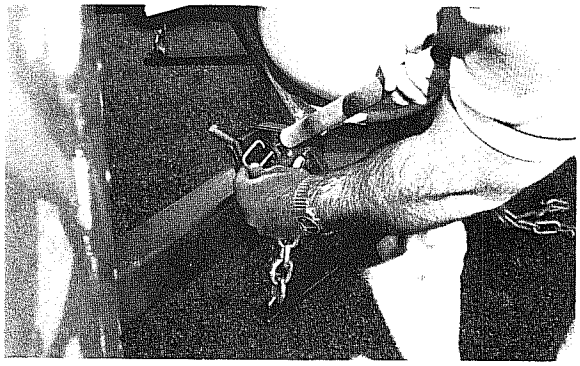


Fig. 6

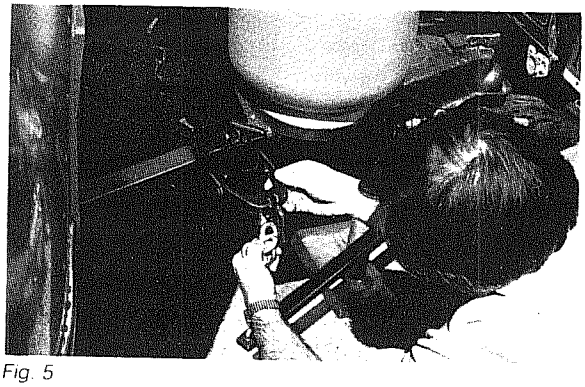


Fig. 5

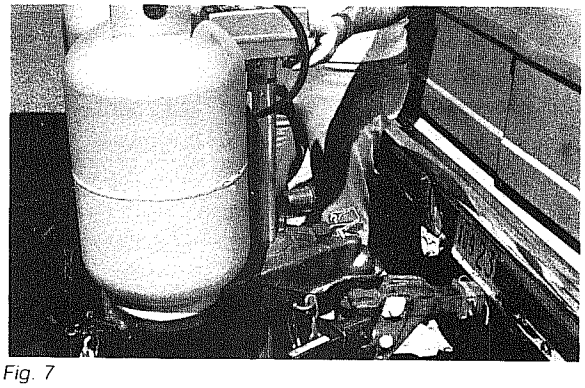


Fig. 7

CAUTION: Retract the hitch jack completely for maximum ground clearance. Remove the jack pad (See Fig. 12) and stow in the car's trunk along with leveling jack and other gear used when stopped. NEVER TOW YOUR TRAILER WITH THE JACK DOWN. Check that the fold-away step is up and that the main door is completely closed and LOCKED for towing. If it is not locked the constant vibration of travel may cause it to open with possible damage.

Move the rig ahead about 50 feet and test the trailer brakes, then check the ground for forgotten objects. Regularly check the condition of your tires, air pressure and the tightness of the lug bolts.

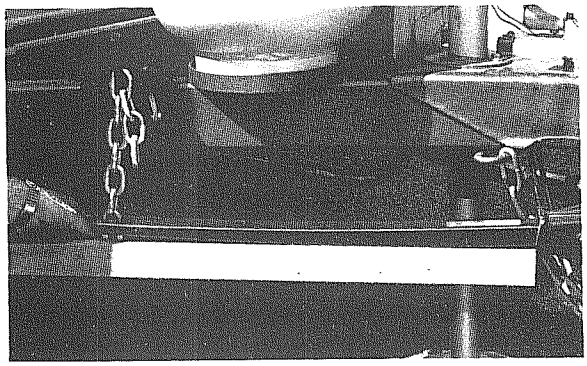


Fig. 8

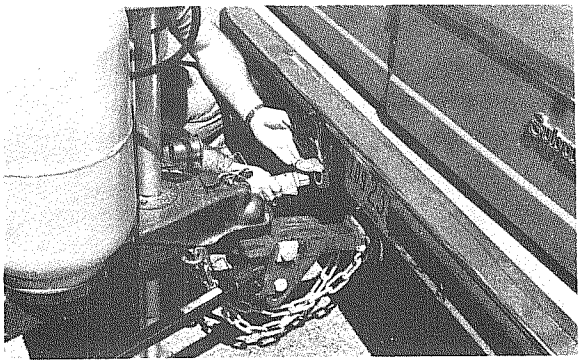


Fig. 9

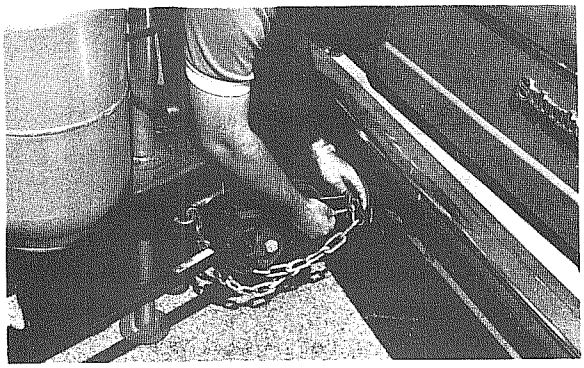


Fig. 10

Fig. 11

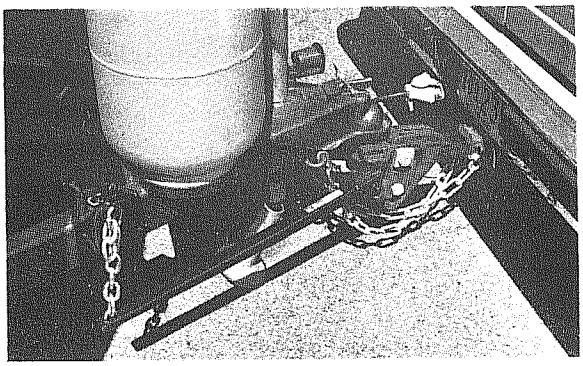


Fig. 12

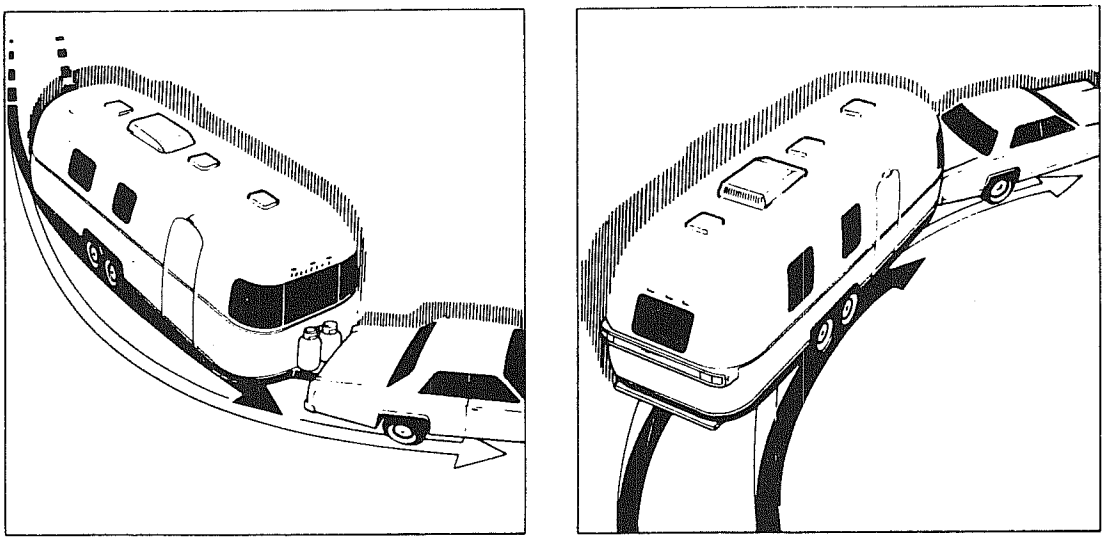
TOWING TIPS

We want every owner to be a safe and courteous driver. A few hours of towing practice in a large empty supermarket lot will make pulling your trailer over the road much easier. Line out two corners for left and right turns. You may also use these corners to practice backing and parking.

OBSERVE THAT THE TRACKS MADE BY THE TRAILER WHEELS ARE DISTINCTLY DIFFERENT FROM THOSE MADE BY THE TOW VEHICLE. Studying this will make it easier for you to correct mistakes. Truck or trailer type fender or door grip rear view mirrors are a must for maximum visibility and in most states they are required by law.

After thoroughly inspecting your hitch, brakes and tires you should be ready to tow. Check traffic, signal that you are about to pull away, and start slowly. Look often in your mirrors, and observe the action of the trailer, then carefully move into the proper lane of traffic. Remember that the trailer wheels will not follow the path of the tow vehicle wheels; therefore, WIDER TURNS ARE NECESSARY WHEN TURNING TO THE LEFT OR TO THE RIGHT.

ON FREEWAYS OR EXPRESSWAYS try to pick the lane you want and stay in it. Always maintain plenty of space between you and the car ahead, at least the length of the tow vehicle plus trailer for every ten miles per hour. Remember that in order to pass another vehicle you will need longer to accelerate. You must also allow for the length of the trailer when returning to the right hand lane.

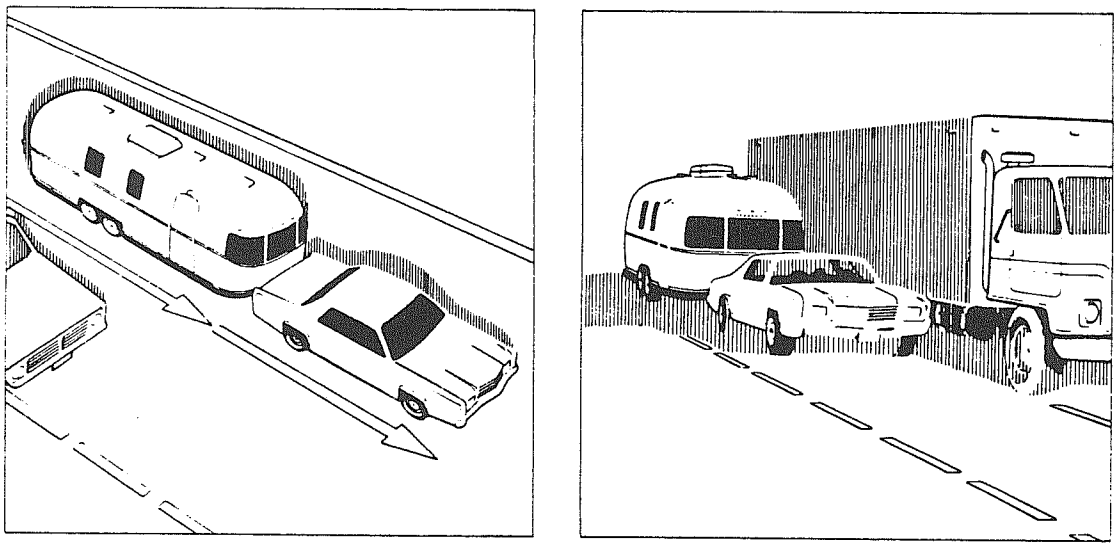


Tracking

On a two lane road cars will be lining up behind you because you travel at a lower speed. It is both courteous and sensible to signal, pull onto the shoulder, and let them pass. Your trailer is designed to be towed easily at any legal speed, so if you are not careful you may be inclined to forget it is there.

The BRAKE CONTROLLER is activated when you apply the brakes of the tow vehicle. Your tow vehicle brakes will automatically apply the trailer brakes first when properly adjusted. This will help keep your tow vehicle and trailer in a straight line and make you stop as if you were driving the tow vehicle alone.

When trailering you might encounter a temporary cooling system overload during severe conditions such as hot days when pulling on a long grade, when slowing down after higher speed driving, or driving long idle periods in traffic jams. If the hot indicator light comes on, or the temperature gauge indicates overheating and you have your air conditioner turned on, turn it off. Pull over in a safe place and put on your emergency brake. Don't turn off the engine. Increase the engine idle speed. Lift the engine hood and check for fluid leaks at the radiator overflow outlet. Check to see that all drive belts are intact and the fan is turning. If you have a problem have it fixed at the next opportunity. If there is no problem the light should go off or temperature should come down within one minute. Proceed on the highway a little slower. Ten minutes later resume normal driving.



Passing

WARNING: Never open a radiator cap when the tow vehicle is hot. Check the coolant level when the vehicle is cool.

When going downhill in dry weather, down shift so that engine compression will slow the whole rig down. Take dips and depressions in the road slowly and do not resume normal driving speeds until you are sure that the trailer wheels are clear of the dip.

WARNING: On slippery pavement do not use engine drag to help slow down as this may cause the rear wheels of the tow vehicle to skid. On icy pavement drive slowly and if you feel the tow vehicle skidding gently apply the trailer brakes only. This will bring the tow vehicle and trailer back into a single line. Chains do not help trailer wheels.

When driving in mud and sand let the momentum carry the rig through. Apply power gently and use as little as possible. Stay in the tracks of the vehicle ahead and keep the tow vehicle in the highest possible gear. If you get stuck it is best to tow out the entire rig together without unhitching.

If you have to tow long distance over bad roads, the stones and gravel thrown back by your tires will dent and scratch the finish of your trailer. To prevent this use masking tape to secure heavy cardboard to the lower front end of the trailer. Remove tape from trailer as soon as possible to avoid damage to the finish.

Despite the best hitch you will notice that whenever a large bus or truck overtakes your rig the displaced air first pushes the trailer rear slightly to the right and then affects the front. It may be necessary to steer very slightly, momentarily, toward the bus or truck to help compensate for the sway induced by the passing vehicle. Do not apply the vehicle brakes as this can tend to exaggerate the situation. You may find, however, that briefly applying the trailer brakes with your manual control will help eliminate sway.

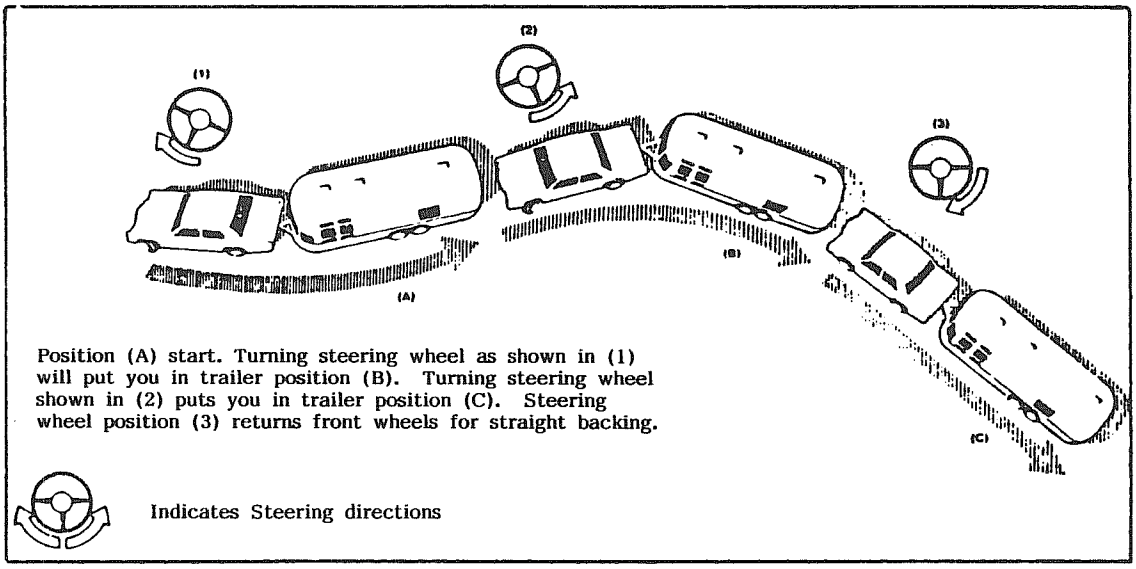
CAUTION: When stopping on a hill or slope, leaving your car in gear is not enough for standstill safety. CHOCK THE TRAILER WHEELS to be double sure. Do not use trailer brakes as parking brakes.

Backing Up

In BACKING UP the important thing to remember is to DO EVERYTHING SLOWLY and to correct immediately if you see the trailer turning the wrong way. Concentrate on the rear of the trailer. With your tow vehicle and trailer in a straight line back up slowly and turn the bottom of the steering wheel in the direction you want the trailer to go. Watch out the window or in the mirror until the rear of the trailer is pointing in the desired direction. Your car will be following the trailer in an arc. Straighten the car and trailer by turning the steering wheel more sharply, then when they are in line, straighten the steering wheel.

ALWAYS TRY TO BACK TO YOUR LEFT BECAUSE THE VISIBILITY IS MUCH BETTER. (See Illustration) When you don't make it on the first try it is usually much easier to pull forward to your original position and start over.

If your spouse or traveling companion normally directs you when backing they should position themselves forward of the tow vehicle so they can easily be seen by the driver. Their directions should always indicate to the driver the direction the rear of the trailer should go. A little practice in a parking lot with the person giving directions can save a lot of frustration when backing into a campsite.



Position (A) start. Turning steering wheel as shown in (1) will put you in trailer position (B). Turning steering wheel shown in (2) puts you in trailer position (C). Steering wheel position (3) returns front wheels for straight backing.

Indicates Steering directions

SUGGESTED PRE-TRAVEL CHECK LIST

Interior

1. Turn off water pump switch.
2. Check battery water level.
3. Close windows and vents.
4. Turn off gas.
5. Lock all interior cabinet doors.
6. Latch refrigerator door. (Seal containers first.)
7. Hold down or stack securely all loose, hard and sharp objects.
8. Fasten sliding and foldette doors.
9. Drain toilet bowl.
10. Turn off interior lights.
11. Set table in upright position.
12. Pull up or retract step.
13. Lower blinds and turn slats vertically.
14. Secure and lock main door.

Exterior

1. Disconnect and stow the electrical hookup cord, the sewer hookup hose (flush out), and the water hookup hose.
2. Turn off gas line shut off valve to appliances.
3. Remove or stow leveling jacks and wheel chocks.
4. Check Hitch: It must be properly attached.
5. Check safety chains and breakaway switch cable.
6. Fully retract jack. Remove and stow jack stand or wood block.
7. Check clearance and stop lights.
8. Check lug nuts.
9. Check tires for correct pressure.
10. Check that TV antenna is pointed forward and dipoles closed.
11. Adjust tow vehicle mirrors.
12. Pull forward some 50 ft., test brakes, and check site for forgotten objects and cleanliness.

Home

1. Leave house key with your neighbor.
2. Store valuables and important papers in a safe place.
3. Discontinue newspaper, milk and other deliveries.
4. Ask the Post Office to hold your mail for you.
5. Arrange with the telephone company for discontinued or "vacation service".
6. Arrange care for your pets.
7. Have your lawn, garden and houseplants cared for.
8. Lock all windows and doors securely. Keep shades open for a lived in look.
9. Cover all food to keep out mice and insects.
10. Eliminate all fire hazards. Place matches in a tin box or glass jar.
11. Store oil, gasoline and other flammables properly.
12. Destroy all newspapers, magazines and oily rags.
13. Notify police.

Trailer Equipment and Accessories

1. Water hose, 5/8" high pressure, tasteless, odorless, non-toxic.
2. "Y" connection - water hose.
3. Sewer hose with clamp.
4. Drain cap with hose drain.
5. Holding tank cleaner and deodorizer.
6. Power cord adapter 30 amp capacity.
7. 50 ft. electric cord, 12-3 wire.
8. 25 ft. electric cord, 10-3 wire, 30 amp capacity.
9. Wood blocks for leveling.
10. Wheel chocks.
11. Hydraulic jacks.
12. Cross type lug wrench.
13. Quality tire gauge.
14. Emergency road warning triangle.

Personal

1. Automobile insurance to cover you and your family fully.
2. Avoid cash. Use travelers checks and credit cards.
3. Confirm reservations.
4. Have sunglasses for everyone.
5. Pack cameras and films.
6. Make a check list of clothing for everyone, and toilet articles.

Motoring Essentials

1. Display car and trailer registration properly.
2. Carry driver's license. In Canada you will need a non-resident liability insurance card.
3. In Mexico you must have special auto insurance.
4. Carry an extra set of ignition and trunk keys in a separate pocket, or in your wallet.
5. Keep an operating flashlight with fresh batteries in the glove compartment.
6. Pack the trunk so that you can reach the tools and spare tire without completely unpacking.
7. Keep sharp or hard articles securely packed wherever they may be.
8. Do not pack things in the passenger seating area. You need the maximum space for comfort.
9. Wear easy-wash, drip-dry traveling clothes.
10. Do not make your vacation trips a mileage marathon. Stop and relax frequently.
11. Carry a first aid kit.
12. Carry your pet's dish, food, leash and health and registration papers.

NOTES

CAMPING

SAFETY

As always, safety should be one of your top priorities. Make sure you, and everyone traveling with you, can operate the man door and exit window rapidly without light.

WARNING: **The escape window (which is the rear, center window) is opened by lifting up both latches, then turning toward the center. Push out on the glass and it will swing clear. The window operation should be checked each trip and the latches lubricated with WD-40 or equivalent every six months. A loop is provided in the SCREEN RETAINING SPLINE so it can be rapidly removed. Models with two doors will not have the exit window.**

WARNING: **At each campsite make sure you have not parked in such a manner as to block the operation of the escape window by being too close to trees, fences or other impediments. Scenic views are one reason for traveling, but don't park so the beautiful lake or steep cliff is just outside your escape window.**

WARNING: **Read the directions carefully on the fire extinguisher. If there is any doubt on the operation, you and your family should practice, then replace or recharge the extinguisher. You will find your local fire department will be happy to assist you and answer any questions.**

WARNING: **Don't smoke in bed!**

Keep matches out of reach of small children!

Don't clean with flammable material!

Keep flammable material away from open flame!

We have all heard these warning many times; but, they are still among the leading causes of fires.

Other safety information on the LPG system of your trailer is located in the Plumbing Section of this manual.

OVERNIGHT STOP

Airstream owners have parked virtually every place imaginable from filling stations to farm lands. In time you will develop a knack for spotting wonderful little roadside locations by turning off the main highway and exploring.

There are many modern trailer parks including State, County and Federal parks with good facilities where you may obtain hookups of electrical, water and sewer connections. Directories are published which describe in detail these parks and tell what is available in the way of services and hookups.

On overnight or weekend trips chances are you will not use up the capacity of the sewage holding tank, deplete the water supply or run down the battery which supplies the 12 volt current.

On a longer trip, when you have stayed where sewer connections and utility hookups were not available, it will be necessary for you to stop from time to time to dispose of the waste in the holding tank and replenish the water supply. Many gas stations (chain and individually owned) have installed Sanitary Dumping Stations for just this purpose. Booklets are available which list these dumping stations.

When stopping for the night your Airstream is built to be safely parked in any spot that is relatively level and where the ground is firm. Your facilities are with you. You are self-contained. Unless the tow vehicle is needed for transportation, it is not necessary to unhitch.

WARNING: Do not park in a manner that would prevent the rear escape window from opening.

Try to pick as level a parking spot as possible. Stabilizing jacks or blocks probably won't be required for an overnight stay. However, if you put the jack pad on the hitch jack and run the hitch jack down to take the weight off the car's springs this will provide some stability. If you must park on a slope, PARK FACING DOWNHILL. It is easier to level the trailer this way.

Although your refrigerator may operate off level, the longevity of the cooling unit will decrease. Keep the bubble of the refrigerator level within the circle and it will be fine.

All you need to do to enjoy the self-contained luxury of your Airstream is to turn on the LP gas and light any appliances with pilots.

Before moving on, check your campsite both for cleanliness and also to be sure you haven't left anything behind. Turn off the gas supply and make sure everything is properly stowed. Use your PRE-TRAVEL CHECK LIST and you are ready for more travel adventure.

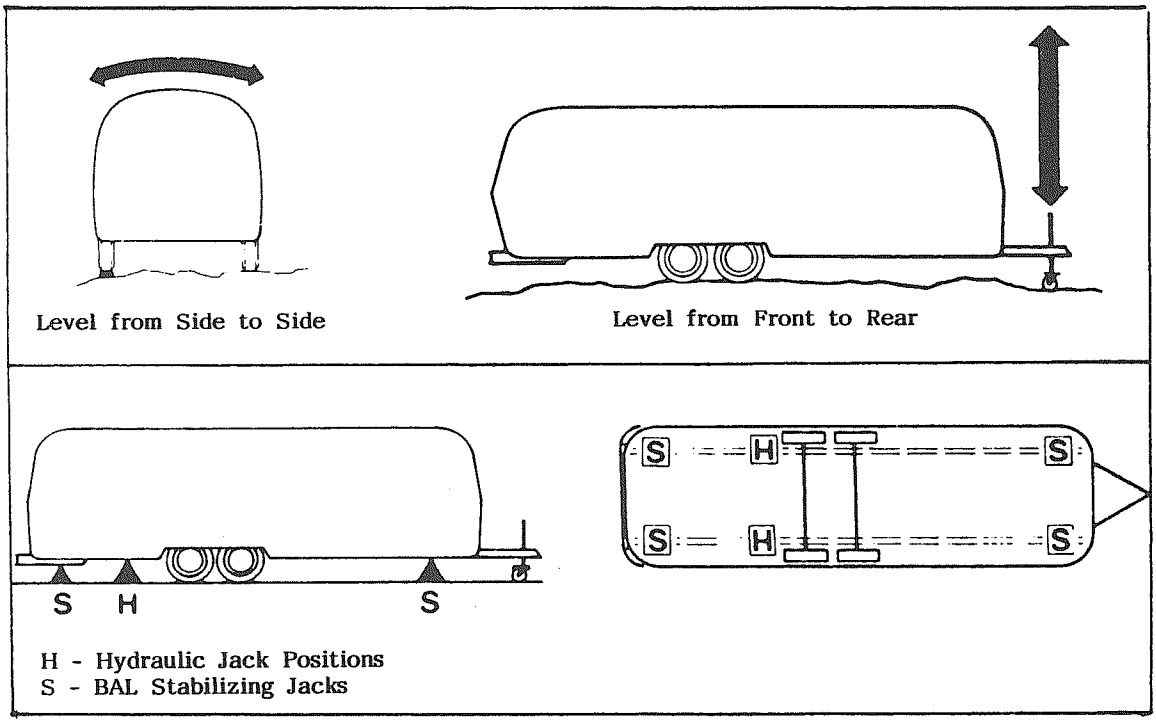
EXTENDED STAY

Making a long trip in your Airstream is not very different from making a weekend excursion. Since everything you need is right at hand, you are at home wherever you go. When packing for an extended trip take everything you need, but only what you need.

When you plan to stay in the same place for several days, weeks or months, you will want your trailer to be as level and steady as possible. Check the attitude with a small spirit level set on the inside work counter or the trailer hitch "A-Frame". (See Diagram Below) If a correction is necessary then YOU MUST LEVEL FROM SIDE TO SIDE FIRST. This can be done easily by backing the trailer up one or more 2" x 6" boards. (See Diagram) We do not recommend placing tires in a hole for leveling.

LEVEL FROM FRONT TO REAR by disconnecting the hitch from the tow vehicle, putting the jack pad under the hitch jack and adjusting the jack up or down until you are level. Block or chock the wheels to keep the trailer from rolling. Use STABILIZING JACKS at all four corners as shown in the diagram to eliminate the natural spring action of the axles. Optional STABILIZING JACKS, whether manual or power, should only be used to stabilize trailer.

WARNING: Whenever the trailer must be lifted with a jack, as when changing a tire or leveling on very rough terrain, ALWAYS PLACE THE LIFTING JACK UNDER THE MAIN FRAME RAIL. A label is provided to indicate the proper position for the jack. NEVER USE STABILIZING JACKS TO LIFT THE TRAILER.



HOOK UP TO WATER (See Fig. 4) by attaching a 1/2" minimum high pressure water hose to the city water service.

Plug the ELECTRICAL CABLE (See Fig. 5) which is stored in the bumper storage compartment into the CITY POWER SERVICE. If your trailer is equipped with a power cord reel do not pull it out more than a foot or two past the white tape wrapped on the cord. Pulling the cord completely out to the stop will make rewinding difficult, if not impossible.

Hook your WATER DRAIN HOSE (See Fig. 6) in the SEWER DISPOSAL FACILITY and attach to the drain outlet in your trailer.

Turn on gas supply. Light the range and oven pilots. Turn on the water heater, refrigerator and furnace.

When you stay for an extended period where electric or water hokups are not available, you must make regular checks on the condition of your 12 volt battery by hooking up the tow vehicle/trailer electrical connector and running the tow vehicle engine at a fast idle. 45 minutes per day should provide about 3-4 hours of power. Carry drinking water in a clean bucket to refill your tank. When your waste tank nears capacity move to a dumping location.

The CABLE TV and TELEPHONE hookups, if so equipped, are located in the small aluminum access door on the roadside rear of the trailer. The interior telephone jack will be located in close proximity to the TV antenna control module.

WARNING: Check your rear escape window to make sure it will open completely. Also make sure the terrain under the window is suitable for rapid exiting.

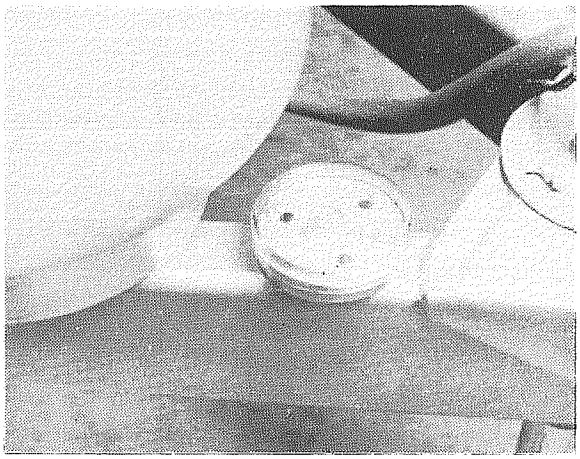


Fig. 1 - Spirit Level

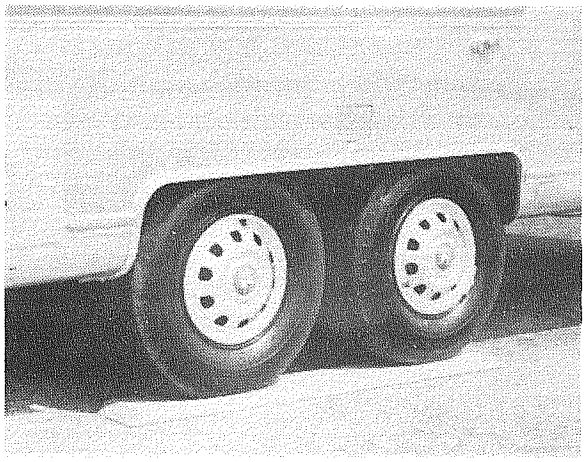


Fig. 2 - Trailer Leveling

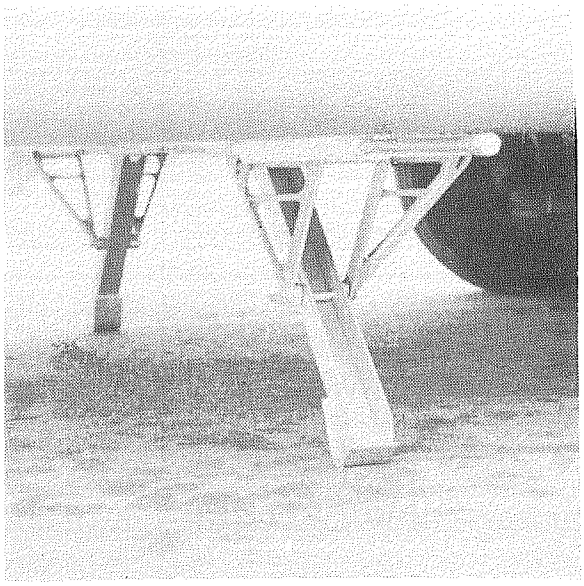


Fig. 3 - B.A.L. Stabilizing Jack

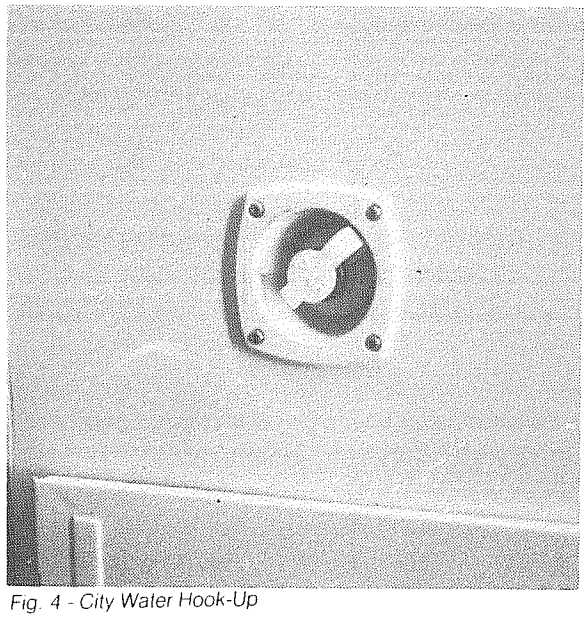


Fig. 4 - City Water Hook-Up

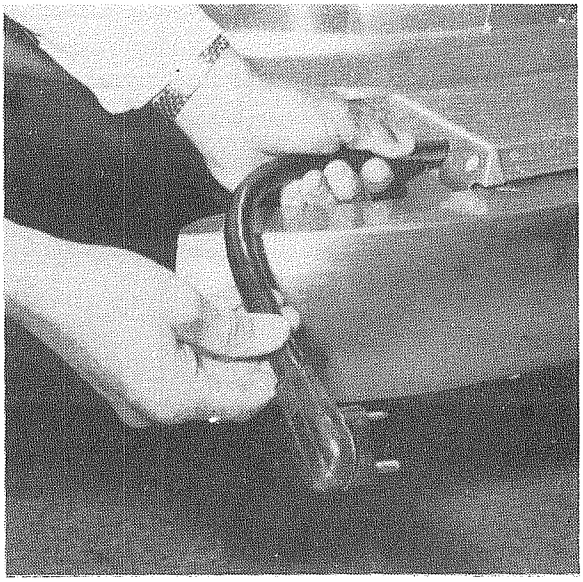


Fig. 5 - 120 Volt Electrical Cable

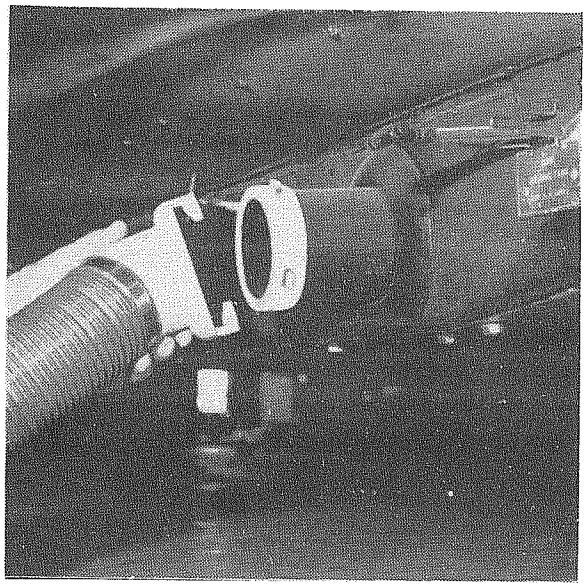


Fig. 6 - Waste Drain Hose Hook-Up

WINTER TRAVELING

Traveling in sub-freezing temperatures will require certain precautions to protect the plumbing system and your personal belongings from being damaged by freezing.

Whenever possible the heat should be kept on at a constant temperature. It is easier for the furnace to keep a constant room temperature than for the trailer temperature to be allowed to drop to 50 degrees Fahrenheit then attempt to raise it to room temperature.

WARNING: Always shut off the LP gas when gasoline is added to the tow vehicle.

Some states do not allow LPG to be turned on while moving. While traveling in these states you must use your common sense. How cold is it? How long will it be before you can turn the heat back on? Is the temperature dropping or raising? Remember, when towing at 50 MPH the wind chill factor will cause the interior of the trailer to cool much faster than a trailer that is parked.

When parked in sub-freezing temperatures make sure you keep a full supply of LP gas and plug into a 110 volt power source whenever possible. A fully charged battery will not last more than 8 to 10 hours if the furnace is running almost constantly and 110 volt power is not available.

Leave cabinet doors, wardrobes and bed doors partially open to allow warm air to circulate around plumbing lines and fixtures. Insulate and/or wrap your exterior water lines with heat tape.

It is also important to guard against excessive humidity. Cold air will not hold the moisture, and "sweating" will occur around window frames, on window glass and may occur where structural beams connect the inner and outer walls of the trailer. The best method to combat sweating is to hold water vapor producing functions to a minimum. Boiling water, baths, showers, washing dishes are necessities, but usually can be reduced. Opening windows just slightly on opposite sides of the trailer will also help alleviate the problem. In severe conditions you may want to use a small dehumidifier to aid in reducing condensation.

Note: The Airstream trailer is built as a recreational vehicle and is not intended as a permanent dwelling or for more than temporary use in sub-freezing temperatures.

EXTERIOR

Cleaning

The clear plasticoat finish applied to the outer surfaces has been specifically formulated by Airstream to provide maximum protection for the shiny aluminum surface. The plasticoat formula includes special plasticizers used to keep the coating flexible so that it can cope with aluminum's high coefficient of expansion. This flexibility, however, results in a surface coat which is of necessity somewhat softer than automotive acrylic lacquer finishes.

CAUTION: For this reason, ABRASIVE POLISHES OR CLEANING SOLVENTS SUCH AS AUTOMATIC DISHWASHER OR ACID ETCH CLEANERS ARE TOO STRONG AND SHOULD NEVER BE USED.

As a general rule of thumb we recommend the trailer be washed about every four weeks and waxed in the spring and fall. To make sure your new unit is always protected you should wax it immediately or have your dealer wax it just prior to delivery. In industrial areas cleaning and waxing should be done on a more frequent schedule.

ALWAYS CLEAN YOUR TRAILER IN THE SHADE OR ON A CLOUDY DAY WHEN THE ALUMINUM SKIN IS COOL. Oil, grease, dust and dirt may be removed by washing with any mild non-abrasive soap or detergent. Cleaning should be followed by a thorough clean water rinse. Spots and streaks may be prevented by drying the unit with a chamois or a soft cloth. WHEN WASHING OR POLISHING YOUR TRAILER, ALWAYS WIPE "WITH" THE GRAIN OF THE METAL.

After cleaning and drying, a good grade of non-abrasive automotive paste or liquid wax will increase the life of the finish, especially in coastal areas where the finish is exposed to salt air or in polluted industrial areas. It will also protect the shell from minor scratches and make subsequent cleaning easier.

It is important to remove sap, gum, resin, asphalt, etc. as soon as possible after they appear by washing and rewaxing. Sunlight and time will bake-harden these materials making them almost impossible to remove without heavy buffing. If asphalt remains on the trailer after washing, use a small amount of kerosene on a rag and wipe the spots individually, being careful not to scratch the finish.

There is no painting process today that has an indefinite life. Plasticoat is no exception to this rule. If the plasticoat loses its flexibility it will tend to crack and peel and the resulting aluminum exposure is subject to oxidation. If cracking or peeling do occur, temporary repairs may be made by applying "Clear RV Acrylic" available in aerosol containers through the Wally Byam Store at your Airstream dealer. It's important that you protect the aluminum from oxidation to keep its original appearance.

To keep your trailer looking new, paint the "A" frame, LPG tanks, and rear frame periodically.

It is recommended that the caulking and sealant used in external seams and joints such as end shell segments and around window frames, light bezels, beltline and rub rail molding, etc. be checked regularly. If this material has dried out and become cracked or checked, or if a portion has fallen out, it should be replaced with fresh material to prevent possible rain leaks. Caulking and sealing material is available from your Airstream dealer.

Main Door

IT IS IMPORTANT THAT THE MAIN DOOR BE COMPLETELY CLOSED AND LOCKED DURING TOWING. If it is not locked, the constant vibration of travel may cause it to open with possible damage.

For your security the lock has been designed as a DEAD BOLT. For this reason never try to shut the door when the striker is in the locked position. The door is properly closed when the handle is firm. If the door is difficult to open, push in to release the latch. When the door swings fully open it will automatically latch against the side of the trailer.

An additional keyed dead bolt is an option on the trailers. To unlock, insert key, turn clockwise as far as possible, then return key to vertical position allowing it to be withdrawn. To unlock, repeat procedure, only turn in the opposite direction.

Screen Door

The screen door secures to the main door by means of a slide bolt type latch. It can be operated independently by releasing the slide bolt and swinging the screen door away from the main door. A roller catch is provided to secure the screen door to the frame when closed.

Step

To operate the fold-away step just press down on either side of the latch bar and the step will automatically drop into position. To stow the step simply lift the front edge and then push it up under the trailer to its stowed position.

The optional extension step available with fold-away step is permanently attached to the main step and when needed it is simply flipped out.

CAUTION: Never travel with step lowered or extended.

Exterior Windows

The windows in your trailer are of tempered safety plate glass. To open: release the two lever locks at the bottom, lift up on the two side operator handles until the window is in the desired position, and place the operators into one of the three positioning slots on the side of the frame. To lock the windows reverse this position

Note: The rear window is designed as an emergency escape exit. The rubber spline holding the screen in place is looped so it can be pulled out in one swift motion.

You and all your family should practice escape procedures so they can be rapidly accomplished even in total darkness.

WARNING: Never park your trailer so the rear window cannot be easily used for emergency exits.

Clean your trailer windows the same way you clean the windows in your home. Clean the seals with a damp cloth or mild detergent every three to six months, taking care not to use strong solvents as they will damage the seals. A coat of natural silicone lubricant applied after the seal has dried will keep it flexible. Spread the lubricant evenly with a brush or finger, working it into the surface.

This is a good practice for all rubber seals in your trailer. For replacement of a damaged window contact an Airstream Service Center.

Your PLASTIC SCREENS are easy to maintain. Just clean occasionally with a damp cloth. **Note:** They will melt at the point of contact if touched by a cigarette.

Vista View Windows

Vista view windows, optional on some models, allow for interior lighting while maintaining privacy. They are equipped with integral shades.

Awnings

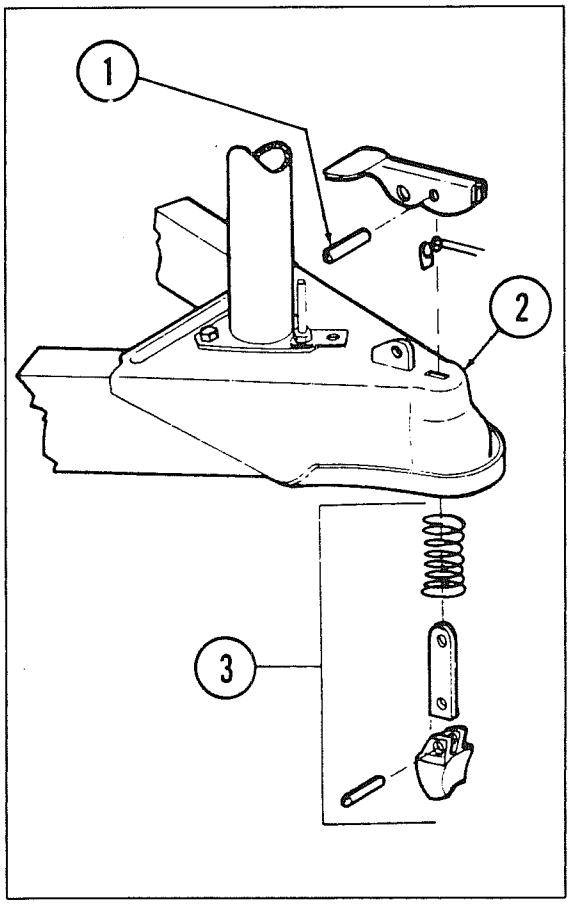
Complete instructions have been provided with your awning. You should make sure your traveling companion is familiar with the operation of the awning. If a sudden wind should come up, or if high wind is forecast, the awning should be retracted and stowed.

Chassis

The standard RECOMMENDED HITCH BALL HEIGHT for your Airstream is 18 3/4". If you plan long trips with the trailer heavily loaded you should check your trailer, after loading, to determine the optimum height. To check, park the trailer on a level surface and crank the front jack up or down until the measurement from the frame to the ground is the same front and rear. Measure from the ground to the upper surface of the hitch ball coupler Add one inch to this figure when setting the ball height on the tow vehicle to allow for the suspension settling under the added weight.

The LATCH ASSEMBLY on your coupling is a relatively simple mechanism, easily removed for cleaning. To remove use a proper size punch to drive the roll pin (see illustration) out of the latch handle. The tongue and spring will then fall free from the housing. When reassembling, compressing the roll pin with vice grip type pliers will make it easier to start through the hole.

1. Roll Pin
2. Coupler Housing
3. Tongue & Spring Assy



OPTIONAL POWER JACK

The optional power jack is operated by a switch located on the bottom of the housing. There is a protective cover screwed over the switch to discourage children from operating the jack and running the battery down. When the jack is fully extended or retracted internal limit switches automatically shut off the motor.

Should an electrical failure occur, remove the power head by loosening the two allen set screws. The jack post may now be operated manually by inserting the emergency handle into the coupling on top of the post.

Replacing Power Head

It is essential that the following procedure is used before the power head is replaced on the post.

1. With 12 volts connected, ground the power head to trailer "A" frame. Operate main switch in "post retracting direction" until the motor stops automatically.

2. Using emergency handle, crank post clockwise by hand until fully retracted, then turn crank one turn counterclockwise.

3. Replace head on post and make sure that drive pin is engaged with post coupler. Tighten allen set screws.

Maintenance

1. Every two years remove screws and cover and check grease condition. Use a HMP grease similar to Lubriplate 630AA and spread on gear teeth. Grease is not required on the nylon timing gears. No internal lubrication of the post is required, but an occasional external application of a silicone or WD-40 spray lubricant on the inner tube of the post when extended is permissible.

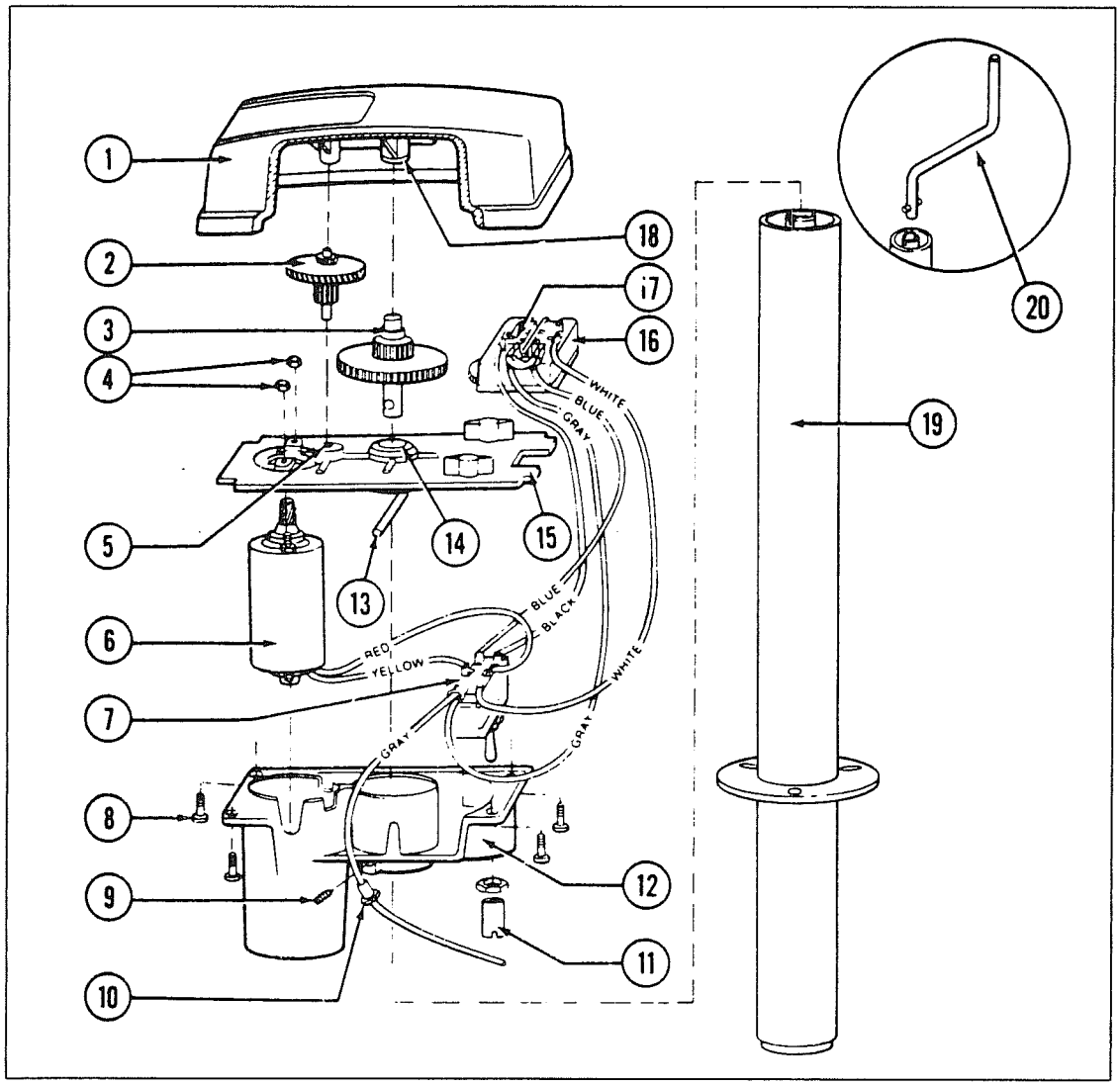
2. Before replacing the cover ensure that the plate and limit switch unit are located correctly.

3. Apply a little sealing compound around the mating surface of the gear cover and replace screws tightening them diagonally. Check synchronization if head has been removed from the post.

4. A little penetrating oil on the allen set screws occasionally will help prevent corrosion and difficult removal.

Note: Leave tow vehicle transmission in neutral when lifting both units. Dolly wheels are not recommended. Always retract stabilizing jacks before using your Super Jack under load.

SUPER POWER JACK ASSEMBLY



1. Cover
2. 2nd/3rd gear assy
3. Drive gear assy
4. Lock nut, No 10-24
5. Bushing, No 3, 3/16" ID x 5/16 OD x 1/4"
6. Motor assembly
7. Toggle Switch
8. Screw No 8 x 1/2" type 23 PH Phillips
9. Set screw 1/4" -20 x 5/16"
10. Strain relief bushing
11. Metal switch cover
12. Motor and switch housing
13. Groove type pin
14. Bushing 7/16" ID x 5/8 OD x 5/8".
15. Plate centering
16. Limit switch assembly
17. Micro switch
18. Bushing No 2, 5/16" ID x 7/16" OD x 3/8"
19. Mechanical ball jack post (less power head)
20. Emergency handle
21. Hex wrench (not shown)
22. Power jack stand (not shown)

TIRES

Your trailer is equipped at the factory with name brand trailer tires. Airstream dealers cannot make adjustments to tires. This must be done by a dealer who handles that particular brand. If you ever have tire problems check the local telephone directory for the nearest dealer.

To get the maximum performance from your tires check the air pressure often, but only when the tires are cool. Never bleed out air immediately after driving. Recommended tire pressures vary with tire type and size. For pressures refer to the SPECIFICATION TABLE.

WARNING: It is also important to periodically check on the tightness of lug nuts. They should be tightened to a torque of 90 to 95 ft. pounds on both the steel and forged aluminum wheels. Care should be taken at all times when handling the forged aluminum wheel because of possible damage to its appearance.

In warm climates park out of the sun whenever possible. In desert regions use the tire covers to prevent ultra-violet deterioration to tires.

TO CHANGE A TIRE with a jack see the label affixed to the underbelly just to the rear of the wheels. This label, [Jack ↓] points to the plate riveted to the main frame where the jack head must be placed. A flat tire may also be changed without the aid of a jack. Drive the unit up a ramp 8" wide, 6" high and about 3 fee long at the base. Position the good tire on the ramp. This will raise the flat tire clear of the ground.

WARNING: Never attempt to change any tire without securely chocking remaining wheels. Never position yourself in a manner where a raised trailer can come down on you if it should become dislodged from a jack or ramp.

All tire, wheel, hub and drum assemblies are balanced at the factory. Be sure to rebalance the tire, wheel, hub and drum assemblies each time a tire is changed or rotated.

WARNING: When removing aluminum forged wheels from spindle, it is very important to mark them to assure the wheel is placed in the same position of the drum when reinstalling. If the aluminum forged wheel is to be mounted on a different drum it is important to sand all loose corrosion from the mating surfaces.

In an emergency remove the flat tire. The independent suspension of the Dura-Torque Axle allows four or six wheel units to be safely towed on three or five wheels for a short distance (100 miles maximum) and only at a low speed (30 MPH).

Be especially cautious in crossing holes or dips in the road. Under these circumstances it is good practice to set your rear view mirrors so that you can observe your tires at all time.

Tips on Tire Care

Any tire, no matter how well constructed, may fail in use as a result of punctures, impact damage, improper inflation or other conditions resulting from use. Tire failures may create a risk of property damage or personal injury. To reduce the risk of tire failure we strongly recommend the following:

1. Check the pressure in your tires, including your spare, at least monthly when the tires are cool (after the vehicle has stopped three hours and then driven less than one mile.) Do not reduce pressure when tires are hot. Use a tire gauge to check pressure and maintain it at the recommended level.

2. Never overload your tires. The maximum load carrying capability of your tires is molded on the sidewall of the tire.

3. Check your tires frequently for scrapes, bulges, separations, cuts or snags resulting from use. See your tire dealer immediately if any such condition is discovered.

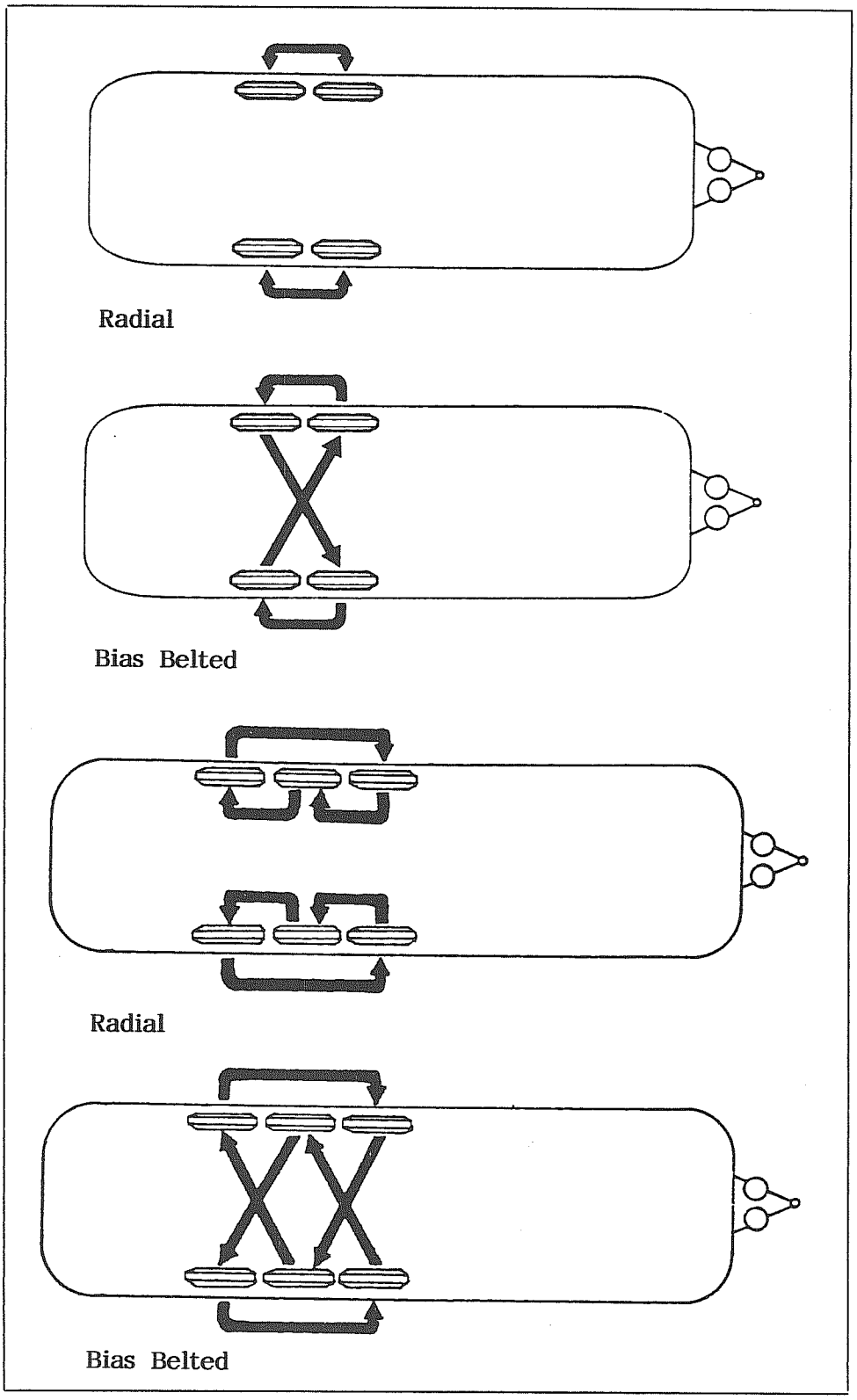
4. Never operate your vehicle in excess of lawful speeds or the maximum speeds justified by driving conditions, or in excess of speeds recommended for the tire you are using.

5. Make every effort to avoid running over objects that may damage the tire through impact or cutting, such as chuckholes, glass, metal, etc.

6. Never drive on smooth tires. Tires should be removed when 2/32nds inch of tread depth remains. In most states it is illegal to drive with less than 2/32nds inch remaining tread depth.

TIRE ROTATION

(10,000 Mile Intervals)



AXLE AND RUNNING GEAR ASSEMBLY

Each Airstream DURA TORQUE axle is aligned during manufacturing, and double checked on a random basis. Alignment after delivery is the customer's responsibility.

Hitting chuck holes or rough railroad tracks while going straight will only cause misalignment after the tire has been struck many repetitive times. Of course, a deep enough hole can affect the alignment immediately.

The worse culprit is curbs because they are normally struck at an angle. Surprisingly rear axles are occasionally damaged when people are attempting to park beside a curb and are backing up their trailer.

As you look under your trailer is it normal for the axle to be bent up in the middle. This bend is how the camber is obtained.

Toe-in is built into the axle by very slight bends in the axle tube on each end.

Should tire wear ever indicate misalignment check with your dealer for the nearest location having the proper equipment.

CAUTION: Never allow heat to be applied to the axle tube since the rubber providing the spring torsion action will be severely damaged.

Dura Torque Axle Alignment Specifications

Toe-In each side 1/16"	Tolerance 1/16" + or -
Camber each side 3/4° Pos	Tolerance 3/4° + or -

Wheel Bearing Maintenance

1. Jack trailer at marked jack location pad behind axle on main frame.
2. Remove hub cap or spindle cover, wheel and tire.
3. Remove dust cap.
4. Remove cotter pin.
5. Remove spindle nut and washer.
6. Remove bearings, hub and rotor.
7. Lay down hub and rotor with inside grease seal down. Knock out inner bearing and grease seal using wood or plastic dowel and hammer.
8. Clean all parts thoroughly with kerosene.

9. Check all bearings and races for chips or roughness of any kind. Any damaged component must be replaced.

10. Pack bearing with a good grease (No 2 grade-265 ASTM penetration or equivalent).

11. Install inner bearing.

12. Install new grease seal in hub and rotor using wooden or rawhide mallet.

13. Install hub and drum on spindle.

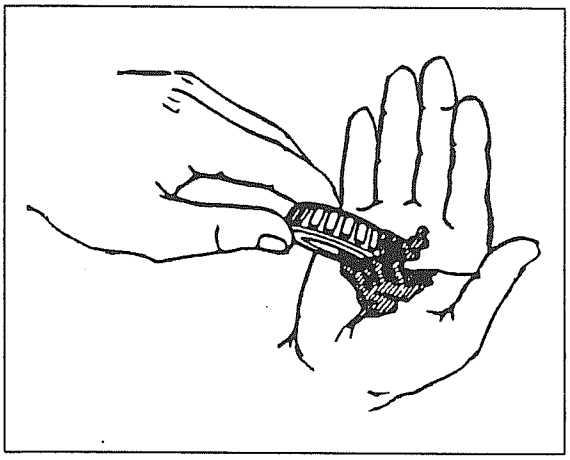
14. Install outer bearing.

15. Install washer and spindle nut.

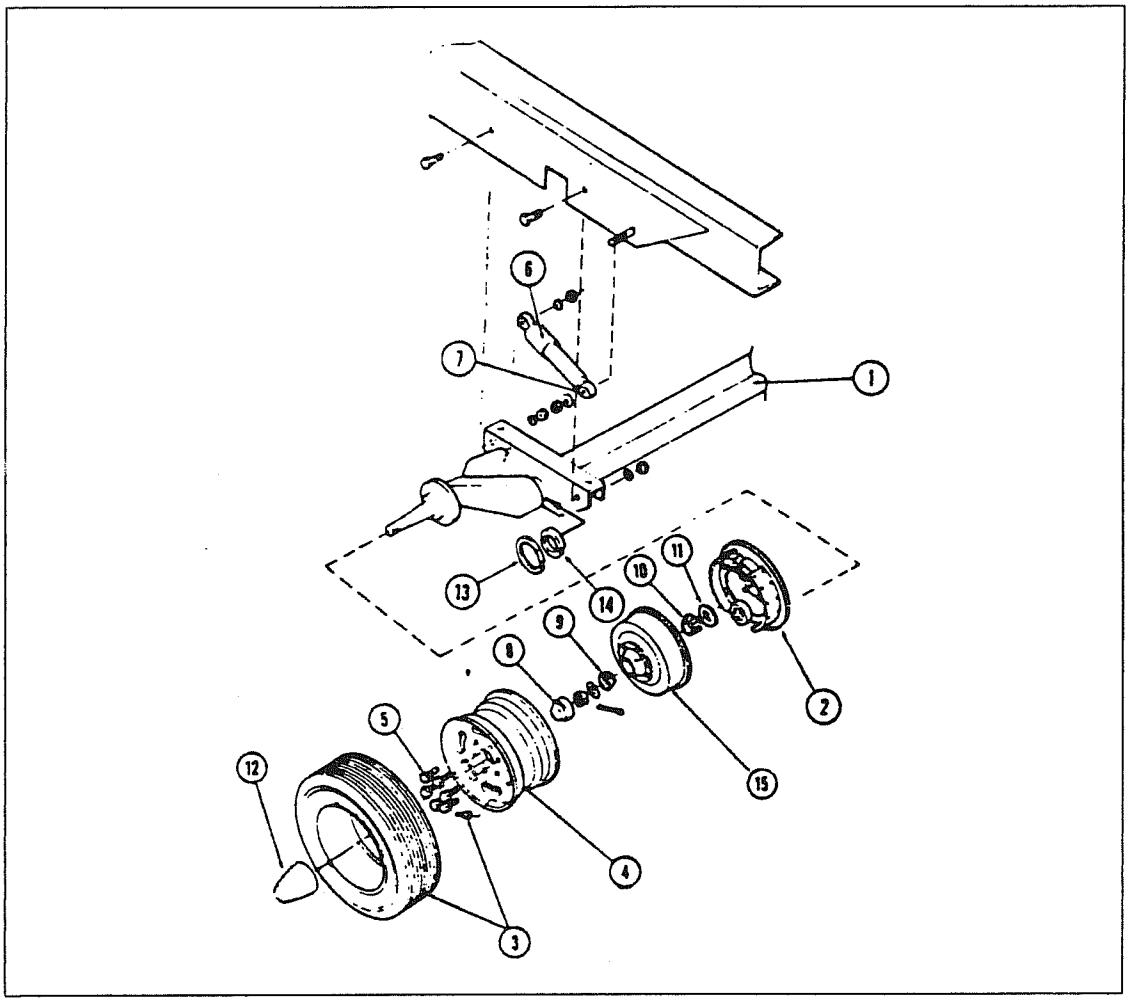
16. While rotating the wheel, tighten the spindle nut with a 12" wrench until there is a slight tension. Then back off one notch and install cotter pin. There should now be from .001" to .010" end play in hub. If not, back off one more notch.

