CLASSIC 1991

MOTORHOME OWNER'S MANUAL

Airstream

§§§

*1000 MILE CHECK OR 60 DAY CHECK-OUT

AUTHORIZATION CARD

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

*After Delivery of your motorhome.

§§§

INTRODUCTION

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

Airstream realizes our customers possess varying degrees of expertise in the area of repairing and maintaining the appliances in their motorhome. 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 and care of component parts such as: chassis, 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 possibility 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.

TABLE OF CONTENTS

G. PLUMBING

LP (Liquid Petroleum) Gas
Water System
Water Pump
Insta Water Dispenser
Faucets
Toilet
Drainage System

H. ELECTRICAL

Battery/Power Converter
12 Volt System and Components
Control Panel
110 Volt System and Components

I. APPLIANCES

Air Conditioner
Furnace
Refrigerator
Range/Oven
Microwave/Convection Oven
Water Heater
Ice Maker

J. SPECIFICATIONS

AIRSTREAM, INC.

LIMITED WARRANTY

AIRSTREAM MOTORHOME

WARRANTY COVERAGE

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

WARRANTY PERIOD

The warranty is for 12,000 miles (20,000 Kilometers) or one year, whichever occurs first, beginning when the vehicle is delivered to the first retail purchaser or first placed into demonstrator service. This warranty must have been started prior to the accumulation of 4,000 miles in order to be valid.

ITEMS COVERED

Any part of the motorhome 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
* TV/VCR/Radio
* Backing monitor
* Microwave oven
* Chevrolet chassis
* AC power plant

The above items 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 motorhome 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, or 12,000 miles whichever comes first. There are no other warranties which extend beyond those described on the face hereof and expressly excludes conditions resulting from normal wear, accident, abuse, exposure or overload. Some states do not allow limitation on how long an implied warranty lasts, so the 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, or 12,000 miles whichever occurs first, 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 motorhome 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 checkup, 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 or 12,000 mile 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 motorhome 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 chassis, appliance and other manufacturers.

INSTALLATIONS NOT COVERED

Airstream, Inc. does not accept any responsibility in connection with any of its motorhomes 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 motorhome needs repairs under the terms of the Airstream Limited Warranty, you should:

1. Take your motorhome 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 motorhome
   * Mileage
   * 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 motorhome 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 Motorhome 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 motorhome. 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.

Limited Warranty coverage on the CMA tag axle components, as listed below, is for 24 months or 24,000 miles from the date of purchase, whichever occurs first.

* Tag axle, up to and including spindle
* Air bags
* Air lines and fittings
* Leveling valves
* Compressor
* Pressure switch
* Air relief valve
* Air supply tank
* Check valve

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

BODY SERVICE AND MAINTENANCE

Along with your new Airstream motorhome you have purchased the Airstream Limited Warranty. Read your Limited Warranty carefully. It contains the entire agreement with respect to Airstream's obligations on the Limited Warranty on your new vehicle. The terms of the Limited Warranty, and only those terms, will define Airstream's responsibility. When you receive your Limited Warranty file it for safekeeping.

Upon proof of purchase date to any Airstream Dealer Service Center, defects in materials or workmanship will be repaired or replaced without cost to the owner for a period of twelve (12) months from the original purchase date, or 12,000 miles, whichever occurs first. Written warranties of some manufacturers of components of the motorhome will be honored by Airstream for the duration on that manufacturer's warranty.

Items such as motorhome chassis, engine, tires, batteries and generator are serviced by their respective manufacturers and will be handled by their service centers according to the terms of their written policy. Any warranty forms from these manufacturers should be completed promptly, preferably at time of purchase.

Your motorhome chassis is prechecked by its manufacturer before delivery to Airstream. All service to the chassis must be performed by the manufacturer according to the manufacturer's warranty and service policies. Literature is supplied with each Airstream motorhome which gives important information concerning its warranty coverage; however, the Airstream Limited Warranty covers the chassis heater, defrosters, speed control, dash instrument cluster, windshield wiper blade, motor, washer, LP gas bottle and gas regulator.

Adjustments to your Airstream motorhome were made at the factory prior to delivery to the purchaser. An additional checkup, including adjustments, is made at the 1,000 mile or 60 day inspection. Any adjustments thereafter are the customer's responsibility and are not covered by the Airstream Limited Warranty.

Paint and appearance items which show imperfections should be brought to the attention of your dealer at the time of delivery and during pre-delivery inspection. Normal deterioration by use and exposure is not covered by the Airstream Limited Warranty.

Damage to enameled or porcelain surfaces resulting from abrasion, collision or impact, and broken window glass is not covered by the Airstream Limited Warranty.

THE AIRSTREAM LIMITED WARRANTY EXCLUDES:

1. NORMAL WEAR: Items such as water purifier packs, curtains, upholstery, floor coverings, window, door and vent seals may show wear within the one year Limited Warranty period depending upon the amount of usage, weather and atmospheric conditions.

2. ACCIDENT: Damage caused by accident is usually visible, and we strongly urge our dealers and customers to inspect the motorhome upon 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 your responsibility upon acceptance of the motorhome. GLASS BREAKAGE, whether obviously struck or mysterious, is always accidental and covered by most insurance policies.

3. ABUSE: Lack of customer care and/or improper maintenance, including failure to comply with the terms of the Owner's Manual, or failure to heed proper vehicle operation shown by the dash instruments are not covered by warranty.

4. EXPOSURE: Deterioration by sunlight is possible to such items as tires, curtains or upholstery. Steel or metal surfaces are subject to the elements, causing rust and corrosion which is normal and beyond the control and responsibility of Airstream.

5. OVERLOAD: Damage due to loading beyond capacity or to cause improper balance is not covered by the Airstream Limited Warranty. The Airstream motorhome body is engineered to properly handle any normal load. There are limits to the amount of load that can be safely transported depending upon speed and road conditions. If these limits have been exceeded the Airstream Limited Warranty will not cover resulting damage. For additional information on the load capacity of your motorhome consult your Owner's Manual or gross vehicle weight rating plate. Each motorhome is aligned during the last quality inspection. These tolerances will only change if the motorhome is subjected to abuse, such as dropping off a sharp berm, striking a curb, or hitting a deep hole in the road. Such damage would 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.

YOU SHOULD ALSO BE AWARE OF THE FOLLOWING:

Airstream is not responsible for any consequential or incidental damages incurred as a result of any defect. Consequential damages include, but are not limited to, travel expenses, gasoline, oil, lodging, meals, telephone tolls, loss of work and loss of use of the motorhome.

In the event of a defect, the owner must take all reasonable corrective action to lessen the damages which might result from such defect. Airstream will not be responsible for damages which could have been avoided.

Airstream's responsibility is defined solely by the Airstream Limited Warranty and Airstream is not responsible for or bound by representations or warranties made by any of its dealers.

Your Airsteam Limited Warranty is transferable to subsequent owners of the motorhome, but only for the duration of the warranty period. Warranty transfer application forms are available from your dealer or the Airstream factory.

REPORTING SAFETY DEFECTS

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Airstream, Inc.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or Airstream, Inc.

To contact NHTSA you may either call the Auto Safety Hotline toll-free at 1-800-424-9393 (or 366-0123 in Washington, D.C. area) or write to: NHTSA, U.S. Department of Transportation, Washington, D.C. 20590. You can also obtain other information about motor vehicle safety from the Hotline.

NOTES

SERVICE

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

Silver Key Delivery does not stop here. After you have traveled with your motorhome for 1000 miles or 60 days (whichever comes first) you can make an appointment with any one of the Airstream dealers for still another checkout of your motorhome. At that time a specified list of performance checks on your motorhome 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 motorhome. 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
Phone: 513-596-6111

MAINTENANCE SCHEDULE

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

EVERY 1000 MILES OR 30 DAYS

	Escape Window	Check operation of latches and upper hinge
	Smoke Alarm	Test and replace battery as required
	Tires	Check tire pressure (70 psi front - 60 psi rear)
	GFI Circuit Breaker	Test and record

EVERY 5000 MILES OR 90 DAYS

	Exterior Door Locks	Lubricate with dry graphite
	Exterior Hinges	Lubricate with light household oil
	LPG Regulator	Check bottom vent for obstructions
	Main Door Striker	Coat with paraffin
	Tag Axle	Add lithium bearing grease to tag axle
	Wheel Lug Bolts	Torque to 90-95 ft. lbs.
	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
*	Rear Suspension Air Tank	Drain moisture at exterior valve under right rear compressor tank

* In high humidity the air tank should be drained at 1,200 mile intervals.

EVERY 10,000 MILES OR 6 MONTHS

Electric Brakes	Check magnets and shoes
Exterior	Clean and wax

EVERY YEAR OR 12,000 MILES

Battery	Clean, neutralize and coat terminals with petroleum jelly
LP Tank	Have purged by LP supplier
Seams	Check seal on exterior seams, windows, lights, and vents. Reseal with Kool Seal or equivalent as needed.
Tag Axle Wheel Bearing	Clean, Repack

MAINTENANCE RECORD

Date	Dealer	Service Performed

SUGGESTED MAINTENANCE PARTS AND LUBRICANTS

Exterior Bulbs

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

Interior Bulbs

Incandescent Ceiling Light, Reading Light, Wardrobe Light	#1141
Fluorescent Ceiling Light	#F14T8-CW
Small Fluorescent Ceiling Light (Thin Lite)	#F8T5-CW
Bath Indirect (Fluorescent)	#F15T8-CW
Dining & Bedroom Indirect (Fluorescent)	#F18T8-CW
Bath Mirror (Excella & Limited)	Jensen J12B- Small Base, Large Bulb
Oven	Standard Screw-in Base 12V, 15W
Refrigerator	E5

Chevrolet Belts

Crank, Water Pump, Alternator, Air Pump	GM14087540
Crank, Water Pump, Compressor, Power Steering	GM14007704
Crank, Power Steering	GM14082454
Power Steering, Air Pump	GM14092344

12 Volt Fuses

Equipment	Fuse Size
C.B. Radio	2 amp AGC
Radio/Tape (Sony) (2)	1 amp SOC
Driving Lights	15 amp AGC
Cruise Control	4 amp ATC
Door Bell	1.5 amp AGC
Leveling Jacks	15 amp AGC
TV Backing Monitor (2)	5 amp AGC
Dual Cooling Fans	25 amp ATC
Chevrolet Fuse Block	5 amp ATC 10 amp ATC 15 amp ATC 20 amp ATC 25 amp ATC

Miscellaneous

Water hose gaskets

Dry Graphite

Touch-Up Paint (Du Pont Centari #44146A - Metallic Gray)
(Airstream #28174W - Clear Arcylic Spray)

Oil can with 30 weight, non-detergent oil

Light Household Type Oil

WD-40 or Equivalent Aerosol Lubricant

Sealer-Kool Seal

Lithium Base Wheel Bearing Grease

DRIVING

Safety Check List

Your Airstream motorhome should be given a thorough safety check before a trip. Regular use of the following list will provide safe operation of your motorhome and will help you spot any malfunctioning equipment and correct the problem as soon as possible.

FAILURE TO HEED MANY OF THE FOLLOWING ITEMS MAY CAUSE DAMAGE TO THE VEHICLE OR PERSONAL INJURY.

Exterior Check List (Before Entering Vehicle)

1. Check condition of tires for proper inflation.

2. Turn off LPG valve on LPG tank.

3. Check that sewer connection, all external compartments and filler openings are properly stowed or closed and/or locked.

4. Check that items stored on exterior of vehicle are securely tied down.

5. Would any items stored on exterior of vehicle present a clearance problem?

Interior Check List (Before Driving Off)

1. It is important that the main door be completely closed and locked with the dead bolt lock during travel. If it is not locked the constant vibration of travel may cause it to open with possible damage. Check to make sure that door light on instrument panel goes out.

2. Turn off living area water pump.

3. Check that refrigerator door is fastened.

4. Check that nothing heavy is stored in overhead or high cabinets which could fall out and cause injury. Heavy items should be stored in low cabinets.

5. Stow folding and pedestal tables.

6. Check that countertops, range top, credenza tops and shelves are clear of even small items that could become projectiles in an accident.

7. Do not cook while underway. Hot food or liquid could scald due to a sudden stop or accident.

8. Be sure all LPG controls on furnace, range/oven and gas/electric refrigerator are turned off.

9. Check that any internal stowage is securely held in place.

10. Check that lights and switches are set in positions safe for travel.

11. Adjust the driver's seat so that you can easily reach and operate all controls. Make sure seat is locked in position. Do not adjust driver's seat swivel or fore and aft mechanism while vehicle is moving. The seat could move unexpectedly causing loss of control.

12. Check that front passenger's seat is locked in position - both fore and aft adjustment and swivel mechanism.

13. Check rear view mirror adjustment, inside and outside. Adjust curtains if necessary for maximum visibility.

14. Fasten lap belts.

15. Check that step light goes out and that electric step has retracted.

SAFETY SEAT BELTS

In the forward driver's area of the motorhome, safety seat belts are provided for the use of the driver and the right front passenger. Safety belts are available for other seats. It is strongly recommended that all occupants remain seated with their safety belts firmly attached while the motorhome is in motion. The driver should adjust his seat so that he is able to reach all controls easily with the belt on, especially able to use all the travel on the foot brake. The belt should be placed as low as possible around the hips to prevent sliding out from under them in case of accident. This places the load of the body on the strong hip bone structure instead of around the soft abdominal area. Two people should never try to use the same seat belt.

WARNING:

Children must be secured in a Federally Approved Child Restraint Device. Failure to use proper restraints can result in severe or fatal injuries in case of accidents.

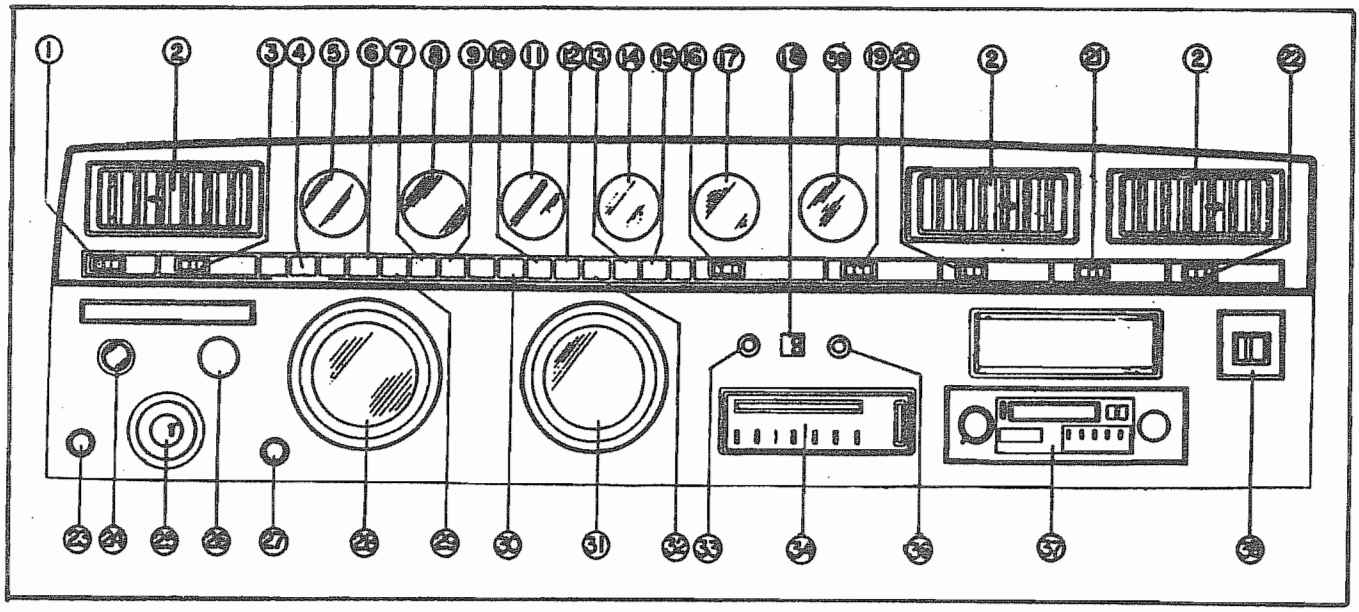
Child restraint devices are designed to be secured with lap or lap/shoulder belts. All instructions supplied by the restraint manufacturer must be followed. Statistics have shown children are safer when properly restrained in a rear seating position than in a front seating position.

Often the children traveling in motorhomes are grandchildren. There are times when our love for grandchildren makes us hesitate to properly supervise their actions. Don't hesitate when it comes to their safety. Make sure they are properly restrained.

CHILDREN HAVE LOVED ONES TOO.....IF YOU WON'T BUCKLE UP FOR YOURSELF, BUCKLE UP FOR THEM.

DASH CONTROLS AND INSTRUMENTS

Instrument Panel



1. I.C.C. Blink
2. Air Conditioner Outlets
3. Driving Lights
4. Left Turn Indicator
5. Fuel Gauge
6. Low Fuel Warning
7. Step Warning Light
8. Voltmeter
9. Brake Indicator
10. Low coolant Warning
11. Temperature Gauge
12. Overheating Warning Light
13. Open
14. Oil Pressure gauge
15. Right Turn Signal Indicator
16. Auxiliary Heater Switch
17. Fuel Economy Gauge, Gas Engine
18. Heater Switch, Exterior Mirror
19. Aisle Lights
20. Exterior Compartment Lights
21. Main Door Dead Bolt
22. Map Light Switch
23. Low Air Pressure
24. Head Light Switch
25. Ignition Switch
26. Wiper/Washer Switch
27. Warning, Leveling Jack Down
28. Speedometer
29. Low Washer Fluid
30. High Beam Indicator
31. Tachometer
32. Low Oil Pressure Warning
33. Switch, Remote Mirror RS
34. Heater/Air Conditioner Control
36. Switch, Remote Mirror CS
37. Radio/Tape Player
38. Generator Start/Stop Switch
39. Air Pressure, Rear Suspension

Note: Further explanations on following pages.

1. ICC BLINK: With this switch it is possible to blink the clearance lights on the motorhome. It is most commonly used as a way of indicating your thanks for a courtesy shown to you by another driver.

2. AIR CONDITIONER OUTLETS: The vanes of the outlets may be directed right or left, and the vane assembly will also swivel up or down.

3. DRIVING LIGHTS: To operate the driving lights the head light switch must be pulled out to the parking light or head light position before this dash switch will turn the driving lights on.

4. LEFT TURN INDICATOR: The light should blink when the turn signal lever is pushed down. If the light does not come on, or comes on and does not blink, the electrical system should be inspected.

5. FUEL GAUGE: The fuel gauge shows the approximate amount of fuel left in your tank. As you become familiar with your particular motorhome you will have a better idea of how much fuel is actually left at any indicated level.

6. LOW FUEL WARNING: When the low fuel light comes on you better slow down to conserve fuel and find a service station.

7. STEP WARNING LIGHT: The step warning light will be illuminated anytime the ignition is turned on and the step has not retracted. A push button switch in the door jamb automatically signals the step mechanism to retract when the door is closed and the engine is running.

8. VOLTMETER: The volt meter shows the voltage available to the electrical system. Because of the many accessories in the motorhome is is possible to see the voltage actually drop while you are driving. If this occurs, accessory use should be reduced until the engine alternator has a chance to bring the batteries up to full charge. You may also start the generator so the univolt system will provide current as well as the engine alternator.

9. BRAKE INDICATOR: The brake indicator serves a two-fold purpose. It lights up when the parking brake is applied or if there is a failure in either the front or rear hydraulic brake system.

10. LOW COOLANT WARNING: The low coolant warning light is measuring the fluid in the radiator recovery bottle. If coolant is needed, only antifreeze solution should be added.

11. TEMPERATURE GAUGE: The normal operating temperature is 190°F to 240°F.

CAUTION: Operation of engine above normal operating range for more than a few minutes can cause severe engine damage that is not covered by warranty.

12. OVERHEATING WARNING LIGHT: This light is to help bring to your attention that a problem is occurring.

13. OPEN: The third indicator light in from each end is not being used on our current models.

14. OIL PRESSURE GAUGE: Oil pressure will vary with ambient temperatures and viscosity of oil used. Readings in the mid-range at moderate temperatures and average road speed is considered normal.

    CAUTION: If oil pressure drops suddenly, or oil pressure is not indicated after starting, the engine must be shut off immediately to avoid damage.

15. RIGHT TURN INDICATOR: The light should blink when the turn signal lever is pushed up. If the light does not come on, or comes on and does not blink, the electrical system should be inspected.

16. AUXILIARY HEATER SWITCH: The heater switch is to operate the two-speed fan. The heat source is from the engine so the "core" of the heater is hot whenever the engine temperature has reached the normal operating range.

17. FUEL ECONOMY GAUGE: The best gas mileage is obtained when the fuel economy gauge is operating at the highest figure.

18. MIRROR HEATER SWITCH: The switch should be turned off as soon as the mirrors are clear. A time delay device is built into the system that will shut the heater off automatically after about 9 minutes.

19. AISLE LIGHTS: The aisle lights enable the driver to illuminate the aisle of the vehicle without turning on overhead lights in the passenger area that could hinder the driver's vision at night.

20. EXTERIOR COMPARTMENT LIGHTS: The compartment lights are located at the LP tank, generator, 110 volt cord storage compartment and docking lights on some models.

21. MAIN DOOR DEAD BOLT: The dead bolt warning light will come on when the ignition switch is on and the dead bolt is not locked. The dead bolt may be locked or unlocked by depressing the dash switch, or it can be operated manually.

22. MAP LIGHTS: The map lights are located overhead in the driver's compartment. Each light has an individual switch and can be swiveled.

23. LOW AIR PRESSURE LIGHT: This light is illuminated when the air pressure to the air bags drops below 60 psi. It is normal for this light to come on when the ignition is turned on after the coach has not been operated for a day or more.

24. HEAD LIGHT SWITCH: The head light switch is operated by pulling in and out. When the switch is pulled out to the first notch the running lights and dash lights will be illuminated. The intensity of the dash lights may be varied by rotating the switch. Pulling the switch out all the way turns on the head lights. The dimmer switch for the head light Hi-Lo beam operation is located left of the brake pedal. If the head lights are left on, and the ignition switch is turned off, a warning buzzer will sound.

25. IGNITION SWITCH: The ignition switch has four positions: Accessory: You can use some electrical accessories when the engine is not running. To engage this position turn the top of the square head key to the left. Off: Normal parking position. Used to turn off the engine and accessories. The key must be turned to "OFF" before it can be removed. Run: Key turned to right and released. Normal operating position. Start: Key turned to right as far as possible and held against spring tension. Do not crank engine more than 30 seconds without releasing key to allow starter to cool.

26. WIPER/WASHER SWITCH: The wiper switch is three speeds and is turned on by rotating clockwise. The sequence is intermittent, slow and high speed. The washer is operated by depressing the knob. **Note:** The large wiping area, long wiper arms and blade, requires two motors in order to have ample power. Each electric motor will run at slightly different speeds, so it is normal for the stroke of the wipers to vary from each other.

27. WARNING LIGHT: Stabilizer jack not retracted.

28. SPEEDOMETER: The speedometer indicates the speed of the vehicle in both miles per hour (MPH) and Kilometers per hour (km/h).

29. LOW WASHER FLUID: If the windshield washer fluid is low this light will glow. Only fluid designed for this use should be used.

30. HIGH BEAM INDICATOR:

31. TACHOMETER: The tachometer indicates the number of times the engine revolves per minute (RPM).

32. LOW OIL PRESSURE WARNING: This is one of the most important warning lights on the dash panel. Engine should be shut down immediately. Failure to do so will almost invariably cause severe engine damage that may not be covered by warranty.

33. & 36. REMOTE SWITCH-EXTERIOR MIRRORS: The angle of the mirror will change in the direction you push the switch. IE: Push the switch up and the mirror tips up, push the switch sideways and the mirror will angle in or out.

34. DASH HEATER AIR CONDITIONER CONTROL:

37. RADIO/TAPE PLAYER: Complete instructions for the operation of the entertainment center is furnished with each new motorhome.

38. GENERATOR SWITCH: The remote generator switch on the dash allows the driver to start or stop the generator without leaving the driver's seat. It should be noted a built-in time delay allows the generator to reach full operating speed before 120 volt current is provided to the coach.

39. AIR PRESSURE, REAR SUSPENSION: This air pressure constantly monitors the pressure in your air bags. The system should be checked if the needle remains in the red on either end of the scale for more than a couple of minutes.

Flood Light

(Optional, not shown) Two switches control the operation of the search lights. The left hand switch controls the directional movement of the lights. Move it up or down, right or left, and the light will move in the same direction. The right hand switch illuminates the light in either spot light or flood light mode.

Auxiliary Start Switch

An auxiliary start switch is located in the glove box next to the 12 volt automotive fuse panel. If the engine battery does not have enough power to start the engine, activating this switch will close a solenoid, tying both coach batteries and the engine battery into one circuit.

Speed Control

The speed control is an automatic control system which enables your motorhome to maintain a desired speed while traveling on the highway.

TO ACTIVATE: Slide switch from "OFF" to "ON" (located on the turn signal lever).

TO ENGAGE: Maintain desired speed and depress "SET SPEED" button (located in the end of the engagement switch): Then release button slowly. You may also engage your speed control by moving slide switch from "OFF" to "RESUME" and releasing. You may remove your foot from the accelerator pedal as speed will be automatically maintained.

The slide switch operates in two modes as follows:

1. RETARD SPEED: Slide switch to "OFF" position. Vehicle speed will decrease.

2. RESUME SPEED: When system is engaged and the brakes have been applied, former set speed can be resumed by sliding the switch to "RESUME" momentarily and releasing.

Speed can be increased at any time with normal pressure on the accelerator pedal.

Your speed control is disengaged by lightly depressing brake pedal, by sliding the switch to "OFF" position, or by turning the ignition off.

CAUTION: The use of the speed control is not recommended on icy or wet roads or in congested traffic.

Considering the fact that the speed control is controlled by vacuum, there will be times when the unit may appear to malfunction. This situation could occur when the vehicle is subjected to extremely heavy loads, severe upgrades, or driving into an excessive head wind; any one of which would create a low vacuum situation, thus causing the vehicle to drop off speed. The solution to overcome this apparent malfunction is to temporarily use the accelerator pedal to assist during the period of low vacuum or an excessive reduction in speed. Under normal driving conditions you can expect the speed control to maintain the set speed plus or minus two miles per hour.

Cab Seats

The cab seats will adjust three ways for maximum comfort. Three levers control the operation. Moving the upper lever on the right side rearward allows the seat to recline. The lower lever on the right side, when moved forward, allows the seat to swivel. Pushing the lever on the left side to the left allows the seat to slide forward or backward.

Power Seat controls

Power seat controls have three switches. The center switch moves the seat up and down, forward and back. The other two switches control the tilt of the seat. If the seat is run to the end of its movement in any direction a stall condition will exist and a 12 volt automatic circuit breaker will "kick-out" to avoid damage to the motors. If this occurs wait approximately 30 seconds and operate the switch in the opposite direction.

CAUTION: Revolving the power seat completely around will pull the wiring apart. The seats should only be swiveled toward the center of the vehicle. If the wires are loosened they can be reconnected by following the color code: Red to red, green to green, etc. On some models the wires will be on a plug that can be reattached.

WARNING:

Never operate seat adjustment while driving vehicle. Unexpected seat movement could cause loss of control.

Note: Information on the operation of driver's controls is provided in the chassis driver's manuals.

TV Backing Monitor (Optional)

The optional TV backing monitor can be extremely helpful, especially when traveling alone. The Owners Packet includes complete instructions on use. Practice with the monitor in a safe place will make it much easier for you to use it when it is really needed.

FUEL STOP SERVICING

The fuel cap is located in a housing marked MOTOR FUEL, see photo.

Note: If the gas cap requires a replacement only a cap with the same features should be used. Chevrolet uses a pressurized cap with a 1.5 psi rating.

WARNING:

All pilots and appliances must be turned off during refueling of motor fuel tank and permanently mounted LP gas tank. Open cap slowly.

Fuel Selection (Carburated Engines)

Use regular grade leaded or unleaded fuel of at least 87 octane (89 octane for leaded fuel), depending on your engine.

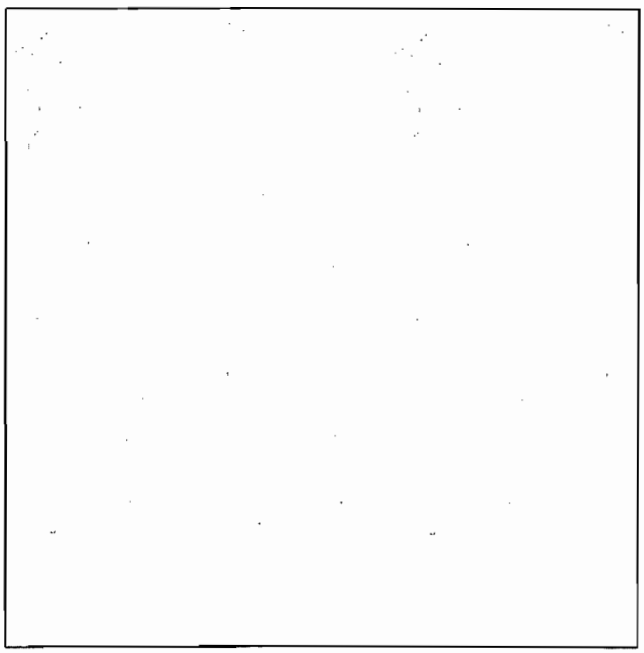
Fuel Selection (Throttle Body Injection Gasoline Engines)

Use only unleaded fuel. Unleaded fuel must be used for the emission control system to operate properly. Leaded fuel will damage the Computer Command Control system oxygen sensor, reduce the effectiveness of the catalytic converter and affect emission control. Using leaded fuel could also result in loss of emission warranty coverage.

Note: Refer to your Chevrolet Driver's Manual for further fuel specifications.

CAUTION:

Motorhome fuel tank should not be overfilled. Only fill until the gas pump nozzle kicks off automatically.



Rear Air Suspension

In high humidity the rear air suspension air reservoir tank should have the moisture drained every 60 days on the Chevrolet chassis. The reservoir tanks are mounted behind the drive axles. When the humidity averages 40% or lower the moisture should be drained at oil change intervals. The drain valve is found under the right rear compartment. To drain, open valve until moisture has been expelled. This valve may also be used to supply air to the system if the compressor should fail for any reason.

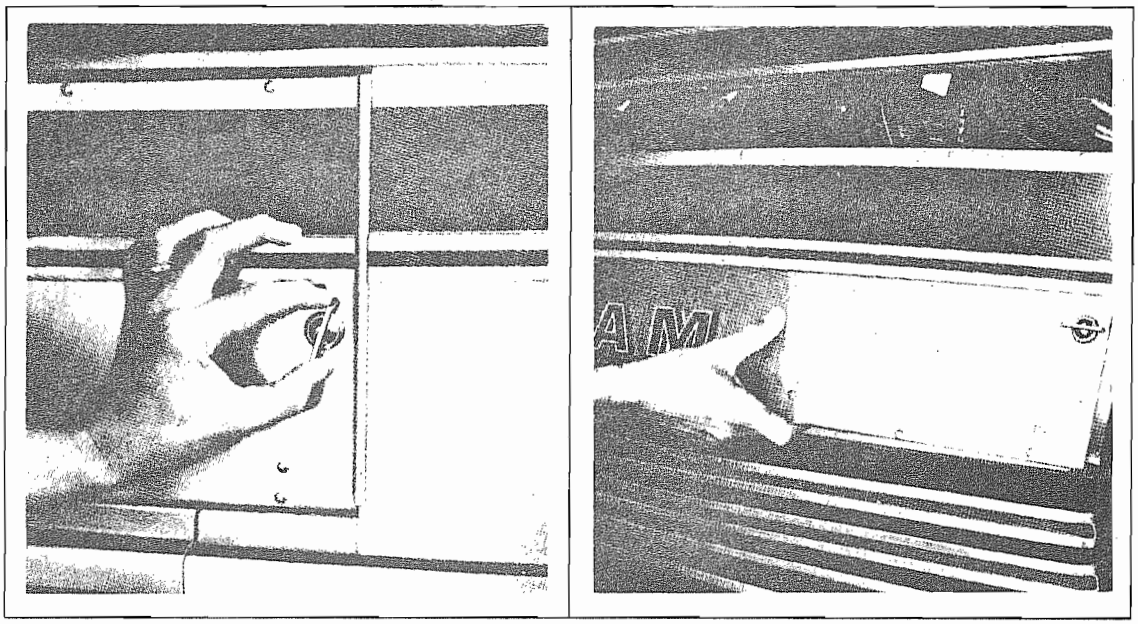
A fitting located in the lower compartment next to the tank is provided so you may tap into the air pressure used by the suspension system. This would allow you to inflate tires, etc. in an emergency. An air hose with fittings and tire chuck are provided with each motorhome. Only attach air hose when in actual use. Any leakage in the hose would deflate the air bag system.

Engine Cover

The engine cover is removed by releasing the four rubber "T" handles. To release pull up on the "T" handles until the stationary bracket is clear, then swing out away from the engine cover.

Forward Service Door

To open forward service door turn latches located on both curbside and roadside, see photo. Pull out on lower edge of door and lower to open position, see photos.



SUGGESTED PRE-TRAVEL CHECK LIST

Interior

1. Turn off water pump switch.
2. Lock all interior cabinet doors.
3. Latch refrigerator door. (Seal containers first).
4. Hold down or stack securely all loose, hard and sharp objects.
5. Fasten sliding and foldette doors.
6. Drain toilet bowl.
7. Turn off interior lights.

Exterior

1. Disconnect and stow:
   a. Electrical hookup cord
   b. Sewer hookup hose (flush out)
   c. Water hookup hose
2. Remove or stow leveling jacks and wheel chocks.
3. Check hitch (if you are towing)
4. Check clearance and stop lights
5. Check lug nuts
6. Check tires for correct pressure
7. Adjust mirrors
8. 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. Hydraulic jacks.
11. Cross type lug wrench.
12. Quality tire gauge.
13. Emergency road warning triangle.

Personal

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

Motoring Essentials

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

NOTES

CHASSIS

The Airstream motorhome is built on a Chevrolet chassis. Operation of the Chevrolet engine and other related components is discussed in the Chevrolet Owners and Drivers Manual supplied with each coach.

If repairs are needed it can be difficult to determine which parts of the chassis are warranted by Chevrolet, and which are Airstream's responsibility. The following list shows the major components of the chassis and the company responsible for their servicing.

CHEVROLET (P-30 Forward Control, Motorhome Chassis)

Engine
Transmission
Brakes (Except Tag Axle)
Steering Assembly
Front Spindle, Bearings
Steel Wheels
*Air Conditioner
Air Pumps for Pollution Control
Turn Signals
Front Suspension, Air Bags (Except Shocks)
Drive Axle and Hubs
Rear Shocks
Automotive Fuse Panel (In Glove Box)
Radiator, Condenser, Oil Cooler
Parking Brake

AIRSTREAM

Tag Axle, Complete
Rear Air Bag Suspension
Drive Shafts
Front Shock Absorbers
Auxiliary Heater
Dash Instruments and Lights
Cruise Control
*Dash Heater
Windshield Wipers
Leveling Jacks
Fuel Tank and Fill
Electric Fuel Pump
Aluminum Wheels
Horn
Isolator
12V Automatic Circuit Breakers

*The warranty on the dash air conditioner/heater can be confusing. Chevrolet provides and installs the air conditioning compressor, condenser, dryer, dual cooling fans and associated plumbing. Airstream provides and installs the blower, evaporator, dash control heater core and heater hoses. All venting and duct work is Airstream's.

The above list covers almost all of the chassis components. If you need further clarification or information contact the Airstream Customer Relations Department at 513-596-6111. If you wish to write the address is:

Airstream, Inc.
419 W. Pike Street
Jackson Center, Ohio 45334

REAR SUSPENSION

The rear suspension on the 350 and 325 models is air suspension on the dual wheel axle, and a Dura-Torque (R) rubber torsion tag axle.

Two automatic leveling valves on the tag axle sense the weight changes on the rear suspension and increases or decreases air pressure in the air bags on the dual wheel axle. This prevents the load from being absorbed by the tag axle and robbing the drive wheels of traction.

AIR COMPRESSOR

The air compressor for the air bags is located in the curbside rear corner cabinet of the 350 and 325 series. The main power supply comes from a 12 volt circuit breaker mounted next to the isolator in the front of the vehicle and goes to a solenoid at the compressor. Current to close the solenoid points comes from the accessory side of the automotive fuse flock. With this circuitry there is only power available to the compressor when the ignition is "on". The compressor is only supplied with power when the ignition key is "ON" or in the accessory position. As with any compressed air system, water is formed. At each oil change the air valve on the bottom of the reservoir tank should be depressed until all liquid has been expelled. In high humidity areas, and during winter months, the tank should be drained on a more frequent basis.

LOW AIR PRESSURE LIGHT

A low air pressure light on the dash will come on if the pressure in the air bags drops below 40 psi and the ignition is on. It is normal for this light to come on and the compressor run for a few minutes when you first start the motorhome after it has set for a while. If the motorhome is parked unlevel it may be necessary to move to a more suitable site before the compressor will fully inflate the system.

If the low air pressure light does not go off, further checks should be made to the system before resuming travel. First check the air pressure at the air reservoir tank behind the axle. A tire-type valve is located on the bottom of the tank. Air pressure should be in the 75-100 psi range.

Second, check the height of the air bags (see illustration). A measurement of less than 9" would indicate a problem. If the height is more than 9 1/2", and the tank pressure is proper, continue on your trip; but, check the air bag height regularly. In an emergency air can be added directly to the reservoir tank. Do not exceed 120 psi.

WARNING: If you must drive to a service location with the air bags deflated, keep speeds below 50 mph and cross any railroad tracks or similar hazards at the lowest speed possible to prevent damage to the tag axle.

TAG AXLE

The tag axle suspension is made by Henschen Industrial, a Division of Airstream, and has been used on Airstream trailers for more than twenty-five years with proven dependability. Since this suspension is within the axle tube, the only downward weight is from the spindle arm out. With the lack of force to push the tire down past its "relaxed" state the inside tag axle tire may be lifted clear of the pavement when traversing sharp corners at high speeds.

Normally there will not be any reason to adjust the brake controller for the tag axle. Occasionally though, after the surface of the brakes are worn in and mate perfectly, it may be necessary to reduce the braking slightly. The controller is mounted under the dash on the left side of the steering column. On the bottom of the controller is a knurled cap. Under the cap is an adjusting screw with arrows indicating the correct direction to turn for more or less brakes.

The "spring" of the Dura-Torque axle comes from four rubber rods extending into the axle tube on each end.

CAUTION: Do not allow heat to be applied to the axle tube. The rubber rods are not visible and will be damaged by excessive heat.

Alignment of this unique axle is accomplished by bending (cold) the axle tube. If realignment should ever be required your dealer can give you the location of the closest alignment shop with the correct equipment.

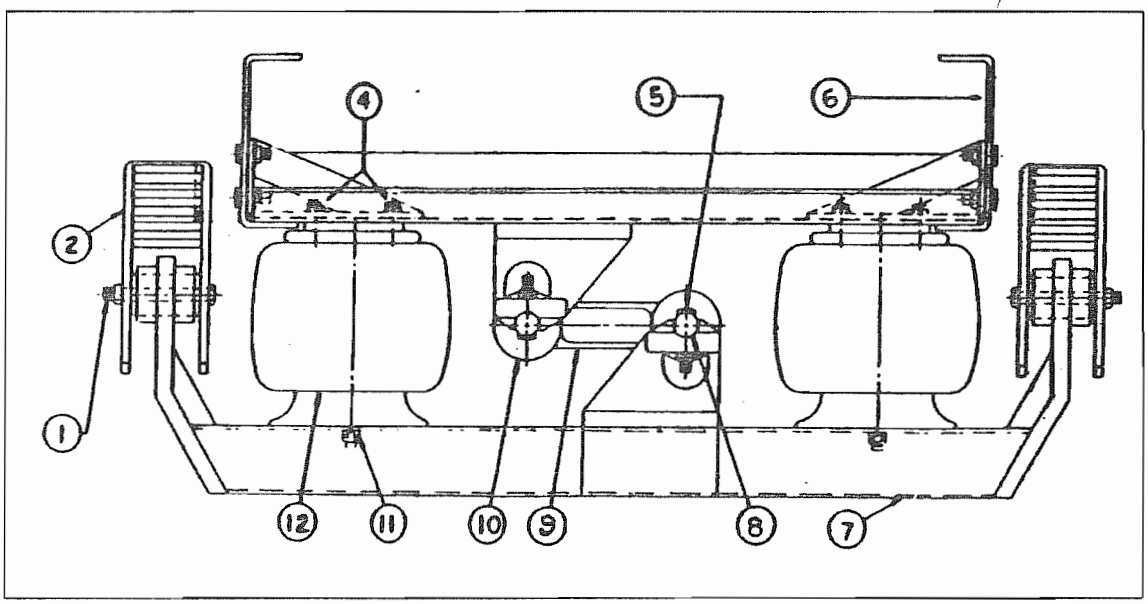
Lubrication

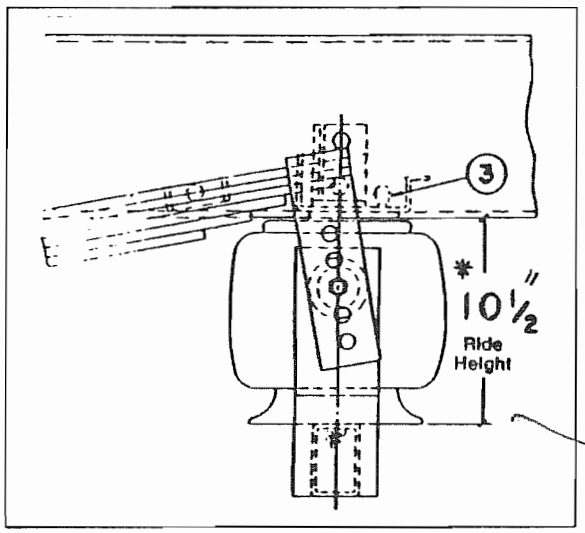
For your convenience all motorhomes with tag axles are supplied with a small grease gun and two cartridges of Lithium base grease.

Tag axles have a special Sure-Lube system to ease wheel bearing maintenance. At each oil change the center of the hub cover on the tag axle should be "popped out" to expose the grease zerk. Lithium base wheel bearing grease is then injected until grease flows from the small vent hole in the axle tube.

CAUTION: The Sure-Lube system is an added feature, but is not intended to replace normal wheel bearing maintenance. Complete wheel bearing cleaning, inspecting and repacking should still be done every year or 12,000 miles.

AIR BAG SUSPENSION ASSEMBLY - CHEVROLET CHASSIS

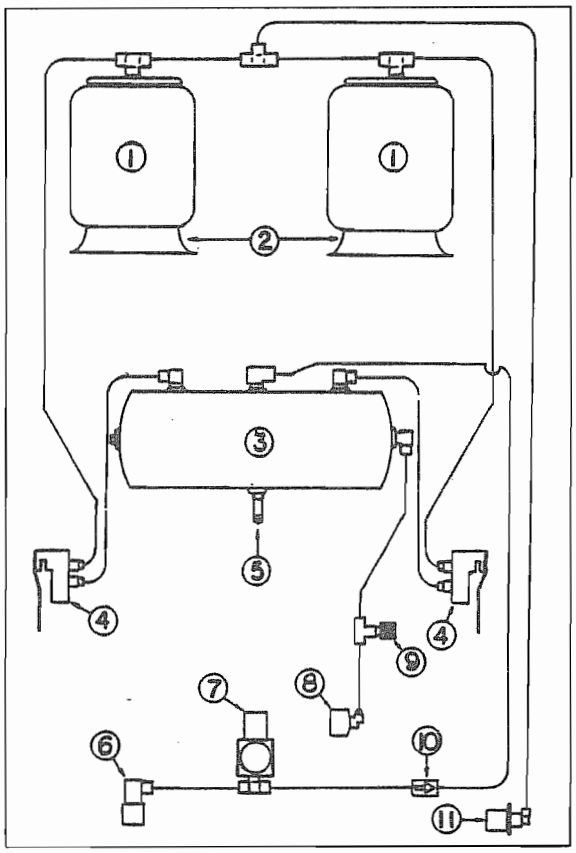




1. Rear Shackle Bolt
2. Stirrup
3. Air Fitting
4. Bolt, Bag Mounting, Upper
5. Bolt, 1/2 x 2 1/2 NF (Gr.8)
6. Chassis Frame
7. Support Beam, Air Bag
8. Straddle Pin
9. Traverse Rod
10. Traverse Rod Bushing
11. Stud, Bag Mounting, Lower
12. Air Bag

The 10 1/2" ride height figure shown in the illustration is optimum. The actual measurement could be 9 1/2" to 10 3/4". A good rule of thumb is to not try to alter the height unless you have good reason to believe there is a problem. Each motorhome is weighed and the leveling valves adjusted and rechecked at the factory. The criteria is 3,000 lbs. total weight on the tag axle. Since the setting is made by actual weight instead of height, the height will vary to some degree. The bags are plumbed together. This means if you are parked so the motorhome is leaning, it is natural for the two bags to measure different heights.

AIR LINE SCHEMATIC



BELOW FLOOR

1. Air Bag
2. Cone, Air Bag
3. Air Supply Tank
4. Leveling Valve
5. Air Valve, Tire Type

ABOVE FLOOR

6. Solenoid, Air Relief
7. Compressor
8. Switch, High Pressure
9. Coupler, Air Hose Fitting
10. Check Valve
11. Sender, Air Pressure

The logic of the air system is as follows: The compressor supplies air pressure through a check valve into the air supply tank. The air supply tank provides pressure to the intake side of the leveling valve. When the leveling valve is opened by the body of the coach lowering over the chassis, the air pressure is supplied to both air bags through a "T", raising the coach back to the proper height.

The high pressure switch controls the air pressure in the air supply tank. The switch comes "on" when the pressure drops below 80 psi, and shuts "off" when the pressure reaches 100 psi.

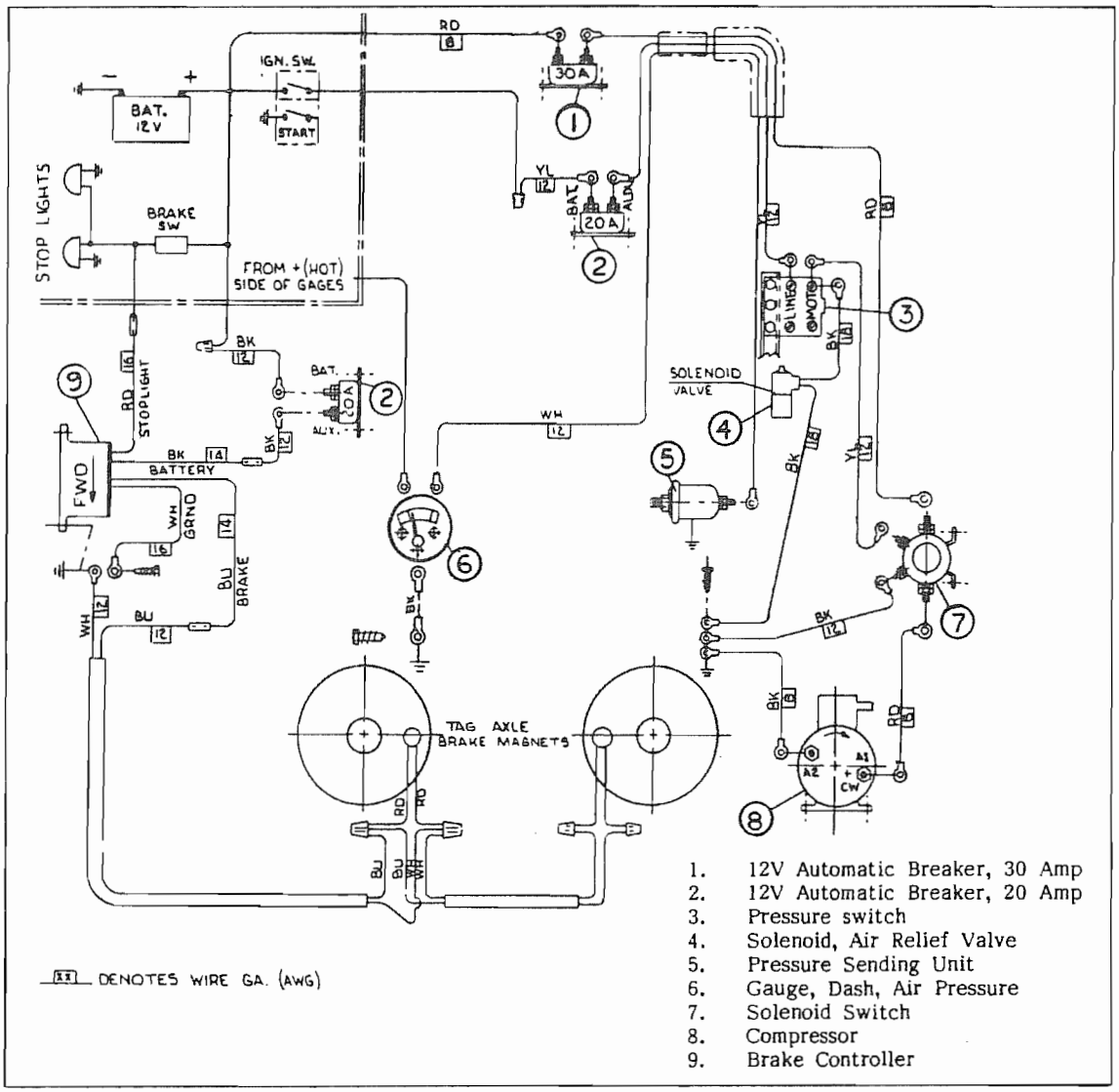
The sender monitors the pressure in the air bags and sends the appropriate signal to the air gauge on the dash.

The solenoid operated air valve next to the compressor is a normally open valve. It is wired with the compressor. When power to the compressor is shut off by the high pressure switch, power is also shut off to the solenoid. Without power the solenoid opens and releases all air pressure from the check valve back through the compressor. When power is supplied to the compressor the solenoid closes. The reason for the solenoid is to allow the compressor to start under a "no load" condition.

The tire-type valve on the bottom of the air supply tank should be drained occasionally by depressing the valve stem. Hold it down until all moisture is drained. A good habit would be to drain the air tank at each oil change. In some high humidity areas you may want to do it on a more frequent basis. On late 1990 models the drain valve was extended out to the side of the vehicle and can be found under the right side rear storage compartment.

The air compressor, solenoid, high and low pressure switches are all mounted in the rear, curbside cabinet next to the bed. Access is gained by removal of a panel held in place by screws.

WIRING SCHEMATIC - AIR SUSPENSION - CHEVROLET

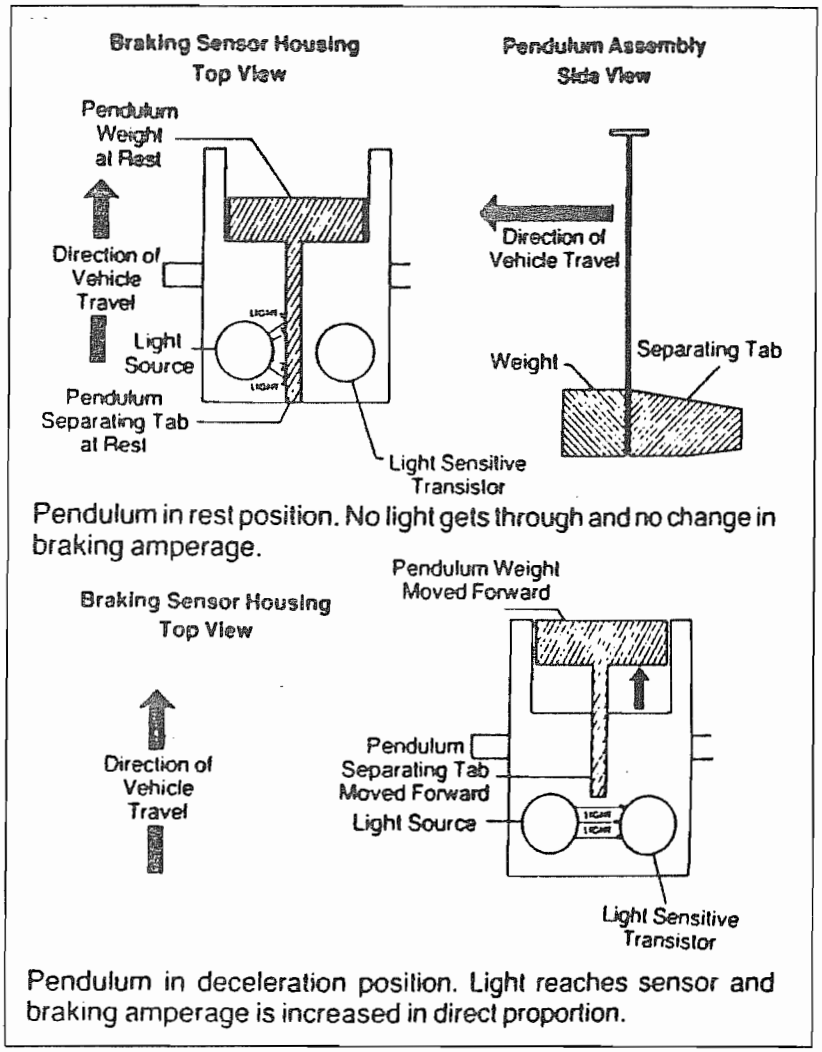


1. 12V Automatic Breaker, 30 Amp
2. 12V Automatic Breaker, 20 Amp
3. Pressure switch
4. Solenoid, Air Relief Valve
5. Pressure Sending Unit
6. Gauge, Dash, Air Pressure
7. Solenoid Switch
8. Compressor
9. Brake Controller

OPERATION

Constant 12V power is supplied from the battery through a 30 amp breaker (Item 1) to a solenoid (Item 7). This is a heavy 8 gauge wire designed to carry the load of the compressor. Lighter 12 gauge wires to open and close the solenoid are routed from an ignition circuit through a 20 amp breaker to the air pressure switch. Only when the ignition is "on" and the pressure switch is closed will current reach the solenoid so its points will close and power the compressor.

Note how the air relief valve (Item 4) is wired to the same side of the pressure switch as the wire operating the solenoid. The air relief valve is normally open. Wired in this manner, when the compressor runs the air relief valve will be closed, allowing the compressor to pressurize the tank. When the air pressure switch is satisfied, and the points open, the compressor shuts off and the air relief valve opens, draining air pressure from the line between the check valve and the compressor.



The electric brakes on the tag axle of the motorhomes may seem exotic to the automotive industry, but to the RV industry they are a standard. So standard that almost all RV travel trailer dealers keep a stock of parts and have mechanics totally familiar with the system.

On our motorhomes we've selected a pendulum type brake controller for its simplicity and dependability. It has been preset at the factory and further adjustments should not be necessary. Occasionally, as the mating surfaces wear into each other, it might be a good idea to reduce braking a little. The controller is mounted on the left side of the steering column support bracket. The adjusting screw is on the bottom of the controller.

Four wires are on the brake control. The black picks up power from a circuit breaker accessible through the front access door. The white is ground, blue goes to the brake magnets and the red is wired to the stop light switch.