17. Check and retighten the lug bolts, if necessary, every 50 miles for the first 200 miles of travel. They should be tightened to torque of 90-95 ft. lbs.

When greasing bearings by hand, place a glob of grease in the palm of one hand and push the large end of the bearing down into the grease (see illustration). Keep turning the bearing around and forcing it down through the grease until the grease is extruded up through the opposite end. Wipe the extra grease in your hand around the outside of the bearing. It's not necessary to fill the hub and dust cap with grease.



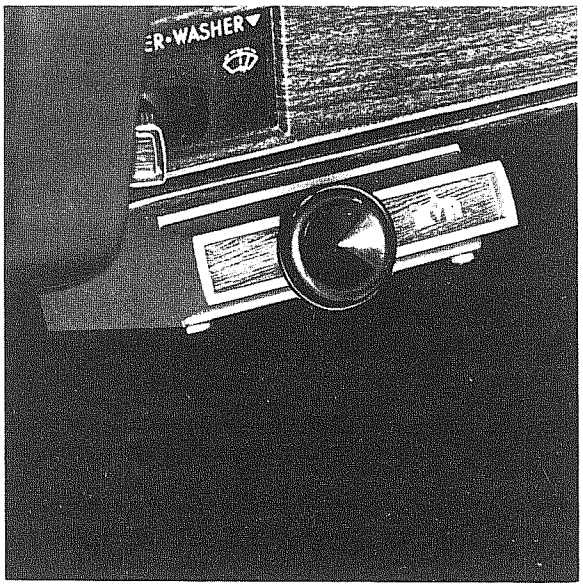
AXLE AND RUNNING GEAR ASSEMBLY



1. Dura Torque Axle
2. Brake Set
3. Valve Stem
4. Wheel
5. Lug Nuts
6. Shock Absorber
7. Shock Absorber Bushing
8. Dust Cover
9. Outer Bearing
10. Inner Bearing
11. Grease Seal
12. Spindle Cover
13. Retainer Ring
14. Nylon Bushing
15. Unicast Hub and Drum

ELECTRIC BRAKES

A CONTROLLER installed in your tow vehicle will synchronize the trailer brakes with your car brakes. It is designed to apply the trailer brakes whenever the tow vehicle brakes are applied.



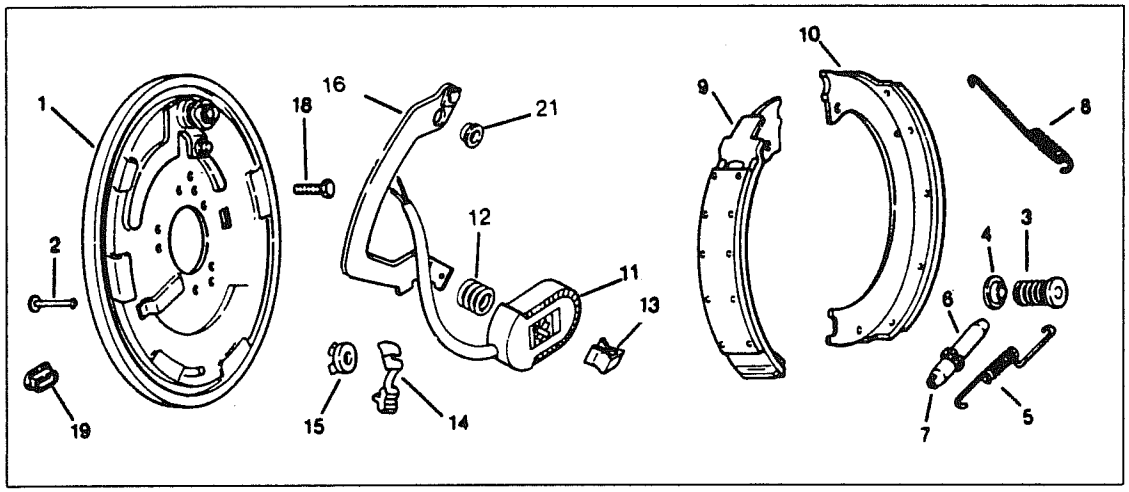
The controller handle adjustment affects the rate of application of the trailer brakes. This adjustment has no bearing on the maximum braking capacity of the trailer brakes. Because of the wide variety of towing vehicles and trailers it is necessary to balance the trailer brakes with the tow vehicle brakes to provide for a safe, comfortable stop. This adjustment should be made to provide for a slight lead of the trailer brakes over the tow vehicle brakes. Turning the handle clockwise will decrease the rate of application of the trailer brakes, while counterclockwise will increase the rate of application. When the desired setting is reached, the controller will hold the adjustment, but may be varied at any time by rotating the handle as described above. After this adjustment there should be no sensation of the trailer pushing the car during a stop, nor should there be an excessive sensation of the trailer pulling the car during a stop.

In THE EVENT OF AN ACCIDENTAL SEPARATION of the tow car and trailer, the BREAKAWAY SWITCH will set and lock the trailer brakes for a sufficient length of time to stop the trailer. The switch is activated when the small pin in the front of the unit is pulled out by the wire attached to it and to the car. THIS PIN SHOULD BE PULLED OUT, LUBRICATED WITH LIGHT HOUSEHOLD OIL AND REPLACED EVERY 90 DAYS.

To prevent corrosion within the breakaway switch, pull the switch's pin straight forward and spray the inside of the switch through the hole with an electric contact cleaner (such as Spra-Kleen) and reinsert the pin. A drop of light household oil on the groove near the base of the pin will allow the pin to operate freely. WHEN THE TRAILER IS CONNECTED TO THE TOW CAR, THE BREAK-AWAY SWITCH LOOP SHOULD BE ATTACHED TO THE PERMANENT FRAME OF YOUR HITCH. When disconnecting trailer from tow vehicle remove wire loop from the frame. DO NOT REMOVE PIN FROM SWITCH BECAUSE THIS WILL APPLY THE TRAILER BRAKES.

CAUTION: Do not use break-away switch for parking brake.

Backing Plate and Shoe Assembly



1. Backing Plate Assy
2. Hold Down Pin
3. Hold Down Cup w/Spring
4. Hold Down cup
5. Adjusting Screw Spring
6. Adjusting Screw Assembly
7. Adjusting Socket
8. Shoe Retractor Spring
9. Primary Shoe & Lining
10. Secondary Shoe & Lining
11. Grooved Magnet 12"
12. Magnet Spring
13. Magnet Retaining Clip
14. Strain Relief
15. Strain Relief Adapter
16. Magnet Lever Arm Assy
17. Wire Loom
18. Bolt - 3/8 for 5 Bolts
19. Plug, Adj. Slot
21. Bushing Lever Arm

Brake Adjustment

1. This should be done at least every year or 10,000 miles whichever comes first.

2. Jack trailer at marked jack location pad behind axle on main frame.

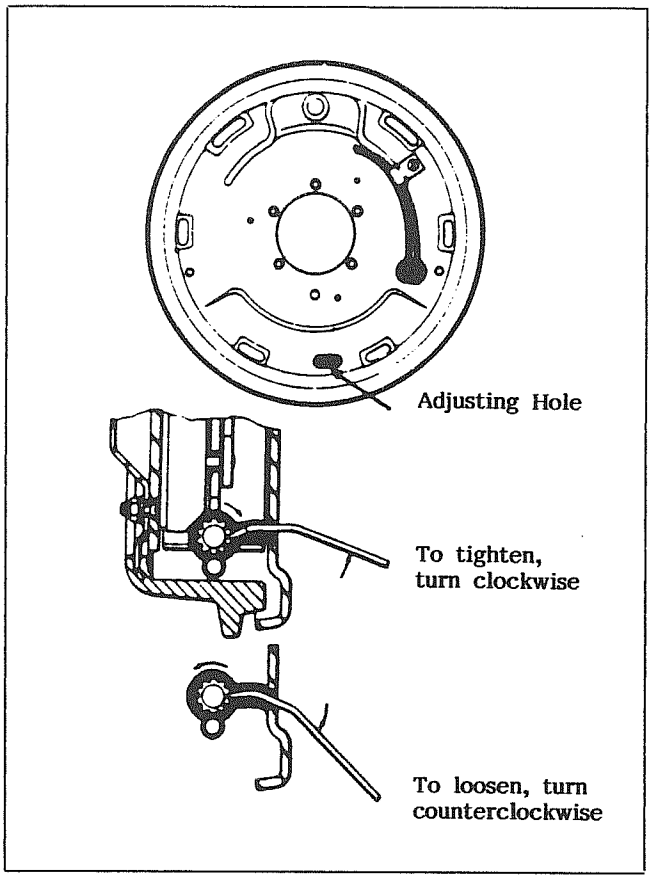
3. Remove the small rubber plug at the base of the backing plate.

4. While turning the wheel and tires, tighten the brakes (See Diagram) using a brake adjusting tool or a screw driver bent to a 90 degree angle until the wheel has a heavy drag. Then back off until the wheel turns freely.

5. Replace rubber plug.

6. Repeat this operation with all trailer wheels.

Brake Adjustment



Brake Assembly Removal and Installation

1. Jack trailer at marked jack location and behind axle on main frame.

2. Index marks should be added to wheel and drum. Realign these marks when replacing wheel, thus eliminating the need for wheel/drum rebalance.

3. Remove hub cap or spindle cover, wheel and tire.

4. Remove dust cap.

5. Remove cotter pin.

6. Remove spindle nut and washer.

7. Remove hub/drum and outer bearing.

8. Remove brake by taking off five bolts attaching brake to brake flange and spindle.

9. To install, reverse procedure. Be sure bearings are clean before installing.

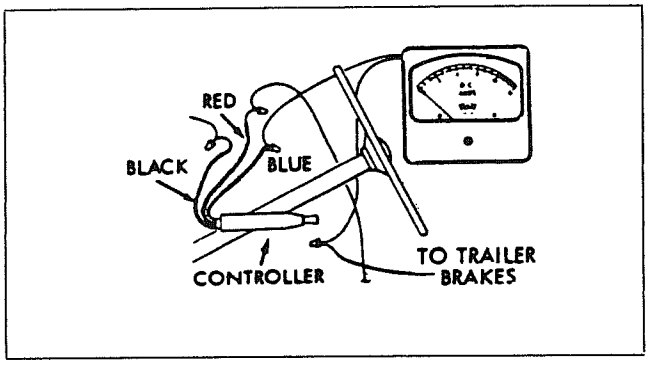
Checking, Repairing and Replacing Electrical Components (After brake assembly removal.)

1. Test Instrument.

   In order to properly check the electrical circuit and components, a D.C. ammeter having a range of approximately 0-15 amps should be used.

2. Test the circuit.

   First check the continuity of the system. To do this connect the trailer to the towing vehicle, then place the ammeter in the circuit as shown in diagram below.



Note: You can avoid possible damage to the ammeter by connecting one lead, then just touch the other lead quickly. If the needle goes the wrong way you have reversed the polarity. To correct, simply reverse the leads, then complete the connection. Now operate the controller slowly. The cut-in, or lowest current should read from 2 to 3 amps. Move lever completely to right. Amp reading should be 12.0 or 13.0 amps. These values are without the selective resistor in the circuit. It should be bypassed by putting both wires on a common terminal.

If the ammeter registers the correct high and low reading and shows smooth current modulation, you may assume that the controller is functioning properly. If you do not show the correct high and low, or the modulation is poor, check the following electrical circuit problems.

A. Circuit Check

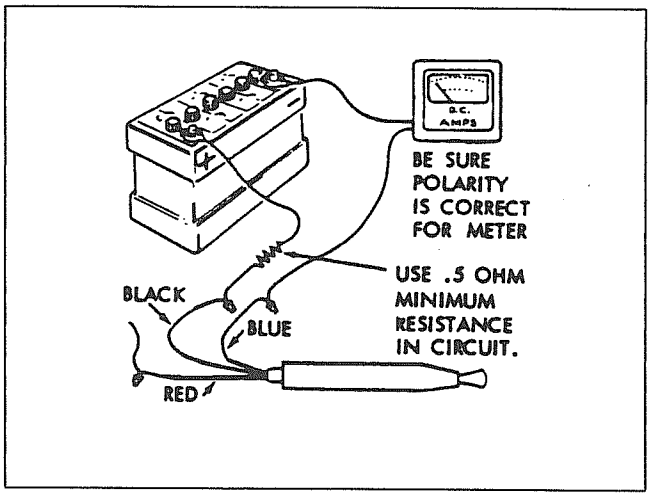
Check 9-way connector for proper engagement and cleanliness.

Check all terminal points and splices in both tow vehicle and trailer.

Note: Sometimes a fuse has been installed in tow vehicle portion of brake circuit. (This is not recommended.)

B. Controller Check

Remove controller from tow vehicle and connect the ammeter as shown in diagram below. The ammeter should vary smoothly from "OFF" to "ON". If it does not vary smoothly or shows no current when the controller is at full "ON", remove the controller cover and inspect the resistor coil. If the coil is burned out it must be replaced. A burned out coil can be detected by visual inspection.

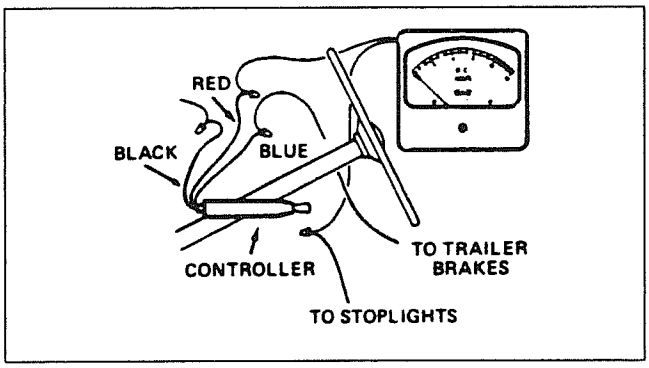


CAUTION: The resistor coil should last indefinitely under normal operating conditions. If the coil is burned out, carefully check the entire electrical system for a short circuited condition. A short circuit can damage any electric brake controller.

After replacing the coil be sure there is at least .020" clearance between the contact strip and the coil when the controller handle is unapplied.

C. Stop Light Switch

First check the continuity of the system. To do this connect the trailer to the towing vehicle, then place the ammeter in the circuit as shown in diagram below.



Note: Whenever connecting the ammeter you can avoid possible damage to the ammeter by connecting one lead then just touching the other lead quickly. If the needle goes the wrong way you have reversed the polarity. To correct simply reverse the leads, then complete the connection.

All controllers are equipped with a separate stop light switch which allows full current to flow to the trailer stop lights throughout brake application. It should be at .020" gap when the controller handle is unapplied. This gap can be adjusted by loosening one screw through an access hole in the bottom on the controller case.

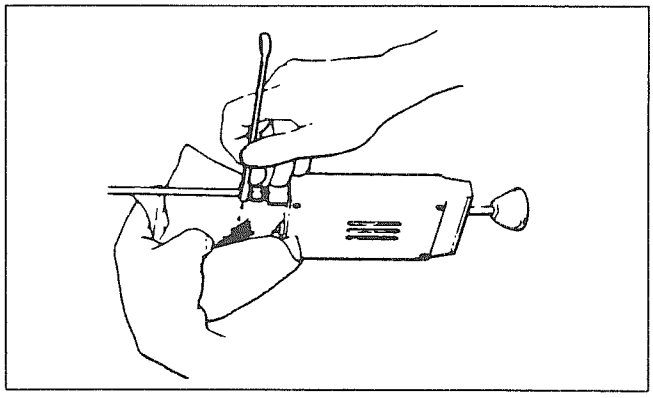
D. Hydraulic Cylinder Leakage

When checking the electrical circuit of the controller it is advisable to check its hydraulic cylinder at the same time to be sure it is tight and free of leakage.

If leakage does occur it is recommended that the complete hydraulic cylinder assembly be replaced. When reconnecting the controller into the hydraulic system of the tow car, bleed and check connection.

C. Bleeding the Hydraulic Brake Line

Removing air from the brake system is easy to do and very important. Follow the procedure given below carefully. Then wipe away all excess of brake fluid to avoid damage to painted surfaces. Refill the master cylinder reservoir.



1. Apply continuous pressure on brake pedal.

2. Loosen fitting at the controller to allow fluid (and air) to bleed out.

3. Bleed until fluid flows continuously (all air removed).

4. If pedal goes to floor board, tighten fitting before raising pedal and repeat Steps 1 thru 3.

5. With all fittings tight, press pedal hard for 10 seconds. Check for leaks at adapter tee and controller.

6. Refill master cylinder reservoir.

Note: If pedal is spongy after bleeding at controller it may be necessary to bleed the system at the wheel cylinders. All automotive hydraulic brakes have a bleeder screw on the backing plates or disc brake for this purpose.

F. Special Note on Failure Switch Reset

All 1967 and later vehicles have a brake failure warning lamp on the instrument panel. This lamp should remain unlit during brake applications after the installation of the controller. It may inadvertently be switched "on" if excess pressure is applied during the controller hydraulic line bleeding, and must be reset.

G. Procedure for Resetting Switch

Ford Motor Company vehicles must be reverse bled in order to reset this switch. To do this, loosen a front connection on the safety switch and rebleed the system. If any difficulty occurs in resetting the switch refer to the vehicle manufacturer's shop manual.

Chrysler and General Motors vehicles have failure lamp switches which are self-resetting and therefore should require no adjustments after controller installation.

American Motors and Kaiser Jeep failure lamp switches do not require bleeding. However, they do require loosening the connector where the failure lamp wire contact the switch. This allows the switch to center and be reset. Consult the vehicle manufacturer's shop manual if detailed procedure is required.

H. Break-Away Switch

The break-away switch can be checked simply by placing an ammeter in the circuit between the break-away switch and the brakes, then pulling out the break-away pin. If no current flows to the brakes, check to be sure the break-away switch contacts are clean. If the contacts are clean, check the trailer battery for adequate charge. Recharge or replace battery if necessary.

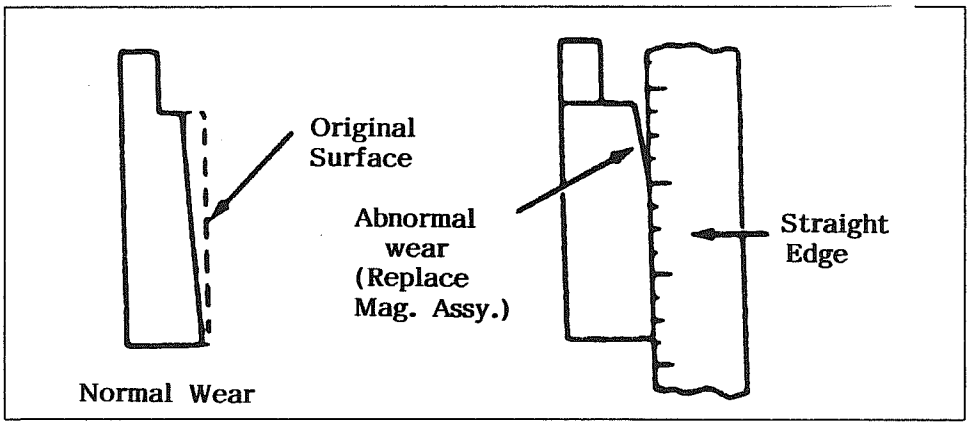
Note: Break-away switch is an emergency device only, and is not to be used as a parking brake. Pull pin and lubricate with light household oil and replace every 90 days.

I. Magnet Assembly

Without removing the magnet assembly from the brake, inspect the magnet for wear and flatness.

If the magnet rubbing surface is flat it need not be replaced until the friction element shows signs of wearing through.

A magnet that is not wearing flat must be replaced since it cannot function efficiently. To check the wearing surface for flatness, lay a scale or straight-edge on the magnet as shown in diagram below.



Before replacing with a new magnet determine the cause of the improper wear. First check the magnet lever pivot. A worn pivot bushing can cause the magnet lever to cock, thus allowing the magnet to tip against the armature plate. If this condition exists, the lever assembly should be replaced. When reinstalling magnets be sure to install the loom (lead wires) properly, avoiding kinks and allowing ample clearance for the lever to move through its full travel. Operate the lever in both directions to be sure the loom moves properly without binding, kinking, or interfering with lever movement.

J. Magnet Bench Check

To check electrically remove the magnet for bench test. To check for a possible coil to case short connect the magnet with the ammeter as shown in Fig. 7. Since the short may be intermittent, move the leads and rap the magnet while checking. If the ammeter shows current a short is present. Replace with a new magnet assembly.

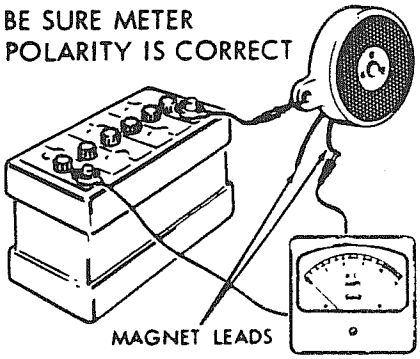


Fig. 7

To check for possible shorts within the magnet coil, connect as shown in Fig. 8. Check current. It should be approximately 2.0 amps on 10" brake magnets; and, 3.0 to 3.5 amps on 12" magnets. If not, replace magnet.

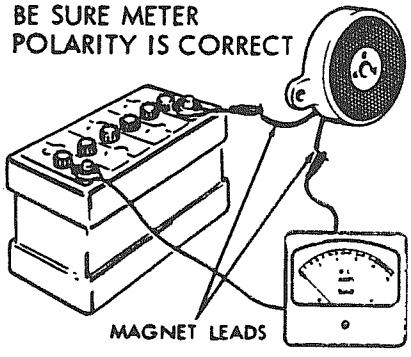


Fig. 8

NOTES

INTERIOR

The interior of all Airstream trailers has been designed for comfort, convenience, durability and appearance. How you use it and how you take care of it naturally depends on you. However, if you learn to operate the interior components and take care of them and the trailer properly, this knowledge will add to your pleasure as well as the long life of your trailer.

All materials should be professionally dry cleaned to remove any overall soiled condition. However, these materials may be spot cleaned using the cleaning code instructions as listed. Sample swatches are furnished to our dealers. The dealer will be able to give you the name of the fabrics used in your particular trailer. Each swatch will show the cleaning code in parenthesis.

Upholstery

The following are the cleaning code instructions for the various fabrics used in the Airstream trailers:

Code WS

Fabric Care: Spot clean this fabric either with a mild solvent or a water based cleaning agent. When using a solvent or dry cleaning product follow instructions carefully and clean only in a well ventilated room. Avoid any product which contains highly toxic carbon tetrachloride. You may also use an upholstery shampoo product or the foam from a mild detergent. With either method pretest a small area before proceeding. Use a professional furniture cleaner when an overall soiled condition is reached.

Code S

Fabric Care: Spot clean, using a mild water free solvent or dry cleaning product. Carefully follow instructions on such product. Clean only in a well ventilated room. Avoid any product containing carbon tetrachloride which is highly toxic. Pretest small area before proceeding. Use a professional furniture cleaner when an overall soiled condition is reached.

Code W

Fabric Care: Spot clean, using the foam only from a water based cleaning agent such as mild detergent or non-solvent upholstery shampoo product. Apply foam with a soft brush in a circular motion. Vacuum when dry. Pretest small area before proceeding. Use a professional furniture cleaner when an overall soiled condition is reached. The above code was designed by the manufacturer of the fabric.

CAUTION: Never remove cushion cover for separate dry cleaning or washing. Any tumble cleaning method can destroy the backing, shrink or otherwise damage upholstery fabric.

SMOKING WARNING: Keep your furniture and family safe from fires caused by careless smoking. Do not smoke when drowsy. Remove immediately any flowing ash or a lighted cigarette which falls on furniture. Smoldering smoking material can cause upholstered furniture fires.

Draperies

CAUTION: All drapery materials and mattress covers must be professionally dry cleaned.

Draperies are removed by unsnapping from the wall, removing a screw or pop rivet from the end of the curtain track, and sliding them out. The pop rivets are removed by drilling through the head with a 1/8" drill bit.

To prevent damage to the draperies while traveling, the VENETIAN TYPE BLINDS should be lowered, secured at the bottom and the slats turned vertically.

Carpet

The carpet can be cleaned with any good commercial carpet cleaner, or with a detergent and water. BE CAREFUL NOT TO SOAK THE CARPET WITH WATER.

Hardwood Flooring (Optional)

The hardwood flooring in the trailer is maintained the same as you would in your home. The flooring may be waxed by using any common floor wax and cleaned using any detergent with water. Should you get any scratches in your floor it can be resurfaced by sanding, using a common floor sander, and then finishing it as you see fit. Polyurethane can also be used as a sealer for your floor. Remember that too much finish on the floor can make it slippery.

Counter Area

Laminate: The high pressure laminate counter top can be cleaned with just soap and water. On tough spots you can use a common cleaning solvent. Be sure no abrasive cleaner is used as there is the possibility it could scratch the surface. A protective pad should always be placed under hot utensils.

Corian (Optional)

Corian is very easy to care and maintain. Conventional cleaning techniques, including abrasive cleaners, can be used on Corian. Common household and commercial cleaners such as powered cleansers, ammonia, strong detergents, oxalic acid solutions, dilute hydrochloric acid, and dilute trisodium phosphate have no affect on Corian. Acid drain cleaners and paint removers should not be used.

Cuts and scratches can be repaired with no permanent damage. A 400 grit sandpaper, and then rubbing with a "Scotch Brite" pad will restore Corian to its original gloss level. DO NOT USE CORIAN FOR A CUTTING BOARD. DO NOT PLACE HOT PANS DIRECTLY ON A CORIAN SURFACE.

Sinks

Stainless Steel: Stainless steel sinks cannot be harmed by boiling water. However, salt, mustard, mayonnaise and ketsup can cause pitting. Stubborn stains will yield to paste made of water and slightly abrasive household cleaner. Be sure to work in the direction of the polish lines on the steel to keep the original finish. Fingerprints are sometimes a problem. They can be minimized by applying a cleaner that leaves a film of thin wax: Simply wipe it on and remove the excess with a dry cloth. After this, fingerprints can be wiped off with a soft dry cloth, or one moistened with a little wax cleaner. The surface should always be washed before wax is applied. Regular cleaning will prevent build-up of scale and film. Ordinary soaps or detergents are best for routine cleaning of the stainless steel sinks. Rinse thoroughly with warm water and wipe dry with a cloth to avoid streaks and spots.

Porcelain (Optional) Be careful in using your porcelain sink. Dropping objects on it can chip the porcelain. Cleaning can be accomplished using normal household cleaners. Stubborn stains can be removed by using scouring powder if necessary.

Lounges

To convert the Deluxe sofa used in the trailers into a bed, it is only necessary to grasp the top of the back rest and pull it toward the aisle of the trailer. The back rest will raise and pivot out of the seat, becoming the front section of the bed.

The large front drawers can be secured by engaging the "hide-a-lock", accessible by raising the seat of the lounge. Once found it is easy to open the slide bolt arrangement. The hide-a-lock can be used for securing the drawer for travel, or to keep casual lookers out of your belongings.

Dinette

The dinette is made into a bed by raising up on the front of the table and folding the table leg up against the bottom of the leaf. As the table is raised it will unhook from the upper wall brackets. Once it is unhooked it can be pulled out and the wall hinge will let it be lowered on the supports of the dinette seats. The back rest of the seats are placed over the table to complete the conversion.

Table

To open the folding table, lift into a horizontal position and pull the table leg down toward the vertical position until it snaps into place. The leg is hinged at the front edge of the table and is held against the bottom of the table with Velcro. To extend into the double leaf position, lift the table slightly so the leg clears the carpet, and slide the leg and center support out toward the center of the trailer. The leaf then unfolds and rests against the leg support.

Airstream recommends that during travel the table be left in the upright position.

Central Control Panel

The solid state central control panel has two different configurations. The Deluxe panels include two LP tank gauges and auto water tank fill controls. The water and holding tanks and battery check is common to both panels. Also common are the water pump switch, range hood light, range hood fan, and power on light.

To check the tank capacities depress the button for the tank you wish to check and read the status by the LEDs directly above the switches. The power on light will automatically glow whenever you are connected to 120 volt power.

Battery Condition Tester

The battery condition tester, used when not plugged into 110 volt power, will indicate whether the trailer batteries are in good, fair or poor condition. When they show weak or bad condition you should take every reasonable step to conserve power by using as few lights as possible and switching off appliances. The battery should be charged as soon as practical with the tow vehicle charging system, or by connection to 110 volt power.

Water Pump Switch

The water pump switch operates the pump. Once the switch is turned on the pump will run until the water pressure reaches about 35 psi. At this point an internal pressure switch will shut it off. When a faucet is opened the water pressure will drop and the pump will start to run again. The water pump switch should be turned off when you are on city water or when the trailer is left unattended.

LP Gauge Switch

The LP gauge switch reads the status of the LP tanks by movement of the rocker switch. Moving the switch in the upward direction will read the roadside bottle. Downward movement of the switch reads the curbside. The contents of the tanks is indicated by the LED read out above the holding tank and battery condition buttons.

Automatic Water Fill Switch (Optional on some models)

The water tank fill switch controls a solenoid. The solenoid is normally closed. By depressing the water tank fill switch voltage is applied to the solenoid, opening it and allowing water to fill the fresh water tank. The valve is designed so that it automatically shuts off when the tank reaches three quarter full. Do not expect it to fill your tank to the "brim". Try to remember to shut your switch off after filling. As long as the switch is left on, the gauge for the fresh water tank will read its condition.

Microwave/Air Conditioner Switch

The trailers built with both microwave ovens and air conditioners have a switch located under the galley rooflocker designed to prevent operation of both high amperage draw appliances at the same time. The switch provides current to the air conditioner in one position and microwave oven in the other.

If equipped with two air conditioners a second power cord is used because of the high loads involved. If both cords are plugged into the same circuit it will probably not have sufficient power For this reason, heavy duty (10 ga.) 25 ft. and 50 ft. extension cords should be used to plug the air conditioner power cord into a separate circuit.

Bathroom Exhaust Fan

The bathroom exhaust fan is in the bathroom ceiling and is operated by pushing up on the handle running across the fan opening and turning on the switch located at the sink. To shut the fan off, shut off switch and pull the handle back down.

Telephone Shower Head

The telephone shower head is designed to give maximum flexibility in usage, and provides for water saving techniques when using your trailer on self containment. It can be held in the hand and moved about the body. Normally the best water conservation procedure is to wet the entire body and then turn the water off. Apply soap, lather thoroughly, then rinse the soap off. The telephone shower head is also used to fill the tub for taking a bath. When you have finished using the shower be sure to shut the water off at the faucet.

Bath Area Remote Switches

Two remote switches for appliances are located on the bathroom wall. One is for the water pump, and duplicates the pump switch on the central control panel. Either pump switch may be used to turn the pump on or off at any time.

The second remote switch, with a red indicator, is for lighting the water heater. Refer to the appliance section for complete instructions.

Zone Heating

The optional zone heating is two separate furnaces and thermostats. In winter months, when leaving the heat on low to prevent freeze-ups, be sure both furnaces are used. Detailed information on the operation of the furnaces is included under the Appliance Section of this manual and in the literature supplied with your trailer.

Ceiling Light Fixtures

The ceiling light fixture has a high-low switch located on the end of the fixture. By sliding the switch to the first position only one half of the light is turned on. Moving the switch further will turn the entire light on. The LENS may be removed by gently squeezing in the middle and pulling down. During cold weather it is a good idea to leave the light on a few minutes prior to removing the lens.

Fluorescent Light Bulbs

Fluorescent light bulbs are removed by rotating one quarter turn and bringing the bulb straight out of the fixture. This would be straight out on bed lights, straight down on ceiling lights, and straight up on the indirect lights located behind the curtain valance. The switch for the indirect lighting is located forward of the roadside living room window.

Fresh Air Vents

The fresh air vents are operated by a control handle. Turning clockwise will raise the vent and at the maximum extension, vents with fans will automatically turn on. For maximum air without fan, open until fan starts and back up just enough to turn fan off. Turning counterclockwise will close the vent. Screens should be removed for periodic cleaning.

Storage

The kitchen cabinet should have the heaviest items on the bottom and lighter items overhead. After loading you should have the skillets and can goods on the floor or bottom shelf, and the cereals and crackers in the overhead rooflocker. Use the unbreakable type plates and saucers, and consider storing your dish towels around them. Better yet, use paper plates. Who want to wash dishes when on a trip or vacation?

A good place to store heavy items is in the front drawer assembly. It is rated for a 100 lb. capacity, plus adding weight to the front of the trailer may even improve towing slightly.

Clothes hung in wardrobes should be kept on hangers that snap over the clothes rods to keep them from "jumping" off on rough roads. Evening dresses should be kept in the plastic bags like dry cleaning businesses use. No matter how hard you try, if you travel a long dusty section of road the dust will work its way into the trailer and soil clothes. Try to avoid large bulky coats. Layers of lighter clothing will usually keep you warmer, are more versatile and easier to store.

Some additional storage is available under the shelf in the bottom of the wardrobe, but you must be sure it is loaded so the drain lines and heat ducts can't be damaged.

WARNING: Keep flammable material away from the furnace.

Remember, heavy items should be stored low and toward the front. Lighter items in the rear and overhead cabinets.

SMOKE DETECTOR

A smoke detector is centrally located in the ceiling of your Airstream.

The alarm horn and the indicator light on your detector lets you know whether your detector is working right.

When the indicator light, which you can see through the clear push button of the test switch, flashes once a minute, the detector is operating normally. (Model 83P has a white push button and does not flash.)

When the alarm is sounding the detector has sensed smoke or combustion particles in the air. The alarm will automatically turn off when the smoke in the air is completely gone.

If the alarm horn beeps once a minute the detector's battery is weak and needs to be replaced immediately.

How to Take Care of Your Detector

Your smoke detector has been designed to be as maintenance free as possible. To keep your detector in good working order you must:

Test the detector regularly (weekly is recommended) by pressing on the test switch for up to 10 seconds until the alarm sounds. It's a good idea to test the detector after storage and before each trip. Make sure your family hears the detector and knows how to react.

Replace the battery once a year or immediately when the low battery "beep" signal sounds once per minute. The low battery signal should last at least 30 days.

This detector uses standard nine volt batteries. The detector will work properly with the following batteries.

Eveready #522, #1222, #216
Duracell #MN1604
Gold Peak #1604P, #1604S

Eveready and Duracell batteries are available at any retail store that sells batteries.

WARNING: Do not use any other kind of battery. The detector may not operate properly with other batteries.

Vacuum the dust off the detector sensing chamber at least once a year. This can be done when you open the detector to replace the battery. Remove the battery before cleaning. Use a soft brush attachment and carefully remove any dust on the detector components, especially on the openings of the sensing chamber. Replace the battery after cleaning.

Clean the detector's cover when it becomes dirty. First open the cover and remove the battery. Then hand wash the cover with a cloth dampened with mild soapy water, rinse it with a cloth dampened with clear water, and dry it with a lint-free cloth. Be careful not to get any water on the detector components. Replace the battery and close the cover.

Test the detector after closing the cover whenever you have opened it to replace the battery or clean it.

LP GAS ALARM

A LP gas alarm is mounted on the wall in the galley area. This position keeps it near the majority of gas appliances.

Operating Instructions

Turning on Power

Switch the unit's on/off switch to the "on" position thus activating the red indicator light. Wait for the unit's alarm to sound. When this happens, the alarm will beep for approximately one minute while the sensor stabilizes to the surrounding atmosphere. When the alarm stops the unit is activated and on guard.

CAUTION: Do not paint the unit. Do not spray directly onto the unit any chemicals such as cleaners, air freshners, hair sprays, insecticides, etc.

DO NOT DIRECT ANY FLAME OR OTHER INTENSE HEAT SOURCE AT THE UNIT.

When powered by a vehicle battery that has been off automatic charge for a period of more than a week, it is advisable to turn the unit off.

THE PRESENCE OF DANGEROUS FUMES WILL ACTIVATE THE BUZZER, WARNING THE USER OF POTENTIAL DANGER. THE FOLLOWING STEPS SHOULD BE TAKEN IMMEDIATELY:

1. **Extinguish all cigarettes and other open flames.**
2. **Have proper extinguisher ready.**
3. **Turn off all gas outlets and safety valves.**
4. **Use forced ventilation to reduce the concentration of gas or vapor level. The alarm will stop when a safe level of fumes is reached.**
5. **Evacuate the area.**
6. **Call for professional help (Fire Department).**

EXPLOSION AND FIRE PREVENTION IS SOUND COMMON SENSE. PUT IT INTO PRACTICE. PREPARE YOUR OWN SAFETY CHECK LIST AND FAMILIARIZE OTHERS WITH IT.

FIRE EXTINGUISHER

The fire extinguisher just inside your forward door should have the charge checked on a regular basis. Make sure your family, especially the cook, knows how to release the extinguisher storage bracket, and how to properly operate the extinguisher. If you find the directions on the extinguisher unclear, check with your local fire department. We're sure they will be happy to assist you and your family.

SAFETY:

Many things can be construed as safety related, but the most important is your common sense. If you are careless with matches, cigarettes, flammable material or any other hazardous material, we are sure you realize your potential for accidents is greatly increased.

EXTERIOR WINDOWS

The windows in your trailer are of tempered safety plate glass. To open: release the two lever locks at the bottom, lift up on the two side operator handles until the window is in the desired position, and place the operators into one of three positioning slots on the side of the frames. To lock the windows, reverse this procedure.

Note: The rear window is designed as an emergency escape exit. The rubber spline holding the screen in place is looped so it can be pulled out in one swift motion.

You and all your family should practice escape procedures so they can be rapidly accomplished even in total darkness.

WARNING: **Never park your trailer so the rear window cannot be easily used for emergency exits.**

These windows are cleaned in the same manner that ordinary windows are. Clean the seals with a damp cloth or mild detergent every three to six months, taking care not to use strong solvents as they will damage the seals. A coat of natural silicone lubricant applied after the seal has dried will keep it flexible. Spread the lubricant evenly with a brush or finger, working it into the surface. This is a good practice for all rubber seals in your Airstream. For replacement of a damaged window contact an Airstream Service Center or the factory.

SCREENS

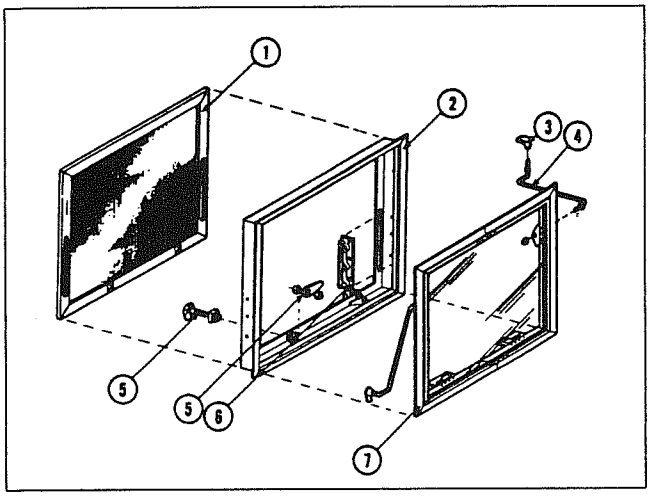
Your plastic screens are easy to maintain. Just clean occasionally with a damp cloth. **Note:** They will melt at the point of contact if touched by a cigarette.

VISTA VIEW WINDOWS

Vista view windows, optional on some models, allow for interior lighting while maintaining privacy. They are equipped with integral shades.

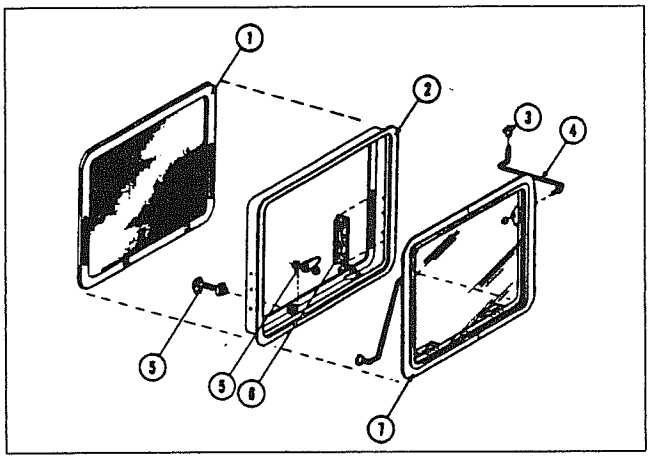
FRONT WINDOW

1. Screen Assembly
2. Frame Assembly
3. Handle Assembly
4. Push Arm Assembly RH
5. Push Arm Assembly, LH
6. Nylon Guide LH/RH
7. Sash Assembly



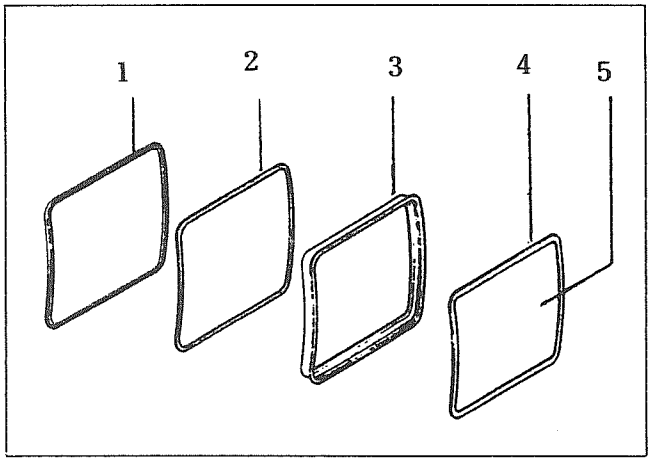
SIDE WINDOW

1. Screen Assembly
2. Frame Assembly
3. Handle Assembly
4. Purh Arm Assembly LH/RH
5. Latch Assembly
6. Nylon Guide, LH/RH
7. Sash Assembly



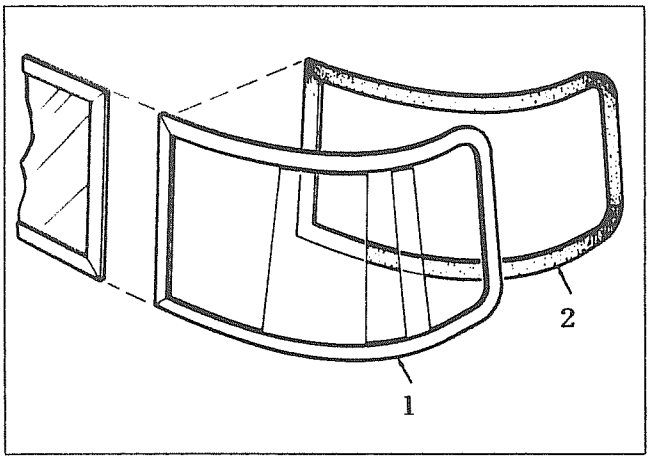
FIXED WINDOW

1. Trim Ring
2. Scotchmate Tape
3. Curved Window Frame
4. Glass Bead Assembly
5. Curved Glass Pane



PANORAMIC WINDOW

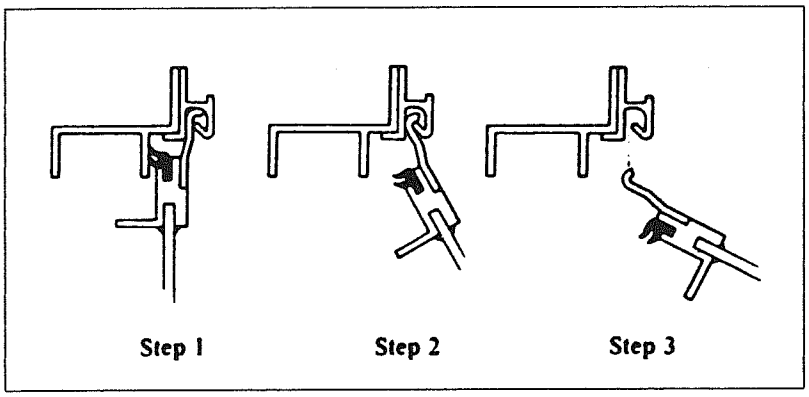
1. Panoramic Window Assy (CS/RS)
2. Gasket, Vinyl Foam Tape



GLASS AND SASH REPLACEMENT (OPENING WINDOWS)

1. Remove nuts from lifting arms and slip arm out of pivot mounts.
2. Rotate window upward past horizontal and it will drop out of stationary hinge.
3. To replace, reverse the above, being sure hinge on window is inside locations on stationary hinge.

WINDOW REMOVAL



Lifting Arm Replacement

1. Remove inside lifting grip by loosening Allen screw.
2. Remove nut from lifting arm and slip out of pivot mounts.
3. Rotate out through plastic guide.
4. To replace, reverse the above procedure.

Window Lock Replacement

1. From outside of trailer:
   a. Remove locking pawl and retainer nuts from shaft.
   b. Remove large nut from threaded housing.
2. From inside of trailer:
   a. Pull old lock inside trailer.
   b. Replace new lock through window frame.

3. From outside trailer:

   a. Replace large nut on threaded housing.

   b. Replace locking pawl and retainer nuts on shaft.

   c. Adjust pawl on shaft to give proper tension on window.

SCREEN REPLACEMENT

1. Remove inside lifting grip by removing #10-24 x 1/2" set screw.

2. Remove No. 8 sheet metal screws attaching screen to window frame.

3. Turn window locking arms to horizontal position and slide screen off.

4. To replace reverse the above procedure.

WINDOW FRAME REMOVAL (ALL)

Front, Rear, Side (moveable), Vista View and Fixed

1. Remove glass and sash (moveable windows).

2. Remove screen (moveable windows).

3. Using No. 30 drill, remove any pop rivets attaching interior skin to window frame.

4. On outside, using No. 30 drill, remove rivets attaching window frame to exterior skin.

   Note: On front window, vertical tie bar between front window and wing window must be removed.

WINDOW FRAME INSTALLATION

1. Apply foam type gasket under window flange.

2. Insert window in opening.

3. Rivet window flange to side of trailer using Olympic rivets.

   Note: On front window, install new vertical tie bar mating center window to wing window.

4. Inside vinyl metal is to be trimmed to window frame (cut out for lift arm movement (moveable only) and fasten with colored pop rivets if inside skin has been replaced.

5. Using rawhide or plastic mallet, tap down any high areas between exterior rivets. Remove excess ribbon caulking and Ten-X the perimeter.

FIXED WINDOW REMOVAL AND REPLACEMENT

1. Remove lower curtain track.

2. Remove interior window trim by drilling out pop rivets.

3. Remove rivets from exterior window frame by drilling out with No. 30 drill.

4. Reverse procedure for reinstallation.

   Note:(1) You may use solid rivets when installing new windows since the back side is open for bucking. (2) Caulk liberally between exterior window flange and side of trailer to prevent rain leakage.

PANORAMIC WINDOW REMOVAL AND REPLACEMENT

1. Using No. 30 drill, drill out rivets around periphery of Panoramic window.

2. Using putty knife, gently pry window loose from shell.

3. To install, apply foam tape gasket under window flange.

4. Place window onto trailer and install screws about every fourth hole, mating the panoramic window and center window.

5. Rivet window flange to side of trailer using Olympic rivets.

   Note: Use stop on drill to prevent drilling inside closeout.

PLUMBING SYSTEM

LIQUID PETEROLEUM GAS (LPG)

Your trailer is equipped with two tanks for LPG (Liquid Petroleum Gas). LPG burns with a clean blue flame. There are two basic types of LPG in common use: BUTANE AND PROPANE. Butane is widely used where temperatures are normally above freezing the year round, and Propane is used when subfreezing temperatures are common since Butane freezes at 32° as compared to -40° for Propane.

How long a full tank of gas will last is dependent on usage. In cold weather, when you are using the furnace, large amounts of hot water, and are doing extensive cooking, you will naturally use more than you will in warm weather when you may do limited cooking. On the average, with normal cooking and other appliance use you can probably count on two to three weeks service from each tank.

AUTOMATIC GAS REGULATOR

All models are equipped with an automatic gas regulator. Both tanks are connected to this regulator. Open both tank valves completely, then close about 1/4 turn. This will allow you to easily check to see if valves are open or closed.

When the gas is turned on it is drawn from only one tank at a time. When the tank being used is depleted the regulator automatically switches to the full tank. An indicator in the regulator knob points toward the tank which was being used to give you a visual reminder when one tank is empty.

Note: The tank in use is not completely empty until the red warning flag is fully visible in the indicator window. The empty tank can be removed for refilling without disturbing the tank being used.

WARNING: LP gas regulators must always be installed with the diaphragm vent facing downward. Regulators that are not in compartments have been equipped with a protective cover. Make sure that regulator vent faces downward and that cover is kept in place to minimize vent blockage which could result in excessive gas pressure causing fire or explosion.

CAUTION: The LPG bottles are securely mounted on the front "A" frame of your trailer. If these bottles must be removed for service or replacement it is important that they be reinstalled correctly in order to prevent any possibility of their falling off or becoming dislodged during travel.

VERTICAL BOTTLES

The following step by step procedure gives you the proper method of removing and installing these bottles:

1. Turn the knob on your automatic regulator so the arrow points to the tank opposite the one to be removed. Shut off the gas valve on the bottle to be removed.

2. Disconnect the rubber gas line at the bottle to be removed. (This fitting has a left hand thread and turns in the opposite direction to most threaded fittings.)

3. Turn the large clamping "T" handle counterclockwise until the hold down bracket is loose enough to remove the bottle. If your trailer is equipped with a gas bottle cover the "T" handle must be removed, and then remove the cover before removing the bottle.

   DO NOT REMOVE THE CENTER HOLD DOWN ROD.

To Install

1. Place the bottle in position on the "A" frame and bottle crossmember so that it rests on the upper collar of both bottles with the collar rims engaged in the grooves on the underside of the bracket. If your trailer is equipped with a gas bottle cover it should be positioned over the bottles next. Make sure the hold down rod projects up through the hole in the shroud center bracket.

2. Replace the "T" handle and tighten down until the bottles are held firmly in place.

3. Turn on gas shut off valves and test all fittings with a soap suds or detergent solution and watch for bubbles.

   If you have allowed both tanks to run out, air may have gotten into the lines. In this event, the air must be forced out through the lines by gas pressure before you will be able to light the pilots. Hold a match to the pilot of the appliance closest to the tanks until it lights and stays lit. Then move to the next closest, etc.

HORIZONTAL BOTTLES

LP Tank Cover

The LPG tank cover is easily removed by turning the two locks at each upper corner one half turn. Then slide the cover forward until it is free from the hold down bracket.

Tank Removal

To remove the tank shut the valve firmly; but, excessive pressure should not be required. Next remove the hose connection at the valve.

Note: The LP hose connection has a left hand thread. Turn clockwise to remove.

A tubing wrench or box end wrench is recommended. Pliers should never be used, and even expensive adjustable wrenches will damage the fitting if not perfectly adjusted.

Raise the latch handle on the hold down strap until the hook can be freed. After noting the direction the bottles are turned, lift up slightly and roll out until it can be lifted clear of the trailer frame.

WARNING: Your LP tanks must be filled as directed by the tank manufacturer. Instructions are located on a decal near the fill valve. The decal must not be defaced.

WARNING: Your LP tank must be, and can only be, placed in the proper position when remounting on the front of the trailer. In any other position the base of the tank will not fit into the recess.

WARNING: Use only the gas bottles furnished with your trailer. If replacement is required it must be a bottle of the same size and design.

WARNING: The vent at the bottom of the regulator must be kept free of any obstructions and must be pointed downward. A good habit is to check the vent each time a bottle is removed for filling. It is especially important to check the vent if the trailer has not been used regularly.

If you have allowed both tanks to run out, air may have gotten into the lines. In this event the air must be forced out through the lines by gas pressure before you will be able to light the pilots. Hold a match to the pilot of the appliance closest to the tanks until it lights and stays lit. Then move to the next closest, etc.

Twice a year, or after a long storage period, we suggest you take your unit in for a checkup and cleaning of the gas operated appliances.

BASIC RULES FOR SAFETY

WARNING: Do not store LP containers within vehicle. LP containers are equipped with safety devices that vent gas should the pressure become excessive.

WARNING: Do not use cooking appliances for comfort heating. Cooking appliances need fresh air for safe operation. Before operation open overhead vent or turn on exhaust fan and open window.

A warning label has been located in the cooking area to remind you to provide an adequate supply of fresh air for combustion. Unlike homes, the amount of oxygen supply is limited due to the size of the recreational vehicle; and, proper ventilation when using the cooking appliances will avoid dangers of asphyxiation. It is especially important that cooking appliances not be used for comfort heating as the danger of asphyxiation is greater when the appliance is used for long periods of time.

WARNING: Portable fuel burning equipment, including wood and charcoal grills and stoves, shall not be used inside the recreational vehicle. The use of this equipment inside the recreational vehicle may cause fires or asphyxiation.

WARNING: A warning label has been located near the LP gas container. This label reads: DO NOT FILL CONTAINER(S) TO MORE THAN 80 PERCENT OF CAPACITY.

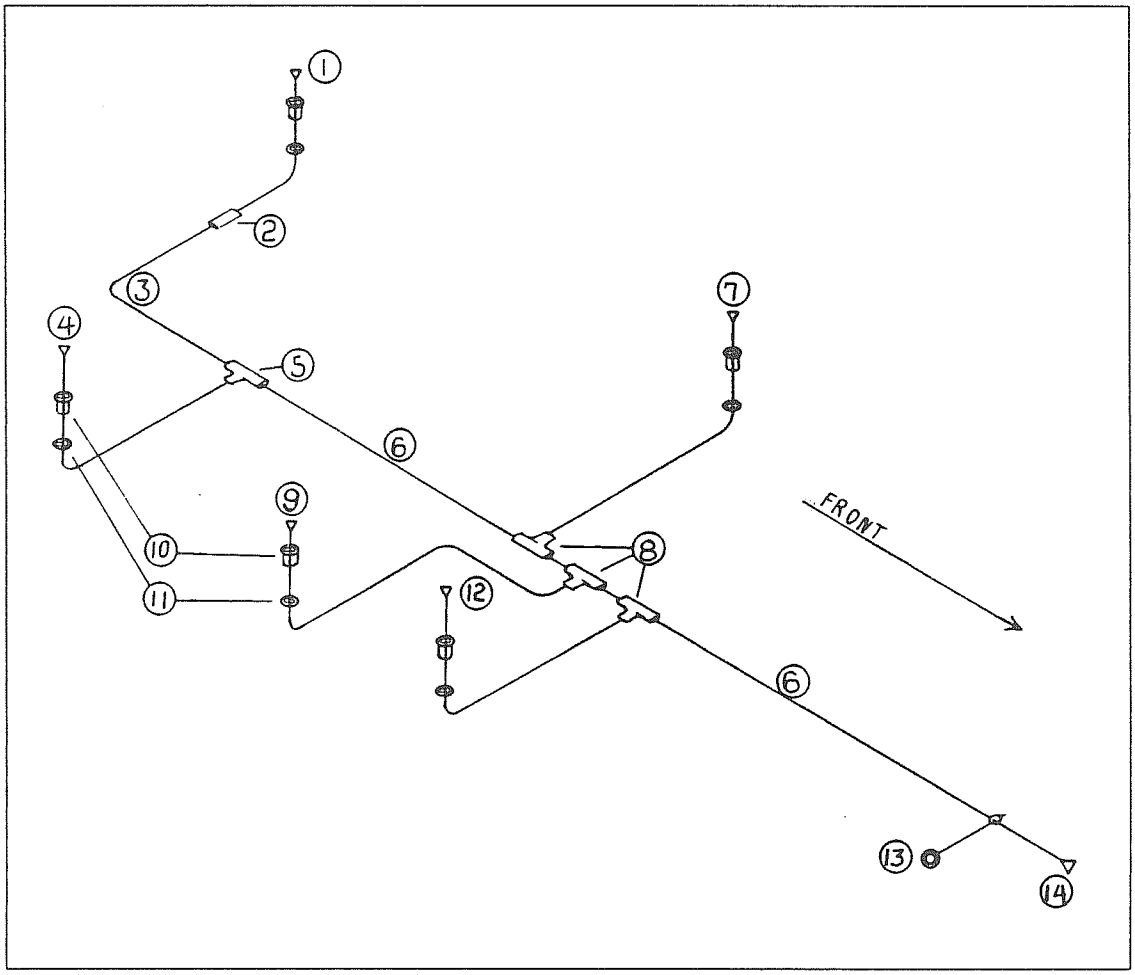
Overfilling the LP gas container can result in uncontrolled gas flow which can cause fire or explosion. A properly filled container will contain approximately 80 percent of its volume as liquid LP gas.

WARNING: Do not bring or store LP gas containers, gasoline or other flammable liquids inside the vehcile because a fire or explosion may result.

WARNING: IF YOU SMELL GAS:

1. Extinguish any open flames, pilot lights and all smoking materials.
2. Do not touch electrical switches.
3. Shut off the gas supply at the tank valve(s) or gas supply connection.
4. Open doors and other ventilating openings.
5. Leave the area until odor clears.
6. Have the gas system checked and leakage source corrected before using again.

TYPICAL GAS LINE SYSTEM



1. Connection, Water Heater
2. 3/8 Flare Coupler
3. 3/8 OD Copper Tubing
4. Connect, Second Furnace
5. 5/8 x 3/8 x 3/8 Brass Tee
6. 5/8 OD copper Tubing
7. Connection, Refrigerator
8. 5/8 x 5/8 x 3/8 Brass Tee
9. Connection, Range
10. Grommet, Floor Level
11. Grommet, Underbelly
12. Connection, Front Furnace
13. Ground Lug
14. Connection, LP Regulator

WATER SYSTEM - SELF CONTAINED

Fill the water tank by opening the exterior access door, remove screw cap and pull the vent plug. A garden hose can now be inserted. It's a good idea to let the water run through the hose for a short time to flush it out. Experienced RVers usually fill their tanks with "home" water to avoid strange water that may be distasteful to them.

The amount of water in the tank may be checked on the Monitor Panel, or you may fill the tank until water overflows out of the fill.

Open the hot side of the galley or lavatory faucet and turn on the water pump switch located on the monitor panel. For some time the open faucet will only sputter. This is because the water heater is being filled and air is being pushed out through the lines. Once the water heater is full a steady stream of water will come from the faucet. Now open a cold faucet. It will sputter for a short time, but will soon expel a steady stream. All other faucets can now be opened until all air is expelled. Be sure to open your Insta-Hot water faucet if your trailer has this option.

Once the system is filled with water and the faucets closed, the water pump will shut off. When a faucet is opened the pump will come back on automatically. If the faucet is just barely open it is normal for the pump to cycle on and off rapidly.

CAUTION: The water pump must be turned off when hooked up to city water supply and when you leave your Airstream unattended.

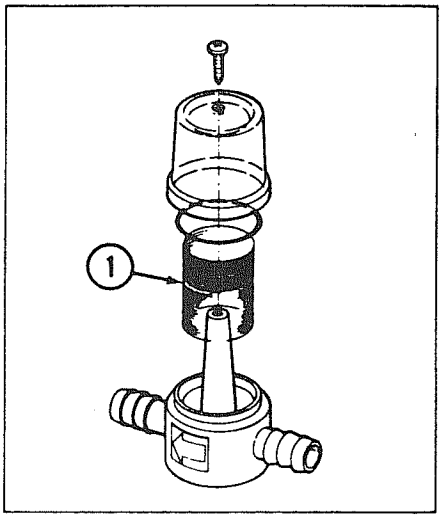
WATER PUMP AND FILTER

The water pump and filter are adjacent to the water heater in the bathroom cabinet on rear bath models, and in the roadside double wardrobe on center bath models. The pump and filter on the 25 ft. trailer is located in the curbside wardrobe.

The filter screen should be cleaned periodically to prevent accumulation of dirt and sand. To remove the screen, disconnect the rubber hoses from both ends, separate the screen housing, remove the screen, clean and replace.

Disassemble Pump Filter

1. Remove screw through top.
2. Pull top from base. Do not damage "O" ring seal.
3. Remove screen to clean or replace.
4. Lift "O" ring from its cavity. Lubricate with silicone grease.
5. Assemble by reversing above procedure.



Cleaning the Fresh Water Tank

To clean the tank pour some bicarbonate of soda into the filler spout with several gallons of water, and allow to stand for a minimum of four hours. Then flush the tank out by opening a faucet, allowing the water pump to drain the system. Then refill with fresh drinking water. If the water tank must be cleaned further, the following procedure is recommended.

1. Prepare a sodium hypochlorite solution using potable water and household bleach (5 1/4 to 6%) in a ratio of 1/4 cup of bleach to one gallon of water. (Common household bleaches are Purex and Chlorox.)

2. Pour 1 gallon of hypochlorite solution for each 15 gallons of capacity into the empty water tank.

3. Add enough potable water to completely fill the water system.

4. Allow closed system to stand for three hours.

5. Drain the hypochlorite solution from the system and refill with potable water. (See Note.)

6. Excessive hypochlorite taste or odor remaining in the water system is removed by rinsing the system with a vinegar solution mixed in a ratio of 1 quart of vinegar to 5 gallons of water.

7. Drain the system and flush with fresh drinking water.

8. Drain the system and refill with fresh drinking water.

Note: A petcock, visible between the tires, will drain the tank sufficiently for most purposes. Total drainage may be achieved by removing the large Allen Head Plug located on the bottom of the tank. An access plate must be removed to expose the plug.