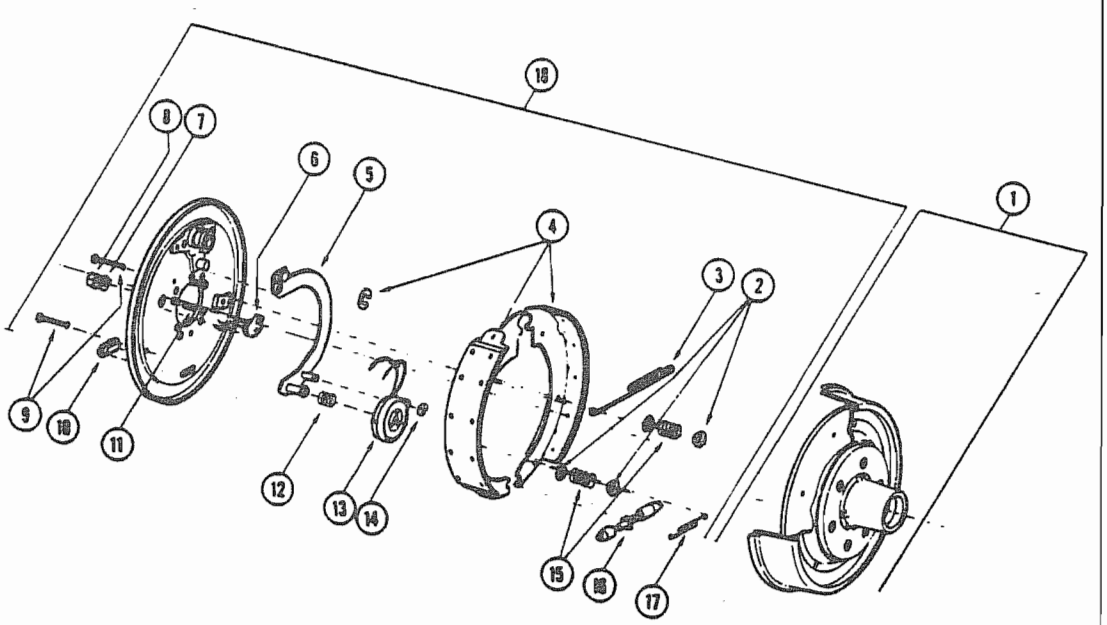
OPERATION

1. When the brake lights are operated the electronics of the controller are activated and a small amount of current is supplied to the brake magnets.

2. As brake pedal pressure increases a pendulum in the controller starts to swing forward, and a directly proportional increase of power is supplied to the brake magnets.

3. When the brake pedal is released, and current to the brake lights senses the release, current flow to the brake magnet is stopped.

TAG AXLE ELECTRIC BRAKE ASSEMBLY



12" Kelsey-Hayes Brake Assembly

1. Unicast hub and drum
2. Hold down cups
3. Retractor Spring
4. Shoe and lining (1 primary, 1 secondary)
5. Lever (RH, LH)
6. Connector (Magnet Leads)
7. Brake mounting washer
8. Brake mounting nut
9. Hold Down pins
10. Brake Adjusting hole cover
11. Brake mounting stud
12. Magnet spring
13. Magnet assembly
14. Magnet retaining ring
15. Hold down springs
16. Adjusting screw assembly
17. Adjusting screw spring
18. Brake assembly (RH, LH)

CHECKING ELECTRICAL BRAKE SYSTEM

1. To check Complete Circuit

   A. Disconnect wire leads at brake backing plate and connect to volt meter.

   B. Apply brake. Low voltage should be indicated.

   C. Take controller loose from steering column bracket and point forward end down. Voltage should increase.

   D. Holding forward end of controller downward, bump it against the heel of your other hand. Volt meter should show increase in proportion to the distance the internal pendulum of the controller is swinging.

2. To Check Magnet

   A. Using a DC ammeter with a minimum range of 0 - 10 amps, connect as shown in Fig. 1.

   B. Wiggle magnet leads and rap on magnet.

   C. If ammeter shows any current, a short is indicated and magnet should be replaced.

   D. Reconnect magnet as shown in Fig. 2.

   E. Current reading should be 3.0 to 3.5 amps. If not, replace magnet.

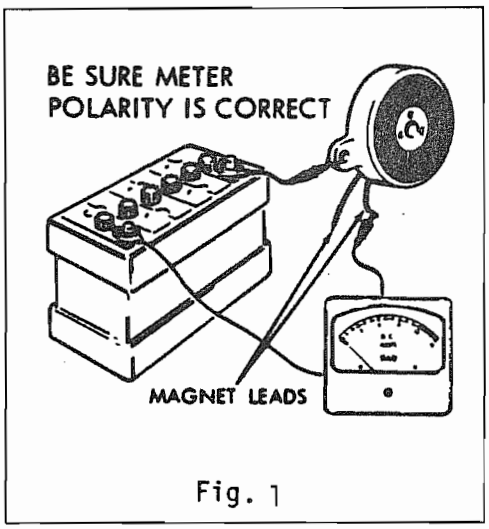


Fig. 1

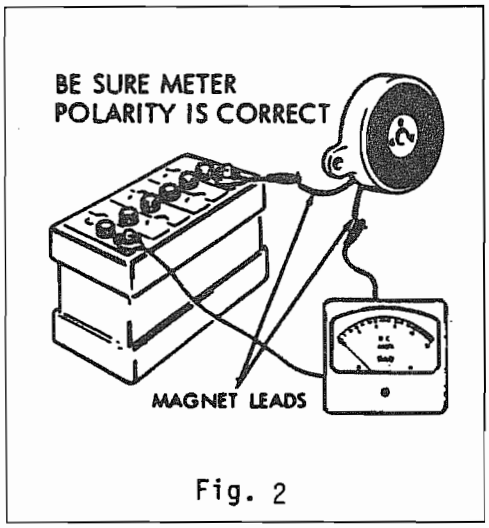


Fig. 2

CHECKING MECHANICAL BRAKE COMPONENTS

1. To check magnet.

   A. Check angle of wear pattern as shown in Fig. 3 with a straight edge.

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

   C. A magnet that is not wearing flat must be replaced since it cannot function efficiently. 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 trip 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.

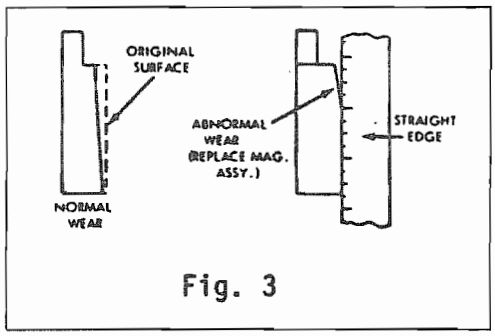


Fig. 3

2. Wheel Bearing Maintenance

   A. Pull dual drive wheels up on ramp approximately 8" high until tag axle tires clear ground.

   B. Set hand brake and chock tires securely.

   C. Place index marks on wheel and drum so they can be mated back in the same position.

   D. Remove wheel from drum.

   E. Remove spindle cover, dust cap, cotter key, spindle nut and washer.

   F. Remove outside bearing and brake drum.

G. Lay down drum with inside grease seal down. Knock out inner bearing and grease seal using wood or plastic dowel and hammer.

H. Clean all parts thoroughly with kerosene.

I. Check all bearings for chips or roughness of any kind. Always replace both bearing and race if damage is found on either.

J. If bearing packing equipment is not available place a quantity of grease in the palm of one hand and push the large end of the bearing cone down into the grease.

K. Rotate bearing and continue forcing large end down into grease until grease is extruded up through small end and completely around circumference of bearing. See Illus:

L. Use No. 2 grade 265 ASTM penetration or equivalent grease.

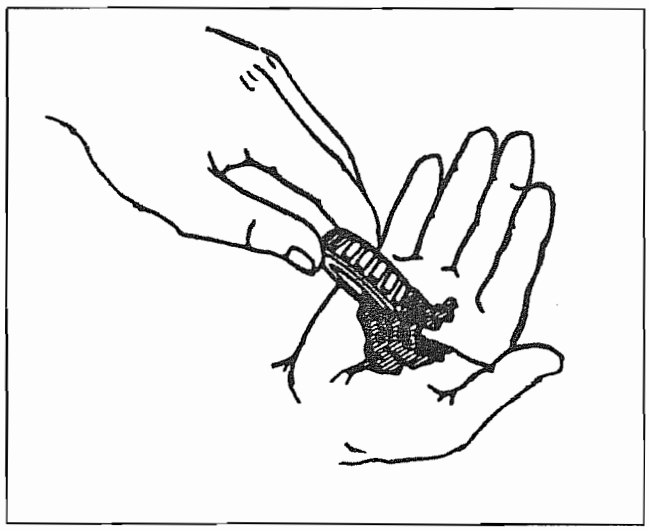
M. Liberally coat outside of inner bearing. Place in drum and install new grease seal with wooden or leather mallet.

N. Carefully place drum on spindle to avoid damaging grease seal.

O. Install packed and coated outer bearing, spindle washer and spindle nut.

P. While rotating the wheel tighten the spindle nut with a 12 inch 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.

Q. Align index marks and install tire and wheel, torquing lugs to 130-150 ft. lbs. Recheck or advise customer to recheck at 50 miles and again at 200 miles to assure tightness.



3. Armature plate (The surface the magnet contacts when brakes are applied.)

   A. Under normal conditions the armature plate should last indefinitely. However, if an armature plate shows excessive galling due to contamination (mud, small stones, etc.) the complete drum must be replaced.

4. Brake Drum

   A. Inspect the brake drum rubbing surface. This surface should have a dull grey appearance free from heavy scoring and/or excessive wear. One or two light score marks are not cause for reboring the drum. If the drum has heavy scoring, is worn more than .020" oversized, or has more than .015" runout, the drum should be rebored. A standard drum lathe may be used, taking care not to remove more than .060" from the original drum diameter (.030" per side). The drum should be discarded if it must be bored more than .060" over its original diameter to clean up the surface.

5. Brake Lining

   A. Inspect the brake linings for wear. If a lining is worn to the rivets it should be replaced. Inspect for uneven lining wear patterns such as shown in Fig. 4, and replace if this condition exists. Wear patterns such as this may indicate improperly located flanges or a bent backing plate. Also, if lining is badly contaminated with grease, oil, etc., it must be replaced since contamination of this type cannot be sanded or disolved out.

IMPORTANT: Always replace brake linings in sets. Both brakes on the same axle.

   B. If the lining is worn to the rivets without evidence of uneven wear, simply replace with new Kelsey-Hayes factory ground shoe and lining assemblies.

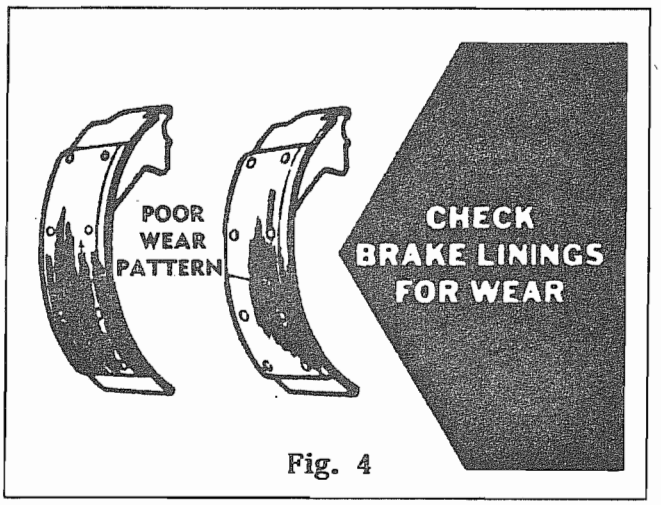


Fig. 4

BRAKE ADJUSTMENT

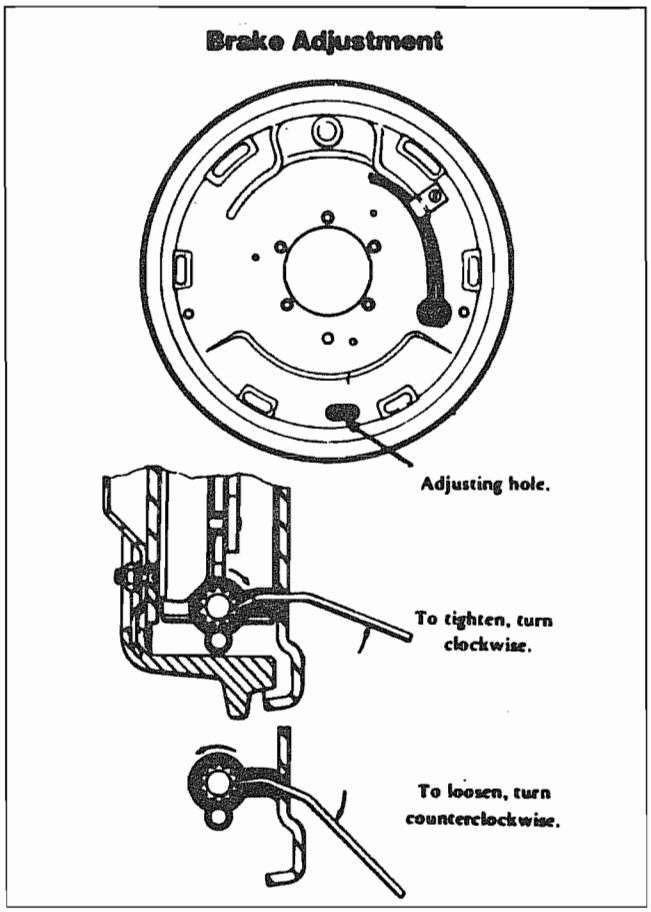
1. Pull dual drive wheels up on ramp approximately 8" high until tag axle tires clear ground.

2. Set hand brake and chock tires securely.

3. Remove rubber plug and tighten the brake adjustment screw while spinning the wheel until heavy drag is felt.

4. Back off adjustment until tire spins freely.

5. Repeat on other side.



TROUBLE SHOOTING BRAKES

PROBLEM: Grabby or locking brakes.

CAUSE/ REMEDY: Control voltage too high. Adjust controller to reduce power.

CAUSE/ REMEDY: Improper lining. Check lining. Replace if necessary.

CAUSE/ REMEDY: Grease on lining. Check for contamination. Replace seals and lining.

CAUSE/ REMEDY: Loose parts in brakes. Check for loose rivets, broken springs, etc. jammed in brakes.

CAUSE/ REMEDY: Rust in armature plate and/or brake drums. Caused by non-use. Usually corrected by normal continued use.

CAUSE/ REMEDY: Selective resistor setting incorrect. Readjust to increase resistance.

PROBLEM: Weak Brakes

CAUSE/ REMEDY: Poor connection. Check that all connections are clean and tight.

CAUSE/ REMEDY: Short Circuit, Check electrical circuit.

CAUSE/ REMEDY: Worn or defective magnets. Replace magnets.

CAUSE/ REMEDY: Poor brake adjustment. Adjust brakes.

CAUSE/ REMEDY: Backing plates bent or misaligned. Check backing plate and flanges. Correct if necessary.

CAUSE/ REMEDY: Greasy lining. Check for worn or damaged grease seals. Replace if necessary. Make sure bearings are packed with high grade bearing grease not cup grease or chassis lubricant.

CAUSE/ REMEDY: Using trailer brakes only. Use of trailer brakes only can cause early fade or loss of friction due to excessive heat.

CAUSE/ REMEDY: Control voltage too low. Adjust controller to increase power.

PROBLEM: No Brakes

CAUSE/ REMEDY: Open circuit. Check for broken wires, loose connections, improper grounding.

CAUSE/ REMEDY: Improperly wired or inoperative controller. Check controller operation.

CAUSE/ REMEDY: Poor brake adjustment. Adjust brakes.

CAUSE/ REMEDY: Worn or defective magnets. Replace magnets.

CAUSE/ REMEDY: Short Circuit. Check electrical circuit.

PROBLEM: Intermittent or surging brakes.

CAUSE/ REMEDY: Out of round drums. Rebore drums if more than .015 out of round.

CAUSE/ REMEDY: Broken magnet lead wires. Bench check magnets. Replace if necessary.

CAUSE/ REMEDY: Loose wheel bearings. Check and adjust bearing.

PROBLEM: Dragging brakes

CAUSE/ REMEDY: Brakes adjusted incorrectly. Check brake adjustment.

CAUSE/ REMEDY: Electrical defect in controller. Insufficient gap between controller contactor strip and coil may cause brakes to be on continuously. Correct condition.

CAUSE/ REMEDY: Badly corroded brake assemblies. Check brake assemblies for severe corrosion. Check to be sure magnet levers operate freely. Clean and lubricate brake assemblies.

CAUSE/ REMEDY: Weak or broken shoe return spring. Check and replace if necessary.

PROBLEM: Noisy Brakes

CAUSE/ REMEDY: Lining worn to rivets. Check and re-line linings.

CAUSE/ REMEDY: Loose parts, rivets, broken springs, etc. Check and Repair.

CAUSE/ REMEDY: Bent backing plate. Check and repair if necessary.

CAUSE/ REMEDY: Grease on lining. Check and re-line if necessary.

CAUSE/ REMEDY: Improper bearing adjustment. Check and adjust bearings. Check for worn or damaged bearings. Replace if necessary.

CAUSE/ REMEDY: Poor adjustment. A certain amount of noise is normal when the brake releases. Proper adjustment will minimize the noise.

FRONT SUSPENSION

The only alternation Airstream makes on the Chevrolet front suspension is to replace the shock absorbers with a double action shock.

The new shock is surrounded with a coil spring that is adjustable. We set the spring in a "no load" position. In other words, as the motorhome is sitting still there is no force on the spring, either up or down.

When Airstream aligns the front end, the pressure in the air bag inside the coil spring is set at 55 psi. There is a tire-type fitting protruding down through the lower coil support plate so the pressure can easily be checked.

DRIVE SHAFTS

The drive shafts on the 325 and 345 motorhomes have been changed to reflect the longer than standard Chevrolet wheel base. Replacements are available through the Airstream Parts Department.

Carrier bearings are Dana/Spicer #210391-1X and are commonly available through automotive parts stores. Universal joints, Dana/Spicer #5-160X, are also easily found in automotive establishments.

AUXILIARY HEATER

The auxiliary heater, located under the front lounge, is plumbed into the radiator system. Two "tees" are located between the engine and the front heater. The water lines to the heater are routed under the floor. A shut off valve, accessible through the rear door of the lounge, can be used to shut off the hot water circulation in the summer, or control the heat to some degree. By using the two speed dash fan, along with the water valve, the temperature output can be varied through a wide range.

WATER HEATER

Your motorhome uses a water heater with a motor aide feature. This feature circulates radiator cooling through an exchanger in the water heater as you drive. It is plumbed from the same hoses that supply hot water to the auxiliary heater. For further information on your water heater see the Appliance Section of this manual. The water heater with motor aide has caused some complaints. It seems that once you take your motorhome out for a long drive you can't light the burner of the water heater.....because the water is already hot!

NOTES

TIRES

The tires installed on your Airstream motorhome are engineered to provide a proper balance of performance characteristics for normal vehicle operation.

This section contains some tips on how you can obtain the most benefit from these tires.

Incorrect tire inflation pressures can have adverse effects on tire life and vehicle performance. Too low an air pressure causes increased tire flexing and heat build-up. This weakens the tire and increases the chance of damage or failure and can result in tire overloading, abnormal tire wear, adverse vehicle handling, and reduced fuel mileage. Too high an air pressure can result in abnormal wear and harsh ride, and also increase the chance of damage from road hazards.

Tire inflation pressures should be checked at least monthly and when significantly changing the load you plan to carry in your motorhome. Always check tire inflation pressures when the tires are "cold".

1. The "cold" tire inflation is the pressure applied to the tire when the motorhome has not been driven more than one mile after sitting for three hours or more.

2. It is normal for tire pressures to increase 4-8 psi or more when the tires become hot from driving. DO NOT "bleed" or reduce tire inflation pressures after driving. Bleeding serves to reduce "cold" inflation pressure and increase tire flexing which can result in tire damage and failure.

3. Always use a tire pressure gauge (a pocket type gauge is advised) when checking inflation pressures. Radial tires may look under-inflated when at the recommended cold inflation pressure.

4. Be sure to reinstall the tire inflation valve caps, if so equipped, to prevent dirt and moisture from getting into the valve core which could cause air leakage.

5. If an air loss occurs while driving, do not drive on the deflated tire more than needed to stop safely. Driving even a short distance on a deflated tire can damage a tire and wheel beyond repair.

The outer tire of a pair on dual wheel installations generally wears faster than the inner tire. When vehicles are driven continuously on high crown roads, an increase in air pressure of from 5 psi to 10 psi on the outside tire of each dual produces maximum tire life.

Proper FRONT END ALIGNMENT improves tire tread mileage. Your front end suspension parts should be inspected periodically and aligned when needed. Improper alignment may not cause the vehicle to vibrate. However, improper toe alignment will cause front tires to roll at an angle which will result in faster tire wear. Incorrect caster or camber alignment will cause your front tires to wear unevenly and can cause the vehicle to "pull" to the left or right. The Chevrolet front air bags are inflated to 55 psi when the motorhome is originally aligned. If this pressure varies excessively alignment will be affected.

A decrease in driving, cornering, and braking TRACTION occurs when water, snow, ice, gravel, or other material is on the road surface. Driving practices and vehicle speed should be adjusted to the road conditions.

When driving on wet or slushy roads it is possible for a wedge of water to build up between the tire and road surface. This is known as hydro-planing, and may cause partial or complete loss of traction, vehicle control, and stopping ability. To reduce the chance of traction loss, follow these tips:

1. Slow down during rainstorms or when the roads are slushy.

2. Slow down if road has standing water or puddles.

3. Replace tires when tread wear indicators are showing.

4. Keep tires properly inflated.

If you equip your vehicle with snow tires use the same size, load range, and construction type (bias, bias-belted, or radial) as your other tires.

Snow tires should be inflated above the advised cold inflation pressures for the load being carried.

To prevent CHAIN damage to your vehicle:

1. Install the chains as tightly as possible, then tighten again after driving 1/4 to 1/2 mile.

2. Do not exceed 45 mph, or the chain manufacturer's speed if lower.

3. Drive in a restrained manner avoiding large bumps, pot holes, severe turns and other maneuvers which could cause the vehicle to bounce up and down.

4. Follow the chain manufacturer's instructions.

WARNING:

Do not mix different construction types of tires on your vehicle such as radial, bias, and bias-belted tires except in emergencies, because vehicle handling could be affected and may result in loss of control.

YOU SHOULD REPLACE YOUR TIRES WHEN:

1. Your tires are worn to a point where 2/32 inch or less tread remains, or the cord or fabric is exposed. To help detect this your tires have built-in tread wear indicators and appear between the tread grooves when the tread depth is 2/32 inch or less. When the indicators appear in two or more adjacent grooves at three spots around the tire, the tire should be replaced.

2. Your tire tread or side wall is cracked, cut, or snagged deep enough to expose the cord or fabric.

3. Your tire has a bump, bulge, or split.

4. Your tire sustains a puncture, cut or other damage that can't be correctly repaired because of the size or location of the damage.

When replacing tires you should use the same size, load range, and construction type (bias, bias-belted, or radial) as the original tires on your vehicle (see the Certification Label). Use of any other size or type tire may affect load carrying capacity, ride, handling, speedometer/odometer calibration, vehicle ground clearance, and tire clearance to the body and chassis. If replacing only a single tire it should be paired on the same axle with the least worn tire of the other three.

WARNING:

WHEELS MUST BE REPLACED if they become damaged (for example: bent, heavily rusted, leak air) or if lug nuts often become loose. Do not straighten bent wheels or use inner tubes in leaking wheels used with tubeless tires Such wheels may have structural damage and could fail without warning.

Maximum loads, maximum inflation pressures, wheel identification codes, and wheel sizes are stamped on each wheel. When replacing wheels for any reason, the new wheels should be equal in load capacity, inflation pressure capacity, diameter, width, off-set, and mounting configurations to those originally installed on your vehicle.

A wheel of the wrong size or type may adversely affect load carrying capacity, wheel and bearing life, brake cooling, speedometer/odometer calibration, stopping ability, headlight aim, bumper height, vehicle ground clearance and tire clearance to the body and chassis. Replacement with "used" wheels is not advised. They may have been subjected to harsh treatment or very high mileage and could fail without warning.

Note: The use of wheels and/or tires with higher load carrying limits than originally equipped on your vehicle does not in itself increase the GAWR or the GVWR of the vehicle.

WHEEL COVERS

The stainless steel wheel covers on your motorhome are held in place by the lug bolts and clamp ring. Occasional waxing will keep them easy to wash.

TIRE ROTATION

Front and rear tires perform different jobs and can wear differently depending on the types of roads driven, your driving habits, etc. To obtain the longest tire life you should INSPECT AND ROTATE your tires regularly. (See Tire Rotation Illustration). Many GM dealers and tire dealers will perform a free tire inspection to look for uneven or abnormal tire wear.

Radial	First 6,000 Miles and at Least Every 12,000 Miles Thereafter.

For the longest tire life, any time irregular wear is seen have the tires checked and rotated by your truck or tire dealer and have the cause of uneven wear corrected. After rotation be sure to check wheel nut tightness and to adjust the tire pressures, front and rear.

WARNING: Wheel nuts should be tightened at certain intervals. See Wheel Nut Tightening Sequence.

There are two different tire rotations we recommend on the 290 series. Rotation A and B as illustrated on the following pages. Rotation A should be done at approximately 6,000 miles, and Rotation B at 12,000 miles. Rotation B cannot be used with aluminum wheels.

The 350 and 325 series also have two different rotation patterns: one to be used if all wheels are steel, and the other if you have the optional aluminum wheels.

Your local tire dealer, upon inspection of your tires, may have a tire rotation recommendation that better fits your driving habits and the characteristics peculiar to your vehicle.

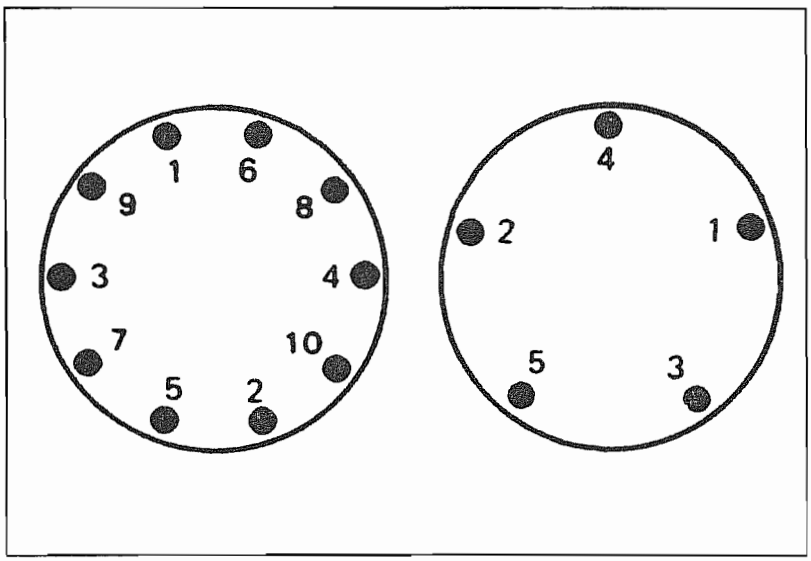
Note: It is recommended that disc brake pads be inspected for wear whenever tires are rotated.

TIRE CHANGING - CHEVROLET

When removing the steel wheel rim to change a tire, loosen all wheel nuts approximately flush with end of stud, then tap clamp ring to loosen rim. Do not remove nuts until clamp rings are free or clamp ring may fly off of stud. New solid aluminum Alcoa wheels do not use the steel clamping ring. When installing rim be sure pins on clamp ring face outboard. Then tighten attaching nuts alternately and evenly to avoid excessive wheel run-out. See torque values and sequence diagram.

LUG NUT TIGHTENING SEQUENCE

CHEVROLET



Torque 130 - 180 Ft. Lbs.

WHEEL NUT TORQUE MUST BE CHECKED AT 100, 1,000 and 6,000 MILES, AND EVERY 6,000 MILES THEREAFTER.

To change front tires the jack should be placed under the control arm. Rear tires, both on dual and tag axles, may be changed by placing the jack under the dual wheeled axle close to the tires being changed.

INFLATION PRESSURES

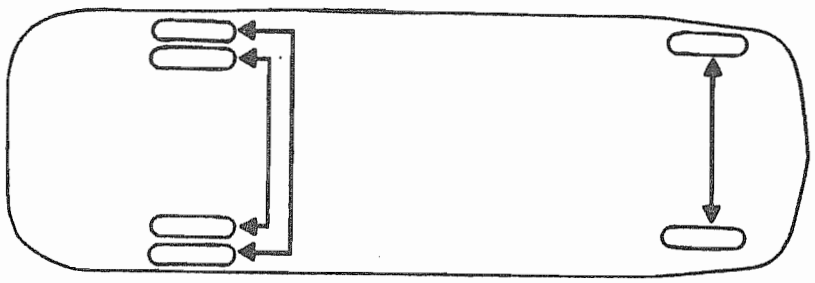
Standard inflation pressures for tires are listed in the "Minimum Tire Inflation Pressure at Gross Vehicle Weight Rating Chart." Front and rear pressures are shown for each model and GVWR, and are based on the GVWR and front and rear axle ratings (GAWR's) printed on your vehicle VIN plate and Certification label. Tires must be inflated to these pressures when the vehicle is fully loaded or an axle GAWR is reached.

MINIMUM TIRE INFLATION PRESSURE (PSI)

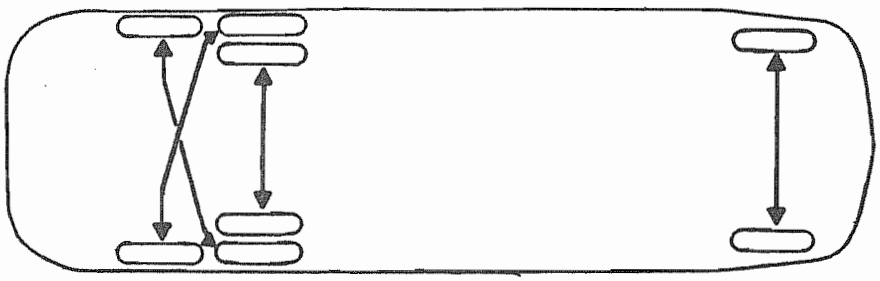
Model		Tire Size	Front	Rear Duals	Tag
29 ft.	14,550 GVWR	8:00-19.5	70 psi	60 psi	-----
32.5 ft.	16,500 GVWR	8:00-19.5	70 psi	60 psi	60 psi
34.5 ft.	16,500 GVWR	8:00-19.5	70 psi	60 psi	60 psi

TIRE ROTATION - FORGED ALUMINUM WHEELS

290 SERIES

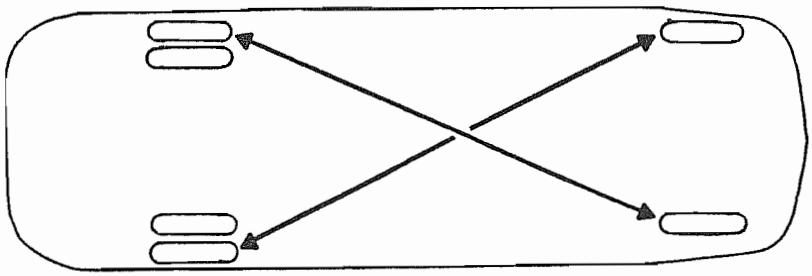


325 & 345 SERIES

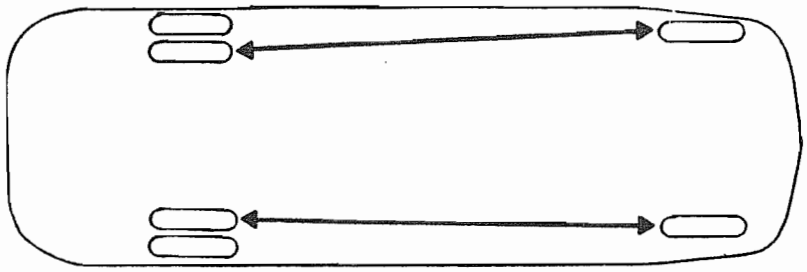


TIRE ROTATION - STEEL WHEELS

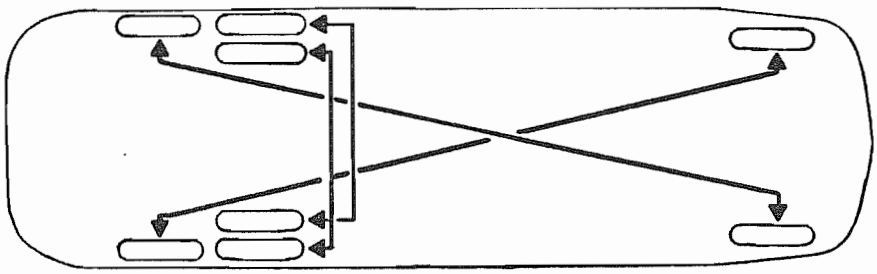
ROTATION "A" 290 SERIES



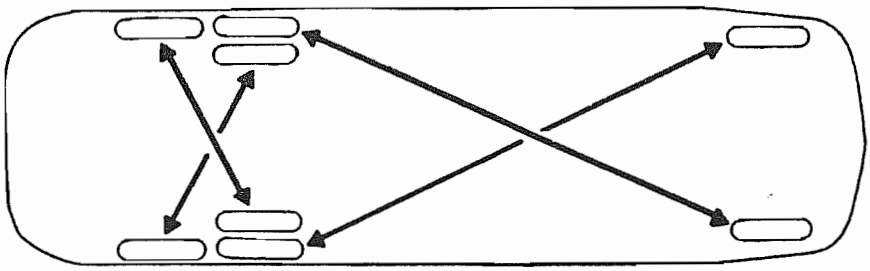
ROTATION "B" 290 SERIES



ROTATION 325 & 345 SERIES

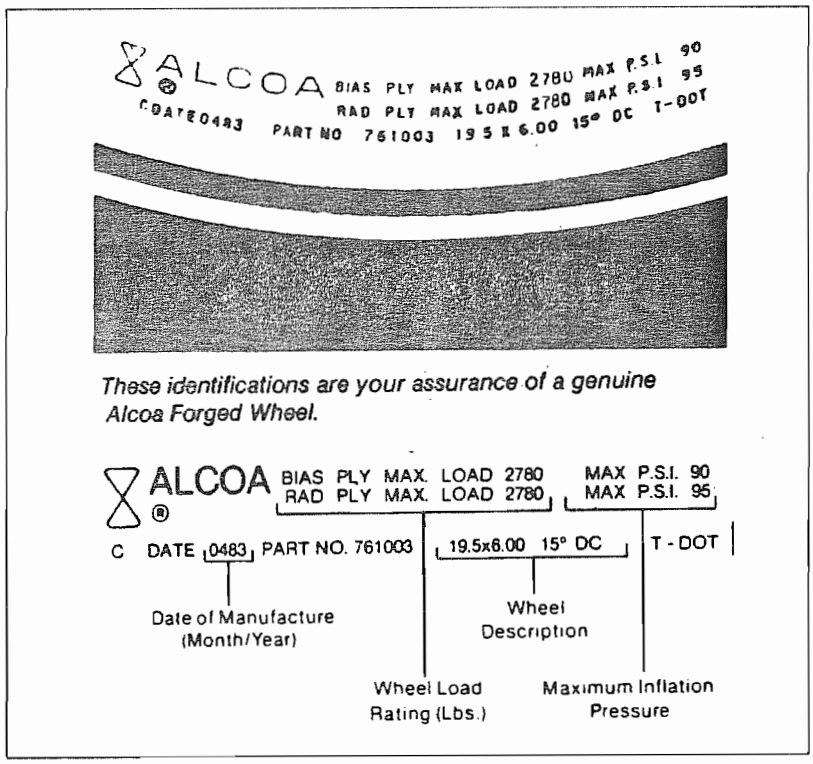


OPTIONAL ROTATION 325 & 345 SERIES



The beauty of Aloca Forged Wheels enhances even the most stylish motorhome. The sparkling shine comes from the polished wheel itself. With ordinary washing and occasional buffing, the corrosion resistant aluminum alloy keeps looking great.

The manual details proper service procedures and should be used as a reference by anyone working on your Alcoa Forged Wheels.



These identifications are your assurance of a genuine Alcoa Forged Wheel.

Alcoa Wheel Identification

Alcoa forged aluminum disc wheels for motorhomes have been identified with a stamped marking like the one above. The roll stamp permanently records the wheel's vital statistics, including cold inflation pressure, load rating and date of manufacture.

SAFETY PRECAUTIONS FOR SERVICING TUBELESS MOTORHOME TIRES

Failure to comply with the following procedures can result in the faulty positioning of the tire, and can cause the assembly to burst with an explosive force sufficient to cause DEATH OR SERIOUS INJURY. Follow all current OSHA and NHTSA regulations when servicing wheels or tires.

1. Always completely deflate tire by removing valve core before demounting.

2. Never stand in front of the wheel during tire deflation.

3. Always check tire/wheel assembly for proper seating before removing from vehicle.

4. Always follow mounting and demounting procedures outlined in the instruction manual supplied with the mounting equipment, or other recognized industry instruction manuals, including OSHA regulations.

5. If using a tire mounting/demounting machine on aluminum wheels special care should be taken to prevent gouging the wheel.

6. Always use a rubber, leather-faced or plastic mallet.

7. Never hammer on, heat, or weld any wheel in an attempt to repair it. Discard and replace damaged wheels.

Wheel Inspection

1. Always select proper tire size and construction to match Alcoa's wheel rating and size.

2. Never use bent, cracked, damaged, worn or badly corroded wheels or mounting hardware.

3. Always clean grease, road dirt and old tire rubber from wheel and bead seat.

4. Never use mounting hardware not designed for use with Alcoa Forged Wheels.

Tire Mounting and Inflation

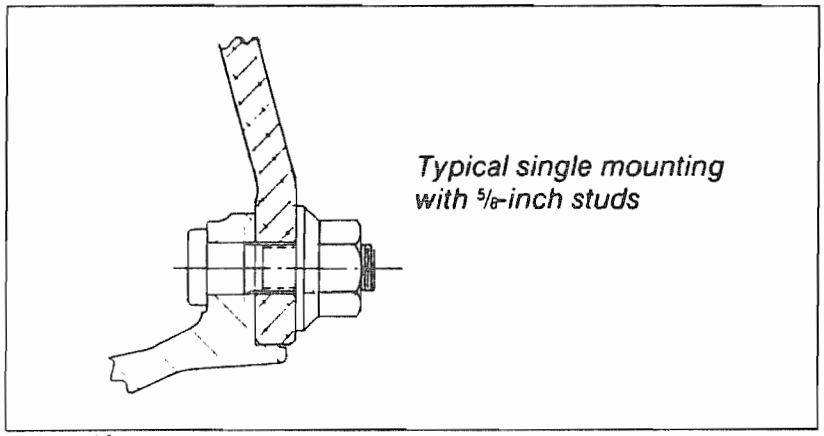
1. Always use a tire safety cage during inflation. Use clip-on air chuck with a remote valve, and stand behind barrier during inflation.

2. Never re-inflate or add air to a tire that has been run flat or seriously underinflated without removing the tire and checking for tire damage. Wheel damage is also possible.

3. Never strike a partially or fully inflated tire/wheel assembly with a hammer.

Single Wheel Mounting

The best wheels should be used on the front axle for the same reason the best tires are run on the front axle. Studs must be long enough to provide sufficient thread engagement. Starting at hand-tightness, you should need seven full turns to disengage the cap nut. The center portion of the axle hub must be of sufficient length to center or "pilot" the wheel, although piloting through the full disc thickness is not required. Single wheel mounting requires five studs and two-piece flanged cap nuts.



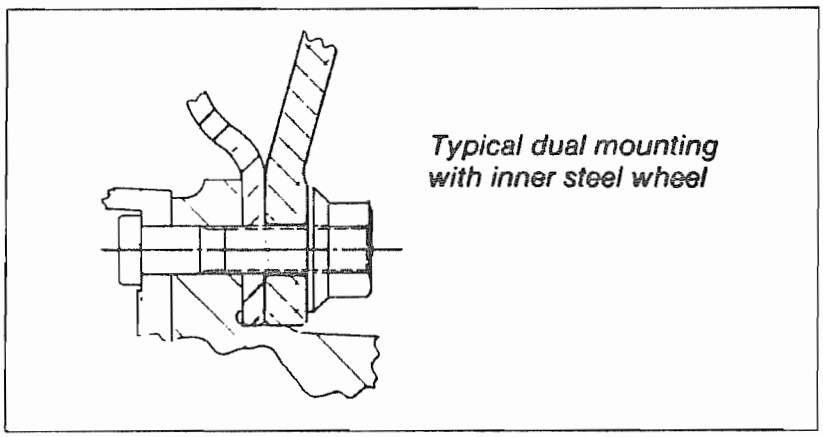
Typical single mounting with 5/8-inch studs

Dual Wheel Mounting

Many motorhomes mount two wheels on each hub of the rear axle. Because of the thickness of the aluminum wheel, a thinner steel wheel must be used as the inner wheel on these motorhomes. This allows the center of the hub to act as a pilot to center both wheels. Piloting through the full disc thickness of the outer wheel is not required.

For dual wheel mounting, stud length must be sufficient to engage cap nuts seven full turns. Ten studs and two piece flanged cap nuts are required for dual assemblies.

WARNING: Do not use two aluminum wheels together as duals unless the hub provides sufficient stud length for proper thread engagement and pilot length to center the exterior wheel. Replacing factory installed studs with longer studs will not increase the pilot length.



Typical dual mounting with inner steel wheel

Valves

Alcoa drop-center wheels for tubeless tires come from the factory with nickel plated number VS 1228-C air valves installed. If it becomes necessary to replace an air valve, install it using 8 to 10 ft. lbs. of torque on the hex nut. Replacement valves may be obtained from authorized Alcoa wheel distributors or your dealer. Do not use brass valves as corrosion can result.

Steel Spares

New motorhomes ordered with Alcoa Forged Wheels may include steel inner wheels for dual assemblies and a steel spare wheel.

A steel spare can replace either a steel or aluminum wheel in an emergency.

Off Vehicle Inspection

Inspect the wheel and other hardware for safe operation. Like tires and other vehicle components that work hard, wheels will eventually wear out. It isn't always possible to predict exactly when the useful life of a wheel will end. But generally, an older wheel should be examined more frequently for obvious signs that it should be removed from service.

Hidden Damage

Some forms of wheel damage can be hidden beneath the tire, so whenever a tire is removed, thoroughly examine the complete wheel. Remove all grease and road dirt. Use a wire brush or steel wool to remove rubber from the bead seats.

Balancers and Sealers

Liquid balancers and sealers can cause corrosion. Using any additive in the air chamber that causes corrosion will void the warranty and can cause premature wheel failure.

CAUTION: Do not heat wheels in an attempt to soften them for straightening to repair damage from striking curbs or other causes. The special alloy used in these wheels is heat treated, and additional heating can destroy the strength of the wheel. Do not weld Alcoa Forged Aluminum wheels for any reason.

Inspections on Vehicle

As an owner you are probably the most frequent inspector of your motorhome equipment. You will probably be the first to spot any signs of potential trouble with your wheels.

Pay particular attention to front end assemblies. Examine all exposed areas frequently. Clean wheels and look for cracks or other damage. Damaged wheels must be replaced. For example, replace wheels that are bent, cracked, heavily corroded, or leak air.

Avoid Abuse

Abuse can shorten the life of a wheel. Lack of care in changing a tire, heavy pounding of the wheel rim, overloading or hitting curbs at high speed or a sharp angle can damage wheels.

Elongated stud holes or dirt streaks radiating from stud holes indicate loose cap nuts.

Cleaning and Maintenance Against corrosion

1. Keep your Alcoa Forged wheels looking great with simple care. Wash the wheels with steam or high pressure water from a hose and a mild soap. Do not use household detergents. Most automotive supply shops carry suitably mild car wash soaps.

2. You can brighten the wheels, even after years of use, with readily available buffing compounds. Follow the buffing instructions that come with the compound.

3. When tires are removed, the entire wheel must be cleaned and inspected Remove any soil or oxidation products from the tire side of the rim with a wire brush. Heavily corroded parts, including studs or cap nuts, must be replaced.

4. Aluminum alloy resists corrosion. This is why your Alcoa Forged Wheels never need sanding or painting. However, certain environments can lead to corrosion: salt, chloride compounds used for snow removal and highly alkaline materials. Wash corrosive elements off the wheel before they have time to react.

NOTES

OPERATING INSTRUCTIONS

In the regulator box of your Speed Control is a safety switch which will not let the system operate until your vehicle is moving above a pre-selected low speed. At the factory this "low speed switch" is set to close between 27 and 33 MPH. It should, however, be checked during the road test.

CONTROL SWTICH

The control switch is the switch you use to operate all features of the system described in the following paragraphs. It is installed where the turn signal lever is normally located and serves that purpose as well.

SET SPEED

On the control switch move the slide button to the ON position and drive at any speed above 32 MPH at which you want automatic control. Hold that speed with your foot while you press and release the SET/COAST button. One second after release take your foot off the accelerator pedal.

You can increase speed at any time with the accelerator pedal. When you release the pedal you will return to the set speed.

ACCELERATION

Hold the slide button in the RESUME/ACCEL position and your vehicle will accelerate until you release it. Then your vehicle will slow to your set speed and again control there.

If you want to make the higher speed your new set speed, release the slide button when you reach the speed you want; and as you do, quickly press and release the SET/COAST button. Remember, you set speed as you release the button - not when you press it.

COAST

When you press and hold the SET/COAST button, you erase the set speed from the regulator's memory and allow the vehicle to coast. Just before you reach the lower speed you want, release the button and it will control there, providing it is above the low speed setting.

DISENGAGEMENT

Depress the brake pedal about an inch and you again are in control of the vehicle speed. You can also disengage the speed control by pushing the slide button to OFF, but this erases the set speed from the regulator's memory.

Note: At the time this manual was being compiled we understood Chevrolet was contemplating providing the cruise control with the chassis. If your cruise control switches are part of a many-featured "smart stick" it would be a Chevrolet part and be best serviced by their dealers.

RESUME

When you disengage the system with the brake, you do not erase the set speed from the regulator's memory, even if you come to a complete stop. To return to your chosen speed, drive to a speed above 32 MPH, then move the slide button to the RESUME/ACCEL position and release it. The Speed Control will take you back to your set speed and control there.

If the rate of acceleration is faster or slower than you like, drive with the accelerator to a speed close to the set speed, then slide the button to the RESUME/ACCEL position and release it.

UNUSUAL CONDITIONS

When the regulator is adjusted right, your selected speed should be held within plus or minus 4 MPH so long as grades do not exceed 7% (most interstate highways). Since the Speed Control is vacuum operated, this speed range will widen as you drive at higher altitudes.

Any opening of the throttle lowers the vacuum to some degree. A wide open throttle can drop the vacuum almost to zero. When you are pulling an extra heavy load, climbing a very steep hill, or bucking a severe head wind, a much wider than normal throttle opening is called for, but this drops the vacuum so low that the throttle is deprived of the strength it needs to hold speed.

The way to handle these once-in-awhile problems is to bring the vehicle up to speed with the accelerator pedal, and then let the Speed Control take over again.

THERE IS NO DRAIN ON THE BATTERY WHEN THE IGNITION SWITCH IS OFF - EVEN IF THE CONTROL SWITCH IS LEFT ON.

WARNING:

Do not use your Speed Control on slippery roads, nor in heavy traffic.

INSTALLATION INSTRUCTIONS

Refer to Fig. 1 to become familiar with the different parts of the Electronic Speed Control. The major components of the system are: the SIGNAL GENERATOR, attached to the speedometer cable drive adapter at the transmission; The REGULATOR, a computer mounted behind the instrument panel; the SERVO, which is mounted in the engine compartment and is linked to the throttle; the CONTROL SWITCH, which also functions as a turn signal; the VACUUM "DUMP" VALVE, operated by the actuation of brake light switch; and the SPARK PLUG CURRENT SENSOR, attaches to a spark plug wire. All other parts in the kit are for connecting these components to the vehicle and to each other.

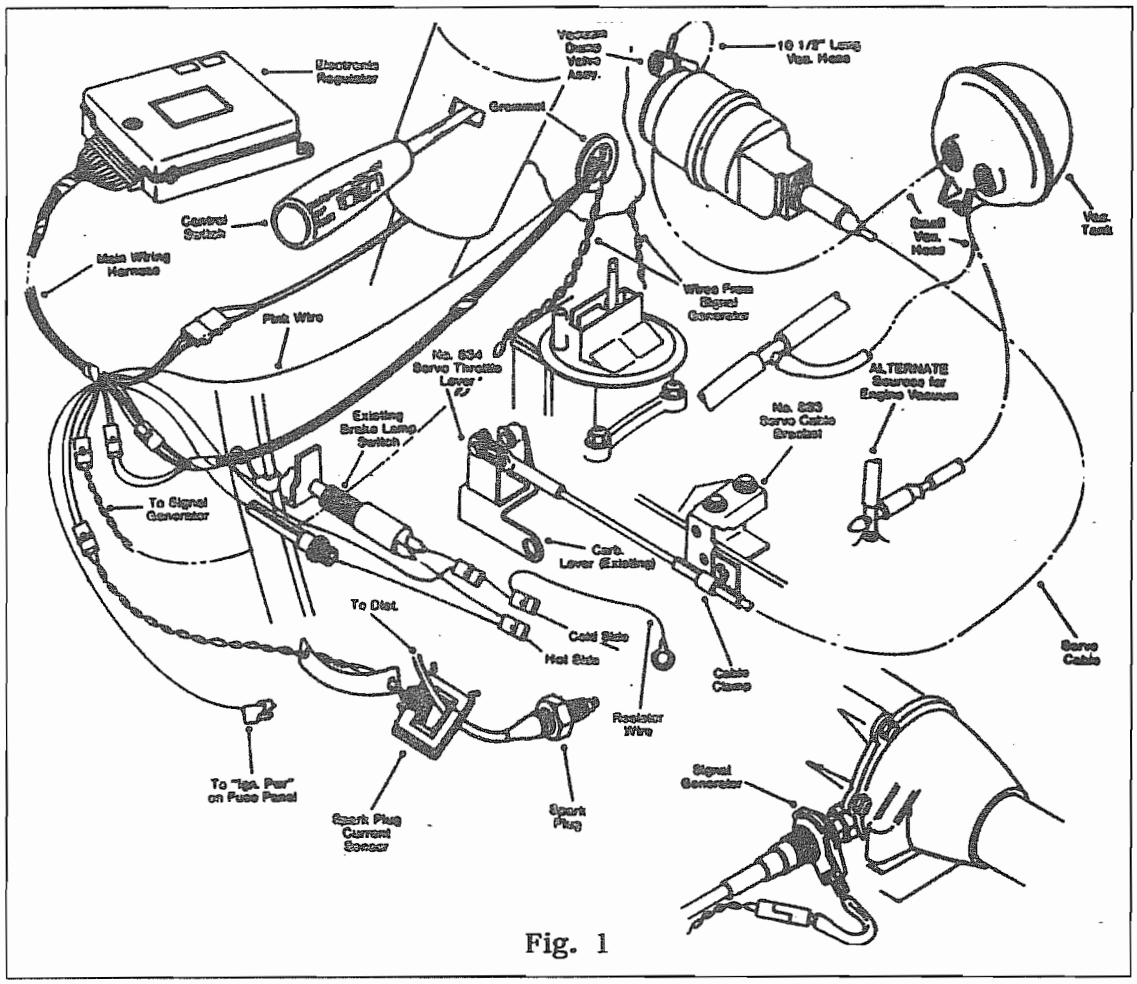


Fig. 1

SIGNAL GENERATOR

(See Fig. 2)

A. Put small O-ring over 3/8" diameter extension of 5/8-18 threaded end, then screw smaller end of hex fitting onto signal generator and snug it up.

B. Seat larger seal ring in large end of hex fitting and insert square adapter key into same end of generator shaft.

C. Disconnect speedometer cable from transmission, screw hex fitting of generator onto transmission, rotating generator so wires are toward rear of vehicle and slightly downward, then tighten hex fitting.

D. Connect speedometer cable to generator and tighten cable nut while holding generator from rotating out of position.

CAUTION: Be SURE all square driving members are properly engaged with square holes and rubber sealing rings are in place.

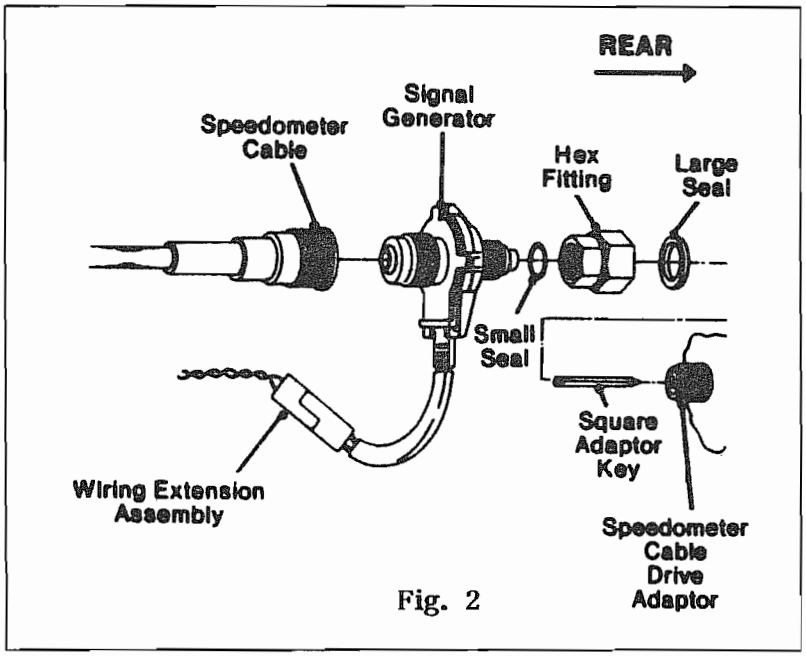


Fig. 2

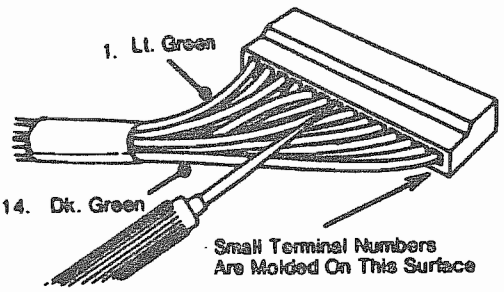
ELECTRICAL CHECK

To make Electrical check shown, insert probe into unplugged connector from wire side . Insertion at open end of terminals will spread them so they will not grip circuit board in regulator.

Connector is shown in proper position for plugging into regulator after check.

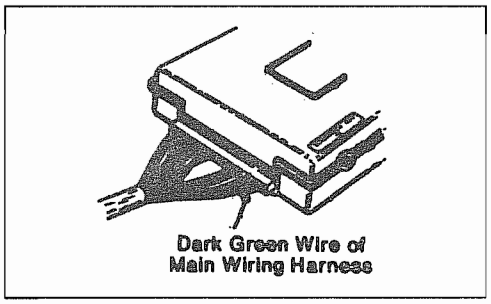
Terminal Numbers & Wire Colors

1. Lt. Green	8. Pink
2. Black	9. Lt. Blue
3. Grey	10. Yellow
4. Maroon	11. Tan
5. Red	12. Orange
6. White	13. Violet
7. Brown	14. Dk. Green

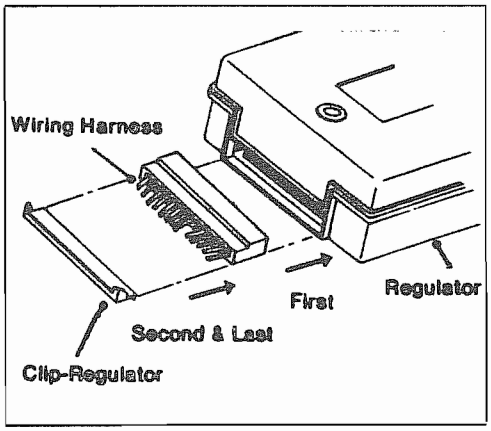


Disconnect harness from regulator and perform these checks with a 12 volt test light. Make test at wire end of terminals as shown on previous page. Plug connector into regulator after check.

When electrical check is done, turn ignition off. Plug wiring harness onto regulator. Use Black plastic clip-regulator to hold regulator and wiring harness to gether. Just push it into place to install.



Let regulator hang down for now because it must be adjusted during road test.



CONDITION	RESULTS	REMEDY
Control Switch OFF - Ignition OFF — Ground one lead of test light, touch other lead to each terminal of connector individually.	Light OFF all terminals	None, system O.K.
	Lights at 14, 10 or 5	Perform Control Switch Check
	Light at 13	Reverse red and violet wire connection at brake light switch
	Light at 7	Brown wire connected to wrong power source. Use a "switched" ACCY. power source at fuse block. Test light should be ON when ignition is ON and OFF when ignition is OFF.
Control Switch ON - Ignition ON — Ground one lead of test light, touch other lead to each terminal of connector individually.	Light at 7	None, system O.K.
	No light at 7	Check accessory fuse. Check blue splicing connector to be sure good connection was made.
Control Switch ON - Ignition ON — Ground one lead of test light, touch other lead to each terminal of connector individually.	Lights at 5, 7 & 14	None, system O.K.
	No light at 5 or 14	Perform Control Switch Check.
	No light at 7	Check accessory fuse. Check blue splicing connector to be sure good connection was made.
Control Switch ON - Ignition OFF — Ground one lead of test light, touch other lead to each terminal of connector individually.	Lights at 5 & 14	None, system O.K.
	No light at 5 or 14	Perform Control Switch Check
Control Switch ON - Ignition OFF — Ground one test light lead. Move switch slide button to RESUME/ACCEL and hold while touching other lead to terminals 5, 10 and 14 individually.	Light at 5, 10 & 14	None, system O.K.
	Light at 10 does not go out when RESUME is released.	If wire colors are in right position in connectors, replace Control Switch.
Control Switch ON - Ignition OFF — Ground one test light lead. Press and hold SET/COAST button and touch other test lead to terminals 5, then to 10, and then to 14.	Lights at 5 & 10	None, system O.K.
	Light goes out at 10 when SET/COAST button is released.	None, system O.K.
	No light at 5, 10; or 10 does not go out when SET/COAST button is released	Verify wire position by color in connectors. If wires are positioned correctly, perform Control Switch Check.
	Light comes on at 14 when SET/COAST button is released.	None, system O.K.
Brake Pedal Depressed — Ground one test light lead. Touch other test light lead to terminal 13.	Light at 13	None, system O.K.
	No light at 13	Check connection of violet wire (blue splicing connector) to cold side of brake light switch.
		Brake light fuse blown - replace fuse.
		Defective brake light switch - replace with original equipment replacement brake light switch.

PRELIMINARY OPERATIONAL CHECK

Regulator Check

A. Set parking brake hard, put shift lever in "park" and start engine.

B. Keep one hand on ignition key and with other hand push slide button on control switch to ON position.

C. Press and hold SET/COAST button for two or three seconds, then release it. The system should NOT engage. If it does (indicated by engine racing faster than cold idle), turn off ignition switch immediately. If system passed electrical check above, and in this check engine did not race until SET/COAST button was pressed, regulator must be replaced.

Vacuum Check

D. Run engine at idle. Unplug hose from "VAC" fitting on tank and put your finger over end. You should feel a strong suction. If you do, put hose back on tank. If not, find another place to get vacuum that gives you suction at idle.

ROAD TEST

For Regulator Adjustments

Note: The adjustments on the Regulator (Low Speed Switch, Centering, and Sensitivity) are set nearly correct at the factory. However, the regulator can be adjusted if necessary. Full adjustment range is 3/4 of a turn. DO NOT force beyond stops. A small screwdriver may be inserted through the appropriate hole to engage the adjusting slot.

WARNING: To insure driving safety a passenger should accompany the driver to make adjustments.

Low Speed Switch Adjustment

1. Start vehicle and make ready for the road.

2. Move slide button to ON position. Drive at about 45 mph. Press and release SET/COAST button to activate the system. Apply brake and reduce speed to about 18 mph.

3. Move slide button to RESUME/ACCEL position and hold it. Accelerate slowly, noting speed at which accelerator pulls away from your foot. This is the LOW SPEED switch setting. It should be within the range of 27-33 mph. If it is not, adjust the LOW SPEED SW ADJ on the regulator.

4. Turn clockwise to increase the setting, or counterclockwise to decrease setting.

Centering Adjustment

1. Move slide button to ON position.

2. On a level road drive at about 45 mph, then push and release the SET/COAST button. The system should engage, and the speed should be within 2 mph of your selected speed. It if is not, adjust the CENTERING ADJ on the regulator.

3. Turn clockwise if the speed decreased, or counterclockwise if the speed increased. Make these adjustments in small steps.

Sensitivity Adjustment

The SENSITIVITY ADJ is set at the factory. No further adjustment is required. It should be set to full clockwise position.

Final Test

After adjustments have been made, use all the features of the system. Set Speed, Coast, Resume, Accelerate - and move slide button to "OFF". If everything checks satisfactorily you are done with the road test. If it does not, see the Trouble Shooting Guide.

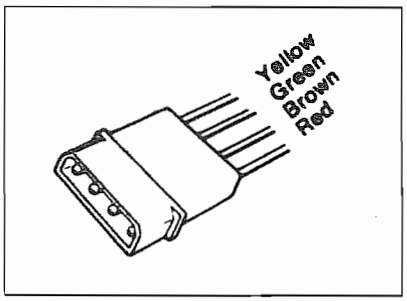
CONDITION	POSSIBLE CAUSE	REMEDY
In-line fuse blown.	Short or ground in Control Switch wiring harness or main wiring harness of Cruise Control.	Check where wiring passes thru or around any sharp, hot or moving metal part. Check grommet in firewall. Repair short, replace fuse with 5 amp. max. Perform Electrical Check Procedure.
Does not engage (SET), "ON-OFF" switch "ON". **NOTE:** System will not engage if vehicle is not moving faster than the LOW SPEED SETTING.	No voltage at terminal #5 (red wire) of 14-pin connector at regulator.	Check connection where red fused wire is spliced to hot side of brake switch - make a good connection.
		Brake light fuse blown - replace fuse.
	No voltage at terminal #7 (brown wire) of 14-pin connector at regulator.	Check connection where brown wire is spliced to 12 volt D.C. accessory power - power - make a good connection.
		Accessory fuse blown - replace fuse
	No ground connection at cold side of brake light switch	Check connection where violet wire is spliced to cold side of brake switch - make a good connection.
	Both brake light bulbs burned out.	Replace brake light bulbs.
	Brake light on all the time.	Adjust brake light switch.
	Ported vacuum, restricted vacuum, or no vacuum.	Be sure vacuum connection is made to a source that has continuous vacuum (below carburetor throttle plate on gasoline engine.
		Check for leaking, collapsed or kinked hoses.
	Light green wires of dump valve and servo wiring harness not grounded.	Ground light green wires to vehicle's chassis.
	Dump valve inoperative (coil open or valve leaking).	Electrical Check - Unplug connector from regulator and check continuity between term. #8 (pink) and #1 (lt. green.). If circuit is open, check ground of light green wire at dump valve and connection of pink wire. If connections ok and circuit open, replace dump valve.
		Leak Check - Disconnect pink wire from main wiring harness and apply 12 V. to dump valve wire. Unplug large hose from servo, suck on hose and seal end with tongue. If vacuum cannot be held, replace dump valve.
	Faulty electrical or vacuum connection.	Tighten connections and make Electrical Checks.
	Light contact pressure between terminals of 14-pin connector and edge card connector of Regulator.	Bend terminals in connector upward to increase contact pressure.
	Control Switch inoperative.	Make Control Switch Check.
	Servo not connected to throttle.	Check bead chain or cable connection at servo and at throttle.
	Low Speed Switch set too high or too low.	See "Low Speed Switch Adjustment" in ROAD TEST section.
	No road speed signal from Signal Generator.	Check wires from signal generator for bare spots and shorts. Repair any found,
		Unplug connecter from regulator. Check continuity between terminals. #2 (black) and #3 (grey) - should be 43 ohms ±10%. If less, replace signal genertorl
	Servo rheostat open, vent valve inopertive, charge valve inoperative. **NOTE:** Continuity checks at right to be made at 14-pin connector with regulator unplugged from wiring harness.	Rheostat Check: Resistance between terminal #2 (black) and #11 (tan) to be 180-600 ohms. Vent Valve Check: Resistance between terminal #6 (white) and #12 (orange) to be 38-48 ohms. Charge Valve Check: Resistance between terminal #4 (maroon) and #12 (orange) to be 38-48 ohms. **NOTE:** If any of above three checks show circuit open or shorted, replace Servo.
	If all of above check okay, regulator could be defective.	Replace regulator.

CONDITION	POSSIBLE CAUSE	REMEDY
Engine accelerates when started.	No slack in bead chain and/or Servo cable.	Recheck and adjust slack with throttle at hot idle position.
	Vacuum connected to large connector on Servo.	Connect vacuum to 3/16" connector. Hose on large connector should run to dump valve.
	Faulty Servo.	Replace Servo.
	Faulty Regulator.	Replace Regulator.
Vehicle continues to accelerate after depressing and releasing "SET/COAST" button.	Centering on Regulator set too high.	Make centering adjustment to Regulator—See Road Test.
	Faulty Servo.	Replace Servo.
	Faulty Regulator	Replace Regulator.
"Resume/Accel" feature inoperative.	Bad ground connection	Ground Lt. Green wires to chassis of vehicle
	Control Switch Faulty.	Perform Control Switch Check. Replace if it does not check properly.
	Faulty Regulator.	Replace Regulator.
When using Resume or Accel feature, throttle opens and system disengages. **NOTE:** This condition applies to gasoline powered vehicles only.	Regulator senses a rapid engine speed change. Regulator is doing what it was designed to do.	Re-adjust Servo to throttle travel, so servo cannot pull throttle to "kickdown" position.
When cruising at a set speed, driver presses accelerator pedal into passing gear and then lets up, Cruise Control disengages. **NOTE:** This condition applies to gasoline powered vehicles only.	Regulator senses a rapid engine speed change. Regulator is doing what it was designed to do.	Actuate "Resume" and return to last set "Cruising Speed".
Does not disengage when brake is applied.	Improper brake light switch adjustment.	Adjust brake light switch.
	Faulty brake light switch.	Replace brake light switch.
	Throttle linkage hanging up or not closing.	Fix throttle linkage.
	Faulty Servo.	Replace Servo.
	Faulty Regulator.	Replace Regulator.
System re-engages when brake is released.	Improper brake light switch adjustment.	Adjust brake light switch or replace if defective.
	Faulty Regulator.	Replace Regulator.
"Resume/Accel" features do not cancel when ignition switch is turned off.	Wrong power source, power is always on.	Connect brown wire of Cruise Control harness to vehicle wire which has 12 volts when ignition is in ON or ACCY position and has no voltage when ignition is OFF.
Throttle does not return to normal idle.	Improper Cruise Control Servo linkage adjustment.	Adjust Cruise Control Servo linkage.
	Improper Accelerator linkage adjustment.	Adjust accelerator linkage.
	Weak or disconnected throttle return spring.	Replace or connect spring.
Accelerates and coasts alternately or has pulsating accelerator pedal.	Variable voltage.	Select a power source for brown wire which has a constant 12 volts.
	Sensitivity set too high.	Rotate "Sensitivity Adj." counterclockwise and reset centering.
	Improper servo to throttle connection.	Re-do throttle connection and adjustment.
Vehicle speed increases or decreases more than 2 MPH. when settng speed with "SET/COAST" button.	Centering improperly adjusted.	See "Centering Adjustment" in ROAD TEST section.

CONDITION	POSSIBLE CAUSE	REMEDY
Erratic operation of Cruise Control.	Ported vacuum (above carburetor throttle plate).	Find vacuum source which is continuous.
	If Cruise Control system uses a generator sense road speed and speedometer needle is wavering, it may be: 1. Loose cable nut fitting. 2. Bent drive tip(s), kinked or worn speedometer cable core.	1. Tighten cable nut or fitting. 2. Replace core (or core and cable) and route so there are no kinks or sharp bends.
	Faulty Servo.	Replace Servo.
	Faulty Regulator.	Replace Regulator.
System disengages when using turn signal for lane change.	Sometimes when contacts in turn signal or hazard flasher are opened, it causes the Cruise Control system to lose its ground.	Make sure resistor wire is attached to "cold" side of existing brake light switch wire.
System disengages without applying brakes.	Loose wiring connections.	Repair and perform Electrical Check Procedure.
	Collapsed vacuum supply hose.	Replace hose.
	Leaky vacuum connections.	Check and repair vacuum connections.
	Servo linkage broken or throttle clamp slipped.	Repair linkage or replace. Adjust and tighten clamp.
	Brake light switch adjusted so a flopping pedal will occasionally actuate brake lights and cause Cruise Control to disengage.	Adjust brake light switch so pedal must move farther to operate switch.
	Faulty Servo (Rheostat momentarily opens and closes).	Replace Servo.
	Spark Plug Current Sensor is picking up additional signals from other spark plug cables. This applies to gasoline powered vehicles only.	Relocate sensor and/or re-route sensor wires as described in manual.
System engages but loses speed and then slowly returns to selected set speed.	Dump Valve leaks.	Replace dump valve.
	Hose from Servo to Dump Valve leaks.	Replace hose.
After system has been used and has been working erratic operation of Cruise Control begins or operation ceases.	Cable may be worn or broken if speedometer is not working.	Repair or replace speedometer cable or cables.
	Service work on vehicle has been performed and something has been left unplugged or something has been removed and not replaced.	Check connectiom to vacuum source as described in manual.
		Unplug regulator from 14-pin connector and perform "Electrical Check Procedure".
		Review all previous Conditions, Possible Causes, and Remedies to help find problem.
NOTE: The following three CONDITIONS and their CAUSES and REMEDIES apply to gasoline powered vehicles only.		
System does not disengage when clutch pedal is depressed (Man. Transm.) or when gear selector lever is moved into neutral (Auto Transm.)	Broken or faulty Spark Plug Current Sensor.	Replace Spark Plug Current Sensor.
	Shorted or open wiring to Spark Plug Current Sensor. Sensor not plugged into harness.	Repair wiring, or plug sensor into main wiring harness.
	Faulty Regulator.	Replace Regulator.
On vehicles with manual transmission, engine RPM. increases too much before system disengages when clutch is depressed.	Jumper wire on Regulator has not been cut.	See Regulator cover for location of jumper wire. Cut wire per instructions given in manual.
On vehicles with auto. transm. system disengages during Resume and Accel, or when controlling on roads with steep hills.	Jumper wire on Regulator has been cut (for Man. Transm.) which makes it extremely sensitive to speed changes when used with Auto. Transm.	Re-connect jumper wire or replace regulator with one that has not had jumper wire cut.

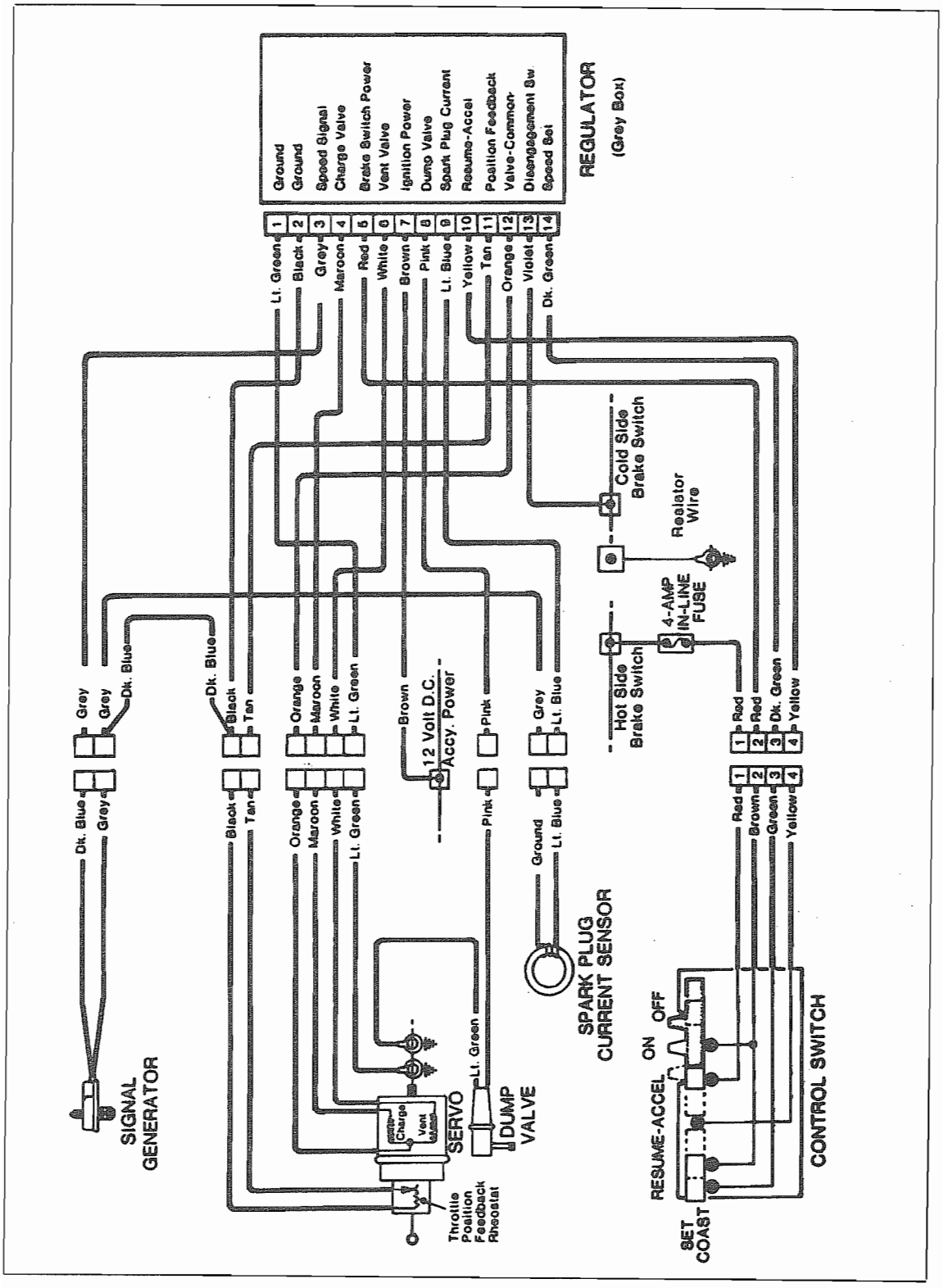
Use a 12 volt test light and jumper wire to perform these checks.

Disconnect switch at flat, 4-wire harness connector. Attach jumper wire from 12 volt power to red wire terminal of control switch connector.



Test Condition	Wire Color	Switch O.K.	Replace Switch
Slide switch to OFF, ground one test light lead, touch other test lead in turn, to terminal of:	Brown wire Green wire Yellow wire	Light OFF Light OFF Light OFF	Light ON Light ON Light ON
Slide switch to ON, ground one test light lead, touch other test lead in turn, to terminal of:	Brown wire Green wire Yellow wire	Light ON Light ON Light OFF	Light OFF Light OFF Light ON
Slide switch ON, press and hold "SET/COAST" button. Ground one test light lead, touch other test lead, in turn, to terminal of:	Brown wire Green wire Yellow wire	Light ON Light OFF Light ON	Light OFF Light ON Light OFF
Slide switch ON, press and hold "RESUME/ACCEL" button. Ground one test light lead, touch other test lead, in turn, to terminal of:	Brown wire Green wire Yellow wire	Light ON Light ON Light ON	Light OFF Light OFF Light OFF

WIRING SCHEMATIC (7-R System)



SHOULD IT BECOME NECESSARY TO REPLACE SPEED CONTROL CABLE, USE THIS PROCEDURE:

A. To remove old cable slide rubber sleeve off cable end fitting so slots are exposed.

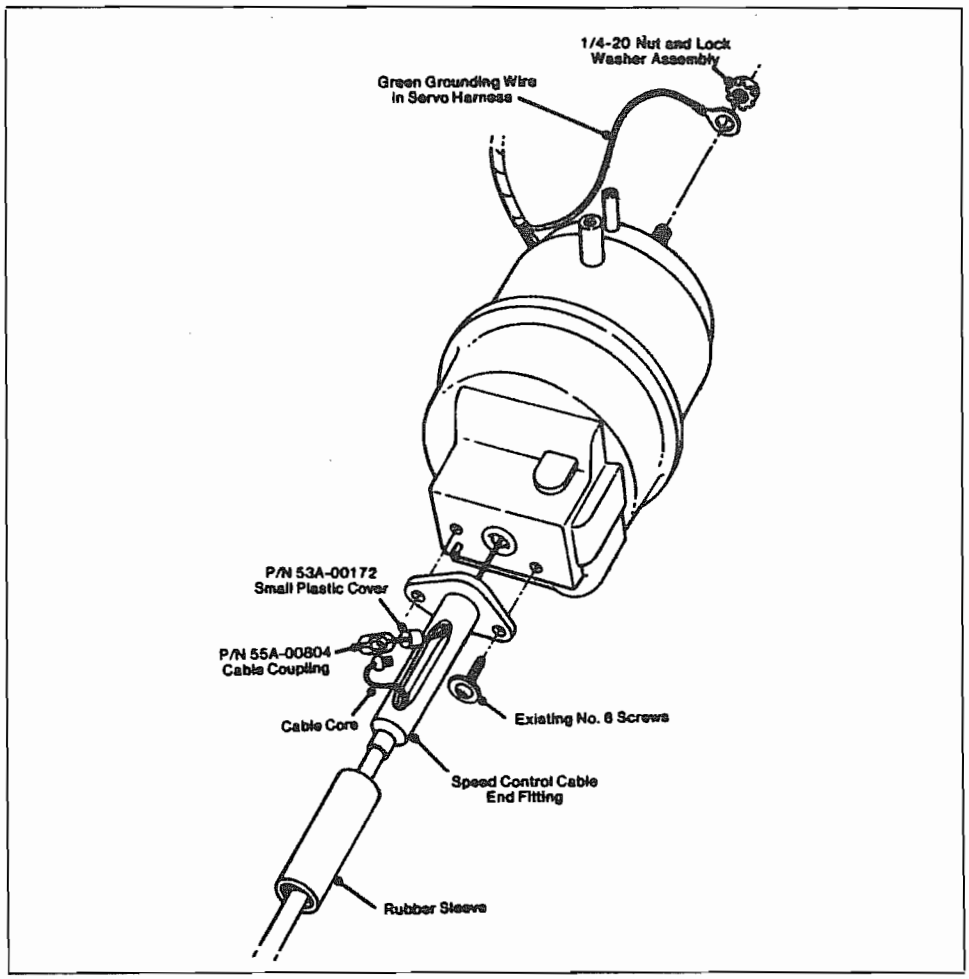
B. Slide small plastic cover off coupling and onto servo coupling cable. Use side cutter pliers or small screwdriver to spread coupling. Remove core end of old cable from coupling.

C. Remove and retain two No. 6 screw and washer assemblies attaching cable end fitting to servo.

D. Thread servo coupling cable into end fitting of new speed control cable and out through slot. Attach cable to servo with two screws retained.

E. Put core end of cable in coupling and squeeze it closed with pliers. Slide small plastic sleeve back onto coupling.

F. From other end of cable, pull all slack from cable core and slide rubber sleeve back into place over end fitting slots.



DANA PERFECT CIRCLE ELECTRONIC CRUISE CONTROL TESTER

(P/N 250-3122)

Note: Tester cannot be used to road test speed control.

INSTRUCTIONS FOR ELECTRICAL CHECKS

Each light checks the following:

LIGHT 1: Power source, fuse and ground. "On-Off" and "Set-Coast" Position of control switch.

LIGHT 2: Speed Sensor, Associated Wiring Harness Terminals and Connectors

LIGHT 3: Brake Light Switch Adjustment and Associated Wiring Harness Terminals and connectors.

LIGHT 4: Throttle position feedback and associated wiring harness terminals and connectors.

LIGHT 5: Servo vent valve, "Resume" contacts in the control switch and associated wiring harness terminals and connectors.

LIGHT 6: Servo charge valve. "Resume" contacts of the control switch and associated wiring harness terminals and connectors.

Test No. and Condition	Correct Response
1. Correct Power Source - First: Ignition Switch OFF Control Switch OFF	All lights off
2. Correct Power Source - Second: Ignition Switch OFF Control Switch ON	Lights On - 1 & 2 Off - 3, 4, 5, & 6
3. Systems Electrical Continuity: Ignition Switch ON Control Switch ON	Lights On - 1, 2, 3 & 4 OFF - 5 & 6
4. Servo Valve Continuity: Ignition Switch ON Control Switch ON Push and Hold Set/Coast button. IMPORTANT: If engine is running, servo will pull throttle to full open.	Lights On - 2, 3,4, 5 & 6 Off - 1 Light 4 will dim when Servo pulls to full throttle if engine is running.
5. Disengagement (Brake Light Switch) Check Ignition switch ON Control Switch ON Push and hold brake pedal	Lights On - 1, 2, & 4 Off 3, 5 & 6 Release brake pedal and light 3 will go ON.

6. "Resume" position of control switch:
Ignition switch ON
Control switch ON
Slide and hold On-Off switch to Resume/Accel. IMPORTANT:
If engine is running servo will pull throttle to full open.

All lights ON.

Light 4 will dim when Servo pulls to full throttle.

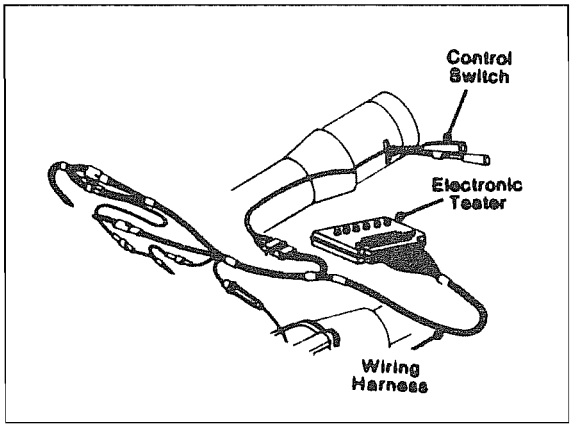


DIAGRAM OF TYPICAL ELECTRONIC CRUISE CONTROL SYSTEM WITH THE REGULATOR REPLACED BY THE TESTER

TROUBLE SHOOTING FOR INCORRECT RESPONSE

Any light on during test No. 1

Brown wire (No. 7 Reg. Terminal) connected directly to constant power source. Bad control switch.

These are checks to make for incorrect lights in tests 2 thru 6.

LIGHT 1 OFF: Check fuse in red wire, check red, brown and green wires at control switch connector, and 14 (dk. green wire) at regulator connector for good connections.

LIGHT 2 OFF: Check speed sensor continuity. Speed sensor termination to grayand dk. blue wire. 2, 3, 5 & 7 terminals (Black, dk. blue, red and brown wires) at regulator connector.

LIGHT 3 OFF: Check brake light switch adjustment. All brown, red, violet and lt. green wire connections.

LIGHT 4 OFF: Check terminals 2 and 11 (black and tan wires) at regulator connector. continuity of throttle position feedback rheostat of servo.

LIGHT 5 OFF: Bad connecton at terminal 6 (white wire) or terminal 12 (orange wire). Bad Servo.

LIGHT 6 OFF: Bad connection at terminal 4 (maroon wire) or terminal 12 (orange wire). Bad Servo.

ALL LIGHTS OFF: Afterpushing "Set/Coast" or "Resume/Accel" (test 4 0r 6) Blown fuse; maroon, red, brown or white wires shorted; Bad Servo.

ELECTRIC STEP (KWIKEE STEP MODEL 2505-8305)

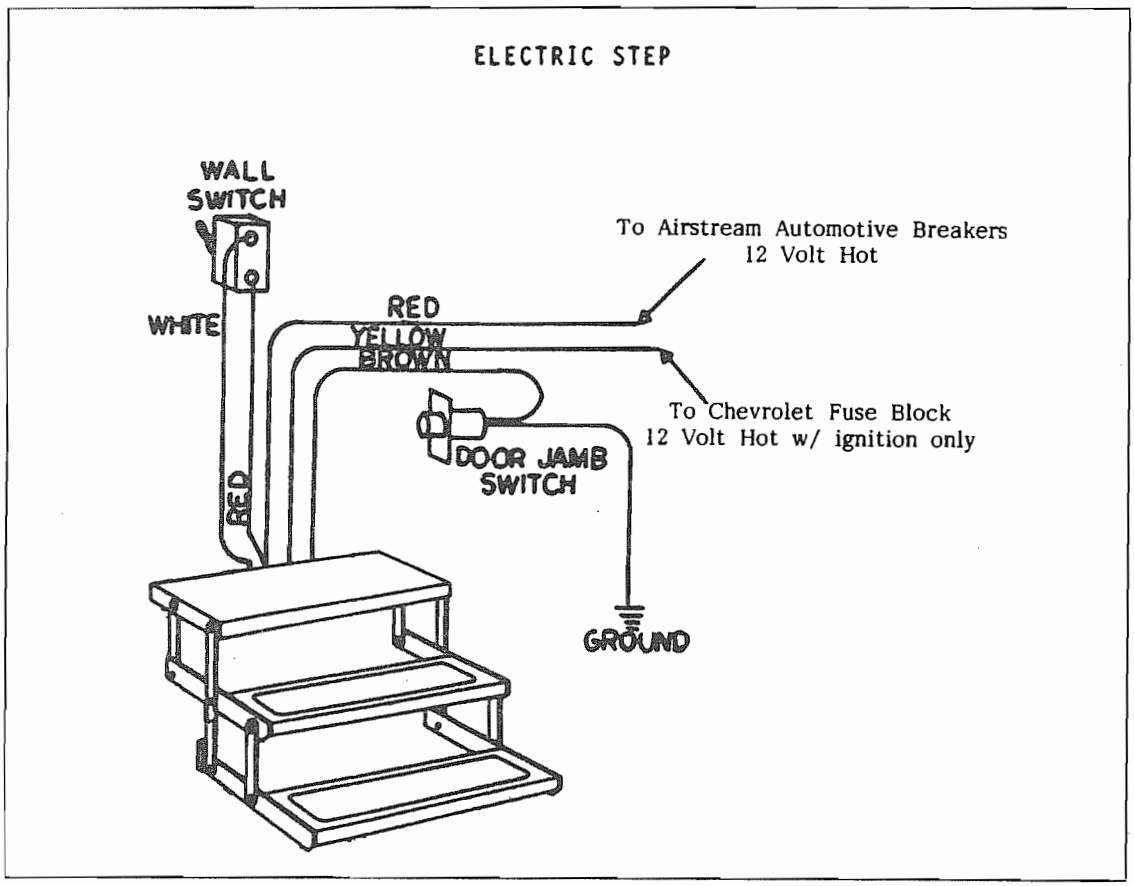
Manufacturer: Kwikee Products Company
Division of Ashton Corporation
P.O. Box 638
Drain, Oregon 97435
Phone: 503-836-2126

The step is easy and convenient to operate. Just inside the main door is a wall switch for the step. When traveling leave the switch in the "ON" position - the step will lower when the door is opened and retract when the door is closed.

When parked, open the door so the step is lowered. Then shut the switch off. The step will remain in the lowered position and the "step" light on the dash will be extinguished. If left on it will run your engine battery down in about a week.

If you forget and leave the switch off as you leave - No Problem! When the ignition is "ON" the wall switch is by-passed and the step will retract when the door is closed.

WARNING: If the wall switch is turned off, and the step is in the retracted position when the ignition is turned off, the step will not lower when the door is opened. Keep your passengers informed.



Basic Summary of Operation

Power is normally supplied to the system through the kill switch by the white wire. The red wire supplies a "stand by" power source which by-passes the kill switch in the "OFF" position. When the ignition switch is turned on, 12 volt DC is supplied to the yellow wire. This engages a relay that passes the "stand by" power into the system and retracts the step automatically when the door is closed.

When the door is open the door jamb switch makes contact to the ground which operates certain relays in the control unit. One of the relays is sent into a down oriented position and the step extends. When the door is closed, the switch opens so the circuit to ground is interrupted. This puts a relay into an up oriented position so the step retracts.

The control unit is essentially a current sensor as well as a switching device. When the motor assembly moves the step tread to its extended or retracted position, or stops moving because of an obstruction, such as a curb or the binding of a damaged or bent step frame, the motor draws a larger amount of current. The control unit "senses" the larger current draw and shuts off power to the motor.

Test Procedures

These test procedures cover the most common problems connected with the automatic steps. Due to the number of variable conditions available, you may experience other symptoms than those covered. Please feel free to contact the customer service department for further information or assistance.

1. Unplug 4 wire plug from control unit and 90° molded plug from the motor. Make certain the kill switch is on for remainder of tests. (See Fig 1)

2. Check main power source by connecting volt meter between white wire and step frame. Reading should be about 12 volts DC. (See Fig. 2)

If voltage is low there may be a corroded or loose connection or low battery charge. If voltage reading is zero, check the fuse/circuit breaker and all connections. Be sure you have a good ground connection from the step frame to the chassis frame. A GOOD GROUND IS ESSENTIAL.

If reading is approximately 12 volt DC proceed with next test.

3. To check the door jamb switch, connect volt meter between white wire and brown wire. (See Fig. 3) Reading should be 12 volt DC with the door open and zero with the door closed.

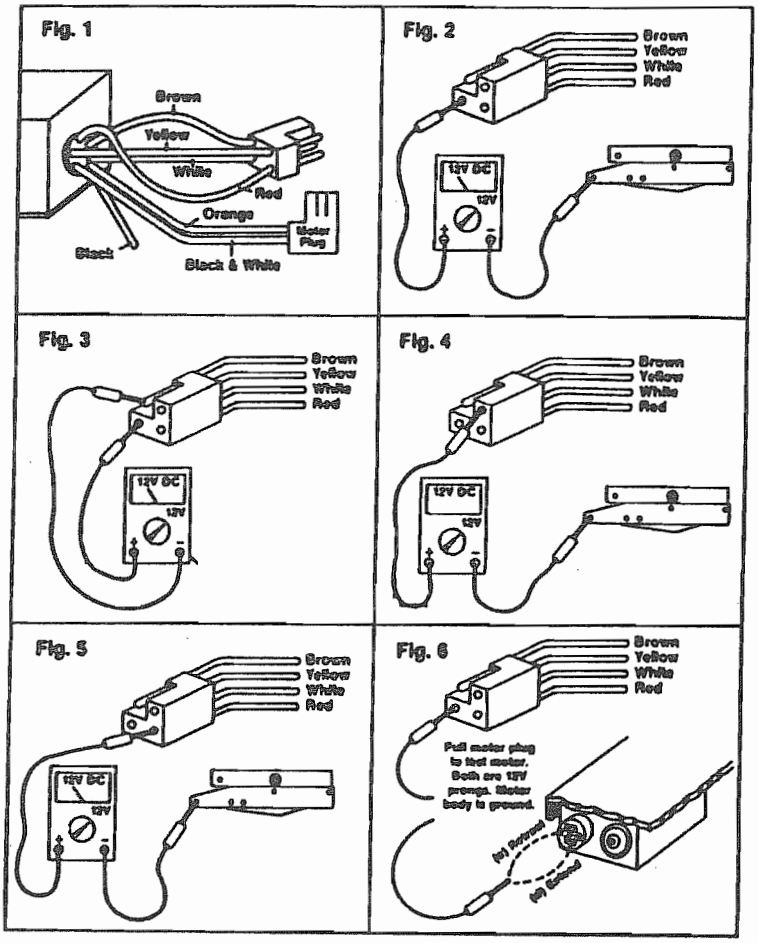
Although the volt meter may read as it should, it is possible that the ground connection (green wire) from the door switch may not be good enough to allow the step to function properly. A poor or improper ground connection can cause intermittent or erratic operation of the step. It is recommended that this connection always be cleaned; and a machine screw or nut, bolt and lock washer be used to connect it to ground rather than a coarse thread screw, such as a sheet metal screw.

If the motor fails to move the motor may be defective. If the step has been struck by some kind of road hazard, the step mechanism may be bent and causing the step to bind. The control unit would then shut off power as described in the operation summary. Check for physical damage to the tread, sliding rails, and extending arms. Also check all pivot points for rusting.

If the step doesn't move then power is applied directly to the terminals, but a dim spark is noticeable, there may be damage to the windings inside the motor requiring replacement. A dim spark or no spark may also indicate a poor ground connection. A very bright spark usually indicates a shorted or burned out motor requiring replacement.

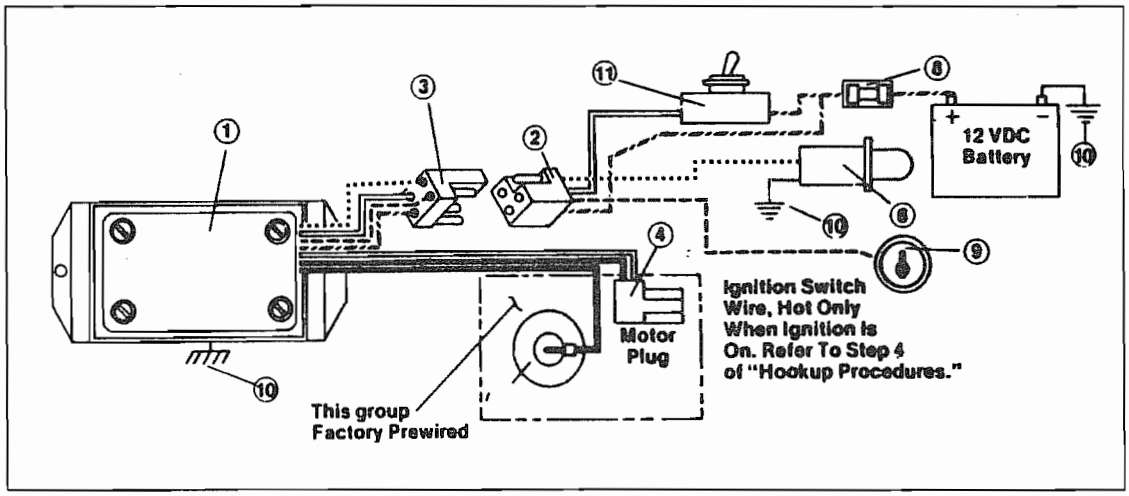
Further inspection of the motor should be done by removing one of the 1/4" hex head bolts at the rear of the motor, next to the motor plug receptacle. Remove one of the bolts that passes through the inside of the motor case. If the shaft of the bolt has a burned, tar substance on it, the motor windings have overheated. The motor should be replaced, even if it still works. However, a clean bolt shaft does not necessarily mean internal damage is not present.

If all the above tests check out and step does not move when the control unit and motor are plugged in, the control unit may be defective and should be returned to the factory for repair.



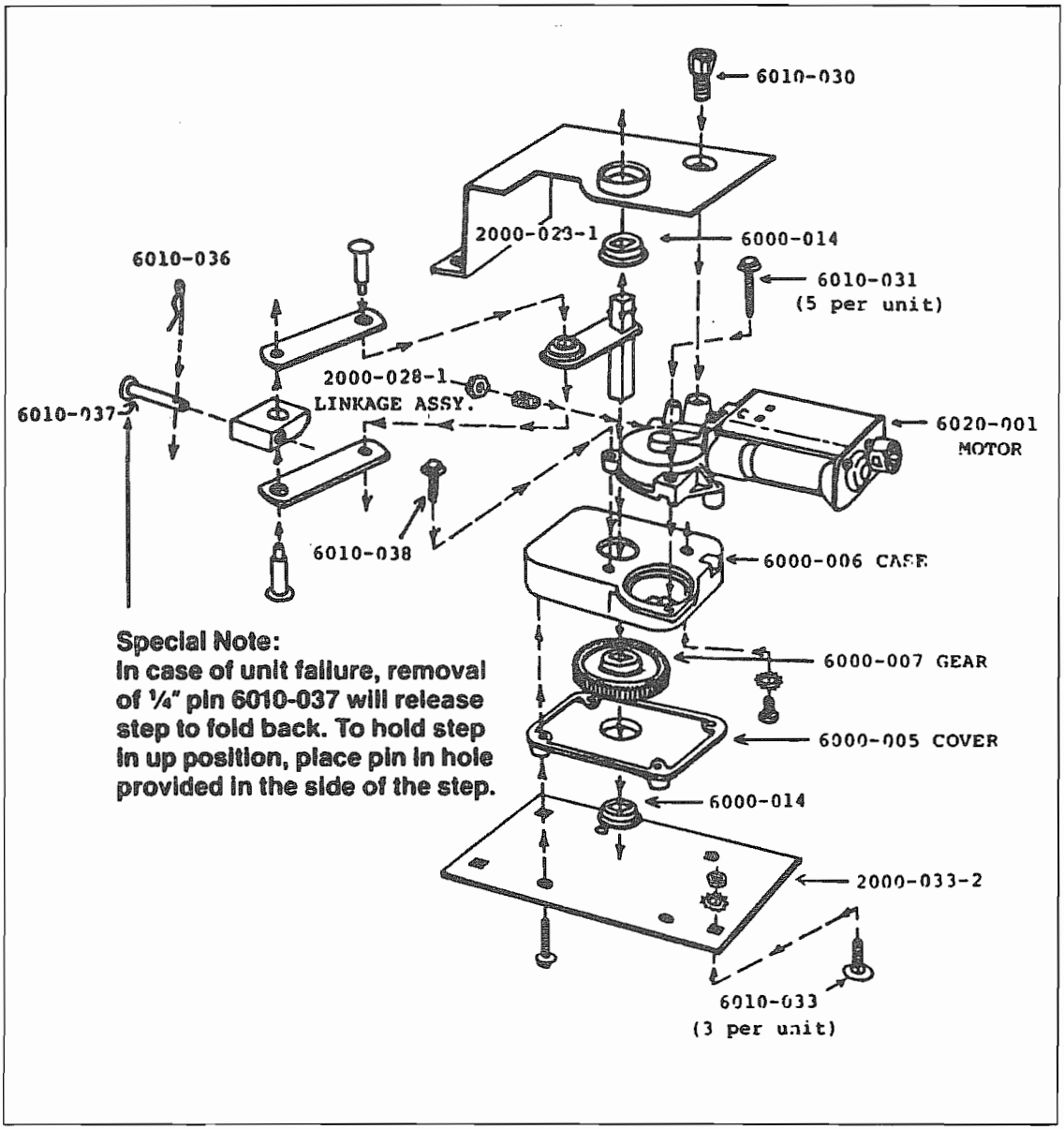
PARTS LIST

Kwikee Step Model 2505-8305

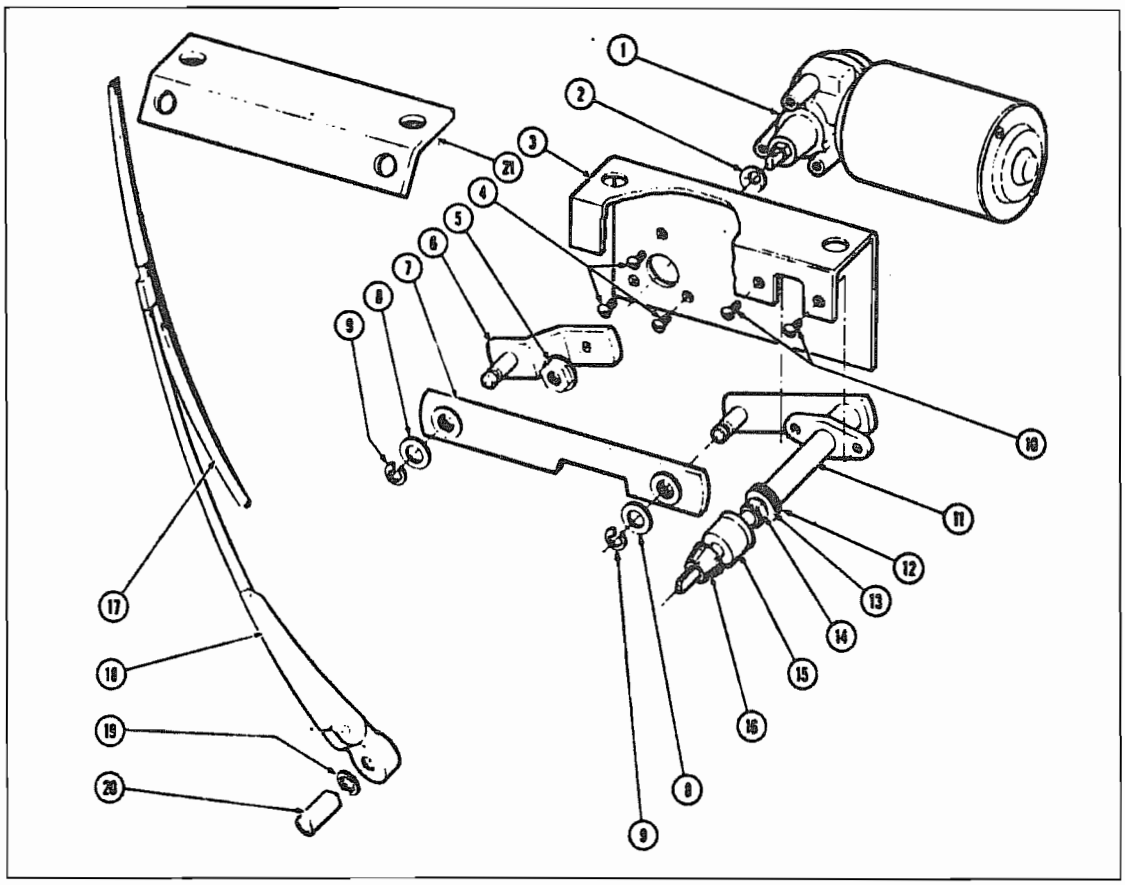


1. Control Unit
2. Plug #6020-002
3. Plug #6020-003
4. Motor Plug, 19"
5. Motor Assembly (See Illus. Next Page)
6. Door switch, automatic
8. Airstream Circuit Breaker (Access through front of unit)
9. Airstream Circuit Breaker
10. Ground Connection
11. Wall Switch

MOTOR ASSEMBLY



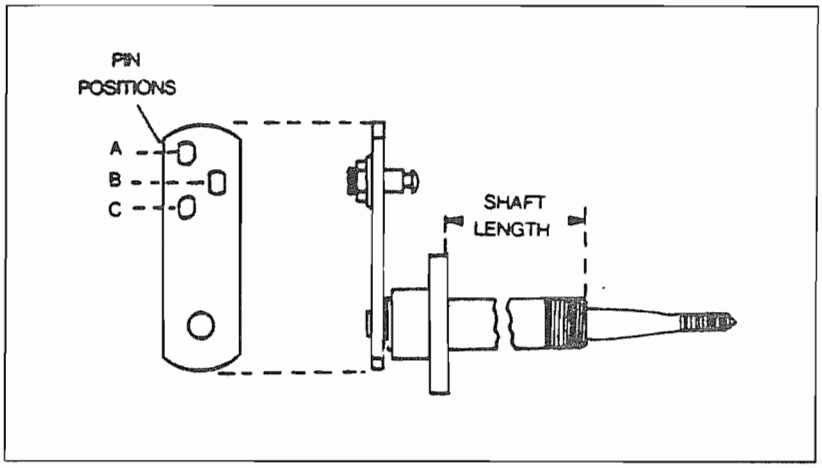
WINDSHIELD WIPER ASSEMBLY



1. Motor
2. Washer
3. Bracket
4. Screw
5. Nut
6. Drive arm
7. Link, connecting
8. Washer, spacer
9. Spring Clip
10. Screw
11. Pivot arm and shaft
12. Washer
13. Washer
14. Nut
15. Cap
16. Knurled Driver
17. Blade
18. Wiper Arm
19. Washer
20. Nut
21. Bracket, windshield wiper assembly attachment - CS, RS

Pivot Arm Removal/Replacement

1. Remove wiper arm and blade.
2. Disconnect extended link from pivot arm.
3. Using a 90° or stubby Phillips screwdriver, remove two Phillips head screws attaching pivot arm and shaft assembly to mounting bracket. Remove Arm and shaft assembly.
4. To install, reverse removal procedures.



Windshield Wiper Motor Removal/Replacement

1. Remove windshield washer hose from fitting on end shell.
2. Remove nut securing wiper arm to pivot arm and shaft assembly.
3. Disconnect electrical connections to motor.
4. Remove 2 bolts securing mounting bracket to end shell structure and remove.
5. For installation, reverse above procedures.

HORN (ELECTRIC AND AIR)

The roof mounted horn on your motorhome may be either air or electric. Both will have the same general appearance and tone. In both cases we've attempted to keep them as simple as possible.

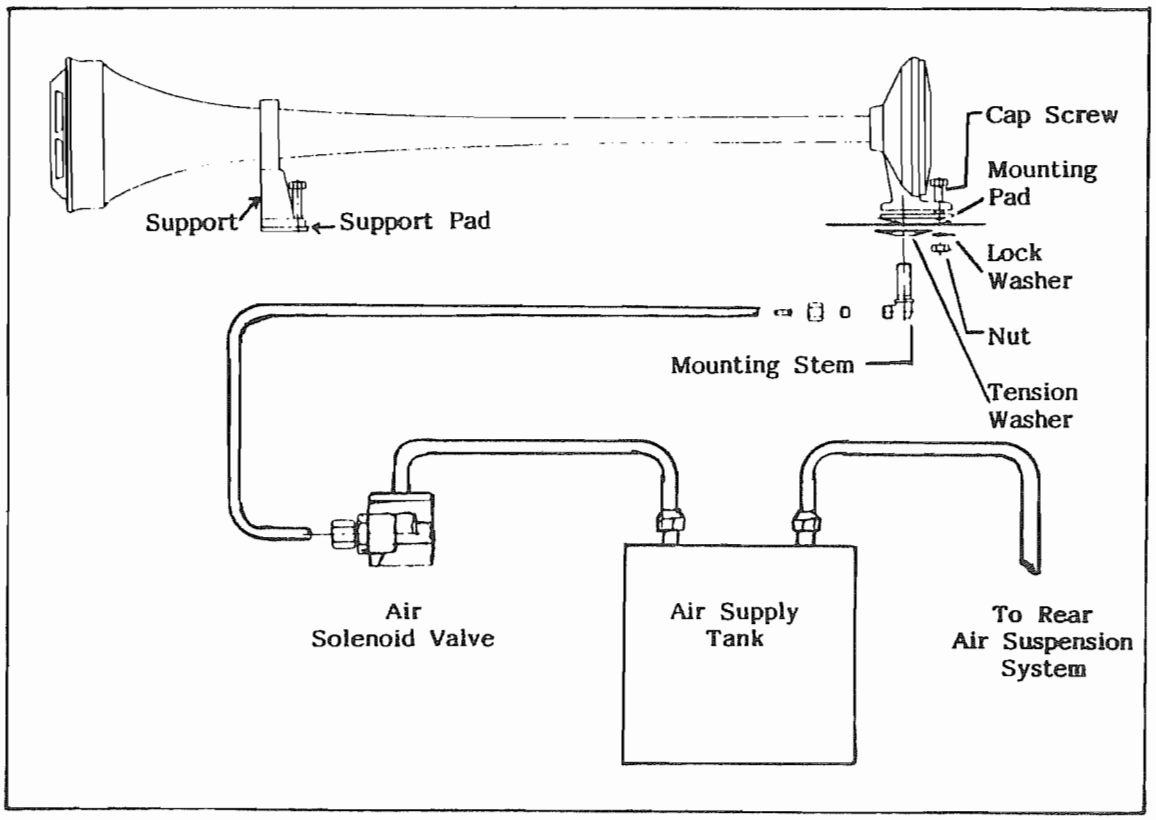
ELECTRIC

On the electric horn we've spliced onto Chevrolet's horn wire at the exterior firewall. The wire (green) runs from the firewall mounted Chevrolet horn back through the cab all just under the driver's window, then up behind the window to the roof mounted horns. In this manner when the horn button is depressed all the standard Chevrolet circuitry is used except where we've spliced on to lengthen the wire.

AIR

The electrical system of the air horn is just as simple. Chevrolet's horn wire is spliced onto and connected to a firewall mounted air solenoid valve. When the horn button is depressed the circuit is completed to the air solenoid valve, which opens and allows air to rush through the horns.

HORN - AIR LINE SCHEMATIC



CAMPING

SAFETY

As always, safety should be one of your top priorities. Make sure you, and everyone traveling with you, can operate the main 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.

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 warnings many times, but they are still among the leading causes of fires.

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

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.

NOTES

OVERNIGHT STOP

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 recreational vehicle 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.

Overnight or Weekend Trips

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 batteries which supply the living area 12 volt current.

Longer Trips

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 you stop for the night your Airstream motorhome 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. Try to pick as level a parking spot as possible.

Hydraulic Leveling Jacks

Some models are equipped with hydraulic leveling jacks that can be deployed. Complete instructions are included with the Owners Packet. Be sure to read the directions completely prior to operating jacks. The jacks will be able to level your unit in most modern campgrounds. However, their capabilities are limited, and in some situations you will have to use planks to level the coach.

TV Backing Monitor

The optional TV Backing Monitor can be extremely helpful, especially when traveling alone. The Owners Packet includes complete instructions on use. Practice with the monitor in a safe place will make it much easier for you to use when it is really needed.

All you need to do to enjoy the self-contained luxury is to:

1. Turn on LP gas supply and light appliance pilots if required.

2. Turn on water pump and open faucets until air is expelled from the system.

3. Make sure water heater by-pass is in normal position or use position.

Before moving on, turn off the LP gas and water pump. Check your campsite, both for cleanliness and also be sure you haven't left anything behind. Make sure everything is properly stowed.

WINTER TRAVELING

Traveling in your Airstream Motorhome during the cold winter months can be a most exhilarating experience.

There are, of course, certain precautions which must be taken as you would in your home in low temperatures.

WARNING: Always shut off the LP gas when gasoline is added to the fuel tank.

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 it is? How long will it be before you can turn the heat back on? Is the temperature dropping or raising? Remember, the wind chill factor when driving 50 MPH will cause the interior of the motorhome to cool much faster than when it is parked.

1. You must have a plentiful supply of propane gas.

2. If your stay is longer than overnight you should endeavor to have 120 volt electricity available. The batteries, fully charged, will not last more than about 15 hours in freezing weather. Of course, you can run your generator to recharge the batteries, or even use the generator continually. Since the generator starts off the same battery as the engine, it is recommended to start the generator prior to shutting off the engine. This will prevent running the engine battery down should there be a difficulty in starting the generator in the cold temperatures.

3. Minimize use of electricity if 120 volt power source is not available.

4. Leave cabinet doors, bed doors and wardrobe doors slightly open at night to allow circulation of air in and around all furniture components.

5. Use propylene glycol type antifreeze in waste and drain water tanks to prevent freezing. Quantity of antifreeze needed will vary with ambient temperature and the amount of liquids in tank.

6. For extended stays in cold weather insulate the water line outside the motorhome. You should remember that low temperatures in combination with high winds cause an equivalent chill temperature much below what your thermometer is reading. For instance, with an outside temperature of zero degrees, and the wind velocity of 10 miles per hour, the equivalent chill temperature is minus 20°F.

It is also important to guard against excessive humidity inside your motorhome during winter campouts. When windows and window frames fog up or "sweat", it means that there is too much moisture in the air. Moisture comes from water vapor and water vapor is the direct result of

water evaporating. Many things such as baths and showers, boiling foods, washing dishes, washing clothes, even breathing, contribute to evaporation. The inside air can only absorb so much of this moisture before it becomes saturated. At this point it can hold no more, and any additional water vapor condenses back to liquid water in the form of droplets on any available cool solid surface. Temperature has a direct effect on the air's saturation point. Cold air holds less moisture than warm air. For this reason, the air immediately adjacent to cold outside walls and windows cools down and causes water vapor to condense and form moisture droplets even though warmer inside surfaces are still dry.