AUTO FILL VALVE (Optional on some models)

The fresh water tank on the trailer is equipped with an automatic filling device. Anytime you are hooked up to city water you can fill your fresh water tank by turning the switch, located on the monitor panel, to "ON". The system automatically stops filling when the 3/4 level is reached. The switch should then be turned "OFF".

The system is operated by a solenoid valve plumbed into the water system. When the switch is "ON" the solenoid opens and water from the high pressure lines will flow into the tank. When the tank monitoring system senses 3/4 full, current to the solenoid is cut and the valve closes.

It is normal for the solenoid to be hot to the touch if it has been left on for a long period of time.

When operating the water pump, the auto fill valve must be in the off position. Otherwise the pump will simply pump water from the tank into the higher pressure lines and the auto fill valve will allow the water to go back into the tank again.

Maintenance

The valve should be operated at least once a month when the trailer is in use. Turning the switch on for just a few seconds will suffice. If the valve is sluggish (you should hear a good solid click), makes unusual sounds when tank is being filled, or if it fails to shut the water off completely, it would indicate the valve needs cleaned. Procedures are given in the following text.

Causes of Improper Operation

1. FAULTY CONTROL CIRCUIT: Check the electrical system by energizing the coil. A metallic "click" signifies that the solenoid is operating. Absence of the "click" indicates loss of power supply. Check for loose or blown fuses, open circuits or grounded coil, broken lead wires or splice connections.

2. BURNED OUT COIL: Check for open circuited coil. Replace coil if necessary. Check supply voltage. It must be the same as specified on nameplate.

3. LOW VOLTAGE: Check voltage across the coil leads. Voltage must be at least 85% of nameplate rating.

4. INCORRECT PRESSURE: Check valve pressure. Pressure to valve must be within range specified on nameplate.

5. EXCESSIVE LEAKAGE: Disassemble valve and clean all parts. If parts are worn or damaged, replace valve.

Valve Disassembly for Inspecting and Cleaning

(Refer to Fig. 1)

WARNING: Turn off electrical power supply and depressurize valve before inspecting and cleaning. Then proceed as follows:

1. Disassemble valve in an orderly fashion. Use exploded view for identification and placement of parts.

2. Disconnect coil lead wires.

3. Remove retaining spring by dislodging the top spring coil and prying the spring upward.

4. Slip coil off plugnut/core tube sub-assembly.

5. Remove mounting screws, cover, plugnut/core tube sub-assembly, gasket and core assembly with core spring.

6. All parts are now accessible for cleaning.

Valve Reassembly

1. Reassemble in reverse order of disassembly. Use exploded view for identification and placement of parts.

2. Lubricate gasket with Dow Corning III compound lubricant or an equivalent high grade silicone grease.

   Note: If core spring has been removed from core assembly be sure to install small diameter end of core spring on core assembly first. The core spring should snap in place and remain engaged.

3. Replace core assembly, core spring, gasket, plugnut/core tube sub-assembly, cover and mounting screws. Torque mounting screws in a crisscross manner to 9 ± 2 inch pounds.

4. Replace coil and retaining spring. Make electrical hookup and restore electrical power and line pressure.

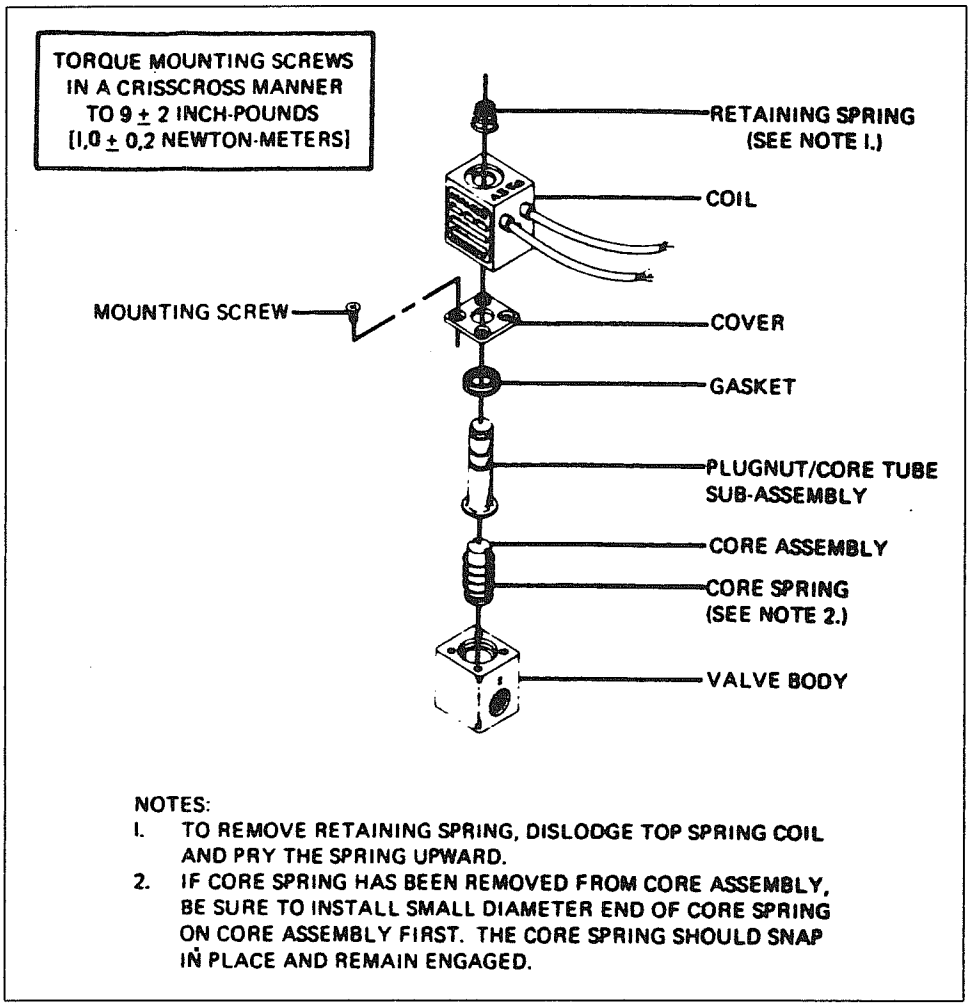
5. After maintenance is completed, operate the valve a few times to be sure of proper operation.

Coil Replacement

(Refer to Fig. 1)

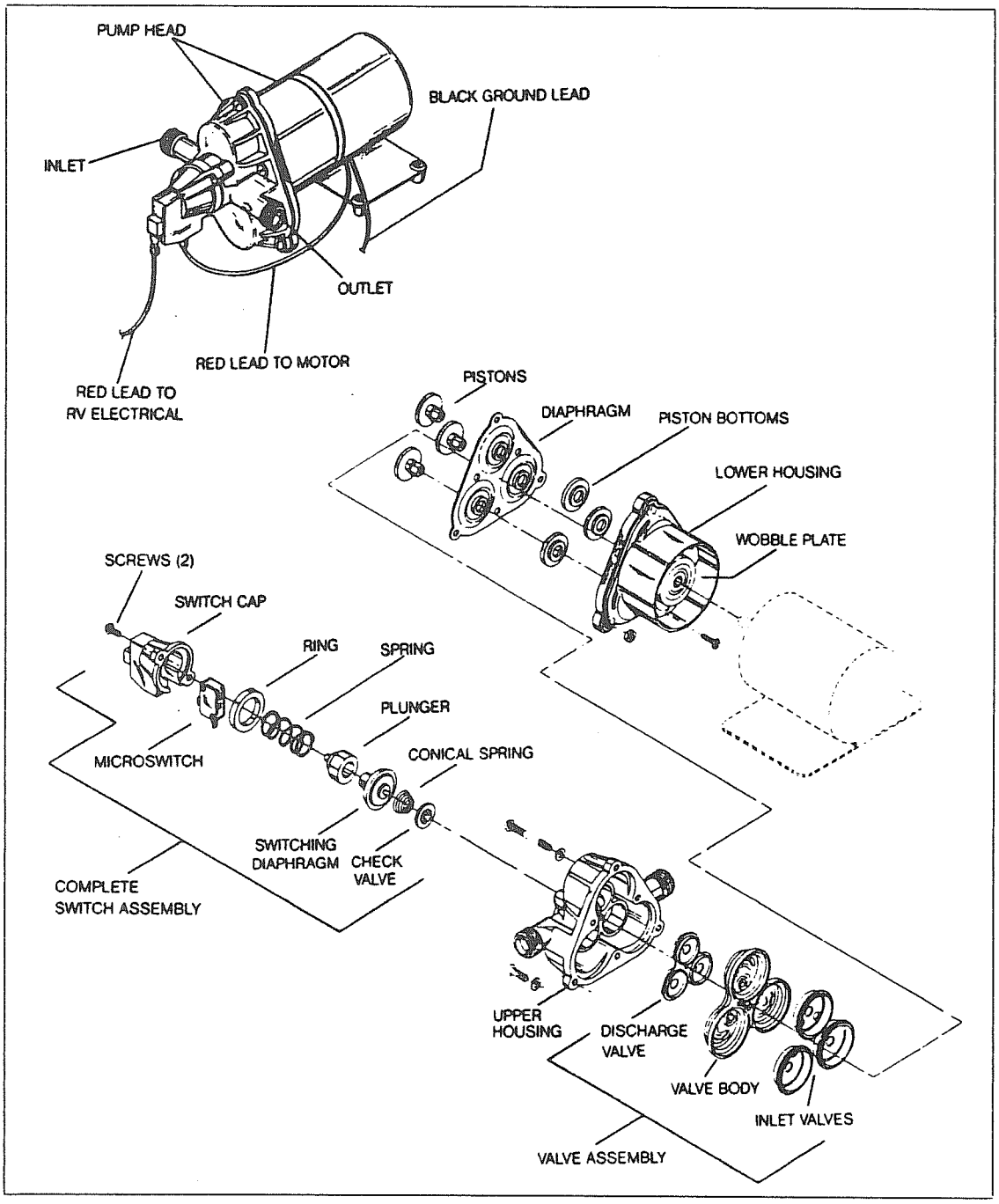
WARNING: **Turn off electrical power supply. Then proceed as follows.**

1. Disconnect coil lead wires.
2. Remove retaining spring by dislodging the top spring coil and prying the spring upward.
3. Slip coil off plugnut/core tube sub-assembly.
4. Install new Coil and replace retaining spring.
5. Make electrical hookup and restore electrical power.



WATER PUMP

Manufacturer: Shur-Flo
1740 Markle Street
Elkhart, Indiana 46514
Phone: 219-294-7581



Switch and Check Valve Repair

The check valve, hydraulic switch mechanism and micro switch are accessible by removing the switch cover.

CAUTION: Care should be taken in removing the switch cover screws. Within the mechanism is a spring under compression.

Replacement of Micro Switch

Occasionally the micro switch fails or an electrode is broken off. Proceed as follows: Remove the two screws holding the cap to the main body. Remember, a spring under compression is retained by this cap. With both screws out, allow the spring to extend fully. Then carefully lift off cap and spring. If only the micro switch is at fault avoid disturbing the hydraulic elements remaining in the head. If examination of the hydraulic parts is required, remove them carefully by pulling. Be sure to note the order of removal.

To replace the micro switch remove the spring and pull out the black retaining ring. This will allow the micro switch to fall free. Replace parts in the reverse sequence: Micro switch, black retainer, and the spring.

Reassemble cover to the main body. Switch cap may be pointed up or down as desired, providing wire has not been shorted.

Having replaced the micro switch be careful to rewire correctly.

Note: If the positive wire from the battery is connected to the "B" terminal the switch is bypassed and the pump cannot shut off. Pressure will build up until the motor stalls. If the proper fuse has been used it will blow. If a larger fuse than recommended has been used the motor will stall and may burn out.

Check Valve Problems

Due to contamination from debris or lime build-up, the check valve may fail to properly seat. To correct, clean out the area and replace the check valve element. If checking the check valve with air be certain to moisten the check valve to get an accurate check. The rubber seals more effectively when wet.

Properly Installed, the Pump will:

PRIME: The pump will automatically prime itself.

AIR-LOCK: Pump will not air-lock as the compression stroke is powerful enough to pressurize the entrapped air and force the check valve open.

RUN DRY: Pump will run dry for extended periods without damage.

BATTERY DRAIN: At free flow the pump draws a mere 7 to 7 1/2 amps.

CHECK VALVE: Built-in check valve prevents back flow and can protect the pump from the dangers of high city water pressure (up to 200 PSI).

FULLY AUTOMATIC: The pump will automatically come on when the faucet or valve is opened. It delivers a smooth steady flow of water and shuts off automatically when the faucet is closed.

Trouble Shooting

MOTOR DOES NOT OPERATE.

- Is battery discharged?
- Are any wires disconnected?
- Are terminals corroded?
- Is switch in "ON" position?
- Is fuse good?
- Is water frozen in pump head?

MOTOR RUNS BUT NO WATER FLOWS.

- Is water tank empty?
- Are there kinks in the inlet hose?
- Is air leaking into inlet hose fittings?
- Is inlet line or in-line filter plugged?
- If using a filter, check the line just before the filter.
- Is outlet hose kinked?

MOTOR RUNS BUT WATER "SPUTTERS"

Check to be certain that air has been bled off the lines and water heater. Also check for air leaks in the input side of the pump.

PUMP CYCLES ON AND OFF WHEN ALL OUTLETS ARE CLOSED.

The pump will normally cycle (go on and off) when a faucet is partially opened. If, however, it cycles when all valves are closed, check for a leak in the lines. It may be a leaky toilet valve or a dripping faucet. Do not forget to check the outside city water entry valve. It may be leaking.

If no leak can be detected, shut pump off. Remove the output hose where it joins the system (not at the pump). Insert a plug in the hose and clamp it. (You can make a perfect plug from a barb fitting. 1/2" size with a cap tightly screwed on the threads.) Turn the pump switch on. The pump should come on, run a few seconds, and then shut off. If it remains off, the problem is NOT the pump. The problem is in the system. If, however, the pump goes on and off there may be a problem in the pump.

There may be an internal leak in the pump which allows water to escape from the high pressure area back into the low pressure area. Look for a pump valve held open or a crack in the plastic parts.

PUMP DOES NOT ACHIEVE SHUT OFF

The wall switch may be used for temporary control of the pump. A low battery charge may be the cause. Or the pump switch mechanism may be stuck. Try tapping the switch cap on the end of the pump with the handle of a screwdriver. If the pump appears in all other respects to run normally, but fails to shut off, you may have to replace the switch mechanism.

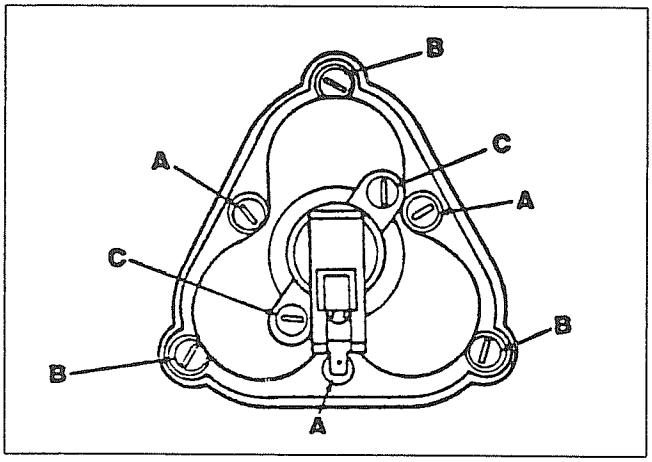
PUMP HEAD LEAKS

If the pump head leaks, first try to tighten the screws in the pump head assembly until they are snug.

CAUTION: **Do not overtighten. The leak may be from a crack in the pump head assembly. If so, then replace.**

One cause of the pump head cracking may be water freezing inside the pump head. If the leaking water is escaping back near the motor, check for a leaking or broken piston.

Pump Repair



Screws (A) hold the entire pump head assembly to the motor.

Screws (B) hold the pump head face to the pump head main body.

Screws (C) hold the switch assembly to the front of the pump head.

Screws (A) would be removed to correct a problem in the "drive train" between the motor and pump head.

Screws (A) and (B) would be removed to correct a problem in the pump head valves or pumping chambers.

Screws (C) would be removed to correct a problem in the automatic switch or check valve.

PUMP HEAD REPAIR

Motor and drive train area. Rarely does a problem occur in this area of the pump head. If a part does fail, it is quite easily replaced. Just be certain to follow closely the sequence of parts as shown in the figure. Also be careful to align the flat surface in the drive adapter with the flat surface on the motor shaft.

LUBRICATION

If the lubricant appears dried out it should be be wiped off the bearing assemblies. A small amount of automotive wheel bearing grease should be applied to both sides of each bearing.

FAILURE TO PRIME

Failure to prime can be caused by the presence of some foreign matter lodged in the valve preventing it from seating. To correct, remove any such foreign bodies.

CAUTION: Do not remove the stainless steel screens. These filter screens should be cleaned without removing them from the plastic housing.

PUMP CHAMBER REPAIR

Replacement of broken piston.

To remove a piston, back out the screw holding the defective piston.

Now lift the corner of the diaphragm and remove the broken piston. Insert the new piston through the diaphragm and slide the retaining ring on. Rotate the piston until it drops into place in the drive plate. Replace the screw and tighten until snug.

CAUTION: Do not attempt to re-use a piston once it has been removed. The plastic stem, if used a second time, may not hold securely. The second thread path removes additional material and there is then no real bite.

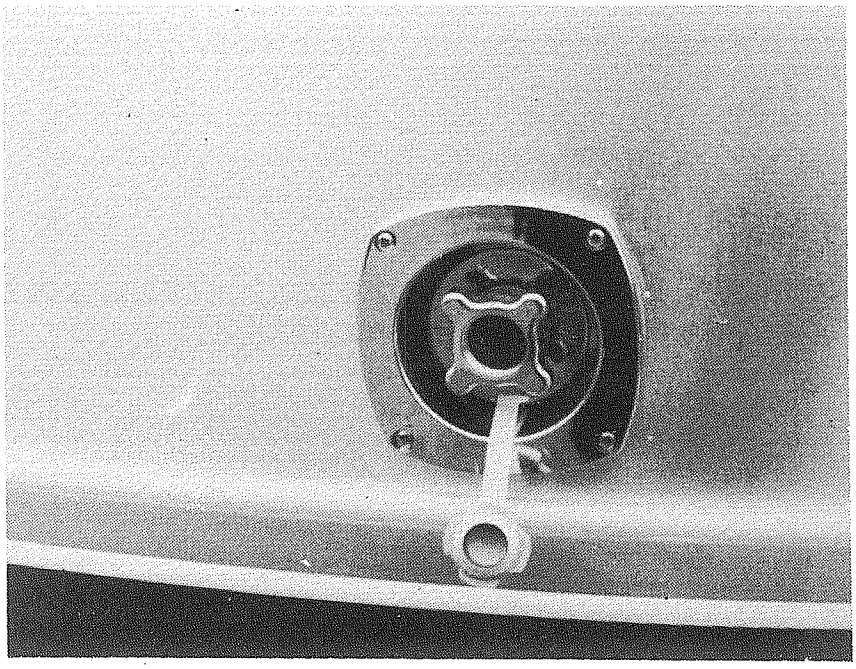
REPLACE A DIAPHRAGM

To replace a diaphragm follow the procedure used in removing the pistons. After removing the three pistons the diaphragm is loose and easily removed.

Screws (A) hold the piston.

Screws (B) hold the drive mechanism and should not be removed when replacing piston.

CITY WATER HOOKUP



Use a high pressure hose of at least 1/2" diameter. It should be one that is tasteless, odorless and non-toxic designed for RV use. The city water inlet is a standard garden hose thread. We suggest you carry two lengths of hose. This way you have the ability to reach hookups further away than normal, plus you have a spare hose should one fail or become damaged unexpectedly.

After hooking up the hose and turning on the city water valve provided in the park, slowly open a faucet. There will be a lot of spurts and sputtering until all the air is expelled from the trailer system. If the water heater is empty it will take some time before all the air is expelled and you get a steady flow of water at the faucet. Once a steady flow is achieved at one faucet the others should be opened long enough to expel the air in the lines going to them. Be sure to include the Insta-Hot water faucet if your trailer has this option.

During city water operation the water pump switch should be in the off position. A check valve built into the pump protects it from city water pressure.

Your plumbing system has a built in pressure regulator to protect your lines and faucets from extremely high pressures on some city water systems.

If your trailer is equipped with an automatic retracting water hose reel, make sure you don't pull the hose out more than a foot past the indicator band near the end. If you do, the hose is very hard to rewind.

WATER FILTER

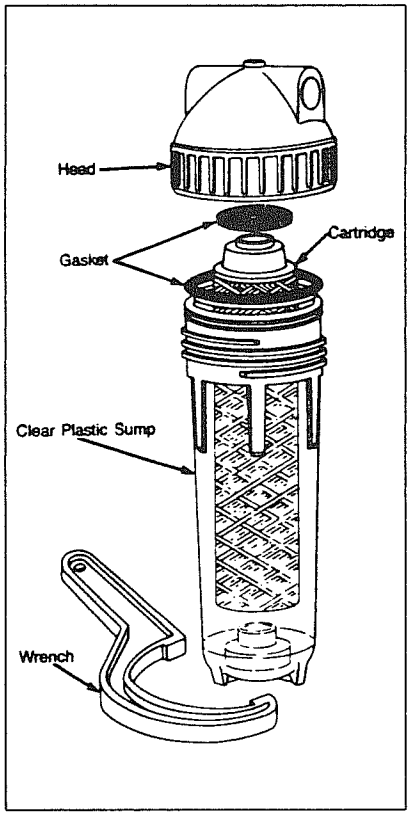
All the water in your Airstream is filtered. It is time to replace the filter cartridge when the water flow is reduced to an objectionable level. Replacement cartridges (RWC-5) are available from your dealer, and many department stores also have interchangeable cartridges.

Before removing the canister shut off the city water supply, or turn off your water pump switch.

Open a faucet to let off the water pressure. Place a bath towel and shallow pan under the filter. Unscrew the canister with the plastic wrench provided with each filter.

Remove the filter from canister and wash out any sediment. Wipe the gasket clean before reinstalling canister with new filter cartridge.

Do not overtighten. Hand tight is usually all that is required.



Filter Locations

34 ft. Walk thru Bath	Curbside wardrobe behind microwave. Lift lower shelf.
32 ft. Walk thru Bath	To rear of water heater. Access through exterior rear roadside compartment.
34 & 32 ft. (All other floor plans.)	In lavatory cabinet.
29 ft. (Optional)	In bottom of roadside wardrobe. Lift Shelf.
25 ft. (Optional)	Access through rear roadside exterior compartment.

INSTA-HOT WATER DISPENSER

Manufacturer: In-Sink-Erator Division
Emerson Electric Company
4700-21st Street
Racine, Wisconsin 53406
Phone: 414-554-5432

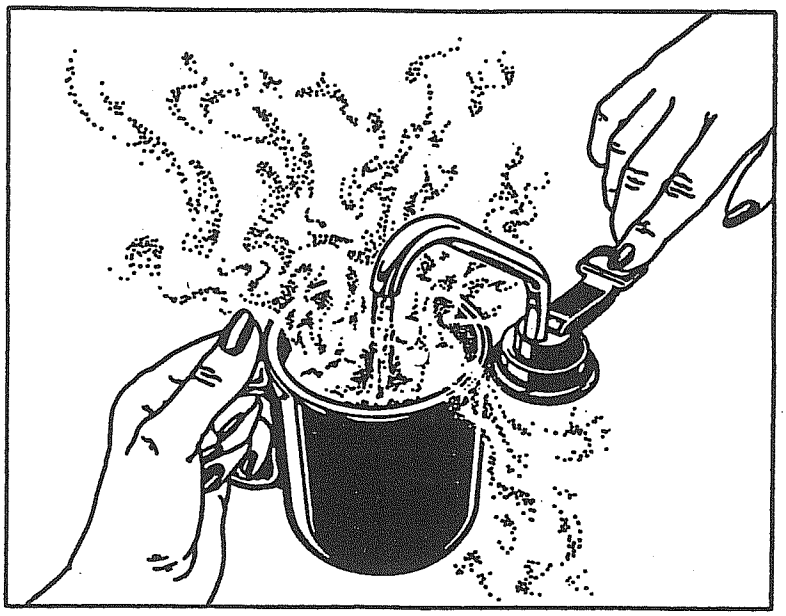
The optional Hot Water Dispenser is provided current through a wall switch above the galley. After the switch has been on a short while one third gallon of hot water is available for coffee, tea, chocolate and soups.

WARNING: This water is HOT. Contact to the skin will cause discomfort and may cause injury.

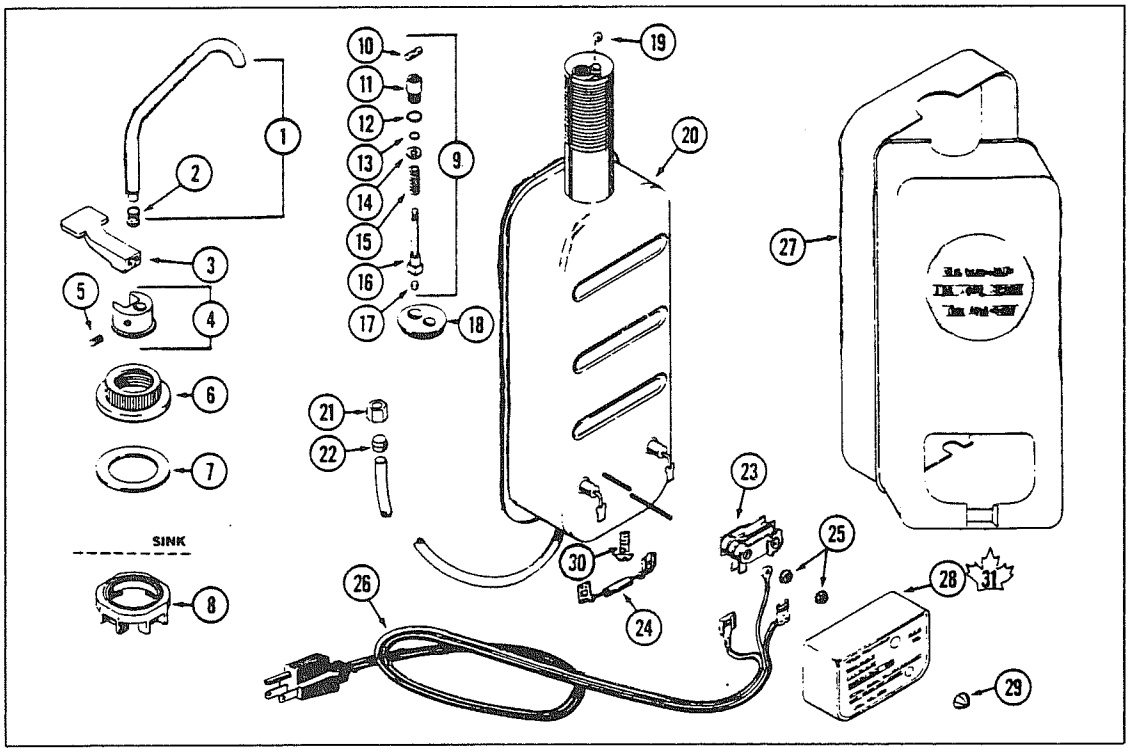
WARNING: Do not store paper towels or other flammable materials against the Insta-Hot Water Dispenser.

The water dispenser is filled by simply opening the faucet when water pressure is available from your pump or city water. The faucet will spit and sputter while filling until a steady stream of water indicates it is full.

CAUTION: Do not turn the dispenser on until you are sure it is filled with water.



Parts Diagram - Insta-Hot Water Dispenser



1. Spout Assy
2. Gasket
3. Handle
4. Cover
5. Screw, Set
6. Nut, mounting, upper
7. Gasket, mounting
8. Nut, mounting, lower
9. Valve guide & Stem Assy
10. Nut, tee
11. Bushing, valve guide
12. "O" ring 29/64 OD
13. "O" ring 9/32 OD
14. Washer
15. Spring
16. Valve stem assy
17. Disc, Valve Stem
18,. Gasket, Expansion Tube
19. Ball, aspirator
20. Tank Assy
21. Nut compression
22. Sleeve, ball
23. Thermostat
24. Thermal fuse assy
25. Nut
26. Plug & Cord Set
27. Case
28. Electrical Cover Assy
29. Nut, Cap
30. Plug, Drain

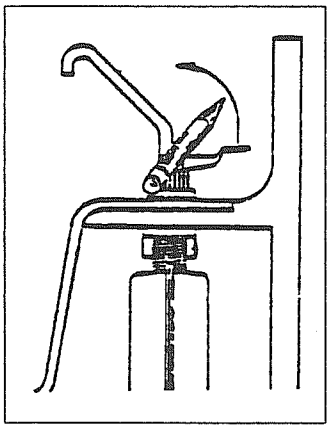
CANADIAN

31. Electrical Cover Assy

Handle Removal

1. Shut off water supply.

2. Place a 1/4" x 5/16" diameter dowel (a pencil will do) between the spout and the handle as shown below.



3. While holding the dowel firmly downward, pivot the handle upward to a vertical position. (See above.) The handle will snap away from the spout but remains secure.

4. With the handle in the vertical position, pull it firmly and straight up. The handle will snap free.

Reassembly

1. Locate the handle in a vertical position and directly over the Tee nut on valve stem. The Tee nut must be positioned to enter the slot in the handle. Push handle directly downward engaging the Tee nut into the slot in the handle. Engaging the handle will require some force, but will snap in place.

2. Return handle to normal operating position. Turn on water supply. If water continues to flow from spout, the Tee nut may need adjustment. Remove handle, turn Tee nut 180 degrees counterclockwise. Reassemble handle. Repeat procedure if necessary.

3. If water flow is not full but shuts off when handle is released, the tee nut is to be turned clockwise 180 degrees. Reassemble handle. Repeat procedure if necessary.

Valve Stem Assembly Removal

1. Turn dispenser on, drawing off all hot water. Shut off water supply. Disconnect electrical power supply.

2. Remove handle.

3. Remove top mounting nut.

   CAUTION: The dispenser may drop thru the sink and should be supported from under the sink.

   Suggestion: Turn the lower mounting nut further down (1" or more). This allows the dispenser to be pulled upward and held while removing the top mounting nut. Hold the dispenser and assemble another lower mounting nut flat side down in place of the top mounting nut.

   CAUTION: DO NOT support dispenser by grasping spout.

4. The valve stem assembly is now exposed for removal.

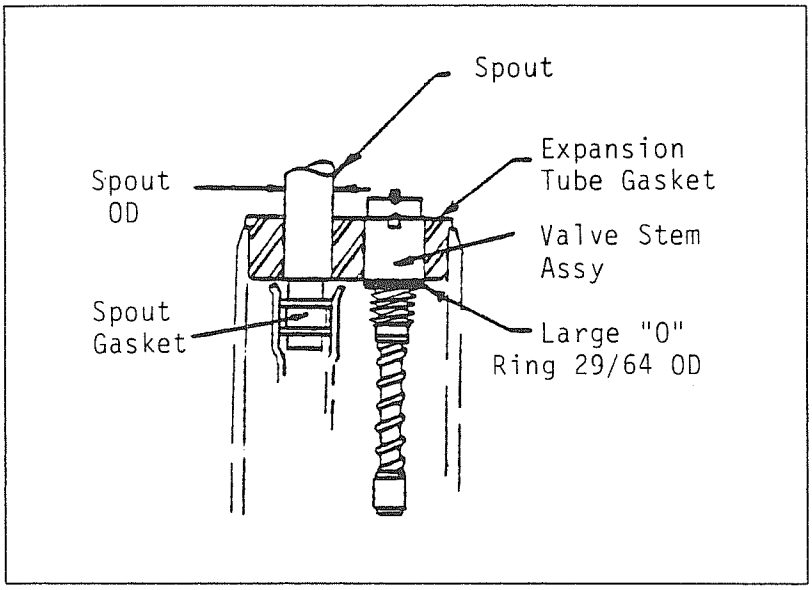
5. Note position of tee from valve stem.

7. The valve stem assembly is screwed down securely and a special tool is used to remove it. The tool is 1/4" Hex x 7/8" long, and at one end has two tips 180 degrees apart. A magnetic 1/4" Hex screwdriver (or 1/4' socket wrench) must be used with the valve stem removal tool. Purchase from your hardware store.

8. Position the tool straight down over the valve stem assembly. Engage the two tips of the tool into the two mating notches in the valve stem bushing. Turn screwdriver counterclockwise unscrewing the valve stem assembly from the dispenser.

   Note: Inspect the valve stem assembly for the large "O" ring (see diagram). If the "O" ring is missing, it became lodged under the expansion tube gasket. It need not be removed unless it needs replacing. Retrieving the "O" ring requires removal of the spout and expansion tube gasket. A very thin film of silicone grease applied to the spout OD (gasket end) and spout gasket will assure easier and positive reassembly. (See Diagram) REPEAT: USE ONLY A VERY THIN FILM OF SILICONE GREASE.

9. Reassemble in reverse. Turn on water supply. Turn on electricity.



Recovery Time/Hot Water Delivery

The recovery time of the hot water dispenser, that is the required time for the water in the tank to reach 190 degrees after drawing hot water, depends on:

* Ambient temperature of the incoming water to the dispenser.

* The amount of water drawn off at one time.

Some people find the taste from a hot water supply objectionable, and may insist on cold water supply. I-S-E suggests cold water supply.

A cold water supply requires an increase of recovery time while a hot water supply decreases recovery time.

You can expect up to forty 6 oz. cups of 190° water per hour by allowing a 1 1/2 minute recovery time between cups. If you draw three 6 oz. cups of hot water at once, there will be a noticeable drop in the next cup of water. After drawing 3 or 4 cups of water, a 4 (approx) minute recovery time is necessary. If all the water in the tank is drawn off, a 10 to 15 minute recovery time is necessary.

Temperature Checking

Water temperature should be checked immediately after the thermostat shuts off. (Draw off three cups of water. A rumble in the tank will be heard in a few moments. Wait (approx 3 1/2 minutes) until the rumble stops. You can hear the thermostat click open. Hot water is now ready for checking.

Place an accurate high quality thermometer (refrigeration type is suggested) in a styrofoam cup. Do not use any cup made of china, ceramic, clay or glass. They are normally cold and will cause a water temperature drop, resulting in an inaccurate reading of the hot water flowing from the dispenser.

Draw 6 oz. of hot water into the styrofoam cup. Allow the thermometer to remain in the cup approximately 15 seconds, then read the thermometer.

Adjusting the thermostat will increase or decrease the water temperature. Allow a few minutes for recovery and test water again if necessary.

Trouble Shooting

PROBLEM: No water or slow flow. (Normal flow is one ounce per second.)

CAUSE/ REMEDY: Main water supply off. Turn on main water supply.

Saddle valve not open. Open saddle valve.

Copper water line not punctured by self-piercing saddle valve. Close saddle valve completely to puncture copper water supply line. After turning valve in fully, open valve completely.

Saddle valve plugged. Close saddle valve completely. Disconnect 1/4" copper tube at saddle valve. Open saddle valve fully to assure a good strong flow of water. If good strong flow, close valve and reconnect 1/4" copper line. If flow is slow or not at all, saddle valve is plugged where it attaches or water supply line is not drilled or punctured completely.

Valve stem disc stuck to valve seat. Disassemble unit. Remove disc from seat area. Install new disc in valve stem. Reinstall and reassemble.

Dirt at dispenser valve seat. Shut off water at saddle valve. Disassemble and clean seat area. Reassemble and open saddle valve.

Tee nut not adjusted properly. Remove handle and adjust tee nut.

Handle broken. Will not raise valve stem. Replace handle.

PROBLEM: No water, or slow flow.

CAUSE/ REMEDY: Obstruction in tank fill tube at venturi hole. Disconnect electricity by removing plug, fuse, or open circuit breaker. Shut off water supply at saddle valve. Disconnect 1/4" water inlet supply line at saddle valve. Depress valve handle, and at the same time blow into spout outlet. Reconnect 1/4" water

supply line to saddle valve. Depress valve handle. If water flows, obstruction has been removed. If no water flows, replace complete assembly.

PROBLEM: Water is cold.

CAUSE/ REMEDY: Plug not installed in outlet. Install plug in outlet.

Circuit breaker open or fuse not installed. Close circuit breaker or install fuse.

Wire loose and/or disconnected at thermostat or heating element. Reconnect wire.

Thermostat not adjusted properly. Adjust thermostat.

Thermostat defective. Replace thermostat.

Thermal fuse open. Replace thermal fuse.

Open heating element. Replace complete assembly.

PROBLEM: Water not hot enough.

CAUSE/ REMEDY: Thermostat not set high enough. Turn thermostat adjusting screw clockwise to increase operating temperature.

Thermostat defective. Replace thermostat.

Tank hot water supply exhausted. Allow tank to recover to full operating temperature.

PROBLEM: Unit spits when drawing first cup of water.

CAUSE/ REMEDY: No aspirator ball. Install aspirator ball.

Aspirator ball stuck in tube. Dislodge and replace ball.

Thermostat set too high. Water boils. Adjust thermostat.

Thermostat set too high. Will not respond to adjustment. Replace thermostat.

No water in expansion chamber. Continued use will fill expansion chamber.

Air in water supply line. Correct household water supply.

PROBLEM: Unit spits after drawing four or five cups of water.

CAUSE/ REMEDY: Aspirator orifice not round. Replace complete assembly.

Aspirator ball not round, flat spots. Replace aspirator ball.

Aspirator ball tube not attached properly. Replace tank assembly.

Note: Some "spitting" is normal when drawing quantities of water.

PROBLEM: Unit drips every 20 minutes when thermostat comes on.

CAUSE/ REMEDY: Thermostat set too high. Adjust thermostat.

Expansion chamber full. Check for low water pressure.

Spout not fully seated. Loosen set screw, push spout down until it bottoms. Tighten set screw.

Thermostat mounting stud bent. Not perpendicular to tank face. Straighten stud. Should be 90 degrees to tank face.

PROBLEM: Water continuously drips from spout.

CAUSE/ REMEDY: Valve not seated due to foreign object. Disassemble and remove foreign object.

Tee nut not adjusted properly. Adjust tee nut.

Valve disc missing. Install valve disc.

Metal valve seat defective. Replace unit.

PROBLEM: Water leaks around spout.

Cause/ REMEDY: Valve stem bushing not tight. Tighten bushing.

Large and/or small "O" ring damaged, cut, missing, etc. Install or replace both large and small "O" ring.

PROBLEM: Water continues to flow for one to two seconds after handle is released.

CAUSE/ REMEDY: Normal

PROBLEM: Unit is loose in sink.

CAUSE/ REMEDY: Upper and lower nuts not tight. Loosen bottom nut. Tighten top nut firmly, then retighten bottom nut.

Top nut has bad threads. Replace top nut.

Expansion chamber tube threads not formed properly. Replace unit.

FAUCETS

Care and Cleaning

The surface of the faucets will stay bright and resist wear with a minimum of care. Strong detergents may tend to dull the finish, so when cleaning a faucet use only mild soap and water.

The finish on the faucets has been designed to retain its polished appearance without scouring. Stains and dirt remove easily without the use of scouring powders or abrasive polishes and cleaners. Use of such agents may cause scratches which mar the finish, and in time become dirt catchers and unattractive.

Airstream uses two manufacturers of faucets in our travel trailers. Repair instructions for both models are included. Be sure to check the manufacturer of your faucet for the appropriate instructions.

B & K FAUCETS

Manufacturer: B & K Industries, Inc.
655 Wheat Lane
Wood Dale, IL 60191

Repair of B & K faucets is relatively simple. One repair kit will repair all three faucets. The procedure for repairing all three is the same.

Included in the faucet repair kit is the cam, cam packing, ball assembly, and seats and springs.

If the faucet leaks from the spout.

1. Shut off water and drain pressure from system.

2. Unscrew the chrome cap located under the handle.

3. Remove the handle and brass ball assembly.

4. Check for any scratches or gouges in the ball itself.

5. Check for any debris in the "seat and spring" area by removing both seats and springs, and inspect thoroughly.

   In most cases replacing the seats and springs will correct the leak. When reassembling, reverse the above procedure making certain the guide pin in the faucet body slides into the slot on the ball. DO NOT FORCE THE BALL INTO THE BODY. IT WILL ONLY FIT ONE WAY.

If the faucet leaks from the base or under the handle.

1. Shut off water and drain pressure from system.

2. Remove the handle and chrome cap.

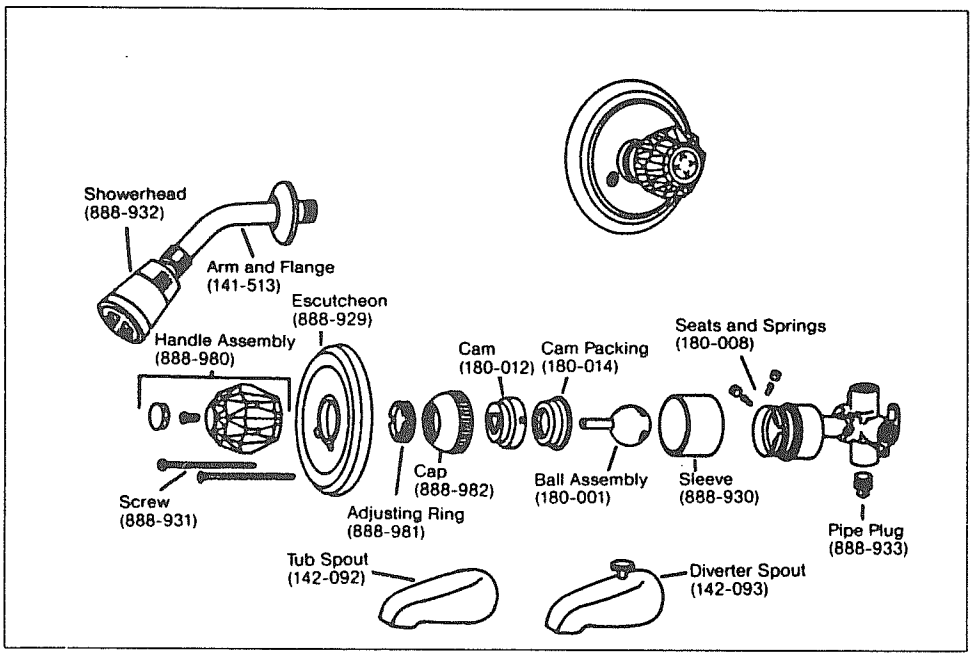
3. Inspect the cam and cam packing.

4. Remove the spout on the kitchen model and inspect both "O" rings on the faucet body.

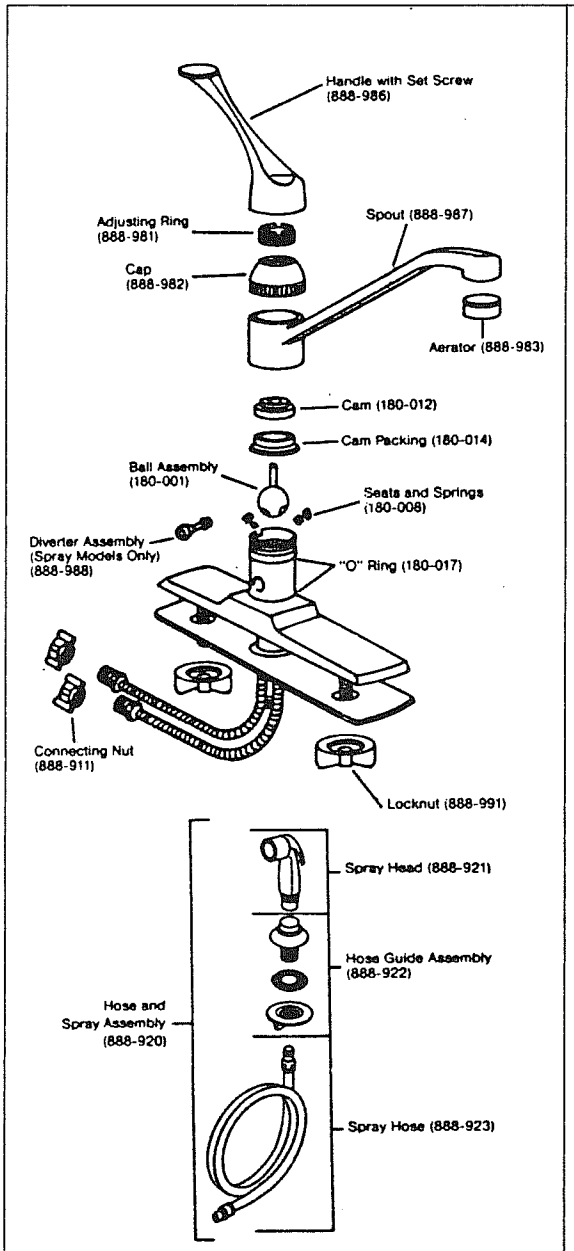
5. Replace any worn, damaged or defective parts.

Reverse the procedure above, making certain the guide pin in the faucet body slides into the slot on the ball. DO NOT FORCE THE BALL INTO THE BODY. IT WILL ONLY FIT ONE WAY.

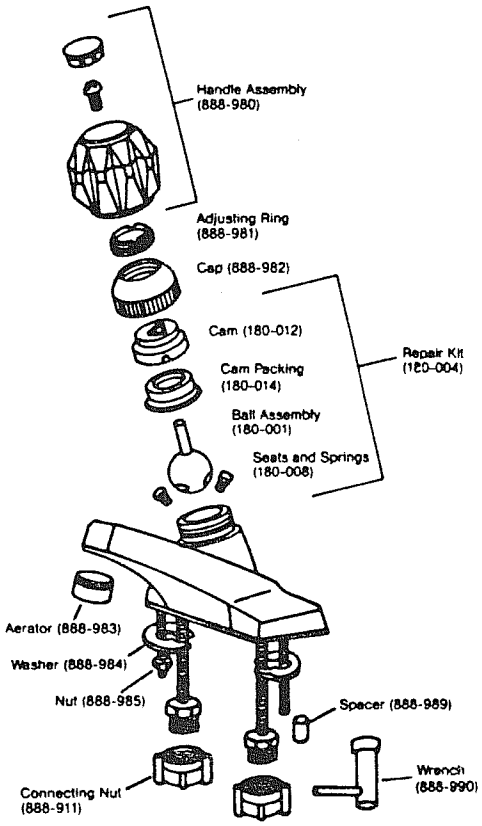
SHOWER FAUCET



KITCHEN FAUCET



LAVATORY FAUCET



NIBCO FAUCET

Manufacturer: Nibco Inc.
500 Simpson Avenue
P.O. Box 1167
Elkhart, IN 46515-1167

Cartridge Adjustment - Galley and Lavatory

1. Remove the decorative button and handle with Phillips screwdriver.

2. Position the cartridge in the "off" position (fully forward).

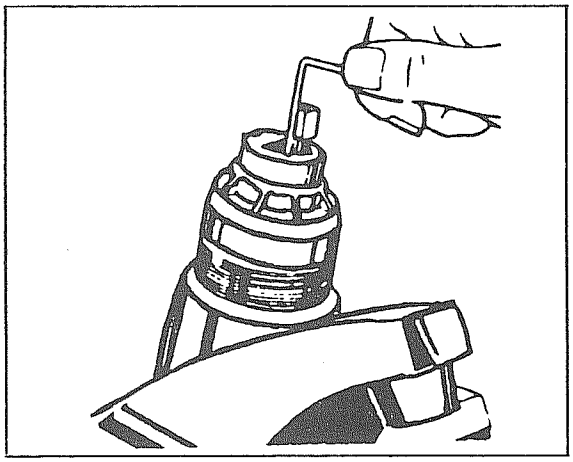
3. Insert a 5/64" Allen wrench into the left-hand hole (hot side) in the top of the cartridge. Turn clockwise until a moderate flow appears. Let it run for approximately 2 minutes. If no flow appears the wrench has not properly engaged the cartridge stem.

4. Slowly turn the wrench counterclockwise until the flow stops. Then turn an additional 1/4 turn counterclockwise. Do not push down on the stem during this adjustment. Remove the wrench.

5. Repeat steps 2, 3, and 4 for right-hand (cold) side.

6. Replace parts removed in #1 above.

7. The cartridge is now properly adjusted.



Cartridge Adjustment - Shower

1. Remove the handle (pull off).

2. Position the cartridge in the "off" position.

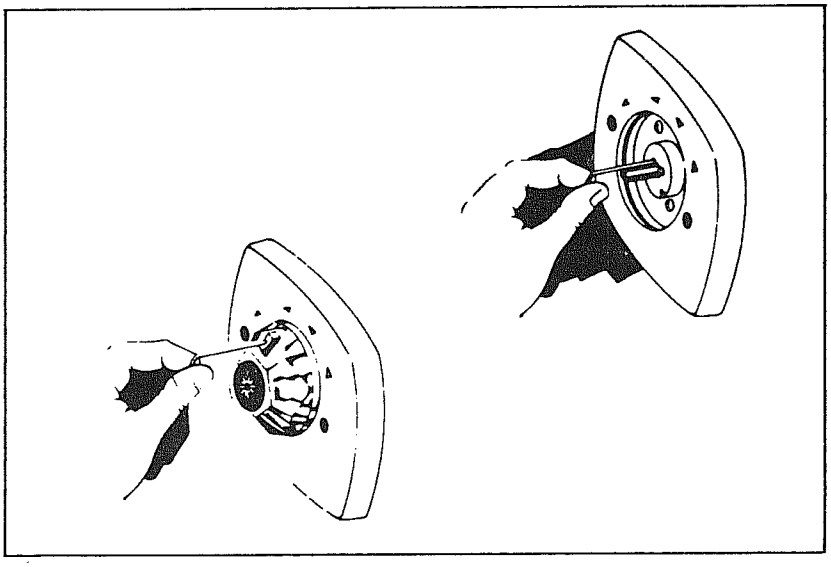
3. Insert a 5/64" Allen wrench into the left-hand hole (hot side) in the top of the cartridge. Turn clockwise until a moderate flow appears. Let it run for approximately 2 minutes. If no flow appears, the wrench has not properly engaged the cartridge stem.

4. Slowly turn the wrench counterclockwise until the flow stops. Then turn an additional 1/4 turn counterclockwise. Do not push down on the stem during this adjustment. Remove the wrench.

5. Repeat steps 2, 3, and 4 for right-hand (cold) side.

6. Replace parts removed in #1 above.

7. The cartridge is now properly adjusted.



Comfort and Safety Stops

The tub/shower unit is equipped with "comfort" and "safety" stop features which are set in the full hot positions. To reposition the "comfort" stop, turn handle to full hot, insert 5/64 Allen wrench through hole in black button and engage hex screw below. Turn counterclockwise to loosen. With Allen wrench still inserted, move handle to desired setting and tighten. Repeat these procedures to position "safety" stop. To override comfort stop push black button.

Cartridge Replacement - Galley and Lavatory

Should any maintenance ever be necessary on your faucet you can do that yourself by simple cartridge replacement. Repair kits are available from your dealer. Tools: 1/8" Allen wrench, screwdriver (Phillips), screwdriver (blade), pocket knife, large pliers, clean rag. Before starting to repair your faucet refer to Parts Identification list for proper identification and nomenclature. Follow these steps:

1. Shut off water supply, close drain to prevent loss of small parts.

2. Remove handle button (1). Remove screw (2) and lift off handle (3 or 4). Fig. 10.

3. Carefully note the position of the handle adapter (5) to insure correct reassembly. Loosen handle adapter set screw (6) with allen wrench. Remove handle adapter. Fig. 11.

4. Lift off decorative cap (7).

5. Loosen and remove brass hold down ring (8).

6. Remove cartridge (9). Pry cartridge out of body using a screwdriver in front of body. Fig. 12.

7. To install new cartridge, open valve before inserting cartridge in under body by pushing stem forward. Note that cartridge will seat only in one position. The tabs on cartridge must seat in slots on underbody.

8. Replace and securely tighten brass hold down ring.

9. Replace decorative cap with tab resting in the slot provided in the top of the cartridge.

10. Replace handle adapter and tighten the set screw securely. (**Note:** the set screw must be positioned toward the front of the faucet, so that when tightened it comes in contact with flat space on the cartridge stem.)

11. Replace handle and handle screw and tighten. Snap in handle button.

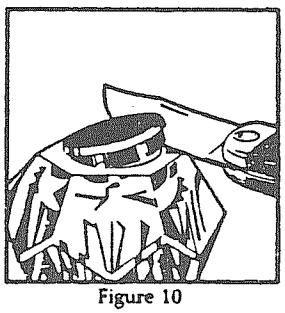


Figure 10

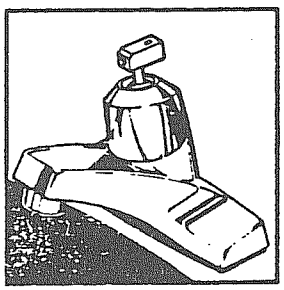


Figure 11

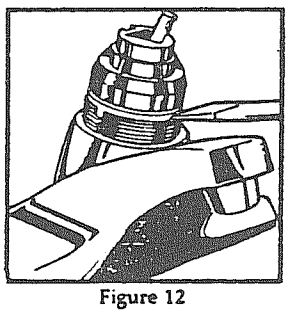


Figure 12

To Clean or Replace Spout Aerator

1. Remove carefully by turning aerator clockwise when facing the installed faucet.

2. Clean aerator and replace. Hand tighten.

Cartridge Replacement - Shower

1. Shut off water. Grasp acrylic handle and pull slowly to remove. Handle is a sliding spring fit with the handle shaft.

2. Use screwdriver to remove cover screws.

3. Remove cover and back-up plate.

4. Loosen and remove brass ring.

5. Turn handle shaft to full open position (counterclockwise).

6. Using blade screwdriver in slot on top of cartridge, carefully pry cartridge out of underbody.

7. Rotate handle shaft on new cartridge to full open position.

8. With screwdriver slot on new cartridge up, insert cartridge into underbody. Note that tabs on cartridge must enter slots in underbody.

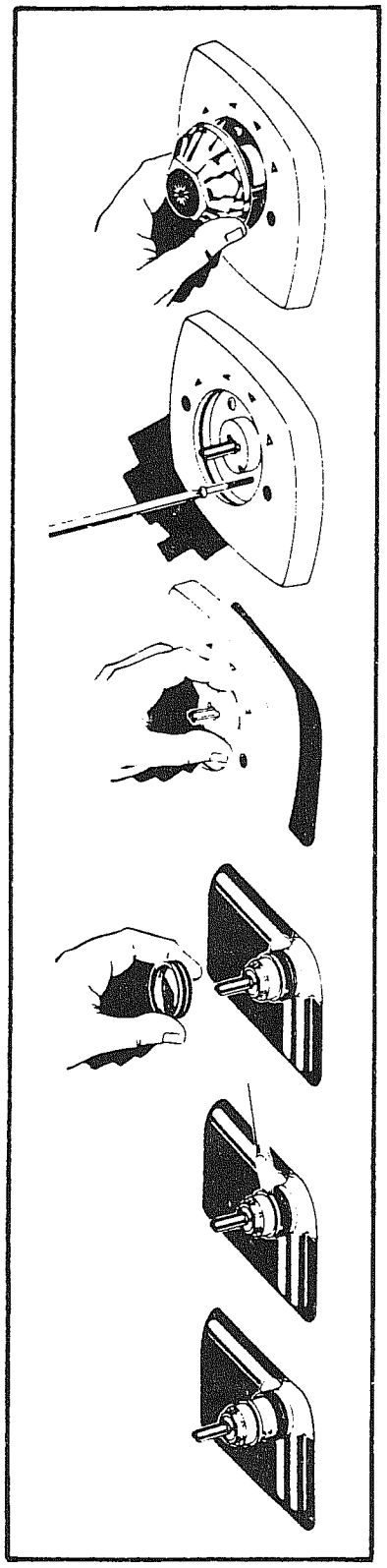
9. Replace and securely tighten brass ring. Install back-up plate and cover. Install screws securely, but do not overtighten.

10. Turn handle shaft to off position. (Clockwise).

11. Replace acrylic handle with comfort stop button in the downward (5 O'Clock) position.

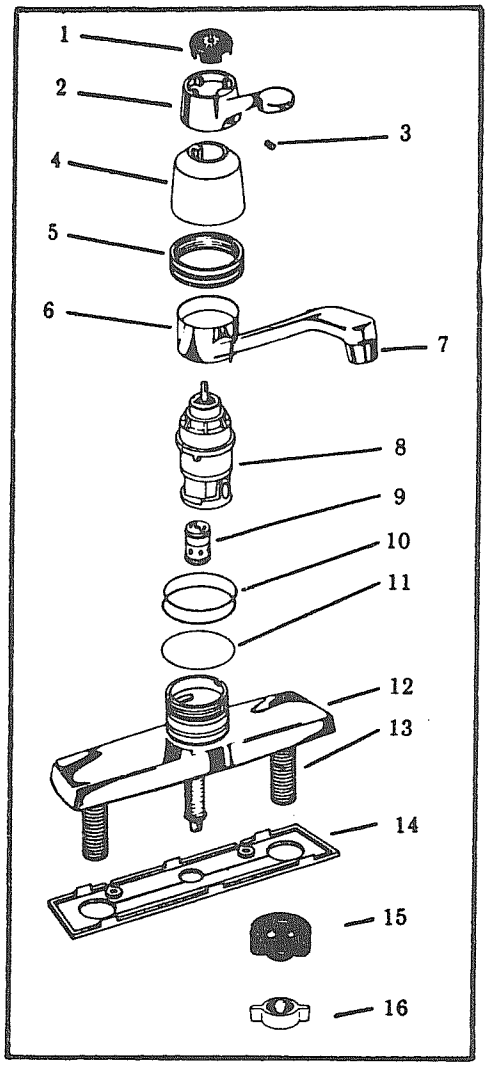
12. Turn on water. Turn handle to comfort stop and thoroughly flush lines for at least one minute.

13. Turn handle to the off position. Control unit is now ready for use.



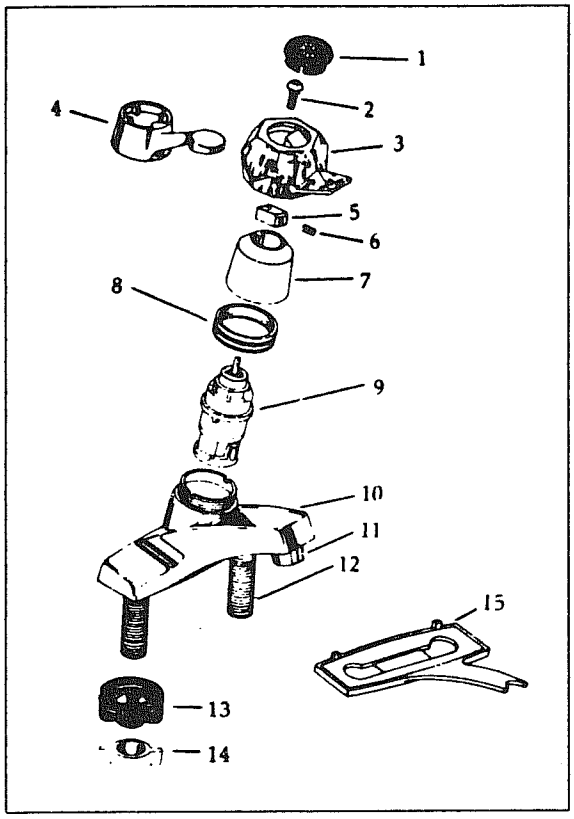
Galley Faucet Parts Diagram

1. Handle Button
2. Handle
3. Set Screw
4. Decorative Cap
5. Hold Down Ring
6. Spout
7. Aerator (Flow Control)
8. Cartridge
9. Diverter
10. Hub "O" Ring
11. Friction Washer
12. Cover
13. Underbody
14. Putty Plate
15. Lock Nut
16. Coupling Nut

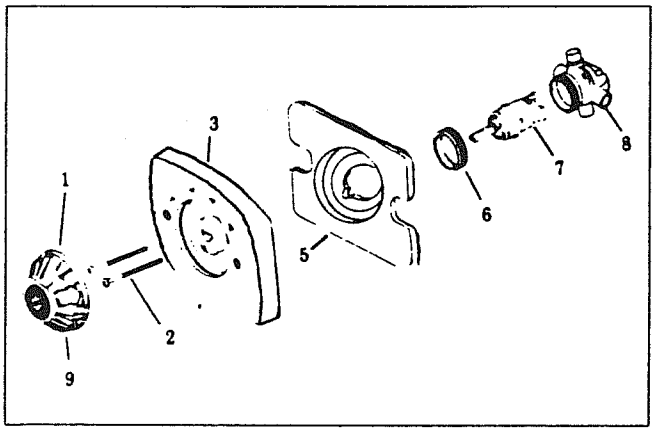


Lavatory Faucet Parts Diagram

1. Handle Button
2. Handle Screw
3. Acrylic Handle
4. Lever Handle
5. Handle Adapter
6. Set Screw
7. Decorative Cap
8. Hold Down Ring
9. Cartridge
10. Plated Cover
11. Aerator (Flow Control)
12. Underbody
13. Lock Nut
14. Coupling Nut
15. Putty Plate



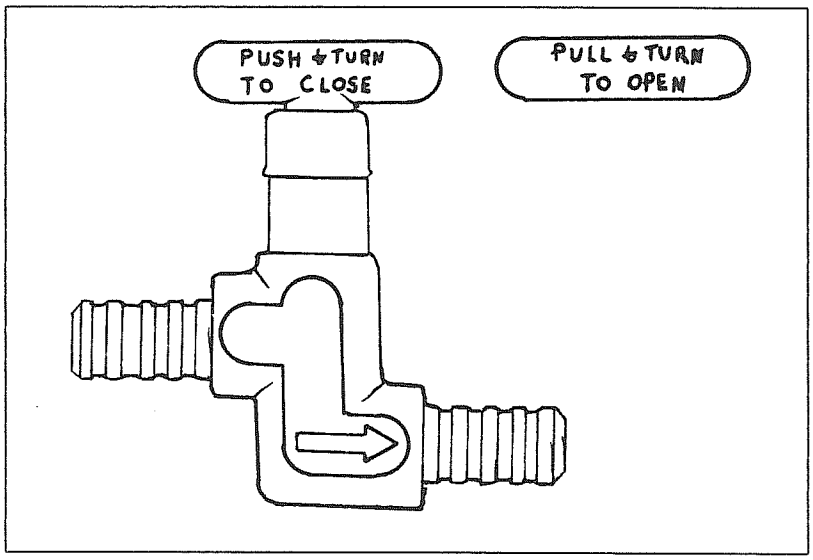
Shower Control Parts Diagram



1. Handle
2 Cover Screw
3. Stop Ring & Cover Assy
5. Support Plate
6. Hold Down Ring
7. Cartridge
8. Underbody
9. Handle Button

DRAIN VALVES

Directly below is an illustration of a line drain valve used by Airstream. They are made out of a gray nylon material. The illustration is close to the actual size of the valves.