The best way to keep condensation under control is to reduce moisture producing activities. It is also important to provide adequate ventilation and keep the air circulating as much as possible.

Use your exhaust fans to remove moisture before water vapor mixes with the air. Open windows slightly once in a while, while operating fans, to bring in drier outside air and aid in overall air circulation. In extremely cold weather, when outside ventilation is not practical, it may be necessary to use a small dehumidifier to aid in reducing condensation.

There is no substitute for common sense in cold weather.

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

EXTENDED STAY

Making a long trip 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.

Some models are equipped with HYDRAULIC LEVELING JACKS that can be deployed. Complete instructions are included with the Owners Packet. Be sure to read the directions completely prior to operating the jacks.

When you plan to stay in the same place for several days, weeks or months, you will want your motorhome to be as level as possible. Check the attitude with a small spirit level set on the inside work counter. If a correction is necessary then you must first level from side to side. This can be done most easily by driving up a small ramp consisting of 2" x 6" boards tapered at both ends. WE DO NOT RECOMMEND PLACING TIRES IN A HOLE FOR LEVELING.

HOOK UP TO WATER by attaching a 1/2" minimum high pressure water hose to the city water service, or the hose from the water reel if so equipped.

Plug the ELECTRICAL CABLE INTO THE CITY POWER SERVICE. Be sure you have the wire grounded and have the proper polarity. See Electrical Section for technical details.

If equipped with a POWER CORD REEL care should be taken to not pull the cord out further than a foot or two past the white band around the cord. Pulling the cord out further will make it difficult or impossible to operate the retracting mechanism. On the 325, 345 and 370 series the power cord is located on the roadside rear lower compartment. The 290 series has the power cord located in a small access compartment similar to the fuel filler. The power cord is on a reel, and is extended by simply pulling it from the recess.

A CABLE TV HOOKUP is available next to the power cord on the exterior and the interior connection is on the TV jack plate.

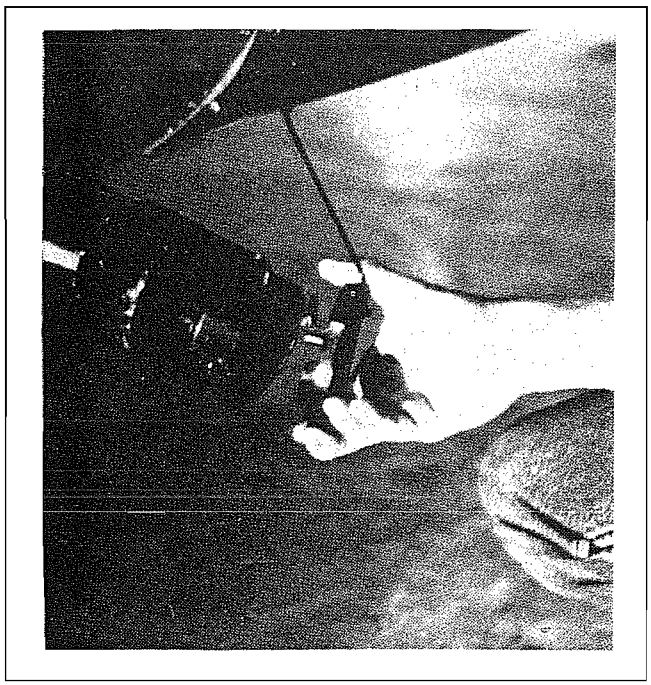
To operate the GENERATOR simply start the generator at the control panel. After the generator has run a couple of minutes an automatic relay will close and current from the generator will be supplied to the 120 volt circuit breakers. This is indicated by the AC power light on the control panel starting to glow. Operating the generator for about one hour each day will normally keep the battery charged.

For your convenience there is an additional switch on the dash within easy reach of the driver. Some models will have a third generator switch in the bedroom.

Hook your WASTE DRAIN HOSE INTO THE SEWER DISPOSAL FACILITY and attach to the drain outlet in your motorhome. For details on this procedure see Drain and Waste System Section.

Turn on the gas supply and light the oven pilot. Lighting a top range burner to bleed any air from the system will make it easier to start other appliances.

When you stay for extended periods where electric or water hookups are not available, you must make regular checks on the condition of your 12 volt battery and the contents of your water tank. Carry drinking water in a clean bucket to refill your tank. When your waste tank nears capacity move your motorhome to a dumping location.



Waste Drain Hose Hookup

EXTERIOR

The clear plasticoat finish applied to the outer surfaces have 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 the automotive acrylic lacquer finishes.

CAUTION:

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

As a general rule of thumb we recommend the motorhome 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 MOTORHOME 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 MOTORHOME 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 with out heavy buffing. If asphalt remains on the motorhome after washing, use a small amount of kerosene on a rag and wipe the spots individually, being careful not to scratch the finish.

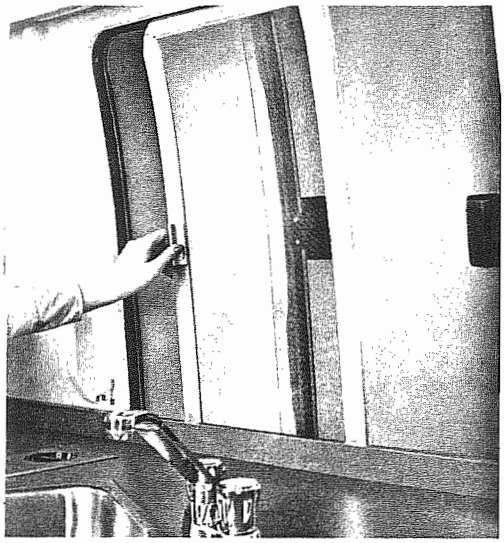
There is no painting process today that has an indefinite life. Plasticoat is no exception to this rule. If the plasticoat loses its flexibility it will tend to crack and peel and the resulting aluminum exposure is subject to oxidation. If cracking or peeling do occur, temporary repairs may be made by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

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 becomes 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.

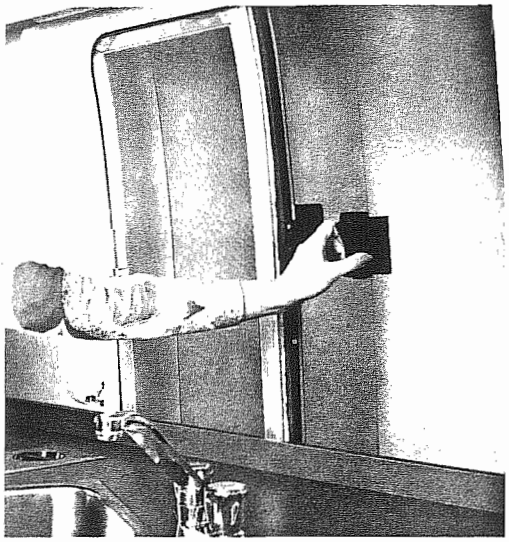
WINDOW OPERATION

To open the side widows depress the pivot bar to release the latch, then slide window away from latch side.

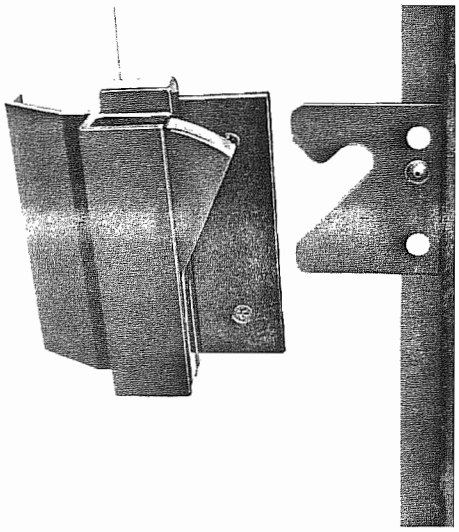
The front shape of the motorhome is a compound radius. For this reason it is normal for the cab sliding windows to fit tighter and tighter as they are slid further forward into the tighter radius. Since the cab windows are normally operated from a sitting position, some attention must be given (especially by shorter people) to make sure the window is being slid forward instead of being pushed upward. Pushing upward will "cock" the widow in the opening so it won't slide at all.



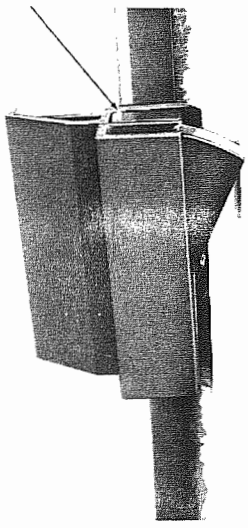
Window Operation 1.



Window Operation 2.



Lock Mechanism Open



Lock Mechanism Closed (Lock Pillar Down)

Sliding Windows

The sliding windows in your motorhome are made of heat strengthened plate glass. For convenience and safety the windows will automatically latch when they are returned to the closed position. To lock, depress vertical slide bar.

These widows are cleaned in the same manner as ordinary windows. 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. For replacement of a damaged window contact an Airstream Service Center or the factory.

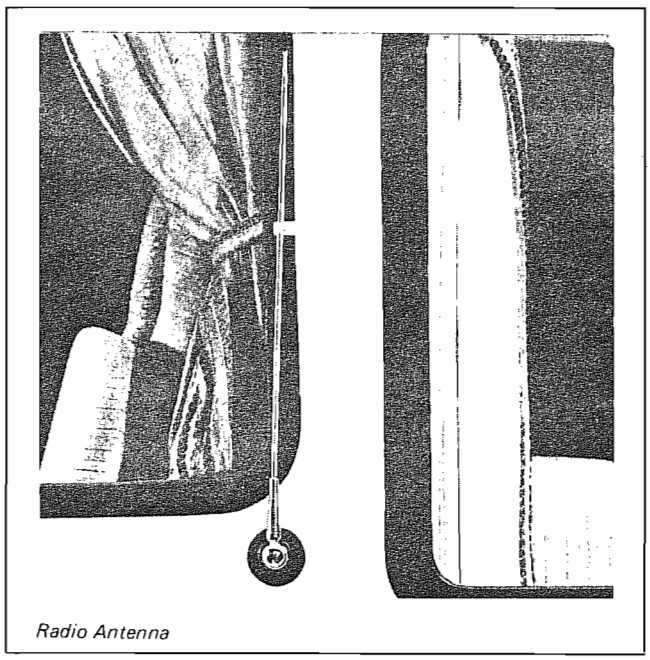
Screens

The screens are made of plastic for hard wear and easy maintenance. Clean with a damp cloth. **Note:** They will melt at the point of contact if touched by a cigarette.

Radio Antenna

The aluminum and steel construction of your motorhome creates a radio shield and you will need outside antennas for perfect reception.

The radio antenna installed provides signal not only to the AM-FM radio, but also incorporates a CB antenna lead. This lead can be found at the splitter located under the dash behind the entertainment center. CB radios should only be professionally installed since it is necessary to match the antenna to the transmitter, and this requires a Standing Wave Meter. To adjust for CB operation the antenna should be fully extended then the splitter adjusted with a non-metallic screwdriver. Additional adjustment is available by turning the tip of the antenna.



Radio Antenna

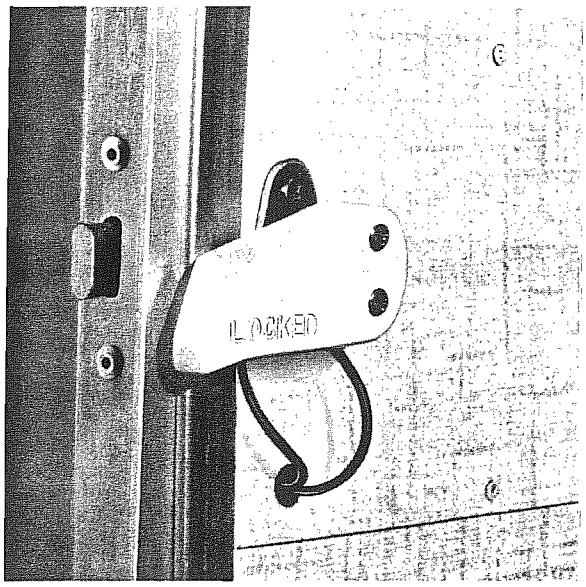
Cellular Telephone Antenna

If your motorhome is equipped with a cellular telephone antenna the lead in for the telephone connection will be found behind the driver's seat. Normally the wires will be found in the crevice between the end of the coach and the driver's platform.

Dead Bolt Lock

A separate dead bolt lock operates only from the inside of the vehicle for your additional security. It is equipped with a 12 volt switch in the handle which activates a warning light on the instrument panel when the lock is disengaged and the ignition is turned on. The lock is installed in the main door frame. To operate, simply turn the handle counter clockwise until the bolt is fully engaged in the door striker. The lock can also be operated electrically from the dash. Once engaged, the door cannot be opened. You should always engage this lock when traveling. The electrical section of this manual contains further service information.

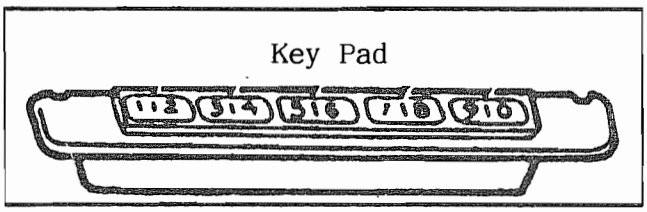
CAUTION: It is important that the main door be completely closed and locked during travel. If it is not locked the constant vibration of travel may cause it to open. Damage may result.



Dead Bolt Type Lock

Keyless Door Entry System

Many of the Airstream motorhomes will have a keyless entry system recognizable by the five button key pad next to the door.



Operation

To lock the system push the last two key pads (7/8 and 9/0) at the same time.

To unlock the system enter the five digit code provided to you by your dealer on a code card. If more than five seconds elapse between button pushes, the system will time out, requiring that you start over.

Owners can also select and program a second personal code. To program this second code, you first have to enter the code from your code card. Then, within five seconds, depress the 1/2 button. Then, within five seconds of each other, depress five buttons in any sequence you desire. This button sequence will be retained by the system as the second code. To erase the second code, simply enter the warranty card code, depress button 1/2, and wait six seconds. This allows you to loan or share your motorhome with another party without exposing your master code.

The system can be overridden with a key if a power failure or electronic failure should occur. We recommend a key be hidden on the exterior of your coach. We are not necessarily worried about a mechanical failure as much as a memory failure. Sometimes names and numbers can totally skip your mind, only to return later. A hidden key could prevent an embarrassing situation.

CAUTION: Do not punch the switch with a car key, ball point pen, pencil, etc. Hard objects may damage the push buttons. Each button should be pressed on the vertical line between the numbers because there is only one switch under each button.

Service and Maintenance

Occasionally it will be necessary to clean the lens of the door lock assembly. Use a multi-purpose concentrate, a mild soap, or household ammonia and water solution. Apply with a soft cloth or cotton swab, followed by a clear water rinse.

The electronic module operating the system is located under the galley cabinet mounted to the outside wall. It is fused in a fuse block located at the lower left of the steering column. Further detail may be found in the electrical section of this manual.

Main Door Lock

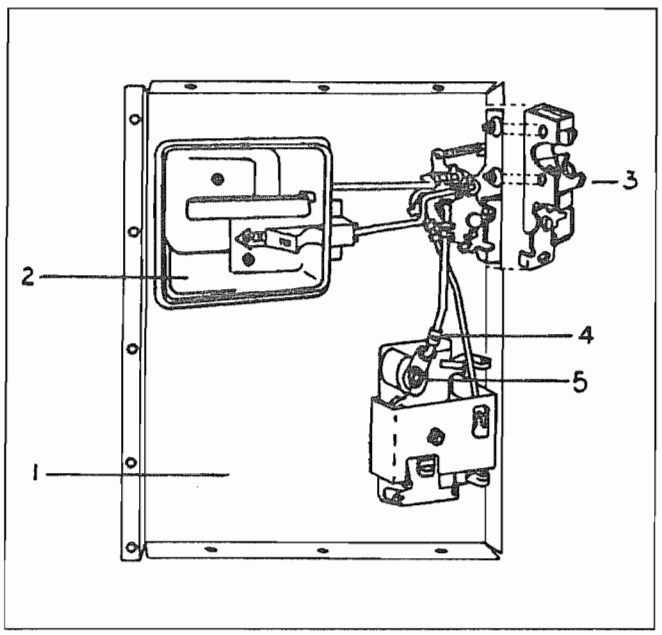
The door lock on your motorhome operates in the same manner as the locks used on most automobiles. Locking the latch actually disengages the linkage between the handles and the latch. This prevents forced entry by using large pliers on the lock handle.

We urge you to keep an extra set of keys for both the door lock and the ignition hidden somewhere on the exterior of the coach. We probably receive a dozen calls a year from people who have lost keys or locked them in the coach.

Occasionally you might find the latch catch, shown in the open position below, out of time. This simply means it has been bumped and has flipped to the closed position when the door is still open. To re-time, hold the door handle in open position, then pull out and down on the latch catch. It should flip to the open position as shown in the illustration.

1. Mounting Plate, Door Lock
2. Lock Handle, Inside
3. Latch Catch
4. Keeper, Rod Linkage
5. "E" Ring, Tumbler Installation

(Lock Assembly as Viewed from Inside of Door with Cover Plate Removed.)



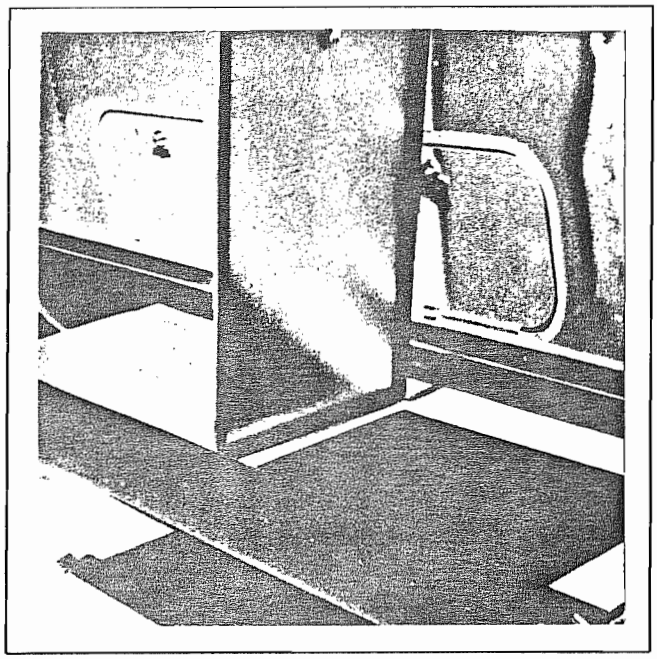
Access to the linkage mechanism of the lock is gained by removing the two screws holding the lock handle and the center panel of the inside door skin. This will expose the door lock assembly as shown in the illustration.

Other than the tumbler, secured by an "E" ring, no other parts located within the door frame are replaceable. The spacing of the three major part groups are critical, and are only available premounted to the main plate. The main lock mounting plate is attached by pop rivets around the perimeter, and three screws going through the latch into the operating linkage assembly.

The tumbler is replaced by removing the inside lock handle and the center panel of the inside door skin so the lock assembly is exposed. Insert key into tumbler then remove the "E" ring (item #5 on Illus) being careful it is not lost.

Underbelly Storage Compartments

The underbelly storage compartments are opened by inserting the key and turning until the spring loaded "T" handle snaps out of its recess. The "T" handle is then rotated to release the door. Only articles that will not be adversely affected by exposure to the elements should be stored in these compartments. On the Drawer Type lower storage compartments the complete section is slid out once the "T" handles are released. Care must be taken to make sure the drawer is fully extended prior to raising the sealed lids to prevent the side of the vehicle from becoming marred.



Access Door Lock Cylinder Removal/Replacement

1. Remove lock assembly from door.

2. With a narrow bladed screwdriver, depress the spring loaded pawl which projects into one of the four small rectangular shaped channel openings in the back portion of the lock cylinder housing.

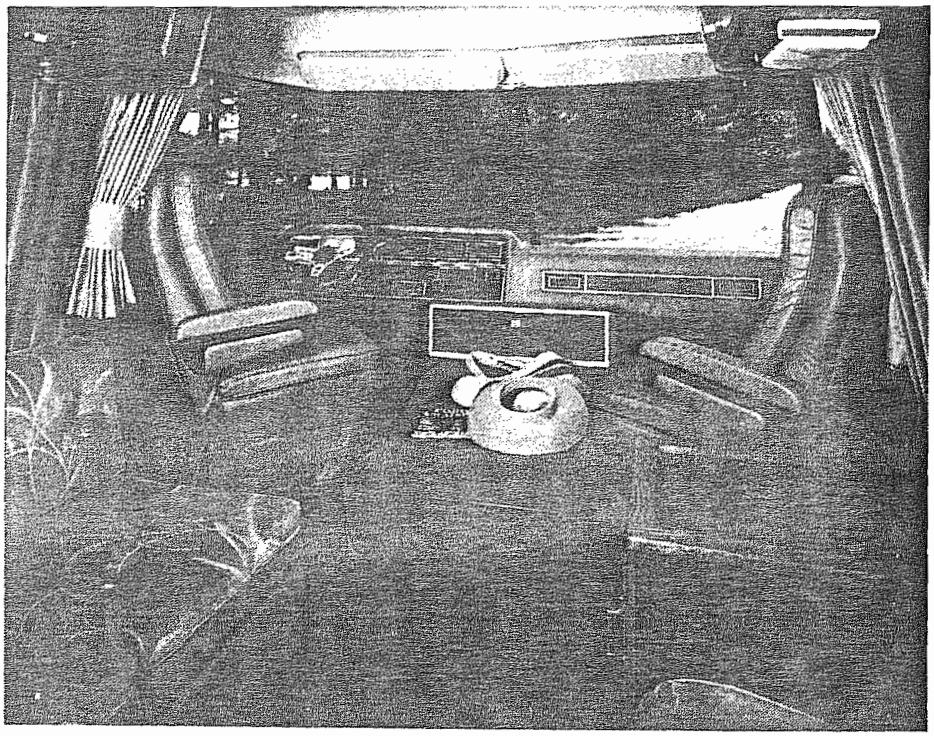
3. With the pawl depressed, push the lock cylinder assembly out of the front of the housing.

4. Remove the small die cast keeper directly in front of the spring loaded pawl. This keeper is loose and should fall out when the cylinder assembly is inverted.

5. Remove the inner "key" portion of the lock cylinder.

INTERIOR

The luxurious interior of your Airstream motorhome has been designed for comfort, convenience, durability and appearance. An understanding of the operational procedures and maintenance techniques of the interior appointments will add to your pleasure as well as the long life of your motorhome.



Pull Out Table

The pull out table is extremely easy to operate. Simply slide the table up out of the storage slot until the stops are reached, then let it tip down toward the aisle. The leaves may be folded out when dining, or left folded in when more room is desired. When storing the table for travel don't allow the table to "drop" in the slot since this can damage the lower support shelf.

* Pedestal Table Operation

1. Remove "plugs" from pedestal floor mounting bracket.

   Note: The plugs are approximately 3" in diameter and the front one is located 10" back from the cab platform. The rear one is 62" from the platform. Both are about 1' from the front of the roadside lounge.

2. Slide pedestal tube into floor socket.

3. Set table leaf down over pedestal tube.

4. A slight twisting action will aid when removing pedestal from floor and leaf sockets.

Raising the front edge of the lounge seat will gain access to the table and pedestal. This area is an excellent location for storing bedding, and the bedding will prevent the table from rattling.

* Note: The pedestal table leaves and support tubes are stored in a wardrobe or under the front lounge seat.

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 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.

Lounges

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

Some models are equipped with electrical powered lounges. The switch is in the armrest, and works much like a power seat. Depress switch and hold until lounge is extended. To retract simply depress the opposite end of the switch.

Cocktail Chairs

The cocktail chairs have two adjustments. As you sit in the chair one lever will protrude on the left side. Releasing this lever allows the chair to move forward and backward.

On the right side is another lever, but it is hidden behind the skirt and is tight up against the bottom of the chair. This lever has purposely been designed to prevent casual operation since the chair MUST be facing the aisle if it is to be used by passengers when in transit. Releasing the right lever enables you to rotate the chair.

Fabric Cleaning

All material should be professionally dry cleaned to remove any overall soiled condition. These materials may be spot cleaned, however, using the cleanability code instructions as listed. Sample swatches are furnished to our dealers. The dealer will be able to give you the cleaning code and part number for the fabrics used in your particular motorhome.

The following are the cleanability code instructions for the various fabrics used in the Airstream motorhomes:

Cleanability Codes

CODE W-S

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.

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.

Drapes

Use the following procedures to remove drapery panels for cleaning:

Front Wrap Around Drapes

1. Remove screw securing rear end of drapery track to wall, both roadside and curbside.

2. Slide draperies to the rear until they are clear of track.

3. After reinstalling drapes, replace screw in end of track.

Lounge Side Draperies, Roadside and Curbside

1. Remove one lower curtain track stop by drilling out rivet with 1/8" drill bit.

2. Remove screw from end of upper curtain track and slide curtains out end of track.

3. After reinstalling drapes replace stops.

   Note: Easier access may be gained by removing the upper valance.

Bedroom Draperies, Roadside and Curbside

1. Remove rearmost screw attaching drapery track to rooflocker top and to side wall bottom.

2. Slide drapery panels to rear until they clear upper and lower tracks.

3. After reinstalling draperies, replace attaching screws.

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

To prevent excessive wear to drapery linings, blinds must be secured at the bottom and slats turned vertically when driving long distances.

Shades

The shades are operated in the same manner as most venetian blinds. Pulling down on the rope raises the shade. Swinging the ropes to one side prior to releasing it will secure the shade in position.

A feather duster, or the soft-bristled brush often found as part of vacuum cleaner attachments, are recommended for cleaning the blinds.

Carpet

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

Counter Areas

The counter areas around the sink are of a high-pressure laminate and can be cleaned with soap and water, or you can use a common solvent on tough spots. 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.

The LE models use a DuPont material called Corian for the galley top and some tables. The color is consistent throughout the material, so it is possible to sand out surface damage. Once sanded out a Scotch Brite pad will bring the surface back to its original luster.

Walls

The fabric covered walls of the LE models should be treated much like carpet. An occasional light sweeping with a vacuum sweeper to prevent dust and dirt build up will keep them new looking for long periods.

The walls of the other models can be cleaned with a vinyl cleaner or any mild household cleaner.

CAUTION: Do not use any abrasive material on the vinyl covered wall.

Bathroom

CAUTION: The lavatory bowl, countertop, tub or shower pan in your bathroom are made of a special ABS long-wearing, light weight, high strength plastic material. When cleaning use soap or detergent only. NEVER USE SCOURING POWDER.

Always rewax the ABS plastic surfaces after each heavy cleaning with a good grade paste wax (without solvents or cleaners). The wax will protect the surfaces from discoloration and stains. When you first purchase your trailer Airstream recommends that you give all ABS plastic surfaces a heavy coating of paste wax. This will assure easier cleaning and lasting beauty.

Stainless Steel Sinks

Stainless steel sinks are not 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, or one moistened with a little wax cleaner. The surface should always be washed before wax is applied. Regular cleaning will prevent buildup 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.

PLUMBING

LPG SYSTEM

Your motorhome is equipped with a permanently mounted tank for LPG (Liquid Petroleum Gas). LPG burns with a clean blue flame. There are two basic types of LPG in common usage: Butane and Propane. Butane is widely used where temperatures are normally above freezing the year round, and Propane is used where subfreezing temperatures are common, since Butane freezes at 32°F as compared to -40°F for Propane. ALL OF THE ORIFICES IN THE LPG APPLIANCES ARE OF THE UNIVERSAL TYPE WHICH WILL BURN EITHER FUEL. 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 cooking extensively, 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 one month of usage from the tank.

If you have allowed the tank 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 can 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.

WARNING:

All pilot lights and appliances must be turned off during refueling of motorhome fuel tank and permanently mounted LPG tank. Gas lines should be checked periodically for leaks with ammonia free soapy water. Do not use open flame.

CAUTION:

Moisture in the LPG tank will cause a malfunction of the regulator in controlling proper pressure. This may result in the flame lifting off the burner, or the flame may go out frequently. Many refueling stations will add approximately 1/4 to 1/2 gallon of alcohol to lower the moisture temperature. Moisture will then pass through the regulator without the formation of ice crystals.

WARNING:

If gas can be smelled, appliance pilots fail to stay on, or any other abnormal situation occurs, shut off tank valve immediately and call on a qualified LPG service center or Airstream Service Center.

LPG Regulator

The LPG regulators used on Airstream motorhomes are designed for low pressure service with a normal outlet pressure setting of 11.5 water column. Only personnel trained in the proper procedures, codes, standards, etc. should service regulators.

Have the regulator inspected each time the tank is refilled. Make sure the regulator vent opening on both first and second stage regulators does not become plugged by mud, insects, snow, ice, paint, etc. Vents must remain open.

Replace any regulator that has had water in the spring case, or shows evidence of external corrosion, or corrosion inside the spring case. Closely examine regulators directly connected to the container valve by means of a solid POL adaptor (horizontal mounting) for signs of corrosion. (An Airstream Service Center is recommended for this service.)

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 period 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 vehicle 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.

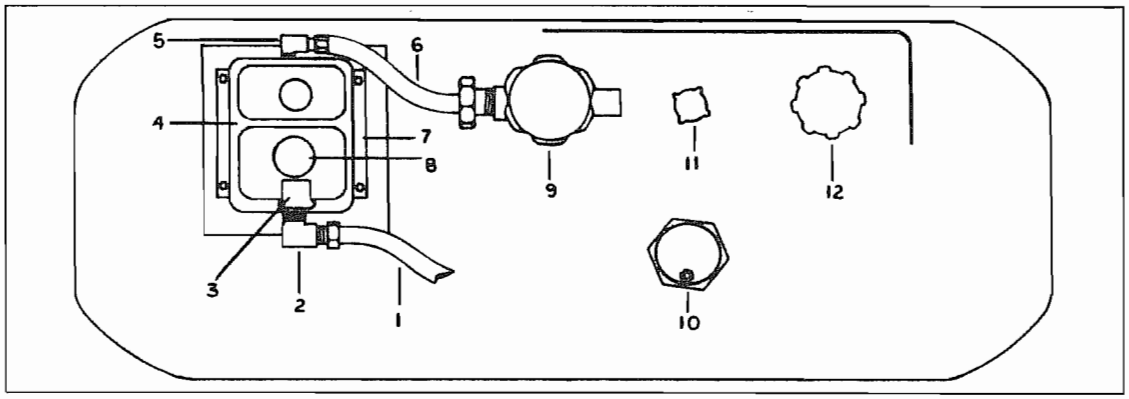
5. Leave the area until odor clears.

6. Have the gas system checked and leakage source corrected before using again.

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.

LP TANK INSTALLATION



1. Hose regulator to main gas line
2. Street el 1/2 MPT
*3. Vent
4. Regulator, two stage
5. Street el 1/4 MPT
6. Hose, gas bottle to regulator
7. Mounting bracket, regulator
8. Cap, second state pressure adjustment
9. Valve, main shut off
10. Gauge
11. 10% Valve
12. Valve, Fill

*** Warning: Check vent each time bottle is filled to make sure it is clear from obstructions.**

LPG Tank Removal/Replacement

The LPG tank is located in a compartment beneath the sub-frame just forward of the main door. To gain access, unlock the compartment door, release the latches and let the door swing down.

1. Shut off main gas supply at the tank.

2. Remove the plastic protective cover from the regulator assembly and disconnect the flexible tubing from the regulator. Always use two wrenches when loosening or tightening a fitting, one to hold the fitting, one to turn the flare nut.

   Note: The flexible tubing nut, attached to the shut off valve, has a left-hand tread and must be turned clockwise to loosen.

3. Disconnect the level gauge wire.

4. From the tank fitting support the tank with a floor jack and remove bolts and nuts attaching the tank mounting flanges (one to the front of the tank and two on the rear) to the chassis sub-frame brackets.

5. Carefully lower and remove the tank.

6. To install, reverse removal procedure.

7. Check all fittings for leaks by spraying with "Snoop" and watching for bubbles.

Second Stage Regulator

The first stage regulator reduces tank pressure down to approximately 25 psi. The second stage regulator reduces the 25 psi on down to the standard 11.5 inches of water column.

Gas Regulator Removal/Replacement

1. Shut off main gas supply at the tank.

2. Remove the plastic protective cover from the regulator assembly.

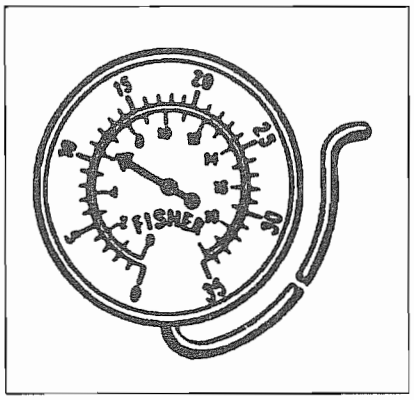
3. Using two wrenches, one to hold the line fitting and one to turn the flare nut, disconnect the regulator from the flexible rubber line.

4. Disconnect the regulator from the tank fitting. Remove regulator.

5. To replace, reverse the removal procedures.

LPG System Pressure Check

Use a pressure gauge
(See Illustration)



This gauge is calibrated to read in "inches of water column pressure". It is a standard manometer reading and is colored red.

To take the test reading.

1. Shut main gas valve off at tank.

2. Gaining access through exterior door remove the 3/8" gas line to the refrigerator burner.

3. Temporarily install a 3/8 gas shut-off valve in line, then turn on main gas.

4. Place manometer hose on shut off valve and turn valve open.

5. The optimum pressure is 11.5 inches of water column. The pressure should never be less than 11.0, nor higher than 12.0 inches with all appliances operating or off.

Copper Tube Flaring

1. Tools Required:

   a) Tubing Cutter
   b) Two piece flaring tool

2. Using a pencil or scribe, mark the point on the tubing where the cut is to be made.

3. Slide the tubing along the "V" formed by the rollers of the cutting tool until the point marked in Step 2 is directly under the cutting wheel.

4. Tighten the cutter clamp screw until the tubing is held firmly against the cutter wheel.

5. Rotate the tool completely around the tubing several times. The wheel should follow the direction of rotation, not lead it.

6. Tighten the clamp slightly and repeat Step 5. Continue to tighten and rotate until the tubing is cut completely through.

7. After cutting, use the reamer on the tool to ream the inside of cut to the original ID.

8. Slide the correct size flare nut on the tubing with the threaded portion and flare seat facing the cut end.

9. Insert the tubing in the correct opening of the flare tool clamping mandrel. Allow tubing to extend 1/32" above mandrel.

10. Slide the flaring head over the mandrel with the clamp fingers on the underside and the flaring tip directly over the clamped end of the tubing. Slowly tighten the flaring tip as far as possible.

11. Loosen and remove flaring head, open clamp tool and remove flared pipe.

WATER SYSTEM

The water system provides full service both when the motorhome is self-contained, Make sure winterizing by-pass valve a on.

When self-conta ed on. The switch is located on the l switch is located in the bath area. the pump on or off. The water pump

Note: The wat oked up to city water supply and when inattended.

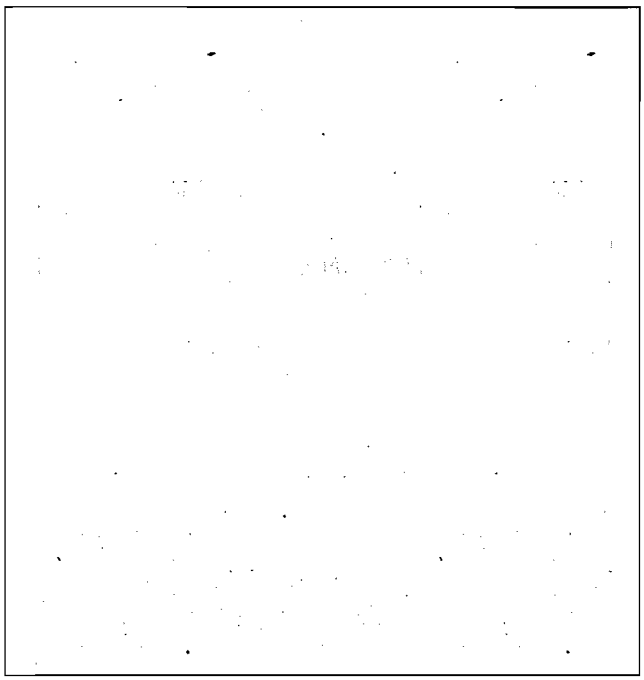
City Water Supp

Most of the m reel located in the roadside rear l all you have to do is pull the hose c onnect it to the city water fitting. idicator band, wrapped around the hose

CAUTION: Do not pull the hose out more than a foot past the band or the hose will become difficult, if not impossible, to rewind.

Turn the hose on and slowly open an inside faucet on the hot side until the water flows free of air. If the system has been completely drained this can take a few minutes since all the air in the water heater is being pushed out as it is filling with water. Each faucet should be opened in turn to allow any air trapped in the line leading to that faucet to be expelled. The system will now be ready for use. If you are staying for some time where city water is available, drain the water storage tank. The drain valves are under the rear beds. On doubles there is an access door in the bed top under the mattress, and on twins the valves are behind the last bed door on the roadside.

Filling Water Storage Tank



To fill the water storage tank, open the filler spout (see photo) on the exterior wall. Pull the vent plug and fill with a hose or a bucket until the water supply pipe is overflowing. If the water tank must be cleaned the following procedure is recommended.

Cleaning Water Storage Tank

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

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.

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

7. Drain the system and flush with potable water.

Water Filter

The optional Everpure QC-2 water filter is located under the galley sink. It will remove even very fine dirt and colloidal matter, and eliminates most chlorine, phenol and similar distasteful odors and tastes while delivering sparkling taste-free water for drinking and cooking. The filter is connected to the cold water galley drinking faucet only. The filter will also remove iron and sulfur provided the water supply is chlorinated. Super-chlorination will precipitate the iron and sulfur which will then be removed by the QC-2 filter. To purify any questionable water, fill the Everpure Chlorine Disinfectant Dispenser with liquid bleach and add 1/6 ounce (one teaspoonful) per 10 gallons of water in the water tank. The water will remain sparkling clear even to the end of the filter pack life, however, as the minute pores slowly fill up with impurities the flow rate will be gradually reduced. When it becomes too slow for convenience, the cartridge can be very simply changed. Follow the instructions on the cartridge. We advise keeping a spare cartridge at all time.

To remove used cartridge:

1. Shut off water by lifting valve handle counterclockwise as far as possible.

2. Turn colored ring all the way to the left. Ring will drop about 5/8".

3. Lift cartridge slightly and turn it further to the left until it can be disengaged.

4. Lower cartridge to disengage it from ring. Discard used cartridge.

To Install New Cartridge:

1. With colored ring in lowered position (turned all the way to the left), orient lug on cartridge with cutout under label on ring.

2. Insert cartridge straight up into ring as far as it will go. Holding colored ring steady, turn cartridge as far to the right as possible, without forcing.

3. Then turn colored ring far to right to drive cartridge up into head.

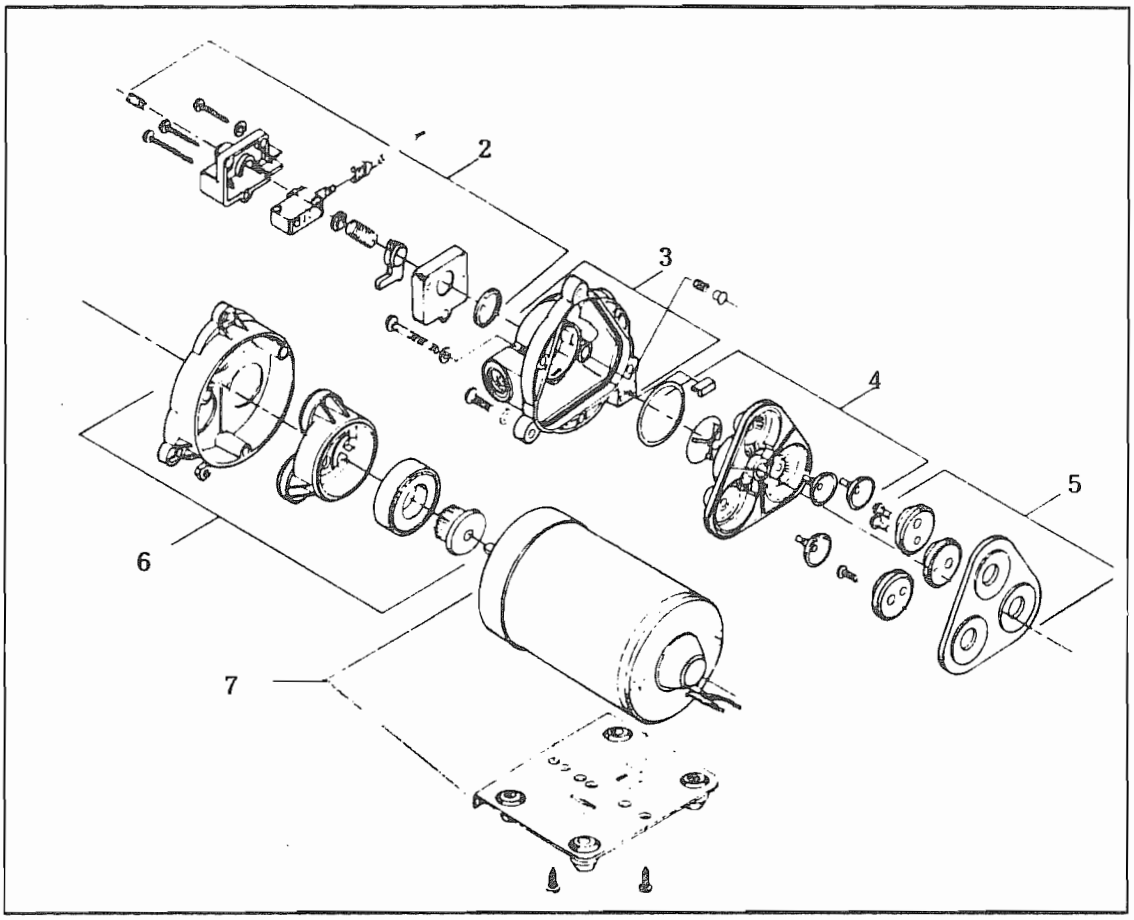
4. To lock ring in place and turn water on, move valve handle down. Be sure handle leg engages ring locking-lug.

The WATER PRESSURE REGULATOR protects the plumbing inside your trailer. Regardless of the variation in city water pressure, the pressure at the faucet is kept constant.

NOTES

SHURFLO WATER PUMP 8000 Series

Manufacturer: Shurflo
1740 Markle Street
Elkhart, Indiana 46517
219-294-7581



1. Complete Pump Head
2. Switch Assembly Kit
3. Upper Housing Kit
4. Valve Kit
5. Diaphragm Kit
6. Lower Housing-Drive Assy
7. Motor & Base Assy

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 the 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 shortened.

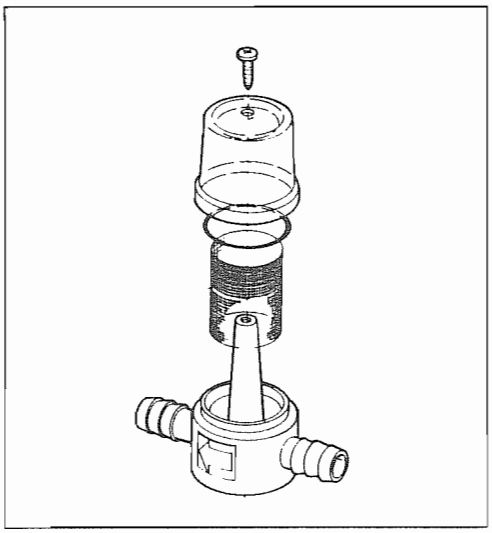
Having replaced the micro switch be careful to rewire correctly.

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.

Water Pump Filter



To 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.

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 period 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 the switch in "ON" position?
- Is the 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 in 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 lower 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.

Another component that may cause the problem is the auto fill valve. If any foreign material gets caught in the seal the pump can force water through the valve and back into the tank. See "Auto Fill Valve" for cleaning instructions.

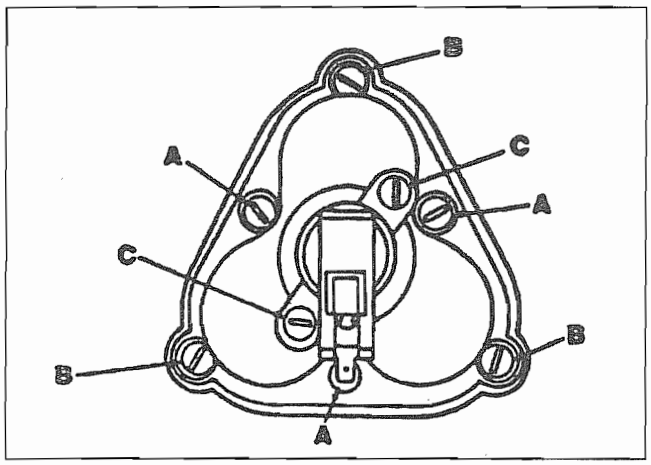
Pump Head Leaks

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 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.

INSTA-HOT WATER DISPENSER

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

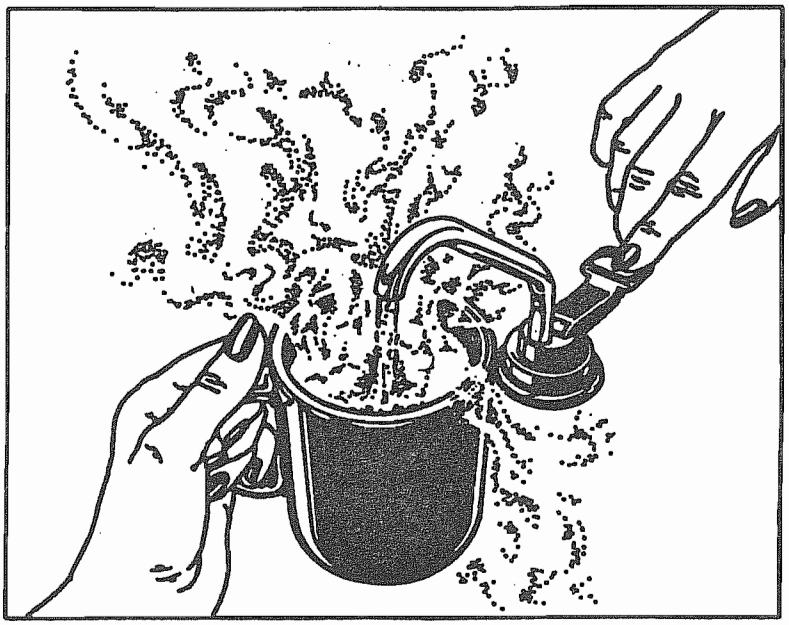
The optional Hot Water Dispenser is provided current through a wall switch above the galley. After the switch has been on a short while one third gallon of hot water is available for coffee, tea, chocolate and soups.

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

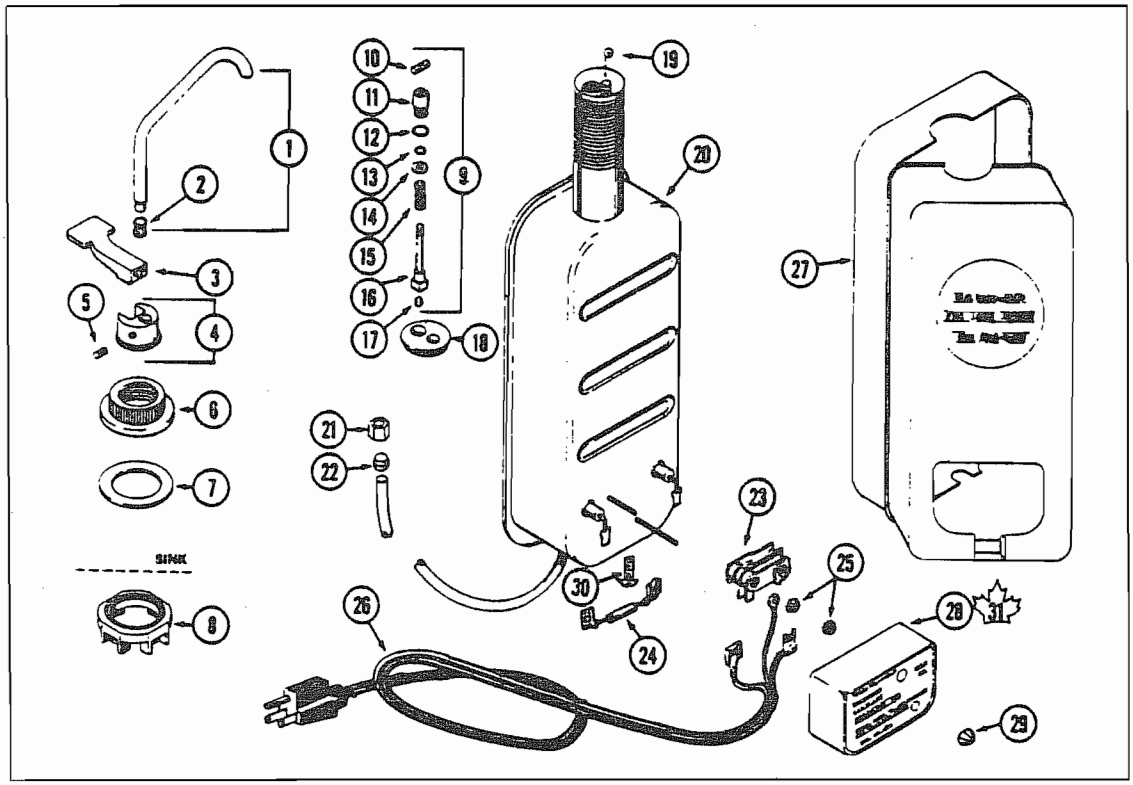
WARNING: Do not store paper towels or other flammable materials against the Insta-Hot Water Dispenser.

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 Assembly
2. Gasket
3. Handle
4. Cover
5. Screw, Set
6. Nut, mounting, upper
7. Gasket, mounting
8. Nut, mounting, lower
9. Valve guide & Stem Assembly
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 Assembly
17. Disc, Valve Stem
18. Gasket, Expansion Tube
19. Ball, Aspirator
20. Tank Assembly
21. Nut compression
22. Sleeve, ball
23. Thermostat
24. Thermal Fuse Assembly
25. Nut
26. Plug & Cord Set
27. Case
28. Electrical Cover Assembly
29. Nut, Cap
30 Plug, Drain

CANADIAN

31. Electrical cover Assembly

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.

Note: 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 nut for re-assembly purposes.

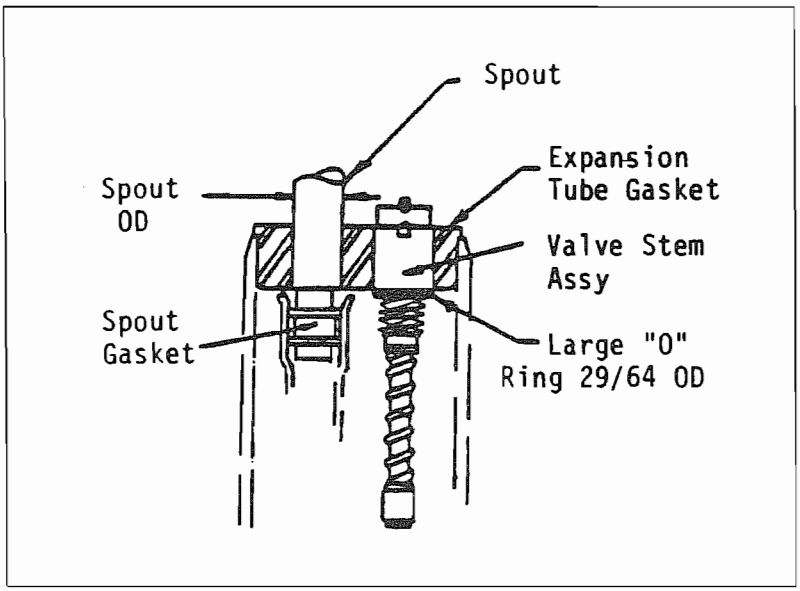
6. Remove tee nut from valve stem.

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 re-assembly. (See diagram). REPEAT: USE ONLY A VERY THIN FILM OF SILICONE GREASE.

9. Re-assemble 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:

1. Ambient temperature of the incoming water to the dispenser.

2. 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 degree water per hour by allowing a 1 1/2 to 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 (approximately 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 the thermometer to remain in the cup approximately 15 seconds, then read the thermometer.

Adjusting the thermostat will increase or decrease the water temperture. 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 thermoststst.

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: Leaks water 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" rings.

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.

NOTES

AUTO-FILL VALVE

The fresh water tanks on all motorhomes are 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 motorhome 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 circuited 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.

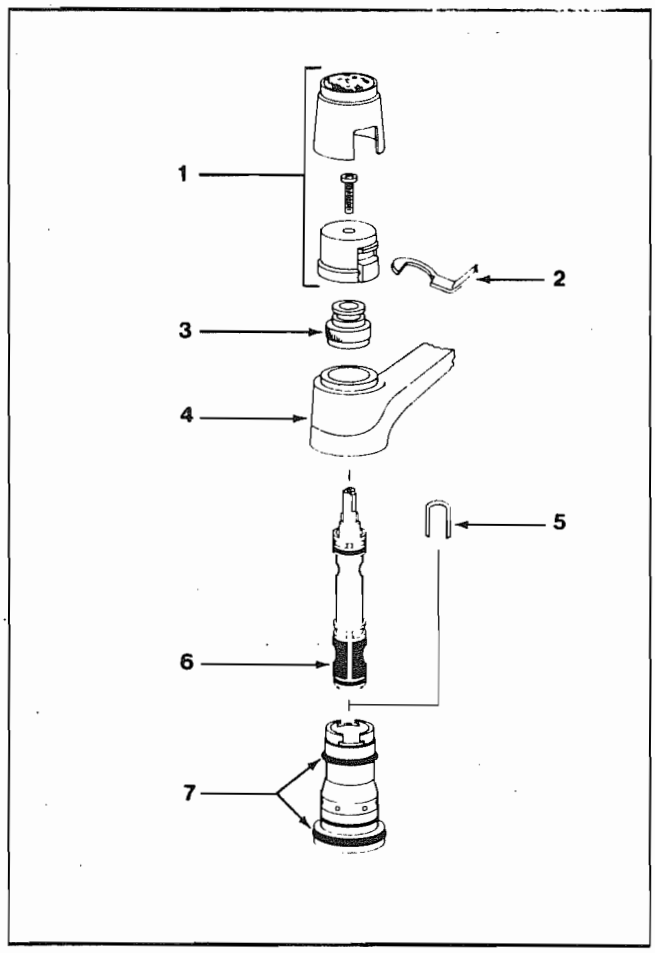
FAUCETS

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 as 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.

MOEN GALLEY FAUCET



1. Handle Assembly Kit
   Handle Cap
   Handle Screw
   Handle body
2. Handle Lever
3. Retainer Pivot Nut
4. Spout Assembly
5. Retainer Clip
6. Cartridge
7. Spout Seal Kit

Moen Galley Faucet Disassembly and Assembly

To Disassemble: (Need pliers and screwdriver.)

1. Turn "OFF" both hot and cold water supplies and remove handle screw.
2. Pull handle down. Place screwdriver in screw hole and press down on cartridge stem. Lift and tilt handle housing off.
3. Remove pivot nut with pliers.
4. Lift and twist spout off.
5. Pry out retainer clip with screwdriver.
6. Grasp cartridge stem with pliers. Lift cartridge out.
7. To flush supply lines turn on both hot and cold water supplies slowly.