The valves are opened by pulling up on the handles while turning them counterclockwise. About five complete turns will open them completely.

To close, push down and turn clockwise about five complete turns.

Note: <u>These valves do not have stops.</u> <u>You can just keep turning them.</u>

Most line drain valves are located in what we commonly call the tank well. This is a rectangular cut-out in the floor that exposes the end of the fresh water tank. In the "well" is where the fill pipe is connected, the intake pump hose, the probe wires to indicate the water level, and most of the drain valves.

To see the valves a flash light will normally be required. In your first attempt to identify the valves you may find a small mirror helpful.

To Empty Fresh Water Tank

The fresh water tank may be emptied by pumping the water out with the self-contained water pump. Simply turn on the pump switch and open a couple of faucets until the water will no longer come out. On all models there is also a petcock type drain valve located in the wheel well and extended out through the tank support pan. Some are seen by looking between the tires, but others are directly behind the tire.

They are located on the same side of your trailer as the water fill pocket.

An additional drain plug is located on the bottom of the tank, accessible under the inspection plate that can be seen on the bottom of the tank support pan. A large allen wrench is required for its removal.

Note: For winterizing purposes, only the petcock behind the tires need to be opened to drain the tank.

Water Heater Draining

All models have a drain plug or petcock on the water heater. Access is from the exterior. The plug or valve is usually located in the lower left corner, viewed as you face the exterior of the water heater.

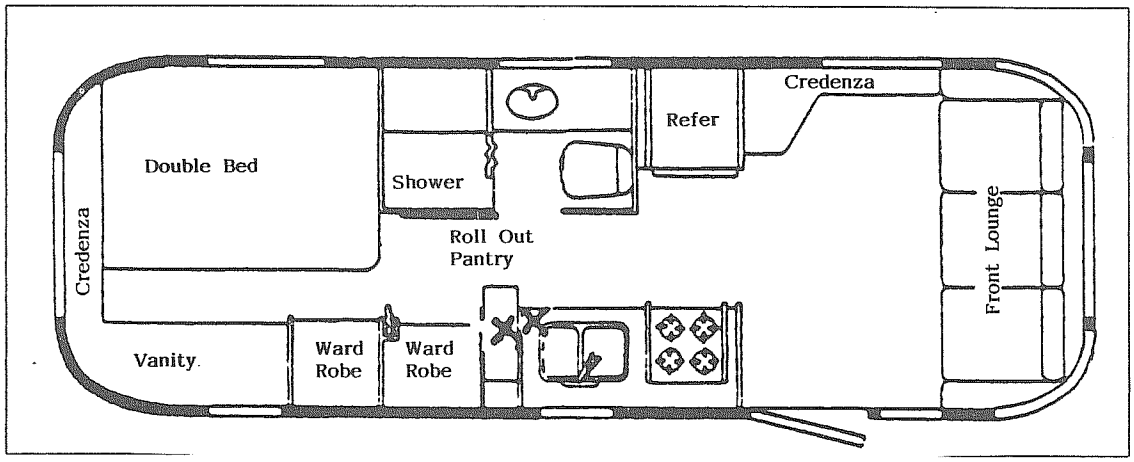
Hot Water Dispenser Draining

If your trailer is equipped with the hot water dispenser there will be a brass drain plug on the bottom of the dispenser accessible in the galley cabinet.

DRAIN VALVE LOCATIONS

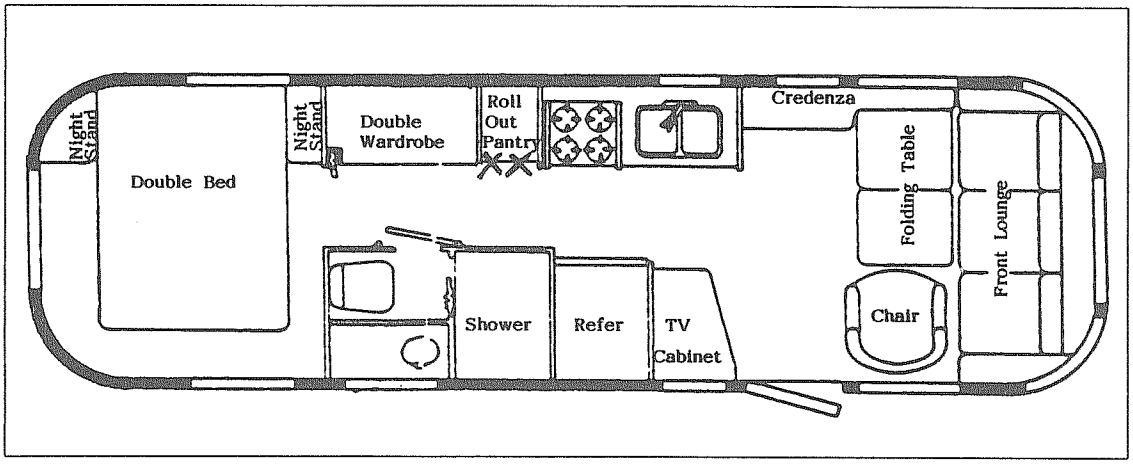
The following illustrations will help you locate the valves in your trailer. The "X" indicates the position of the line drain valves relative to the cabinetry.

Twenty-Five Foot



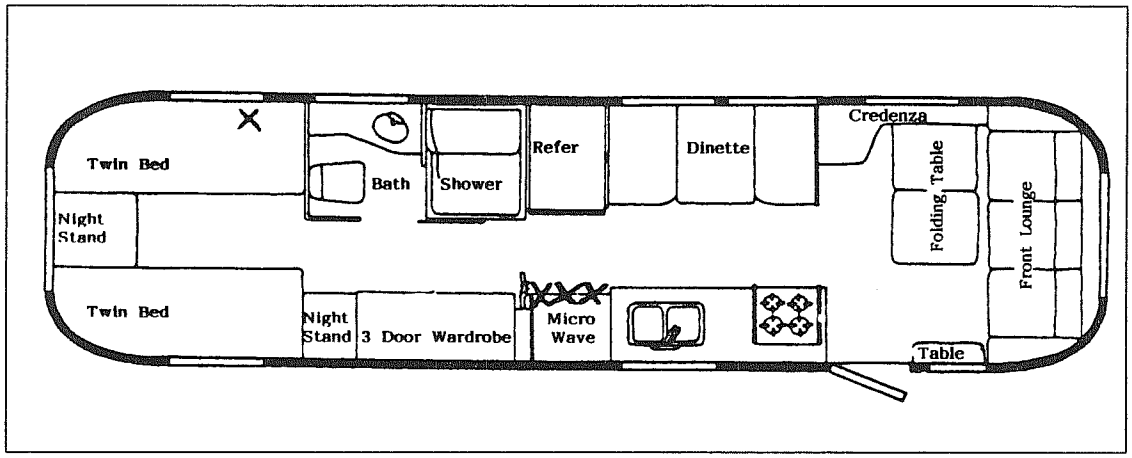
The two line drain valves are located in the tank well almost directly under the roll out pantry. There is an access panel screwed to the bottom shelf of the galley cabinet.

Twenty-Nine Foot



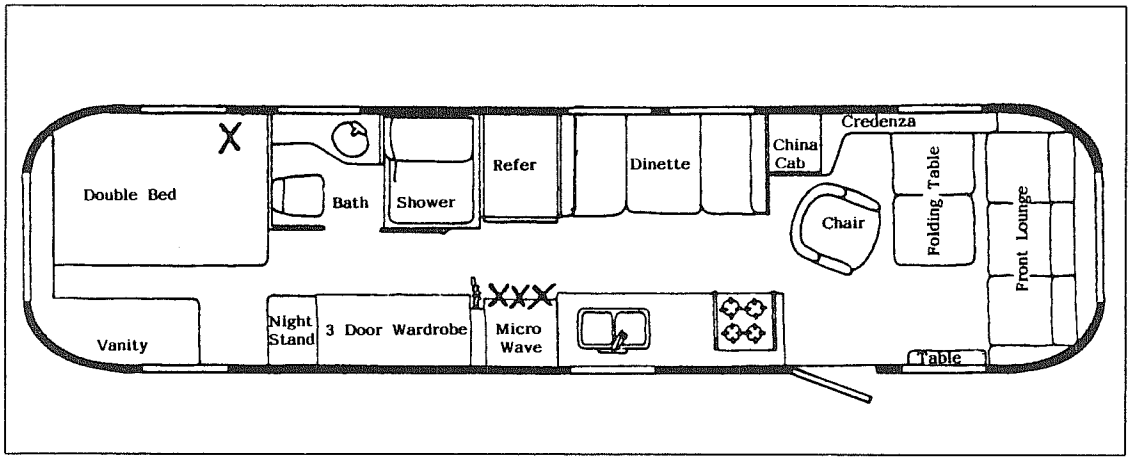
The two line drain valves are found down in the tank well located under the pantry or microwave cabinet.

Thirty-Two Foot



The thirty-two foot center bath models have four line drain valves. Three are located close together in the tank well. Lifting the false bottom of the microwave cabinet will give you access. The fourth valve is located under the rear bed (no matter what style) on the roadside of the trailer. An access panel in the bed top can be found by sliding the mattress to one side, or the complete bed top can be removed. On 32L models the tank well would be located under the galley. A false bottom panel lifts up for access.

Thirty-Four Foot



The thirty-four foot center bath models have four line drain valves. Three are located close together in the tank well. Lifting the false bottom of the microwave cabinet will give you access. The fourth valve is located under the rear bed (no matter what style) on the roadside of the trailer. An access panel in the bed top can be found by sliding the mattress to one side, or the complete bed top can be removed.

WINTERIZING AND STORAGE

When storing your trailer for short or long periods use the same precautions as you would in your own home in regard to perishables, ventilation and rain protection. In addition, for prolonged storage periods, flush out all the drain lines and the holding tanks. Also drain the entire water system including the water heater and the water storage tank. Instructions for draining the water system are explained in the following paragraphs on winterizing.

THE MAIN CONSIDERATION IN WINTERIZING IS TO GUARD AGAINST FREEZING DAMAGE TO THE HOT AND COLD WATER SYSTEMS, THE WASTE DRAIN SYSTEM (INCLUDING THE TRAPS), THE WATER HOLDING TANKS, THE WATER HEATER AND THE BATTERY.

To completely winterize your trailer follow this procedure:

1. Level the trailer from side to side and front to rear. Open all faucets.

2. Turn the water pump switch to the ON position to expel water from the storage tank.

3. Open all drain valves including drain plug or valve on water heater.

4. While the water is draining from the system, open and flush the toilet flushing valve. Depress hand spray lever while holding the spray head down inside the bowl. Depress hand spray thumb button on the telephone shower head while holding down inside the tub and drain all water from the flexible hose. Unscrew the heads on both spray units and store.

5. After all water has been removed from the storage tank, turn the pump switch OFF.

6. Remove exhaust hose from water pump.

7. Disconnect the water pump inlet connection and turn the pump on until all the water is expelled. This water, about 1/2 cup, can be caught in a towel or rag.

8. Lower the front of the trailer as far as the jack will allow until water ceases to drain, then crank the jack up as high as it will go and let any remaining water drain out.

9. After the water has stopped running from the drain lines, apply at least 60 lbs. of air pressure at the city water inlet. An air to city water adapter is available from your dealer's RV accessory store. Be sure the toilet valve and all drain valves and faucets are open and

pump outlet hose is disconnected. This can be accomplished at a service station and will force any remaining water from the water heater and remove any water which may be trapped in low areas.

10. Pour a cup of *approved non-toxic antifreeze into the lavatory, sink and tub drains to prevent trap freeze-up.

    *Approved and listed by a recognized testing authority such as UL (Underwriter Lab).

11. Be sure to open the waste holding tank drain valves and drain and flush the tanks thoroughly (THIS IS VERY IMPORTANT AS THE SEWAGE IN THE TANKS, IF FROZEN, COULD SERIOUSLY DAMAGE THE TANKS.)

12. Remove the cartridge of the water purifier and leave the purifier valve in the open position. (If so equipped.)

13. Remove the batteries from your trailer and store in a cool dry place where there is no danger of freezing. It is very important for optimum life of a battery to check it periodically and to keep it fully charged.

14. Remove any items (food, cosmetics, etc.) from trailer interior that might be damaged by freezing - or might damage the trailer if containers break.

For additional winterizing protection add a non-toxic antifreeze (approved for drinking water system) to the water lines using the following procedure;

1. Reconnect all lines except the hose to the pump inlet port. Close all drain valves (See Steps 3 and 12).

2. Turn by-pass valve to by-pass position.

3. Attach a length of hose to the pump inlet port. This piece of hose should be long enough for the free end to be inserted into and reach the bottom of the antifreeze container.

4. Dilute the antifreeze solution in accordance with the manufacturer's instructions.

5. Open all water faucets.

6. Insert hose length into the antifreeze container, turn the pump switch on, and run the water pump until the antifreeze solution fills all water lines and the water heater. Flush toilet, work hand spray while holding down in bowl. Work hand shower spray while holding down in tub.

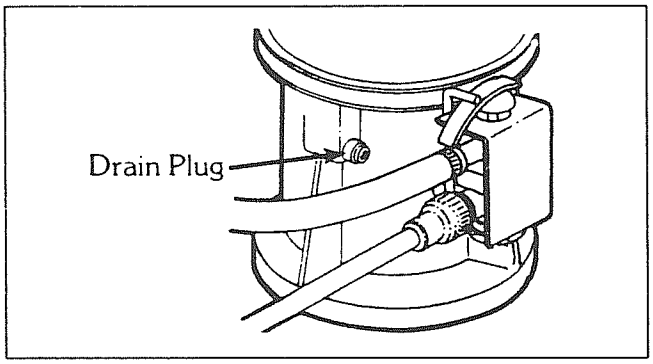
7. Shut off the pump and close all faucets.

8. Disconnect the hose length from pump inlet fitting and reconnect water system inlet line.

9. On Sealand toilet remove drain plug. (See diagram.)

   Remove water line and screen.

   Depress flush lever until all water drains from the system.



DRAIN AND WASTE SYSTEM

Your trailer has a drain and waste system that includes waste holding tanks made from molded plastic, free from corrosion problems, with trouble-free dump valves.

The MAIN HOLDING TANK enables you to use the toilet for several days away from disposal facilities. The waste water from the sink, shower, bath and lavatory drains in the AUXILIARY HOLDING TANK. Each tank has its own dump valve, however, both tanks drain through a common outlet. Therefore, you need to make only one connection when hooking up in a trailer park with sewer facilities.

CAUTION: **Never put wet strength paper towels or tissues in your holding tank since they won't dissolve and can "catch" in the mechanism of the dump valve. Colored toilet tissue is slower to dissolve than white. Most RV accessory stores offer tissue designed for RVs that will completely dissolve.**

Deodorizers

There are many deodorizers on the market in tablet, liquid and powder form. These not only combat odor, but stimulate the bacteria that works to dissolve the solids in your tank.

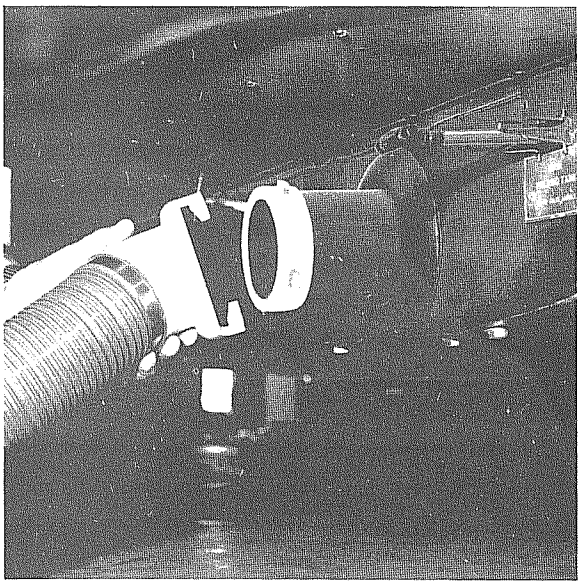
Monitor Panel

Check your monitor panel frequently. When the MAIN HOLDING TANK is completely full, sewage cannot be emptied from the toilet bowl. If the AUXILIARY HOLDING TANK is overfilled, drain water will "backup" into the tub and cause an unpleasant cleaning job. Never drain the tanks at any place other than an approved dumping station.

Emptying Tanks

Almost all campgrounds will have dumping facilities. Park directories such as Woodalls and Rand McNally also list dumping stations.

To empty one or both tanks attach the sewer hose by pressing the bayonnet fitting onto the dump valve outlet and rotate clockwise until it feels solid and secure. Attach the outlet end of the hose to the sewage outlet, making sure that the hose is placed so it will drain completely.



Pull the dump valve handle as far as it will go and wait until the tank is drained. When dumping, the main holding tank should be dumped first; then the auxiliary holding tank. This will help to rinse out the sewer line with auxiliary holding tank water.

The main holding tank must be flushed out until all paper and waste material is removed. Close the dump valve and refill the tank with clean water and repeat until clean. Replace the cap prior to traveling.

When Parked and Connected to Sewer Outlet

When you are in a park and connected to a sewer outlet keep the main holding tank dump valve closed, and empty the tank every few days or whenever it becomes almost full. ONLY BY SENDING A LARGE VOLUME OF LIQUID THROUGH THE MAIN HOLDING TANK AT A TIME WILL TOILET PAPER AND OTHER SOLIDS COMPLETELY WASH AWAY.

This practice will avoid the accumulation of solids in the main holding tank which could lead to an unpleasant cleaning job. Should solids accumulate, close the dump valve, fill the tank about half full with water, then tow the trailer for a few miles. The turbulence and surging of the water will usually dissolve the solids into suspension so the tank can be drained. Keep the auxiliary tank valve open when connected to a sewer outlet.

Draining the tanks as described will protect them from freezing during storage. When traveling in sub-freezing temperatures use a winterizing solution designed for RV use. Follow the directions on the container.

Drain Systems Cleaning

The only cleaning agents that can be used without causing harm to the system are household ammonia and trisodium phosphate in small quantities. Do not use any product that contains any portion of petroleum distillates. This attacks the rubber seals of your toilet and dump valve. Also, do not use any dish detergent or abrasive cleaners. All products should be marked approved for ABS drainage systems.

When winterizing drains use only trailer plumbing system type antifreeze. These are sold through your dealer.

Drain System Repair

Fittings are cemented together with ABS corlon cement; therefore, cannot be successfully separated. Section to be repaired must be cut out of the drain system using a hacksaw. Surfaces to be cemented must be clean and dry. Use a small 1/2" paint brush to apply the cement. Fittings must be installed immediately as the cement dries rapidly and bonding action is in seconds. For this reason it is best to have all pieces pre-cut and a trial assembly made without the use of cement.

Dump Valve Removal

To remove the valves, aircraft type snips are used to cut out the metal under the valves. Don't skimp on the hole size. It is easier to put on a little larger inspection plate when you are done than it is to try to work through a small opening.

No matter which installation is in your trailer, a rubber union will always be between the two gate valves. Loosen the clamps on the rubber unions and the clamp on the dump valve furthest from the union. The gate valve, tee, wye and corlon extension is all removed as an assembly. Once the large assembly is removed, the other dump valve is easily removed. In many instances the nuts for the clamps will be facing upward, and a short open end wrench will be the easiest tool to use when loosening them.

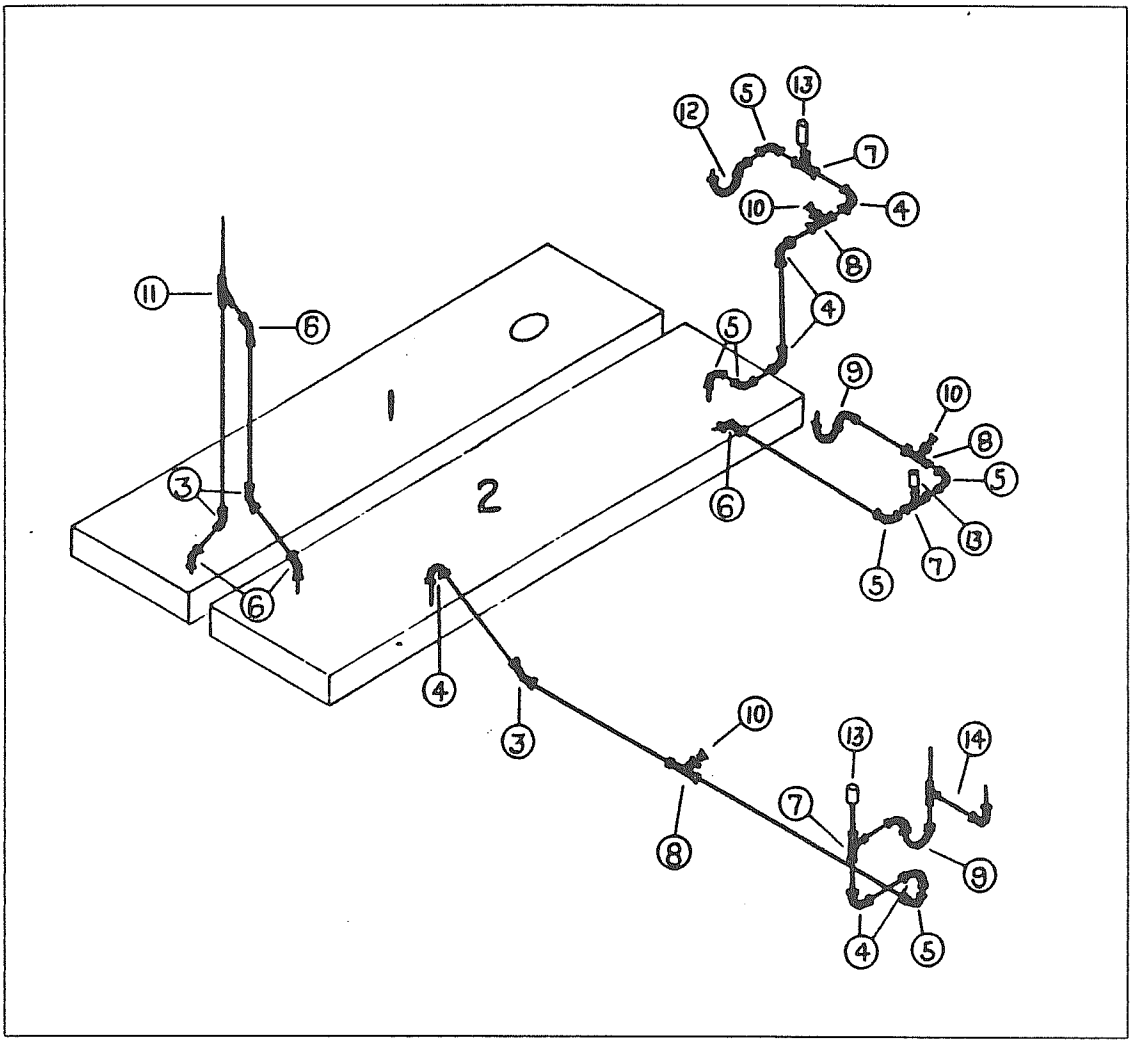
We don't normally replace the valves, but repair them while they are still glued to the assembly. Each repair kit includes instructions for working on the valve itself.

If a valve must be replaced, a hacksaw or hacksaw blade is used to cut the valve off flush with the black corlon. Work your way around the fitting, driving the screw driver and little deeper each time. About the second time around the glue will usually "pop" loose.

Be sure to note the position of the original valve so the new one will be glued in the same direction.

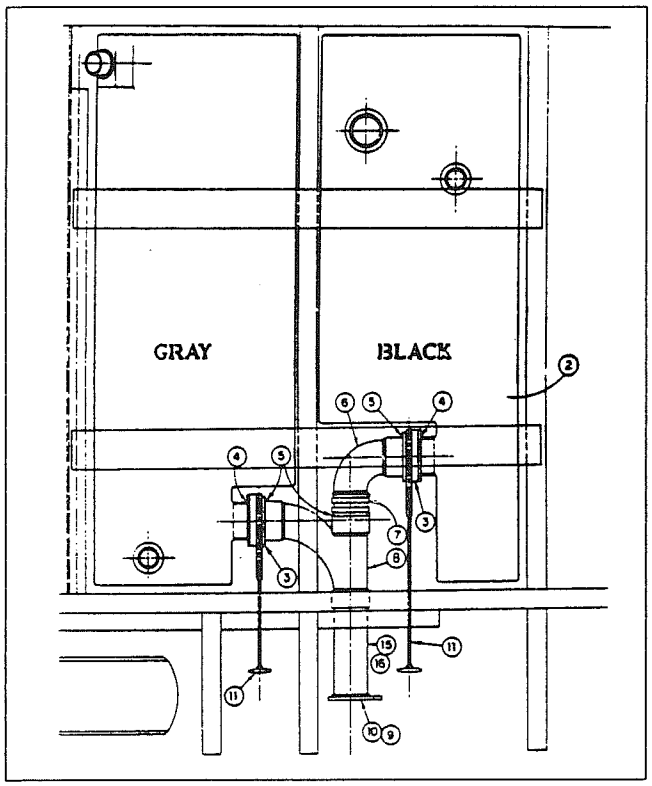
Once the valve repair is completed use sheet metal screws or pop rivets to fasten a flat piece of aluminum over the hole you cut in the bottom of the tank pan. Almost all Airstream dealers will have the aluminum you need for your new inspection plate.

DRAIN LINES - ABOVE FLOOR



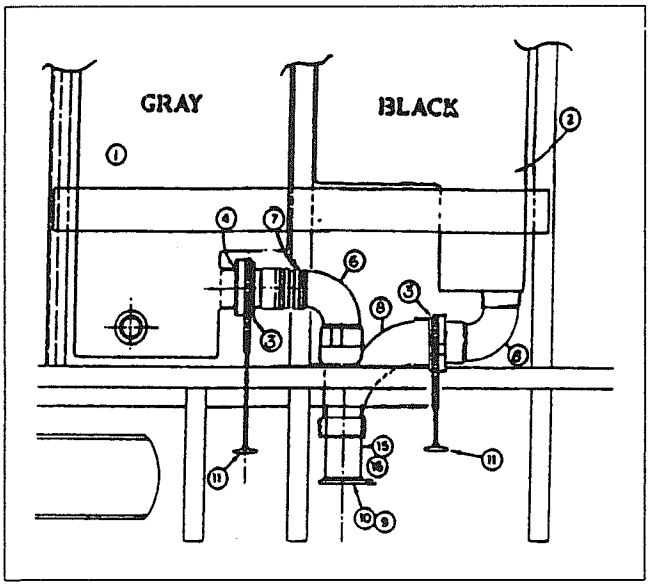
1. Holding Tank, Black
2. Holding Tank, Grey
3. 1 1/2" 45° Ell
4. 1 1/2" 90° LT Ell
5. 1 1/2" 90° ST Ell
6. 1 1/2" 45° ST Ell
7. 1 1/2" Sanitary Tee
8. 1 1/2" Cleanout, Bi-Directional
9. 1 1/2" P Trap
10. Clean Out Plug
11. 1 1/2" 45° Wye
12. 1 1/2" P trap w/slip
13. 1 1/2" Auto Vent
14. 1 1/2" Continuous Waste (Galley)

DRAIN LINES - BELOW FLOOR



Typical Installation A

1. Tank, Grey Water
2. Tank, Black Water
3. Dump Valve
4. Caulking, Duribbon
5. Cement, IPS Weld On, ABS Pipe
6. Fitting, 3" Dia. 90° Ell
7. Union, Rubber 3" Dia.
8. Fitting, 3" Dia. Wye, Tee ABS
9. Ring and Cap, Sewer Hose
10. Bayonet, Sewer Hose
11. Handle, Dump Valve, Ext. 19"
12. Pad, Slope, Grey Water
13. Pad, Slope, Black Water
14. Pan, Septic Tank Holding
15. Corlon, 3" Dia. IAPMO Approved
16. Corlon, 3" Dia. CSA Approved
17. Styrofoam 1/2" thick
18. Screw, 5/16-18 X 7/8 H.H. Cap



Typical Installation B

TOILET

Manufacturer: Sealand Technology, Inc.
P.O. Box 38
Fourth Street
Big Prairie, Ohio 44611
Phone: 1-800-321-9886
In Ohio 216-496-3211

Traveler Model 510/511

How to Use

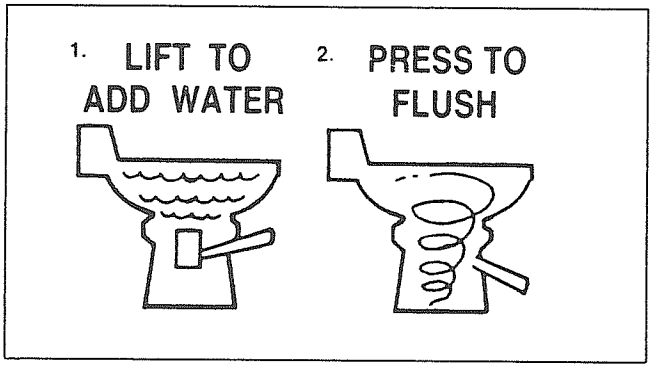
1. To add water to the toilet before using, lift or raise the flush lever until desired water level is reached. Generally more water is required only when flushing solids.

2. To flush toilet, push lever all the way down until sewage leaves toilet.

3. Release flush lever.

4. A small amount of water should remain in bowl.

   Note: Holding flush lever down longer than necessary results in excessive water usage. A good biodegradable tissue, available through RV dealers, is recommended.



Cleaning

The toilet should be cleaned regularly for maximum sanitation and operational efficiency.

Clean the toilet bowl with a mild bathroom cleaner. Do not allow caustic cleaners to set in the bowl for long period of time to avoid damaging seals.

If an odor is apparent from the toilet:

1. Clean out system.

2. Add odor control deodorant in amount specified for your holding tank capacity after cleaning and every few days during use.

Winterizing

At the end of each season the toilet should be winterized for storage.

The following procedure should be used:

1. Clean and flush toilet.

2. Shut off water supply, then remove inlet water line.

3. Remove drain plug. (See Fig. 5)

4. Remove water line and clean screen. (Refer to Fig 6 in Troubleshooting Section.)

5. Depress flush lever until all water drains from the system.

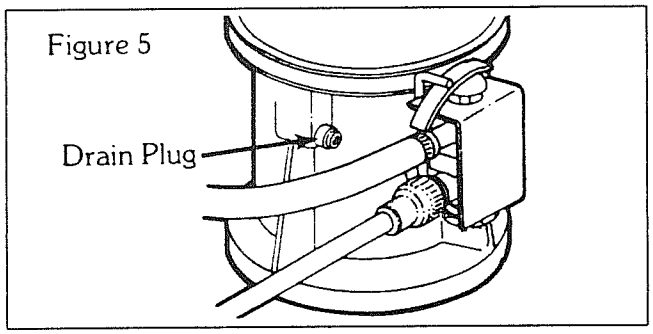


Figure 5

Preparing for Summer Use

To prepare the toilet for summer use, check to be sure drain plug is installed in side of toilet base. Turn on water supply and check system for leaks. Flush toilet and check for leaks. Repair any leaks as necessary. Toilet is now ready for use.

FIGURE 6

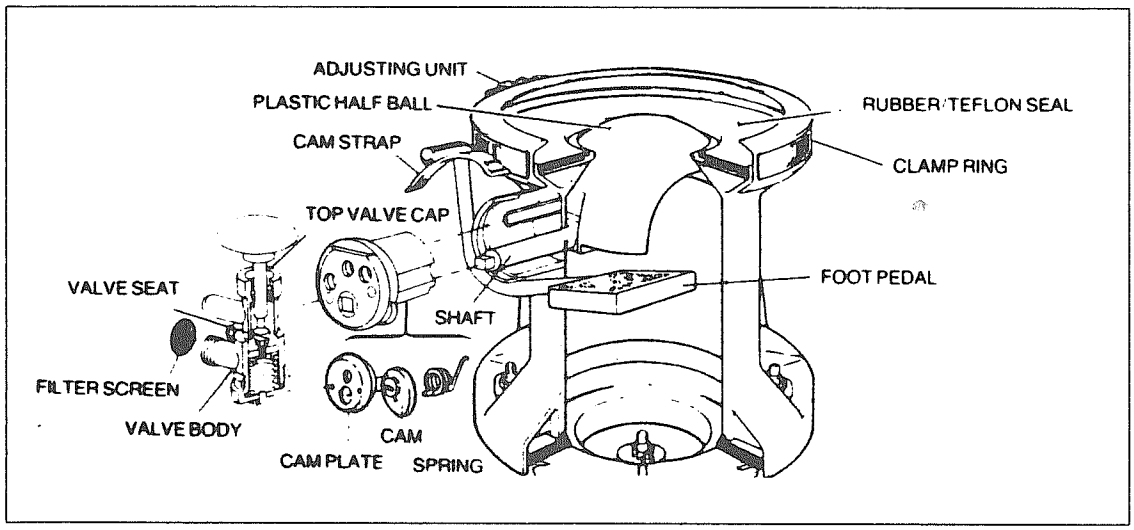
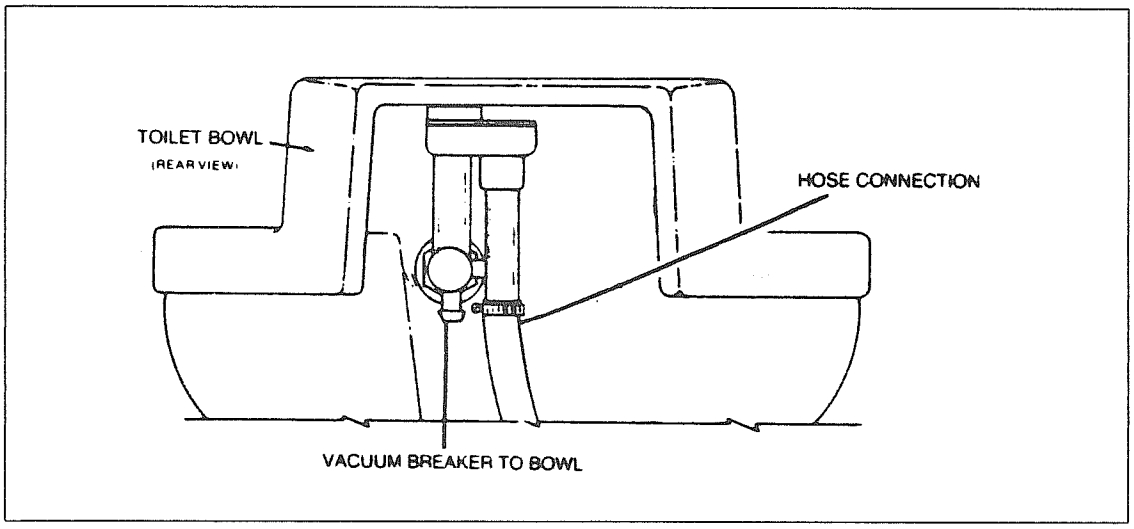


FIGURE 7



PROBLEM: Water will not stay in bowl. (See Fig. 6)

CAUSE/ REMEDY: Loose clamp ring. Tighten clamp ring adjusting nut.

Improper seal around flush ball due to dirt or debris on underside of teflon ball seal. Inspect flush ball and under side of teflon seal for foreign objects.

Worn or damaged flush ball. Replace flush ball.

Cracked half clamps. Replace half clamps.

PROBLEM: Plastic flush ball will not close completely. (See Fig. 6)

CAUSE/ REMEDY: Clamp ring overtightened causing too much tension on seal and flush ball. Loosen clamp ring.

Weak or defective spring. Check spring tension by letting up on flush lever suddenly. If lever does not "snap back" replace spring, cam and plate with new spring cartridge.

Worn or damaged flush ball or shaft. If lever "snaps back" but flush ball does not close completely, replace flush ball and shaft.

PROBLEM: Water doesn't shut off in toilet (toilet overflows). (See Fig. 6)

CAUSE/ REMEDY: Dirt lodged in water valve seal. Disassemble and clean water valve.

Cam strap bent down holding water valve open. Bend front of cam strap up about 1/16".

Worn or defective water valve. Replace valve assembly.

Worn or defective spring. Replace spring, cam and plate with new spring cartridge.

PROBLEM: Water does not enter toilet bowl properly. (See Fig. 6)

CAUSE/ REMEDY: Low water pressure. Check incoming water pressure.

Water valve clogged. Remove and clean filter screen located on inlet of water valve.

Water valve defective. Replace water valve.

Worn or defective flush lever. Replace flush lever.

Check vacuum breaker for leakage. Replace vacuum breaker.

Rim wash holes plugged. Clean holes.

PROBLEM: Water leaking from water valve. (See Fig. 6)

CAUSE/ REMEDY: Loose connection. Tighten bottom cap, inlet fitting and outlet hose clamp.

Worn or defective water valve. Replace water valve.

Stripped threads. Replace water valve.

Seal worn or missing. Replace water valve.

Valve body cracked. Replace water valve.

PROBLEM: Water leaking from bottom of toilet base. (See Fig. 6)

CAUSE/ REMEDY: Toilet loose. Tighten toilet mounting bolts.

Worn or defective toilet mounting floor seal. Replace sponge rubber seal between floor flange and toilet base.

Worn or defective base. Replace base assembly.

Worn or defective floor flange. Replace floor flange.

PROBLEM: Water leaking from rear of toilet bowl. (See Fig. 7)

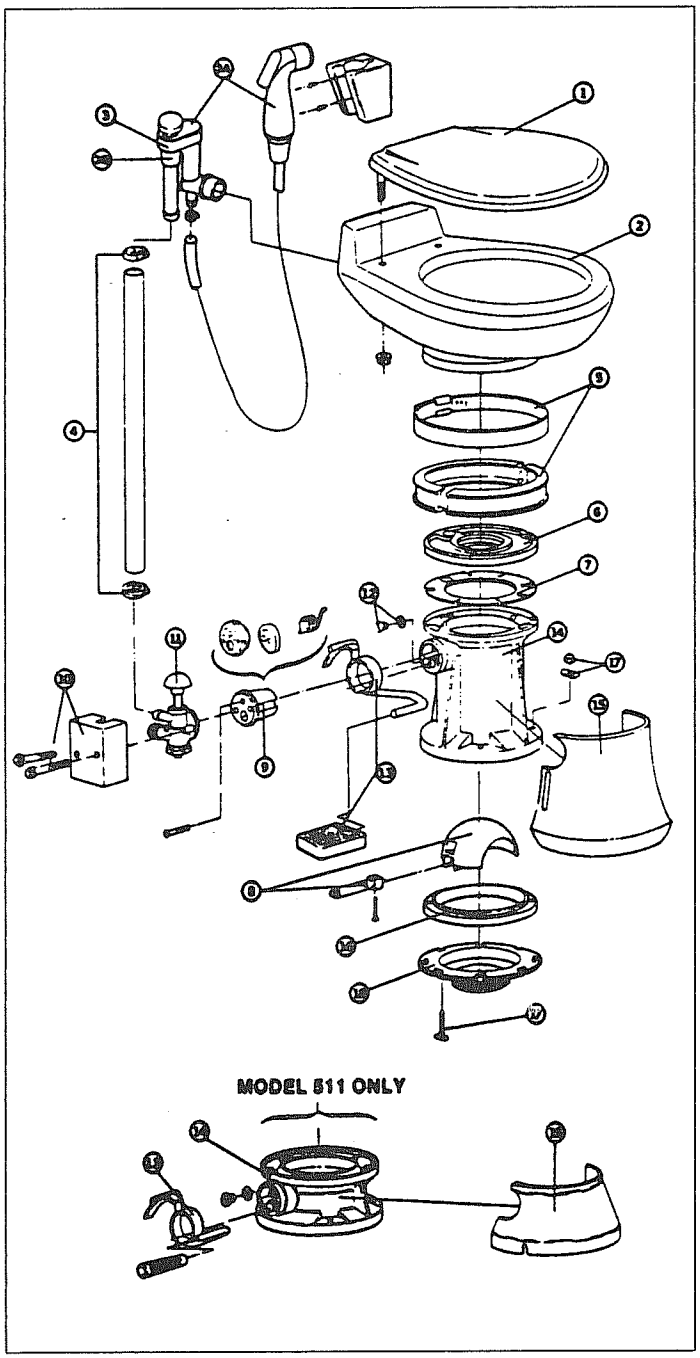
CAUSE/ REMEDY: Loose hose connection. Tighten hose connections.

Loose vacuum breaker. Tighten vacuum breaker to bowl connection.

Worn or defective vacuum breaker. Replace vacuum breaker assembly.

Cracked or defective toilet bowl. Replace toilet bowl.

Replacement Parts List (Models 510/511)



1. Seat Assy
2. China Bowl w/vacuum Breaker Kit
3. Vacuum Breaker Kit

3a. Vacuum Breaker w/ hand spray kit

3b. Vacuum Breaker w/ diverter valve assy

4. Universal Tubing Kit
5. Ring & Half Clamps Kit
6. Teflon & Rubber Seal Kit
7. Plastic Seal Support
8. Ball, Shaft & Cartridge kit
9. Spring cartridge assy
10. Valve cover w/screws kit
11. Water valve kit
12. Drain plug, cap w/seals kit
13. Flush lever w/cover
14. Base assy kit
15. Shroud
16. Floor flange seal
17. Floor bolt kit
18. Floor flange w/ 3" MPT

ELECTRICAL

OPERATION

The major portion of electrical power in your Airstream is 12 volt. Your lights, fans, furnaces, water pump and water heater ignition are all powered by the 12 volt current. Some exceptions are the roof air conditioner, sweeper and table lamp (options) that are powered by 110 volt.

All 12 volt current comes through the battery system in the front of your trailer. The battery or batteries are accessible from the exterior on the front of your trailer. Power from the battery first goes to a master or "kill" switch inside the trailer below the front window. On models with a couch across the front the switch is located in the shelf behind the backrest. If your trailer has a cabinet across the front, the master switch is in the table storage recess. The master switch should be left in the ON position except when storing, or a mechanic may use the switch when servicing the trailer. On Limited models the batteries are side mounted and the kill switch is located in the dinette seat.

Power from the main switch continues on to the 12 volt distribution panel, and from there to the rest of the trailer. The 12 volt distribution panel has automatic circuit breakers and does not require routine servicing. If a short should occur the breaker in that circuit will "click" off and on and you may notice some lights or appliances losing power. If this should happen, immediately turn the lights and appliances off that are on the shorting circuit. If the breaker continues to "click" turn the main power off until your trailer can be serviced by a qualified technician.

The charge in the 12 volt batteries is replenished when towing, or whenever you are plugged into 110 volt city power. As you read further in this section you will find more detailed explanations, wiring diagrams and component information.

BATTERY

CAUTION: A normal battery can discharge by itself in 30 to 40 days when not in use, therefore, IT IS NECESSARY TO PERIODICALLY CHECK THE BATTERY AND CHARGE IT AS IS NECESSARY.

We suggest checking the battery at least every two weeks in freezing weather. The temperature at which a battery will freeze depends on the condition of its charge. As an example: a fully charged battery with a specific gravity of 1.265 will not freeze until the electrolyte temperature drops to -71.3°F, while a discharged battery will freeze at +19°F. The following table shows the freezing points of batteries at various specific gravity readings, temperature corrected 80°F.

1.265	-71.3°F
1.250	-62°F
1.200	-16°F
1.150	+5°F
1.100	+19°F

Do not add water to a battery in freezing temperatures unless the vehicle will be put to use at once, otherwise the added water may freeze. Neglect is expensive. Care costs little. Check your batteries regularly.

MAINTAIN A CLEAN BATTERY TOP AND CHECK TERMINALS AND CABLES FOR TIGHTNESS AND CLEANLINESS. A dirty battery will dissipate its charge through surface contamination. Clean battery top with a damp cloth and dry thoroughly.

The terminals should be tight and free of corrosion. To clean terminals, neutralize with a solution of baking soda, rinse in clear water, and dry.

Note: Care must be used to make sure soda is not allowed to enter battery cells.

To insure maximum battery capacity on both charge and discharge, the battery terminals and the inside portion of the cable connector should be scraped or brushed until both of these surfaces are shiny bright. The cable connectors should then be reconnected to the battery and tightened. The complete assembly, battery post and cable connector should be coated with a heavy body mineral grease, petroleum grease or a petroleum jell.

CAUTION: RECONNECT THE BATTERY CABLES TO THE CORRECT BATTERY POSTS. The black cable should be connected to the negative (-) post and the red cable to the (+) post. The polarity of your tow vehicle must also be negative (-) ground since it must always match the trailer. Most tow vehicles are negative grounded, but always check your vehicle owner's manual to be sure.

ADD WATER TO CELLS AS NECESSARY. Check the electrolyte level at least once a month. When you are traveling steadily and for an extended period of time, or if you are in climates above 90°F, check the electrolyte level about every two weeks.

CAUTION: Do not fill battery above the split ring in filler opening. DO NOT MEASURE SPECIFIC GRAVITY IMMEDIATELY after adding water. The water must mix with the electrolyte by charging or by driving a few miles.

WARNING: The gases generated within a storage battery cell may be ignited by an open flame or spark in the vicinity of the battery. Do not use a match or flame to provide light for checking the level of the water.

During the winter the battery should be removed from the trailer and stored in a cool, dry place, where there is no danger of freezing. It should be kept full of water, cleaned and charged monthly. A battery which is allowed to completely lose its charge will never regain its original power or a full charge.

Slide the battery out onto the opened compartment door for service and removal.

For battery service or replacement, go to any service station or dealer who sells and services the make battery installed in your trailer.

When being towed, the 12 volt battery in your trailer is receiving a constant charge from the car's generator or alternator through the seven way connector.

The charge rate is controlled by your automobile's voltage regulator. It is important to keep the seven way connector clean. One method is to use "Spra-Kleen".

Whenever possible use the automatic built in charge of the univolt system for charging. The charging circuit automatically controls the current, reducing it as the battery increases in charge.

At service stations make certain they give your battery a slow charge because quick charges will drastically shorten the life of the battery, as will allowing repeated complete discharges.

UNIVOLT

The univolt system is the interior low voltage electrical system which enables you to use the interior lights, fans, pumps and 12 volt appliances whether operating on self-contained battery power or 120 volt city power.

CAUTION: Plugging the trailer into 120 volt city power with the master switch off will blow radio fuses and may damage other 12 volt components. The master switch is meant to be used when storing the vehicle for long periods of time.

12V Power Circuits

The current in the univolt system is 12 volts direct current (12VDC) negative grounded.

Power sources which supply 12VDC current to the system are as follows:

A. Main charge line from tow vehicle.

B. Trailer Battery

C. Univolt Converter

The power sources above are all electrically connected to the 12 volt distribution fuse panel which distributes current to interior branch circuits. The circuits provide power to operate all 12 volt DC lights, pumps, motors and appliances.

Univolt Converter

The univolt converter transforms 120 volt alternating current (AC) into 12 volt nominal direct current (DC). This provides power to charge the trailer battery and to operate the 12 volt interior lighting, fans, and appliances.

The converter is energized only when the trailer is hooked up to 120 volt city power.

Univolt Testing

A. Confirm 120 volt power is going into univolt.

B. Disconnect 12+ wire from master switch.

C. Using a volt meter check voltage output between heavy positive and negative wires coming out of univolt.

D. The voltage must be within 13.8 and 14.2 volts. (The meter of the tester should be calibrated periodically.)

E. If univolt is not within these voltages, replace it.

Univolt Repair

The case cover to the univolt must not be removed. (There is high voltage within the case which is dangerous.) The univolt should be returned to Airstream for repair.

Univolt Removal

1. Disconnect power cord for 120 volt supply.

2. Switch circuit breakers to off position.

3. Remove the front lounge, or open credenza door.

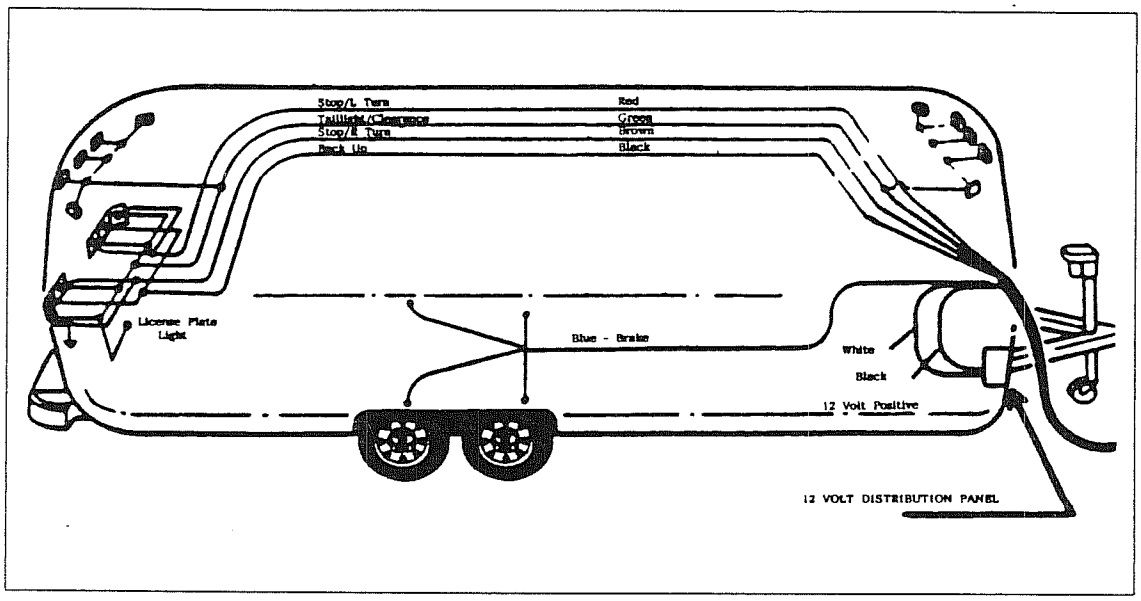
4. Disconnect lead-in wires running from univolt assembly to 12 volt fuse distribution panel.

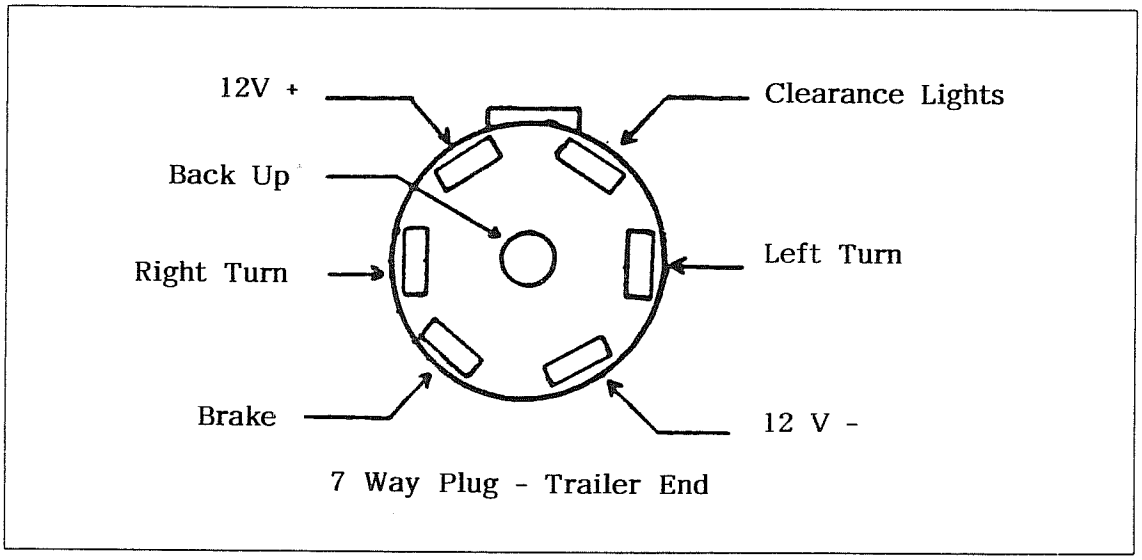
5. Remove four screws mounting the univolt assembly to the floor.

6. Remove the univolt assembly.

7. To install, reverse the removal procedures.

12 VOLT EXTERIOR

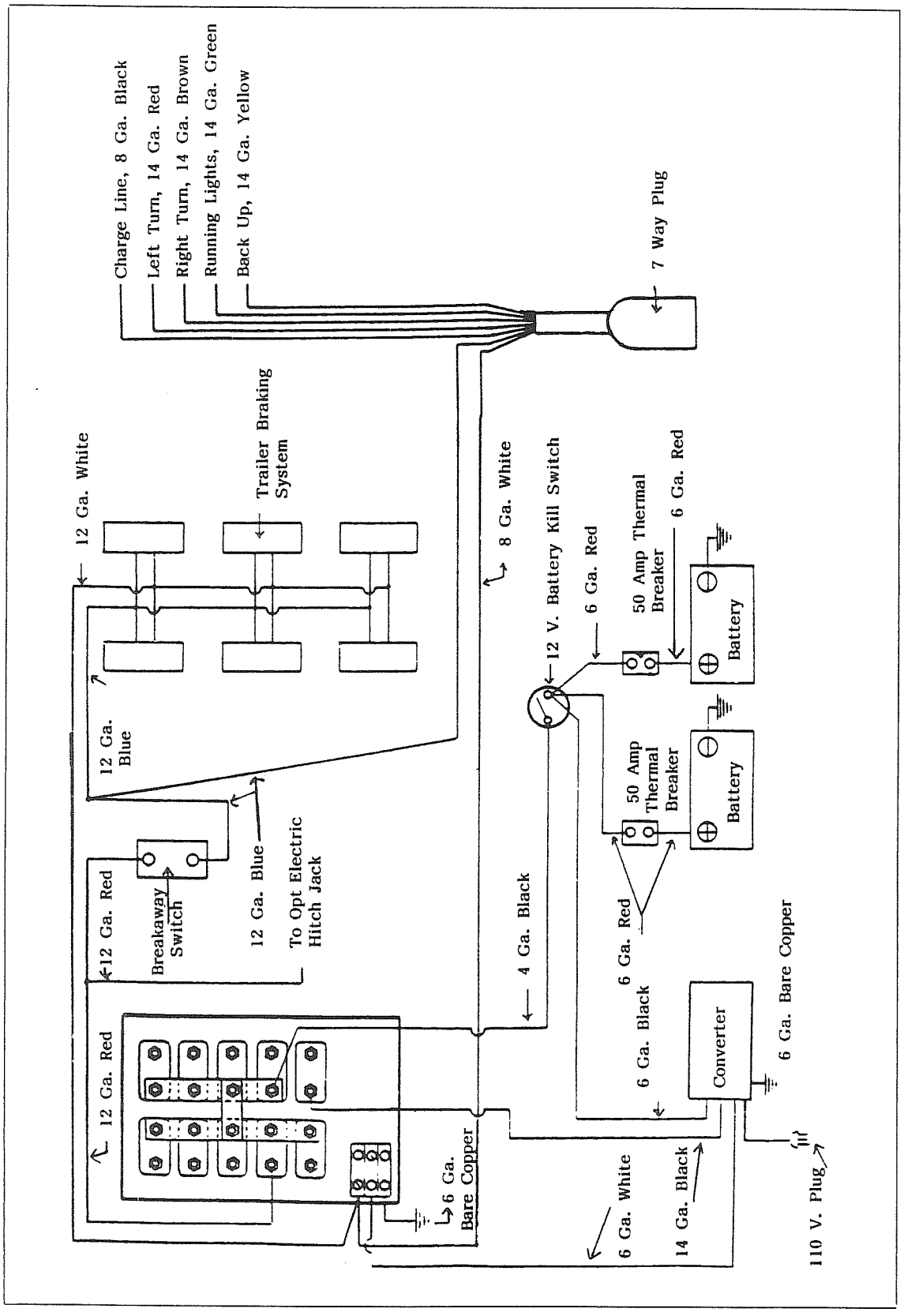




Note: The 7 way wire is spliced to the main harness in the area of the 12 volt distribution panel in front of the trailer.

One of these wires is not spliced onto a wire of the same color. It is the back up wire which is yellow in the cable and black in the harness.

Wire Routing Schematic - 7 Way Plug to Batteries and 12 Volt Distribution Panel



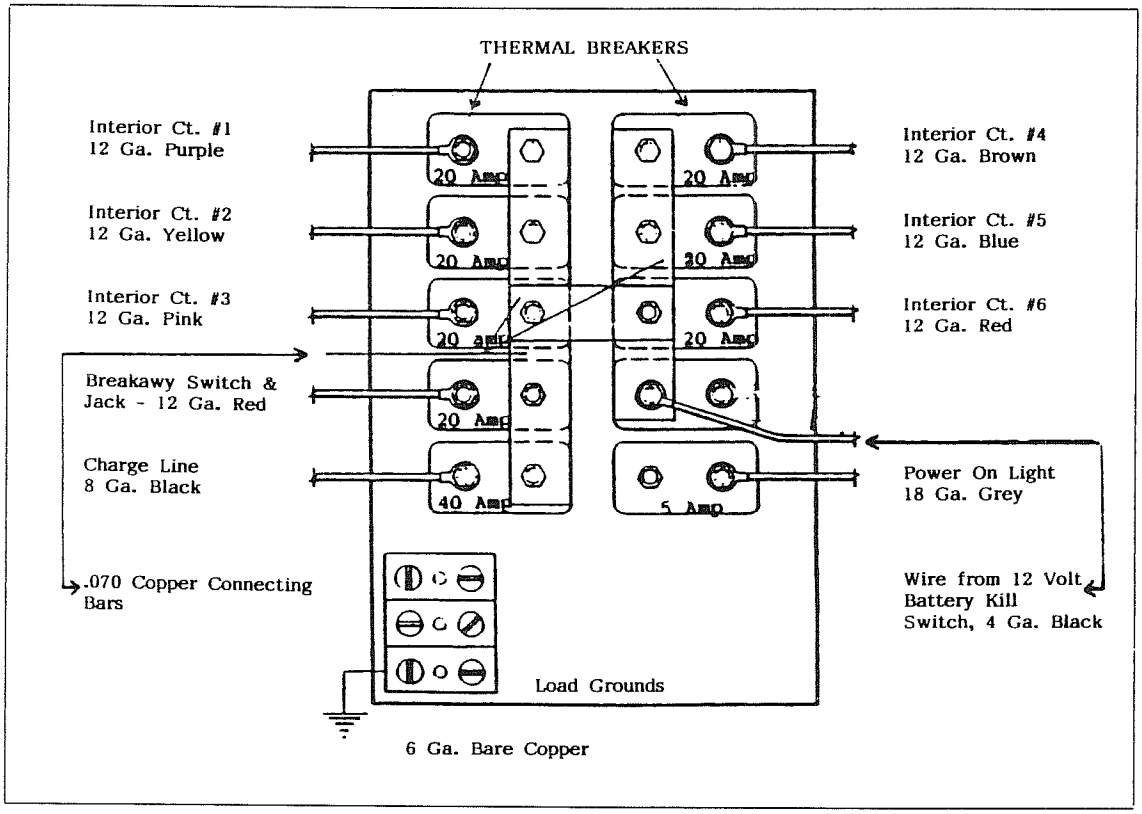
12 VOLT INTERIOR

Distribution Panel

The low voltage distribution panel is located on the interior front panel below the window. On Limited models it is under the roadside curved window, and on the Excella models it is under the center window. In some cases it is covered by a wall pad that unsnaps to remove. The 12 volt circuits are all protected by automatic resetting circuit breakers. If a breaker trips, an audible click will be heard, and you will probably see lights or hear appliances or fans quit working. In a short time the breaker will reset and power will resume. If the breaker trips a second time some of the lights or appliances on that circuit should be shut off. The questionable breaker can either be identified by the audible click or it may be much warmer than the others.

Each trailer has a master 12 volt switch often called a "kill switch". On Limited trailers the switch is located in the face of the dinette seat and on other models it is located in the front of the trailer below the window. This switch should only be used when storing or servicing the trailer.

WARNING: Do not allow circuit breakers to cycle rapidly for long period of time. Either remove the wire from the breaker or unplug the trailer and disconnect the battery until the wiring is corrected.



TROUBLE SHOOTING

The most common failure in the exterior electrical system is an open circuit. An open circuit is an interruption in the current flow .which may be in either the wire to the component or in the ground return. Check the following areas for open circuits:

1. Light bulb (filament open.)

2. Loose or corroded connections at lighting device.

3. Loose or corroded connections at 7 way connectors.

4. Improper grounding at the lighting device.

A continuity light or an ohm meter will help you isolate the point of the "open" on the circuit.

Another cause of failure is a short circuit usually resulting in a blown fuse or cycling circuit breaker at the power source. A short is usually caused by the wire coming in contact with a sharp edge. The sharp edge wears the wire's insulation away until the "hot" wire shorts to ground.

Locating Shorts and Opens

The key in locating shorts and opens is isolation. The first step is to isolate the circuit with the short or open and then isolate the section of the circuit with the fault. Once the section is identified, the specific problem can be located. The cause may be a loose or corroded connection, cut wire, worn insulation, defective component, etc. The following paragraphs describe methods of isolating shorts and opens. There are several other approaches that may be used; however, these may be used as a guide.

Shorts

1. Locate circuit which has short by noting fuse blown or cycling breaker.

2. Remove fuses or wire from breaker, and open all switches. Check for continuity between (+) 12 volt wire or shorted circuit and ground. (If it cannot be determined if switch is in open position, remove lead from switch.) Continuity to ground indicates there is a short.

3. Remove leads of shorted circuits from univolt and components one at a time. After disconnecting each component, check continuity of the (+) 12 volt wire to ground. If there is no continuity the short is in the component removed. If continuity still exists, continue with the following steps.

4. Inspect leads carefully where they pass through the skin or near sharp edges.

5. Note objects attached to skin after manufacturing. The mounting screws or rivets may be causing the short.

6. Remove multidome to expose main body of harness. Inspect harness for cause of short, such as rivets or screws in harness or evidence of drilling.

7. If short cannot be found, cut circuit into sections, checking each section for continuity. Shorts can be isolated by this method.

8. Examples of shorts are:

   * The (+) 12 volt wire contacting (-) negative wire or grounded surface.

   * Internal short in a 12 volt component or appliance.

Opens

1. Check all components on circuit which has open. If all components are without power, begin to look for open on distribution panel.

2. Check for voltage on each side of the breaker. Check for tightness of crimp on connector and nut.

3. After inspecting all accessible wire on circuit for opens, remove multidome. Remove tape and inspect splices for poor connection.

A continuity light is a useful tool in locating an open. Each section of circuit can be checked for continuity. By a process of elimination the open may be found.

4. Examples of open are:

   * Wire is cut.

   * Connector falls off component's terminal.

   * Loose or corroded connection.

   * Contacts in switch do not touch.

COMMON ELECTRICAL PROBLEMS

PROBLEM: No 12 volt power. (Lights and appliances do not work.)

CAUSE & REMEDY:

1. Input line and/or battery not connected. Make necessary connections.
2. Master (Kill) switch not turned on.
3. Discharged trailer battery. Charge battery.
4. Trailer battery on wrong polarity. Make proper connections to battery terminals.