To Assemble:

1. With cartridge stem up, insert cartridge and push down by its ears.
2. Turn cartridge ears to front and back.
3. Turn red (notched) flat of cartridge stem toward sink (**Note:** for cross piping installations where supply piping is reversed, red (notched) flat faces back of sink.)
4. Replace clip all the way.
5. Replace spout. Push down until it nearly touches the faucet escutcheon.
6. Screw on pivot nut. Do not cross thread. Tighten with pliers.
7. Press cartridge stem down. Holding handle up, hook ring in handle housing into groove on sleeve.
8. Swing handle back and forth until it drops down into place.
9. Replace handle screw. Tighten securely.

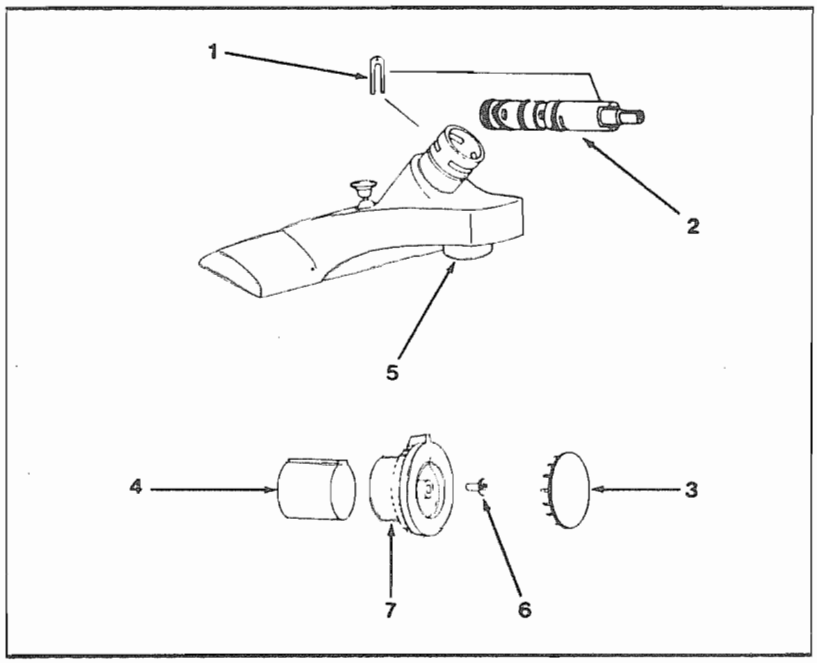
To Flush the Installation:

1. Faucet body and supplies should be flushed under pressure to remove pipe chips or other foreign material that might clog the faucet when in service. To do this make sure the water supplies are "OFF". Follow the detailed instructions below and disassemble the faucet. Turn on both hot and cold water supplies slowly, and thoroughly flush the installation. Reassemble faucet as shown in the instructions below.

   A. If the handle won't operate properly you have not hooked handle ring into sleeve groove. (See Step 7)

   B. If hot and cold are reversed, the red (notched) flat is not toward the sink. Remove handle assembly. Turn red (notched) edge of stem so it faces sink. (See Step C)

   C. For proper water flow, aerator must be free of foreign particles. If flow is weak or irregular, unscrew aerator, clean and replace.



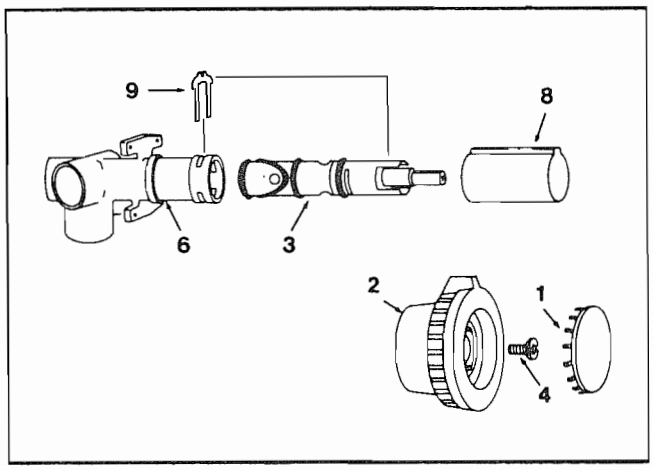
1. Retainer Clip (Knob Handles)
2. Valve Cartridge
3. Handle Cover (Knob Handles)
4. Stop Tube (Knob Handles)
5. Aerator - Male Thread
6. Handle Screw (Knob Handles)
7. Handle Assembly (Knob Handles)

Removal and Replacement

1. Disconnect City water supply.
2. Shut off pump switch.
3. Open Faucets
4. Open drain valves
5. Remove hose clamps holding plastic hot and cold water lines to copper pigtails on faucet. Remove lines.
6. Form lines from faucet so they are paralleled with one another.
7. Remove nuts and washers securing faucet in place.
8. Remove faucet by lifting it from its position.
9. To replace, reverse above procedure.
10. Check for leaks.

Note: See end of faucet section for removal of cartridge.

MOEN SHOWER MIXING VALVE ASSEMBLY



1. Handle Cover
2. Handle
3. Cartridge
4. Handle Screw
5. Valve Body
6. Stop Tube
7. Retainer Clip

Removal and Replacement

1. Cover carpet and cover bottom of shower pan to protect them from damage.
2. Disconnect city water. Shut off water pump.
3. Open drain valves
4. Open galley, lavatory and shower faucets and allow water to drain from lines
5. Remove screws from top of faucet inspection cover in wardrobe. Tip back and remove water lines from faucet.
6. Pop out metal insert in control valve handle. Remove screw and pull knob off.
7. Remove screws in escutcheon plate.
8. Disconnect shower hose.
9. Wrap masking tape on chrome fitting so as not to scratch chrome.
10. Using wrench, remove fitting.
11. Mixing valve, shower outlet, tube and hot and cold feed line assemblies may then be removed through wardrobe inspection hole.
12. Replace by reversing above procedure.

Note: If existing hose clamps were destroyed in removal, they should be replaced with screw type clamps.

LAVATORY FAUCET & SHOWER MIXING VALVE CARTRIDGE REMOVAL

Shut off water pressure for entire system.

Disassemble: Remove handle cover. Take out handle screw and remove handle and stop tube. Lift out retaining clip and pull the cartridge out of the body by the stem.

CAUTION:

Reinsert cartridge by pushing it all the way into the body and until the front of the ears on the cartridge shell are flush and aligned with the body. Replace the retainer clip so that the legs straddle the cartridge ears and slide down into the bottom slot in the body. This prevents the cartridge from rotating and locks it in the body. Reinstall stop tube and handle. Tighten handle screw securely, and replace the handle cover. The red flat on the stem must point UP when mounting the knob handle (down for lever handle).

If cold water is on left side and hot water is on right side (red flat pointed down), remove cartridge and reinstall 180°.

STORAGE AND WINTERIZING

When storing your motorhome for a short or long period 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.

Twice a year, or after a long storage period, we suggest you take your unit into your Airstream dealer for a check-up and cleaning of the gas operated appliances.

Living Area

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 waste holding tanks, the water heater and the batteries. To completely winterize your motorhome follow this procedure:

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

2. Turn the water pump switch to the OFF position.

3. Open all drain valves. One drain valve on all models is located on the water heater exterior and is accessible through the water heater access door.

   The 325, 345, and 350 models have three valves under the rear bed. On these models sliding the mattress toward the front of the motorhome will expose an inspection cover screwed down in the curbside rear corner. Removing the cover gains access to the valves.

   The 290 model drain valves are located under the bottom drawer of the microwave cabinet. To remove the drawer slide it out against the stops, then relieve the stop in the drawer guide. If your 290 has the optional ice maker an additional drain valve will be located under the front lounge directly behind the driver's seat. (On the pages immediately following the winterizing instructions you will find more information on the drain valves.)

4. The toilet water valve should be left in open position while draining water. It is located in the lavatory cabinet.

5. While the water is draining from the system depress hand spray thumb button on the telephone shower head and drain all water. Unscrew the heads on both spray units and store.

6. After the water has stopped running from the drain lines, apply at least 60 lbs. of air pressure at the city water inlet. 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.

7. Pour a cup of non-toxic antifreeze into the lavatory, sink and tub drains to prevent freezing water in traps.

8. 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 tank, if frozen, could seriously damage the tank.)

9. Remove water filter canister and dump.

10. Remove the batteries from your motorhome and store in a cool, dry place where there is no danger of freezing. It is very important for optimum life of your battery to check it periodically and to keep it fully charged. This is especially true in winter months when the temperature may drop below freezing. If the period of storage is for 30 days or less, you may turn off the "kill" switch rather than remove the batteries.

    CAUTION: Make sure you turn the kill switch on prior to operating any appliances or accessories in the motorhome.

    Please refer to the battery section for more information on battery maintenance.

11. With OPTIONAL ICEMAKER

    *a. Disconnect the water line where it enters the solenoid valve in the unit compartment. Allow the machine to run for one hour so that all water is drained through the system.

    b. Leave disconnected until re-using.

    * Motorhomes with the icemaker mounted between the chairs will have a drain valve in the cabinet.

c. Mop out any remaining water in the Ice Maker mold.

d. Leave door propped open two inches so that humidity will not build up inside the cabinet and corrode the microswitches.

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

For additional winterizing protection add non-toxic antifreeze (approved for drinking water systems) to your 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).

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.

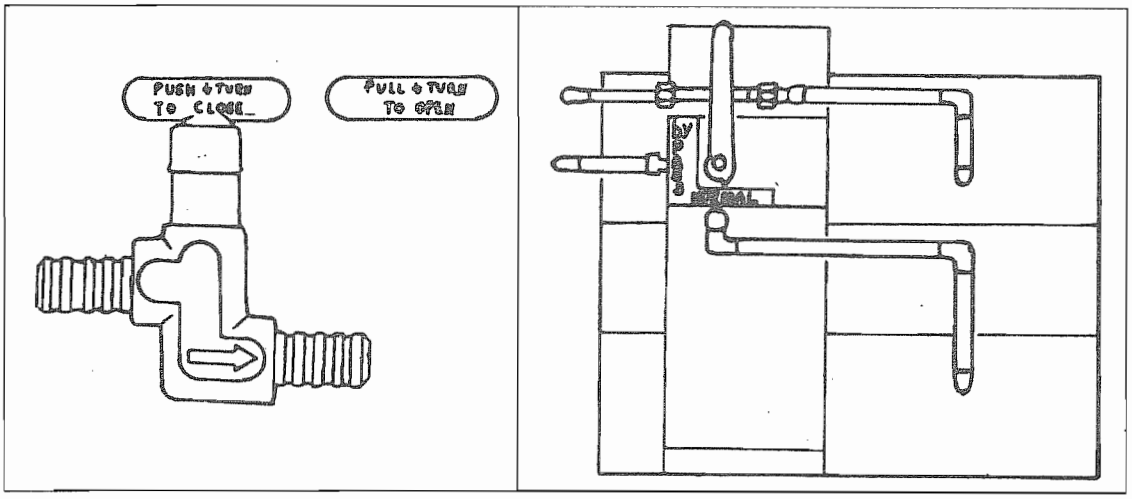
7. Shut off the pump and close all faucets.

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

Note: Most by-pass valves are found next to the water heater and can be reached under the galley on most units. Access of the 290 is through the rear door of the front lounge.

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 diagram on the right is the back of a water heater showing the by-pass valve in the normal flow position.



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.

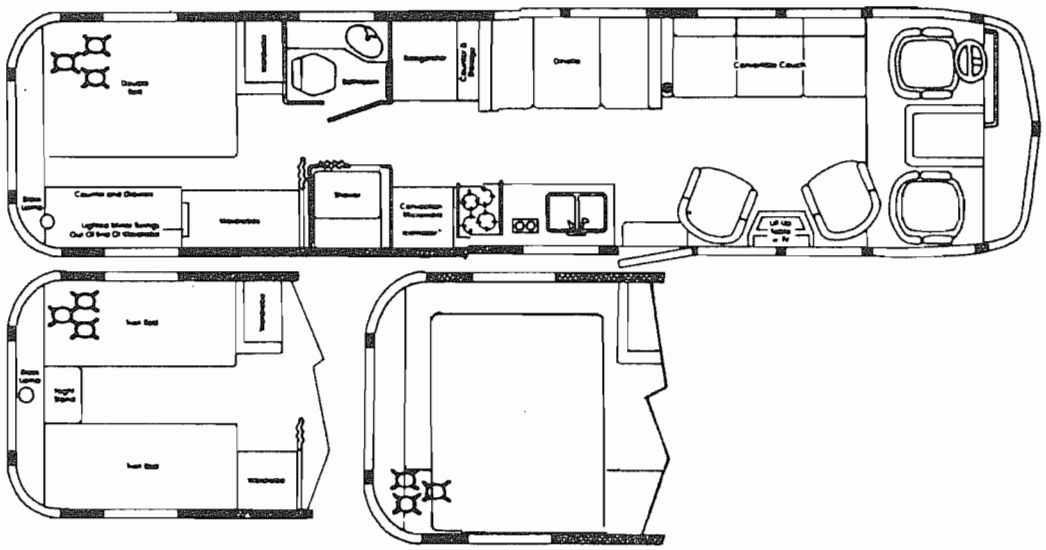
Note: These valves do not have stops. You can just keep turning them.

Most drain valves are located under the rear beds. The floor plan illustrations on the following pages will indicate the valve locations according to the floor plan of your motorhome.

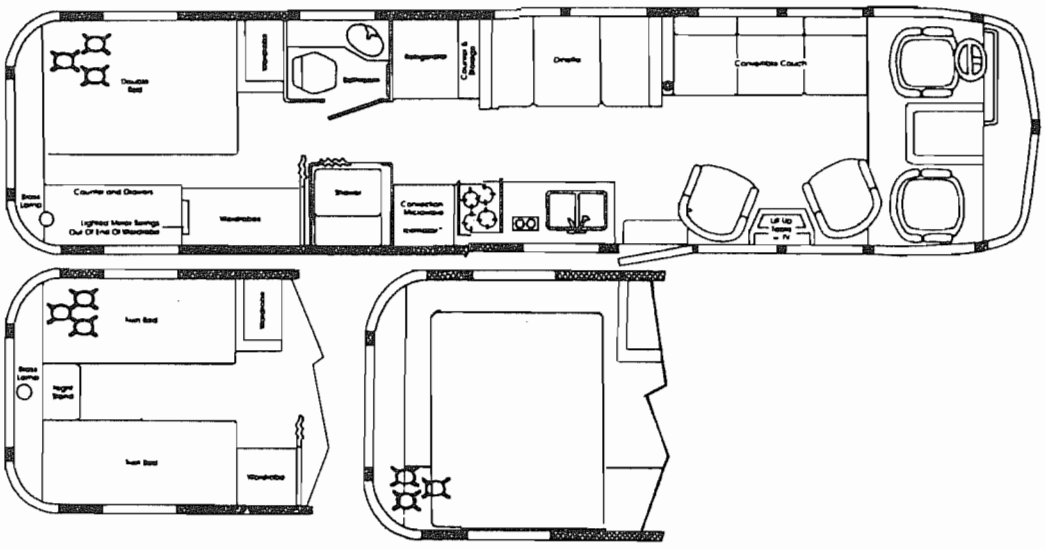
DRAIN VALVE LOCATIONS

Valves Indicated By: ⋈

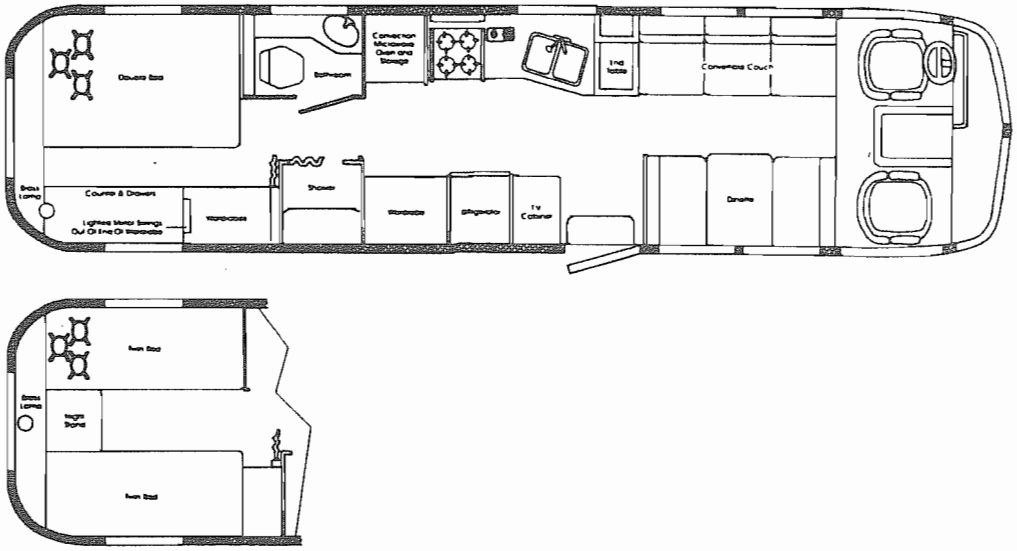
350 SERIES
Corner Double - Twin Bed - Island Double (Queen)



345 SERIES
Corner Double - Twin Bed - Island Double (Queen)

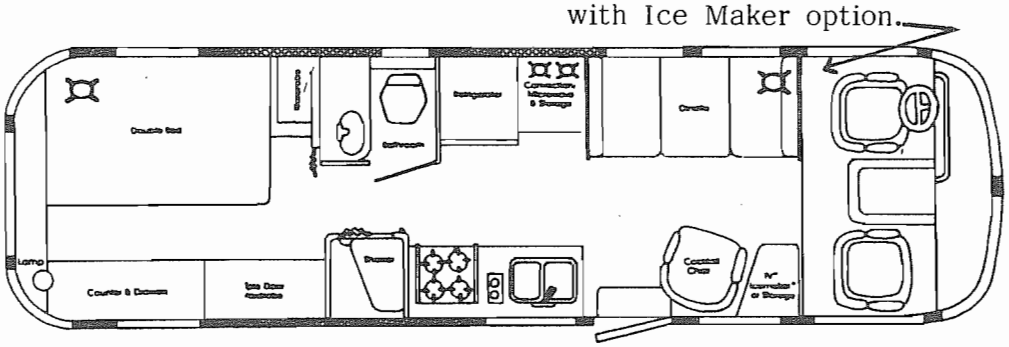


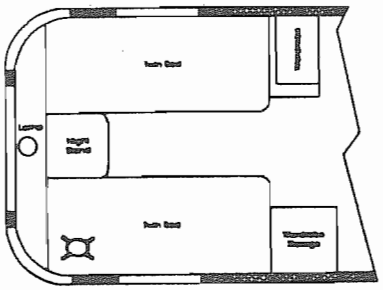
325 SERIES
Corner Double - Twin Bed



290 SERIES
Corner Double - Twin Bed

Note: This valve used only with Ice Maker option.





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

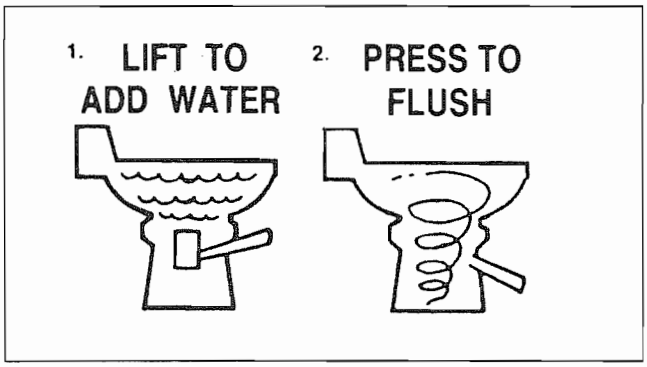
1. To add water to the toilet before using, lift or raise the flush lever until desired water level is reached. Generally more water is required only when flushing solids.

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.

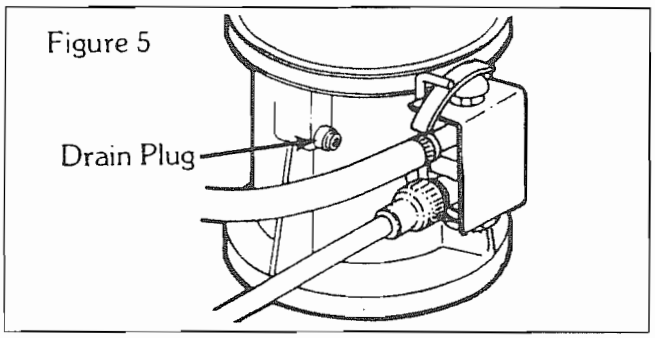


Figure 5

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

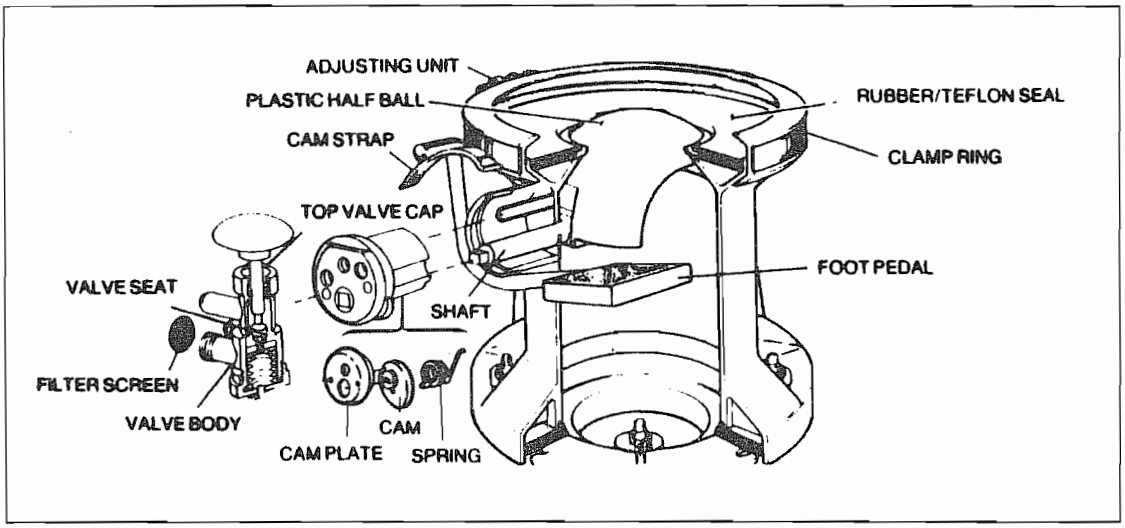
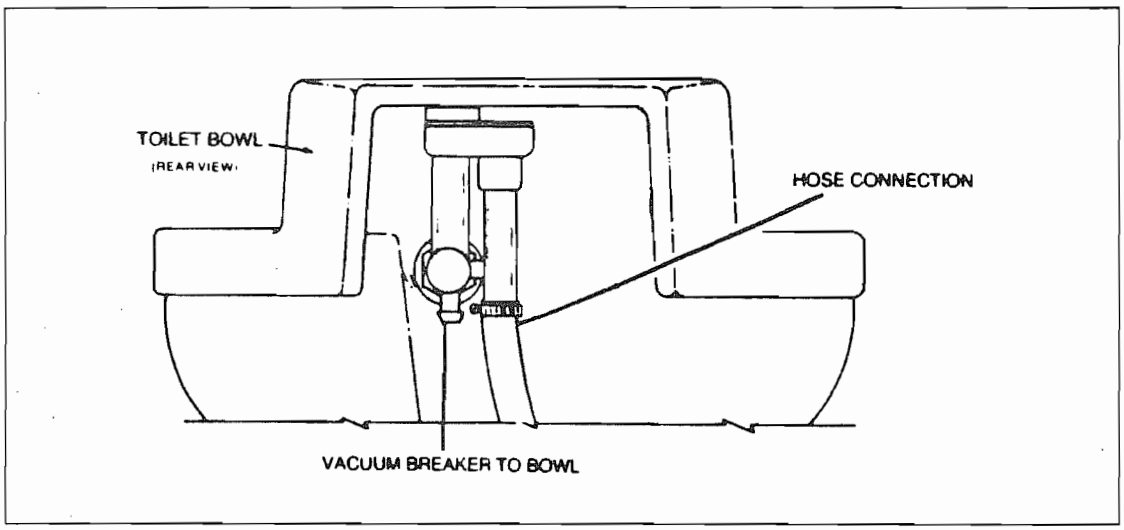


FIGURE 7



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)

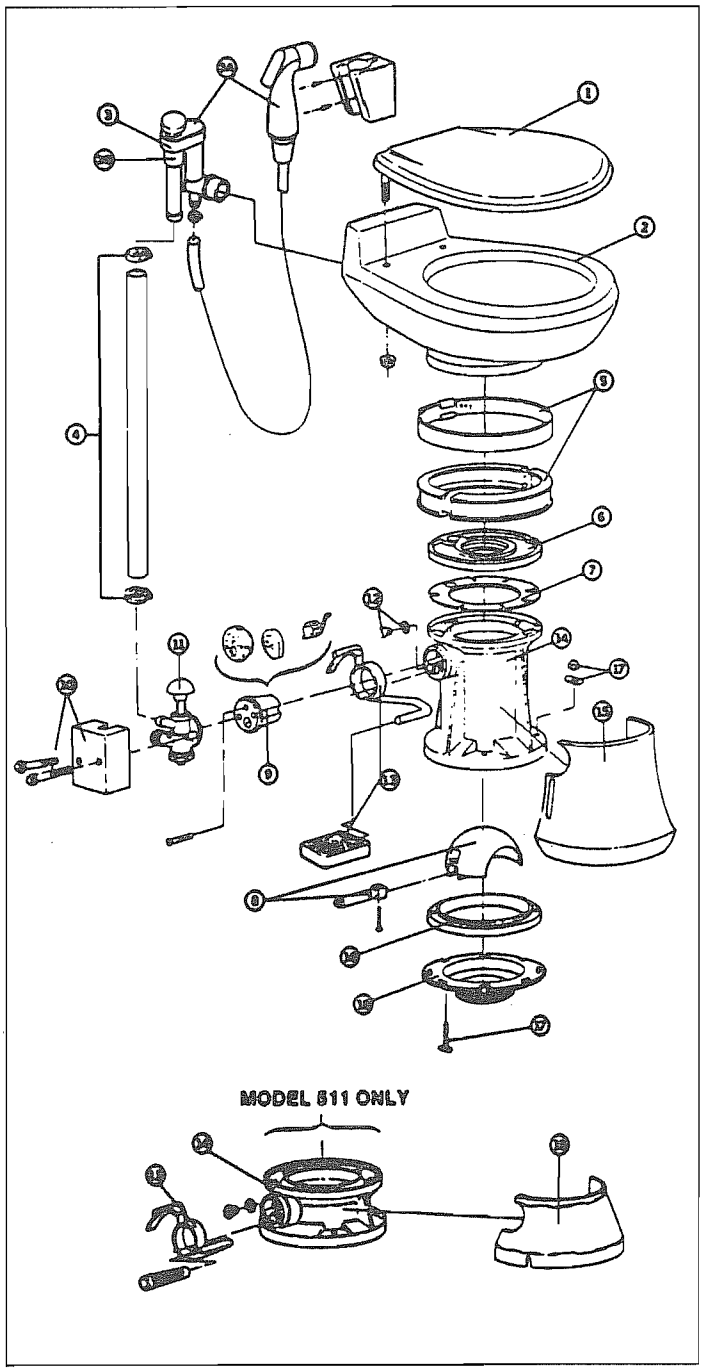
CAUSE/ REMEDY: Loose hose connection. Tighten hose connections.

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)



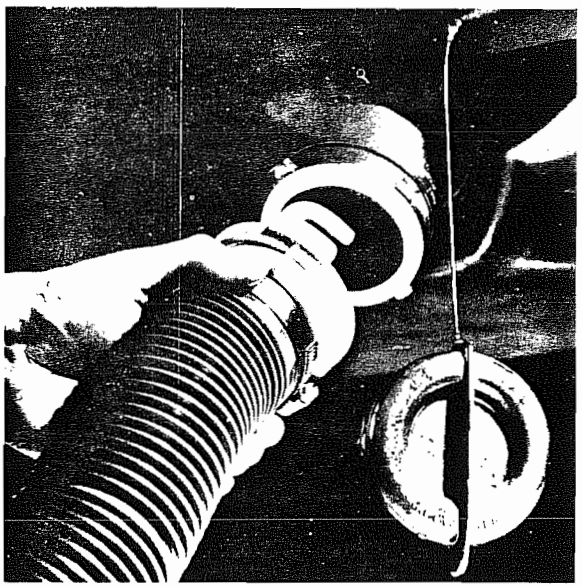
1. Seat Assy
2. China Bowl w/vacuum Breaker Kit
3. Vacuum Breaker Kit
3a. Vacuum Breaker w/ hand spray kit
3b. Vacuum Breaker w/ diverter valve assy
4. Universal Tubing Kit
5. Ring & Half Clamps Kit
6. Teflon & Rubber Seal Kit
7. Plastic Seal Support
8. Ball, Shaft & Cartridge kit
9. Spring cartridge 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

The drain and waste system of your motorhome includes waste holding tanks made from molded plastic. The MAIN HOLDING TANK enables you to use the toilet for several days away from disposal facilities. The waste water from the sink, shower, and bath and lavatory drain into 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.

Note: When the toilet will no longer drain, the main holding tank is full and must be emptied. Watch this closely, because when the tank is full sewage cannot be emptied from the toilet bowl.

To empty both tanks attach the sewer hose that is stored in the roadside rear compartment by pressing the bayonet fitting onto the outlet adapter 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 that it will drain completely. The dump valves are located on the lower rear roadside corner of the motorhome. Pull up the dump valve handle as far as it will go and wait until the tank is drained. If the auxiliary tank is drained after the waste tank, the soapy water will help keep the sewer hose and outlet clean.

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 5 to 10 gallons of clean water and repeat until clean.



Sewage Outlet

When connected to a sewer outlet keep the 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 and close the dump valve, fill the tank about half full with water then drive the motorhome for a few miles. The turbulence and surging of the water will usually dissolve the solids into suspension so the tank can be drained.

Note: There are certain items that should never be put into the toilet or tank. Among these are facial and other similar tissues, because they have wet strength and do not dissolve easily. Toilet paper, especially white, dissolves well after a period of traveling.

CAUTION: Use only recreational vehicle sewage tank deodorizers. Ammonias, alcohols and acetones may cause damage to the tank, valve parts, tank fitting, and drain hose. For protection against freezing use recommended fluids. (See Winterizing)

Some state and federal parks prohibit draining sink and bath waters into the ground, although this is sometimes done in the wilderness. Your auxilliary holding tank will hold this water until you are at a dump area.

Drain Systems Cleaning

The following cleaning agents can be used without causing harm to the system:

* Naptha
* Household Soaps
* Soapless Detergents
* Trisodium Phosphate
* Household Ammonia
* 10% Hydrochloric Acid (solution)
* 5% Sulfuric Acid (solution)
* Hypochlorite Bleach (Clorox)
* 10% Sodium Hydroxide (solution)

Never use any other type cleaners unless marked approved for ABS drainage systems.

When winterizing drains use only trailer plumbing system type antifreeze. (These are sold through the Wally Byam Stores). Do not use abrasive cleaners.

Drain System Repair

Fittings are cemented together with ABS corlon cement. and therefore cannot be successfully separated. Sections to be repaired must be cut out of the drain 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.

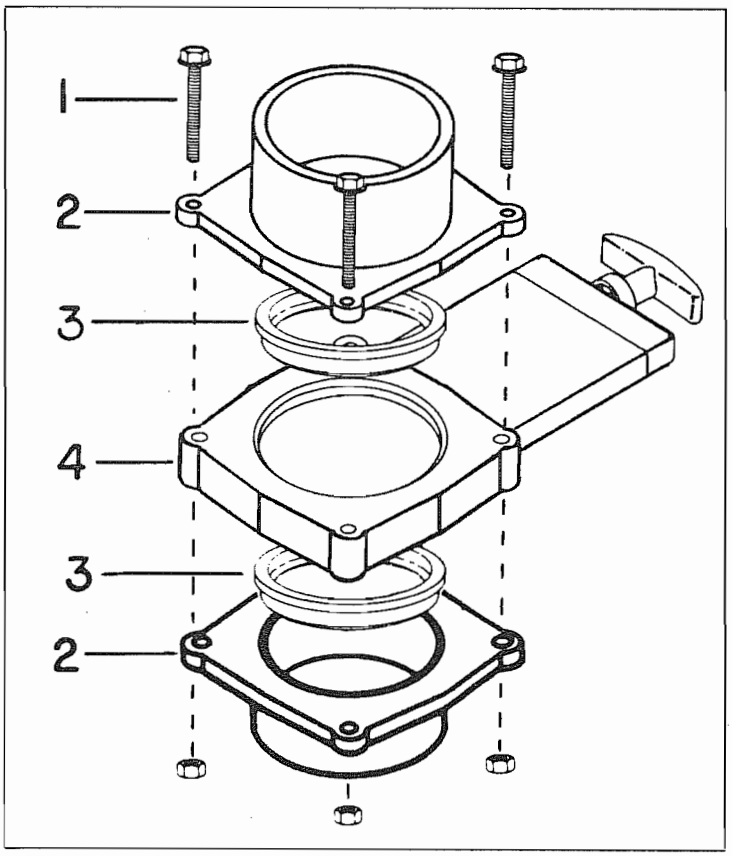
GATE VALVE REMOVAL AND REPLACEMENT

1. Make sure both tanks are empty.
2. Remove self tapping bolts from perimeter of pan.
3. Drill out rivet attaching extension handle to shaft.
4. Remove four bolts holding slide mechanism to adapters.
5. Pry adapters away from slide and pull seal clear.
6. Slide mechanism will now be free to come out from between adapters.

Most repairs will only require replacement of seals. Using a small mirror and flash light to make sure they are properly positioned before installing the bolts can save time in the long run.

CAUTION: The tanks must be supported by jacks and boards before filling to test for leaks. It is always a good practice to test prior to reinstalling the support pan.

1. Mounting Bolts
2. Adapters, Line to Slide
3. Seals
4. Slide Mechanism



Gray Tank Removal

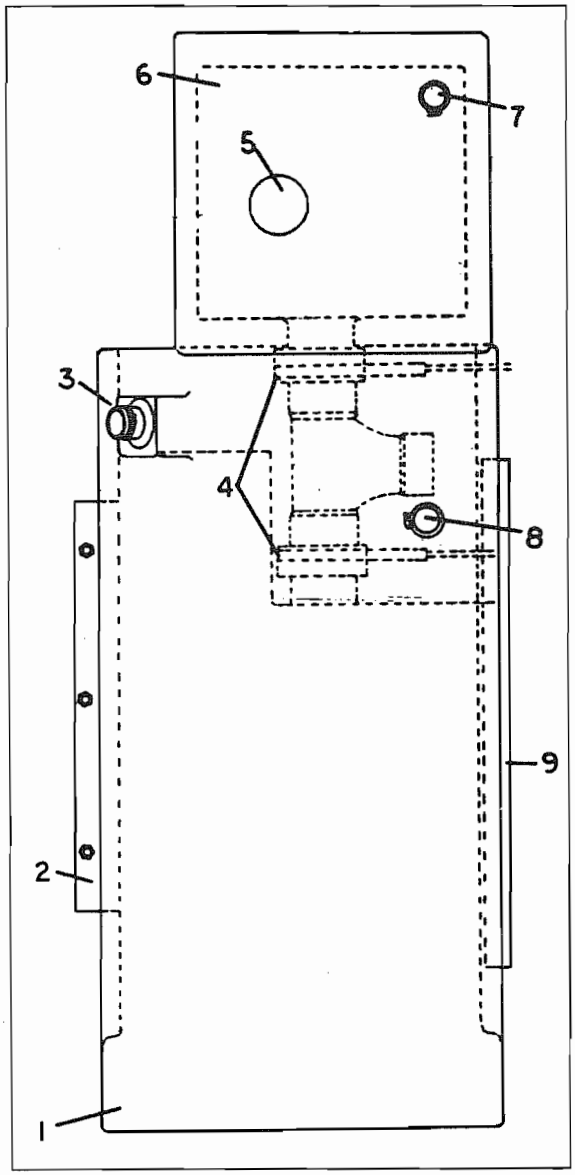
1. Drain and flush both holding tanks.
2. Remove bolts attaching both gate valves to tanks and remove as an assembly.
3. Loosen hose clamp on inboard drain line adapter.
4. Support tank with jack or stands and remove the three bolts from inboard support bracket.
5. Lower inboard side tank just enough to allow the hose clamp to be loosened on outboard drain line adapter.
6. Remove stand or jack and pull tank toward center of vehicle to free it from outboard support bracket.

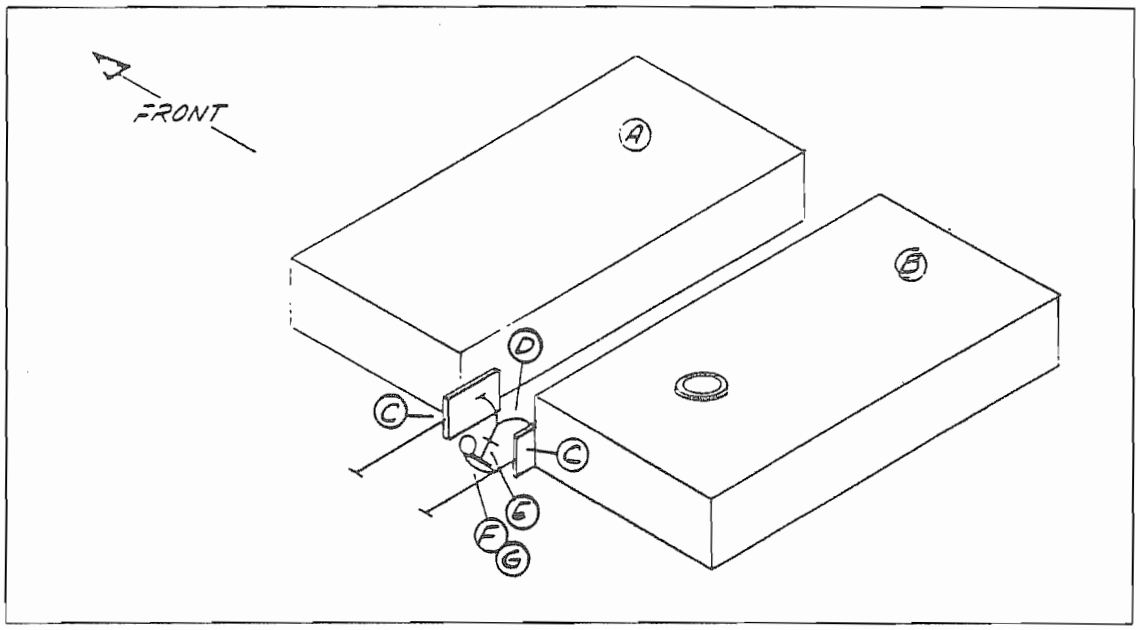
Black Tank Removal

1. Drain and flush both holding tanks.
2. Remove bolts attaching both gate valves to tanks and remove as an assembly.
3. From inside coach lift padded trim pieces out from around toilet.
4. Remove water line at union (finger tight) on back of toilet.
5. Remove front and rear bolts attaching toilet to flange and lift toilet out.
6. Remove screws around perimeter of flange and unscrew flange from tank.
7. Pull back carpet along floor next to vertical face of tank cover and remove screws attaching tank cover to floor.
8. Remove clamp from tank vent. **Note:** Tank vent pipe may have to be cut and shortened.
9. Remove holding tank cover and lift tank up through floor.

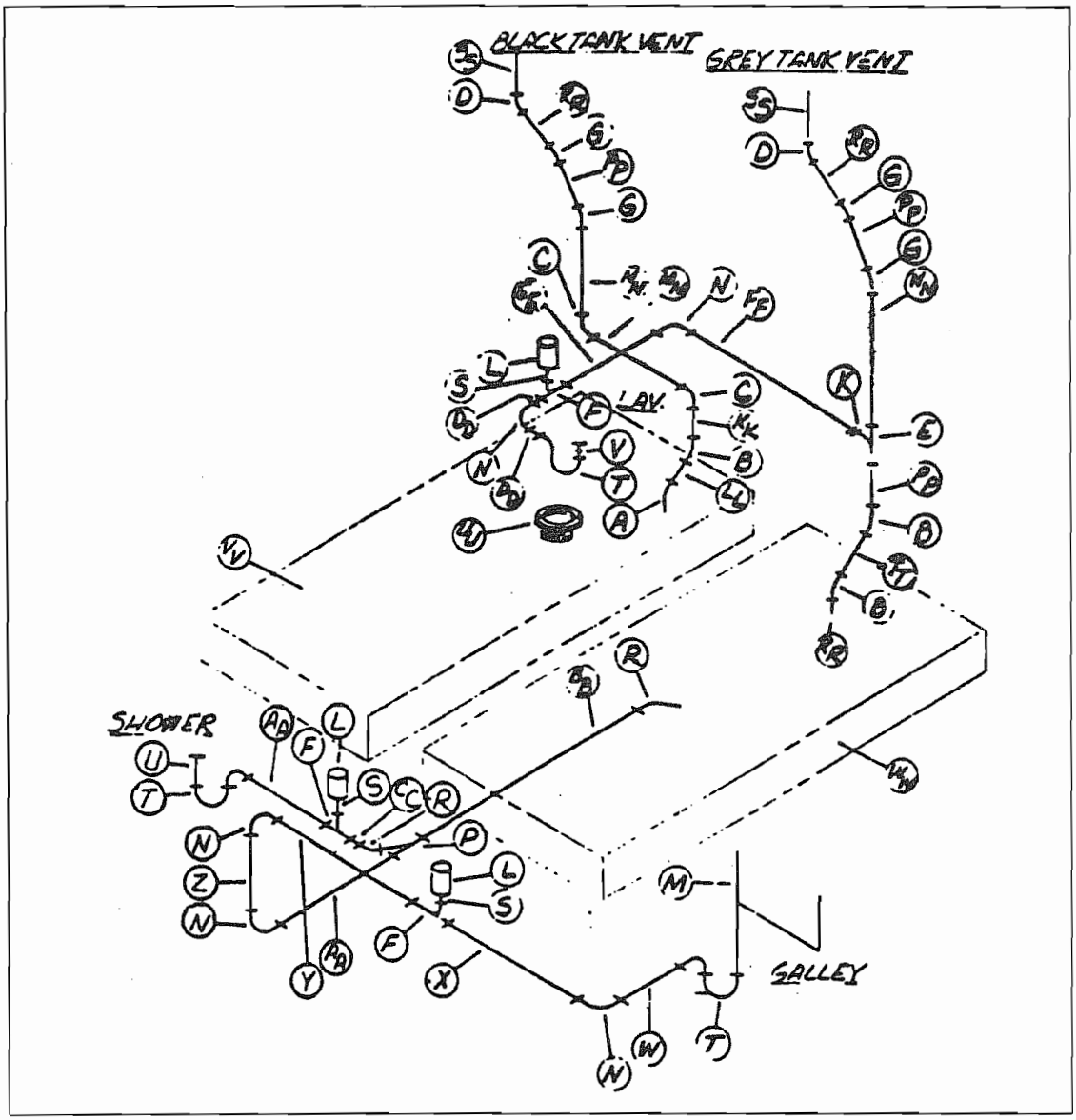
CENTER BATH MODELS

1. Gray Water Tank
2. Inboard Support Bracket
3. Inboard Drain Line Adapter
4. Gate Valves
5. Flange Mounting Hole
6. Black Water Tank
7. Tank Vent
8. Outboard Drain Line Adapter
9. Outboard Tank Support Bracket

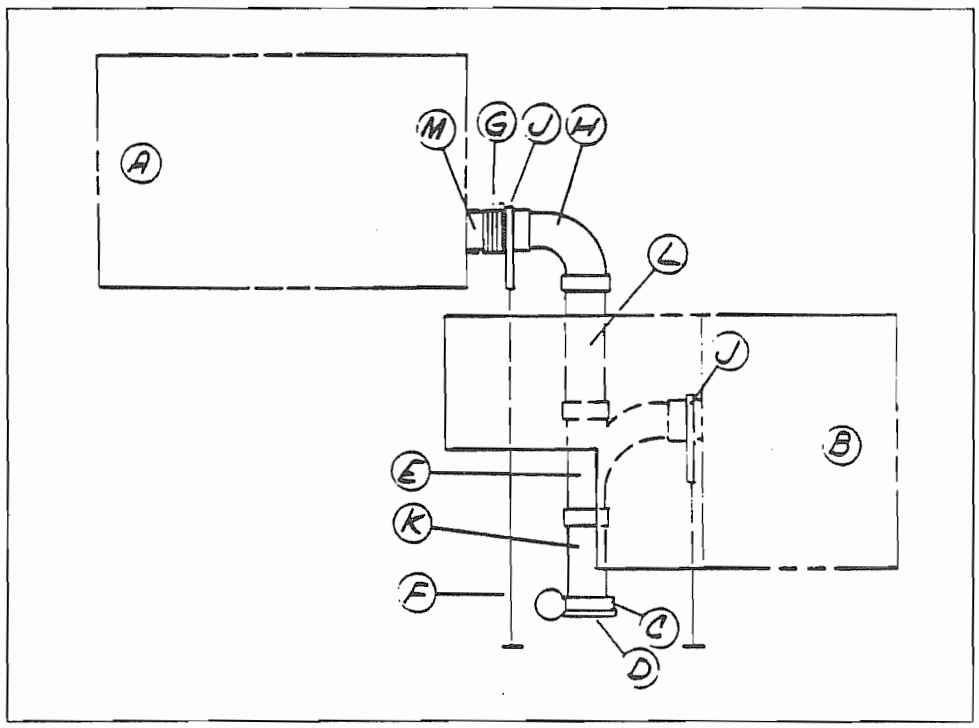




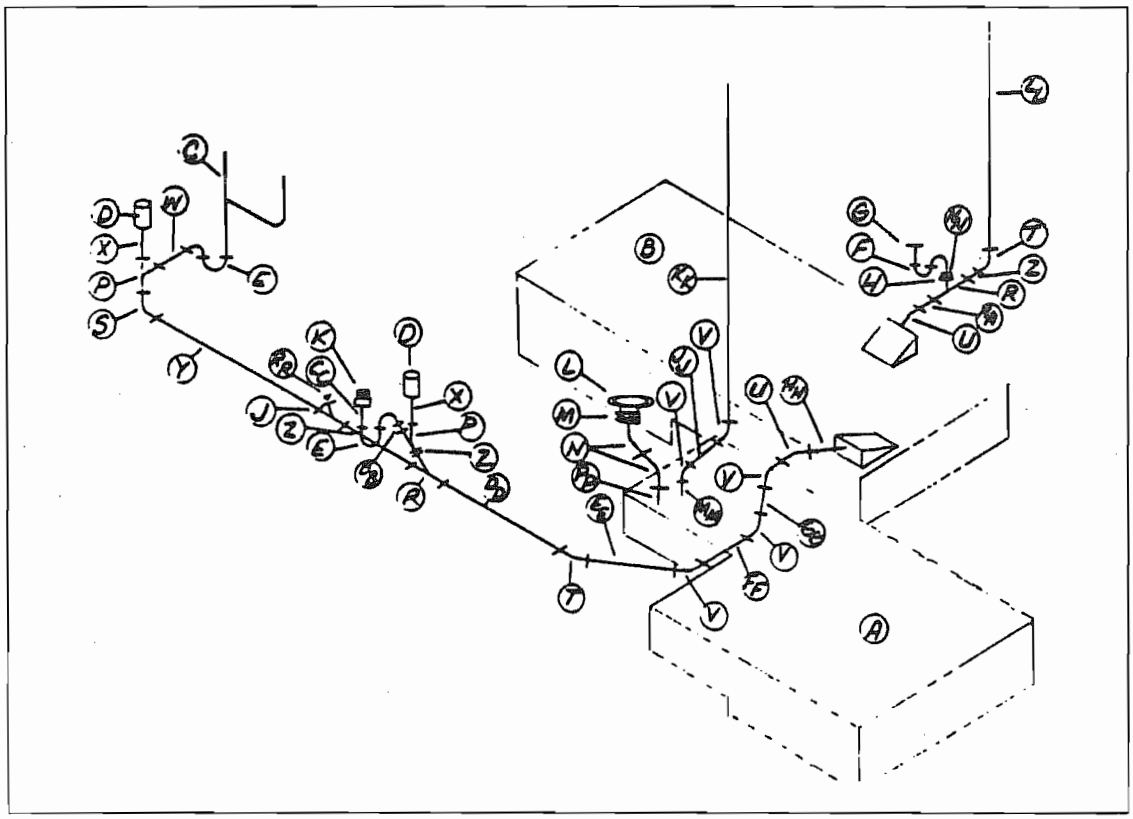
A. Grey Tank
B. Black Tank
C. Gate Valve
D. 3 Way Elbow
E. 3" Dia x 3 3/4"
F. Bayonet Ring
G. Bayonet cap



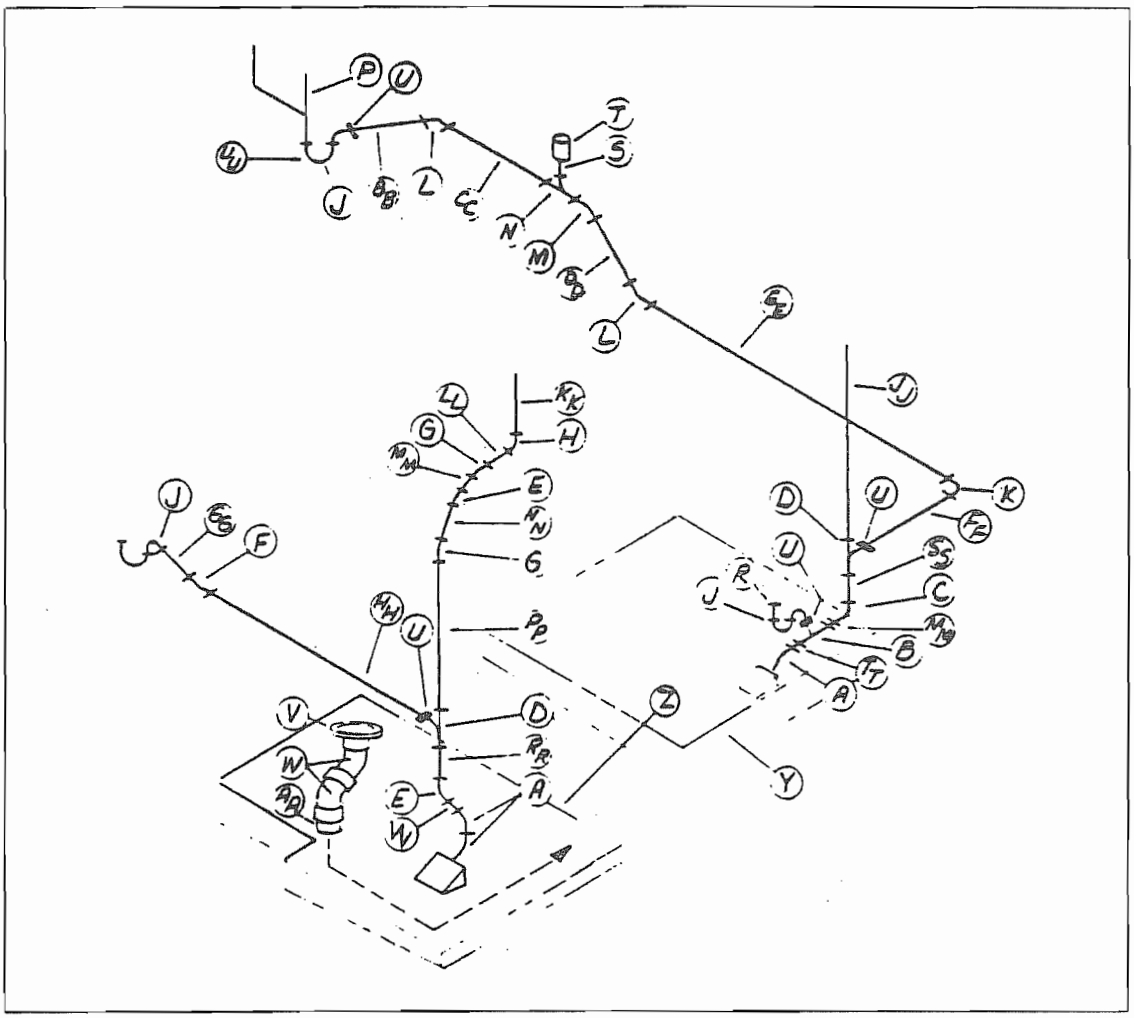
A. 1 1/2 45° St. Ell
B. 1 1/2 45° Ell
C. 1 1/2 90° XLT Ell
D. 1 1/2 90° Vent Ell
E. 1 1/2 San Tee
F. 1 1/4 San Tee
G. 1 1/2 22 1/2 Ell
K. 1 1/4 x 1 1/2 Reducer
L. 1 1/2 Auto Vent
M. 1 1/2 x 1 1/4 Cont. Waste
N. 1 1/4 90° XLT Ell
P. 1 1/4 45° Wye
R. 1 1/4 45° St. Ell
S. 1 1/2 x 1 1/2 Auto Vent Adap
T. 1 1/4 P Trap Hub and Hub
U. 1/2 x 1 1/4 Swiv Strain
V. 1 1/4 Pipe Trap Adapter
W. 1 1/4 Dia 9 1/2
X. 1 1/4 Dia x 22 1/2
Z. 1 1/4 Dia x 11
AA. 1 1/4 Dia x 12
BB. 1 1/4 Dia x 56 1/4
CC. 1 1/4 Dia x 3
DD. 1 1/4 Dia x 1 1/2
EE. 1 1/4 Dia x 12 3/4
FF. 1 1/4 Dia x 12 3/4
KK. 1 1/2 Dia x 2
LL. 1 1/2 Dia x 3
MM. 1 1/2 Dia x 14
NN. 1 1/2 Dia x 31
PP. 1 1 /2 Dia x 11
RR. 1/1/2 Dia x 7
SS. 1 1/2 Dia x 6
TT. 1 1/2 Dia x 4
UU. Closet Flange 4x3
VV. Black Tank
WW. Grey Tank



A. Grey Holding Tank
B. Black Holding Tank
C. Bayonet Ring
D. Bayonet Cap
E. 3 x 3 x 3 Wye
F. Extension Handle
G. 3" Caulder Coupler
H. 3" 90° Wye
J. 3" Gate Valve
K. 3" Dia x 4 1/2
L. 3" Dia x 16 1/2
M. 3" Dia x 2



A. Black Holding tank
B. Grey Holding Tank
C. 1 1/2 Cont. Waste
D. 1 1/2 Auto Vent
E. 1 1/2 P Trap
F. 1 1/4 P Trap
G. 1 1/4 x 1 1/2 Swivel Strain
H. 1 1/2 x 1 1/4 Adapter
J. 1 1/2 Clean Out
K. 1 1/2 x 1 1/4 Trap Adapter
L. 4 x 3 Closet Flange
M. 3" Caulder Coupler
N. 3" 45° St. Elbow
P. 1 1/2 Sanitary Tee
R. 1 1/2 45° Wye
S. 1 1/2 90° XLT St. Elbow
T. 1 1/2 90° XLT Elbow
U. 1 1/2 45° St. Elbow
W. 1 1/2 Dia x 7 1/2
X. 1 1/2 Dia x 4
Y. 1 1/2 Dia x 81
Z. 1 1/2 Dia x 1 1/2
AA. 1 1/2 Dia x 2 1/2
BB. 1 1/2 Dia x 3 1/4
CC. 1 1/2 Dia x 2 3/4
DD. 1 1/2 Dia x 19 1/4
EE. 1 1/2 Dia x 13 3/4
FF. 1 1/2 Dia x 6 3/4
GG. 1 1/2 Dia x 4 3/4
HH. 1 1/2 Dia x 5 3/4
JJ. 1 1/2 Dia x 8 3/4
KK. 1 1/2 Dia x 78
LL. 1 1/2 Dia x 85
MM. 1 1/2 Dia x 3
NN. 1 1/4 Dia x 1 1/2
PP. 6" Nipple, Cut in half
RR. 1 1/2 Clean Out Plug



A. 1 1/2 45° St Ell
B. 1 1/2 x 1 1/2 x 1 1/2 45° Wye
C. 1 1/2 XLT Ell
D. 1 1/2 San Tee
E. 1 1/2 45° Ell
F. 1 1/4, 22 1/2° Ell
G. 1 1/2, 22 1/2° Ell
H. 1 1/2, 90° St Vent Ell
J. 1 1/4 P Trap
K. 1 1/4 90° XLT Ell
L. 1 1/4 45° Ell
M. 1 1/4 45° St Ell
N. 1 1/4 San Tee
P. Cont. Waste
R. 1 1/4 x 1 1/2 Swivel Strain
S. Auto Vent Adapter
T. Auto Vent
U. 1 1/2 to 1 1/4 Adapter
V. Closet Flange 4 x 3
W. 3" 45° St Elbow
Y. Grey Tank
Z. Black Tank
AA. 3" Dia x 2 1/2
BB. 1 1/4 Dia x 14
CC. 1 1/4" Dia x 26
DD. 1 1/4" Dia x 14
EE. 1 1/4 Dia x 56
FF. 1 1/4 Dia x 16
GG. 1 1/4 Dia x 8
HH. 1 1/4 Dia x 34
JJ. 1 1/2 Dia X &%
KK. 1 1/2 Dia x 14
LL. 1 1/2 Dia x 4 3/4
MM. 1 1/2 Dia x 1 1/2
NN. 1 1/2 Dia x 8 1/2
PP. 1 1/2 Dia x 36
RR. 1 1/2 Dia x 8
SS. 1 1/2 Dia x 6 1/2
TT. 1 1/2 Dia x 2 1/2
UU. 1 1/2 P Trap w/ Slip
VV. 1 1/2 Dia x 3 1/4

ELECTRICAL SYSTEM

12 VOLT SYSTEM

BATTERIES

Your Airstream motorhome is equipped with three batteries; an engine battery and two univolt batteries.

Engine Battery

The engine battery is used for starting the engine, generator and operating the headlights, taillights, running lights, instrument panel lighting, automotive air conditioning and other accessories. The engine battery is charged by the alternator while driving, and by a trickle charge when the generator is being operated.

Univolt Batteries

The univolt batteries are used for interior lighting, exhaust fans, water pump, central control panel, entertainment center, optional 12 volt convenience outlets and the refrigerator when it is switched to 12 volt power. These batteries are charged by the engine's alternator when driving, or by the univolt when plugged into 120 volt city power. They are also charged by the generator, when it is running, through the 120 volt city power system.

On the 350 models an inverter is used to convert the 12 volt power to 120 volts. This allows most small appliances to be operated for a short time until the generator is started or the motorhome is plugged into city power.

Battery Isolator

A battery isolator, located in the engine service compartment, electronically isolates your auxiliary batteries from the engine battery, allowing you to operate your interior accessories without draining the starting battery. The engine alternator properly charges each battery as you drive.

BASIC 12 VOLT OPERATION

Both coach batteries are wired in parallel and are connected to one side of the main solenoid. The other side of the solenoid has the wires from the engine battery that continue on to the starter.

The main battery solenoid and 80 amp circuit breaker are mounted on the back of the battery slide out drawer. The solenoid contacts are only closed when the auxiliary start switch located in the glove box is activated. This ties all three batteries together for emergency cranking power.

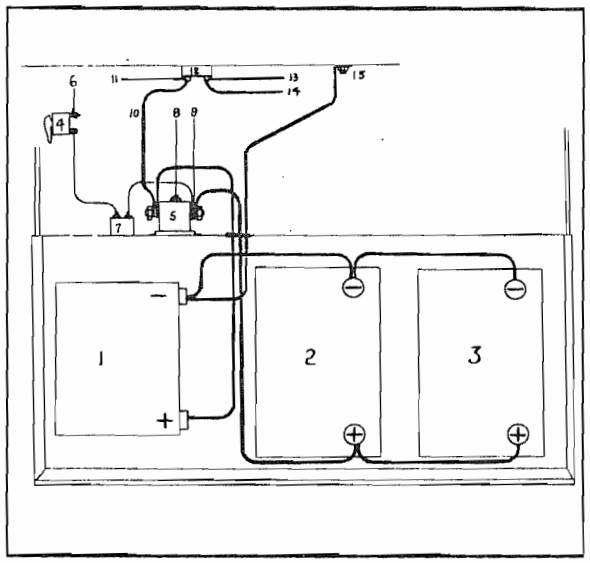
Item 12 is a heavy duty junction block mounted to the frame rail. Its purpose is to give a convenient terminal to connect the heavy wires together between the solenoid, 110 volt generator, hydraulic jack pump and engine starter.

The kill switch, in the off position, breaks the circuit between the coach batteries and the 12 volt interior fuse panel. It is intended to be used during storage.

CAUTION: Never operate the interior lights and appliances without the kill switch on. The system is designed to operate with the batteries in the circuit. Operation on univolt power only will blow radio fuses, shorten 12 volt motor life, and can cause damage to transistorized components.

Main Battery Solenoid and "Kill" Switch

1. Engine Battery
2. Coach battery
3. Coach Battery
*4. Kill switch (always have switch on when operating lights and appliances)
5. Main battery solenoid
6. To 12V distribution panel
7. 80 amp circuit breaker
8. To auxiliary start switch
9. To isolator
10. To junction block
11. To generator
12. Junction block, mounted on frame.
13. To starter
14. To hydraulic pump for jacks (optional)
15. Main ground to frame



* Located just inside main doorway.

Interior 12 Volt

290 & 325 Series*

From the previous page we can easily follow the wiring from the coach batteries to the interior 12 volt distribution panel.

The 12 volt interior distribution panel is located low to the floor to the right side of the refrigerator on the 325 series, and below the range on the 290 and 350 series.

The univolt, an automatic battery charger, is wired into the distribution panel. When you are plugged into 110 volt city power, or when you are operating the 110 volt generator, the univolt will be charging the batteries and supplying much of the power to the 12 volt system. In the 12 volt automotive section we will see how the coach batteries are charged by the engine alternator while driving.

The univolt has an internal thermal circuit breaker. If you happen to turn on all the lights in the unit, plus operate some accessories, you can cause the thermal breaker to "kick out". Without the power and charging current the lights will begin to dim as the batteries become discharged. The thermal breaker may take up to an hour to cool enough to come back on. Turning off just a few of the lights and accessories will prevent the problem from reoccurring. In normal usage we've never heard of this happening. However, it does sometimes happen when you are trying to show the coach off. Just remember to shut off a couple of lights and you won't have any problem.

After the power is received from the batteries and univolt, by the 12 volt distribution panel, it does as its name implies.....it distributes the power through automatic circuit breakers to the lights and accessories throughout the coach.

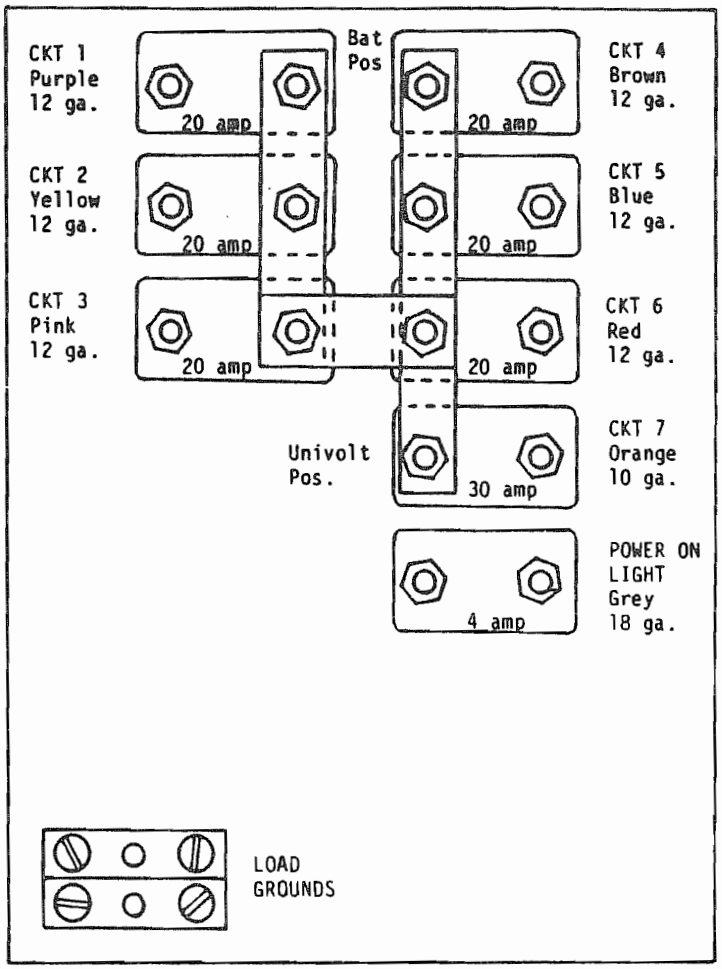
The 12 volt breakers are for your safety and to protect the coach. Trouble with the electrical system is extremely unlikely, but if it should occur, we recommend that you contact your nearest Airstream Service Center for repairs.

WARNING:

DO NOT allow circuit breakers to cycle rapidly for long periods of time. Either remove the wire from the breaker or unplug the motorhome and disconnect the battery until the wiring is corrected.

The system may sound complicated, and it is to a degree. But, in operation it is simple. Just try to plug into 110 volt when you park for more than an overnight stop and everything else will happen automatically.

* The 345 & 350 system is reviewed on the following pages.


CKT 1
Purple
12 ga.
20 amp
Bat
Pos
CKT 4
Brown
12 ga.
20 amp
CKT 2
Yellow
12 ga.
20 amp
CKT 5
Blue
12 ga.
20 amp
CKT 3
Pink
12 ga.
20 amp
CKT 6
Red
12 ga.
20 amp
Univolt
Pos.
CKT 7
Orange
10 ga.
30 amp
POWER ON
LIGHT
Grey
18 ga.
4 amp
LOAD
GROUNDS

Interior 12 Volt

350 Series

The 12 volt distribution panel on the 350 models is located under the range. This is also the location of the 110 volt breakers.....and also the location of the inverter!

It is difficult to discuss one voltage level at a time in the 350 series since the 110 volt and 12 volt systems interact automatically with each other. It is called an energy management system, and is marketed under the trade name ENERGENIUS. You will find a separate manual for this piece of equipment in your packet.

The Energenius performs two basic functions. When the motorhome is plugged into city power, or the generator is running, it acts as a converter. The converter takes the 110 volt and reduces it to 12 volt DC. The 12 volt supplies power to most lights, appliances and fans, plus a charging current to the coach batteries.

The big plus to the Energenius is its added feature to perform inverter functions. When you are not plugged into city power, and the generator is not running, the Energenius will take 12 volt DC current from the batteries and supply 110 volt AC to your receptacles. About 600 watts of power is available. It won't run your air conditioner, but it is nice to be able to percolate that early morning pot of coffee without disturbing the quiet serenity of the wilderness by starting your generator.

Operation is simple. Just press the on/off switch on the upper right hand corner of the unit until the Energenius logo glows. From this point on it takes care of everything automatically.

When operating the inverter portion you must be aware of the tremendous loads put on your batteries. This is probably best shown by a little ninth grade science. If you have a percolator that uses 500 watts here is what the figures look like:

120 Volt (Plugged In)	12 Volt (Battery Power)
$\frac{500 \text{ Watts}}{120 \text{ Volt}} = 4.1$ AMP	$\frac{500 \text{ Watts}}{12 \text{ Volt}} = 41$ AMP

Your two coach batteries are rated around a total of 210 amp hours. As you can see from the formula above, after about three hours there is not going to be a lot of battery power left.

A little common sense will make the system useful. But, if you try to over do it you will soon have dead batteries.

ENERGENIUS SYSTEM (345 & 350 Series)

Manufacturer: Eneractive Group, Inc.
25416 C.R. 6, Suite 313
Elkhart, Indiana 46514
Phone: 219-264-1393

TROUBLE SHOOTING GUIDE

The Energenius system Products are designed using the highest quality of parts and components available. With the extensive engineering and high quality going into these products, you should enjoy many years of trouble free operation and enjoyment from your Energenius product. If the Energenius product doesn't appear to be working properly, chances are that the problem is small and can be corrected by using this trouble shooting guide.

SYMPTOM: No AC Power at the AC Outlets

SOLUTION:

1. Check that either the Shoreline, Generator, or charged batteries are available to the Energenius.

2. Check that all AC circuit breakers are in the "ON" position.

3. If using batteries as your source, check that the silver Energenious logo is lighted located beside the on/off switch.

SYMPTOM: No 12 Volt charger/converter (Charge indicator not lighted)

SOLUTION:

1. Make sure the shoreline or generator is providing adequate power.

2. Check that 30 amp AC breaker (Green) is in the ON position.

3. Check batteries for charge condition. Batteries may be fully charged and the Energenius large charger/converter may have automatically shut off. If so, the Energenius is simply maintaining the battery's charge with a small trickle charger.

SYMPTOM: No 12 volt charger/converter (Charge indicator lighted)

SOLUTION:

1. Check that the square circuit breaker located at the lower right side on the front panel of the Energenius. If a white Marker is exposed, the breaker must be reset.

SYMPTOM: 12 Volt lights and loads flicker approximately every 10 minutes.

SOLUTION:
1. This indicates that there are NO batteries connected to the output of the Energenius. This could be from your remote battery disconnect, or the battery cable(s) are disconnected at the batteries. This Flicker will NOT harm your lights or 12 volt appliances.

SYMPTOM: Energenius won't change over to the Generator after it is started.

SOLUTION:
I. There is an approximate 30 second delay after starting the Generator before the Energenius will switch over to the Generator.

2. Check that the circuit breakers on the generator are in the ON positon and haven't been "tripped".

SYMPTOM: Only some of the 12 volt lights and appliances are working.

SOLUTION:
1 Check that all of the 12 volt fuses behind the front access door are good and that none of them are "blown".

SERVICE CENTER INFORMATION

WARNING: Service should only be performed by qualified service technicians. There are no serviceable parts inside of the unit.

The Energenius is easy to service if the need should ever arise. The electronics of the Energenius system is located on one printed circuit board and is connected using common connectors. To service follow the following simple instructions.

1. Determine by following the Trouble Shooting Guide that there is in fact a failure.

2. Order from the Eneractive Group, Inc. Parts Department a new Main Board Assembly (Part Number A10036). These boards are "pooled" so the cost will be low. There will also be a deposit required for the assurance of the old board being returned.

3. Remove the top/side cover of the Energenius unit. Remove the main board (large printed circuit board) noting the position of the wires and their connection points.

4. Install new circuit board and connect all wires as before. Loosely mount top/side cover and test unit for proper operation. If operating correctly, tighten all screws on top/side cover and install unit back into proper position.

5. If you experience difficulty during the above procedures, please contact Eneractive Group Customer Service Department.

Automotive 12 Volt System

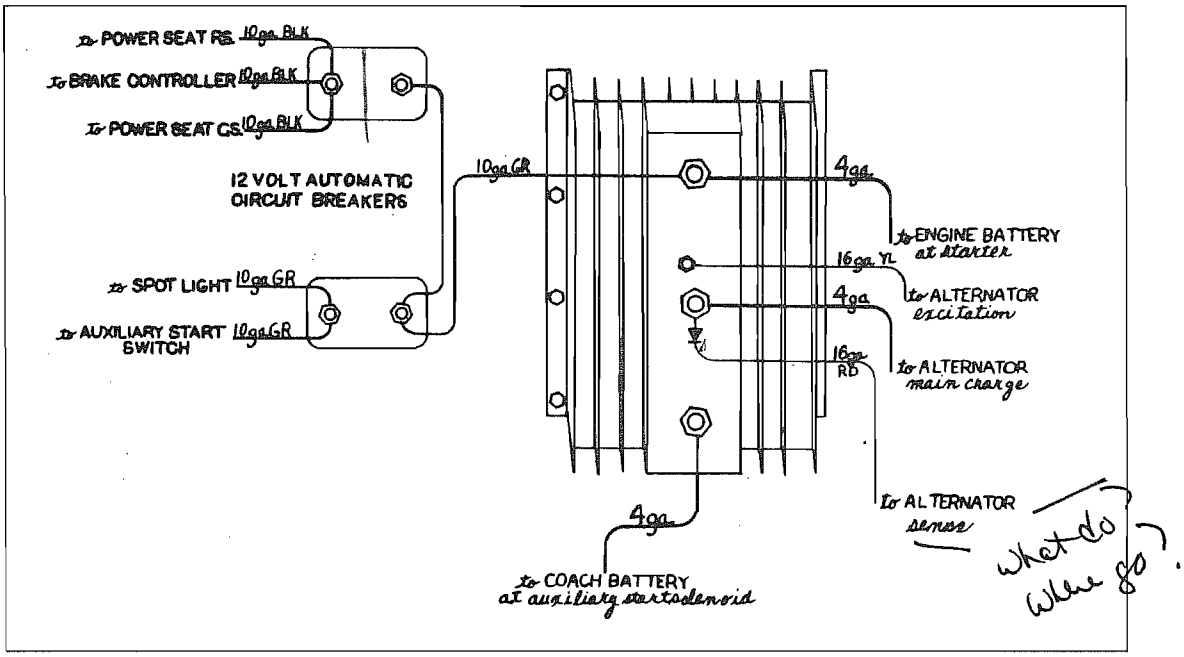
290, 325, and 350 Series

The Airstream autmotive 12 volt system of your motorhome powers the Airstream accessories normally associated with driving, such as: power seats, electric mirrors, back-up monitor, automatic step, etc.

As an owner/operator your job to make the automotive system function is easy. Simply turn the ignition key on and start the engine. Everything happens automatically.

The main component of the Airstream automotive system is the isolator shown in the diagram. If you open the front access door of the motorhome, the isolator is the blue, finned component on the right.

The function of the isolator is to distribute charging current from the alternator to the engine and coach batteries when you are driving, yet sever the connection when the key is "off". This prevents the engine battery from becoming discharged by use of the interior 12 volt lights and appliances even if you are not plugged into 110 volt city power.



Automotive 12 Volt System

The Chevrolet fuse block is located in the glove box. The cover panel is held in place by Velcro and is pulled off for access.

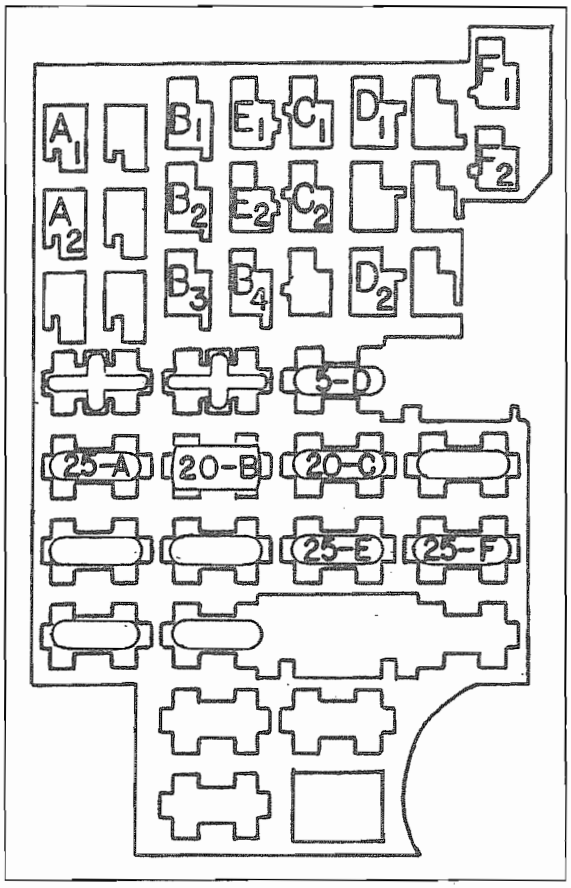
Chevrolet Fuse Block

On the drawing of the Chevrolet Fuse Block the upper section with large letters and small numbers represent the circuits Airstream uses.

The lower section is for the fuses. Airstream uses the fuses where the amperage size and circuit is noted. (IE: 20C is a 20 amp fuse feeding all three C circuits in the upper section.)

Of special note is the fuse location marked 20-B. In this location we are using a 12 volt, 20 amp automatic resetting circuit breaker.

Other fuses in the block are standard Chevrolet fuses not used or modified by Airstream. As with all fuses they can deteriorate with time and use. If a fuse blows and the elements appear to be melted, there may not be a problem with the system. If the replacement fuse blows have the wiring checked by Chevrolet or Airstream as the case may be.



Airstream 12 Volt Accessories

Circuit	Fuse	Conn. Color	Wire Color/Gauge	Function
A-1	25 Amp	Black	Blue/16 Ga.	Visor Light
A-2	25 Amp	Black	Orange/14 Ga.	Cigarette Lighters
B-1	20 Amp C.B.	White	Yellow/14 Ga.	Step Solenoid
B-2	20 Amp C.B.	White	Red/16 Ga.	Refrigerator Relay
B-3	20 Amp C.B.	White	Red/18 Ga.	Cruise Control
B-4	20 Amp C.B.	White	Yellow/14 Ga.	Compressor solenoid for Air Bags
C-1	20 Amp	Brown	Yellow/14 Ga.	Door Lock
C-2	20 Amp	Brown	Red/16 Ga.	Back-Up Monitor
D-1	5 Amp	Green	Gray/18 Ga.	Light at Cigarette lighter
D-2	5 Amp	Green	Gray/18 Ga.	Gear Indicator
E-1	25 Amp	Blue	Black/12 Ga.	Dash Heater/Air Conditioner
E-2	25 Amp	Blue	Red/12 Ga.	Auxiliary Heater
F-1	25 Amp	Gray	Yellow/14 Ga.	Wiper
F-2	25 Amp	Gray	Yellow/14 Ga.	Exterior Mirror

Miscellaneous 12 Volt Fuses

Equipment	Location	Fuse Size
C.B. Radio	Under dash - behind radio - in line	2 Amp AGC
Radio/Tape (Sony) (2)	By automotive fuse block - in line	1 Amp SOC
Stereo Power Amplifier	By automotive fuse block - in line	8 Amp SOC
Driving Lights (2)	Front access door, above isolator - in line Under dash - behind head light switch	15 Amp AGC 2 Amp AGC
Cruise Control	Under dash - above steering column - in line	4 Amp SFE
Door Bell	Fuse In door bell - fuse block	1.5 Amp AGC
Leveling Jacks	At control box - fuse block	15 Amp AGC
TV Backing Monitor (2)	Under dash - in line*	5 Amp AGC
Dash Air Conditioner (Chevrolet)	Front access door, centered above radiator	30 Amp ATC

* Remove mounting screws from TV monitor and pull wires up through dash air for fuse access.

Interior Lights

Many interior lights have been included in your Airstream to give you almost infinite variable light intensity. The forward ceiling lights, bath lights and rear bedroom lights all have remote switches. The bath and bedroom areas have indirect lighting as well as the usual ceiling lights.

There are two main clusters of light switches. Just inside the main door on the galley end panel are switches for the step light, floor light and forward ceiling lights. The forward ceiling lights must have their switches on before the remote switch on the galley end panel will control them.

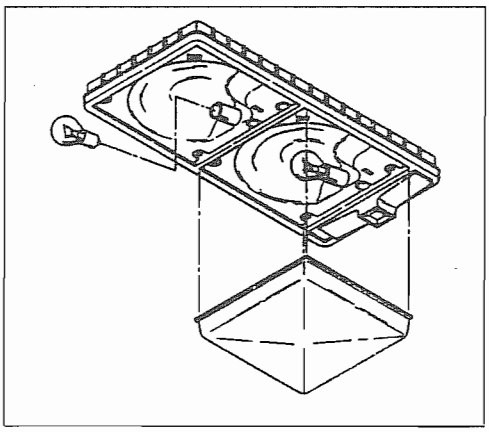
In the bathroom is another cluster of four switches. Two of these control lights; one the mirror lights and the other is for the indirect lighting above the window. The pump switch will turn the water pump on or off. Another pump switch is on the control panel. Either switch serves the same function. The fourth switch in the bathroom is the black switch with the red light for the water heater. Turn this switch on and you will usually see the red light flash briefly, then go out. This indicates the lighting function of the water heater has cycled. The appliance section of this manual has more information on the water heater.

Two map lights above the driver's and passenger seat are controlled by their individual switches and the remote switch on the dash. Another set of interior lights controlled from the dash are the aisle lights. These are located in the step well and the hallway of the motorhome. A detailed description of the dash operation is in the Driving Section of this manual.

The bulbs in the interior lights are all easily replaced if they burn out. Round, exposed bulbs, such as those around the bathroom mirror and map lights, are replaced by depressing them into their base, then turning to the left about 1/4 turn. This will allow them to "pop" out part way so they can be removed.

WARNING: If they are difficult to turn, use a folded rag to protect your hand when grasping the bulb in case it should unexpectedly shatter.

The ceiling and wardrobe light lens are removed by squeezing the sides of the lens in until they clear the frame. In cold weather it is helpful to leave the light on for a while to soften the plastic and avoid cracking. The bulbs are removed by depressing and turning to the left about 1/4 turn.

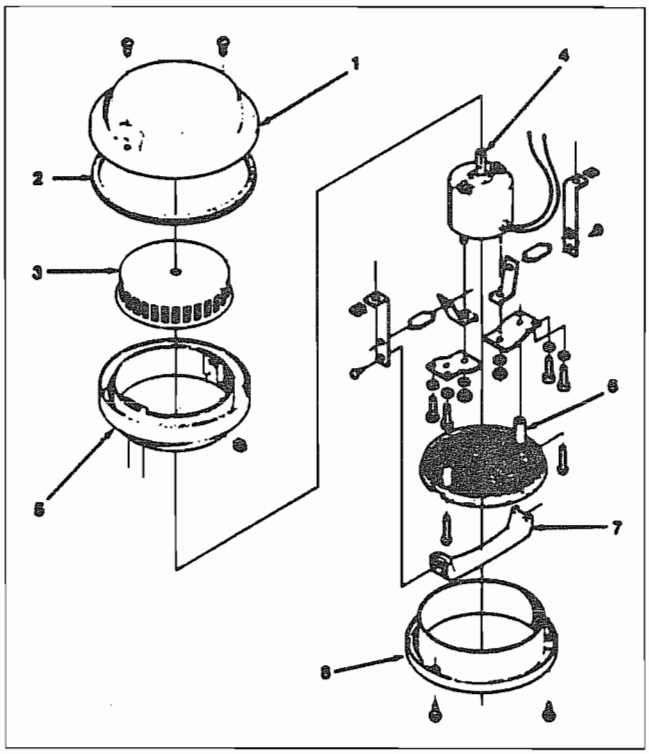


Any fluorescent bulbs, such as those used in the indirect lighting, are removed just like the larger bulbs you may have in your home or place of business. Turning the bulb 1/4 turn in either direction will allow it to be pulled straight out of the base.

Bath Exhaust Fan

To open the bath exhaust push the cross handle (Item 7) straight up. Turn the fan on by rotating the small knurled knob next to the handle.

1. Cover Assembly (Includes Gaskets)
2. Gasket Assembly
3. Blower Wheel Assembly
4. Motor Assembly
5. Ring Body Assembly
6. Grille Assembly
7. Handle Assembly
8. Trim Ring Assembly



Bath Exhaust fan Assembly Removal/Replacement

1. Working from the outside top of motorhome, 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.

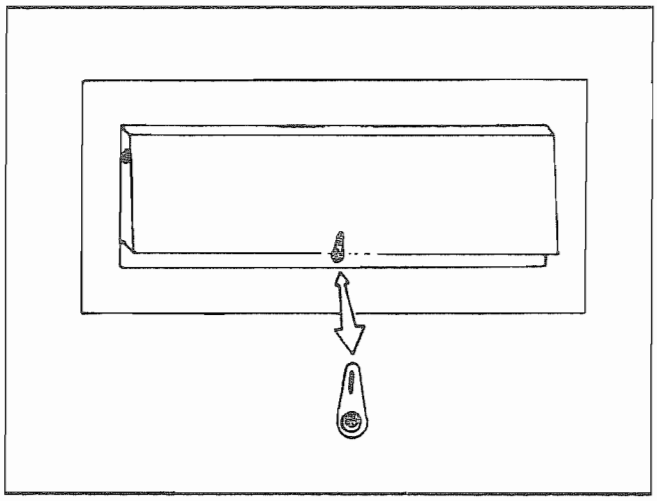
4. Remove the fan assembly.

5. To install, reverse the removal procedures.

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 dish water by letting it soak for awhile, then slosh back and forth. Rinse thoroughly then air dry.

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.

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 OPERATION

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 the 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

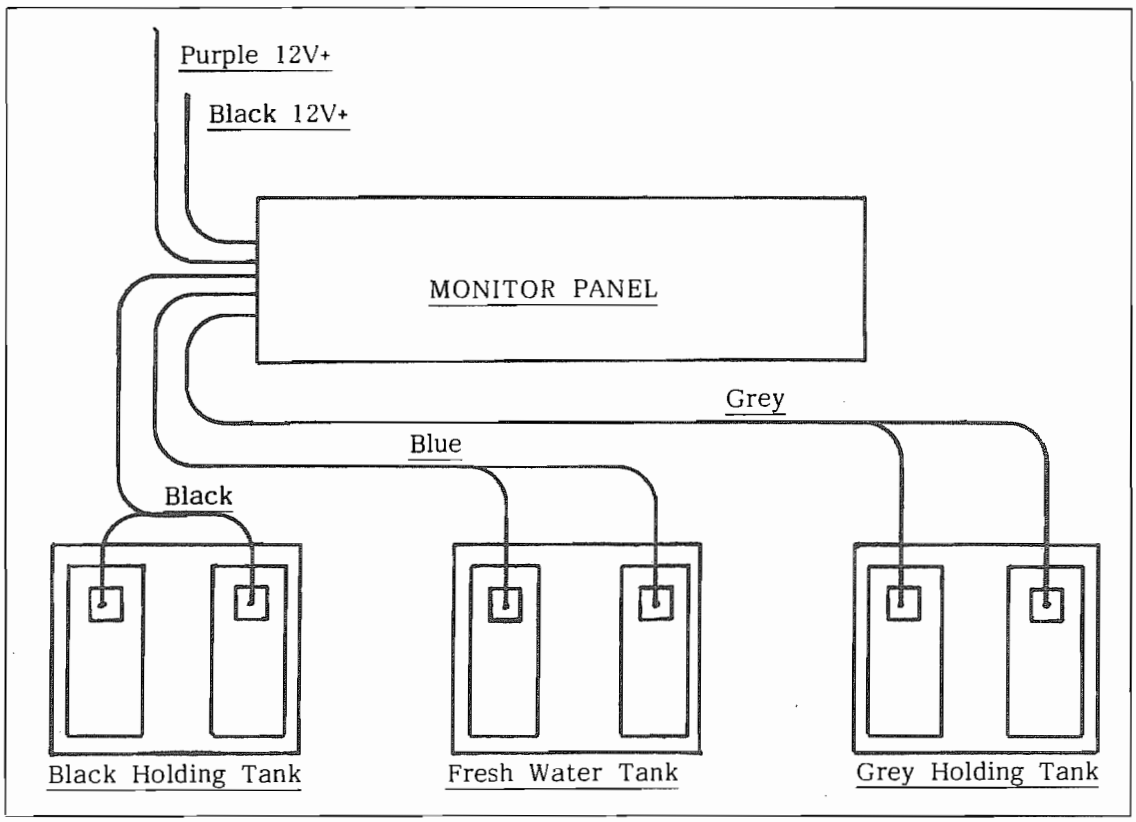
For the purpose of trouble shooting we usually divide the system into three components:

1. The panel.
2. The cable harness (and panel connection).
3. The tanks (and foil and 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:

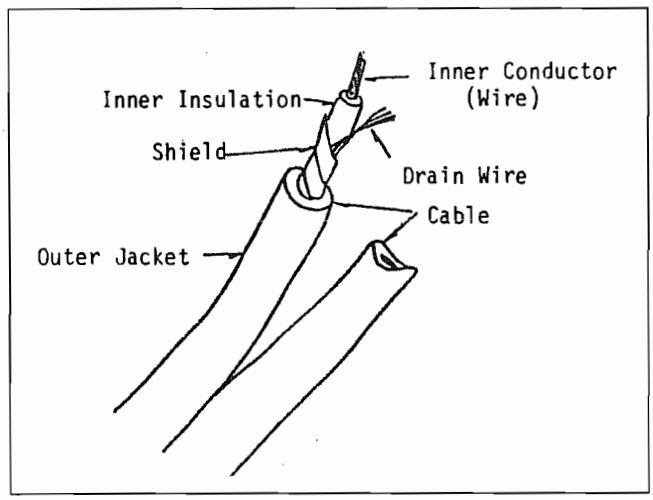


The alternating voltage is passed down to one of the aluminum foil pads on the fresh water tank by the blue cable, red inner insulation side. (See Cable Construction for details and terminology.) The alternating voltage is passed from that connection to one of the pads on each of the holding tanks by 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 shield (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. Check fuse on back panel.

2. Test panel on module tester or replace panel to see if the same problem occurs.

3. 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.)

4. Using a voltmeter, check to see if the power wires at the connector have about +12 volts across them (purple is positive, black is negative.)

5. 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 shields 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 forefinger 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 forefinger, 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 thru 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 the 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 connections 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 not 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 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 made 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 inch) 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 the 7th from the top. On the 106 vertical models, the proper slot is the 7th from the left. On the 105 models, the proper slot is 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.

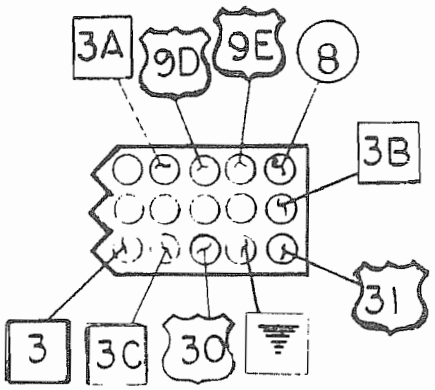
6. Replace sending unit.

7. Replace tank float system.

PROBLEM: Aluminum foil pads came unstuck.

CAUSES: 3M 4693 glue was not used to stick the pads on.

PIGTAIL, MONITOR PANEL



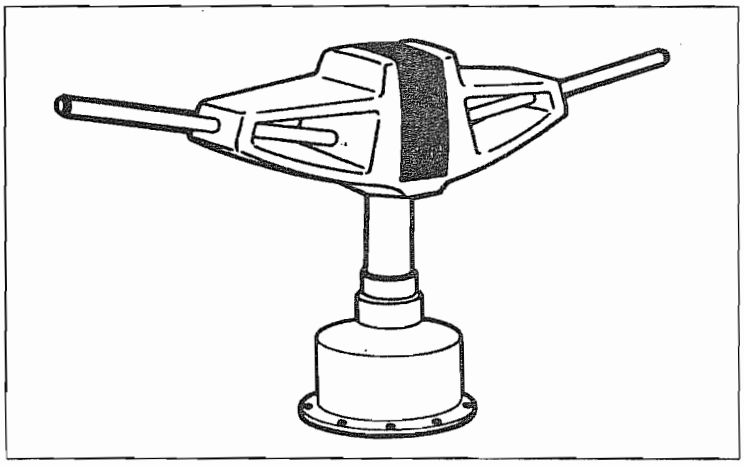
= 20 GA. = 12 GA. = 18 GA.

CKT	COLOR	FUNCTION
3	Pink	Main
3A	Orange	Pump Sw.
3B	Orange	Pump Sw.
3C	Orange/White	Pump Sw.
8	Gray	Power On
9D	Orange/Yellow	Auto Fill
9E	Blue/Yellow	Auto Fill
30	Lt Blue/White	C.S. LPG Tank
31	Blue/Orange	R.S. LPG Tank
⏚	White	Ground

TV ANTENNA

Manufacturer: Barker Manufacturing
723 East Michigan
Battle Creek, MI 49016
Phone: 616-965-2371

The controls for the TV antenna are mounted on the ceiling directly below the antenna. The large, knurled outer ring of the control rotates the antenna. The crank handle extends or retracts the dipoles.

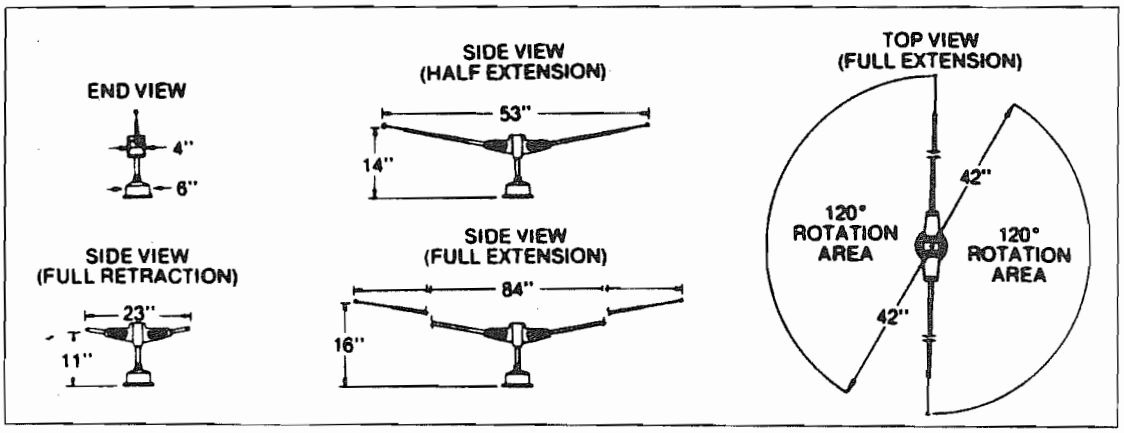


IMPORTANT: To achieve the very best TV reception with your Delta, Follow the steps listed below:

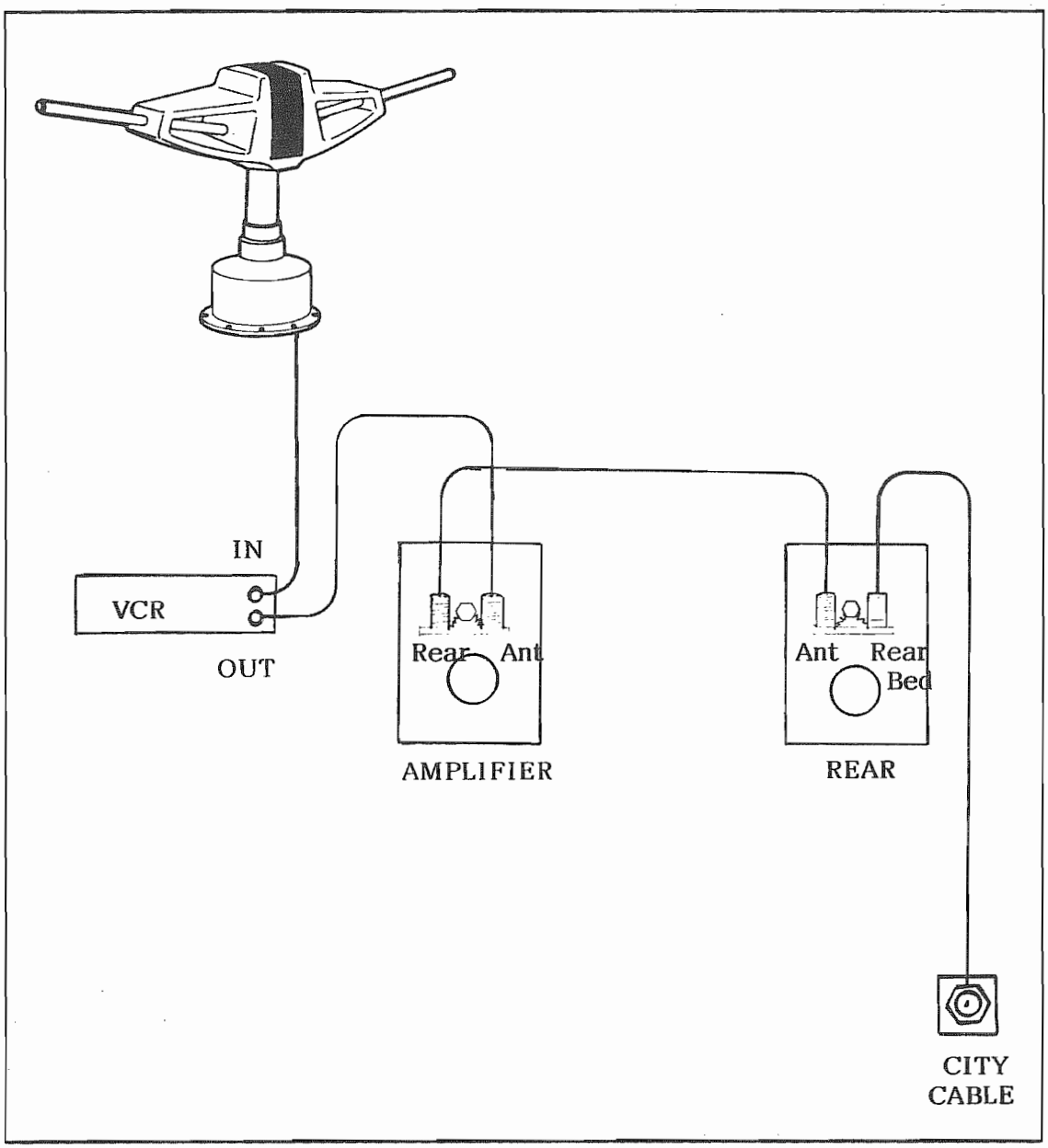
A. Turn amplifier "on".

B. Rotate the Delta until the best picture is received. If parked (stationary) extend or retract the Delta's dipoles until the best picture is received.

Note: We do not recommend traveling with the Delta's dipoles extended due to the possibility of damage by low hanging tree limbs. However, you may still use and rotate the Delta when traveling with the dipoles retracted.



COAXIAL CABLE WIRING



INTERIOR 12 VOLT WIRING DIAGRAMS

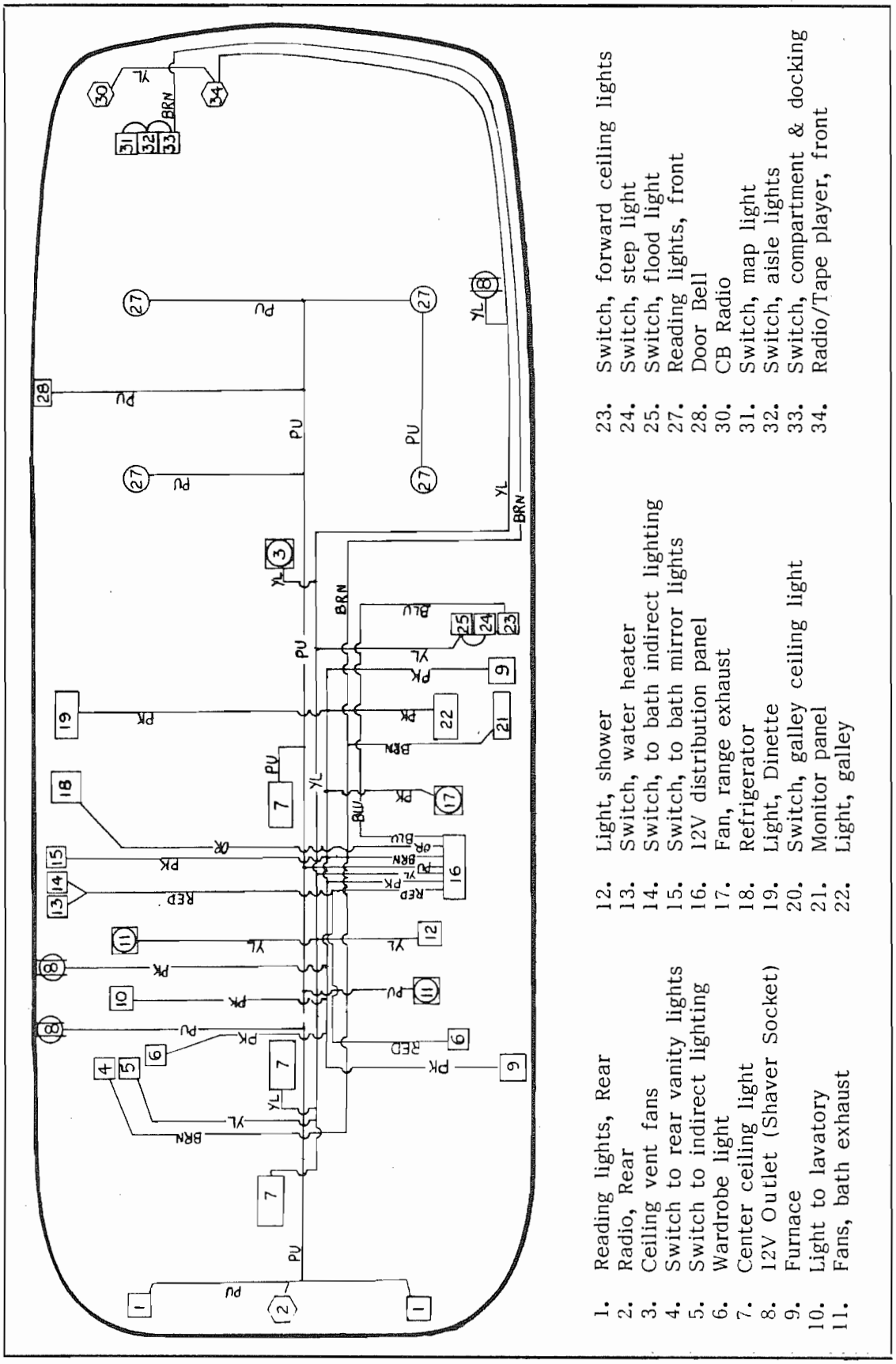
On the following pages are wiring diagams for the 12 volt system.

These diagrams show the path of the wires from the 12 volt distribution panel to switches or appliances.

Wires from the switches to the light or lights they control are distinguished by the wire having a colored tracer. The color of wire and tracer is easily found by pulling the switch out of the wall.

325, 345 and 350 SERIES - 12 VOLT WIRING DIAGRAM

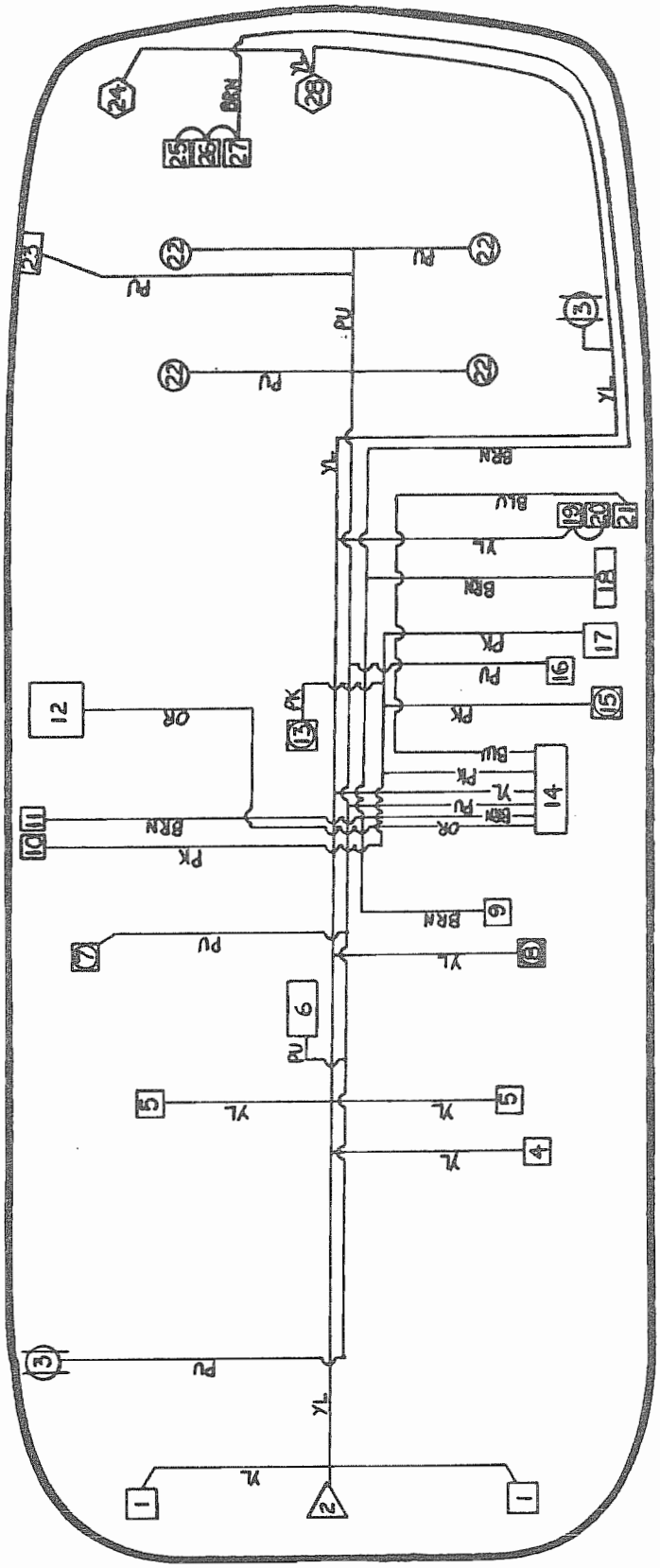
Wiring shown from 12 volt distribution panel to switch or appliance.



1. Reading lights, Rear
2. Radio, Rear
3. Ceiling vent fans
4. Switch to rear vanity lights
5. Switch to indirect lighting
6. Wardrobe light
7. Center ceiling light
8. 12V Outlet (Shaver Socket)
9. Furnace
10. Light to lavatory
11. Fans, bath exhaust
12. Light, shower
13. Switch, water heater
14. Switch, to bath indirect lighting
15. Switch, to bath mirror lights
16. 12V distribution panel
17. Fan, range exhaust
18. Refrigerator
19. Light, Dinette
20. Switch, galley ceiling light
21. Monitor panel
22. Light, galley
23. Switch, forward ceiling lights
24. Switch, step light
25. Switch, flood light
27. Reading lights, front
28. Door Bell
30. CB Radio
31. Switch, map light
32. Switch, aisle lights
33. Switch, compartment & docking
34. Radio/Tape player, front

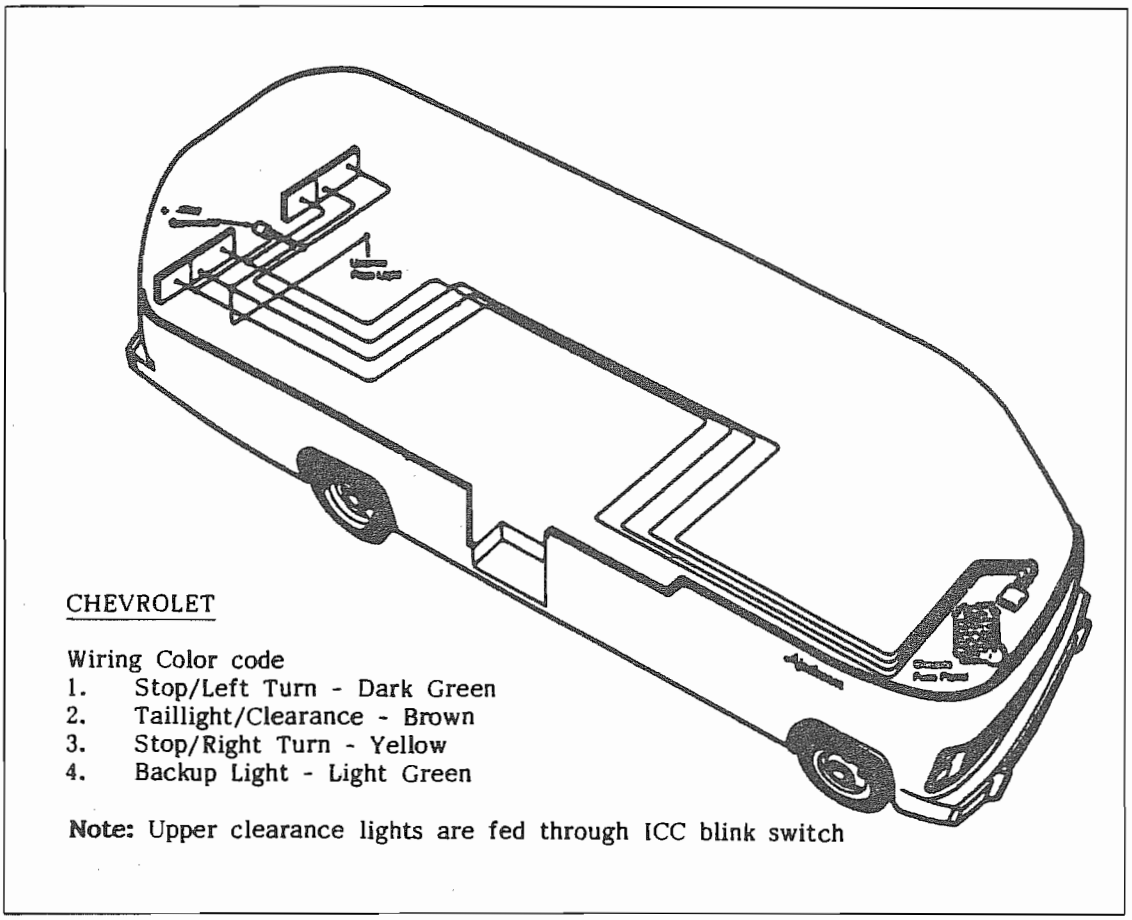
290 SERIES - 12 VOLT WIRING DIAGRAM

Wiring shown from 12 volt distribution panel to switch or appliance.



1. Reading lights, rear
2. Clock
3. 12V outlet (shaver socket)
4. Switch, bedroom lighting
5. Wardrobe lights
6. Ceiling light
7. Exhaust fan, lavatory
8. Exhaust fan, shower
9. Light, shower
10. Switch, lavatory light
11. Switch, water heater
12. Refrigerator
13. Fan, ceiling
14. 12V distribution panel
15. Range exhaust fan
16. Switch, galley lights
17. Furnace
18. Monitor Panel
20. Switch, living room lights
22. Reading lights, front
23. Door Bell
24. CB radio
25. Switch, compartment lights
26. Switch, map lights
27. Switch, aisle lights
28. Radio/Tape player

TYPICAL 12 VOLT EXTERIOR WIRING



CHEVROLET

Wiring Color code
1. Stop/Left Turn - Dark Green
2. Taillight/Clearance - Brown
3. Stop/Right Turn - Yellow
4. Backup Light - Light Green

Note: Upper clearance lights are fed through ICC blink switch

The exterior lights of the Airstream motorhome are fed current from the Chevrolet chassis wiring harness. The wiring harness to the taillights plugs into the back of the automotive fuse block on the front of the fire wall. The lower front clearance lights and turn signals also pick power up from this location. The upper clearance lights are fed through the ICC blink switch which picks up power from the head light switch.

The wiring harness for the taillights run past the left side of the engine, back the left frame rail, then up into the body.

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.