PROBLEM: Tripping Breaker

CAUSE & REMEDY:

1. Overloaded circuit. Turn off switches to reduce load.
2. Electrical short. Find tripping breaker distribution panel and identify circuit. Check the circuit for defective wiring, lamps or motors.
3. Shorted battery. Replace battery.
4. Battery terminals not properly connected to univolt + and - terminals. Make proper connections.

PROBLEM: Dim lights or sluggish fan motor.

CAUSE & REMEDY:

1. 25- or 50- cycle power (some foreign countries). Use 60-cycle power.
2. Discharged battery (when operating without 110 volt line) Charge battery.
3. Battery is low on water. Add distilled water to battery.

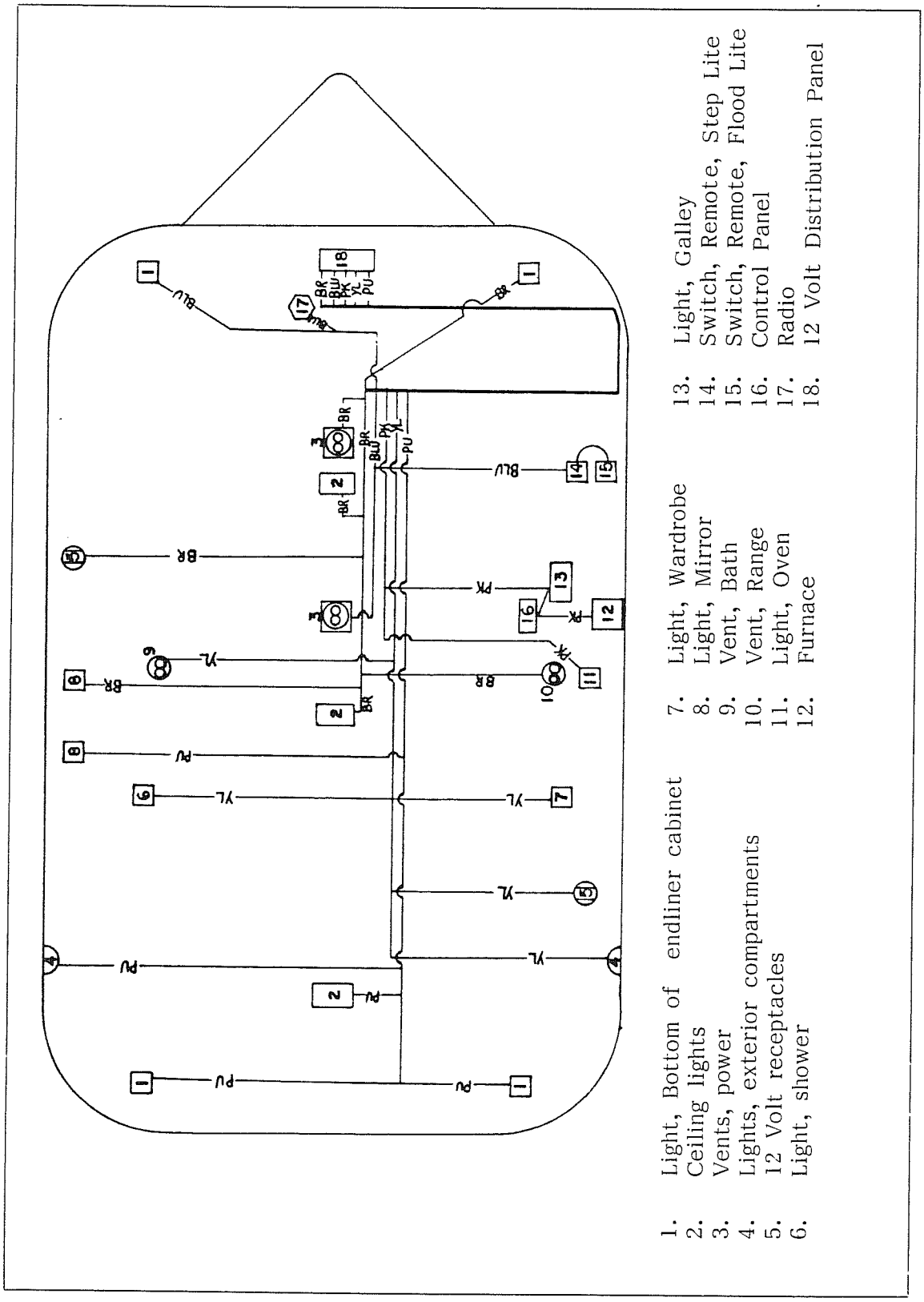
PROBLEM: Univolt will not charge battery.

CAUSE & REMEDY:

1. In put line not connected. Connect.
2. Battery not connected or polarity reversed. Connect battery to univolt (Check polarity).
3. Bad Battery. Replace.
4. Too many lights and appliances. Reduce electrical load.

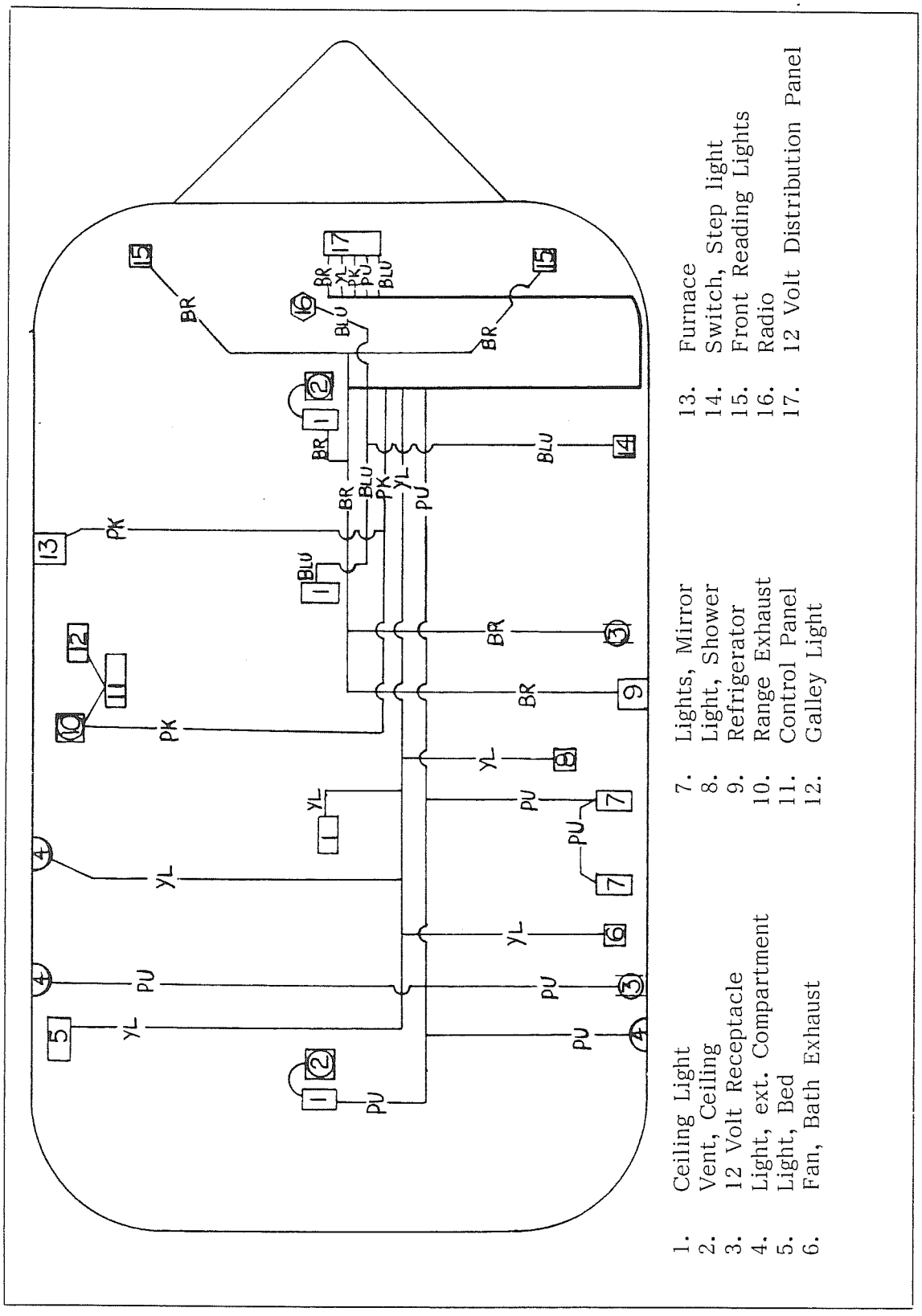
12 VOLT DISTRIBUTION PANEL TO SWITCH OR APPLIANCE

25 FOOT MODEL



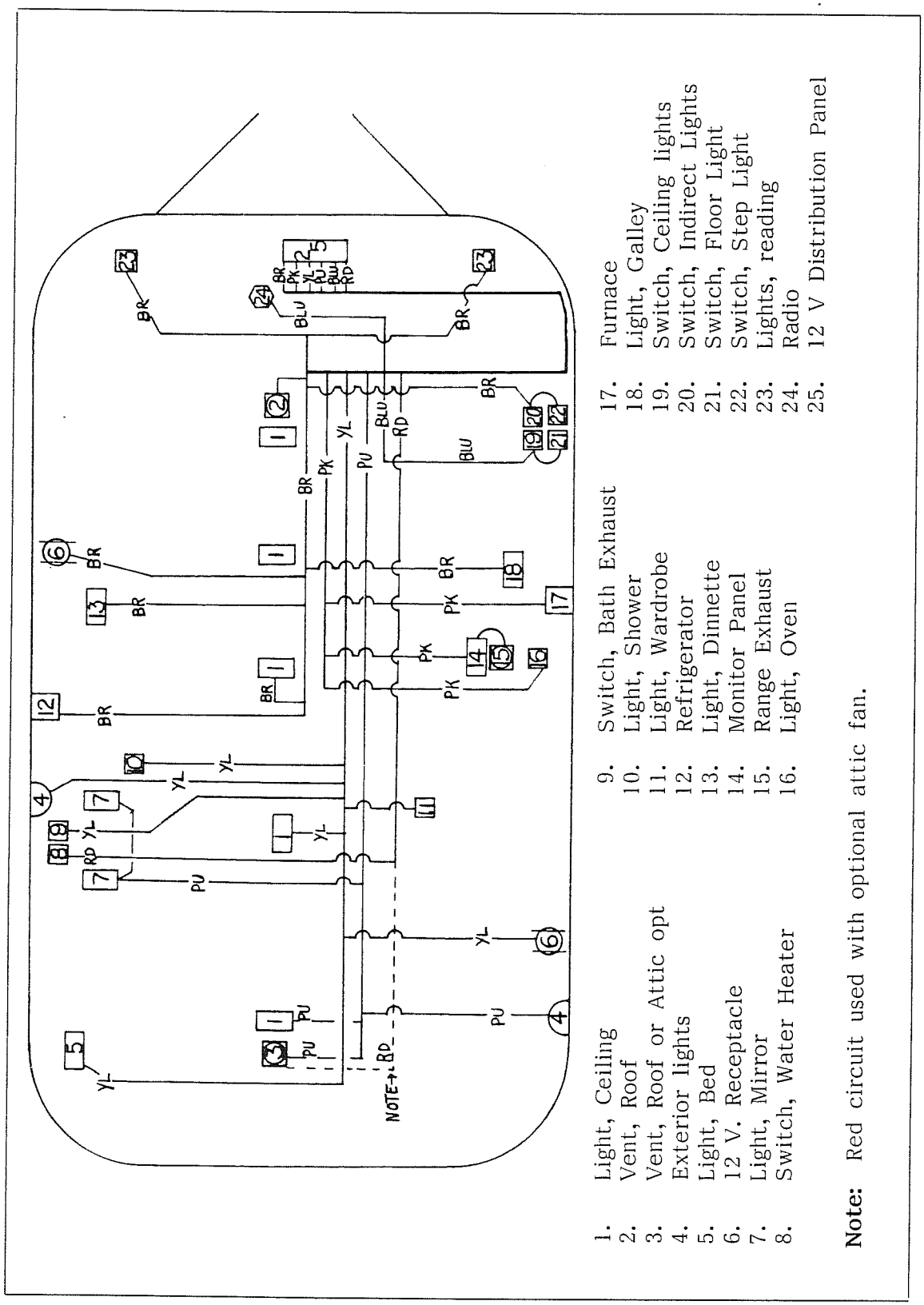
12 VOLT DISTRIBUTION PANEL TO SWITCH OR APPLIANCE

29 FOOT MODEL



12 VOLT DISTRIBUTION PANEL TO SWITCHES OR APPLIANCES

32 & 34 FOOT MODELS

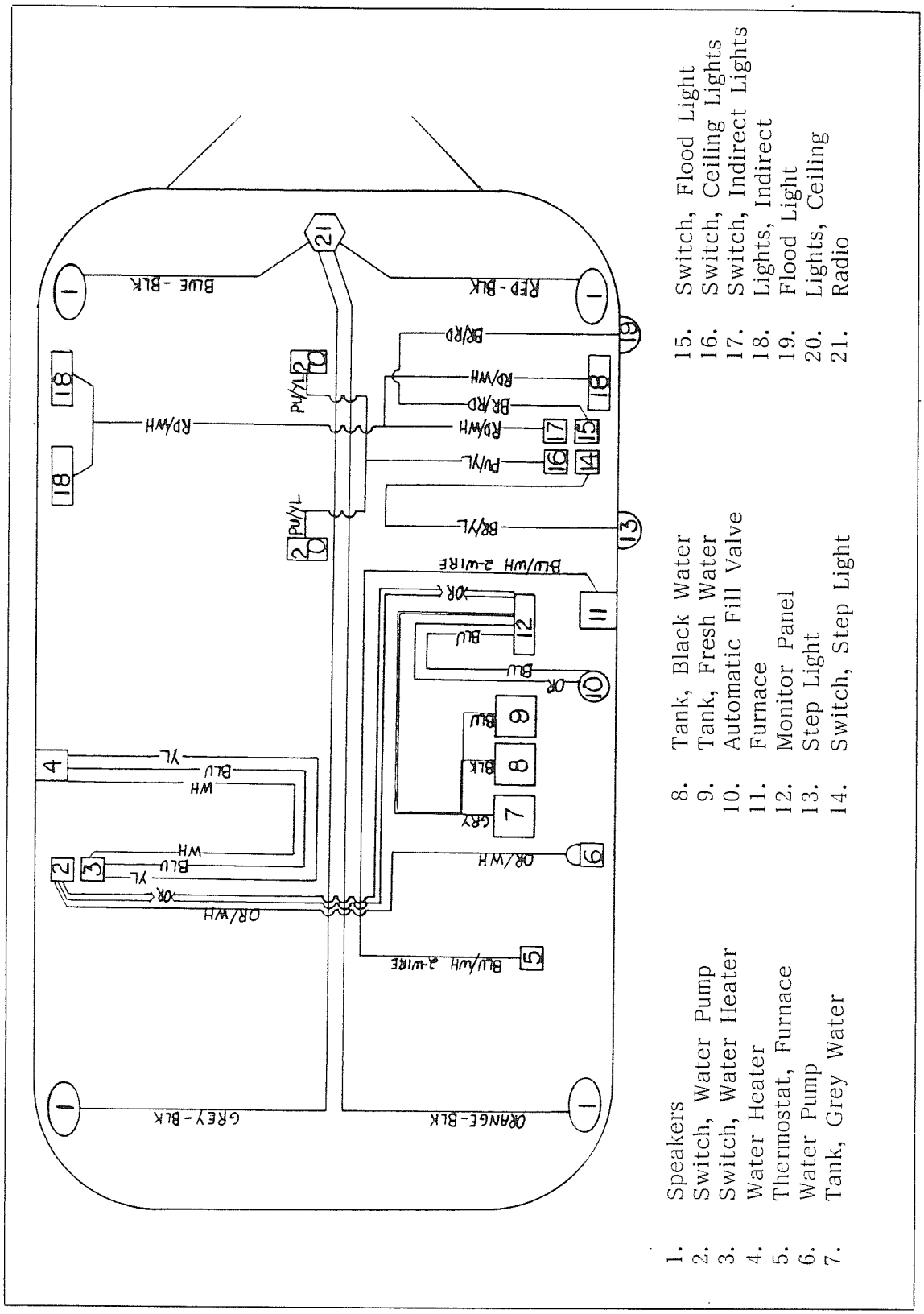


1. Light, Ceiling
2. Vent, Roof
3. Vent, Roof or Attic opt
4. Exterior lights
5. Light, Bed
6. 12 V. Receptacle
7. Light, Mirror
8. Switch, Water Heater
9. Switch, Bath Exhaust
10. Light, Shower
11. Light, Wardrobe
12. Refrigerator
13. Light, Dinnette
14. Monitor Panel
15. Range Exhaust
16. Light, Oven
17. Furnace
18. Light, Galley
19. Switch, Ceiling lights
20. Switch, Indirect Lights
21. Switch, Floor Light
22. Switch, Step Light
23. Lights, reading
24. Radio
25. 12 V Distribution Panel

Note: Red circuit used with optional attic fan.

TYPICAL 12 VOLT SWITCH TO LIGHTS OR APPLIANCES

Speakers - Control Panel - Furnace



TV ANTENNA

Manufacturer: Braund Manufacturing Company
730 East Michigan Avenue
Battle Creek, Michigan 49016
Phone: 616-965-2371

The controls for the TV antenna are in the ceiling directly below the antenna. To raise the antenna turn hand crank clockwise until it stops. Then turn on TV set and select channel. If equipped with a booster, turn on switch in wall jack. While watching picture, reverse the handle approximately one half turn, push handle up toward the ceiling, hold in that position and rotate antenna. If you hit a stop in rotation before the picture is clear, reverse rotation. You may have to readjust when changing channels. To close, reverse the direction of cranking. Before traveling check outside that the antenna is folded and pointed straight forward.

About twice a year each pivot point on the antenna should be lubricated with an aerosol such as WD-40.

Trouble Shooting

DIFFICULT TO PUSH HANDLE UP AND DOWN

A. After raising the antenna always "back off" the crank handle in the opposite direction about half a turn before pushing up to the rotate position.

B. It is very important that there is no sideways pressure on the shaft when the ceiling plate is fitted. To check this, raise antenna, remove the ceiling plate and refit crank handle. The shaft should move up and down with little effort. Before refitting ceiling plate enlarge the ceiling hole so that the plate will fit flush to ceiling without putting any stress on the shaft. Also check that glass fiber insulation is not fouling the shaft.

C. The shaft may have been cut too short during installation, thus preventing up and down movement. The only remedy is to replace the shaft. Remove pin (80405) which passes through the slot in the top of worm (10300). Shaft (12927) may then be withdrawn downward after removing the ceiling plate (10302). The new shaft should be checked for "burrs" and coated with silicone grease before fitting. Use a twisting motion when inserting the new shaft to avoid damage to the "O" ring (80903) positioned just below the worm (10300).

DIFFICULT TO ROTATE

A. The most common cause is excessive caulking around the base and mounting plate causing binding. In extreme cases it will be impossible to turn the antenna, usually resulting in breakage of the crank handle (10739). Check that the bearing surfaces of the base (12928) and mounting plate (12660) are clear of caulking or sealing material.

B. If the lead wire (10319) is too short (less than 4 feet) it may prevent full rotation, or if too long the loop may catch on some other roof top device such as a vent.

C. The antenna may have been installed too close to a vent or air conditioner with insufficient clearance for the base to rotate fully.

ANTENNA WILL NOT RAISE

A. Usually caused by a stripped worm gear (10294) and/or worm (10300). Gears are usually damaged by (1) trying to raise the antenna by turning the crank in the wrong direction. (2) With the antenna raised, a heavy blow on the antenna head from a tree limb will strip either or both gears. For this reason we do advise against driving with the antenna in the raised position. A new worm gear (10294) is easily replaced after removing the gear cover (12662) and withdrawing the drive axle (12394). The worm (10300) may be replaced by removing pin (80405) at top of worm and then partly withdrawing the shaft (12927) downward until it is clear of the worm. Damaged worm may then be removed and replaced.

CAUTION: Do not lose the worm washer (80233) which is positioned just below the worm.

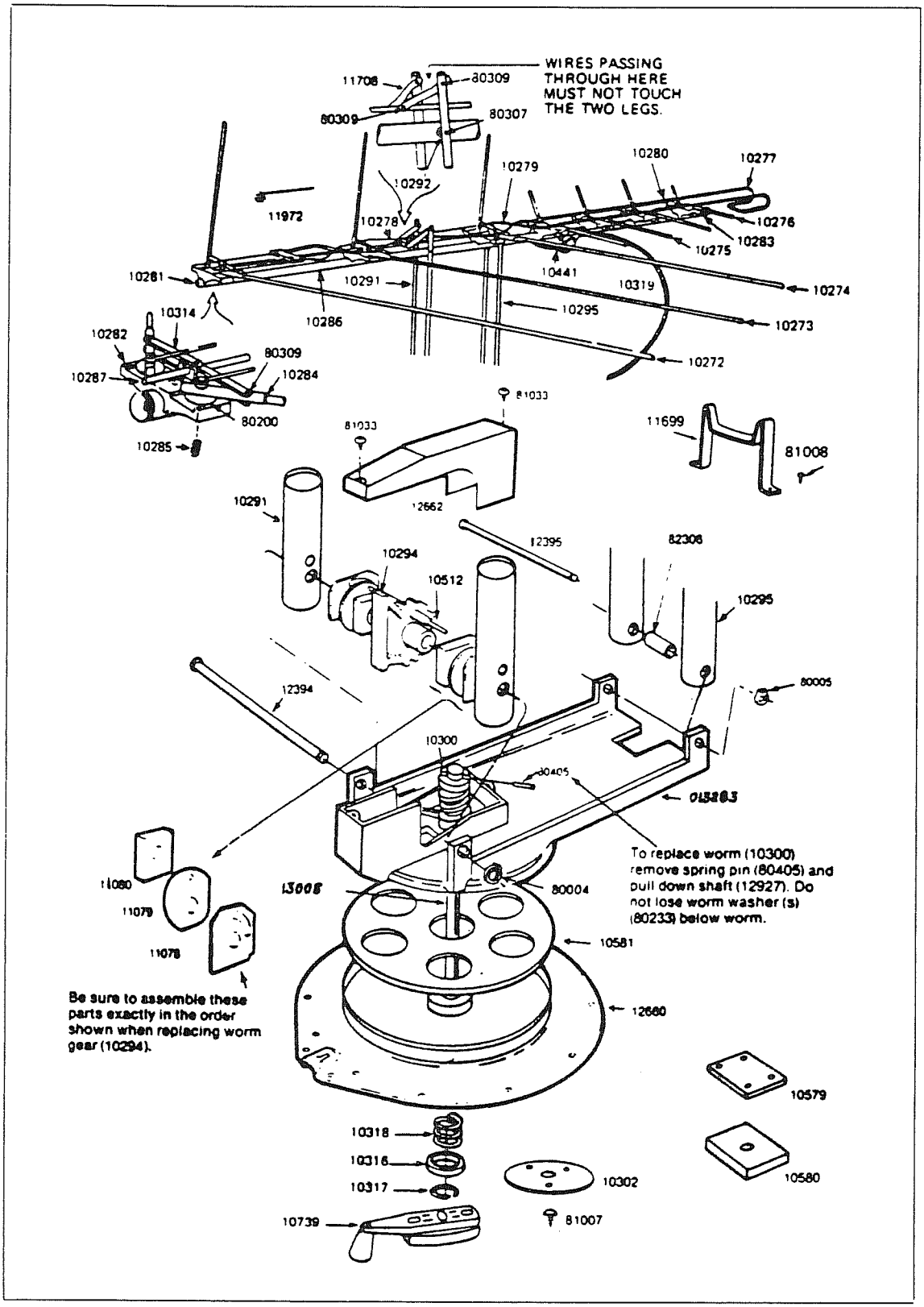
All of the above work may be carried out without removing the unit from the vehicle. However, any damage to the base (12928) or plate (12660) will require removal from the roof.

RECEPTION

Due to the various locations used by recreational vehicles, reception will not be so consistent as at a fixed location because of the large variation in the terrain encountered throughout the country. In general TV/FM signals (particularly UHF) travel roughly in a straight line, so hills or mountains etc. between your vehicle and the transmitting stations may severely reduce the amount of signal reaching your antenna.

When more than one TV outlet jack is used in a vehicle it is ESSENTIAL to use a splitter device (this is incorporated in the Braund PBA booster amplifiers or Autocouplers) to avoid reduction in picture strength and quality.

TV ANTENNA


WIRES PASSING THROUGH HERE MUST NOT TOUCH THE TWO LEGS.
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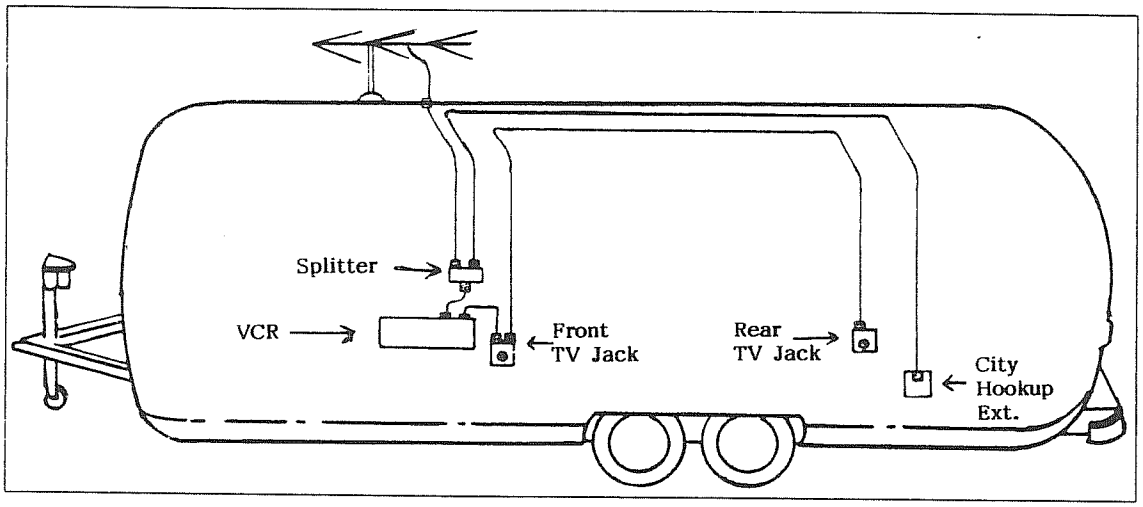
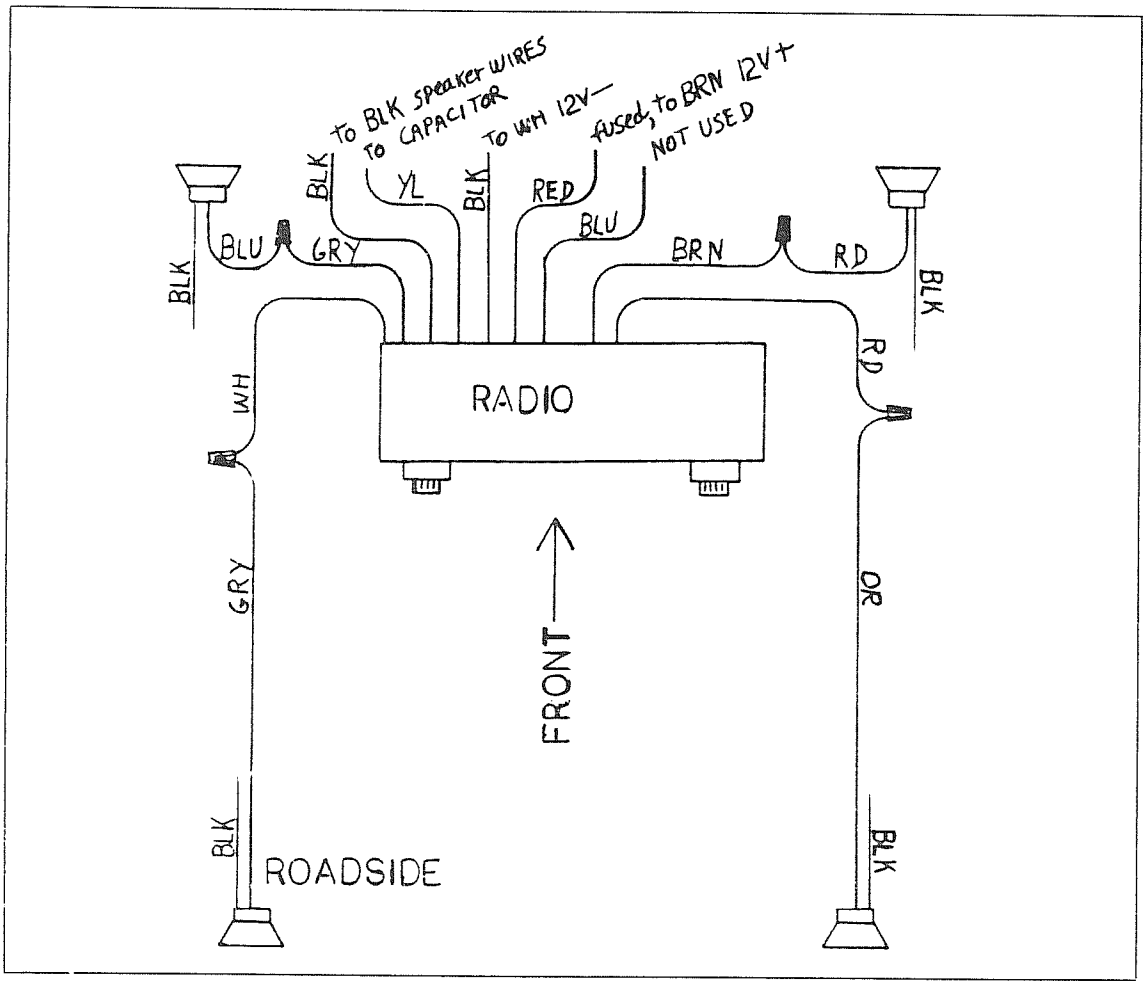
81033
11699
81008
12662
10291
12395
82306
10294
10512
10295
80005
12394
10300
80405
10581
11080
11079
11078
80004
12660
10579
10580
10318
10316
10317
10739
10302
81007
To replace worm (10300) remove spring pin (80405) and pull down shaft (12927). Do not lose worm washer (s) (80233) below worm.
Be sure to assemble these parts exactly in the order shown when replacing worm gear (10294).

Coaxial Cable Wiring Schematic



Radio Schematic



POWER VENTILATION SYSTEM (Optional)

Manufacturer: Kool-O-Matic Corporation
1831 Terminal Road
Niles, Michigan 49120
Phone: 616-683-2600

The optional ventilator removes hot stuffy air and cooking heat, and replaces it with cool fresh outdoor air. By simply opening the windows and turning the ventilator on the complete trailer is rid of stuffiness.

WARNING: DO NOT operate ventilator without providing an opening such as a window, another ceiling vent, or the main door. If an opening is not provided a vacuum may form and affect the ventilation and operation of the appliances.

The thermostat has an "ON" position which provides a thermostat control override for manual fan operation. This switch position is normally used to quickly cool the trailer when first entering it, or to remove smoke, cooking heat, moisture and odors.

Automatic Switch

The automatic switch position provides automatic fan operation with the fan operating at or above the thermostat set point temperature. Fan operation terminates at approximately 2°F below the thermostat set point temperature.

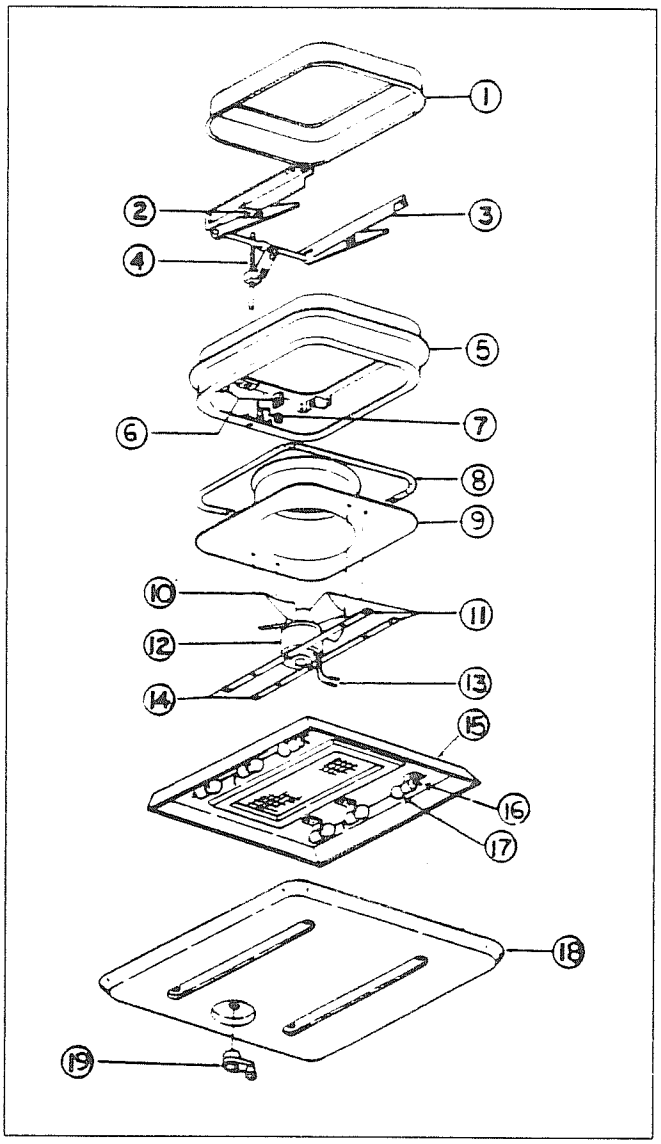
The thermostat also has an "OFF" position to eliminate the fan from accidentally operating while the trailer is completely closed up or in storage.

The power ventilator has a magnetic cover which must be removed during operation. During cooler weather, or when the furnace is used, the cover should be replaced. To replace the cover, set the cover in place and compress it slightly. It will automatically lock and adhere to the opening.

The grille on your power ventilator fan should be cleaned periodically. A soft bristled brush and a vacuum cleaner will clean the grille.

COMBINATION CEILING LIGHT & VENT ASSEMBLY

1. Vent Cover
2. Spring, vent mechanism
3. Vent linkage assembly
4. Elevator screw
5. Vent frame
6. Support Blocks
7. Fan micro switch
8. Gasket, vinyl foam
9. Vent shroud
10. Fan blade
11. Power kit assembly
12. Fan motor
13. Terminal, Bulb
14. Support brackets, motor
15. Light base with screen
16. Lamp socket
17. Bulb 1141-F (Frosted)
18. Light shade
19. Crank handle



Bulb Replacement

1. Remove crank handle.
2. Remove four screws holding light shade to base.
3. Depress bulb down into socket and turn counterclockwise approximately one quarter turn.
4. Pull bulb out of socket. Number 1141F frosted bulbs are normally used, but you may use #1141 clear bulbs if you desire.

Fluorescent Bulbs

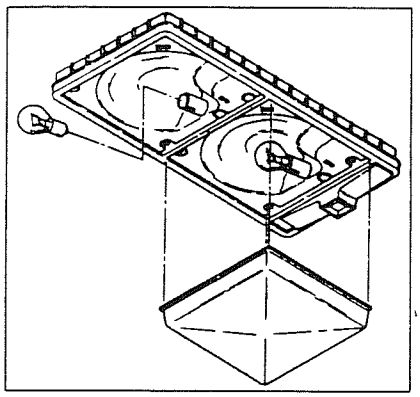
The optional fluorescent bulbs are just as easy to replace. Remove lens as described above, then turn bulb one quarter turn in either direction. Pull bulb straight down. The replacement bulb is GEF14T8-CW or equivalent.

CEILING LIGHT ASSEMBLY

The light fixture shown is commonly called a ceiling light. However, you will also find this basic light used in many other applications.

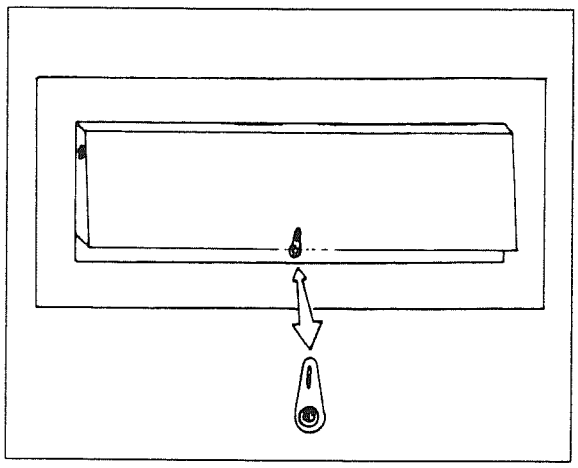
You will see the light in single, double and even triple stack configurations. The base may or may not be highlighted with hardwood trim.

Bulb Replacement



Lens and bulb replacement are the same in all applications.

1. Squeeze the lens in on each side and it will be free of the base.
2. Depress bulb into socket and turn counterclockwise about one quarter turn.
3. Replacement bulb is #1141.



Range Exhaust

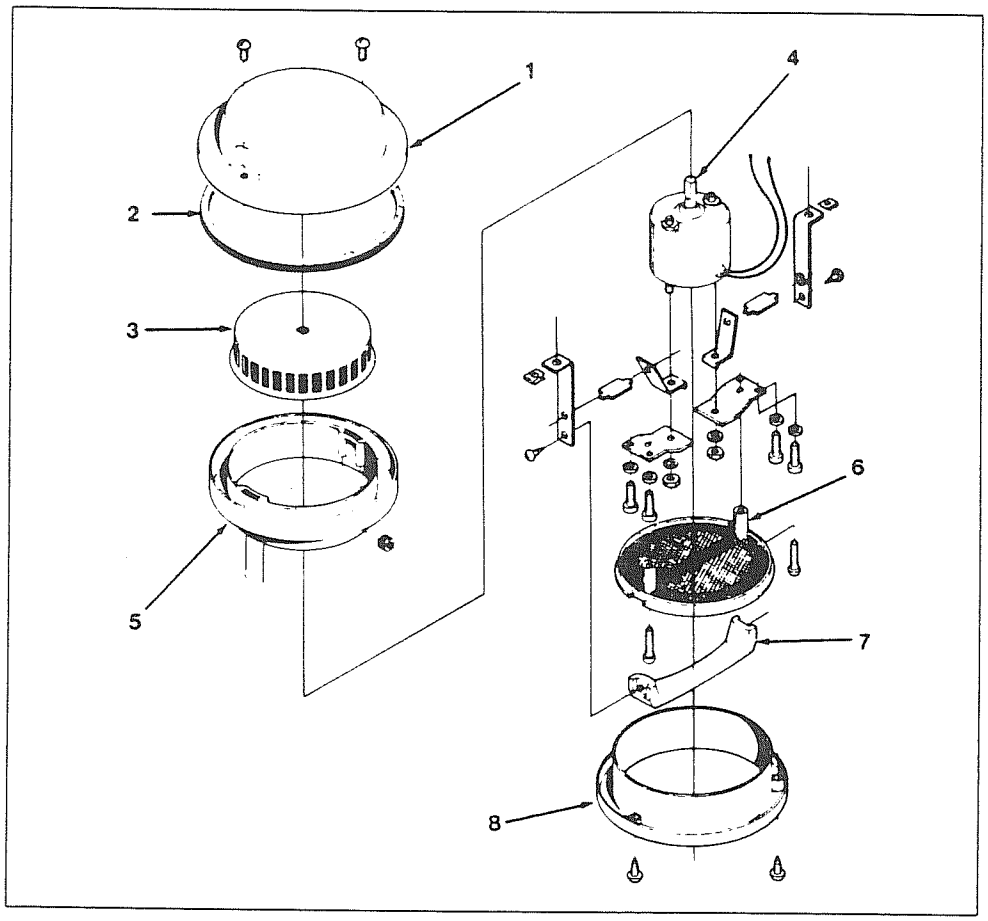
The switches for the range exhaust fan and light are located on the monitor panel.

CAUTION: Under the exterior range vent cover is a swinging door with a pivoting latch on the bottom. The latch should be turned horizontally for normal operation. In some windy conditions the swinging door may flap annoyingly, and by turning the latch vertically the door will be held closed. Operating the fan with the door latch closed may cause premature motor failure.

As shown in the diagram the latch is mostly hidden up underneath the hood. Operate the latch a few times when the weather is decent. That way, when the cold, icy wind is blowing and your fingers are stiff and numb with cold you will be able to quickly latch the door shut.

The range exhaust filter should be cleaned every couple of months. The filter is removed from inside the coach. Slide the filter toward the wall and the front edge of the filter will come down and out. Clean the filter in dishwater by letting it soak for a while, then slosh back and forth. Rinse thoroughly then air dry.

BATHROOOM EXHAUST FAN ASSEMBLY



1. Cover Assy w/gaskets
2. Gasket Assy
3. Blower wheel Assy
4. Motor Assy
5. Ring Body Assy
6. Grille Assy
7. Handle Assy
8. Trim Ring Assy

Removal and Replacement

1. Working from the outside top of trailer remove the screws holding the fan protective cap, and remove the cap.

2. Remove the 6 screws securing the fan flange to the outer skin.

3. Pull the fan out to the extent of the wiring harness and unplug the harness.

4. Remove the fan assembly.

5. To install, reverse the removal procedures.

MONITOR PANEL

Operating Instructions

SYSTEM SELECT:

1. Set switch to either Tanks or Batt. (Battery).

2. For battery level, now push the TEST switch.

TANK SELECT:

3. With SYSTEM SELECT switch set at TANKS position, select either FRESH (drinking water), GREY (Shower and dish waste water) or BLACK (Septic waste water) and then push the TEST switch.

4. Water pump on/off switch is provided also. When pump is on, indicator light will come on.

AUTO FILL (Optional)

When hooked to a city water source you may fill your fresh water tank by turning on this switch. An electrical valve opens and allows water to flow into the tank. The water tank lights will remain illuminated until the switch is turned off. The valve remains open until the 3/4 level is reached, then shuts off automatically.

Calibration

To calibrate your monitoring panel simply fill all of your tanks with tap water. Set the selector switch to the tank to be calibrated. Press the test switch and, using a small flat bladed screwdriver, rotate the adjustment located behind the small hole on the face of the panel and identified by the small black letter above (F fresh, G grey, B black). As the adjustment is turned, the lights will turn on and off in sequence. When the last light (marked F) is fully lit, the tank is properly calibrated.

Principles of Operaton

Two aluminum foil pads are glued to each tank. A small high frequency alternating voltage is passed to one of the pads. A radio signal is capacitively coupled to the other pad. The radio signal is passed back up to the panel where it is electronically converted to a direct voltage which drives the LED readout.

That is the mechanism by which water level is sensed through the walls of the tank. The radio signal (and the readout) is proportional to the area of the aluminum foil pads covered by water (on the other side of the tank wall). Therefore, if the pads are installed correctly the read out is proportional to the water level in the tank.

Trouble Shooting Considerations

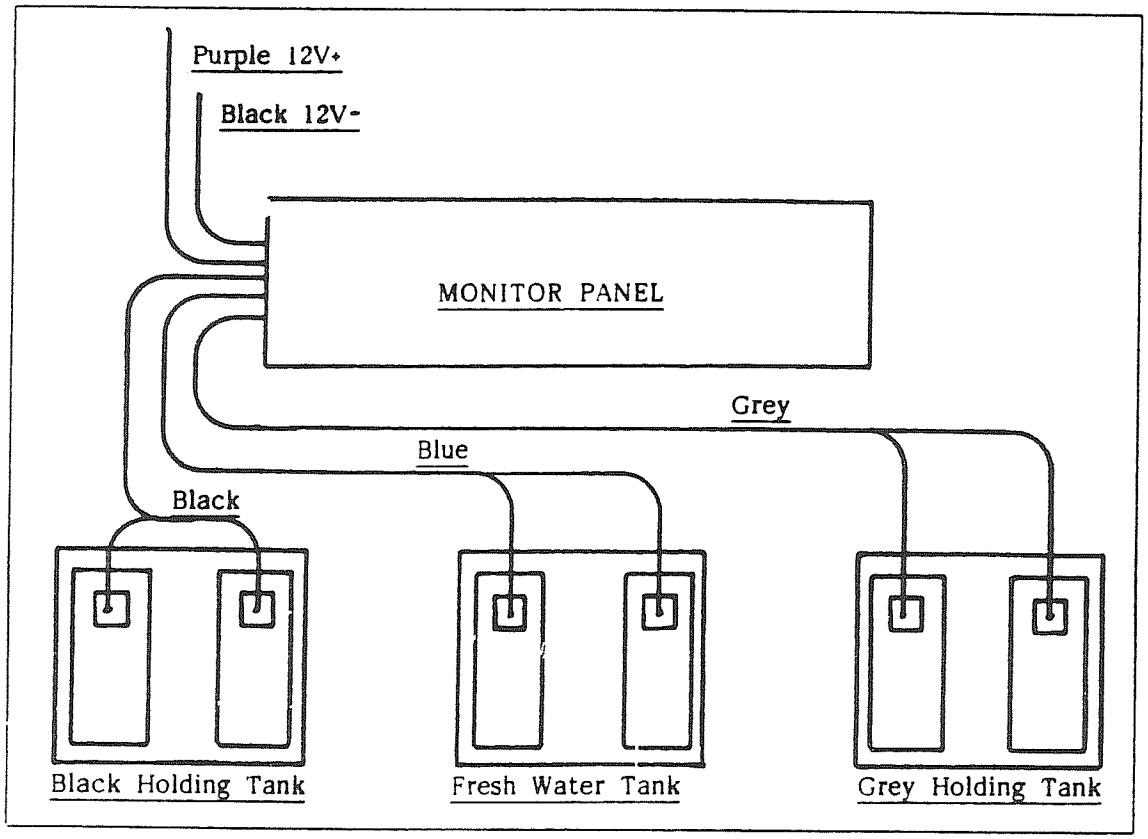
For the purpose of trouble shooting we usually divide the system into three components:

1. The panel.
2. The cable harness (and panel connection).
3. The tanks (and foil tank connections).

Generally the first step is to see if the problem is caused by improper adjustment. If not, check to see if the panel is defective. If it is not, check either the tanks or the cable harness (or both) in whichever order is most convenient.

System Configuration

The cable harness is connected to the tanks and the panel (and the power) as shown below:

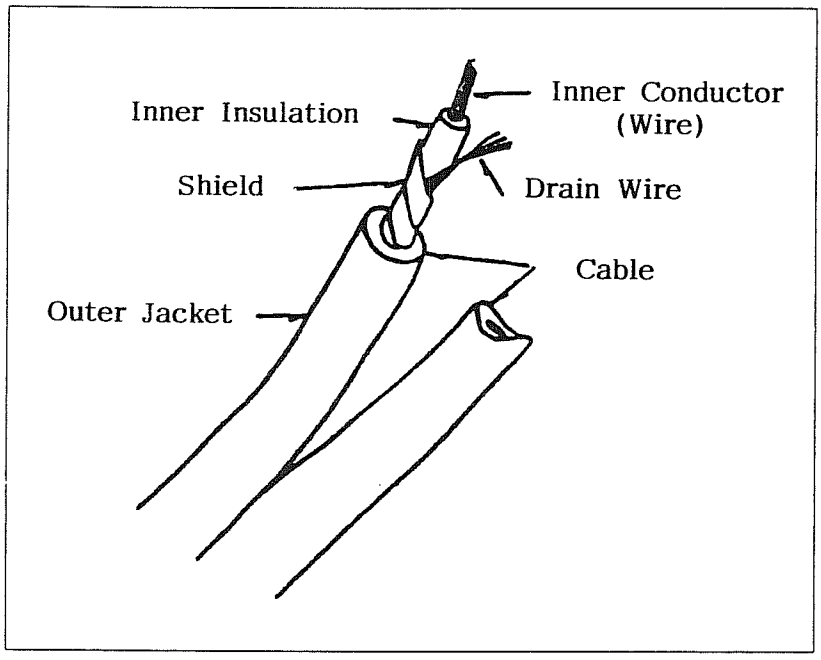


The alternating voltage is passed down to one of the aluminum foil pads on the fresh water tank by the blue cable, red inner insulation side. (See Cable Construction for details and terminology.) The alternating voltage is passed from that connection to one of the pads on each of the holding tanks by two jumper wires.

The radio signal is passed from the other pad on the fresh water tank to the panel by the blue cable, clear inner insulation side. The radio signal is passed from the holding tanks to the panel by the two sides of the grey cable.

Cable Construction

Each cable consists of two sides bonded together in a zip-cord. Each side has a copper stranded center conductor covered by an insulating layer (inner insulation is red on one side and clear on the other side). A non-insulated copper stranded wire runs alongside (called the "drain wire") and an aluminized mylar foil (called the "shield") is spiral wrapped around the center conductor and the drain wire both. A PVC jacket which is either blue or grey covers the whole cable. See below:



The center conductors conduct the alternating voltages and radio signal. The center conductors are connected to a wire soldered to a copper foil pad which is glued to the aluminum foil pad. This method is used because of the difficulty of soldering copper to aluminum. The drain wires and the shields (since they touch the drain wires) are grounded to the frame through the panel.

The aluminum pads are glued to the tanks with a rubber based glue. This is because polyethylene (the tank material) expands more than the aluminum pads when heated. Using the glue allows the pads and tank to expand at their differing rates without breaking the glue joint.

Problem Solving

PROBLEM: No LEDS go on when the test switch is pressed.

CAUSES:
A. Panel is getting no power.
B. Defective panel.

REMEDY:
1. Test panel on module tester or replace panel to see if the same problem occurs.
2. Check to see if the connector is on properly. Connector pins must contact the foil etch fingers on the board (if edge connector is used).
3. Using a volt meter, check to see if the power wires at the connector have about +12 volts across them (purple is positive, black is negative).
4. Make sure power wires are not reversed.

PROBLEM: Panel reads only empty on one or more tanks.

CAUSES:
A. Broken connections to tanks.
B. Aluminum foil pads loose.
C. Not enough aluminum foil pad area.
D. Grounded center conductor of cable or pad on tank.
E. Defective panel.

REMEDY:
1. Fill tanks and adjust pots completely clockwise. If you do not want to fill the tanks you can simulate a full tank by pressing a hand on both aluminum foil pads on the tank.

2. Test Panel on module tester or replace panel to see if the same problem occurs.

3. Visually check pads on tanks: They should be firmly stuck to the tank. They should have an area of at least 50 square inches each, and there should be no metal (other than copper foil pads) touching them (thereby grounding them).

4. Check the connections of the cables (and jumper wires) to the tank. The drain wires and shield should not be connected or touching anything. (Ideally the drain wires and shield should be trimmed back all the way to the outer jacket and a piece of electrician's tape wrapped around there).

5. If the problem still exists, disconnect all of the tank connections from the tanks, but keep the blue cable, red side and the two jumper wires connected together. Apply the "finger test" to each set of cable pairs (or cable-jumper wire pairs on the holding tanks).

   FINGER TEST: Lick your thumb and fore-finger of one hand. Lay the bare ends of the cable pair (or the cable-jumper wire pair) which were connected to a tank on your fore-finger, close to each other but not touching. Squeeze the two ends between your thumb and finger. This simulates a full tank, so the panel should read full on whichever tank the cable pair (or the cable-jumper wire pair) was connected to. You should be able to vary the reading by squeezing harder or softer.

   If you cannot get a good finger test on all three tanks, or the fresh tank only, the blue cable is damaged and must be replaced. If you cannot get a good finger test on the grey and/or the sewer tank, the grey cable has been damaged and must be replaced.

   If you have an Acu-Gauge cable tester, using it will shorten the trouble-shooting process. The cable tester detects shorts (to frame ground) in the cables. Use as directed in the cable tester instructions supplied with the tester. PLEASE NOTE: If a short is indicated by the tester the short could be in the indicated cable or anything connected to that cable. For example, if the blue cable-red side is indicated, that cable could be shorted, or the pad connected to that cable (on the fresh water tank) could be shorted to the frame, or the jumper wires (which are connected to the blue cable, red side) could be shorted, or the foil pads connected to the jumper wires could be shorted to the frame. The short could also be in the connection of the cable, jumper wires and foil pad.

If the grey cable (either side) is indicated, the short is either in the grey cable, the pads connected to the grey cable, or in the connections between the grey cable and its pads.

PROBLEM: Cannot get a full reading on one or more tank tests.

CAUSES: A-E Same causes as in the previous section.

F. Metal hanger strap between the two aluminum foil pads.

G. Needs slightly more foil because tank walls are thicker than usual.

H. Swelling tank loosens connection between foil strips making up pads.

REMEDY:

1. Do procedures 1 through 4 from the previous section.

2. Check to see if there is a metal hanger strap passing between the pads. (The strap does not have to touch the pads to cause a problem.) If there is, remove one of the pads and relocate it so that both of the pads are on the same side of the hanger strap.

3. If the aluminum foil pads are made of vertical strips of aluminum foil tape, run a few strips of foil tape horizontally across the vertical strips (cross-hatching). If the pads are made of horizontal strips, cross-hatch vertically.

4. If the reading is almost full (one light down from full) try adding a little more pad area. One or two more strips on each pad should do it (assuming there were 50 square inches on each to begin with). Do not overdo this. If two more strips of aluminum foil tape per pad does not solve the problem move on to the next procedure.

5. Do procedure 5 from previous section.

PROBLEM: Tank tests read only full or read only where they were adjusted regardless of water level.

CAUSES:

A. Power wires connected to the converter rather than the battery.

B. Disconnected or cut drain wires at connector.

C. Unshielded wire spliced into cable.

D. Short between center of conductors of cable, or between aluminum foil pads on tank.

E. Pads too close together.

F. Pads much too large.

G. Defective panel.

REMEDY:

1. Test panel on module tester or replace panel to see if the same problem occurs.

2. Empty the tanks. Unplug the coach from shore power (thereby turning off the converter). If that removes the problem disconnect the power wires and reconnect them directly to the battery.

3. Visually inspect the connector to the panel. There should be 4 bare drain wires in the connector. Drain wires should not be cut.

4. Using an ohmmeter check for continuity between the drain wires and the frame (ground). Panel should be connected but do not push the test button. If there is no continuity and the panel is okay the connector is bad and the pin connectons in the connector should be redone.

5. Visually inspect the tanks. The aluminum foil pads should not touch each other and should be at least 2 inches apart. The aluminum foil pads should be no larger than 100 square inches (sometimes you need more than the recommended amount, 50 square inches, because the tanks are built thicker etc., but over 100 square inches is too much).

6. Visually check to see if the proper colors of cable are connected to the tanks (blue to fresh water, grey and a jumper to each of the holding tanks). If not it is likely that some unshielded cable has been spliced on and the cable must be replaced.

7. Expose the drain wires near the tanks by stripping back the outer jacket. Using an ohmmeter check the continuity between the drain wire and the frame (ground). Panel should be connected, but do not push the test switch. If there is no continuity the cable is damaged and must be replaced. After completing this test trim the drain wire and shield back to the outer jacket and wrap a piece of electrician's tape around there.

8. Trace the cables to see if there are any splices. If so replace the cable.

PROBLEM: Cannot get an empty reading on tanks or LEDS flicker or some stay on.

CAUSES:

A. Power wires connected to converter rather than battery.

B. Too much pad area.

C. Jumper wires too long.

D. Aluminum foil pads pass under the tank.

E. Defective panel.

REMEDY:

1. Empty the tanks.

2. Test panel on module tester or replace panel to see if the same problem occurs.

3. Unplug the coach from shore power. If this removes the problem disconnect both power wires and connect them as near to the battery as possible.

4. Check the aluminum foil pads on the tanks. They should have an area of less than 100 square inches each. They should not touch. They should be at least 2 inches apart. They should be on the vertical faces of the tank and should not slip under the tank. Also, if the tank has a curved bottom edge the lower edge of the foil pads should be cut off just above the curved bottom edge.

5. Make sure that the jumper wires are not stretched across the pads. If the jumpers are longer than 10 foot and the problem still occurs, use shielded cable for the jumper wire and connect the drain wires to the blue cable, red side drain wires (see cable construction).

6. If the problem still occurs make sure the cables and jumper wires are not run alongside a wire coming from the converter.

7. If the problem still occurs, do procedures 3, 4, 6, 7, and 8 from previous section.

PROBLEM: Erratic Readings: They suddenly jump two or more LEDS as you fill or empty tanks, or move when no water is being added or taken. Or, certain LEDS do not go on or go on in wrong order.

CAUSES:

A. Loose intermittent connections.

B. Foil pad on non-vertical face of tank.

C. Swelling tank loosens connection between foil strips making up pad.

D. Power wire connected to converter.

E. Defective panel.

REMEDY:

1. Test panel with module tester or replace panel to see if the same problem occurs.

2. Check all connections for looseness, etc.

3. Pads should be only on vertical faces and both pads should run from near the top edge of the tank to near the bottom edge of the tank. If the tank is stepped, put the pads only on the vertical faces of the tank. Connect the vertical pads across step with a thin (1/4") strip of foil.

4. If the pads are made of vertically run strips of aluminum foil tape, run a few strips of foil tape horizontally across the vertical strips (cross-hatching). If the strips making up the pads are horizontally run, cross-hatch vertically.

5. Make sure the pads are stuck firmly to the tanks.

6. Connect the power wires as close to the battery as possible.

PROBLEM: LPG not working (if panel is equipped with one).

CAUSES:

A. LPG not connected properly.

B. Sending unit bad.

C. LPG float bad.

D. Defective panel.

REMEDY:

1. Test panel on module tester or replace panel to see if problem still occurs.

2. Ground red wire from connector. LPG should read empty. Disconnect red wire. LPG should read full.

3. Check to see that the red LPG wire in the connector to the panel is in the proper slot in the connector. On the 106 horizontal models, the proper slot is in the 7th from the top. On the 106 vertical models, the proper slot is in the 7th from the left. On the 105 models, the proper slot is in the 11th from the left. On the HRC models the proper hole is the middle vertical row, second horizontal row from the top. (The top of the connector has 2 notches in it.)

4. Connect the red wire to the 90 ohm sending unit on the LPG tank.

5. Check to see that the sending unit and LPG tank float magnets are aligned.

6. Replace sending unit.

7. Replace tank float system.

PROBLEM: Aluminum foil pads come unstuck.

CAUSES: 3M 4693 glue was not used to stick the pads on.

110 VOLT ELECTRICAL SYSTEM

City Power

The Airstream univolt system enables you to use the lights and appliances whether operating on self-contained battery power or hooked up to 110 volt city power. The 12 volt light bulbs give off the same light as regular household bulbs, so that when operating on self-contained battery power, everything works normally except the 110 volt convenience outlets and 110 volt appliances.

Exterior outlets for 110 volts are located on the curbside exterior wall between the wheels and above the wheel well.

CAUTION: When operating with city power make very certain that the service is 110 volt and not 220 volt. Open the bumper storage compartment lid, uncoil only the needed amount of cord and plug it into the city power source. Before closing the lid, carefully place the cord in the opening provided for it.

The univolt system is a transformer designed to maintain constant output voltages regardless of the variances that occur in city power systems. The transformer design eliminates the need for complex electronic sensing systems to charge the battery, minimizing the possibility of failures and greatly increasing its overall reliablity.

WARNING: When the three pronged plug can be used there will be no problems with proper polarity or grounding.

In some older parks and other locations where three pronged outlets are not available, certain precautions to insure proper grounding and polarity must be taken. These precautions are listed below:

1. Attach the three pronged plug to a two pronged adapter. The third conductor line of this adapter has a short wire lead which must be grounded.

2. For proper grounding connect the short ground lead to a grounded outlet box or to a cold water pipe. When no water pipe is available drive a metal rod two feet into the ground and attach the ground lug to it, thus providing the unit with proper grounding.

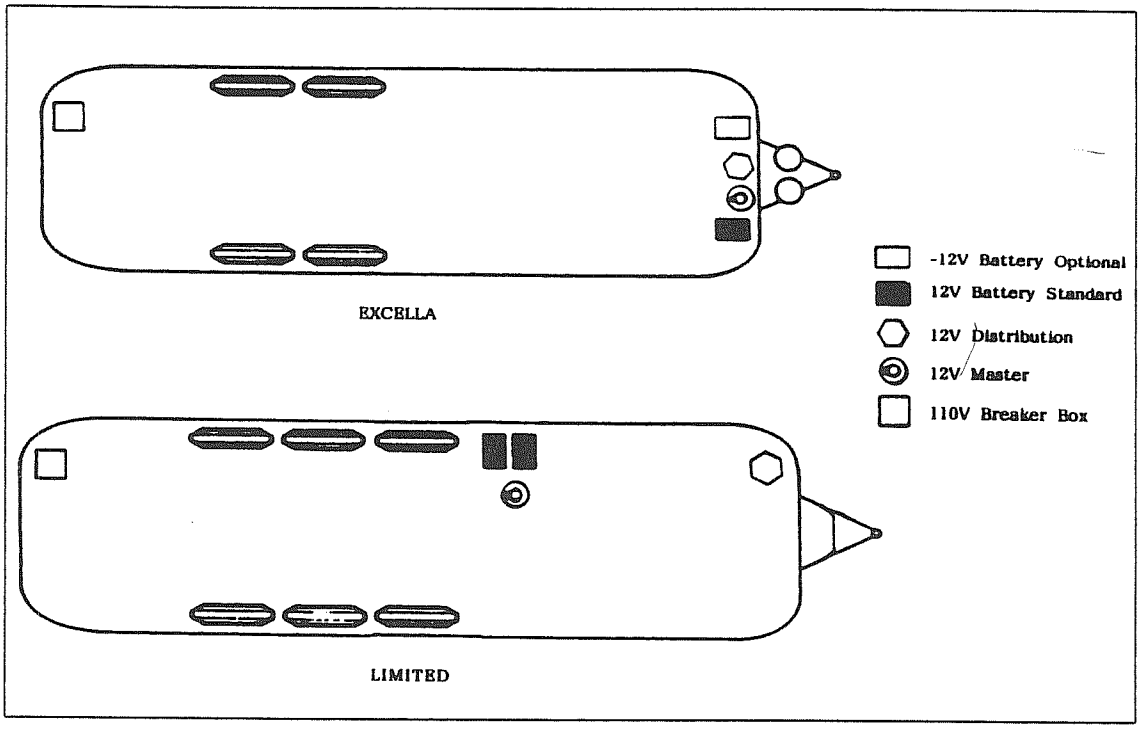
To operate self-contained, simply disconnect the power supply cable.

When your trailer is hooked up to 110 volt AC the univolt system automatically charges the trailer batteries; and, if it is hooked up, your automobile battery as well. The speed and degree of charge depends on how much power is used for lights and appliances, as only the surplus goes to charging the battery. If you are making an extended stay, then you should, if it is available, keep your trailer hooked up to a 110 volt current.

Circuit breakers for the 110 volt system are located in the roadside rear corner of the trailer. In most instances they are in the overhead rear cabinet. Trailers with CSA approval may have the circuit breaker box under the bed or lower cabinet.

While you are connected to the 110 volt receptacle the wiring is protected by circuit breakers in the breaker panel. In the event of a failure of a 110 volt circuit check your circuit breakers first. If a breaker continues to trip after you have reset it several times, your circuit may be overloaded with appliances or there may be a short in the circuit. If lessening the load does not solve the problem consult an Airstream Service Center.

ELECTRICAL COMPONENT LOCATIONS



The 110 volt electrical system provides power to operate the air conditioner, univolt converter and 110 volt receptacles for portable appliances. The power is carried through the 110 volt city power flexible cord to the 110 volt distribution panel, and then is distributed to each appliance or receptacle.

All wire, components and wiring methods conform to federal, state and Canadian requirements.

United States and Canadian requirements vary in type of components, approved listing agencies and wiring methods. Therefore, there are special trailers manufactured for Canadian sales. Figure 30 on the following page illustrates the proper wiring for 110 volt distribution panels for US trailers. Figure 40 illustrates panels for Canadian trailers.

110 VOLT ELECTRICAL PANELS

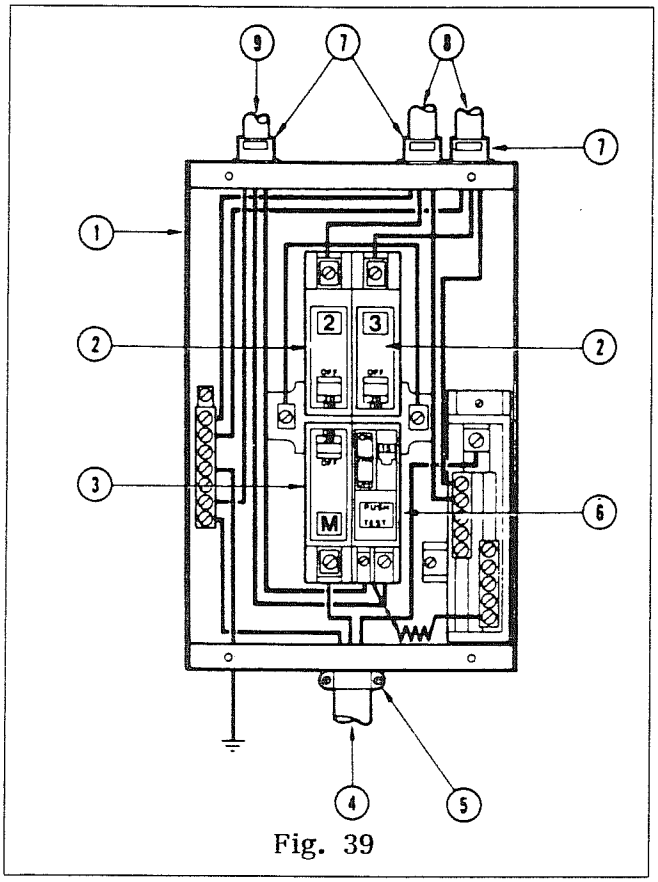


Fig. 39

UNITED STATES

1. Breaker Box G.E. T1410ST
2. Breaker THQP 120, 20 Amp
3. Breaker THQP 130, 30 amp main
4. Power supply cord
5. Clamp Romex 3/4"
6. Ground Fault Breaker THQL 1115 GF, 15 amp
7. Romex clamp T&B 3300
8. Romex
9. Romex

CANADIAN

1. Clamp Romex 3/4"
2. Power supply cord, Romex NMD -7
3. Romex Clamp T&B 3300
4. Romex NMD -7
6. Breaker THQP 115 15 amp
7. Breaker THQP 120 20 amp
8. Ground fault breaker THQL 1115GF, 15 amp
9. Breaker THQP 130 30 amp main
10. Breaker box G.E. TL410ST

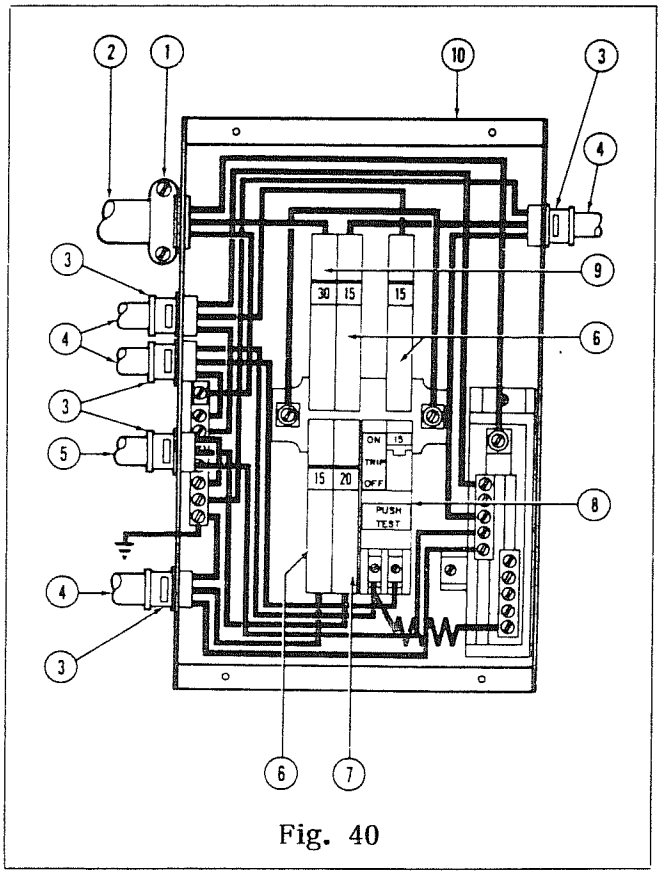
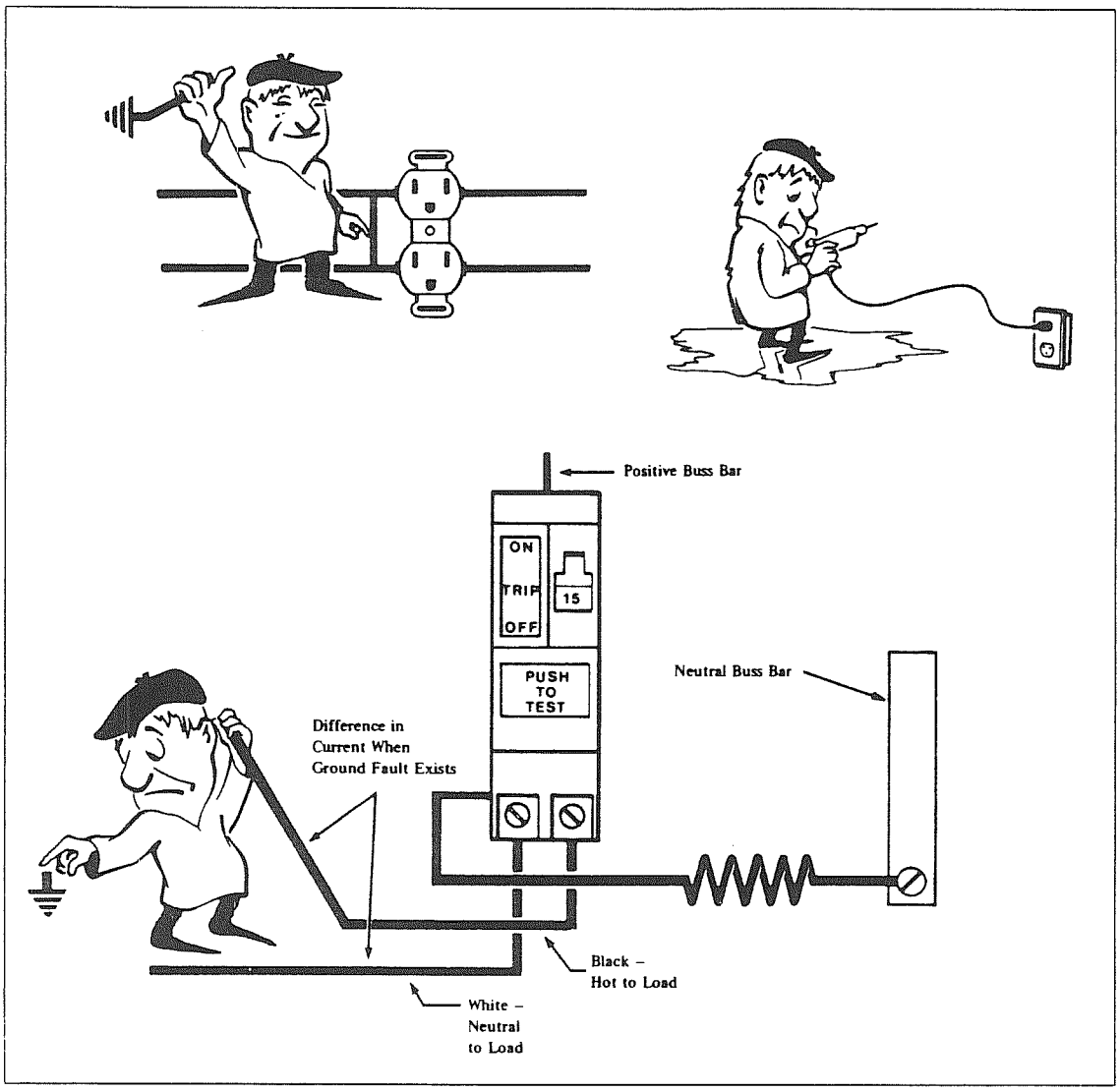


Fig. 40

GROUND FAULT CIRCUIT INTERRUPTER (GFCI)

Many states require trailers which are sold in their state, and which have exterior 110 volt receptacles, to have a ground fault circuit interrupter.

Trailers manufactured for sale in these states have type THQL 15 amp GFCI breakers installed on the general circuit, since the exterior breaker is on this circuit. The breaker replaced the standard TQL-15 amp breaker.



When properly installed, the GFCI circuit breaker provides reliable overload and short circuit protection PLUS protection from Ground Faults that might result from contact with a "HOT" load wire and ground.

IMPORTANT NOTE: The GFCI circuit breaker will NOT reduce shock hazard. if contact is made between a "HOT" load wire and a neutral wire or 2 "HOT" load wires.

Each GFCI circuit breaker is calibrated to trip with a ground current of 5 milliamperes or more. Since most persons can feel as little as 2 milliamperes, a distinct shock may be felt if the need for protection exists. However, the shock should be of such short duration that the effects will be reduced to less than the normally dangerous level. However, persons with acute heart problems or other conditions that can make a person particularly susceptible to electric shock, may still be seriously injured.

While the GFCI circuit breaker affords a high degree of protection, there is no substitute for the knowledge that electricity can be dangerous when carelessly handled or used without reasonable caution.

WARNING: The GFCI circuit breaker provides protection only to the circuit to which it is connected. It does NOT provide protection to any other circuit.

OCCUPANT:

Make this test each month and record the date on the chart.

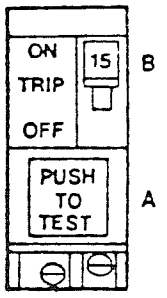
1. With handle B in "ON" position, press PUSH TO TEST button A.

2. Handle B should move to TRIP position, indicating that GFCI breaker has opened the circuit.

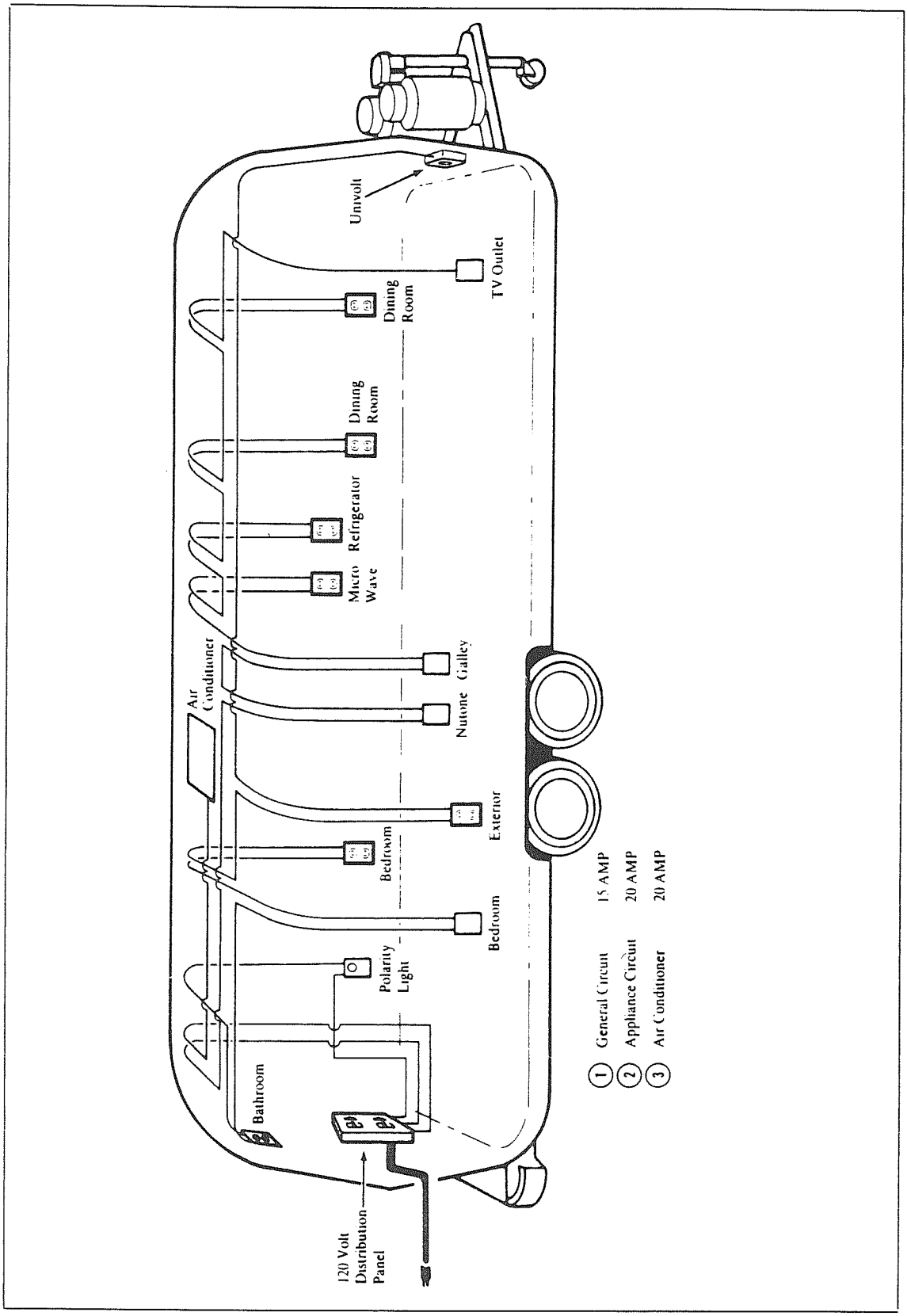
3. To restore power move handle B to "OFF" and then to "ON".

Important: If handle B does not move to TRIP position when test button is pressed, the GFCI breaker protection is not complete. If this happens, replace GFCI breaker.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1989												
1990												
1991												



TYPICAL 110 VOLT DISTRIBUTION SYSTEM



NOTES

APPLIANCES

AIR CONDITIONER

Manufacturer:

The Coleman Company, Inc.
Heating and Air Conditioning Group
3050 N. St. Francis
Wichita, Kansas 67219
Phone: 316-832-6450

The roof air conditioner used on Airstream trailers is one of the most popular on the market today. In your Owner's Packet is a set of literature covering all operating and maintenance instructions. If the literature is misplaced please contact the air conditioner manufacturer or your Airstream dealer for replacement. A detailed service guide may be ordered from the manufacturer.

The voltage to the air conditioner is critical. We commonly refer to 110 or 120 volts, but a check with a volt meter may find voltage much lower. Your air conditioner will probably not function if the current drops below 105 volts. Low voltage is usually associated with older or poorly maintained trailer parks, but many people have found their homes, built only twenty or thirty years ago, may not be capable of operating the air conditioner on some receptacles. Parking your trailer so the power cord can be plugged into a receptacle close to the fuse or circuit breaker box can alleviate the problem.

Avoid extension cords and adapters whenever possible. If an extension cord must be used it should be as short and heavy as possible to provide the most current to the air conditioner. The optional dual air conditioners will require the second power cord to be plugged in. A heavy extension cord should be used so you can plug into a different circuit. Trying to run both air conditioners through the same circuit will probably blow the fuses or trip the breaker of the park.

If high temperatures are expected you should make an effort to park in a shaded area. Starting the air conditioner early in the morning also helps. It's much easier to hold a comfortable temperature than it is to lower the temperature after the interior of the trailer is already hot.

Since a travel trailer is mobile, the cooling size of the air conditioner is a compromise between size and cooling capacity. The 13,500 BTU seems to be the most practical for RV use. If you are spending an extended amount of time in a hot, humid area you may want to discuss having a second air conditioner installed with the local dealer Under most conditions you will find your single air conditioner performing adequately.

If you feel the air conditioner is not operating properly there is a very simple test. Two small inexpensive thermometers are all that is needed. With the air conditioner in the HIGH-COOL mode place one thermometer next to the air intake and the other thermometer in the flow of cool air being expelled. After about 5 minutes check the thermometers. A normally operating air conditioner will have at least a 15 degree difference in temperature.

The first place to check if your air conditioner has lost efficiency is the intake filters. When used consistently they should be cleaned every two weeks.

CAUTION: **You may repeat the above-mentioned test using two thermometers with the filters removed to isolate the problem. But, NEVER operate the air conditioner over a long period without filters, or expensive repairs will be required.**

If warranty repairs are required use only one of the air conditioner manufacturer's service centers, or an Authorized Airstream Dealer.

The roof of your Airstream will easily support a mechanic if a little common sense is used to keep his weight spread out. If the mechanic weighs 250 lbs., is carrying 50 lbs. of equipment, and jumps up and down on one foot, he can damage the roof. And, he can pay for the repair too!

Service Problems

The following list of service problems covers only some of the more common problems which may occur and lists only the more probable causes.

In many instances it will be necessary to use the wiring diagram to check out the electrical circuits step by step starting at the power service.

PROBLEM: Nothing runs on either Hi or Low Cool.

CAUSE:
1. Power supply dead. Open circuit breaker or fuse.
2. Faulty selector switch.

PROBLEM: Inadequate cooling but compressor and fan run.

CAUSE:
1. Selector switch set at Low Cool.
2. Low evaporator air flow (frost may form on accumulator). Check for a) dirty filter: b) air damper set on low: c) squirrel cage loose on motor shaft: d) fan motor not up to speed due to tight bearings, faulty fan capacitor: e) dirt and lint on evaporator coil.
3. Moisture in system. Frost periodically forms and melts on accumulator.
4. Heat gain of RV exceeds cooling capacity of air conditioner.
5. Low charge. Leak in system.

PROBLEM: Fan runs on Low or High Cool, but compressor neither runs nor hums.

CAUSE:
1. Selector switch open to compressor.
2. Thermostat open.
3. Compressor overload switch open.
4. Compressor winding open.

PROBLEM: No cooling. Compressor runs but won't pump.

CAUSE: Compressor vane stuck (compressor must be replaced).

PROBLEM: Fan runs on Low or High Cool but compressor periodically hums for 15 to 30 seconds.

CAUSE:
1. Low voltage. Voltage must be 115V plus or minus 10% (Minimum of 103.5V).
2. Faulty capacitor.
3. Start relay contacts open.
4. Compressor start winding open or grounded.
5. Compressor mechanically stuck.

PROBLEM: Compressor trips breaker or thermal current overload immediately - no hum.

CAUSE:
1. Compressor winding shorted or grounded.
2. Circuit breaker or thermal current overload faulty.

PROBLEM: Compressor cycles on and off, resulting in inadequate cooling.

CAUSE:
1. Thermostat bulb touching metal.
2. Thermostat out of calibration.
3. Collar connecting blower outlet to ceiling assembly missing or too short.
4. Compressor cutting out on overload due to: a) dirty condensor coil: b) Low or High voltage: c) overcharge or non condensables in the system: d) Low charge: e) plugged up cap tube.

PROBLEM: Fan won't run regardless of selector switch setting, but compressor runs on High and Low Cool.

CAUSE:
1. Faulty selector switch.
2. Fan motor windings open, shorted or grounded.
3. Fan capacitor shorted, weak or open.
4. Fan bearings dry.

PROBLEM: Air conditioner vibrating.

CAUSE: 1. Fan blade or blower wheel out of balance.

2. Motor shaft bent.

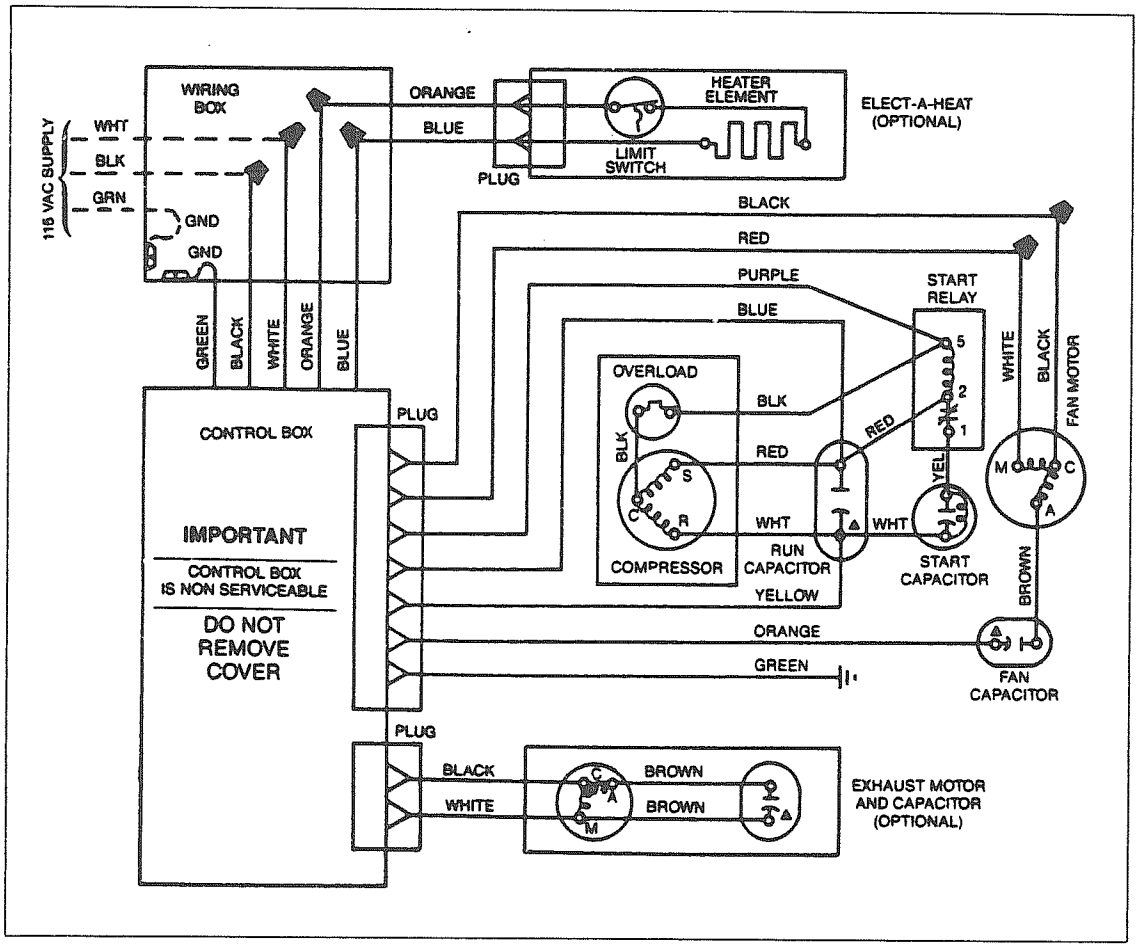
PROBLEM: No heat (models equipped with heating elements.)

CAUSE: 1. Limit switch open.

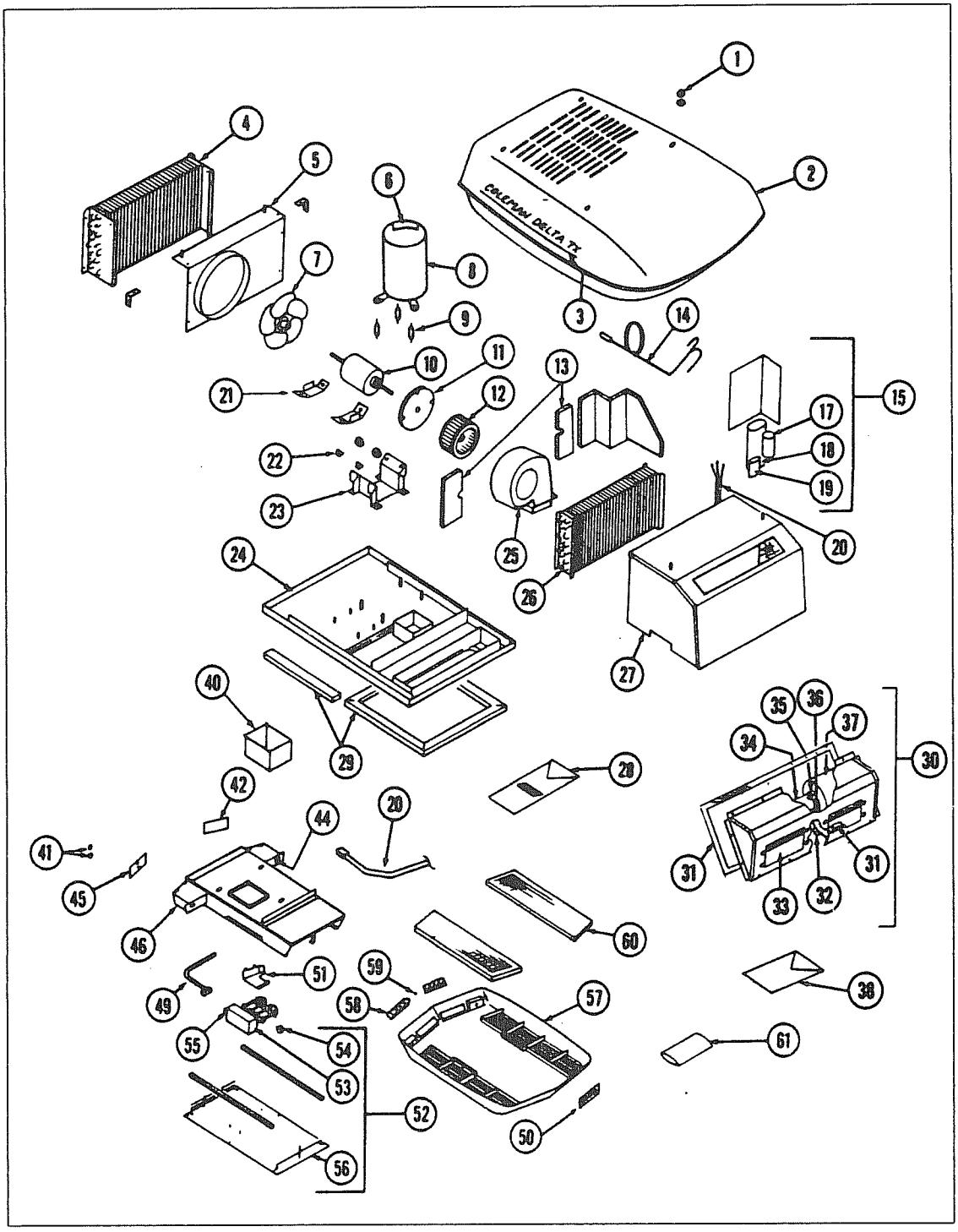
2. Selector switch open.

3. Thermostat open.

Electrical Wiring Diagram



AIR CONDITIONER PARTS DIAGRAM



Parts Description Precedng Page

1. Acorn nut & washer
2. Shroud
3. Delta TX Decal Pkg
4. Condenser Coil
5. Fan Shroud
7. Fan (4 blade)
8. Compressor
9. Compressor Mount
10. Motor
11. Cover (Scroll)
12. Impellor
13. Blower Cover
14. Liquid Line
15. Junction Box Assy, Comp.
17. Start Capacitor
18. Run Capacitor
19. Run Capacitor
20. Conduit & Wiring Assy
21. Motor Bracket
22. Motor Mount (Rubber)
23. Motor Mount (Steel)
24. Base Pan Assy
25. Scroll Assy
26. Evaporator Coil
27. Evaporator Cover Assy.
28. Customer Envelope
29. Gasket Pkg.
30. Exhaust Assy Complete
31. Gasket Pkg
32. Run Capacitor
33. Door w/hinge
34. Motor
35. Motor Mount
36. Blower Wheel
37. Scroll Assy, Right/left
38. Small Parts Pkg
40. Duct Collar
41. Knob
42. Decal
44. Wire Connector
45. Decal
46. Control Ass
49. Wire Bundle
50. Logo
51. Cover, Control Box left
52. Heat Strip Assembly
53. Heat Element
54. Limit Switch
55. Wire Bundle
56. Heat Strip, bottom
57. Ceiling Shroud
58. Louver
59. Washer
60. Filter

SPECIFICATIONS/DIMENSIONS

		6779 Delta TX Series
BTU Capacity (nominal)	Cooling	13,500
Electrical Rating		115 V/60 Hz./1 Phase
Compressor Locked Rotor AMPs		63.5
System Full Load AMPs At ARI Standard Condition	Cooling	14.1
RUNNING WATTS: (cooling) A.R.I. Standard Condition (80°F. DB/ 67°F. WB Indoor, 95°F. DB Outdoor at 115 VAC)		1600
RUNNING WATTS: (cooling) A.R.I. Maximum Condition (95°F. DB/ 71°F. WB Indoor, 115°F. DB Outdoor at 103.5 VAC)		1930
Evaporator Air Delivery (CFM)		Infinite Selection Between 210 to 310 CFM
Compressor Start Delay		4 Second Maximum
Low Voltage Shutdown Point		86 VAC ± 6 VAC
Low Voltage Shutdown Time		40 Seconds Minimum 70 Seconds Maximum
Start Winding Cut Out Voltage		150 VAC Minimum 200 VAC Maximum
Compressor Start Limit 1st Try		.9 Seconds Minimum 1.9 Seconds Maximum
Compressor Start Limit 2nd Try		.6 Seconds Minimum 1.6 Seconds Maximum
Thermostat Cycling Temperature		61° ± 5° @ Full Counterclockwise 85° ± 5° @ Full Clockwise
Compressor Motor Resistance Both Windings R to S Run Winding R to C Start Winding C to S		Approximately: 7.0 Ohms @ Rx1 .5 Ohms @ Rx1 6.5 Ohms @ Rx1

EXTERIOR SHROUD	HEIGHT	12¾"
	WIDTH	29"
	LENGTH	48"
CEILING PLATE	DEPTH	3"

FURNACE

Manufacturer: Suburban Manufacturing Company
P.O. Box 399
Dayton, Tennessee 37321
Phone: 615-775-2131

Listed below are several safety related items that you should follow to assure continued safe operation of the furnace. Read the information supplied by Suburban in your Owner's Packet for more detailed instructions.

1. Keep the furnace area clear of any combustible materials, gasoline or other flammable vapors and liquids.

2. Do not restrict the flow of combustion air or the warm air circulation to the furnace. To do so could cause personal injury and/or death.

3. Never operate the furnace if you smell gas.

4. Immediately shut furnace down and call a service agency if furnace cycles erratically or delays on ignition.

5. Always follow the lighting instructions. Do not deviate from the step by step procedures.

6. Never attempt to repair the furnace yourself. Seek the help of a qualified service agency.

7. Never attempt to repair damaged parts. Always have them replaced by a qualified service agency.

8. Periodically observe the main burner flame to assure it is burning with a hard blue flame with well defined burner ports (See Illus.) If flame appears yellow or burner has a lazy flame, shut furnace down and contact a qualified service person.

   Note: To observe flame, cabinet front must be removed. Operation of burner can then be observed through the viewing window on front of chamber (See Illus).

9. Periodically inspect outside vent cap for obstructions or presence of soot. If soot is present, immediately shut furnace down and contact a qualified service person.

10. Never restrict the ducting installed by Airstream. To do so could cause improper furnace operation.

NOTES

Operating Instructions

1. Turn the manual valve to the "OFF" position (See Fig. 1).

2. Set thermostat above room temperature to begin blower operation. Allow blower to run for 5 minutes for combustion chamber purge cycle.

3. After 5 minutes, set thermostat to the "OFF" position.

4. Open manual shut-off valve. Correct operating characteristics depend on this valve being positioned fully open. Never attempt to operate with valve partially closed.

5. Set thermostat on desired temperature.

6. Allow 30 seconds for main burner to light.

7. If burner does not light, set thermostat on "OFF". Wait until blower stops and repeats steps 1 through 5.

8. If after three (3) attempts with no ignition, go to shutdown and contact your dealer or a qualified service agency. Do not continue to cycle furnace through thermostat in an attempt to get ignition.

To Shut Down

1. Set thermostat to positive off position.

2. Turn manual shut off valve to the "OFF" position.

Parts Description

Fig. 1

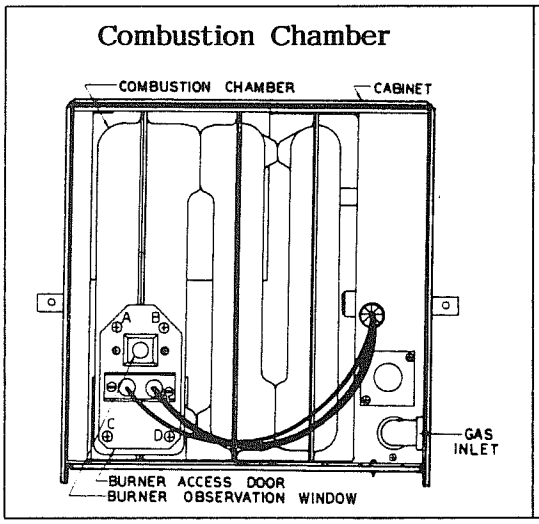


Fig 2

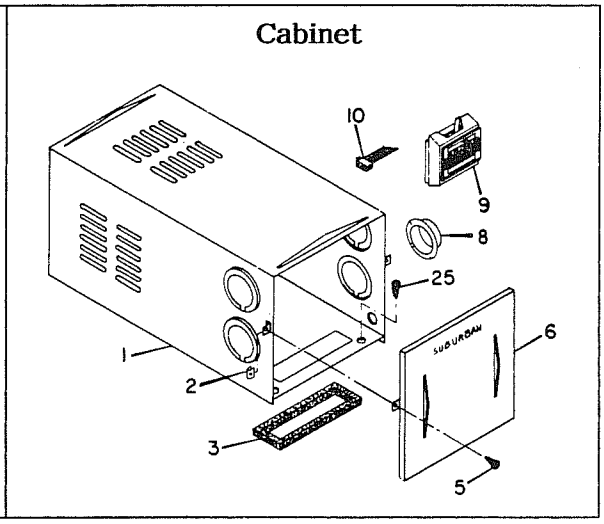
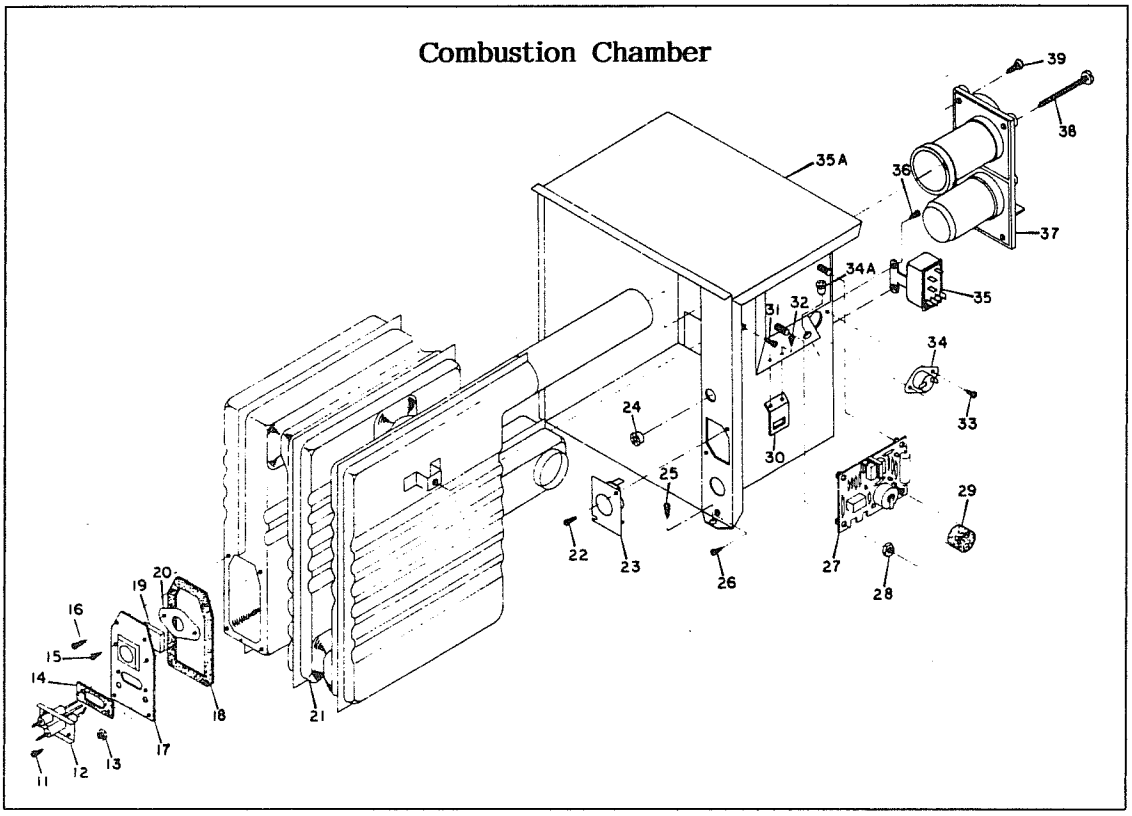


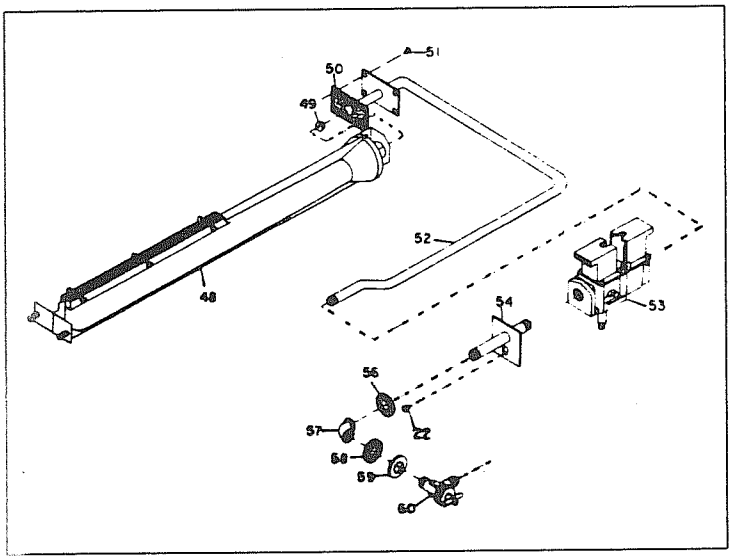
Fig. 3



Parts Description for Preceding Page

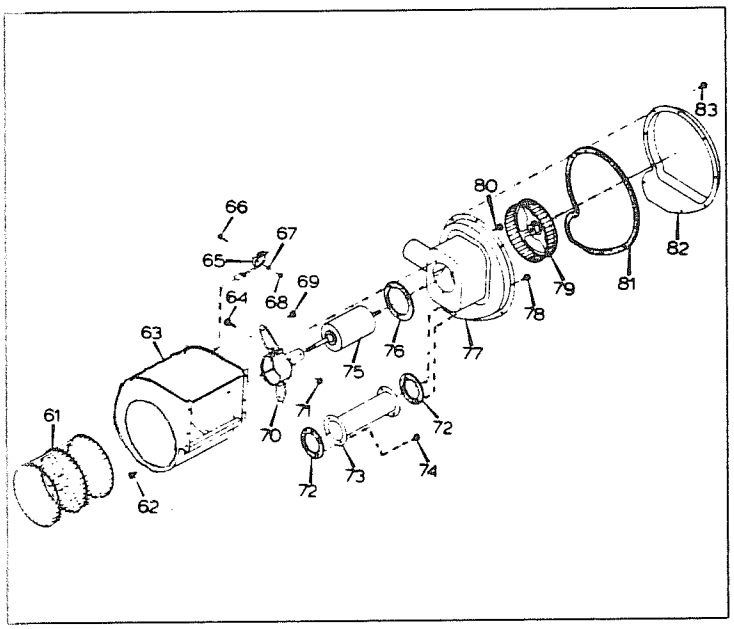
1. Cabinet Assembly
2. Tinnerman "U" Clip (2 Req.)
3. Gasket, Bottom Duct Adaptor
   (Required only if bottom duct discharge is used.)
5. Screw, #10 x 3/4 (2 req.)
6. Cabinet front
8. Duct collar (3 Req.)
9. Thermostat
10. Power Supply Harness
11. Screw, 8-32 x 1/2 (2 Req.)
12. Electrode Assembly
12A. Electrode Wire (not shown)
13. Nut, Hex 10-24 Thread Locking (2 req)
14. Gasket, Electrode
15. Screw #8 x 3/8 (2 req.)
16. Screw, #10 x 1/2 (Serrated Head) (4 req.)
17. Door, Burner. Access
18. Gasket, Burner Access Door
19. Glass Disc
20. Cover Plate
21. Combustion Chamber Assembly
22. Screw, #8 x 3/8 (2 req)
23. Limit Switch
24. Bushing
25. Screw, #10 x 3/8
26. Screw, #10 x 3/8
27. Module Board
28. Nut Hex 6-32 (2 req)
29. Cap Insulator
30. Bracket, Power Supply
31. Screw, #10 x 3/8 (2 req)
32. Screw, #8 x 3/8 (2 req)
33. Screw, #10 x 1/4 (2 req)
34. Fan Switch
34A Bushing
35. Thermostat Relay
35A Radiation Shield Assembly
36. Screw, #10 x 1/4 (2 req)
37. Vent Cap Assembly
38. Screw, #8 x 3"
39. Screw, #10 x 3/4 (4 req)

Burner Assembly



48. Burner Assy
49. Orifice, Main Burner
50. Gasket, Manifold
51. Screw
52. Mainfold Pipe
53. Valve
54. Pipe Assembly (Gas Inlet)
56. Gasket, Gas Inlet Pipe
57. Elbow, 90°
58. Gasket, Disc Cover
59. Disc Cover, Gas Inlet
60. Valve, Manual Shut Off

Blower Assembly



61. Wheel, Room Air
62. Screw
63. Blower Housing Assy
64. Screw
65. Microswitch & Paddle Assy
66. Screw
67. Washer #2 Lock
68. Nut #2 Hex
69. Screw #10
70. Bracket, Motor Mount
71. Nut #10, Hex Keps
72. Gasket, Crossover Tube
73. Crossover Tube
74. Screw
75. Motor Assy
76. Gasket, Motor Mount
77. Housing, Combustion Air Assy
78. Screw #10
79. Wheel, Combustion Air
80. Screw #10
81. Gasket, Combustion Air Housing
82. Housing, Combuston Air
83. Screw #10

WARNING: THE FOLLOWING INFORMATION IS BEING SUPPLIED TO ASSIST A QUALIFIED SERVICE AGENCY IN SERVICING YOUR FURNACE. PERSONAL INJURY AND/OR DEATH CAN RESULT FROM AN IMPROPERLY OPERATING FURNACE.

Furnace Removal and replacement

1. Shut off main gas supply and cover carpet for protection.

2. Disconnect battery.

3. Unfasten latches on each side of furnace face cover and remove. On some models the right side latch is partially covered by heat duct, and on those units the left side latch is unfastened and the cover is swung open like a hinged door and unhooked from the right side latch.

4. Remove 90 degree sheet metal heat duct elbow attached to right lower side of furnace cabinet to provide access to electrical connector. (**Note:** On some models it may be possible to remove this elbow fitting. On these models leave the electrical connector plugged in until the furnace can be moved out far enough to gain access.) Disconnect electrical connector (quick disconnect plug on right side of cabinet).

5. Unscrew gas line and remove 90 degree Ell gas line fitting. If the thread compound installed in production has taken a firm set, it may be necessary to cut a slot in the furnace cabinet wall so the furnace can be removed without removing the 90 degree fitting.

6. Remove the vent cap screws and remove vent cap from outside trailer.

7. Remove screw on right side of furnace assembly attaching it to furnace cabinet and slide assembly out.

8. To install, reverse removal procedures. (Be sure to re-rivet during installation).

Burner Adjustment

To adjust primary air to the main burner, the small sheet metal cover found just below and to the right of the lighter opening must be removed. Behind the cover is a slotted screw head. With a screwdriver, turn screw head counterclockwise for less primary air, and clockwise for more primary air. A symptom of too much primary air will be a howling or screeching noise when burner is on. (Reduce air to correct.) A symptom of too little primary air will be sooting on the exterior vent, and a distinct yellow and floating flame. (Increase air to correct.) A hard blue flame is the sign of correct adjustment.

Sequence of Normal Operation

1. When the thermostat calls for heat, the blower motor is energized immediately.

2. As the blower motor reaches approximately 75 percent of the normal R.P.M. (within 3 to 5 seconds) the microswitch, in response to the air flow, will engage, allowing current flow to the solenoid valve and the spark ignition system.

3. The current to the valve opens it and allows gas to the main burner. The spark then ignites the main burner.

4. After main burner ignition, the flame detector will sense the presence of flame (usually within 7 seconds) and de-energize the lockout feature. If the main burner does not ignite, or the flame detector does not de-energize the lockout feature within 7 seconds, the unit will go into lockout. At this time it will be necessary to set the thermostat on "OFF" and repeat Steps 1 thru 5 of the lighting instructions.

5. If after 3 tries and no ignition, or main burner continues to go off within 7 seconds, go to shut down and determine cause.

6. If within a period of approximately 2 minutes after the main burner is lit, the thermostat is turned back, both the blower motor and solenoid valve are de-energized. However, if the furnace continues to run longer than 2 minutes, which it normally should, a slight snap can be heard from within the casing. The snap is caused by the fan switch as it changes its position. After this occurs, if the thermostat is satisfied or turned back, the solenoid valve will close, the flame on the main burner will go out, but the blower will continue to run for a short period of time and will then shut off. The purpose of this is to remove most of the remaining gases from the heat exchanger. Be assured that this period of blower over-ride is a part of the unit's normal operation.

Fan Switch

The purpose of the fan switch is to control the sequence of the blower operation. The fan is a two pole switch. When the bimetal disc of the fan switch is heated to the operating temperature, the switch closes. This completes a circuit through the motor from a direct source. The blower will continue to run as long as the chamber is hot, even though the thermostat is satisfied and the main burner is off. When the chamber cools, the fan switch changes back to its original position and shuts the blower off. If burner and blower shut off simultaneously after the thermostat is satisfied, then the fan switch failed change over. This is a symptom of a faulty switch. Replace it.

Limit Control

The purpose of the limit control is to turn off the gas to the main burner if, for any reason, the furnace becomes hotter than is safe. Improper operation of the furnace due to the limit control does not always indicate a defective control. If the circulating air is blocked, or only partially so, the limit control will function and cause the main burner to cycle. Cycling on the limit is not always undesirable if it happens only occasionally. This is a good indication of safe operation and will most likely happen on a warm day. If cycling happens too often or for an extended period, the circulating air system should be thoroughly cleaned.

If the limit control is found to be defective, there is no recommended method of repairing it. Because of its importance for safety reasons, it should be replaced with a new one.

CAUTION: Never short the limit control even for temporary operation.

Microswitch

The microswitch has two purposes.

1. It is an "air prover". It operates in response to the current of air generated by the blower. Hence, if the air from the blower is not sufficient, the switch will not operate. This may be caused by a slow motor due to low voltage, restricted return air, or lint accumulation on the blower wheel.

2. The switch allows time for the blower to pull in a sufficient amount of air to support combustion before it engages. Once it engages, the solenoid valve opens, gas flows to burner, and ignition occurs.

Blower Assembly

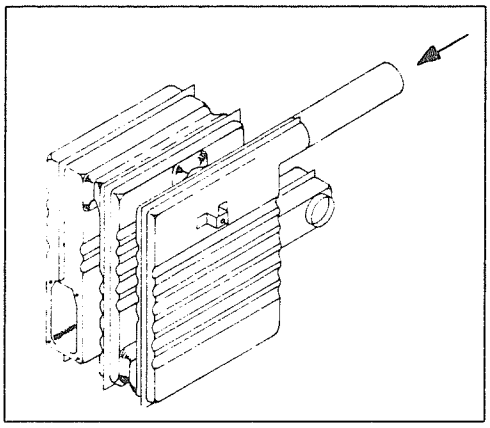
Although one motor drives all wheels, the blowers are separate. The combustion air blower is sealed so no air will pass between it and the circulating room air blower. The combustion air blower draws air from the outside atmosphere, discharges it into the combustion chamber and forces the combustion products out the exhaust tube. The circulating room air blower pulls return air in and forces it across the heat chamber, discharging into the area to be heated.

Maintenance and Cleaning

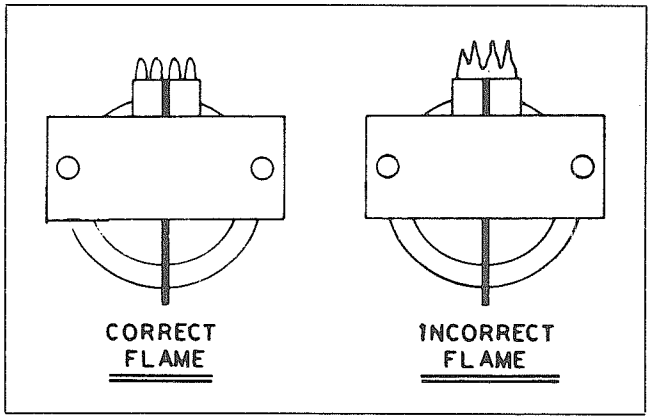
We recommend that the furnace be inspected and thoroughly cleaned by a Qualified Service Agency before each heating season. This would include the combustion chamber, the main burner, the blower assembly, and all control parts. A careful inspection of all gaskets should be made, and if any gaskets show signs of leakage or deterioration they should be replaced.

Cleaning of the chamber and main burner will be required if the unit has been allowed to operate with a high yellow flame. The yellow flame is due to incomplete combustion (lack of air) and will deposit a soot formation inside the chamber and on the main burner.

To clean the chamber, main burner, blower assembly and controls, the chamber assembly must be pulled from the furnace cabinet.



To clean the chamber, the furnace must be removed from the cabinet and the manifold, blower assembly, and controls removed, leaving chamber only as shown. Using a high compression air hose, blow through the exhaust tube, as shown by arrow, to remove soot or loose debris.



Service Hints, Diagnosis and Corrective Measures

Note: To service, furnace must be removed from cabinet.

Complaint - No Heat

1. Thermostat off.

   Check to be sure thermostat is calling for heat. Wire to thermostat could be off terminal.

2. Gas Supply.

   Be sure manual gas valve is in the open position (level parallel to gas line).

3. Electrical Connections and Power.

   Battery must be charged. If battery is low there will be sufficient power to run the blower at full speed. If blower doesn't run at its prescribed speed the microswitch cannot be engaged and gas will not flow to the main burner nor will the spark begin. Be sure the connection of the voltage lines in the terminals are tight.

4. Malfunctioning Microswitch.

   Be sure the microswitch is sailing in far enough to open the solenoid valve and to energize the spark module board. If the switch is not sailing in, clean any dust or dirt from the actuator pin. Other reasons for switch not sailing in are:

   a) Insufficient blower speed (slow motor due to low charged battery, faulty motor, lint and dust accumulation on the blower wheels, or restriction of return air to furnace). Check wiring in accordance with unit's wiring diagram to assure the proper polarity of the 12V DC power supply is observed.

   This polarity must be observed so the motor will run the proper direction of rotation to insure correct air delivery.

   b) Faulty microswitch. Replace switch if valve does not open when switch is manually engaged. Switch should also be replaced if battery is fully charged and blower motor running at top speed fails to engage switch within 6 to 7 seconds.

   c) Inadequate duct discharge.

   Note: To service switch, combustion chamber must be pulled out.

5. Gas Valve

Within 30 seconds after motor reaches 75% of its RPM and microswitches engage, check the following:

a) Voltage at valve. If voltage is present but valve is not opening, check wire connecting valve circuit.

b) Wire connections okay. Replace valve.

c) No voltage at valve. Check circuit completion through microswitch, limit switch and module board.

6. Blower not Operating.

a) Check power supply to furnace (blown fuse).

b) Check electrical connections at furnace.

c) With thermostat points closed, check for circuit completion across terminals 2 and 4 and wiring to relay okay. Replace relay.

7. Short Cycling (Fan Switch)

If burner and fan shut off simultaneously when the thermostat is satisfied, it indicates a defective fan switch. Replace switch. (Chamber must be removed.)

8. Defective Relay

Relay may be faulty if motor fails to start when thermostat calls for heat. This will be evidenced by a click when the thermostat is raised and motor fails to operate.

9. Ignition Failures

CAUTIONS:

a) Never operate the furnace with the electrode wire disconnected nor with the electrode assembly removed from the furnace.

b) Never use a battery charger to check out an electronic ignition furnace.

c) Never use a screwdriver on any part of the electrode assembly while furnace is in operation.

d) Be certain that the spark from the electrode never reaches the flame sensor portion of the electrode assembly.

e) Be sure the electrode assembly screws are snug at all times, especially after the electrode has been removed and reinstalled.

f) DISCHARGE MODULE BOARD BEFORE REMOVING FROM FURNACE. This is accomplished by placing a screw driver on the terminal coming out of the coil (where electrode wire connects) and grounding it to some portion of the furnace.

g) 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.

h) Insure that the gap between electrode and ground is always 1/8". The gap between the ground and the flame sensor should be approximately twice the gap between electrode and ground to insure no sparking to sensor. Sparking to sensor will damage 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 four functions.

1) When the blower reaches full RPM a circuit is completed to the main module board.

2) After a 12-18 second delay a circuit is completed to the solenoid valve.

3) At the same instant, the electrode produces a spark as indicated by the small neon bulb on the board as it flashes.

4) The module board also performs the lockout function in cases where the spark fails to light the burner. When lockout occurs, the spark stops and 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.

It is important to determine the type problem being experienced and 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 microswitch engaged, check the following:

a) Check for proper voltage at spark module board after the blower motor reaches full RPM. If no voltage, check back through circuit to determine cause.

b) Voltage is present but no spark at electrode after 12-18 second delay. Check electrode wire connections.

c) Wire connections okay, but electrode wire does not show continuity through it. Replace electrode wire.

d) Electrode wire does show continuity through it. Check electrode gap.

e) Electrode gap okay. Check electrode assembly for possible cracks or carbon on tip of electrode.

f) Electrode okay. 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 12-18 second delay. If no voltage and wire connections are okay, 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 the burner. 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 to be certain that it is 11 inches water column at furnace.

c) Gas pressure okay. Check for obstruction in main burner, check to be sure that air shutter is not completely closed and be sure electrode is positioned approximately 1/4" above and directly over one of the sawed slots on the main burner.

d) Check all gaskets to be sure they are tight and forming a good seal.

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

a) Check to be certain that flame sensor is over one of the slots in the main burner and that the main burner flame is burning against the tip of the flame sensor. Adjust by sliding burner sensor in direction necessary.

b) Burner still goes off and into lockout. Check wire connections at flame sensor and at module board.

c) Wire connections okay. Check continuity through flame sensor wire.

d) Continuity of flame sensor wire okay. Check with mirco amp meter in series with 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. Replace electrode assembly if test is negative.

e) Flame sensor okay, but burner still goes off and into lockout. Replace the module board.

5. Repeated module board failure:

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 is not shorted to the chamber wrapper.

c) Be sure fish paper insulator covering the electrode wire connection on the coil of the module board is in place.

d) High voltage. 14.5 volts DC maximum.

6. Customer complains of unit going into lockout only once in a while.

a) We have found that 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, and obstruction or a kink 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.

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

1. Disconnect gas bottle and drain it completely dry of all gas and moisture.

2. Disconnect and blow out all gas lines completely dry.

3. Install a new pressure regulator on the gas bottle.

4. Add the drying agent. 1/2 pint of methonol alcohol per 100 pound bottle capacity is recommended.

5. Never fill the gas bottle over 80%.

6. Do not use gas bottle completely dry to avoid using up the drying agent.

We have found the above procedures to be effective in over 95% of all occasional lockout problems. All of these steps must be performed as described for the preparation of a contaminated gas system to be 100% effective.

Complaint - Excessive Noise

1. Blower out of balance. Replace blower.

2. Motor hum. Replace motor.

3. Air adjustment. A screeching or howling noise while burner is on is due to excessive primary air. To adjust for less air, see instructions under "Burner Adjustment".

Complaint - Erratic Blower Operation

1. If blower is going off and on check the following:

   a) Thermostat points. If points are opening and closing see No. 2 below.

   b) If thermostat points are remaining open or closed the internal overload switch in the motor is defective. Replace motor.

2. If thermostat points are observed opening and closing rapidly when furnace first starts, check the following:

   a) Quick disconnect plug on side of furnace. Plug must be wired as shown on electrical diagram.

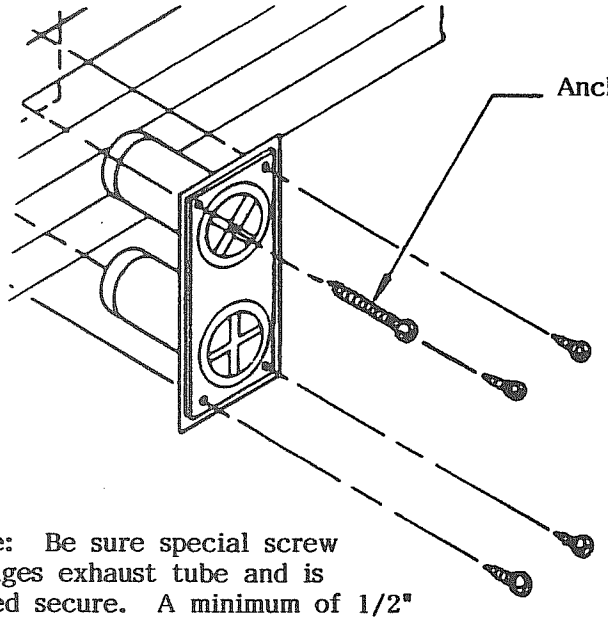
   b) Miswiring at thermostat relay (See wiring diagram.)

   c) Shorted gas valve. If furnace runs properly with wires at gas valve disconnected, replace gas valve.

Complaint - Main Burner will not Cycle off.

1. Check thermostat points. Points should break cleanly.

2. Check solenoid valve. Valve may be stuck open. If so, replace. DO NOT ATTEMPT TO REPAIR VALVE.



Note: Be sure special screw engages exhaust tube and is pulled secure. A minimum of 1/2" overlap of tubes is required on all installations.

Component Replacement Procedures

REPLACE GAS VALVE

1. Disconnect gas and power supply (quick disconnect).
2. Disconnect gas manifold from piping at union fitting.
3. Remove cabinet front.
4. Remove shipping screw securing chamber shield to cabinet.
5. Remove vent cap screws (outside)
6. Remove 3" screw (center of exhaust, outside).
7. Remove chamber assembly.
8. Remove two valve wires.
9. Remove valve and replace.

REPLACE MAIN BURNER ORIFICE

1. Disconnect gas and power supply (quick disconnect).
2. Disconnect gas manifold from piping at union fitting.
3. Remove cabinet front.
4. Remove shipping screw securing chamber shield to cabinet.
5. Remove vent cap screws.
6. Remove 3" screw (center of exhaust, outside).
7. Disconnect manifold tubing.
8. Remove screws from burner compartment door.
9. Remove burner assembly and replace main burner orifice.

REPLACE MAIN BURNER

1. Disconnect gas and power supply (quick disconnect).
2. Disconnect gas manifold from piping at union fitting.
3. Remove cabinet front.
4. Remove shipping screw securing chamber shield to cabinet.

5. Remove vent cap screws (outside).

6. Remove 3" screw (center of exhaust, outside).

7. Remove screws from burner compartment door.

8. Remove two gas valve wires.

9. Disconnect manifold tubing.

10. Pull burner assembly.

11. Remove burner.

REPLACE MICROSWITCH

1. Disconnect gas and power supply (quick disconnect).

2. Disconnect gas manifold from piping at union fitting.

3. Remove cabinet front.

4. Remove shipping screw securing chamber shield to cabinet.

5. Remove vent cap screws (outside).

6. Remove 3" screw (center of exhaust, outside).

7. Remove chamber assembly.

8. Remove two screws and nuts holding micro switch to assembly to blower housing.

9. Remove wires.

10. Remove switch.

REPLACE MOTOR

1. Disconnect gas and power supply (quick disconnect).

2. Disconnect gas manifold from piping at union fitting.

3. Remove cabinet front.

4. Remove shipping screw securing chamber shield to cabinet.

5. Remove vent cap screws (outside).

6. Remove 3" screws (center of exhaust, outside).

7. Remove chamber assembly.

8. Remove two micro switch wires from terminal block. Disconnect two motor wires.

9. Disconnect metal crossover tube.

10. Remove blower from firewall.

11. Remove motor and blower wheels.

12. Loosen Allen screw on circulating wheels and remove from motor shaft.

13. Replace motor.

REPLACE BLOWER ASSEMBLY

1. Disconnect gas and power supply (quick disconnect).

2. Disconnect gas manifold from piping at union fitting.

3. Remove cabinet front.

4. Remove shipping screw securing chamber shield to cabinet.

5. Remove vent cap screws (outside).

6. Remove 3" screws (center of exhaust, outside).

7. Remove chamber assembly.

8. Disconnect micro switch wires.

9. Remove micro switch.

10. Remove screws holding blower to firewall.

11. Remove metal crossover tube.

12. Remove blower.

REPLACE LIMIT SWITCH

1. Disconnect gas and power supply (quick disconnect).

2. Disconnect gas manifold from piping at union fitting.

3. Remove cabinet front.

4. Remove shipping screw securing chamber shield to cabinet.

5. Remove vent cap screws (outside).

6. Remove 3" screw (center of exhaust, outside).

7. Remove chamber assembly.
8. Remove two wires from limit switch.
9. Remove limit switch.

REPLACE FAN SWITCH

1. Disconnect gas and power supply (quick disconnect).
2. Disconnect gas manifold from piping at union fitting.
3. Remove cabinet front.
4. Remove shipping screw securing chamber shield to cabinet.
5. Remove vent cap screws (outside).
6. Remove 3" screw (center of exhaust, outside).
7. Pull chamber assembly.
8. Remove 2 wires from fan switch.
9. Remove fan switch.