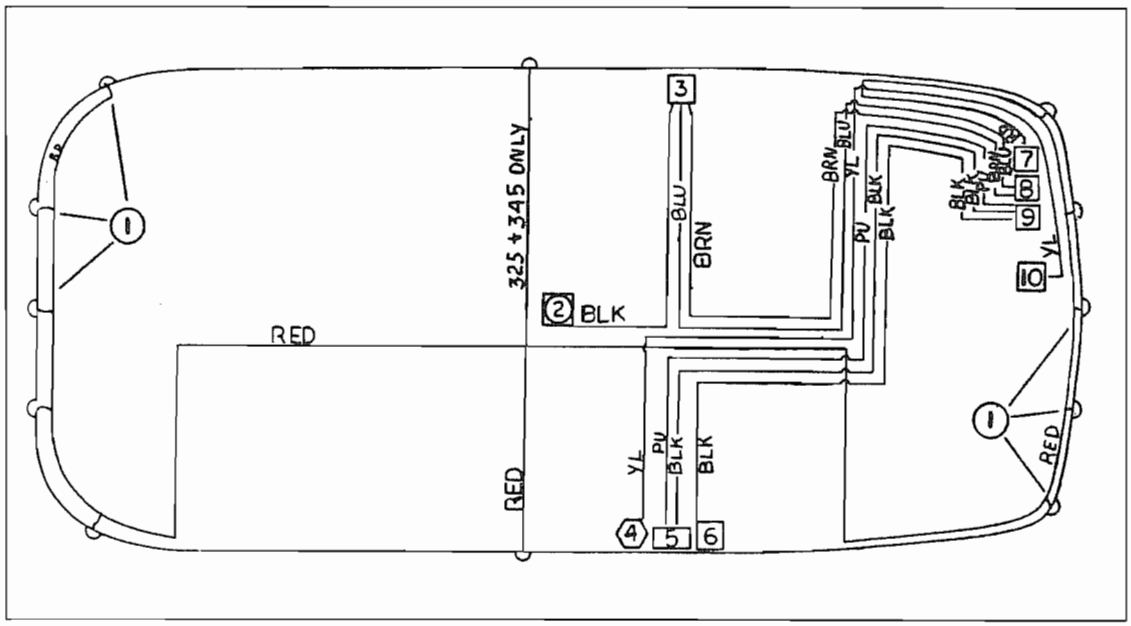
3. Loose or corroded connections at 7-way connectors.

4. Improper grounding at the lighting device.

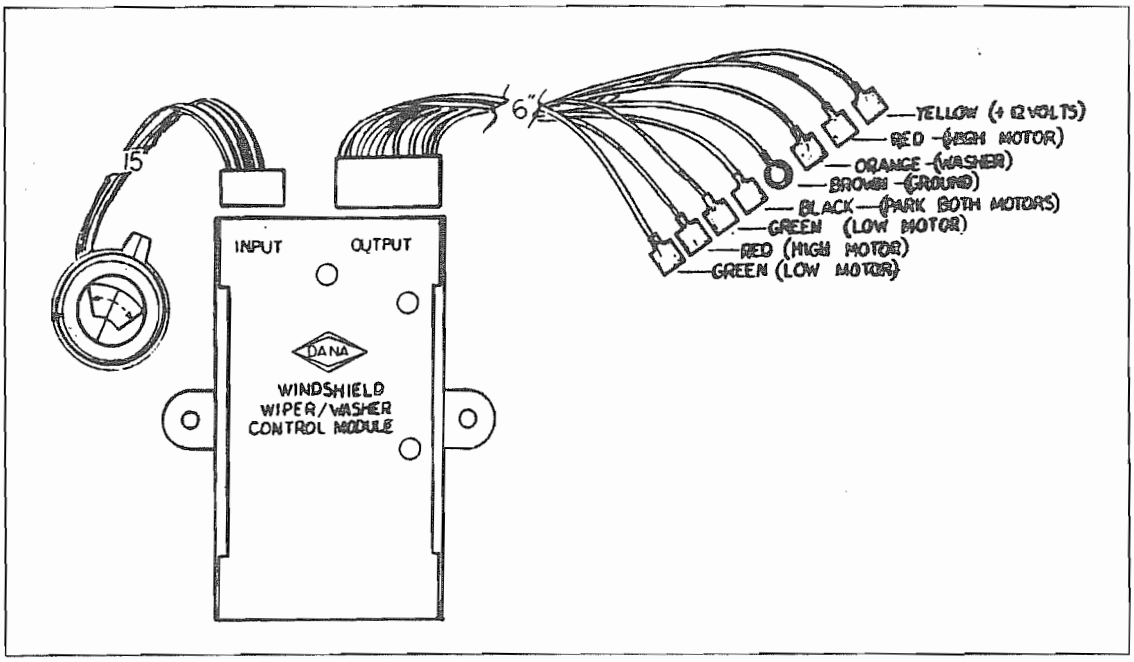
A continuity light or an ohmmeter will help you isolate the point of the "open" on the circuit.

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.

DASH TO BODY LIGHTS AND ACCESSORIES



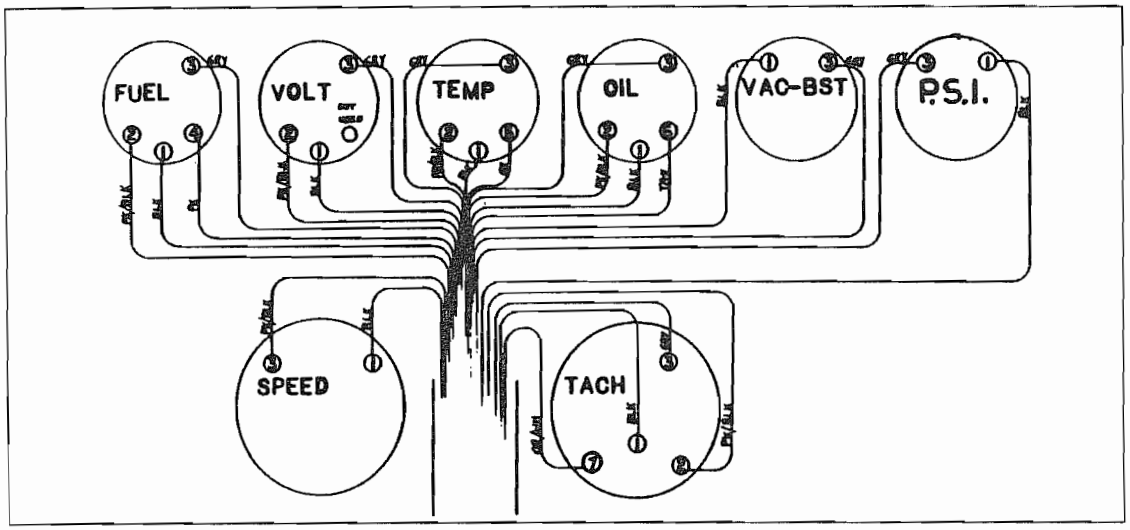
1. Clearance Lights
2. Ceiling Fan
3. Auxiliary heater
4. Refrigerator
5. Electric dead bolt
6. Switch, Mercury, dead bolt
7. Switch, I.C.C. Blink
8. Switch, Auxiliary heater
9. Switch, dead bolt
10. Fuse block, 12 V Chassis



The windshield wiper/washer module is attached to the back of the dash. Steady pressure will break the adhesive.

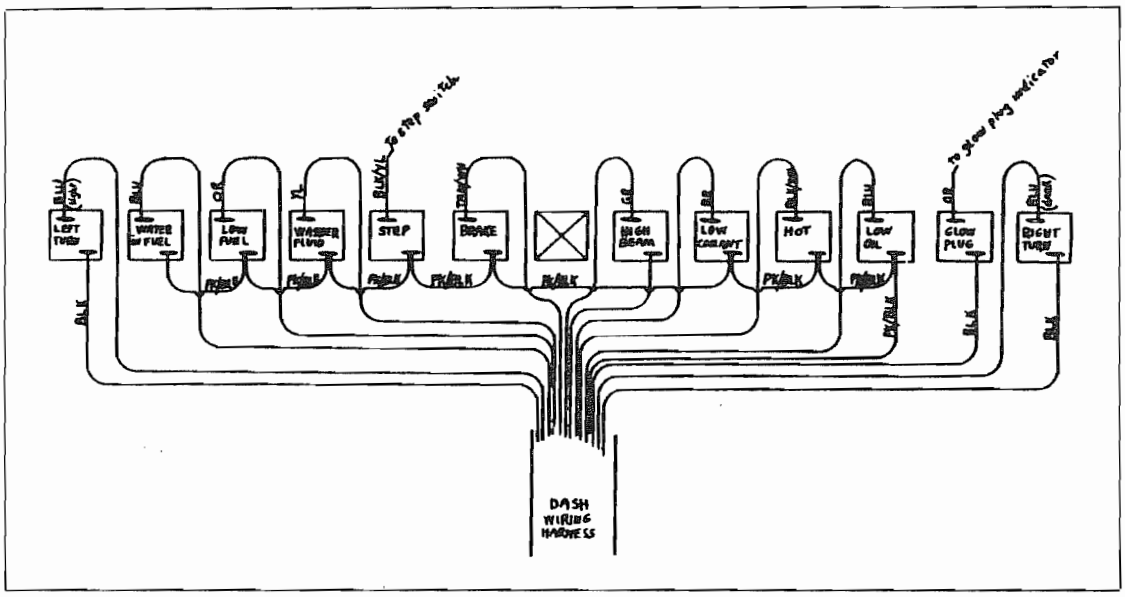
Power is supplied from the Chevrolet or Gillig fuse panel. Each wiper motor has its own green (low speed) and red (high speed) wire from the control module. The"park" circuit is shared by both wiper motors.

DASH INSTRUMENTS

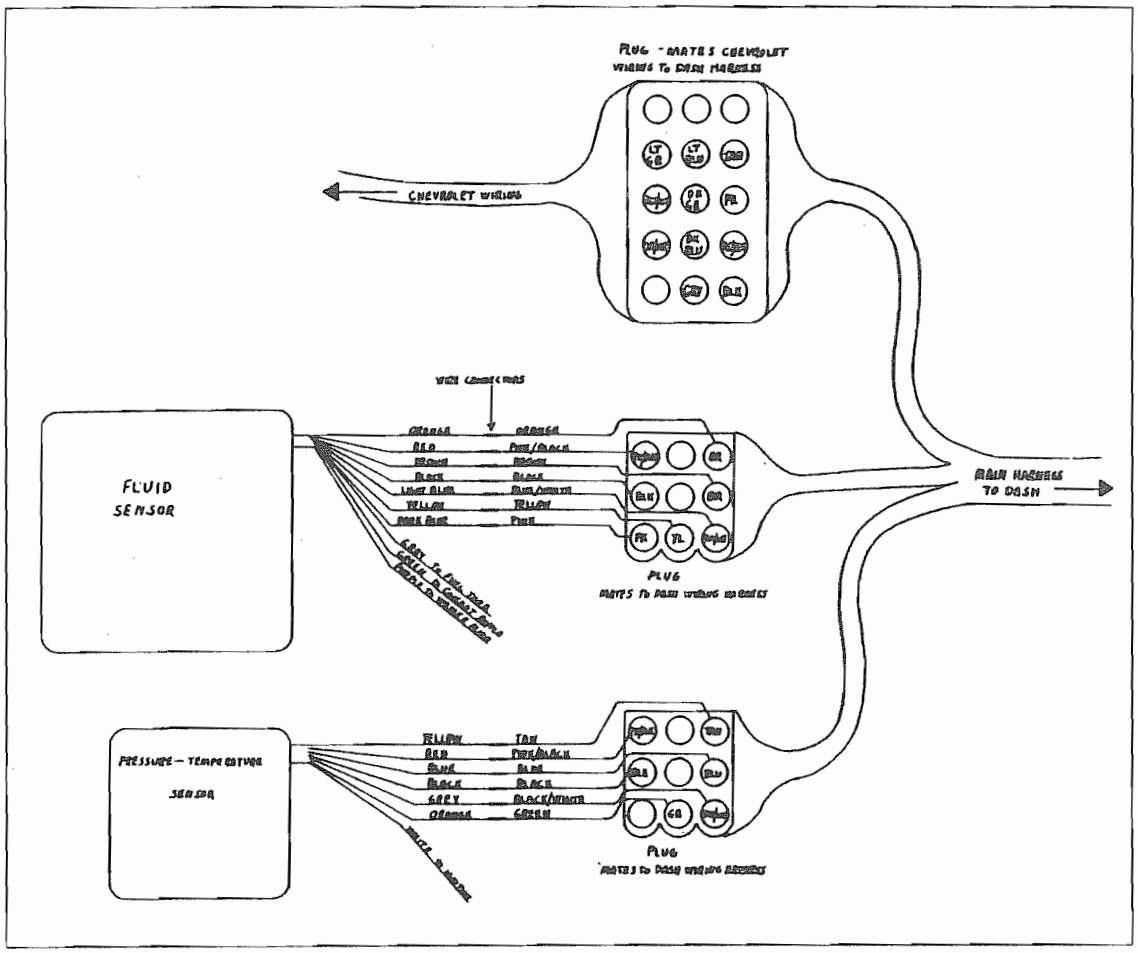


1. Black Wire - ground
2. Pink w/ black tracer - hot ignition
3. Grey - display lights - tied into head light switch
4. Pink - to Chevrolet harness - fuel tank sender
5. Green - to Chevrolet harness - temperature sender
6. Tan - to Chevrolet Harness - oil pressure sender
7. Orange w/ white tracer - to Chevrolet harness - electronic distributor

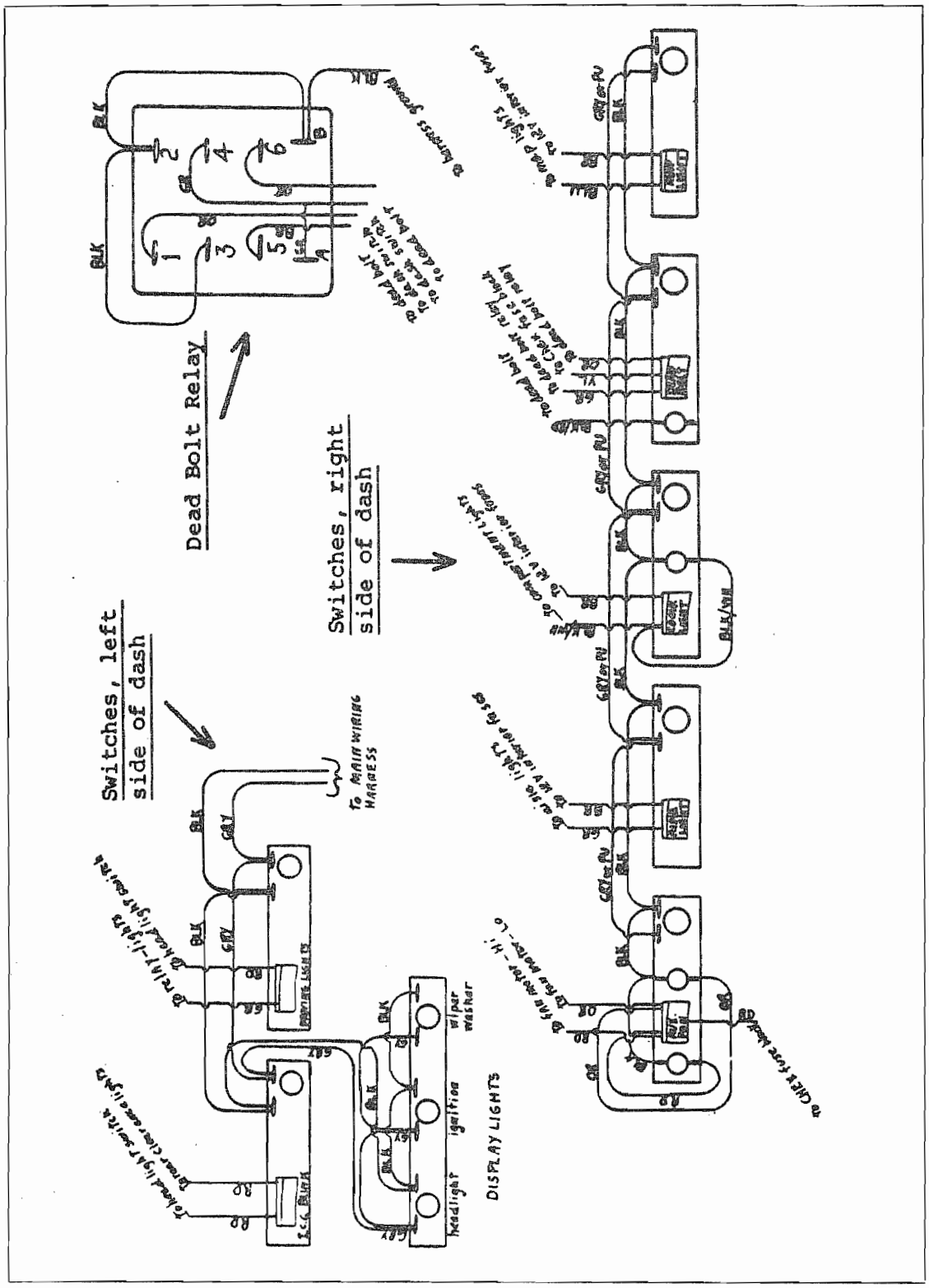
DASH BAR LIGHT



DASH HARNESS PLUGS, CHEVROLET



DASH SWITCH BAR



KEYLESS ENTRY SYSTEM

The dead bolt lock on your Airstream motorhome is designed so it can be operated without keys. It is locked by depressing the last two pads (7/8 and 9/0 on the code pad) just to the left of the main door. To open, press the five digit code given you at the time of purchase. We would suggest you make note of these numbers in your wallet or purse just in case a sudden memory lapse happens.

The system can be overridden by the manual key. Since 12 volt power is required to operate the keyless entry system it is a good idea to keep an extra key hidden on the exterior of the vehicle. This way a dead battery can't keep you from entering the coach.

A convenience like this can really spoil you, and the back up key hidden on the exterior will give you extra peace of mind.

SERVICE INFORMATION

There are four major electrical components used to operate the keyless entry system.

* Key Pad
* Dash Switch
* Drive Motor
* Control Module

The CONTROL MODULE is the heart of the system. Twelve volt power from the engine battery supplies power to the module, and is distributed by the control to the key pad drive motor and aisle lights.

The control module and the connections shown on the wiring diagram are located under the galley back against the wall.

If any failure occurs the first check is to look for power at the key pad. Does it light when a key pad is depressed? If not, check the engine battery for charge. If it is okay check for 12 volt positive and negative. Perform this check at the red and white wires providing power to the module as shown on the wiring diagram.

Listen! Depress key pads 7/8 and 9/0. Can you hear the drive motor trying to work the plunger?

Does the dash switch work the lock when the key pad doesn't? If this is the case depress each key pad button one at a time. Pause long enough for the light illuminating the pad to go out between each test. Did each pad make contact indicated by the light being activated?

The dash switch is a simple grounding device. Grounding either wire going to the switch should extend or retract the lock plunger.

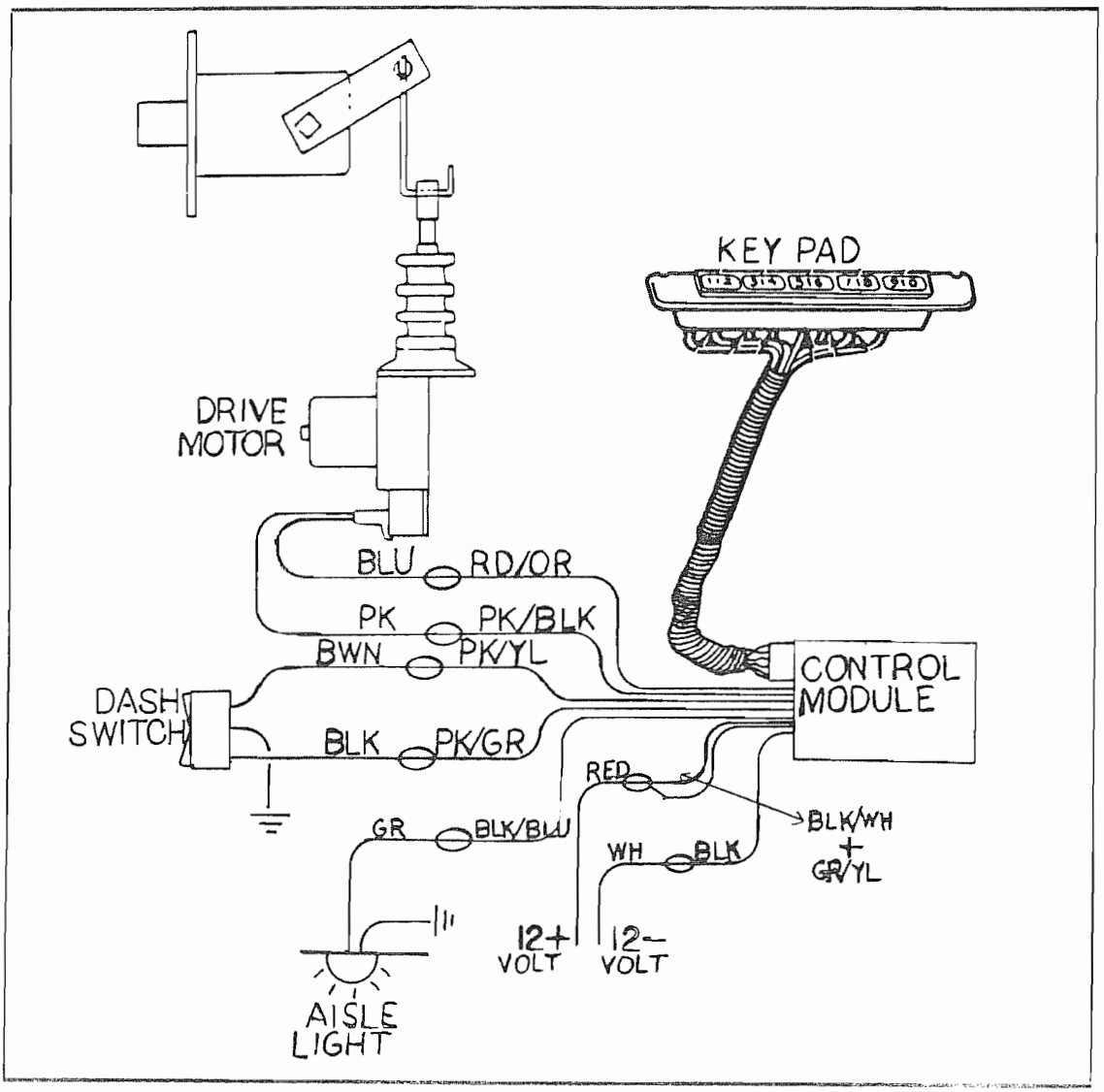
CAUTION: Do not ground both wires simultaneously to prevent damage to the control module.

When performing simple tests like these it is important to realize the drive motor is polarity sensitive. This means either wire to the motor may be negative or positive according to the mode. When the mode is reversed (open to close or close to open) the wire that was positive becomes negative and the negative becomes positive.

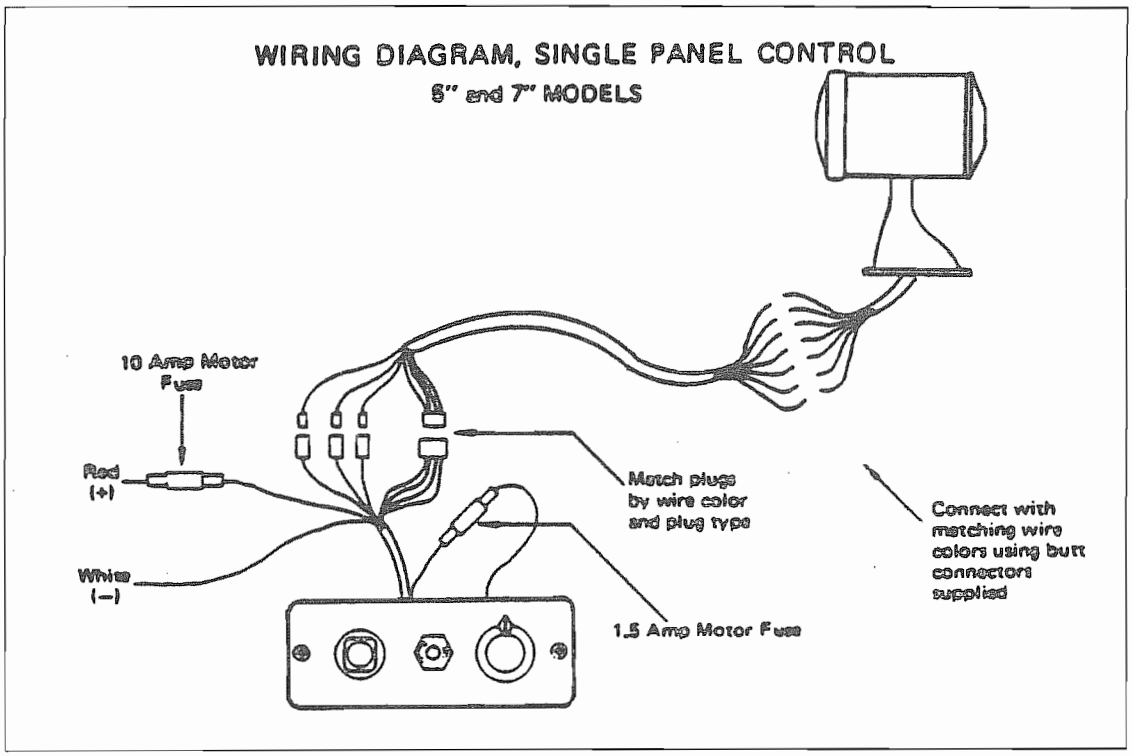
The drive motor can be tested by providing positive and negative current to the blue and pink wires. Just touching the wires will be enough to active the motor. Switch the polarity to the wires. Did the drive motor reverse?

Performing these simple tests will isolate 95% of any problems. Don't let the number of wires at the control module scare you. Close examination will show we've only used a few of the functions the module is capable of performing, and the only wires you need to be concerned about are those shown on the following diagram.

If more detailed information is required a 30 page diagnostic booklet has been produced by Ford. A copy may be obtained upon request through your dealer.



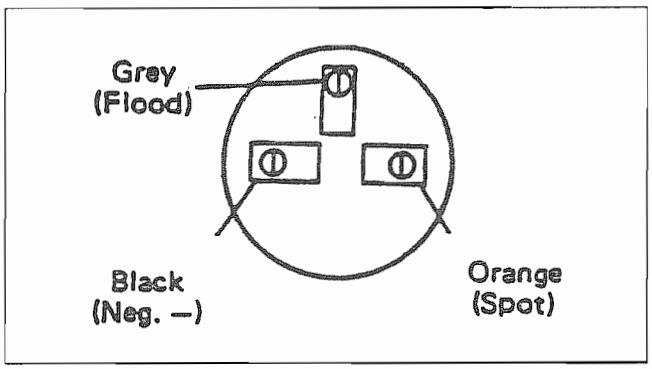
Spot light



Power to the spot light is supplied from the 25 amp automatic circuit breaker mounted next to the isolator. The fuses shown in the above diagram are both accessible by removing the switch panel.

Bulb Replacement

Loosen screw and remove bulb retaining ring. Disconnect wires from faulty bulb. Connect wires to new bulb as shown in diagram. Install bulb and fasten with bulb retaining ring.



Trouble Shooting

All lights are thoroughly inspected before shipping and are warranted to operate within specifications. If light does not operate correctly, check fuses, wire harness connections and color matching of wires before proceeding with this trouble shooting.

PROBLEM: Dual filament bulb works in reverse (up is spot, down is flood).

REMEDY: Disconnect orange and gray wires. Reconnect as follows:
(Orange from light) to (Gray from switch)
(Grey from light) to (Orange from switch)

PROBLEM: Control lever works in reverse in all directions. (Left is right, down is up, etc.)

REMEDY: Reverse Red and white battery connections.

PROBLEM: Control lever works in reverse in horizontal direction only. (left is right and right is left)

REMEDY: Disconnect Yellow and Blue wires. Reconnect as follows:
(Yellow from light) to (Blue from Switch)
(Blue from light) to (Yellow from switch)

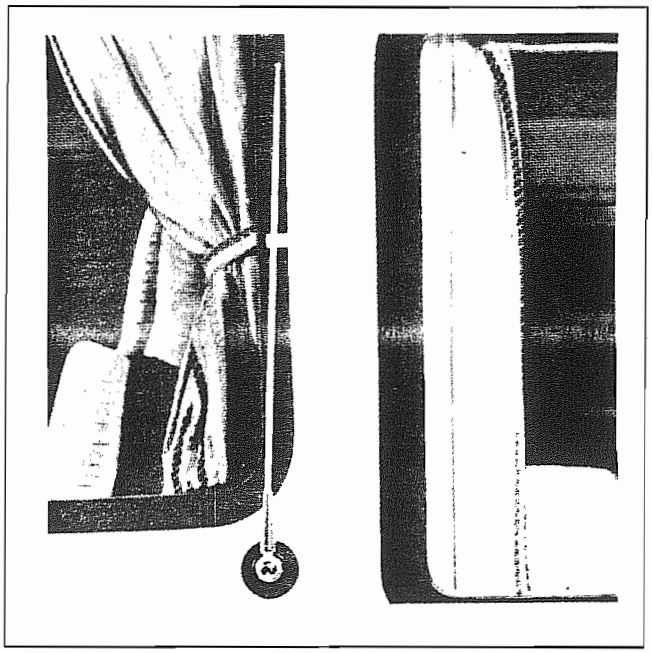
PROBLEM: Control lever works in reverse in vertical direction only. (Up is down, and down is up)

REMEDY: Disconnect Green and Violet wires. Reconnect as follows:
(Green from light) to (Violet from switch)
Violet from light) to (Green from switch)

PROBLEM: Light moves in only three of the four possible directions.

REMEDY: A. One horizontal direction is inoperative. Reverse connections as in Step 3. If opposite horizontal motion becomes inoperative, replace the switch. If problem persists, return light for service.

Radio Antenna



The aluminum and steel construction of your motorhome creates a radio shield, and you will need outside antennas for perfect reception.

The radio antenna installed provides signal not only to the AM-FM radio, but also incorporates a CB antenna lead. This lead can be found at the splitter located under the dash behind the entertainment center. CB radios should only be professionally installed since it is necessary to match the antenna to the transmitter, and this requires a Standing Wave Meter. To adjust for CB operation the antenna should be fully extended, then the splitter adjusted with a non-metallic screw driver. Additional adjustment is available by turning the tip of the antenna.

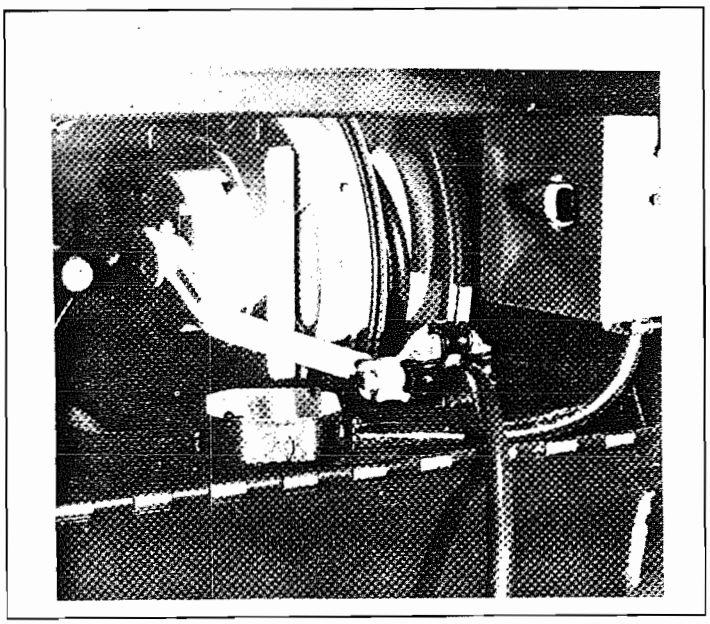
Note: If your motorhome also has a rear radio, a second exterior antenna is mounted on the exterior. It is located on the roadside just forward of the rear panorama window.

110 VOLT POWER

The Airstream motorhome can use two different sources of 110 volt power. One is obtained by plugging the power cord into a receptacle at the campsite. The other is by starting the generator. Plugging into an outside source is preferable. The generator is normally for use when other sources aren't available.

The power cord is stored on a reel on the roadside rear of the vehicle. The 290 series has the power cord located in a small access compartment similar to the fuel filler.

Care should be taken to not pull the cord out further than a foot or two past the white band around the cord. Pulling the cord out further will make it difficult or impossible to operate the retracting mechanism.



Three Pronged Plug

When the three pronged plug can be used there will be no problem 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.

1. Attach the three pronged plug to a two prong adapter. The third conductor line of this adapter has a short wire lead which must be grounded.

2. For proper grounding connect the 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.

When your motorhome is hooked up to 110 volt city power, or the generator is running, the univolt system charges the univolt battery. 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 batteries. If you are making an extended stay or storing your motorhome, then you should (if it is available) KEEP YOUR MOTORHOME HOOKED UP TO 110 VOLT CITY POWER.

Generator Operation

To operate the generator simply start the generator at the control panel or dash switch. After the generator has run a couple of minutes an automatic relay will close and current from the generator will be supplied to the 120 volt circuit breaker. This is indicated by the AC power light on the control panel starting to glow. Operating the generator for about one hour each day will normally keep the battery charged.

A separate operating manual has been provided that covers the generator operation in more detail.

Selector Switch

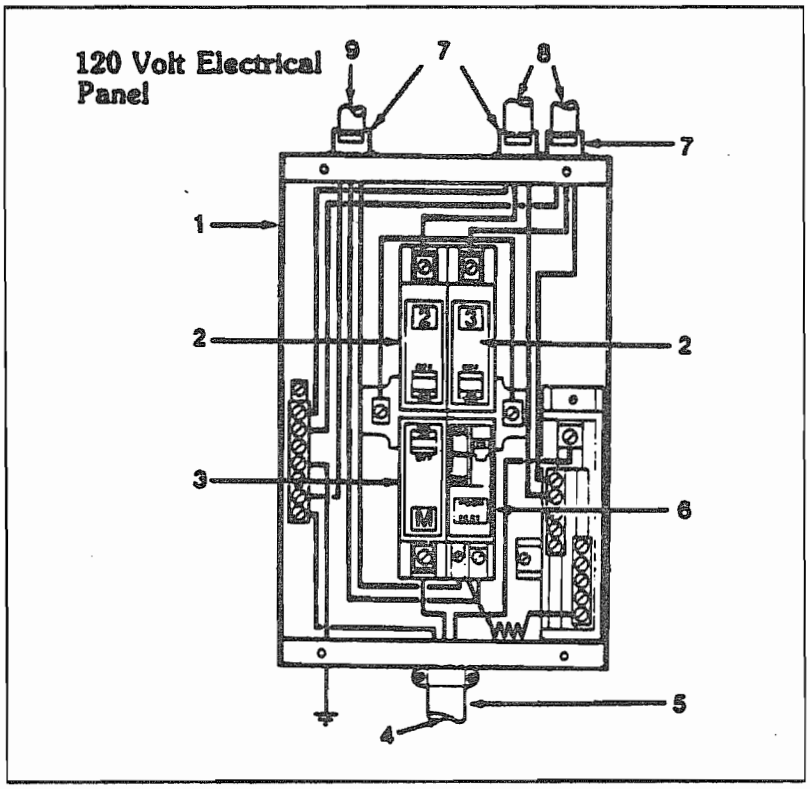
The 290 and 325 motorhomes have a six position appliance selector switch located in the rooflocker above the range. When plugged into city power only one of the appliances noted on the switch may be used at a time. When operating the generator, power is automatically fed to the rear air and the selector switch may be set on any one of the other appliances.

All 345 and 350 motorhomes have a wall switch above the galley to select between front and rear air conditioners. It looks just like an on/off wall switch in your home.

To obtain the fastest cooling from the air conditioners you must run the generator and set the selector switch on "front air". This allows you to operate both air conditioners at the same time. Once the motorhome has cooled, operating one air conditioner will hold the temperature unless the temperatures are extreme.

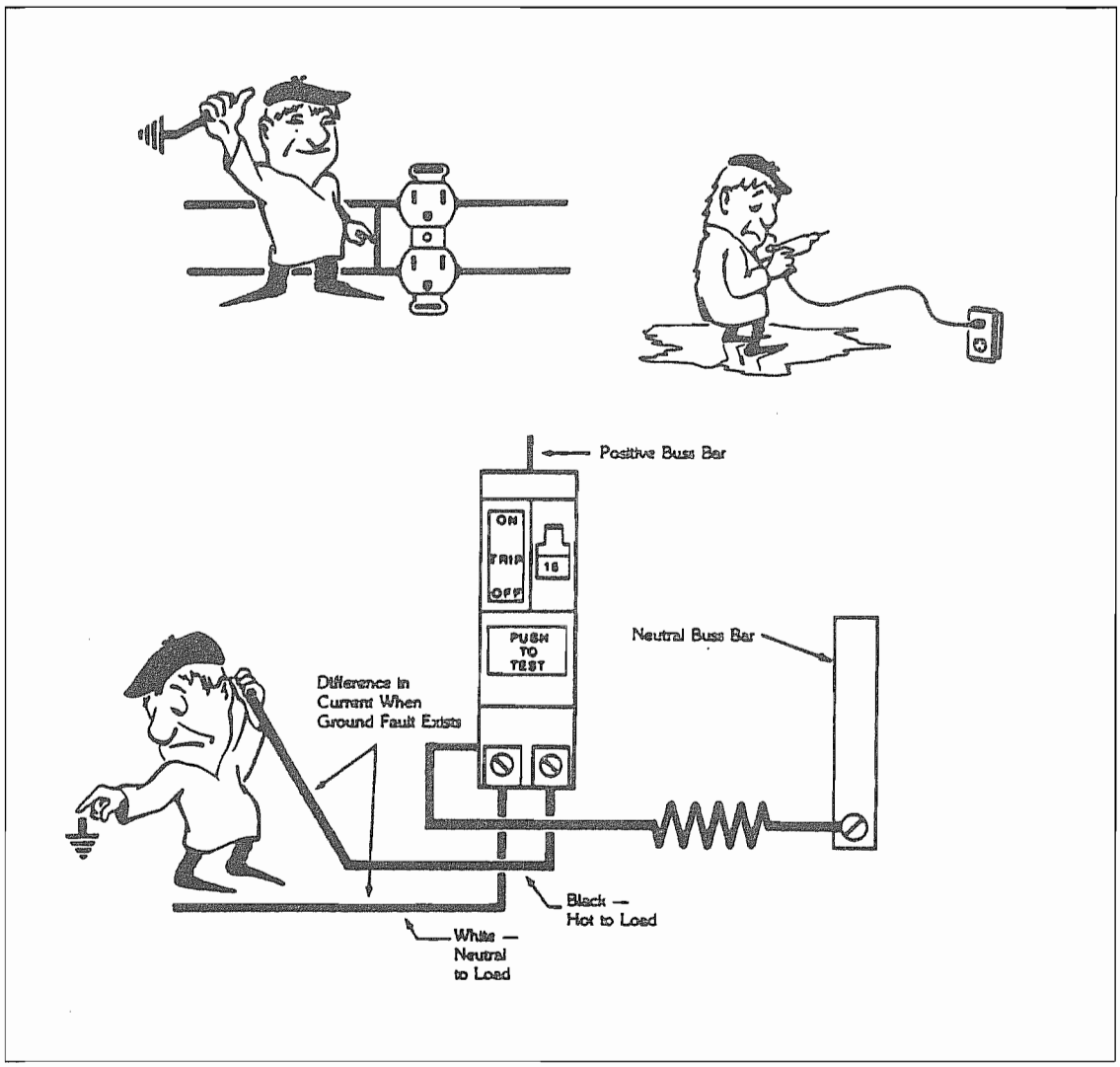
Circuit Breakers 290 & 325 Series*

The 120 volt circuit breaker panel is located in the upper rear rooflocker. A second breaker box with only one breaker is mounted on the interior cover of the generator compartment. This may be found under the dinette seat or the wardrobe, depending on the floor plan of your motorhome. In the event of a failure of a 120 volt circuit, check your circuit breaker first. While you are connected to the 120 volt receptacle, or 120 volt generator, the wiring is protected by circuit breakers in the breaker panel. 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 or the factory.



1. Breaker box G.E. TL410ST
2. Breaker TQL 1120 20 amp
3. Breaker TQL 1130 30 amp main
4. Power supply cord
5. Clamp Romex 3/4"
6. Ground Fault Breaker THOL 1115 GF
7. Romex Clamp T&B 3300
8. Romex
9. Romex

* See "ENERGENIUS" for 345 and 350 Series



Many states require RV's which are sold in their state, and which have exterior 120 volt receptacles, to have a ground fault circuit interrupter. Units 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. This 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.

Note: The GFCI Circuit breaker will not reduce shock hazard if contact is made between a "hot" load wire and a neutral wire, or two "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 a 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.

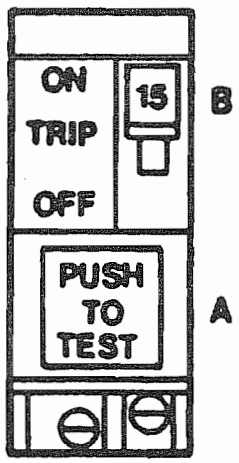
WARNING:

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
1990												
1991												
1992												

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. The second step is to 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 procedure is one method for isolating shorts and opens.

SHORTS

1. Isolate the circuit which has the short by noting which circuit breaker has tripped.

2. Disconnect the power inlet cord from the power source.

3. Using the 120V schematic as a reference, disconnect outlet boxes one at a time starting at the box furthest from the distribution panel. After disconnecting each box check for continuity between the black wire and ground or common (white) wire, on the distribution panel side of the circuit. When a continuity light or OHM meter indicates no continuity the short is either in the receptacle just removed or the section of Romex wire between this receptacle and the previous receptacle removed.

4. Examples of a short are: A) The black wire of the 120V system contacting the white wire, bare wire or grounded surface. B) An internal short in a 120V appliance.

Any damaged wire must be replaced. The National Electrical Code does not permit splicing 120V wiring outside an outlet box or junction box. Also, the wire must not be exposed to an area such as a sharp metal edge which may damage the wire.

OPENS

1. Check all receptacles and components for voltage on the circuit which has the open.

2. If all receptacles and components of the circuit are without power, begin to look for open in the distribution panel.

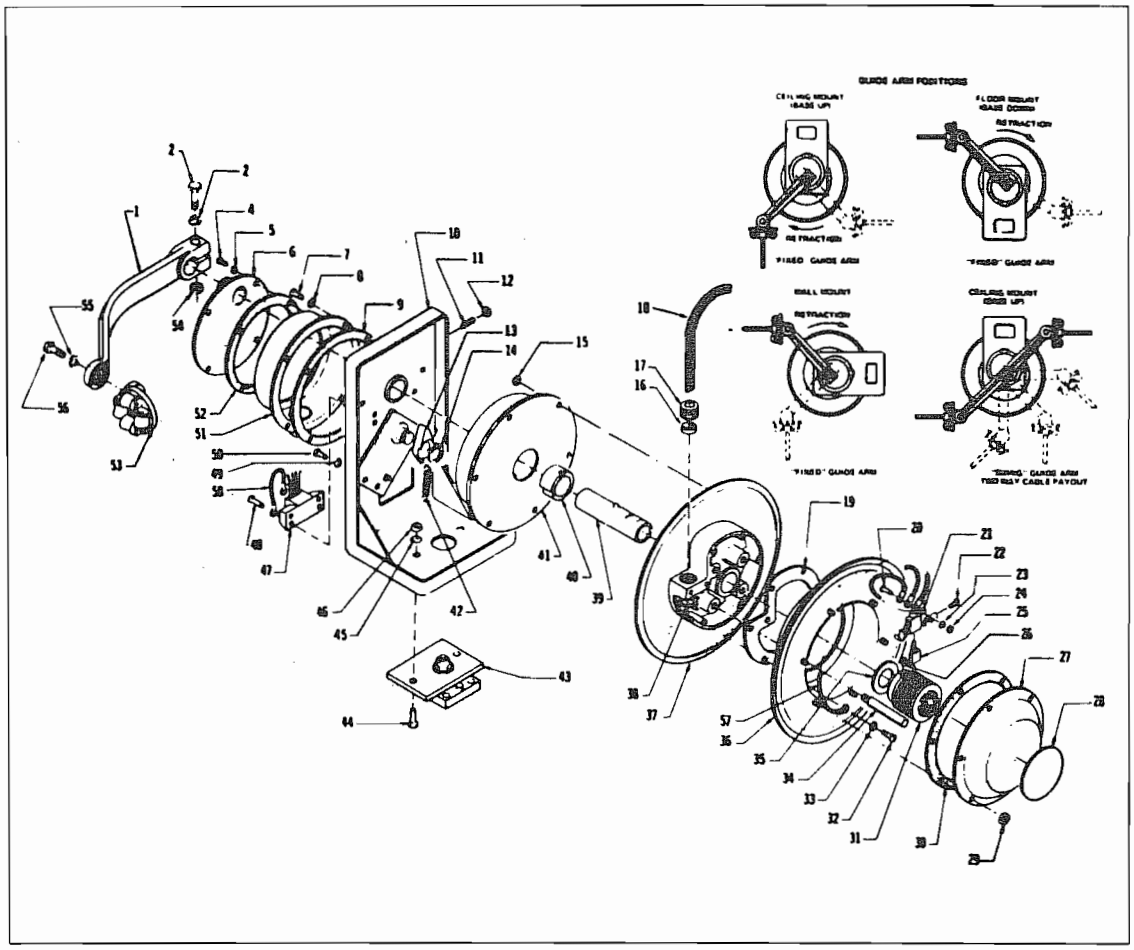
3. Inspect for loose or corroded connections and a faulty circuit breaker.

4. Check for power on both ends of circuit breaker. If there is no power on the inlet side of the circuit breaker, the open is between the power cord's male connector and the distribution panel.

5. The open can be isolated by noting the outlets which do not have power. Example: If the bath outlet in the rear bath model has power, and the converter has no power, the open is between the bath outlet and converter outlet.

6. Examples of an open are: A) Loose or corroded connections. B) A wire disconnected from a terminal. C) Contacts in the circuit breaker which do not make contact. D) A broken wire.

110 Volt City Power Cord Reel Assembly



1. Guide Arm
2. Screw
3. Lockwasher
4. Screw
5. Lockwasher
6. Junction box cover
7. Screw
8. Lockwasher
9. Gasket
10. Stand Assembly
11. Set screw
12. Nut
13. Ratchet lever
14. Retainer ring
15. Lock nut
16. Cable packing
17. Cable nut
18. Cable
19. Gasket
20. Screw
21. Brush holder
22. Screw
23. Washer
24. Nut
25. Brush
26. Set screw
27. Slip ring cover
28. Name plate
29. Lock nut
30. Gasket
31. Slip ring
32. Screw
33. Lockwasher
34. Mounting stud
35. Washer
36. Drum & flange assy
37. Flange & drum assy
38. Clamp
39. Main shaft
40. Hub
41. Mainspring & cup assy
42. Ratchet spring
43. Pivot base
44. Screw
45. Lockwasher
46. Nut
47. Terminal board
48. Screw
49. Lockwasher
50. Screw
51. Junction box
52. Gasket
53. Cable guide
54. Nut
55. Lockwasher
56. Screw
57. Ground wire
58. Ground wire

Power Cord Reel Adjustment

1. Ratchet Lock: All models are supplied with ratchet lock which works in any position. If ratchet lock is not required (constant tension) place lock adjustment plate in position shown in diagram. For ratchet lock action, move plate to position shown with phantom lines.

2. Cable Guide: The cable guide arm may be set at any fixed position around the cable drum. The guide must be set so the cable pays off reel in a straight line without bends. If guide arm is to be free-swinging (self-aligning) loosen screw on back of guide arm.

3. Spring Tension: Before making final connections of cable, pretension reel by pulling cable out far enough to allow one full wrap of cable to be thrown back over spool, hold spool from turning, and place cable back on reel. Repeat until desired cable tension is set. After tension is set, pull cable out completely to insure enough spring travel remains for operating. Failure to test in this manner can lead to spring damage.

Service

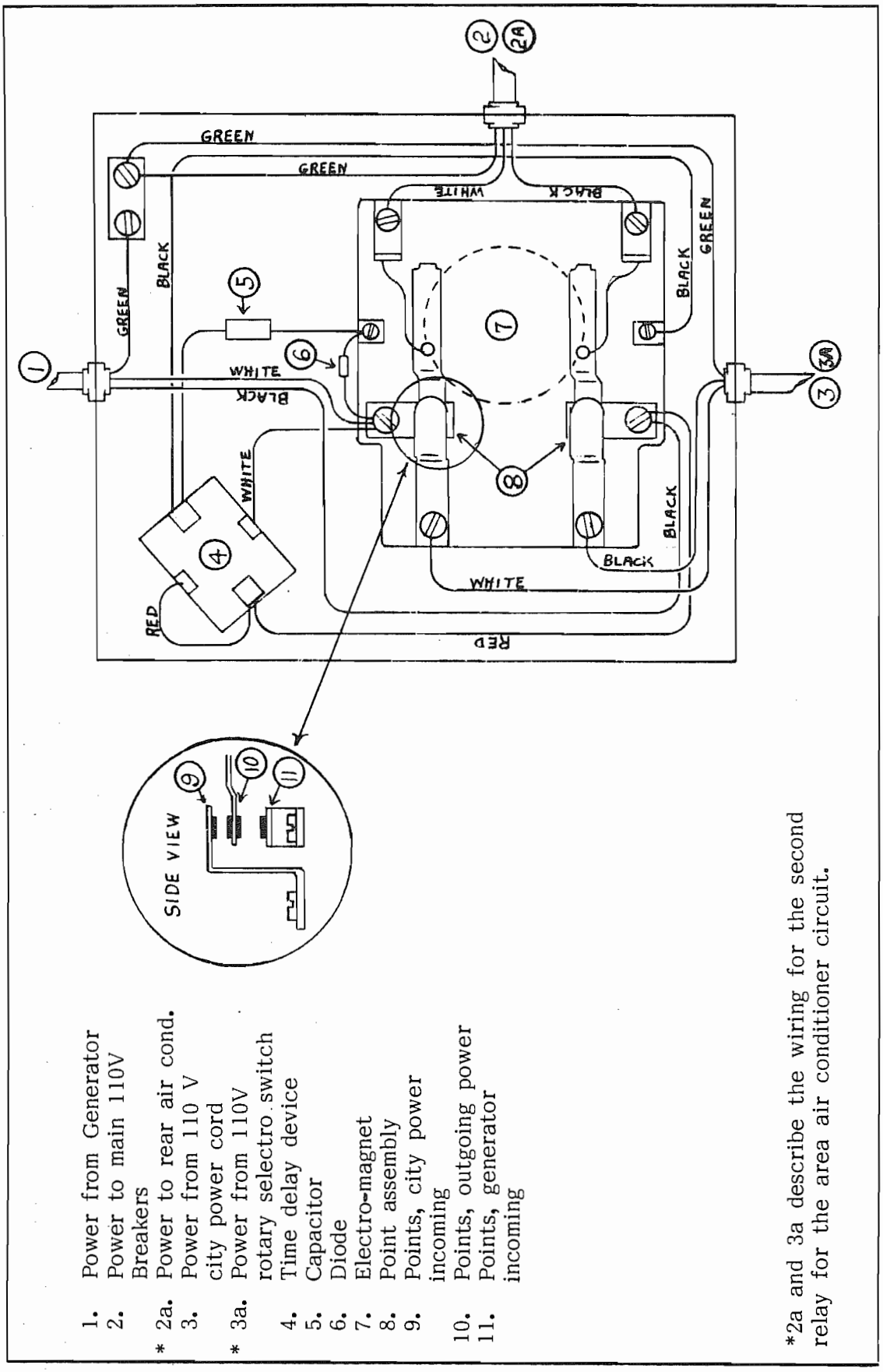
CAUTION:

Before performing any service to reel, remove all spring tension and electric power.

1. Mainspring and Cup: If reel will not develop tension or retract cable, mainspring and cup may need to be replaced. To replace mainspring remove junction box, disconnect wires on terminal board which enters junction box through mainshaft, remove set screw, and remove spool from stand. Remove mainspring and cup assembly from spool and replace with new part if necessary. Reverse above to reassemble.

2. Slip Ring: Remove cover and drum exposing slip ring. Brush and brush holder may be removed from mounting studs by loosening screw and lifting brush holder from mounting studs. Slip ring may be removed by removing all brush holders, set screw and wires on terminal board. Slip ring will now slide off mainshaft. To reassemble reverse above procedure.

Generator Switch-Over Relays (Main and Rear Air Conditioner Circuit)



1. Power from Generator
2. Power to main 110V Breakers
* 2a. Power to rear air cond.
3. Power from 110 V city power cord
* 3a. Power from 110V rotary selectro switch
4. Time delay device
5. Capacitor
6. Diode
7. Electro-magnet
8. Point assembly
9. Points, city power incoming
10. Points, outgoing power
11. Points, generator incoming

*2a and 3a describe the wiring for the second relay for the area air conditioner circuit.

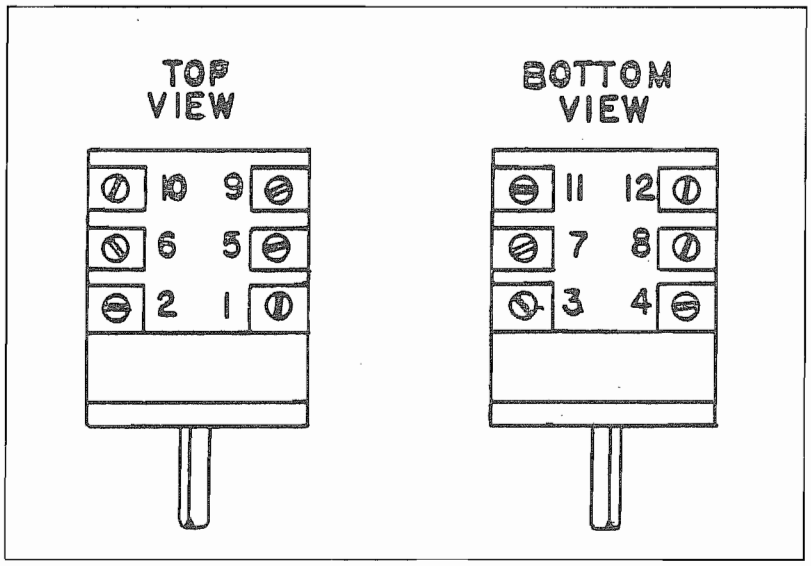
All motorhomes have a generator switch-over relay mounted near the junction of the 110V power cord to the vehicle. Motorhomes with two roof air conditioners will have a second relay mounted on the interior of the generator closeout. The relays are identical, but of course are wired differently according to the function being performed.

Let's look at the main switch-over relay first. Points #9 and #10 are normally closed. The power cord #3 provides current to point #9. The current is passed through to point #10 and on out of the relay through wire #2 feeding the main 110V breaker box.

When the generator is started, power coming in #1 is fed to Point #11 and to the time delay #4. When the time delay is satisfied (about 45 seconds) the circuit to the electro-magnet #7 is completed and the magnet pulls Point #10 down to point #11 completing the circuit between the generator wire coming in and the 110V wire #2 going to the main circuit breaker box.

When the switch-over relay is used on the rear air conditioner circuit, point #9 is fed from the rotary selector switch via wire #3a. Point #10 is connected to the rear air conditoner via wire #2a.

Rotary Selector Switch, 110 Volt 290 and 325 Series Only



The rotary selector switch is used to allow many 110 volt appliances to be permanently wired into the motorhome circuit, yet overloading is avoided since only one appliance may be used at a time.

Power comes into the switch on terminal #1. External jumpers on the switch ties terminal #1 together with terminals 5, 9, 3, 7, and 11.