REPLACE LARGE BLOWER WHEEL

1. Disconnect gas and power supply (quick disconnect).
2. Disconnect gas manifold from piping at union fitting.
3. Remove cabinet front.
4. Remove shipping screw securing chamber shield to cabinet.
5. Remove vent cap screws (outside).
6. Remove 3" screw (center of exhaust, outside).
7. Pull chamber assembly.
8. Remove micro switch wires.
9. Disconnect motor wires.
10. Remove blower from firewall.
11. Remove large blower with 1/8" Allen wrench.

REPLACE SMALL BLOWER WHEEL

1. Disconnect gas and power supply (quick disconnect).
2. Disconnect gas manifold from piping at union fitting.
3. Remove cabinet front.
4. Remove shipping screw securing chamber shield to cabinet.
5. Remove vent cap screws (outside).
6. Remove 3" screw (center of exhaust, outside).
7. Pull chamber assembly.
8. Remove two micro switch wires from terminal block.
9. Disconnect motor wires.
10. Remove blower from firewall.
11. Remove screws on motor housing.
12. Remove small blower with 1/8" Allen wrench.

REPLACE COMPLETE CHAMBER ASSEMBLY

1. Disconnect gas and power supply (quick disconnect).
2. Disconnect gas manifold from piping at union fitting.
3. Remove cabinet front.
4. Remove shipping screw securing chamber shield to cabinet.
5. Remove vent cap screws (outside).
6. Remove 3" screw (center of exhaust, outside).
7. Pull chamber assembly.

REPLACE CHAMBER ONLY

1. Disconnect gas and power supply (quick disconnect).
2. Disconnect gas manifold from piping at union fitting.
3. Remove cabinet front.
4. Remove shipping screw securing chamber shield to cabinet.
5. Remove vent cap screws (outside).

6. Remove 3" screw (center of exhaust, outside).
7. Pull chamber assembly.
8. Remove chamber from chamber wrapper.
9. Remove electrode assembly.
10. Remove blower assembly.
11. Remove main burner and valve assembly.
12. Remove relay, fan switch and limit switch.
13. Remove module board.

REPLACE THERMOSTAT

1. Turn power off or thermostat to "OFF" position.
2. Remove thermostat cover.
3. Remove two screws holding thermostat body to wall.
4. Remove two wires.

REPLACE BURNER ASSEMBLY

1. Disconnect gas and power supply (quick disconnect).
2. Disconnect gas manifold from piping at union fitting.
3. Remove cabinet front.
4. Remove shipping screw securing chamber shield to cabinet.
5. Remove vent cap screws (outside).
6. Remove 3" screw (center of exhaust, outside).
7. Pull chamber assembly.
8. Remove two valve wires.
9. Remove screws from burner compartment door.
10. Remove burner assembly.

REPLACE VENT CAP

1. Remove vent cap screws (outside).
2. Remove 3" screw (center of exhaust, outside).

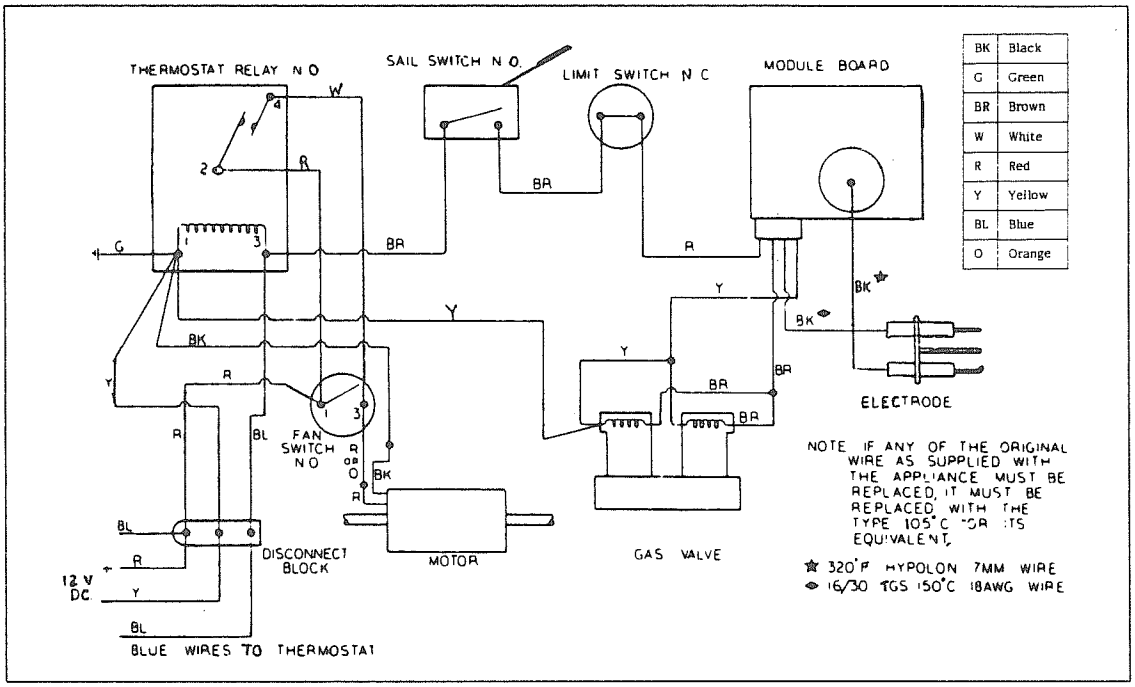
REPLACE THERMOSTAT RELAY

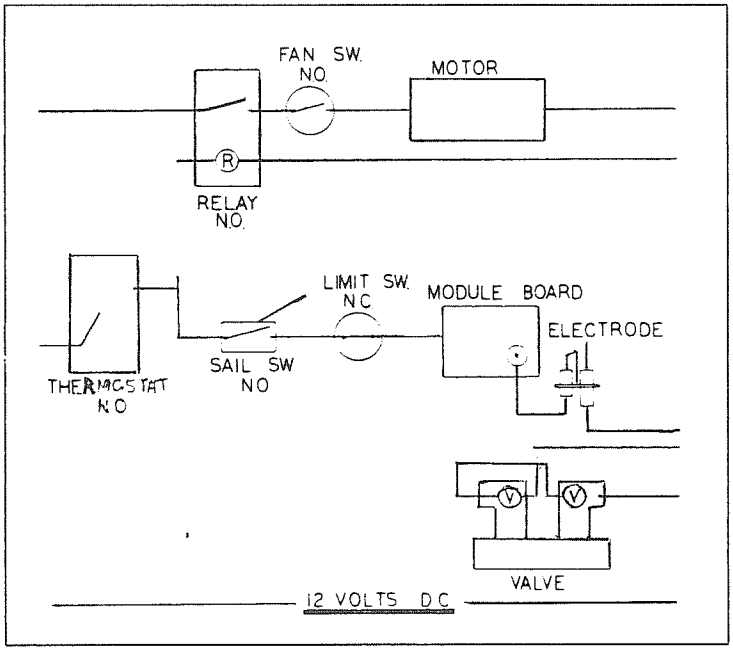
1. Disconnect gas and power supply (quick disconnect).
2. Disconnect gas manifold from piping at union fitting.
3. Remove cabinet front.
4. Remove shipping screw securing chamber shield to cabinet.
5. Remove vent cap screws (outside).
6. Remove 3" screw (center of exhaust, outside).
7. Pull chamber assembly.
8. Remove screw from relay.
9. Disconnect electrical leads to relay and replace.

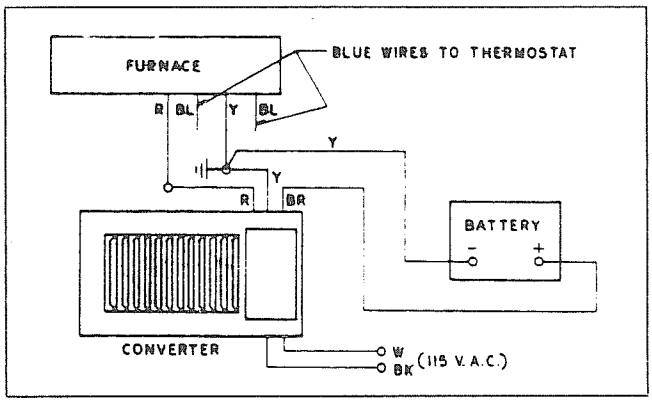
REPLACE MODULE BOARD

1. Disconnect gas and power supply (quick disconnect).
2. Disconnect gas manifold from piping at union fitting.
3. Remove cabinet front.
4. Remove shipping screw securing chamber shield to cabinet.
5. Remove vent cap screws (outside).
6. Remove 3" screw (center of exhaust, outside).
7. Pull chamber assembly.
8. Remove electrode wire at board.
9. Disconnect wiring at board (quick disconnect).
10. Remove board.

Furnace Wiring Diagrams







NOTES

RANGE AND OVEN

Manufacturer: Magic Chef, Inc.
28812 Phillips Street
Elkhart, Indiana 46514
Phone: 219-264-9578

The range and oven in your Airstream works on LP gas. Electrical power used is the by 12 volt oven light in some models.

People using gas ranges in their home will find little difference in the operation of the range in the trailer. Other customers, used to electric ranges may be a little apprehensive at first; but, will quickly gain confidence. The basic operation of the gas ranges have been the same for many years, but please be sure to read all the directions furnished by the manufacturer and located in the Owner's Packet. Excellent service and parts manuals are available from the manufacturer.

We find many experienced RVers do not use the pilot light for the top burners, preferring the flint type hand lighters instead. The main reason the pilots aren't used is due to the size of the trailer and the climate in which most trailers are used. The pilots are very small, but, of course, produce heat that may be noticeable in the trailer. With limited counterspace it is normal to set articles on the closed top of the range. If the day is hot and the article is plastic it may become deformed from the low but constant heat of the pilot.

Operation Prinicple

Top Burners

The manifold along the front of the top burner section is continually pressurized as long as the LP tank valve is open. Upon opening any of the burner valves this gas is injected through the burner orifice and into the venturi (mixing tube) where it mixes with primary combustion air and flows on to the burner. At this point, the gas-air mixture is evenly discharged through the ports in the burner cap where ignition occurs (by use of a match or pilot light if applicable). The amount of primary air may be adjusted on earlier models to alter combustion characteristics.

Oven

(Main Burner)

The fuel supply for the oven burner is taken from the manifold in the top section of the range. The tube leading from the right hand side of the manifold extends down the rear of the range and into the automatic oven safety valve. (On newer models this gas flow is taken at the thermostat mounted on the manifold. A tube leads from the thermostat to the oven safety valve.) When this valve opens, gas passes through it to the burner orifice. The orifice meters the gas flow into the burner venturi, where it mixes with primary combustion air and enters the burner casting. The oven pilot ignites this mixture resulting in flame evenly spread around the burner.

(Pilot Burner)

The pilot burner is actually two pilots in one:

1. The STANDBY PILOT is that portion of the pilot light which burns constantly, providing that the LP tank and manifold valve (if appliacable) are on. It ignites the gas-air mixture at the burner when the oven valve opens. It also provides the base for the heater pilot.

2. The HEATER PILOT is actually an extension of the standby pilot. It is on only when the oven thermostat "calls for heat". The purpose of the heater pilot is to open the oven safety valve thereby enabling gas to flow to the oven burner.

(Thermostat)

The thermostat is probably the most important component part in the functioning of the oven. It regulates the temperature of the oven keeping it at the desired cooking temperature. Thus, the thermostat is conducive to excellence in oven cooking. It is the thermostat (directly behind the oven control knob) that increases the "Standby Pilot" to the "Heater Pilot" flame.

The thermostat "senses the oven temperature by means of a "thermal bulb" located in the top of the oven. This bulb is filled with gas and connected to a bellows in the thermostat by a capillary tube. When the oven is on: (1) the bulb heats up, (2) the gas expands, (3) causing the bellows in the thermostat to expand, (4) a mechanical linkage within the thermostat shuts off the higher flow of gas to the pilot burner and throttles the amount down considerably. The pilot flame ceases to burn at the heater position, but continues at standby.

As the temperature begins falling in the oven, the above described re-occurs, except now (1) the bulb cools, (2) the gas contracts, (3) the bellows in the thermostat contracts, (4) the mechanical linkage in the thermostat then causes an increasing amount of pilot gas to flow and the pilot goes to the heater flame position.

Note: On the new model ranges the thermostat will have a "pilot off" or "pilots off" position on the thermostat knob. With the thermostat set at this position, all gas is shut off from the oven pilot "pilot off". When the thermostat is set on the "pilot off" position all gas to the top pilot and oven pilot is shut off.

(Oven Safety Valve)

This valve controls the gas flow to the main burner. The valve is operated by a thermal bulb in the heater pilot flame. This bulb is connected to a bellows in the valve by a capillary tube. When the bulb is heated it expands the mercury in it, expanding the bellows and opening the valve. The opposite occurs when the heater pilot flame subsides.

Sequence of Oven Operation:

With the thermostat set at 350°, for example, the following steps automatically occur:

a. The thermostat "calls" for heat (see thermostat operation principle).

b. The pilot flame increases to the heater position (see thermostat operation principle).

c. The oven valve opens (see "Oven Safety Valve") and lets gas into main burner.

d. Burner heats up oven and thermostat quits calling for heat.

e. Pilot heater flame subsides.

f. Oven safety valve closes.

g. Oven is ready for another cycle.

Trouble Shooting

(Top Burners)

The possibility that a service call on the top burner portion of the range will require anything more than minor adjustments and/or cleaning is very remote.

Combustion problems may occasionally arise, but these can normally be attributed to an accumulation of dirt, grease, dust, or spider webs etc. in the venturi or the burner.

(Pilot Adjustment)

On models ordered from the factory with top burner pilots, these pilots may need to be checked in cases of (1) burners not lighting, or (2) soot accumulating within top burner section. The proper setting for this pilot is when the flame burns blue with a slight yellow tip. The tip of the flame should be about even with the top of the body of the lighter.

PROBLEM: No constant pilot.

CAUSE/ REMEDY:

1. No gas to range.
   Use top burner or other constant gas supply outlet to check gas supply.

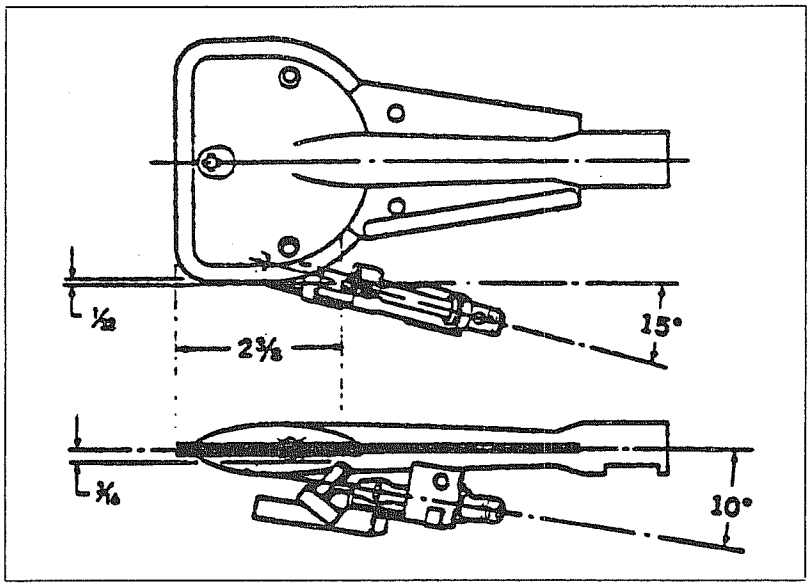
2. Constant pilot adjustment turned off.
   Adjust constant pilot adjustment.
   a) Single tube pilot - set either to Natural (N) or LP GAS (LP) position.
   b) Two tube pilot - turn adjustable cartridge to obtain stable blue flame approximately 3/8" long.

3. Tubing supply line blocked.
   Disconnect tubing at source and at pilot end and blow out to clear passageway.

4. Orifice blocked.
   a) Single tube pilot - disconnect tubing from pilot and blow out to clear orifice. **Note:** DO NOT ream or drill out orifice hole.
   b) Two tube pilot - disconnect tubing from pilot and blow out to clear orifice. **Note:** These orifices may be reamed out with a small needle to clear blockage.

5. Pilot blocked.
   Disconnect tubing from pilot. Remove orifice from pilot and clean out blockage or replace pilot.

6. Pilot too close to oven burner flame. Adjust position of pilot assembly (See Illus. below).



PROBLEM: Unstable constant pilot flame (pilot flame flutters - two tube pilot only).

CAUSE/ REMEDY:

1. Insufficient gas.
   a) Reset constant pilot adjustment and/or check for blockage of orifice.
   b) If gas pressure too low check pressure regulator (if applicable) and increase pressure.

2. Shield under constant pilot too close to pilot tube. Check spacing by inserting a quarter between shield and pilot tube. Snug fit indicates proper spacing. Carefully bend shield to obtain proper spacing.

PROBLEM: No heater pilot.

CAUSE/ REMEDY:

1. Thermostat turned off.
   Turn thermostat knob to setting above oven temperature.

2. Heater pilot adjustment turned off.
   Reset heater pilot adjustment until flame just envelopes flame responsive element.

3. Tubing supply line blocked.
   Refer to "Tubing Supply Line Blocked" under 'No constant pilot".

4. Orifice blocked.
   Refer to "Orifice blocked" under "No constant pilot".

5. Pilot blocked.
   Refer to "Pilot blocked" under "No constant pilot".

PROBLEM: Oven will not maintain proper baking temperatures.

CAUSE/ REMEDY:

1. Oven bulb not in proper location (on its oven clips).
   Secure oven bulb in clips that hold it in proper location. Oven bulb should not touch any surface. Approx. 1/2" away from surface of oven drum top.

2. Oven bulb coated with foreign material, oven cleaner, etc.
   Use fine steel wool or scouring pad and gently clean surface of bulb. **Note:** Recheck location of bulb.

3. Oven bottom improperly positioned.
   Reposition according to range manufacturer's instructions.

4. Oven bottom covered with aluminum foil.
   If foil blocks holes or slots in oven bottom, oven heat distribution will be affected. Remove foil.

5. Heater pilot flame not cycling off.
   a) (Single tube pilot) High pressure could cause the constant pilot flame to act as a heater pilot flame. Check pressure and proceed as follows: (1) Pressure Regulated Appliance. Check pressure and adjust regulator if necessary, according to range manufacturer's instructions. (2) Non Regulated Appliance. Turn constant pilot selector cartridge to LP position to correct for high pressure natural gas.
   b) Replace thermostat if problem is not due to Step a.

6. Safety device not closing. Flame responsive element (Mercury bulb) is being heated by the oven burner flame due to either improper location or an over-rated oven burner.
   Check the following:
   a) Flame responsive element must be properly located on pilot burner.
   b) Pilot burner must be properly located on bracket.
   c) Bracket must be in proper location. (See Illus. under "No Constant Pilot")
   d) Oven burner rate.

7. Safety device not closing (when flame responsive element is not being heated).
   Replace safety device with an exact replacement.

PROBLEM: No main burner flame.

CAUSE/ REMEDY:

1. Thermostat set lower than actual oven temperature. Reset knob to higher temperature.

2. Oven burner orifice closed.
   Readjust to range manufacturer's rated input.

3. Flame responsive element (mercury bulb) not hot enough.
   a) Check position of flame responsive element. It MUST be enveloped in the heater pilot flame. If not, adjust flame.
   b) Check gas pressure. Low pressure may give insufficient heater pilot flame.
   c) Check pressure regulator (if applicable). An erratic or malfunctioning pressure regulator may cause pressure to be low.

4. Defective thermostat. No heater pilot flame, no main burner flame at any setting.
   Replace thermostat. **Note:** No heater pilot flame could be due to 3b or 3c above. Check pressure before replacing thermostat.

5. Defective safety.
   Replace safety. **Note:** No field adjustments on this control.

Oven Thermostat Removal and Replacement

1. Shut off gas at LP gas tanks.
2. Remove main top and grates.
3. Disconnect pilot fuel lines and 1/4" main fuel line at thermostat.
4. Remove two screws mounting thermostat to manifold pipe.
5. Open oven door and remove capillary bulb clips in top of oven.
6. Pull capillary bulb up through top of stove and remove thermostat.
7. To install, reverse above procedure. Be sure thermostat gasket is in place before installing thermostat.
8. Check for gas leaks at all connections with soap solution.

Oven Automatic Shut Off Valve Removal and Replacement

1. Shut off gas.
2. Remove oven racks and oven bottom. Oven bottom is removed by pushing oven bottom toward back of oven. Then lift up front of oven bottom to release catches, pull oven bottom forward.
3. Remove mounting screw from oven burner and remove burner.
4. Disconnect 1/4" supply tube from shut off valve.
5. Loosen screw holding sensing bulb to pilot light assembly.
6. Remove sensing bulb.
7. Remove 2 screws attaching automatic oven shut off valve support and remove automatic oven shut off valve.
8. To install, reverse above procedure.
9. Check for gas leaks at all connectons with soap solution.

Oven Burner Removal and Replacement

1. Shut off gas.
2. Remove oven racks and oven bottom.
3. Remove mounting screw from oven burner and remove burner.
4. To install, reverse above procedure.

Oven Pilot Light Assembly Removal and Replacement

1. Shut off gas.
2. Remove oven racks and bottom.
3. Remove screw holding sensing bulb to pilot assembly.
4. Remove sensing bulb from pilot assembly.
5. Remove pilot fuel tube.
6. Remove nut and bolt attaching pilot assembly to support.
7. Remove pilot assembly.
8. To install, reverse above assembly.
9. Check for gas leaks at all connections with soap solution.

Remove of Range Top Burner Valve

1. Shut off gas supply at bottles.
2. Remove knobs.
3. Remove burner grates, main top and top burners.
4. Remove two bolts from thermostat and raise slightly to permit removal of manifold.
5. Remove gas inlet tube from half union and move tube out of way.
6. Remove two screws, one from each end of manifold assembly.
7. Remove manifold assembly from range.
8. Remove defective valve (Screw counterclockwise).
9. To install, reverse above procedure.
10. Before installing new valve, apply LP pipe sealant to threads.
11. Check for gas leaks at all connections with soap solution before igniting burners.

Range Top Pilot Light Adjustment for Range so Equipped

1. Remove thermostat knob to provide access at adjusting screw. Adjusting screw is located at bottom right corner of thermostat.

2. Adjust so that the tip of the flame is just over the edge of the inner cone and the top burners light within four seconds.

Range Removal

1. Turn off gas at LP bottles.

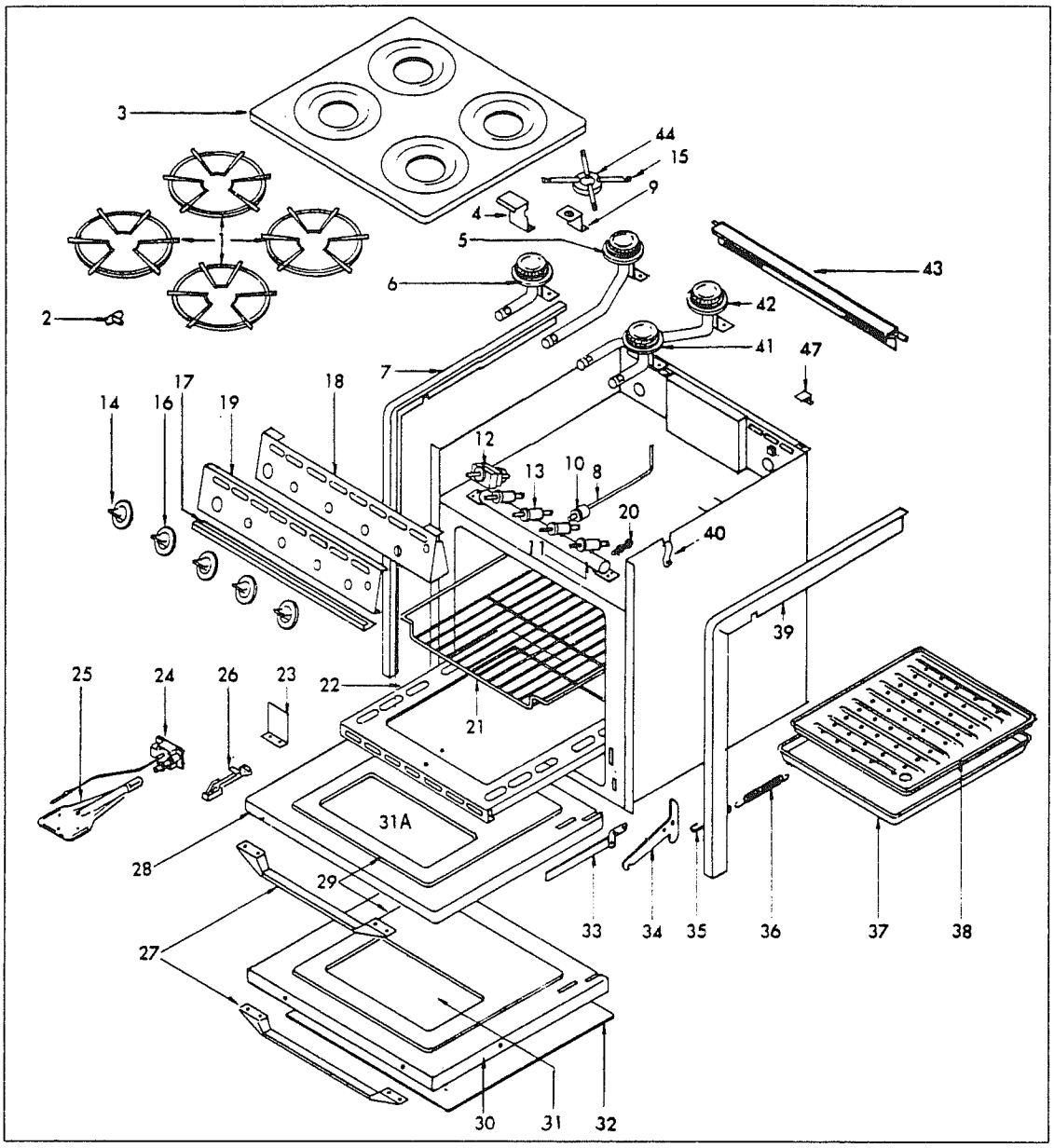
2. Raise burner cover and disconnect gas line from manifold.

3. Remove 4 Phillips head screws going through side trim into edge of countertop.

4. Slide range out.

WARNING: Check gas connection with soap solution when range is reinstalled.

Range/Oven Parts Diagram



Parts Description for Preceding Page

1. Top Burner Grate
2. Tee Nut
3. Main Top
4. Top Pilot Shield
5. Left Rear Burner
6. Left Front Burner
7. Left Side Trim
8. Pilot Tube
9. Top Pilot Support
10. Pilot Filter
11. Manifold Pipe
12. Thermostat
13. Top Burner Valve
14. Thermostat Dail
15. Flash Tube
16. Top Burner Knob, Front
17. Top Burner Knob, Rear
18. Manifold Panel Back Up
19. Manifold Panel Trim
20. Half Union
21. Oven Rack
22. Oven Bottom
23. Broiler Pan Stop
24. Mercury Control Valve (LP Gas Only)
25. Oven Burner
26. Oven Pilot
27. Door Handle
28. Door Panel
29. Door Liner
30. Glass Door Frame
31. Inside Glass

31A. Window Assembly

32. Outside Glass
33. Door Hinge Assembly
34. Spring Hinge Arm
35. Spring Hook
36. Door Spring
37. Broiler Panel
38. Broiler Pan Insert
39. Side Trim, Right
40. Main Top Hold Down Clip
41. Right Front Burner
42. Right Rear Burner
43. Flue Deflector
44. Top Pilot Lighter
45. Oven Rack Clip
46. Grate Clip, Package
47. Spring, Main Top Rear

Microwave Ovens

Only technicians specifically trained and equipped for servicing microwave ovens should work on your unit.

The microwave information provided with your coach will provide you with a list of service facilities, or the manufacturer's phone number to obtain this information.

REFRIGERATOR

Models 2500, 2600 and 2800

Manufacturer: Dometic Sales Corporation
2320 Industrial Parkway
P.O. Box 490
Elkhart, Indiana 46514
Phone: 219-295-5228

How to Start the Refrigerator

Note: Review all Dometic literature supplied in your Owner's Packet or stored in the refrigerator prior to operating.

Leveling

In the boiler ammonia vapor is distilled from an ammonia-water mixture and carried to the fined condenser, where it liquifies. The liquid flows to the evaporator, where it creates cold by evaporating into a circulating flow of hydrogen gas. If the evaporator coil is not level the liquid readily accumulates, forming pockets which can impair the gas circulation or even block it, in which case, of course, the cooling will stop.

When the recreational vehicle is stationary it must be leveled to be comfortable to live in. If the refrigerator is properly installed, (ie: the freezer shelf parallel to the floor) the refrigerator will then also perform well. A bubble level should be placed on the freezer shelf. When the vehicle is in tow, the continuous rolling and pitching movement will not affect the refrigerator as long as the movement passes either side of level, but when the trailer is temporarily parked this sensitivity of the refrigerator should be remembered. SO, ONCE MORE, BEFORE YOU START THE REFRIGERATOR MAKE SURE IT IS LEVEL.

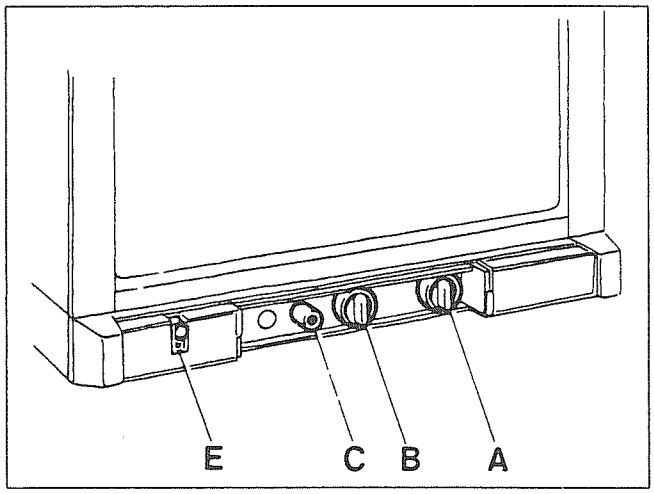
Gas Operation

1. To start the refrigerator turn knob A to position, gas lamp E comes on.

2. Turn the gas thermostat knob B a quarter of a turn from position "OFF".

3. Press the button C to stop and keep it depressed. When lamp E goes out wait 15 seconds and release button C. If the lamp comes on again, repeat the procedure. If flame blows out reignition will take place automatically. To shut off the refrigerator turn the knob A to "OFF" position.

Note: After a replacement of the gas container or a long shut off period, the gas line is likely to be filled with air. In such cases the lighting procedure has to be repeated until the air is pushed out of the line and the gas has reached the burner.



Flame Blow Out

If trouble is encountered with the flame blowing out under specially windy conditions, try to avoid the wind blowing against the wall where vent outlets are located. If the trouble persists, set the thermostat to MAX. This later measure can, of course, only be temporary such as when the vehicle is in tow, for after a day or so at this setting the foodstuffs in the cabinet will freeze.

Electric Operation

1. Check that the attachment plug is correctly connected to the main supply. When the refrigerator is equipped also for 12 volt DC operation the low voltage connection is made at the marked terminals at the rear of the refrigerator.

2. Turn the knob A to desired position for electric operation.

3. Turn the thermostat knob B a quarter of a turn from position "OFF".

To shut off the refrigerator turn the knob A to off position.

How to Use the Refrigerator

Food Storage Compartment

The food storage compartment is completely closed and unventilated, which is necessary to maintain the required low temperature for food storage. Consequently foods having a strong odor or liable to absorb odors should be covered. Vegetables, salads, etc. should be covered to retain their crispness. The coldest positions in the refrigerator are underneath the cooling evaporator and at the bottom of the refrigerator. The least cold positions are on the upper door shelves. This should be considered when different types of food are placed in the refrigerator.

Frozen Food Storage Compartment

The ice trays should be placed in direct contact with the freezer shelf for fastest ice making. Quick frozen soft fruits and ice cream should be placed in the coldest part of the compartment which is at the bottom of the aluminum liner or, in models with a shelf, on this or just below it. Frozen vegetables, on the other hand, may be stored in any part of the compartment.

The compartment is not designed for the deep or quick freezing of foodstuffs. Meat or fish foods, whether raw or prepared, and provided they are pre-cooled in the refrigerator, can however, also be stored in the frozen food storage compartment. They can then be stored about three times as long as in the fresh food storage compartment. To prevent drying out, keep food in covered dishes, in plastic bags, or wrapped in aluminum foil.

Ice Making

Ice cubes can be made in the ice trays which should be filled with water to within 1/4" from the top. To release the ice cubes seize the tray with both hands and twist the tray. Cubes not required should preferably be replaced in the tray. Refill the tray with water and replace the tray on the freezer shelf.

Ice making is accelerated if the thermostat knob is turned to setting "MAX". It is a good idea to do this a few hours before an anticipated need for ice, but be sure to turn the knob back to normal setting when the ice is formed or the foodstuffs in the cabinet may become frozen hard.

To Shut off the Refrigerator

To shut off the refrigerator turn the knob A to off position. If the cabinet is not in operation over a period of weeks, it should be emptied and cleaned and the door left ajar. Some models are provided with an interior light which comes on when the door is opened. To avoid running out of battery the light should be shut off. Use tape to close the switch or remove the lamp. The ice trays should also be dried and kept outside the cabinet.

Defrosting

Shut off the refrigerator.

Empty the refrigerator leaving the drip tray under the finned evaporator and the cabinet and freezer doors open. If desired, defrosting may be speeded up by filling the ice tray with hot water and placing it in the freezer. When the frost on the finned evaporator section has melted, water will be collected in the drip tray. The drip tray should be emptied at regular interals.

When all frost is melted, empty the drip tray and dry the interior of the refrigerator with a clean cloth.

Replace the drip tray and ice tray, replace all food stuffs and set the thermostat to MAX for a few hours. Then reset the thermostat knob to its normal position.

Cleaning

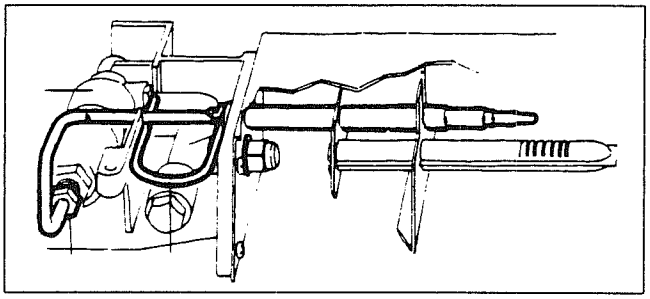
To clean the interior lining of the refrigerator use lukewarm weak soda solution. The evaporator, ice trays and shelves must, however, be cleaned with warm water only. Never use strong chemicals or abrasives to clean these parts or the protective surface will be spoiled. It is important always to keep the refrigerator clean.

CAUTION: Do not store explosive substances in the refrigerator, such as cigarette lighter gas, petrol, ether or the like.

The Flame Failure Safety Device (Thermocouple)

The feeler of the thermocouple shall reach in over two slots of the burner. (See Illus. below). To replace the thermocouple proceed as follows:

1. Remove the cover.
2. Unscrew plug and pull thermocouple straight out.
3. Remove spring.
4. Pull out thermocouple sideways from burner housing.
5. Bend the new thermocouple to the same shape as the old one.
6. Reassemble in reverse order. Check that feeler has been correctly refitted in relation to burner.
7. Mount plug, taking care not to damage the threaded hole in the aluminum cap of the housing. The plug must be properly tightened to the valve housing to ensure good contact between the thermocouple and the magnetic coil within the housing.



Flue Top and Baffle

The flue baffle is suspended from the top and must be in position in the central tube of the cooling unit.

The Igniter

The refrigerator is fitted with an automatic reigniter which does not normally need any maintenance. If the igniter does not work properly contact an authorized service point.

The Thermostat

The refrigerator is equipped with a thermostat which is regulated by turning the knob to different settings in order to obtain the desired controlled cabinet temperature.

At OFF Under normal operating conditions the thermostat valve remains closed and the burner is running continuously at the by-pass rate, just enough to keep the burner lit.

At MAX The thermostat valve remains open and the burner is running continuously at full gas rate. Lowest cabinet and freezer temperatures are obtained at this setting.

Between these two extremes of the dial various controlled temperatures can be obtained by turning the thermostat knob to a suitable position. The closer to MAX the lower the temperature. As soon as the required cold temperature inside the cabinet is reached, the thermostat cuts the burner main flame leaving the by-pass flame to keep the safety valve open.

Electric Equipment

Cartridge Heater

The refrigerator is equipped also for electric operation. The heat necessary for the operation of an absorption type cooling unit is supplied by an electric cartridge heater mounted in a pocket of the boiler system.

To replace the heater, first check that the wall plug is disconnected. Then proceed as follows:

1. Remove the cover of the main control structure by loosening the two screws.
2. Disconnect the heater leads.
3. Pull off the metal hose.
4. With a pair of pliers unfold the lug holding the lid of the boiler casing and open the lid.
5. Remove some insulation wool so that the heater is accessible.
6. Turn and lift the heater out of its pocket.
7. Fit the new heater into the pocket and pull on the hose around the leads.
8. Connect the leads and put on the plastic cover.
9. Reset the insulation and close the lid of the boiler casing.

The Thermostat

The electric thermostat is combined with the gas thermostat and is thus operated by the knob B at the front panel. The temperature in the refrigerator can be regulated by turning the thermostat knob. Although the exact setting is not critical, choose a setting at which the frost which gradually forms on the cooling evaporator is just maintained in dry conditions.

It will be necessary to turn the thermostat knob closer to MAX when the ambient temperature becomes higher or the load is unusually heavy.

If less cooling is required a lower setting should be chosen.

WARNING: If the refrigerator is used intermittently it should be checked at least once a year. It is important to keep the appliance area clear and free from combustible materials, gasoline and other flammable vapors and liquids. Check the venting system. The flow of combustion and ventilating air must not be obstructed. Check the flue baffle that it is clean and reasonably free from soot. Heavy soot formation indicates improper functioning of the burner. Clean baffle and flue. Further, clean cooling unit and floor under refrigerator. The entire gas installation should be checked for leaks at intervals. Test all pipe connections with soapy water, not with an open flame.

Note: Any service of the gas controls, with exception of the above mentioned replacment and maintenance and cleaning operations, must be performed by an authorized service center only.

Note: Avoid water spraying through the refrigerator vents while washing your trailer.

Periodic Maintenance

Note: Before working on the refrigerator make sure that 120V AC and optional 12V DC leads are disconnected. Shut off gas valve.

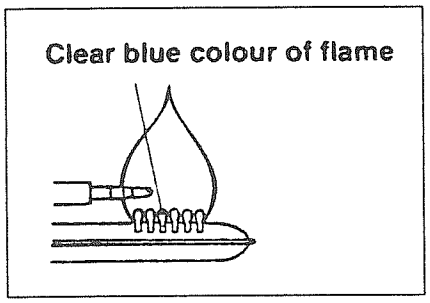
The Burner and the Burner Jet

The color of the flame shall be clear blue over the slots of the burner.

Once or twice a year, depending on use, it is necessary to clean and adjust the burner assembly. Proceed as follows:

1. Loosen screw and remove cover plate for burner housing.
2. Disconnect lighter cable from the electrode.
3. Loosen burner fixing screw and withdraw burner.
4. Clean burner tube with a brush. Blow with compressed air.
5. Screw off jet and clean with alcohol. Blow with compressed air. Never use a needle or similar tool.
6. Reassembly.
7. Be careful that the end of the burner fits into the slot on the bracket.

The slots of the burner must be centrally located under the boiler tube.



The Electrode

For a proper ignition function it is necessary to keep the electrode insulation dry and free from dirt. The gap between the burner tube and electrode shall be max. 3/16" (5mm) and min. 1/8" (3 mm).

Fault Tracing

PROBLEM: The refrigerator does not freeze satisfactorily.

CAUSE/ REMEDY:

a. Jet orifice clogged. Unscrew jet and blow clear or wash in alcohol. Do not use wire or pin to clean orifice.

b. Check the leveling of the refrigerator.

c. Flame has gone out. Remedy 1) Gas in bottle is used up. Refill. 2) Feeler point of the thermocouple is not heated enough by flame. 3) Clogged bypass screw. Clean or exchange it.

d. Air circulation around cooling unit is restricted. Be sure that refrigerator is properly ventilated.

e. The evaporator is heavily coated with frost. Defrost.

f. Flue baffle not inserted into the central tube of the cooling unit.

g. The thermostat is incorrectly used. See paragraph on thermostat. In hot weather the setting should be closer to MAX than ususal.

h. Gauze in burner head clogged. Clean.

i. Burner damaged. Replace

j. Burner may be dislocated. Relocate.

k. Wrong gas pressure at the burner. Have pressure checked at gas bottle. Pressure at burner must not fall below 11" W.C. when thermostat is set on MAX.

PROBLEM: Odor from fumes.

CAUSE/ REMEDY:

a. The flame touches side of the boiler due to dislocation of the burner. Relocate. Burner dislocation may also cause smoke and discoloring of walls and ceiling.

b. Burner damaged. Replace.

c. The flame touches flue baffle. Remedy: 1) Burner damaged. Replace. 2) Flue baffle too low. Correct the position of the baffle.

d. The flue tube is dirty. Clean the flue as follows: Cover burner and jet. Remove flue top and baffle. Clean flue with special flue brush. Clean baffle before putting back in place.

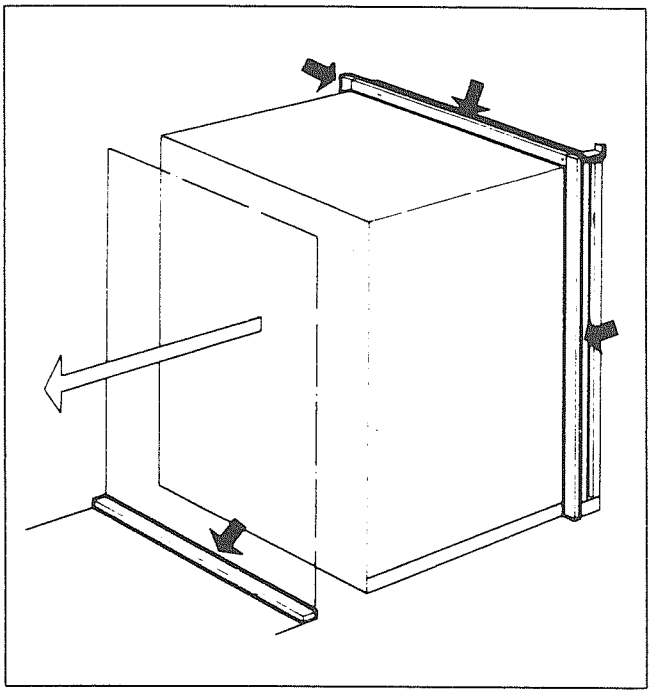
All the above instructions are to be followed closely. The refrigerator is quality-guaranteed. However, we are not responsible for any failures caused by improper adjustments and unfavorable installation conditions. Contact service point or distributor service department for assistance.

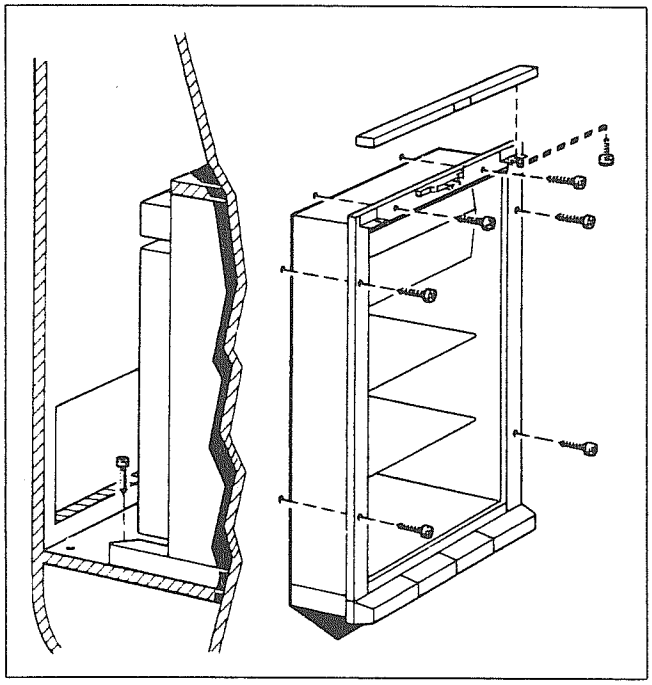
To Remove and Replace the Refrigerator

Before working on the refrigerator make sure that 120V AC and optional 12V DC leads are disconnected. Shut the gas valve. Unscrew the hexagon nut 11 and move the valve on the gas line out of the bracket. Check that the valve slips out of the clip connection with the switch shaft.

Loosen the screws fixing the refrigerator to the enclosure and remove the refrigerator

When replacing the refrigerator make sure that the sealing strips are properly positioned. After reassembly the gas connection should be checked for leaks.





After Replacement

Test of the Gas Safety Shutoff

The gas safety shutoff device must be tested after the refrigerator is placed in operation.

1. Start the refrigerator according to the instruction for gas operation with automatic reigniter.

2. Check that the gas flame is lit. The lamp E is out.

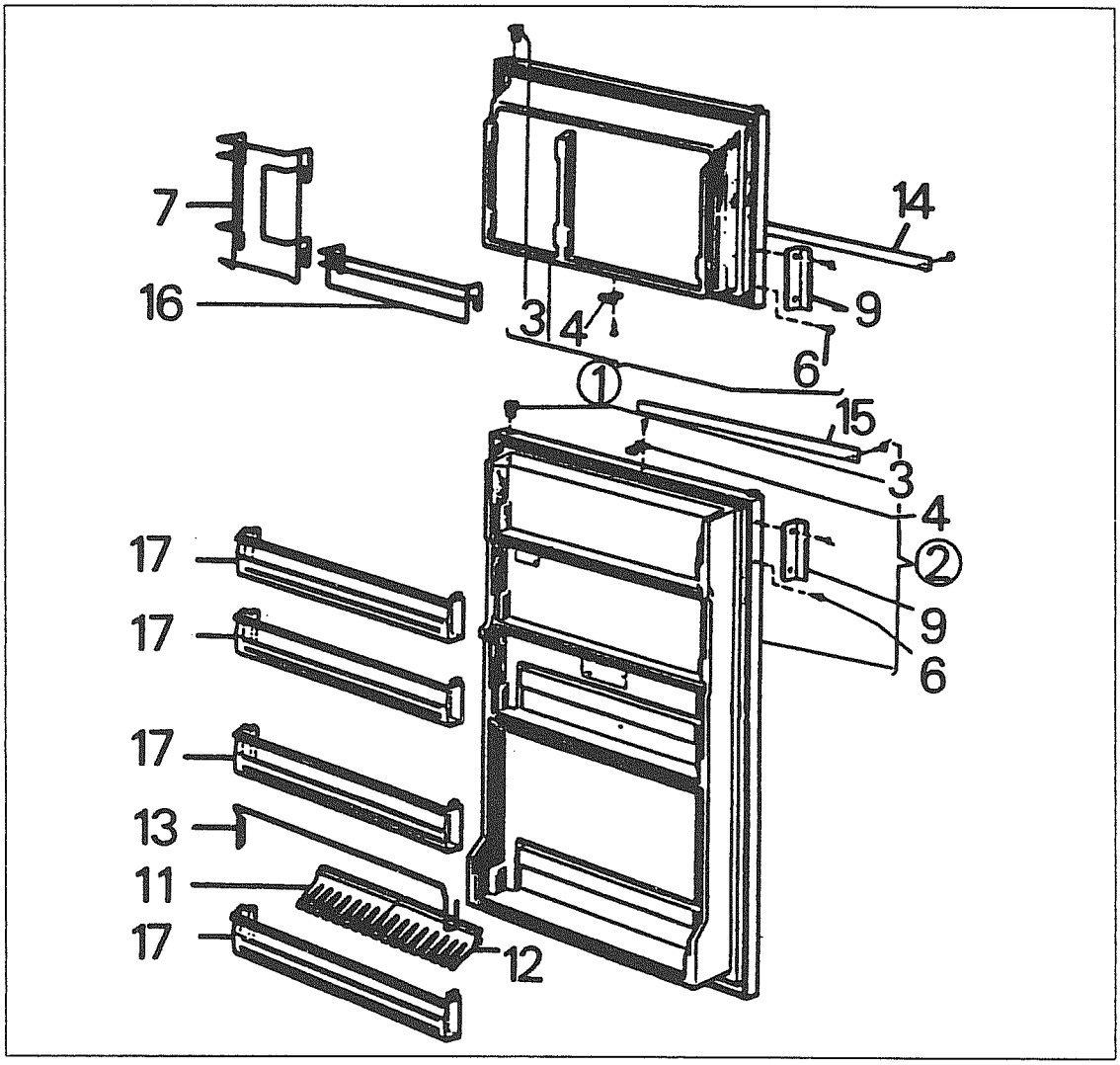
3. Close the gas valve by turning the knob A back to position "OFF".

4. Wait 1 minute, disconnect 12V DC.

5. Remove cover plate. (See Parts Description) Open the gas valve by turning knob A to position "GAS" without pushing the button C. The igniter shall not spark. Test that no gas comes through the jet. Use soapy water. Be careful not to damage the jet.

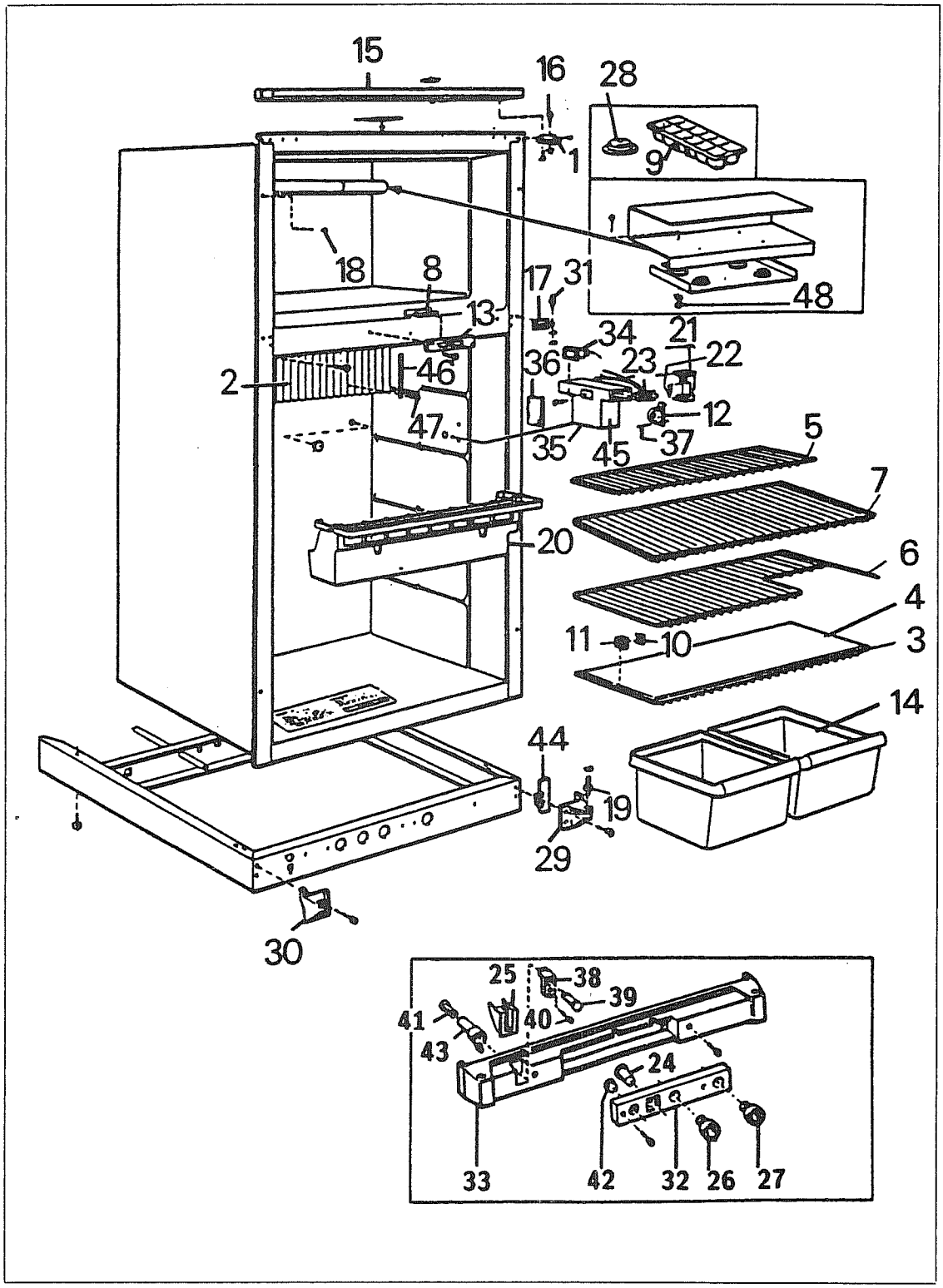
6. After test, rinse the jet with water. Once more be careful not to damage the jet. Assemble the cover plate. Connect the 12V DC again. Start the refrigerator by following the instruction for gas operation with automatic reigniter. Normal gas operation should now return. Operate for at least 5 minutes.

PARTS DESCRIPTION - DOOR ASSEMBLY (MODEL 2601)



1. Door, upper w/o shelves
2. Door, lower w/o shelves
3. Bushing
4. Catch retainer
5. Pop rivet
6. Plug, grey
7. Basket
8. Screw
9. Handle
10. Screw
11. Bottle holder, 7"
12. Bottle holder, 8"
13. Rack
14. Decoration strip
15. Decoration strip
16. Wire Shelf
17. Door Shelf

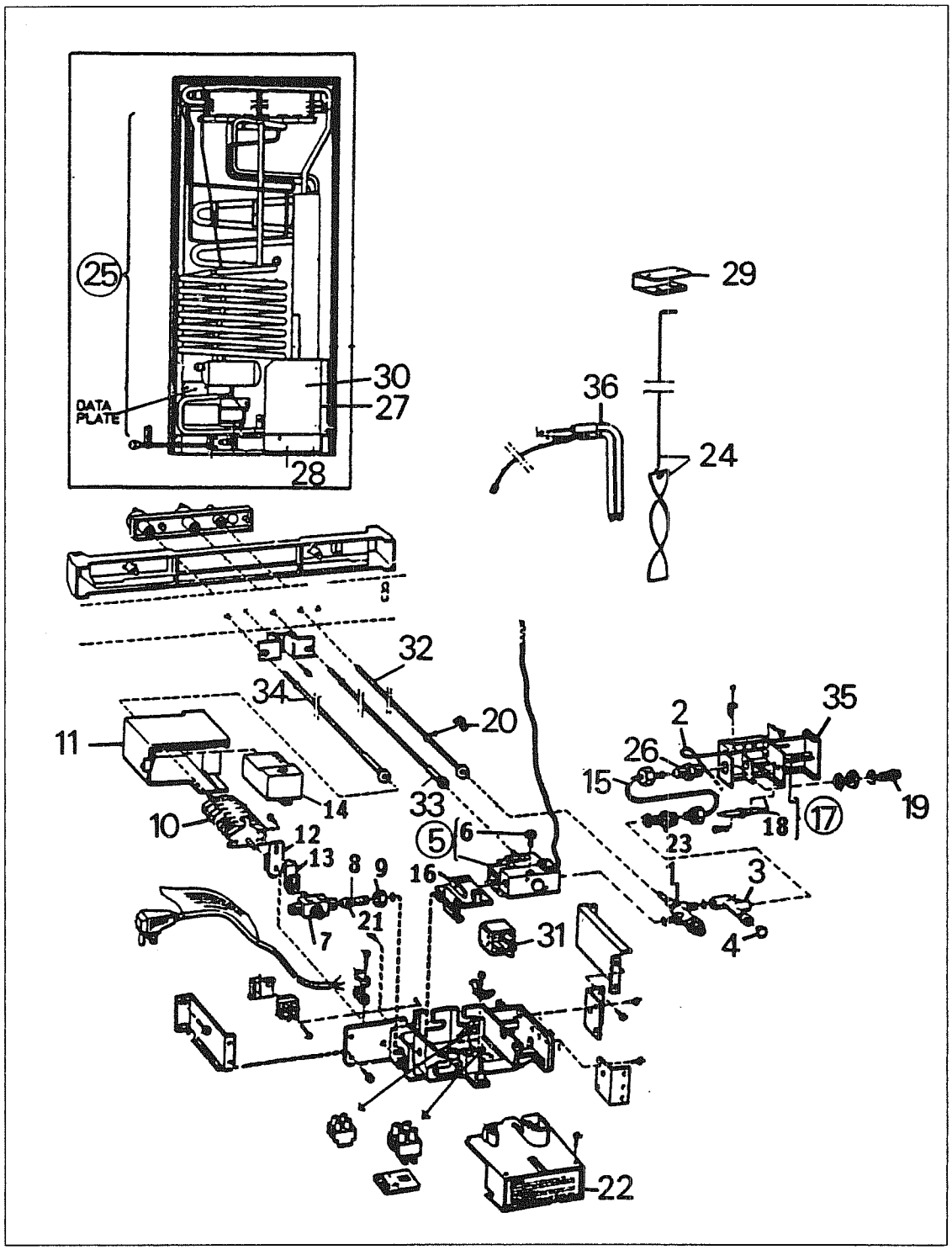
PARTS DESCRIPTION - REFRIGERATOR CABINET (MODEL 2601)



Parts Description for Preceding Page

1. Hinge, upper
2. Cooling flange
3. Shelf, 11.5"
4. Plastic shelf, 11"
5. Shelf, comp. D approx 8"
6. Shelf, D approx. 12"
7. Shelf 12"
8. Latch, grey/brown
9. Ice tray
10. Shelf lock, outer
11. Shelf lock, inner
12. Thermostat retainer
13. Latch housing, grey/brown
14. Crisper
15. Front decoration, upper - grey/brown
16. Hinge pin, upper
17. Hinge
18. Masing plug, grey/brown
19. Hinge pin
20. Drip bowl
21. Light 12V cmpl.
22. Lamp 12V
23. Switch
24. Push button, grey/brown
25. Lamp retainer, grey/brown
26. Knob, thermostat, grey "OFF-MAX"
27. Knob, selector "12V-Off-Gas-Elec"
28. Spirit level
29. Hinge, RH
30. Hinge, LH
31. Hinge pin
32. Panel, grey/brown
33. Base front, grey/brown
34. Switch
35. Cover
36. Lamp shade
37. Pin
38. Lamp socket, grey/brown
39. Pilot lamp
40. Screw
41. Sealing sleeve
42. Plug, grey/brown
43. Protecting sleeve
44. Sealing plate
45. Cover
46. Clamp
47. Screw
48. Cover

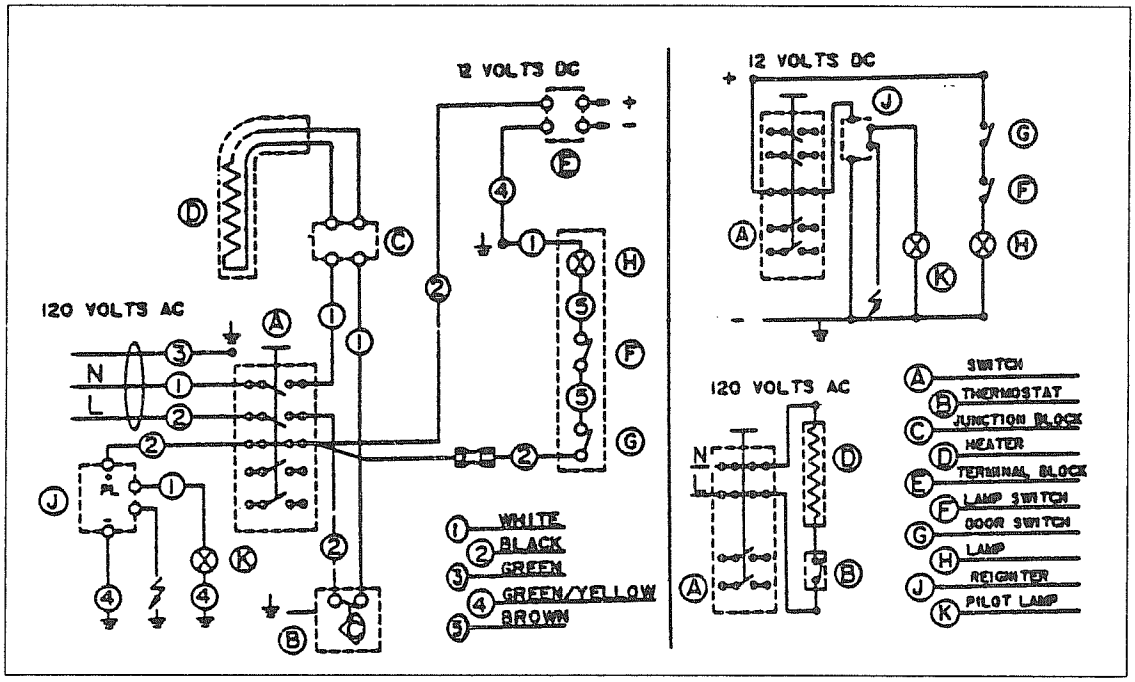
PARTS DESCRIPTION - CONTROL SYSTEM/COOLING UNIT (MODEL 2601)



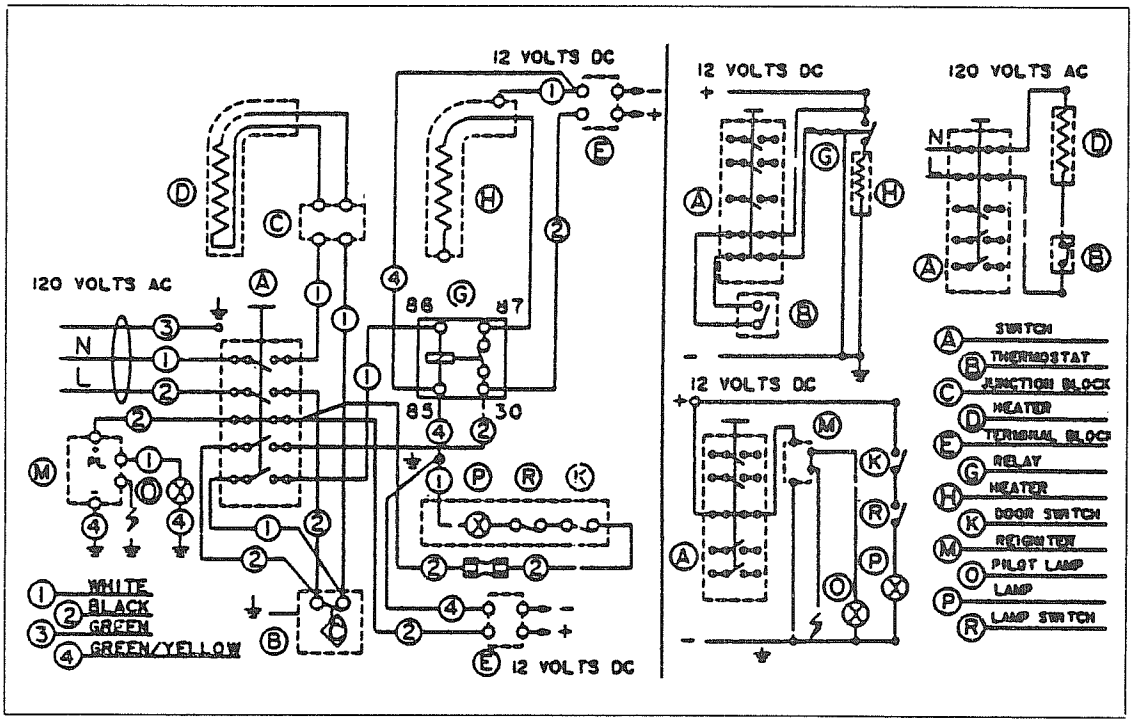
Parts Description for Preceding Page

1. Thermo electric safety valve
2. Thermocouple element
3. Coupling
4. Plug screw
5. Thermostat
6. Bypass screw
7. Cut off valve
8. Nipple
9. Nut
10. Switch
11. Cover
12. Spring
13. Spring
14. Reigniter
15. Gas tube
16. Snap catch
17. Burner
18. Electrode
19. Burner Jet
20. Clip
21. Retaining ring
22. Cover
23. Nipple
24. Flue baffle
25. Cooling unit
26. Nipple
27. Protection plate
28. Drip plate
29. Flue cap
30. Protection plate
31. Relay for 12/120V
32. Push rod
33. Shaft, thermostat
34. Shaft, switch
35. Burner housing
36. Heater, 120V, 295W

WIRING DIAGRAMS - MODEL 2601

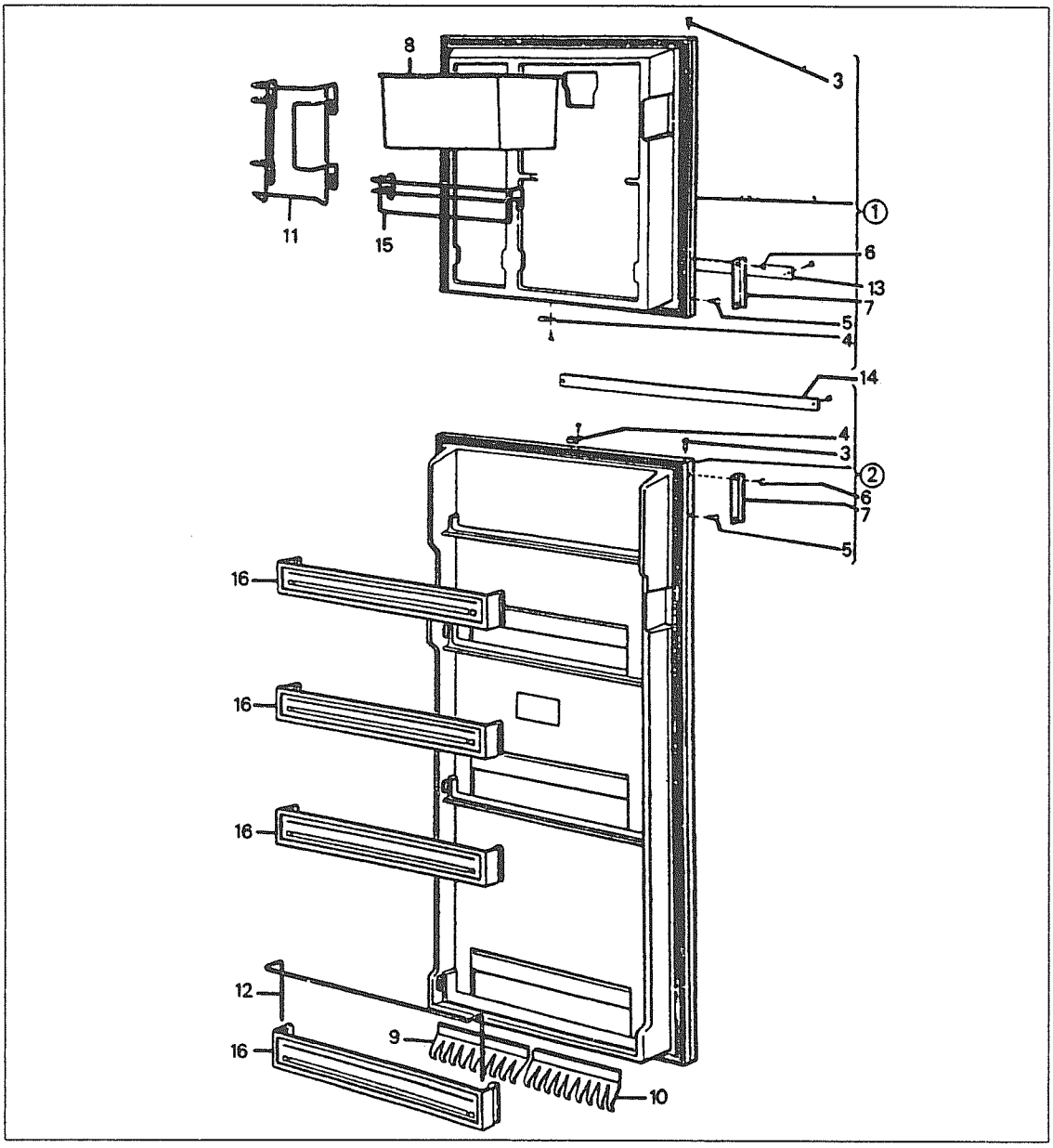


For Product No. 026 63 45



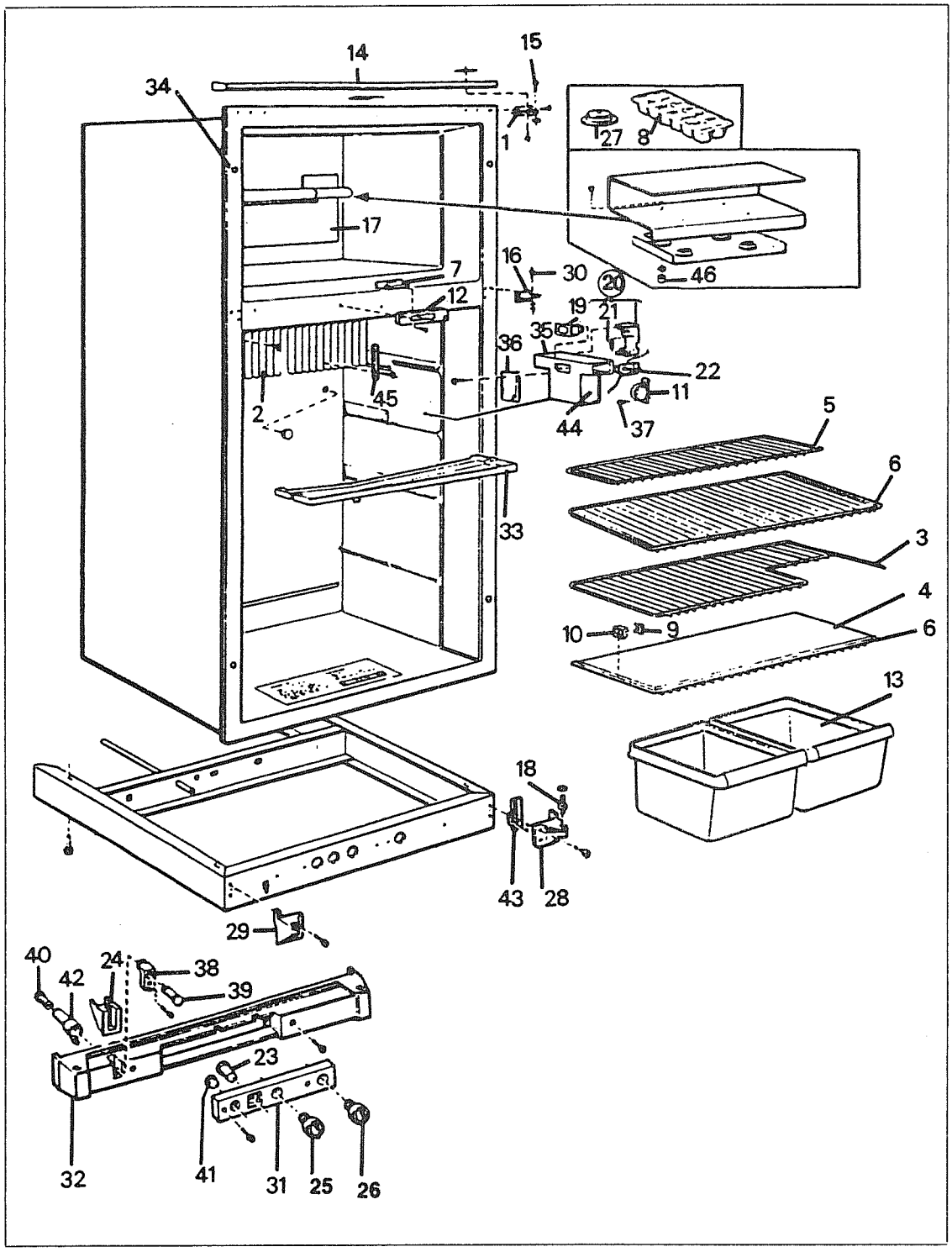
For Product No. 926 63 46

PARTS DESCRIPTION - DOOR ASSEMBLY (MODEL 2801)



1. Door, Upper w/o shelves
2. Door, lower w/o shelves
3. Bushing
4. Catch retainer
5. Plug, Grey
6. Screw
7. Handle
8. Box
9. Bottle holder, 7"
10. Bottle holder, 8"
11. Basket
12. Rack
13. Decoration strip
14. Decoration strip
15. Wire shelf
16. Door shelf

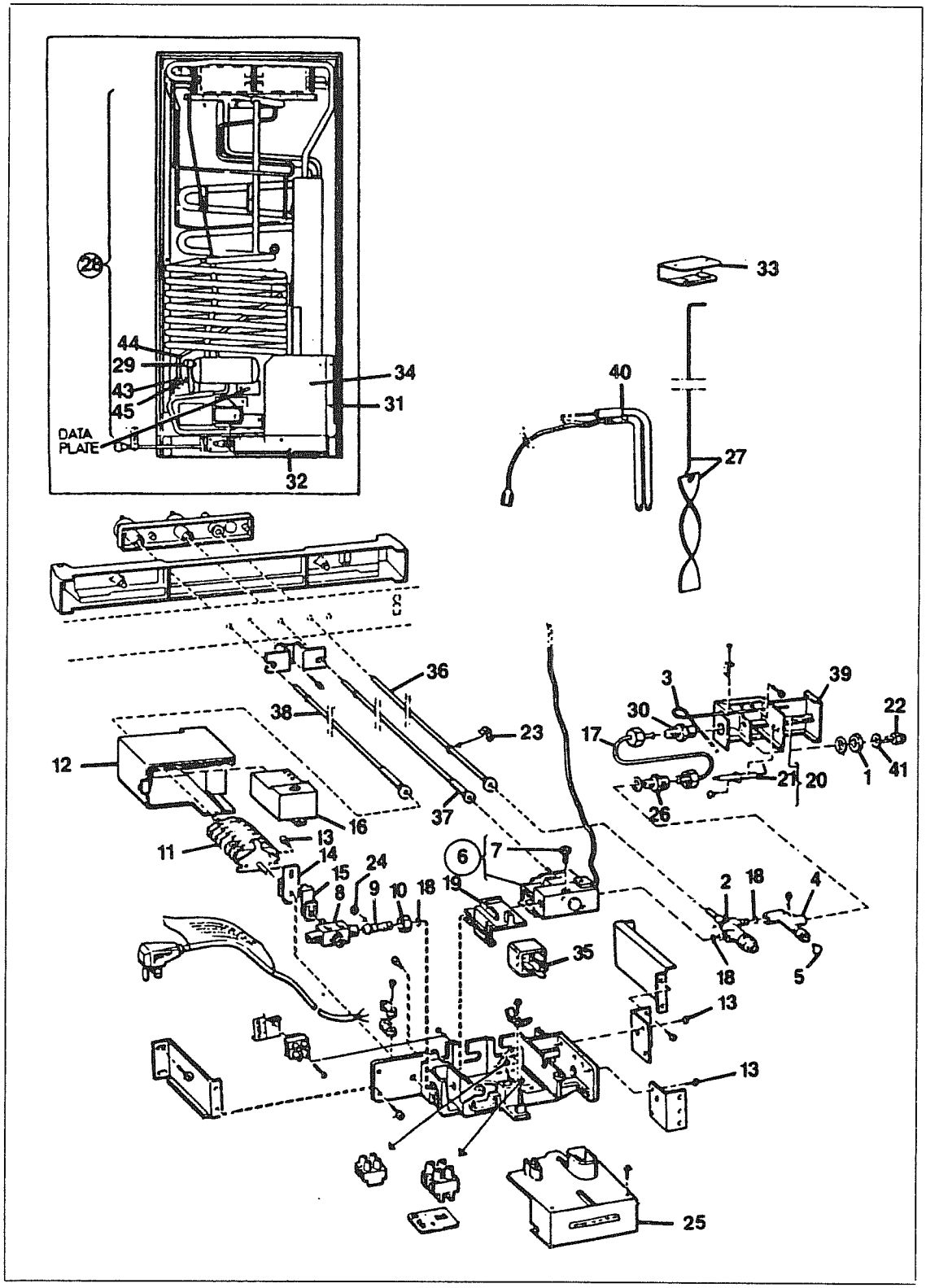
PARTS DESCRIPTION - REFRIGERATOR CABINET (MODEL 2801)



Parts Description for Preceding Page

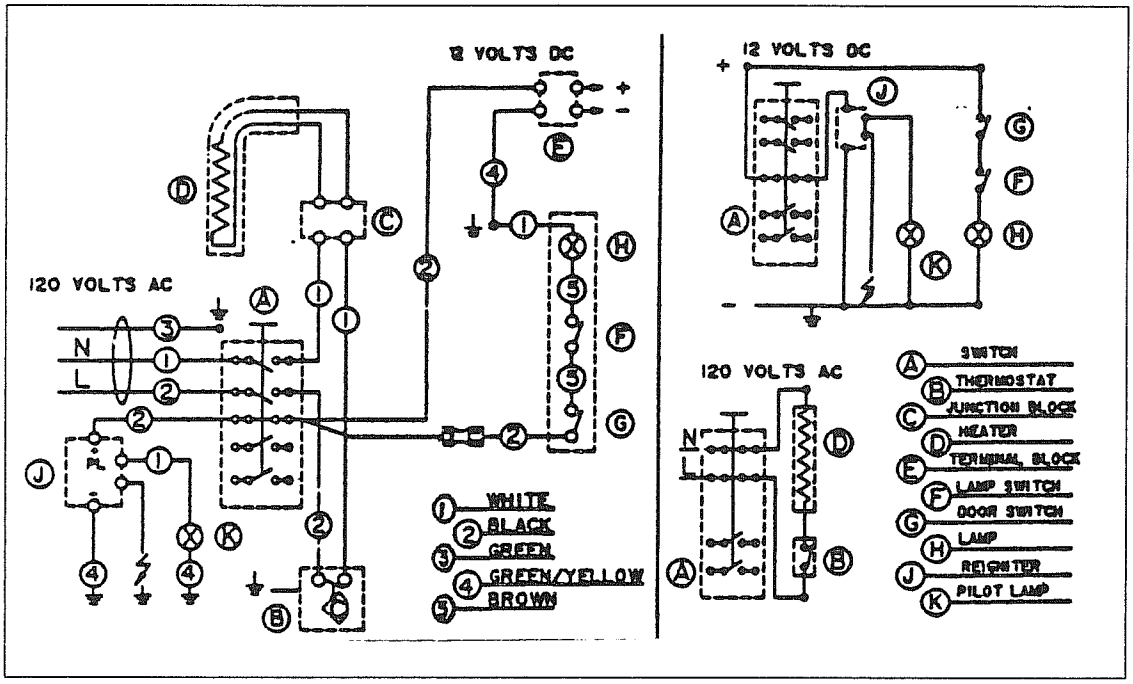
1. Hinge, upper
2. Cooling flange
3. Shelf 12"
4. Plastic shelf, 11"
5. Shelf, Cpl. D approx 7"
6. Shelf, D approx. 12"
7. Latch, grey/brown
8. Ice tray
9. Shelf lock, outer
10. Shelf lock, inner
11. Thermostat retainer
12. Latch housing, grey/brown
13. Crisper
14. Front decoration, upper grey/brown
15. Hinge pin, upper
16. Hinge
17. Covering plate
18. Hinge pin
19. Switch
20. Light 12V cpl.
21. Lamp 12V
22. Switch
23. Push button, grey/brown
24. Lamp retainer, grey/brown
25. Knob Thermostat "OFF-MAX"
26. Knob, selector "12V-OFF-GAS-OFF-ELEC"
27. Spirit level
28. Hinge, RH
29. Hinge, LH
30. Hinge pin
31. Panel, grey/brown
32. Base front, grey/brown
33. Drip tray
34. Plug
35. Cover, light
36. Shade, lamp
37. Pin
38. Lamp socket, grey/brown
39. Pilot lamp
40. Sealing sleeve
41. Plug, grey/brown
42. Protecting sleeve
43. Sealing plae
44. Cover
45. Clamp
46. Cover

PARTS DESCRIPTION - CONTROL SYSTEM/COOLING UNIT (MODEL 2801)

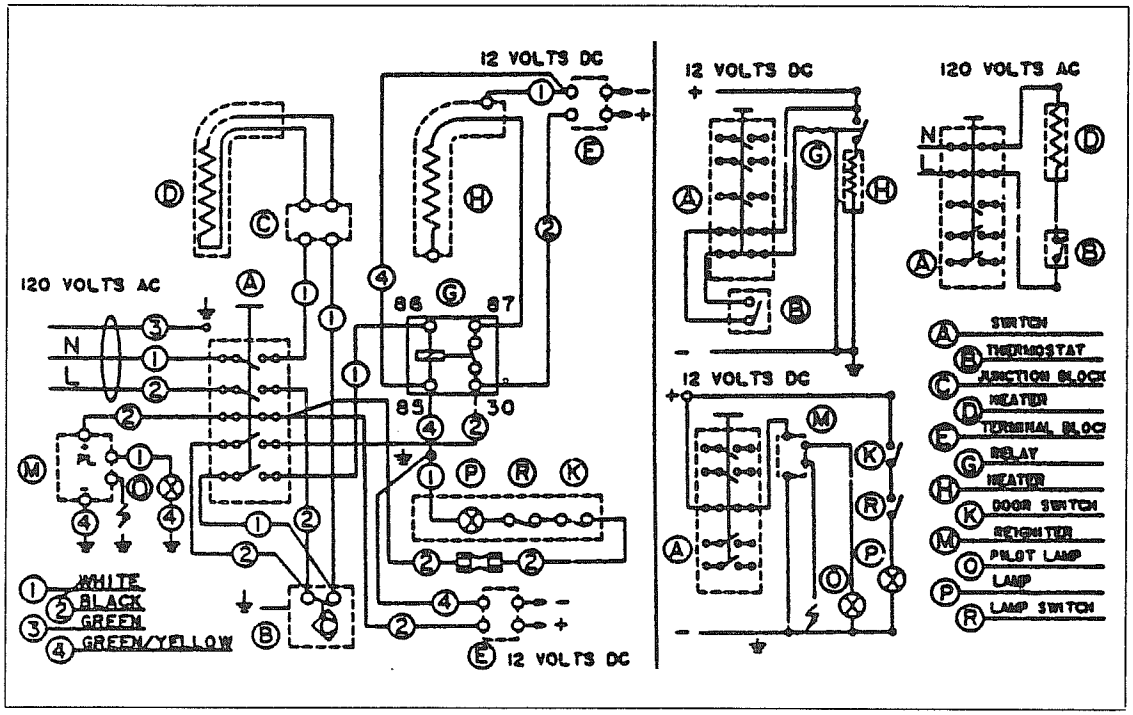


Parts Description for Preceding Page

1. Nut, F/orifice
2. Safety valve
3. Thermocouple element
4. Coupling
5. Plug screw
6. Thermostat
7. Bypass screw, S14
8. Cut off valve
9. Nipple
10. Nut
11. Switch
12. Cover
13. Screw
14. Spring
15. Spring clip
16. Reigniter
17. Gas tube
18. Sealing ring
19. Snap catch
20. Burner
21. Electrode
22. Burner Jet
23. Clip
24. Retaining ring
25. Cover
26. Nipple
27. Flue baffle
28. Cooling unit
29. Filling cap
30. Nipple
31. Protection plate
32. Drip plate
33. Flue top
34. Protection plate
35. Relay for 12/120V
36. Push rod
37. Shaft, thermostat
38. Shaft, switch
39. Burner housing
40. Heater, 12V, 215W
41. Washer, orifice
42. Evaporation try
43. Spillway
44. Draining hose
45. Clamp



For Product No. 926 72 35



For Product No. 926 72 37

WATER HEATER

Manufacturer: Atwood Mobile Products
4750 Hiawatha Drive
P.O. Box 1205
Rockford, IL 61105
Phone: 815-877-7461

Operating Instructions

Note: Review the water heater literature supplied in your Owner's Packet before proceeding.

WARNING: Hydrogen gas can be produced in a hot water system served by this heater that has not been used for a long period of time (generally two weeks or more). Hydrogen gas is extremely flammable. To reduce the risk of injury under these conditions it is recommended that the hot water faucet be opened for several minutes at the kitchen sink before using any electrical appliance connected to the hot water system. If hydrogen is present, there will probably be an unusual sound such as air escaping through the pipe as the water begins to flow. There should be no smoking or open flame near the faucet at the time it is open.

Electronic Ignition

1. Check to make sure heater is full of water by opening a "hot" faucet. A full water heater is indicated by a steady, full stream of water. If faucet sputters allow water to run until sputtering stops.

2. Place remote switch, located on bathroom exterior wall, in the "ON" position.

3. If switch light comes on, place switch in "OFF" position and wait 5 minutes.

4. Repeat step one.

5. For complete shutdown and before servicing:

   a. Place remote switch in "OFF" position.

   b. Remove red wire from left hand terminal of E.C.O. switch (E.C.O. to valve).

6. If heater fails to operate due to high water temperature it will go into a lockout condition (indicator light on). When water cools, reset by opening switch for at least 30 seconds, then close. If this condition repeats, contact Atwood Service Center.

Operating Instructions

Pilot Models

How to Light Pilot

1. Turn lighting control to "OFF" position.

2. Wait at least five minutes to allow gas which may have accumulated in burner compartment to escape.

3. Your water heater may have either Robertshaw "unitrol" or a Jade control.

   Robertshaw "Unitrol" (Fig. 1)

   A. Turn lighting control dial to "pilot" position.

   B. Depress and hold reset push button while lighting pilot burner. Allow pilot to burn for one half minute before releasing button.

   C. Turn control dial to "ON" position. If pilot does not remain lit, repeat operation allowing longer period before releasing push button.

   Jade Control (Fig. 2)

   A. Turn lighting control dial to "pilot" position and hold against stop while lighting pilot burner. Allow pilot to burn approximately one half minute before releasing dial.

   B. Turn knob to "ON" position. If pilot does not remain lit, repeat operation allowing longer period before releasing button or knob.

4. The temperature knob or lever is factory adjusted to its lowest dial setting. On the Robertshaw control we recommend the mid-point position between warm and hot. On the Jade control, set the lever at the mark between the warm and hot position. Settings at a higher position will produce a higher temperature and also increase the scald hazard.

Pilot Burner Adjustments

1. Remove cover screw.

2. Observe flame size while turning pilot burner adjusting screw.

3. Flame size should be as shown in pilot burner illustrations.

4. Replace cover screw.

Main Burner Adjustment

Loosen air shutter set screw. Slide main burner air shutter to the right until some yellow appears in main flame, then move to left until yellow disappears and tighten set screw.

ROBERTSHAW UNITROL

CAUTION

Tampering with the pilot orifice to increase the pilot flame size can cause high water temperature and failure of the gas control.

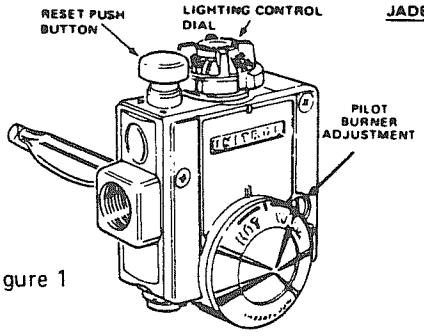


Figure 1

JADE CONTROL

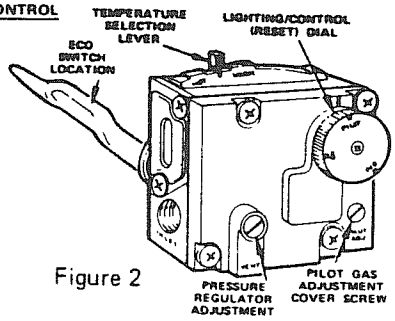


Figure 2

Suggested Maintenance

1. Keep the control compartment clean and free of combustible material and flammable liquids.

2. Keep the vent and combustion air grille clear of any obstructions.

3. Compare Main (Fig. 5) and pilot Burner (Fig. 4) flame illustration periodically.

4. Manually operate the pressure temperature relief valve at least once a year. Operate only when storage water in tank is cool.

5. Should overheating occur, or the gas supply fail to shut off, turn off the manual gas control valve to the appliance.

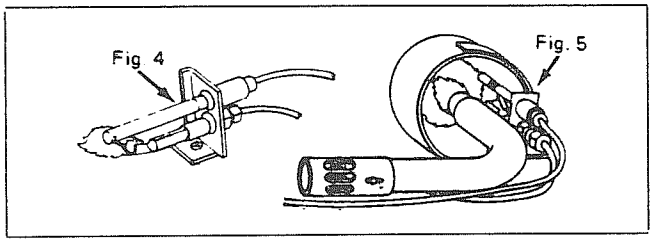
6. Clean the burner assembly at least once a year.

   A. Remove the air shutter screw and slide the air shutter down the burner tube.

   B. Run a flexible wire brush down the burner tube until it is visible at the end of the burner tube.

   C. Vacuum in and around the burner where it enters the combustion tube.

   D. Return the air shutter to its original position and replace the screw.



A temperature and pressure relief valve is installed on your water heater. This relief valve is designed to open if the temperature of the water within the heater reaches 201 degrees F., or if water pressure in the heater reaches 150 psi. RV water systems are closed systems and during the water heating cycle, the pressure build up on the water system will reach 150 psi. When this pressure is reached, the pressure relief valve will open and water will drip from the valve. This dripping will continue until the pressure is reduced below 150 psi and the valve closes. This condition is normal and does not indicate a defective relief valve. DO NOT plug, cap or reduce the outlet of the temperature and pressure relief valve.

It is possible to prevent a lot of the dripping in the following manner. An air chamber is designed into the top of the water heater, but in use the air is slowly absorbed by the water. If you will turn the water pressure off to the trailer, open a faucet to relieve the pressure, then open the lever on the relief valve on the water heater and allow it to drain, the chamber will again be filled with air. The next few times the pressue is relieved only air will be expelled and there won't be any drip. In time the air will be displaced by water and it will be necessary to repeat the above procedure if you wish to alleviate the drip.

CAUTION: No valve is to be placed between the relief valve and the tank. If a discharge line is used, no reducing coupling or other restriction can be used. The line must be installed to allow complete drainage of both valve and line. Do not plug the relief valve under any circumstance. Manually operate the relief valve at least once a year. Operate only when the water in the tank is cool.

Checking, Removal, Replacement and Maintenance

Water Heater Removal and Replacement

1. Shut off water supply and open hot water faucets.

2. Open drain valve on water heater tank and drain completely.

3. After tank is drained, disconnect inlet and outlet water lines. These are located inside trailer by opening cabinet door. With a wrench, loosen the two flare nuts connecting these lines to the tank.

4. Shut off gas supply and disconnect gas lines, both at control valve of water heater and shut off valve under trailer. Remove gas line completely.

5. Drill pop rivets from rub rail along bottom of water heater using a No. 30 drill bit. Drill to gain access to Phillips screws in bottom of water heater flange.

6. Remove screws along heater mounting flange, top, bottom and both sides.

7. Heater is now ready for removal and can be moved from trailer body. Sealers used to prevent rain leaking around installation flange may bind heater to body of trailer. With a putty knife or screwdriver carefully pry heater loose.

8. Install by reversing above steps. Before pushing heater into place remove all the old gasket from the flange and replace with new gasket material.

9. When installing gas line be careful not to get any dirt into line when pushing through the underbelly.

10. Check all gas connections for leaks, using soapy water.

Thermostat Removal and Replacement - Pilot Model

1. Shut off water supply.

2. Open water heater drain valve. Open hot water faucets.

3. Shut off gas valve.

4. Disconnect gas at thermostat control valve.

5. Disconnect pilot gas line and thermocouple lead at thermostat control.

6. Using thermostat wrench remove thermostat.

7. Replace by reversing above procedure.

Main Burner and/or Orifice Removal and Replacement

1. Remove hex nut.
2. Remove main burner assembly and flint lighter.
3. Remove main burner orifice.
4. Clean with alcohol and compressed air or replace.
5. Replace by reversing above procedure.

Main Burner Air Adjustment

1. Loosen screw.
2. Slide air adjustment sleeve to gain proper air adjustment. (Primary air should be adjusted so that slight yellow streaks may be seen in the flame. This flame should have slightly forceful noise.)

Thermocouple and Pilot Assembly Removal and Replacement

1. Remove main burner assembly.
2. Remove pilot line and thermocouple lead at thermostat control valve.
3. Remove screw.
4. Replace by reversing above procedure. The thermocouple nut should be started and turned all the way in by hand. An additional quarter turn with a small (4") wrench will then be sufficient to seal the lock washer. **CAUTION: Over tightening may cause damage to the thermocouple or magnet and is unnecessary.**

General Description

The Unitrol R103-Rv-LP-78 is a combination water heater thermostat, 100G automatic pilot built-in automatic over temperature "ENERGY CUT OFF" device, balanced adjustable main gas pressure regulator, pilot filter, separate fixed setting pilot gas regulator, with main and pilot gas cock in one compact unit.

Balanced Pressure Regulator

The main gas regulator, located within the manual valve, has a balancing diaphragm in addition to the main pressure regulator diaphragm to balance the effect of pressure differential across the regulator valve.

The location of the regulator in the normal gas flow pattern, without materially diverting the normal flow, minimizes the pressure drop within the control.

The combined advantages of using a balanced regulator plus its optimum regulator location within the control makes possible a combination control with improved characteristics using a regulator of greatly reduced size.

The unitrol R11OR-LP-TP for LP gas has a pressure adjustment range of 10"-12" W.C.

Built in E.C.O. Operation

In addition to the previous features of the Unitrol, the new Unitrol R11ORT-P with built in E.C.O. provides the following additional function. In case of excessive water temperature in the heater a switch inside the tank assembly shuts off the automatic pilot and all gas to the heater. The Unitrol R11ORT-P provides a completely self-contained automatic gas shut off system.

Pilot Regulator

A separate pressure regulator for pilot gas is located in the control downstream of the pilot filter to control pilot gas pressure independently. No pilot adjustment key is provided or needed on controls with pilot regulators.

Installation Instructions

Piping

Make sure that the piping is clean and free from scale and burrs. Apply a small amount of good quality pipe thread compound which is suitable for the type gas being used. Thread compound should be used sparingly and on male threads only, leaving the first two threads clean. Pipe dope or thread compound should never be used on female threads as it may be pushed into the valve body.

Thermocouple

The thermocouple nut should be started and turned all the way in by hand. An additional quarter turn with a small (4") wrench will then be sufficient to seat the lock washer. CAUTION: **Over tightening may cause damage to the thermocouple or magnet and is unnecessary.**

Pressure Regulator Adjustment

The main burner pressure regulator adjustment screw slot is filled to seal the factory pressure setting. The regulator should never need readjustment. If, however, adjustment should be necessary a qualified serviceman can proceed as follows:

1. Remove regulator adjustment cap by inserting screwdriver in slot and rotating counterclockwise (See Fig. 1).

2. With small screwdriver, remove sealant from adjustment screw slot if necessary.

3. Rotate adjustment screw "clockwise" to increase, or "counterclockwise" to decrease pressure.

4. Replace regulator adjustment cap.

Note: Pilot pressure regulator is non-adjustable.

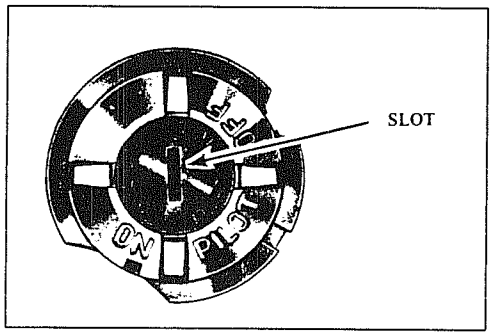


Fig. 1

Built In E.C.O. Test Procedure Unitrol 110T Series

Follow standard procedure for lighting or relighting.

1. If heater does not start up immediately under standard procedure for lighting, check the following:

   A. Check thermostat valve action. Thermostat valve leaks can result in overheating of tank water and result in shutdown due to E.C.O. action. If valve is found to leak, clean valve. If valve still leaks, replace thermostat.

   B. Check thermostat calibraton at highest setting. 160° thermostats (Hot-Warm Dial). If top temperature exceeds 160° F at shut-off, shutdown was likely due to E.C.O. action. Recalibrate so top setting is in 155°F range. 180° thermostats (Very Hot Dial). If top temperature exceeds 180°F at shut-off, recalibrate so top setting is in 175°F range.

   C. If none of the above conditions exist, shutdown was most likely due to other causes.

2. If standard procedure for lighting does not result in start up, proceed to Sections 3, 4 and 5 if test kit is available; or Sections 6, 7 and 8 if test kit is not available. A proven "good" magnet is required for tests outlined in Sections 6, 7 and 8.

If Test Kit is Available.

3. Make closed circuit millivolt check as follows:

   A. Use Graysen Test Kit No. B165-34 or equivalent millivolt meter.

   B. Connect Adaptor No. 75036 and Test Kit as shown in Fig. 2, being sure connections are tight.

   C. Follow standard lighting procedure.

   D. Check closed circuit output, if less than eight millivolts replace the thermocouple.

   E. Repeat standard lighting procedure after thermocouple replacement.

   If closed circuit millivolt check is greater than eight millivolts, or Section C does not secure start up, proceed to Section D.

4. With adaptor connected as in Fig. 2, check as follows:

   A. Follow standard lighting procedure.

   B. With closed circuit output in excess of eight millivolts, blow out pilot.

   C. A good magnet should remain locked up for a drop of five millivolts or more from original stabilized output.

   D. If magnet does not operate properly replace magent.

   E. Repeat standard lighting procedure.

   If Section D does not result in start-up, proceed to Section 5.

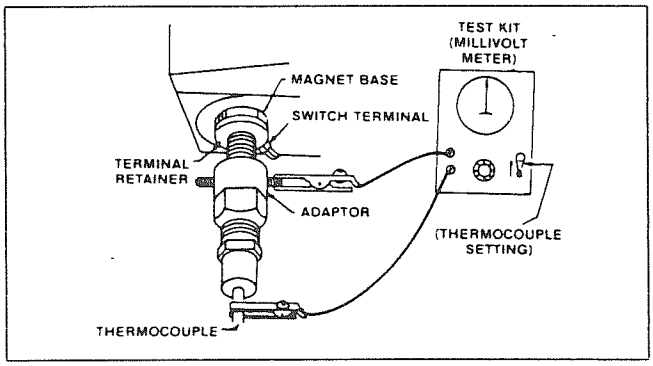


Fig. 2

5. Check E.C.O. switch for closure.

A. Be sure water at thermostat level is below 120 degrees F. To insure this, draw water from hot water faucet until thermometer registers 120 degrees F or less.

B. With Test Kit on 'Magnet" setting and dial set for maximum amperage, check for switch closure and continuity through the switch by touching clips to opposite switch terminal contacts as shown in Fig. 3.

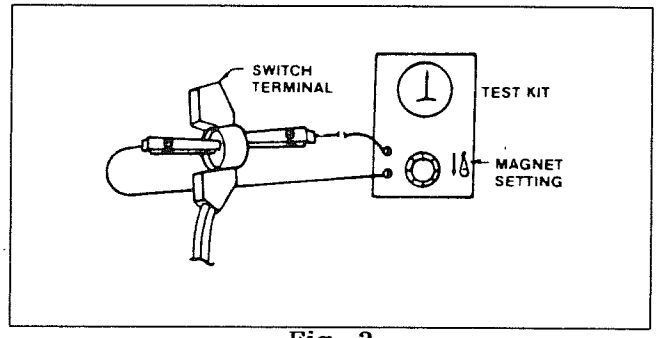


Fig. 3

1. If switch is closed, essentially full amperage reading will be obtained (approaching maximum needle deflection to the right.)

2. If switch is open, no current will be shown (no meter needle deflection).

C. If switch contacts are open, replace control.

D. If switch contacts are closed, follow standard lighting procedure. If these checks do not result in start up, replace control.

Without Test Kit

6. To check thermocouple:

A. Remove thermocouple nut from Magnet base and connect "known good magnet" to thermocouple.

B. Follow standard lighting procedure, holding reset button down at least 30 seconds after lighting pilot.

C. Lock up "known good magnet" by depressing magnet valve face. If thermocouple is good, magnet should remain locked up for at least 30 seconds after pilot is extinguished.

D. If thermocouple does not lock up "known good magnet" replace thermocouple.

E. If thermocouple is good, proceed to Section G.

7. To Check Magnet

   A. With small screwdriver remove E.C.O. terminal retainer.

   B. With narrow blade screwdriver pry E.C.O. terminal from magnet base slot, working from both sides to avoid terminal damage.

   C. Follow thermocouple installation instructions, leaving switch terminal out of magnet base.

   D. Follow standard lighting procedure.

   E. After thermocouple temperature is stabilized (pilot burning at least 2 minutes) blow out pilot. If magnet is good it should remain locked up for at least 30 seconds after pilot is extinguished.

   F. If magnet will not lock up, or will not remain locked up for at least 30 seconds after pilot is extinguished, replace magnet following Magnet Replacement Instructions. If magnet is good, proceed to Section 8.

CAUTION: Never leave water heater with switch terminal disconnected from magnet at conclusion of service call.

8. To check E.C.O. switch:

   A. Be sure water at thermostat level is below 120 degrees F or less.

   B. Light Pilot. If pilot does not remain lit when reset button is released, proceed as follows:

   C. Remove thermocouple from magnet base.

   D. Remove E.C.O. terminal retainer.

   E. Remove E.C.O. switch terminal.

   F. Install thermocouple in magnet base.

   G. Light pilot. If pilot remains lit when reset button is released, and if tests in Section 6 and 7 prove thermocouple and magnet are good, E.C.O. switch is not closing. Replace entire control.

CAUTION: Never leave water heater with switch terminal disconnected from magnet at conclusion of service call.

Ordering Information

When ordering control specify:

1. Model - Unitrol
   (See smooth side of casting for stamped model number.)

2. Outlet size - 1/2" inverted flame 3/8" pipe.

3. Shank length (See Fig. 4)

4. Temperature Dial:

   Hot - R11ORTP
   Very Hot - R11)RT8P
   (Dials not interchangeable.)

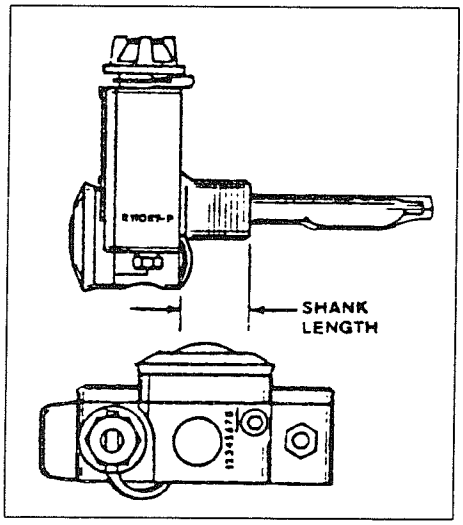


Fig. 4

Water Heater Service Analysis

EFFECT			
Pilot will not stay on	Not enough hot water	Over heated water	CAUSE
x			Too much primary air
	x		Dirt in orifice
x			Defective magnetic valve
x			Need new thermocouple lead
x			Thermocouple lead connection loose
x			Pilot line clogged
	x		Dirt in pilot orifice
x	x		Improper pressure on regulator
x			Pilot not striking thermocouple properly
		x	Thermostat set too hot
	x		Thermostat set too low
		x	Dirt on thermostat seat
x			Wrong pilot burner
	x		Heater too small for the job
	x		Sediment or lime in tank
	x		Wrong piping connections
	x		Leaky faucets
	x		Long runs of exposed piping
x	x		Heater subjected to strong cold drafts
	x	x	Defective thermostat
	x	x	Improper calibration
x			E.C.O. switch contacts open (See test procedure for E.C.O.)

Electronic Ignition

Principle of Operation

When the switch is turned on power is supplied to the thermostat (located inside the junction box at back of water heater). When the thermostat senses the water in the tank requires heat (below 120 degrees F) its contacts close and completes the circuit to the circuit board.

This will energize the coils in the dual solenoid gas valve allowing gas to flow out of the main burner orifice, mix with air at the ventura (air adjusting slots), the flow out of the end of the main burner.

Simultaneously the coil on the circuit board provides a high voltage current to reach the spark probe at the main burner. This ignites the gas. When the flame is sensed by the probe, current is conducted to the relay and the valve remains energized. Sparking ceases when the electrode to ground current path is altered by the presence of flame. The water heating process begins.

When the water in the tank drops below 120 degrees F the process will automatically repeat itself.

Safety

E.C.O. Switch: The unit is equipped with an E.C.O. (Energy Cut-Off) switch. This is located next to the thermostat and should the water exceed 190 degrees F, the contacts in the ECO switch will open and completely shut off the power to the unit.

It is unlikely, but should this occur it is necessary to move the rectangular cover from the back (inside) of the unit and manually depress the red button. The unit should then be checked before continuing use to determine why the water overheated. Refer to trouble shooting section.

Relief Valve: Each unit is equipped with a temperature pressure relief valve. Should the water in the tank exceed 210 degrees F., or 125 PSI, the valve will open and allow cold water to enter and reduce the temperature of the water or release the pressure build-up.

Circuit Board Lock-Out: Should the spark not ignite the gas, a built in timing circuit in the circuit board will shut down and the red light next to the interior switch will come on. It is necessary to shut this switch "off", wait 30 seconds, then turn switch back on. If unit again fails to light, check trouble shooting section.

Storage and Winterization Procedure for Water Heaters

Normal storage and winterization procedures would be as follows:

1. Thoroughly drain the inner tank. Simply open the pet-cock drain valve contained at the front base of the unit. To assist in draining, plus to eliminate the chance of developing an air lock, also open your relief valve.

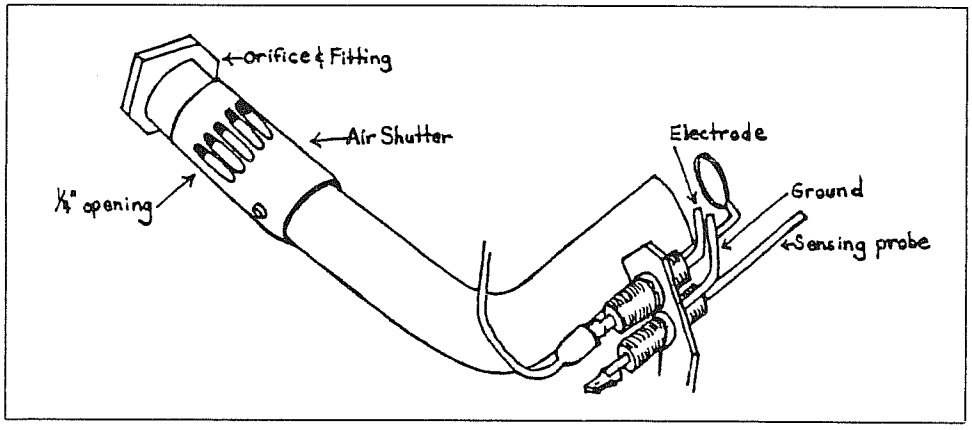
2. Once the unit has been thoroughly drained, approximately two quarts of water will remain in the base of the tank due to the position of the pet-cock drain valve. Strictly for winterization precautions, these remaining two quarts of water will not harm the unit. As these two quarts of water freeze, it has ample room for expansion without causing freezing damage.

Adjustment for Direct Ignition Water Heater

The following are adjustments that can be made to all direct ignition water heaters. These adjustments will improve initial start up and recycling capabilities of the unit.

Air Shutter Positioning

The air shutter should be positioned in such a manner that will allow the main burner flame to be blue with a trace or flash of yellow appearing through the flame. Approximate positioning is 1/4 way open. (Note Illustration) The importance of this adjustment is to allow an adequate air/gas mix to be ignited by the electrode at the end of the burner tube. If the air shutter is not positioned properly this will minimize the unit's start up and recycling capacilities.



Main Burner Alignment

It is important that the air shutter is fitted over the orifice holder. It is also important that the orifice is centered in the main burner tube. This adjustment allows for the proper air/gas mix.

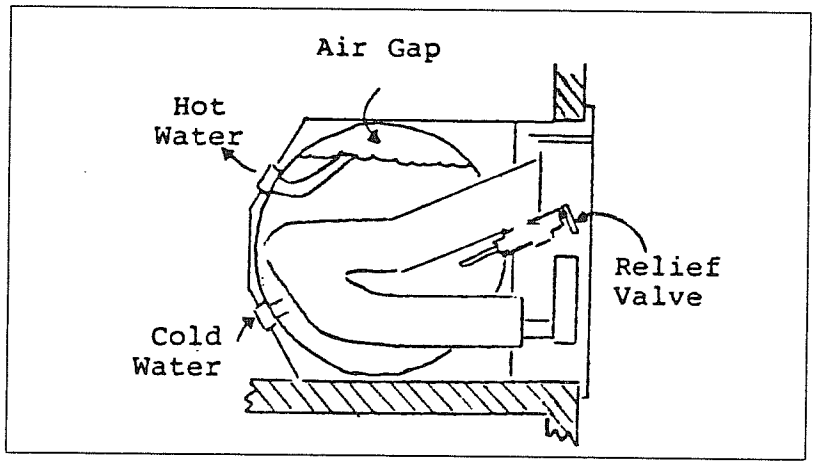
Electrode Positioning

The electrode and the ground probe should be positioned in the area between the end of the burner tube and the flame spreader. This adjustment allows for instantaneous start up and recycling. The flame sensing probe should not be grounded on the flame spreader or any other metal object in the combustion chamber. The sensing probe is the component part of the electrode that relays to the circuit board that a flame is present and everything is functioning properly. The flame sensing probe sends microamps to the circuit board. When the circuit board receives the proper amount of microamps it allows the gas valve to stay open and the main burner flame to stay on. The male connector on the back of the flame sensing probe should be clean and free of corrosion; also, the female connector on the white wire. If the water heater initially starts up, runs for one minute or less, the probe could be at fault. First clean it. If this does not correct the problem, replace the electrode assembly. It is important to note that the air adjustment shutter positioning plays an important part in the functioning of the flame sensing probe. When the main burner flame is blue and not roaring, the flame spreads correctly and the sensing probe is heated quicker.

Temperature/Pressure Relief Valve

PROBLEM: Weeping or dripping of relief valve while water heater is running DOES NOT mean it is defective. This is caused by the normal expansion of water as it is heated in the closed water system of a recreational vehicle.

The Atwood water heater tank is designed internally with an air gap at the top of the tank to reduce the possibility of this occurring.



In time, the expanding water will absorb this air. To replace the air:

REMEDY:

1. Turn off water heater.
2. Turn off incoming water supply.
3. Open a faucet in the coach.
4. Pull handle of P & T valve straight out and allow water to flow until it stops.
5. Allow P & T valve to snap shut. Close faucet and turn on water supply.

Electronic Ignition System

PROBLEM: Switch on red light does not flash.

REMEDY:

A. Water in tank at 160 degrees. Drain off water below 160 degrees then observe unit for start up.

B. Unit must be connected direct to battery. Battery must produce at least 10 volts DC. If lower, charge battery.

C. Remove cover from back of water heater and manually depress red reset button.

D. Check wiring of switch with diagram.

E. Defective interior switch. Replace.

F. Defective ECO switch. Check for closed contacts with continuity tester. Replace.

G. Defective thermostat. Contacts should be closed when thermostat is cooled. Replace.

PROBLEM: Switch on red light remains on (not a flash).

REMEDY:

A. Inadequate voltage. Check battery.

B. Improper wiring. Check with diagram.

C. Circuit board ground wire or ground at back of unit broken or disconnected.

D. Flame sensing probe grounding to flame spreader or burner. Check by removing lead from probe. If unit goes through lock-out cycle, bend sensing probe away from flame spreader and replace lead.

E. Top of SCR contacting sheet metal casing with power off. Bend SCR top until contact with sheet metal is broken.

PROBLEM: Switch on red light flashes then stays on.

A. No gas supply. Check all valves to open. Unit must have minimum of 11" water column pressure.

B. Check connection to solenoid valve with volt meter. Should have 12V DC.

C. Defective solenoid valve. Test with good battery. One lead on case, one lead on white wire. An audible click should be heard.

D. Water temperature may be 160 degrees, causing contacts to fluctuate.

E. Defective circuit board. Replace.

PROBLEM: Switch on red light flashes one time, then goes out. Unit not lit.

REMEDY:

A. Spark probe grounded. Proper gap 1/8" from center wire, burner tube and/or flame spreader.

B. Broken or shorted spark probe lead wire (heavy insulated, light brown.)

C. Temperature of water at 160 degrees allowing thermostat contacts to fluctuate.

D. Possible defective circuit board. Replace.

PROBLEM: Yellow main burner flame.

REMEDY:

A. Improper air adjustment.

B. Partially plugged main burner orifice. Remove and clean. DO NOT ENLARGE.

C. Obstruction in main burner tube. Spiders, rust etc. Remove and clean.

D. Bent or missing flame spreader. Straighten or replace.

E. Inadequate gas pressure into valve. Check with manometer. 11" water column minimum.

F. Inadequate gas pressure at outlet side of valve. Remove pressure tap lug located at right front of solenoid valve. Insert 1/8" NPT pipe nipple. Hook up monometer, turn on unit.

G. Grill in upper left hand side of grille obstructed. Filters, tape, etc. should not be used to block any portion of this grille.

H. Gas solenoid bracket bent. Orifice not pointed up center of main burner.

PROBLEM: Tank leaks water.

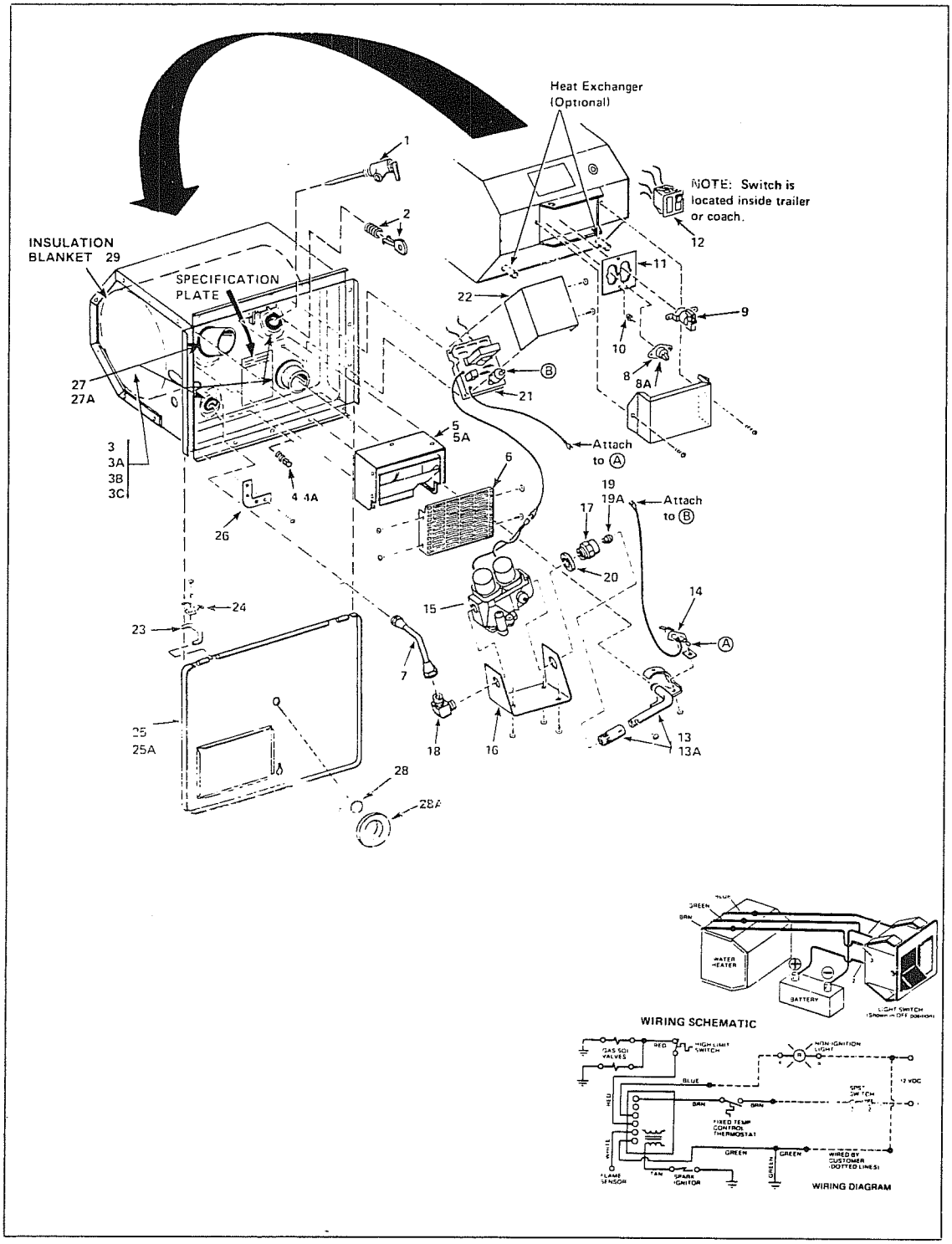
REMEDY: A. Check all plumbing fittings for leaks.

B. Tank corrosion. Refer to warranty with unit.

PROBLEM: Spark igniter continues to spark while burner is on.

REMEDY: A. Flame sensor not correctly positioned in flame.

PARTS DESCRIPTION WATER HEATER MODEL G6A-6E



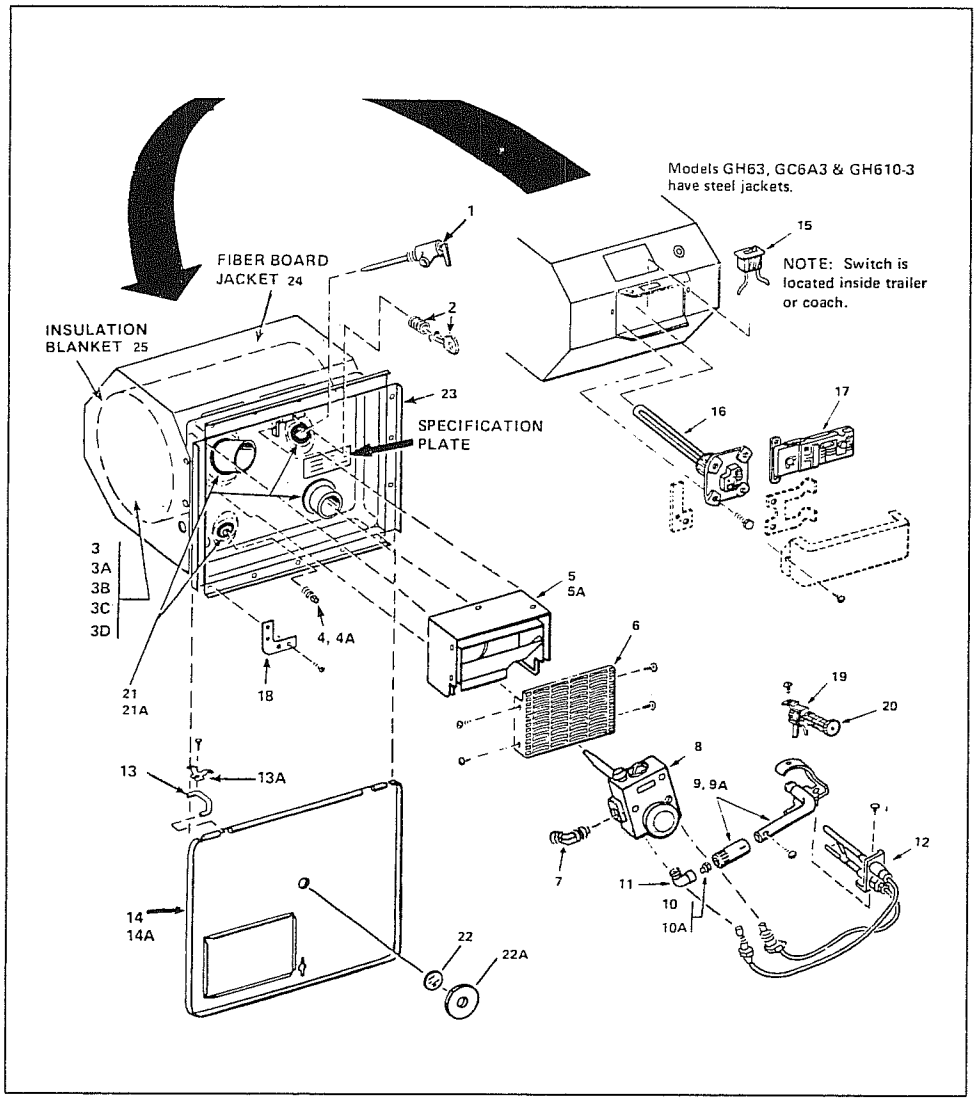
Parts Description for Preceding Page

1. Relief Valve 1/2" fitting
2. Cam-loc fastener
3. Inner tank
4. Drain Plug
5. Flue Box
6. Exhaust Grille
7. Gas inlet tube
8. Thermostat 12V DC, 140° preset
9. ECO Switch
10. Lock-nut
11. Control retainer plate
12. Switch package
13. Main burner
14. Spark probe assembly
15. Gas valve
16. Valve bracket
17. Orifice holder
18. Elbow fitting
19. Main burner orifice
20. Washer gasket
21. Circuit board
22. Circuit board cover
23. Hinge pin
24. Hinge clip
25. Access cover
26. Corner brackets (set of 4)
27. Gasket kit (Standard or high performance)
28. Gasket for sight window

28A. Access cover, sight window

29. Insulation blanket

PARTS DESCRIPTION WATER HEATER MODEL G6A-6



Parts Description for Preceding Page

1. Relief valve 1/2" fitting
2. Cam-loc fastener
3. Inner Tank
4. Drain plug
5. Flue box
6. Exhaust grille
7. 45° elbow fitting 3/8" NPT x 3/8" flare

* 8. Thermostat 3/8" NPT, inlet

9. Main Burner
10. Main burner orifice
11. Main burner orifice elbow

**12. Safety pilot assembly (Jade) Includes thermocoupler & Tubing

1. Hinge pin/clip
14. Access cover
15. On/Off switch
16. Heating element
17. Thermostat
18. Corner brackets (Set of 4)
19. Spark igniter bracket
20. Spark igniter
21. Standard gasket kit

21A. High performance gasket kit

22. Gasket for sight window

22A. Access cover for sight window

23. Drawn pan
24. Fiberboard jacket
25. Insulation blanket

* The two types of thermostats, Robertshaw and ITT, are interchangeable.

** Item 12, Jade Pilot, mounts on the right side of burner and has flexible gas lines.

NOTES

SPECIFICATIONS

WEIGHTS & LENGTHS

Length	Model	Dry Weight	Hitch Weight	Additional Allowable	Actual Length
25'	Excella	5100#	700#	1700#	25' 11"
29'	Excella	5600#	700#	1200#	29' 2"
32'	Excella w/Dinette	6500#	800#	1800#	32' 9.5"
32'	Excella w/o Dinette	6300#	700#	2000#	32' 9.5"
34'	Excella WTB	6700#	740#	2200#	34' 7"
34'	Excella w/Dinette	7100#	800#	1800#	35' 2"
34'	Limited WTB	7025#	800#	1875#	34' 7"
34'	Limited w/Dinette	7400#	800#	1500#	35'

DIMENSIONS

Exterior Width	95.5"
Exterior Height	With A/C 115.5": Without A/C 103"
Interior Height	With A/C 75.25": Without A/C 78.75"

CAPACITIES

Size/Model	Fresh Water Tank	Main Holding Tank	Auxiliary Holding Tank
25' Side Bath	50 gal.	30 gal.	35 gal.
29' Side Bath	50 gal.	30 gal.	35 gal.
32' All Models	50 gal.	30 gal.	35 gal.
34' All Models	50 gal.	30 gal.	35 gal.

Note: All weights and measurements were made on prototype vehicles. Your production trailer may vary slightly.

Alignment

Toe In	0 - 1/8" (All Models)
Camber	0 - 1 1/2 degree positive (All Models)

Battery

12 Volt Deep cycle (All Models)

Tire Inflation (PSI) Cold

7:00 - 15XCA LRD Radial	60 psi
7:00 - 15XCA LRC Radial	45 psi
H78 - 15 LRC Bias	50 psi
ST225/75R16	50 psi

Hitch Ball height

The proper height will vary according to the weight you carry and the tires you use. However, checking the height on your trailer is relatively easy:

1. With trailer on fairly level ground measure from ground to bottom of frame, front and rear.

2. Adjust front jack until measurements are equal.

3. Now measure from ground to the inside top of ball coupler. This figure is the hitch height. The hitch ball is then usually set 1/2" to 1" higher, according to the spring weight of your tow vehicle, to allow for it to settle when the trailer is hitched up.

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