The wiring on the remaining six terminals is as follows:

#2 Microwave
#6 Open. This circuit is not currently being used.
#10 Trash compactor
#4 Front air conditioner
#8 Blender
#12 Rear Air Conditioner

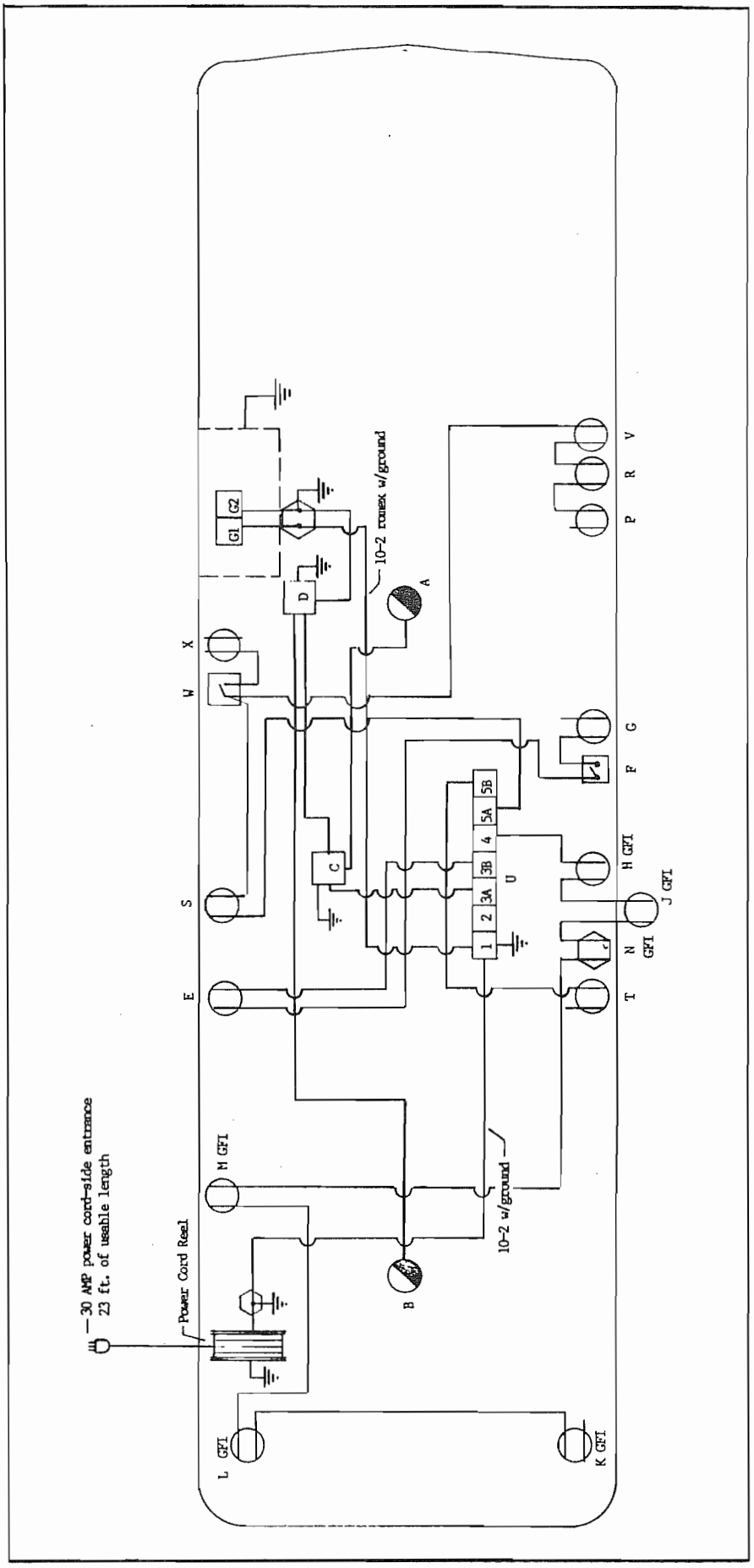
110 VOLT

WIRING

DIAGRAM

345 & 350

SERIES



Circuit 1, 30 Amp Main Breaker

Circuit 2, Not Used

Circuit 3 Power supplied from shoreline or generator.

20 Amp H.A.C.R. breaker, 12-2 Romex w/ground. This circuit when operating from the shoreline supplies power to single pole, double throw switch "C" which will operate either the front or rear air conditioner depending on switch position. When the generator is operating, automatic switch over relay "D" will override shoreline and operate the rear air conditioner with power supplied by generator circuit C-2. If switch "C" is in the front A/C position it will operate the front AC with power supplied through generator Circuit G-1.

Circuit 3B Power supplied from shoreline or generator.

20 Amp breaker, 12-2 Romex w/ground.

E.	Refer	2.7 Amps
F.	Hot water tap switch	
G.	Hot water tap recept.	4.3
	Total	7.0 Amps

Circuit 4 Power supplied from shoreline, generator or inverter.

20 Amp GFI breaker, 12-2 Romex w/ground.

H.	Galley Recept.	1.0 Amp
J.	Outside recept.	1.0
K.	Roadside bedroom recept.	1.0
L.	Curbside bedroom recept.	1.0
M.	Bath recept.	1.0
N.	Blender wired direct	5.4
	Total	10.4 Amps

Circuit 5A Power supplied from shoreline, generator, or inverter.

20 Amp breaker 12-2 Romex w/ground

P.	Credenza Recept.	1.0 Amp
R.	Opt. ice maker recept.	2.9
S.	Dinette Recept.	1.0
V.	VCR	1.0
X	Wall Lamp	1.2
	Total	7.1 Amps

Circuit 5B Power supplied from shoreline generator or inverter.

20 Amp breaker, 12-2 Romex w/ground.

T.	Microwave	15.0 Amps

Circuit G-1

This circuit is a 30 amp breaker that supplies distribution panelboard "U" (Energenius) with A/C power when the generator is running. Panelboard "U has an internal switchover relay.

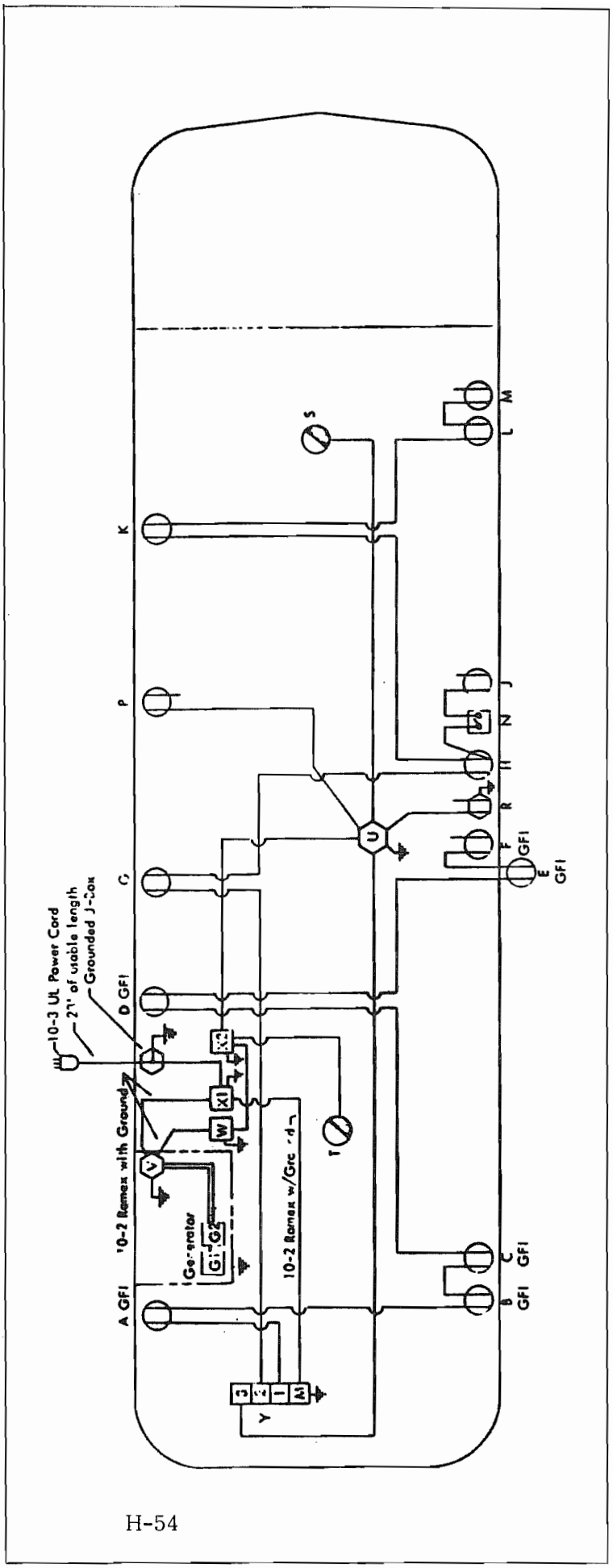
Circuit G-2

This circuit is a 20 amp H.A.C.R. breaker and supplies switchover box "D" when the generator is running.

110V WIRING

DIAGRAM

290 SERIES



Wiring Description for Preceding Page (290 Series)

Circuit 1, 20 amps, 12-2 Romex w/Ground GFI Protected

A. Roadside bedroom recept
B. Curbside bedroom recept
C. Curbside bedroom recept
D. Bath recept
E. Outside Recept
F. Converter recept

Circuit 2, 20 amps, 12-2 Romex w/Ground

G. Refrigerator recept
H. Kitchen recept
J. Instant hot water tap recept
K. Roadside dining area recept
L. Optional ice maker recept
M. Curbside dining area recept
N. Single pole, single throw, 20 amp rated UL/CSA switch. Used to power the instant hot water tap.

Circuit 3, 20 amps, 12-2 Romex w/Ground

P. Microwave oven recept
R. Blender (wired direct)
S. Front air conditioner
T. Rear air conditioner
U. Switch, 6 pole, 6 position, 20 amp rated UL/CSA rotary switch. The switch will power any of the above appliances, but only one at any given time.

Circuit G-1 (Generator)

From the 30 amp breaker (supplied integral with the generator) 10 ga. stranded wire is run in flexible metal conduit to junction box "V" located in the generator compartment. 10-2 Romex is then run from "V" to automatic switchover relay box "X1". "X-1" automatically switches the coach from shore power to generator power when generator is operating. From "X-1" 10-2 Romex with ground is run to coach breaker box "Y".

Circuit G-2 (Generator)

From the 30 amp breaker (supplied integral with the generator) 10 ga. stranded wire is run in flexible metal conduit to junction box "V" located in the generator compartment. 10-2 Romex with ground is then run from "V" to a 20 amp HACR breaker in breaker box "W". 12-2 Romex is then run from the 20 amp breaker to automatic switchover relay box "X-2". "X-2" prevent Circuit G-2 from back feeding the 6 position switch "U". From "X-2" 12-2 Romex is run to the rear air conditioner.

NOTES

APPLIANCES

AIR CONDITIONER

Manufacturer: Dometic
509 S. Poplar Street
LaGrange, IN 46761

Note: Review the air conditioner literature supplied in your Owner's Packet before proceeding.

The roof air conditioner used on Airstream motorhomes 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.

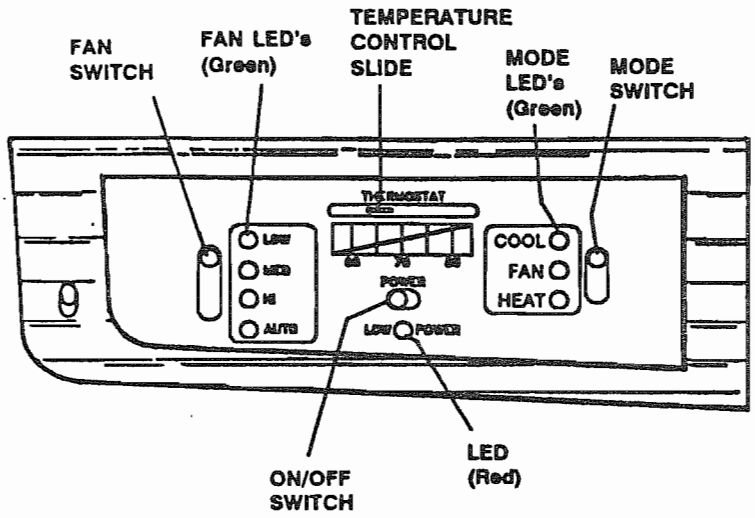
On the 290 and 235 a rotary selector switch is located in the cabinet above the range. It may be set to either front or rear air conditioner, but to operate both you must start the generator to have sufficient power.

The 345 and 350 models have a priority switch above the galley that allows you to choose between front and rear air conditioners. It may be set to operate either one, but to run both air conditioners you must start the generator. Set the priority switch to the front air conditioner and the generator will automatically supply power to both.

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 motorhome 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.

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 is much easier to hold a comfortable temperature than it is to lower the temperature after the interior of the motorhome is already hot.

OPERATING INSTRUCTIONS (Model 610015.405)



CONTROL DESCRIPTION:

1. Power Switch:

   a. Located lower center of control.
   b. Turns air conditioner ON to set condition of FAN and MODE switch.
   c. Turns air conditioner OFF.
   d. Green LED lights next to FAN and MODE switch light up to indicate power ON.
   e. No LED lights on when control is OFF.

2. Mode Switch:

   a. Three position switch located on right side of control.
   b. Used to select COOLING, FAN or HEAT mode of air conditioner operation.
   c. Mode selected is indicated by green LED light when control is turned on.

3. Fan Switch:

   a. Four position switch located on left side of control.
   b. Used to select HIGH, MEDIUM, LOW or AUTOMATIC FAN operation.
   c. Fan speed selected is indicated green LED light when control is turned on.

4. Temperature Slide:

   a. Located top center of control.
   b. Moveable arm on control selects temperature at which the refrigerant compressor or electric heater (if so equipped) is turned ON and OFF.
   c. User sets to position to maintain temperature level desired.

5. Low Power Light:

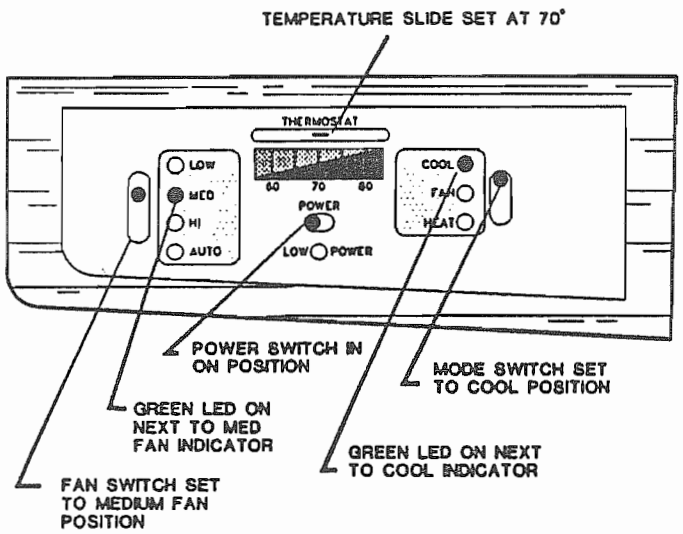
a. Red indicator light located lower center of control.
b. When on it indicates AC voltage is below 97 volts AC.
c. Unit continues to operate (see Special Control Features E.4)

6. Remote Power Switch Connection:

a. Two screw terminals located on back side of control.
b. Used to connect a remote ON/OFF switch.
c. Remove ON/OFF switch, if used, operates same as power switch. (See Special Control Features E.5)

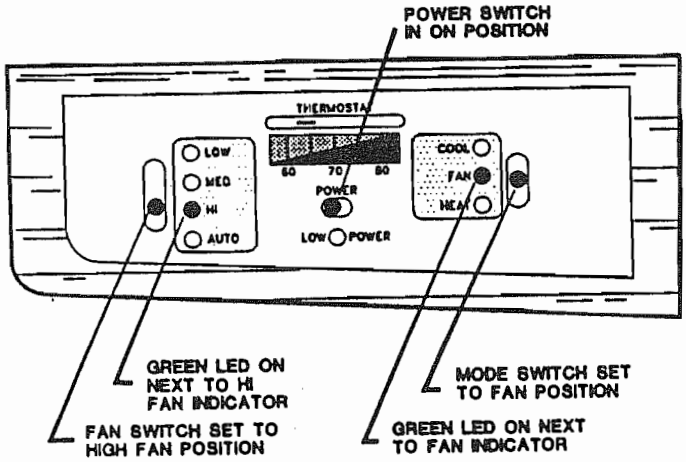
COOLING MODE OPERATION

1. Turn POWER switch (or REMOTE switch if used) to ON position.
2. Place mode switch COOL position.
3. Set temperature slide switch to your desired temperature level.
4. Select your desired fan speed. NOTE: See Special Features Section E.1 for AUTO fan operation.
5. The fan starts immediately and after a delay of approximately two minutes, the compressor will start.
6. The fan runs continuously with the compressor cycling ON/OFF per the set point to maintain an even comfort range.



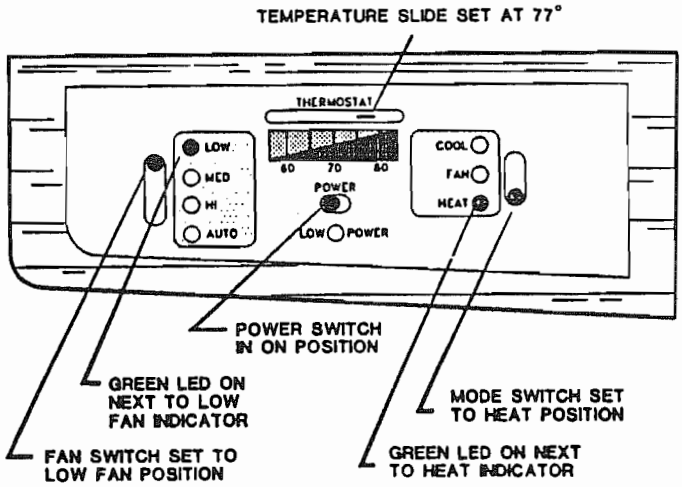
FAN MODE OPERATION

1. Turn POWER switch (or REMOTE switch if used) to ON position.
2. Place MODE switch in FAN position.
3. Select the desired fan speed: HI-MED-LOW-AUTO. NOTE: in AUTO position the fan operates only at low speed in FAN mode of operation.



HEAT MODE OPERATION

1. Turn POWER siwtch (or REMOTE switch if used) to ON position.
2. Place mode switch in HEAT position.
3. Set temperature slide switch to your desired temperature level.
4. Select your desired fan speed HI-MED-LOW-AUTO) NOTE: in AUTO position the fan operates only at low speed in HEAT mode of operation.
5. The fan runs continuously with the electric heater cycling ON/OFF per the set point to maintain an even comfort range.

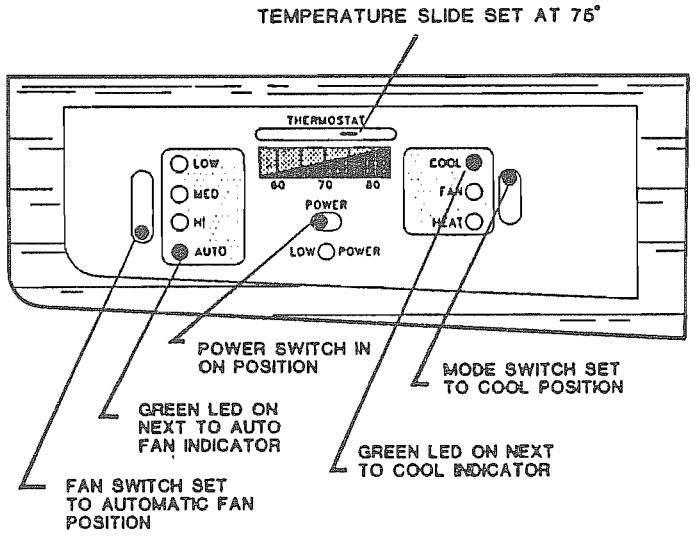


SPECIAL CONTROL FEATURES:

1. Auto Fan: When selected, FAN switch will:

   a. Automatically select the fan speed depending on the difference between eet temperature and room temperature.
   b. Temperature difference of:

8° or more	Fan operates on HIGH
4° to 8°	Fan operates on MEDIUM
4° or below	Fan operates on LOW



2. Refrigerant Compressor Time Delay:

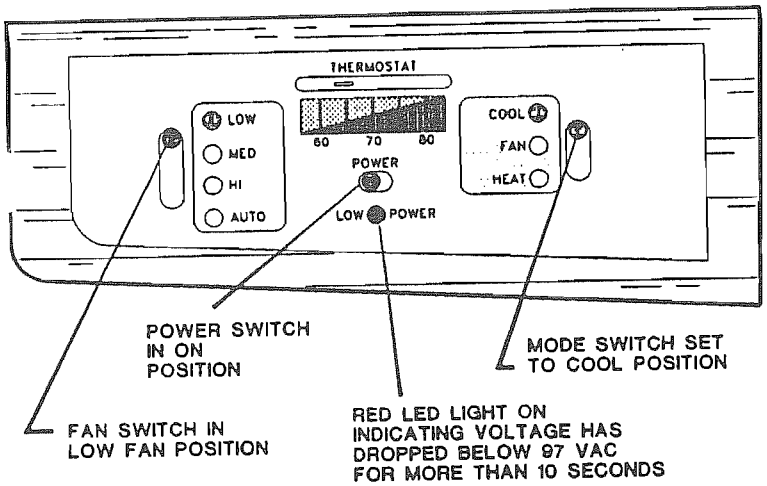
The compressor will always have a delay in starting of approximately two minutes any time it is required to start.

3. Power Interruption:

In the event power to the air conditioner is interrupted for any reason, the system will restart in the condition previously set by user.

4. Low Power Indicator:

The red light will come on any time AC voltage drops below 97 volts AC for more than ten seconds. The light will remain on until the voltage is above 103 volts AC. The air conditioner will continue to run when red light is on as long as sufficient power is available to compressor to keep it running. NOTE: If red light is on, investigate the cause of the low voltage condition and correct to insure efficient operation of the air conditioner.



5. Remote ON/OFF Switch:

This switch is user supplied and may be installed up to 40 feet from the control. Two screw terminals are located on the back of the control for this connection. The remote switch acts in conjunction with the power switch and when installed acts like a three way switch in your home.

MAINTENANCE

Air Filters: Periodically remove the return air filters. Wash the filters with soap and warm water, let dry and then reinstall or replace as required.

NOTE: Never run the air conditioner without return air filters in place. This may plug the unit evaporator coil with dirt and may substantially affect the performance of the unit.

Frost Formation on Cooling Coil: Under certain conditions frost may form on the evaporator coil. If this should occur, inspect the filter and clean if dirty. Make sure air louvers are not obstructed. Air conditioners have a greater tendency to frost when the outside temperature is relatively low. This may be prevented by adjusting the thermostat slide to a warmer setting. Should frost continue, operate on LOW, MED, or HIGH FAN setting until the cooling coil is free of frost.

SERVICE

If your unit fails to operate or operates improperly, check the following before calling your service center:

A. If RV is connected to motor generator, check to be sure motor generator is running and producing power.

B. If RV is connected to power supply by a land line, check to be sure line is sized properly to run air conditioner load and it is plugged into power supply.

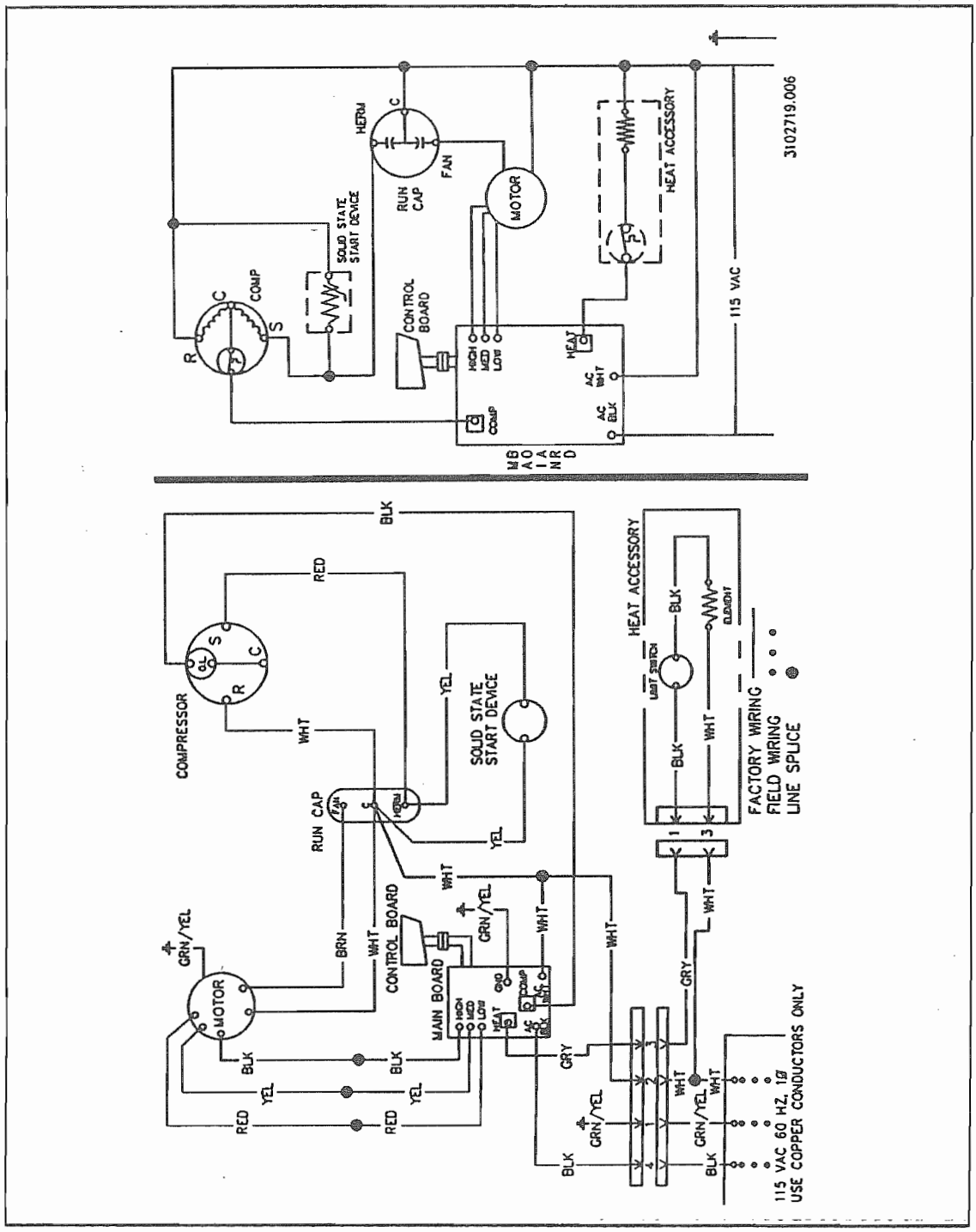
C. Check your fuse or circuit breaker to see if it is open.

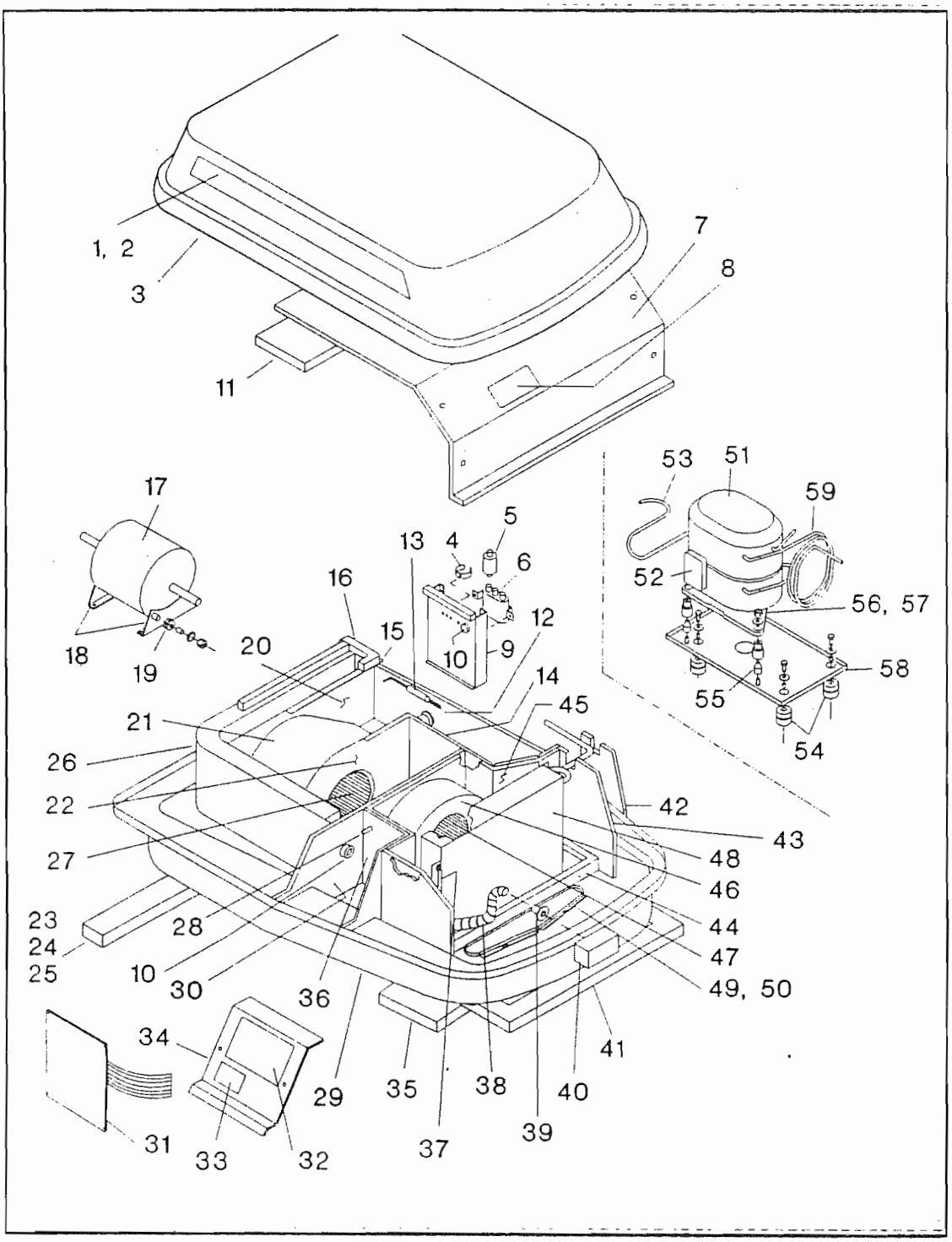
D. In the air conditioner air box, check to be sure the air conditioner conduit is plugged into the junction box and ribbon cable is connected.

E. After the above checks call your local service center for further help. This unit must be serviced by qualified service personnel only.

When calling for service always give the air conditioner model number and serial number. This information can be found on the unit rating plate located on the air conditioner base pan.

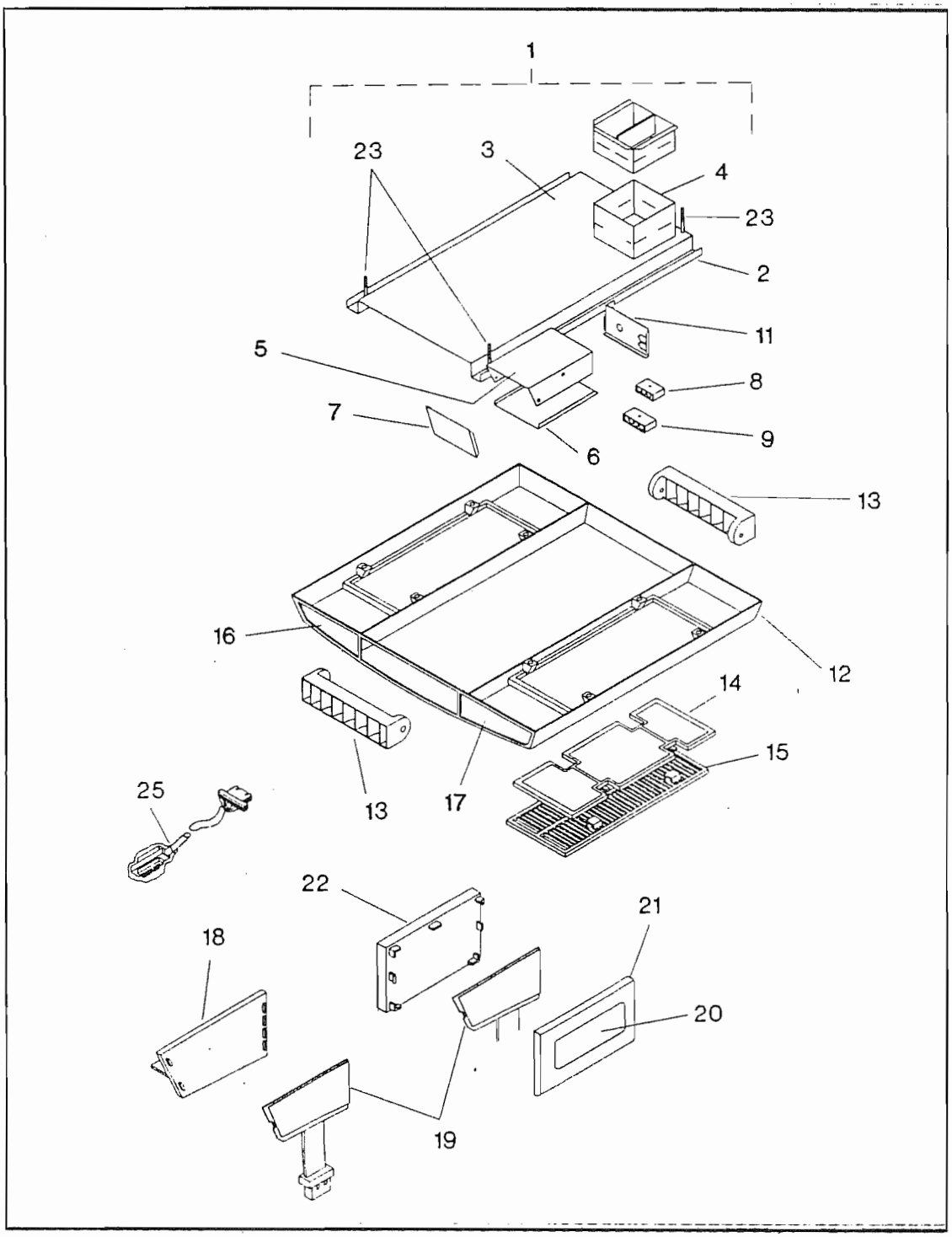
WIRING DIAGRAM




1, 2
3
11
7
8
17
18
19
20
16
15
13
4
5
6
10
9
12
14
45
21
26
22
27
23
24
25
28
10
30
36
29
34
31
33
32
35
37
38
39
40
41
42
43
48
46
44
47
49, 50
53
51
59
52
56, 57
58
55
54

PARTS DESCRIPTION FOR PRECEDING PAGE

1. Decal, LH (not shown)
2. Decal, RH
3. Shroud
4. Bracket, PTCR device
5. PTCR device
6. Capacitor fan/run
7. Cover, evap. w/insulation
8. Decal
9. Panel, Capacitor
10. Bushing, snap in
11. Insulation
12. Capillary tube (2 req)
13. Drier
14. Bulkhead, compressor
1. Plate, close-off
16. Tape, foam
17. Motor
18. Bracket, motor
19. Grommet
20. Blower side, rear
21. Blower scroll
22. Blower side, front
23. Gasket (16 x 1.5")
24. Gasket (16 x 1.5") not shown
25. Gasket (10 x 1.5") not shown
26. Coil, condenser
27. Wheel, condenser
28. Support, PC board (4 req.)
29. Base pan
30. Bulkhead, evaporator
31. Board, main
32. Decal, wiring
33. Decal, caution
34. Cover, electrical
35. Insulation, blower housing
36. Bulkhead, electrical box
37. Clamp, cable
38. Conduit
39. Anti short device
40. Plug, male 4 pole
41. Gasket 14 x 14
42. Insulation, evaporator
43. Plate, evaporator close-off
44. Pan, drain
45. Insulation, Evaporator
46. Blower housing evaporator
47. Wheel, evaporator
48. Coil, evaporator
49. Bracket, mtg. less nuts (3 req)
50. Nut with clip (3 req)
51. Compressor
52. Overload
53. Line, discharge
54. Grommets, 7 req.
55. Sleeve
56. Plate, compressor
57. Spring
58. Plate, weldment, compressor mount
59. Line, suction


1
23
3
4
23
2
11
5
8
7
9
6
13
16
12
14
15
13
17
25
22
21
18
20
19

PARTS DESCRIPTION FOR PRECEDING PAGE

1-24 Box, assembly complete
2-11 Ceiling Template, complete

2. Ceiling template less insulation
3. Insulation
4. Duct, discharge lower
5. Junction box
6. Cover, junction box
7. Box front
8. Plug, female 3 pole
9. Plug, female 4 pole
10. Decal, wiring (not shown)
11. Box back
12-18 Complete air box assembly
12. Air box only (not available)
13. Louver, 3 req
14. Air filter, 2 req
15. Return air grill, 2 req
16. Decal, left side
17. Decal, right side
18. Mounting, control board
19-22 Thermostat, Complete
19. Board, control
20. Decal, thermostat
21. Cover, thermostat
22. Base, thermostat
23. Bolts, mounting, 3 req
24. Small parts bag (not shown)
25. Cable, control

FURNACE

Manufacturer: Hydro Flame Corporation
1874 South Pioneer Road
Salt Lake City, UT 84104
Phone: 801-972-4621

The manufacturer of the furnace in your motorhome has been well known in the RV industry for many years. The furnace burns LP gas, and is powered by 12 volt current from the battery or power converter when plugged into city power. Operating instructions are located in your Owners Packet. If they should become misplaced new literature can be ordered direct from the manufacturer or your Airstream dealer. The manufacturer also offers a detailed service guide for your furnace.

WARNING: Carefully read all the manufacturer's instructions prior to operating. NEVER store flammable material next to the furnace.

If warranty service is required use only a service location recommended by the furnace manufacturer or your Airstream dealer.

Lighting Directions

WARNING: This furnace is sealed and cannot be lit with a match. Failure to follow the instructions exactly may result in an explosion and possible damage to the furnace and injury to the operator.

1. Set thermostat to "OFF".
2. Turn gas off at outside LP tank and wait 5 minutes.
3. Turn gas valve to "ON".
4. Turn thermostat up until blower comes on.
5. Allow 20 seconds or more for furnace to light due to a pre-purge cycle designed into the ignition system. On initial start up in cold weather it may take up to two (2) minutes for the furnace to light.
6. If burner does not light, set thermostat to "OFF", wait 60 seconds and try again for ignition.
7. If after three tries and no ignition, go to shutdown and determine the cause. Be sure to have gas to the furnace (no air in the gas line).
8. If furnace lights, set thermostat to desired temperature setting.

WARNING: Service and repair procedures in the following text is intended for Qualified Service Personnel use only.

Blower Assembly

The blower assembly is powered by a 12 volt DC motor. Two wheels are used. One for circulating warm air and the other for providing combustion air. See Fig. 1. The blower motor is permanently lubricated and no oiling is required. However, the blower assembly, including blower wheels, should be cleaned every season to remove accumulations of dirt and lint.

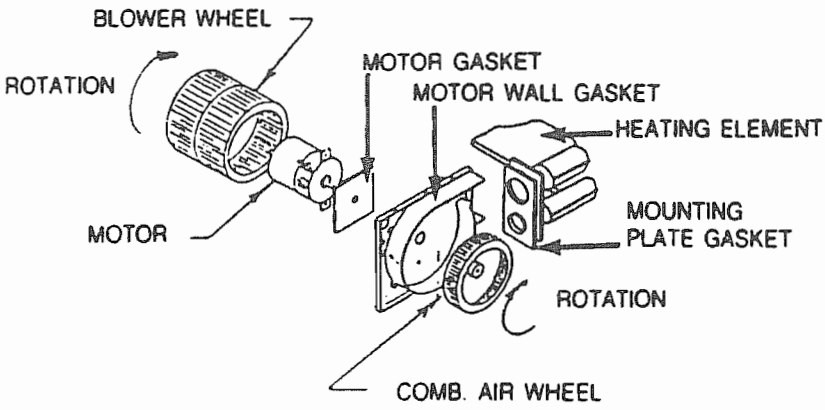


Fig. 1

Direct Spark Ignition Circuit Board

The circuit board is located on the back of the electrical panel just behind the front door. As shown in Fig. 2 it operates in conjunction with the igniter assembly (located at the right side of the control box on the burner box assembly). To provide safe reliable ignition without the use of a standing pilot as described in the "Sequence of Operation" section, the circuit board provides an initial purge cycle of about 20 seconds. During this time only the blower runs so that any unburned gases are purged out of the heat exchanger, prior to ignition.

This purge cycle time is unique to the circuit board used by Hydro Flame and is not the same as most other circuit boards used by other manufacturers. Therefore, it is essential to use only the Hydro Flame Circuit Board if a replacement is required. Hydro Flame circuit board has a protective cover added to the assembly to give added protection from handing and moisture. See Fig. 2.

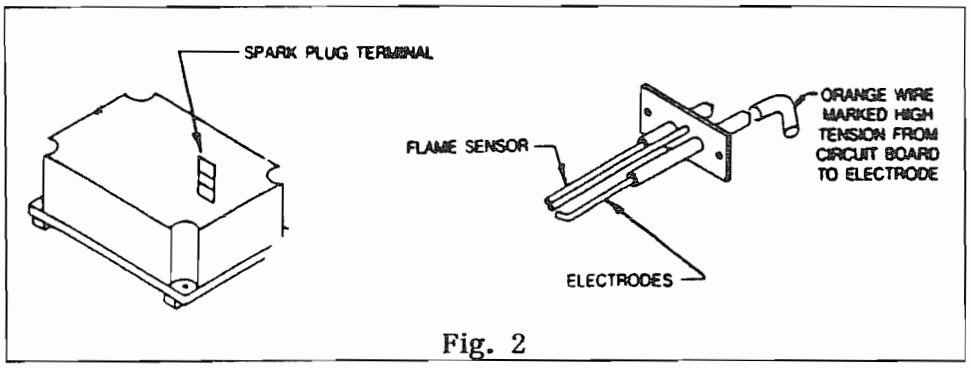


Fig. 2

The electrode assembly consists of two electrodes and one flame sensor probe. The spark produced by the circuit board to the electrodes ignites the burner after the purge cycle is completed. The flame sensor probe senses the heat from the burner and signals the circuit board to keep the gas valve open. If ignition does not occur so that the flame sensor does not sense heat, the circuit board will shut the gas valve off within 6 to 9 seconds.

Burner Assembly

To remove the burner assembly from the control box, first remove the draft shield assembly by opening the front door catches and unscrewing the wing nut located on the side of the combustion air housing cover and front screw. See Fig. 3. Next unscrew the manifold from the blower wall and remove the three (3) screws on the burner box.

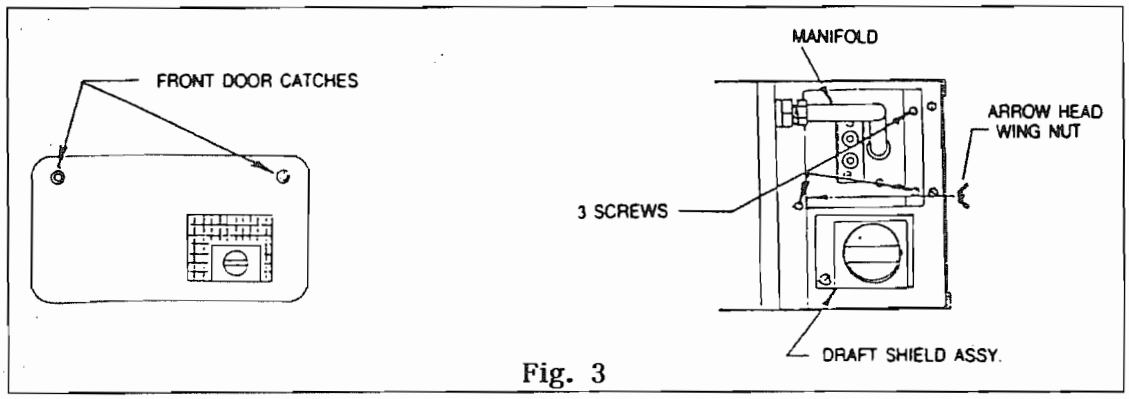


Fig. 3

Pull manifold to the right until manifold clears the brass fitting. Now remove burner assembly by pulling the manifold toward you and disconnecting the electrode wires.

CAUTION: **When re-installing the burner assembly make sure the two screws on the burner box flange are secure and not stripped.**

Air Seal Gaskets

In order to prevent leakage of combustion air from the sealed system, there are gaskets in the following places. These gaskets must be in place and undamaged. See Fig. 4 for gasket locations.

1. Heat exchanger gasket.
2. Motor wall gasket.
3. Motor gasket.

Heat Element Assembly

The heat element assembly can be removed in order to service the exchanger or the heat element gasket. Follow the steps listed:

1. Turn off gas at LP tanks.

2. Disconnect gas line from left side of furnace.

WARNING: Fire or explosion may result when gas line is disconnected at the furnace and the gas bleeds out. Check all appliances which have a pilot still burning and extinguish them or any other flame source in the vicinity.

3. Unplug the electrical plastic disconnect plug from the left side of the furnace.

4. Remove six screws on the left inside of the control box and the two screws on the right inside of the control box. See Fig. 4.

5. Remove the twelve screws holding the front door on.

6. Pull the entire control box assembly forward where it can now be serviced and bench tested.

7. Remove burner assembly as described earlier and remove three remaining screws holding element assembly to control box.

CAUTION: When re-installing heat element assembly and control box assembly, be sure all screws are firmly in place.

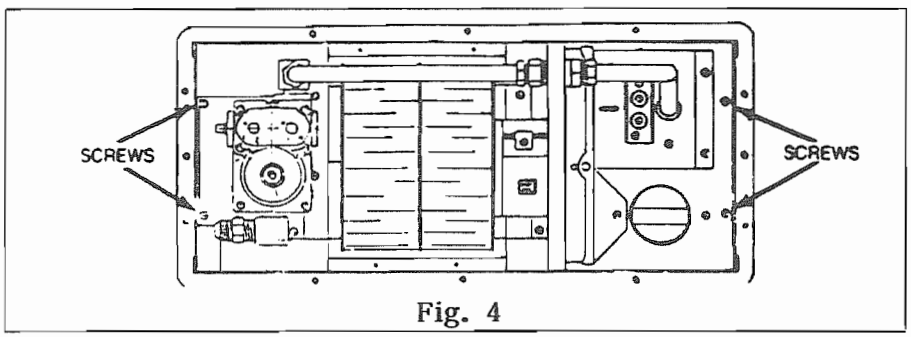


Fig. 4

SEQUENCE OF OPERATION

A. On stand by the +12 VDC is connected to terminal #3 of the fan relay which is closed. The voltage will extend (1) through the red wire to terminal #1 of the open fan relay, (2) through another red wire to the limit switch, (3) through the limit, (4) through the red wire to the sail switch. See Fig. 5.

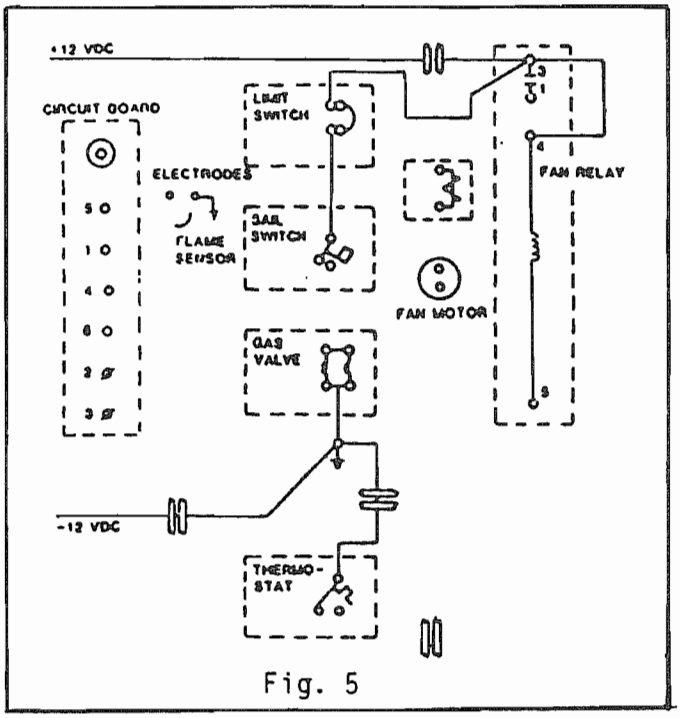


Fig. 5

B. When the temperature inside the RV drops to the set temperature of the thermostat, the thermostat contacts close to (1) switch 12 VDC to terminal #5 of the fan relay terminal, (2) through the yellow wire to -12 VDC ground, thus the fan relay coil is energized. See Fig. 6

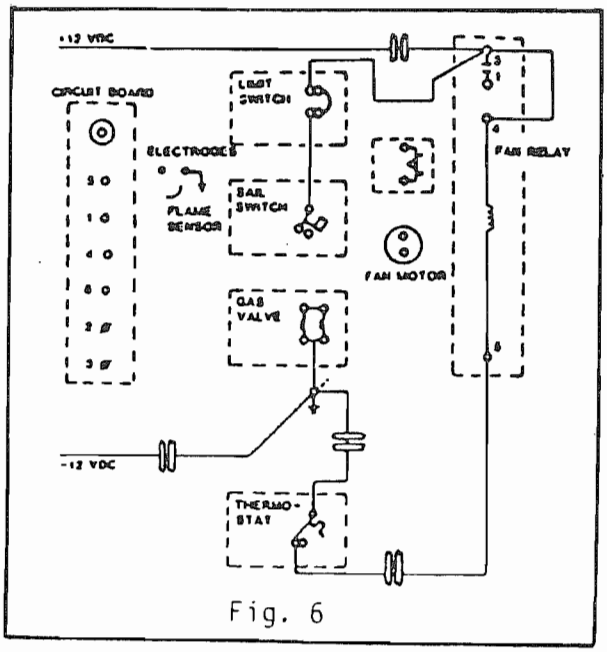


Fig. 6

C. With the fan relay coil energized, the contacts of the fan relay will close and the +12 VDC will pass (1) through the contacts from #3 to #1, (2) through the red wire to the circuit breaker, (3) through the circuit breaker, (4) through the red wire to the motor, (5) through the motor, (6) through the black wire to the ground system. Thus, the fan motor runs. See Fig. 7

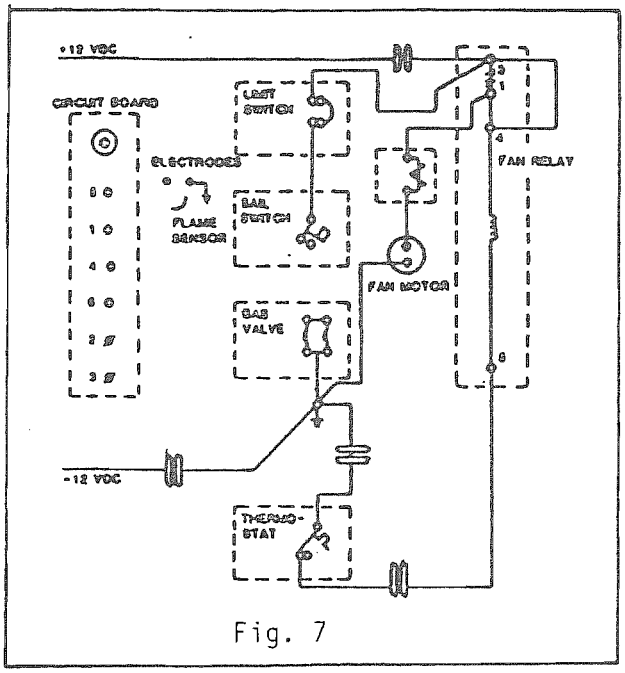


Fig. 7

D. As the fan comes up to speed the air current will close the sail switch and the +12 VDC will pass (1) through the sail switch, (2) through the wire to the #1 terminal of the circuit board.

Note: The ground side of the circuit board is established from terminal 6 through the red wire to the grounded side of the fan relay. When the circuit board is energized it will start the 20 second count down of purge time. See Fig. 8.

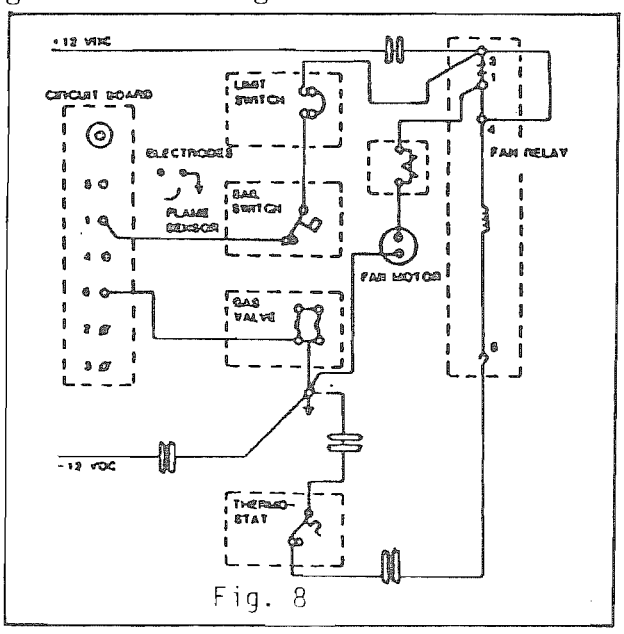


Fig. 8

E. When the 20 second purge time is complete, the circuit board will switch +12 VDC to the ungrounded terminal of the gas valve and the gas valve will open. The circuit board will simultaneously initiate the igniter spark through the large orange wire to the igniter electrode, then ignition will occur. See Fig. 9.

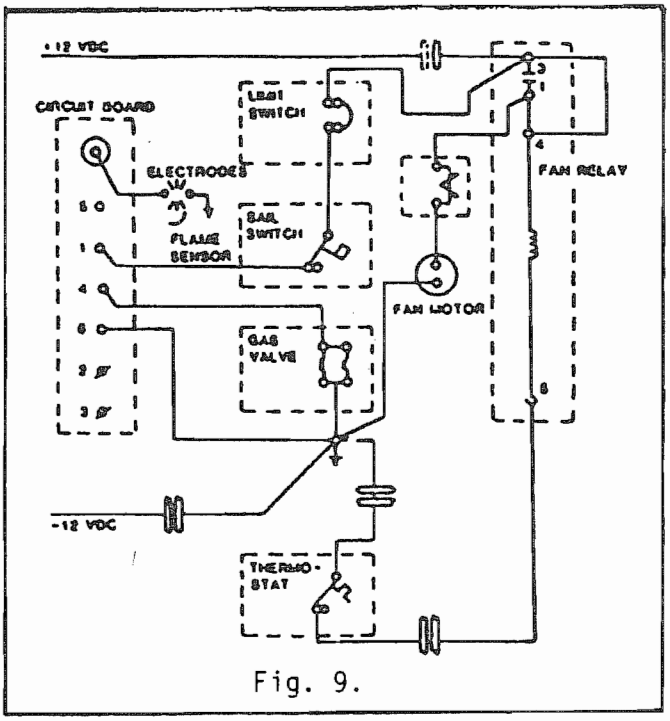


Fig. 9.

F. When the gas valve is energized and the ignition spark occurs, (Paragraph E) the circuit board will start the 6 to 9 seconds waiting time to prove the presence of a flame. When the flame is established above the burner in less than 6 to 9 seconds, the flame sensor will detect the flame and signal (through the black wire to terminal #5) circuit board to continue the heating cycle.

Note: If the flame sensor does not detect a flame, the flame sensor will signal the circuit board to lock-out the gas valve.

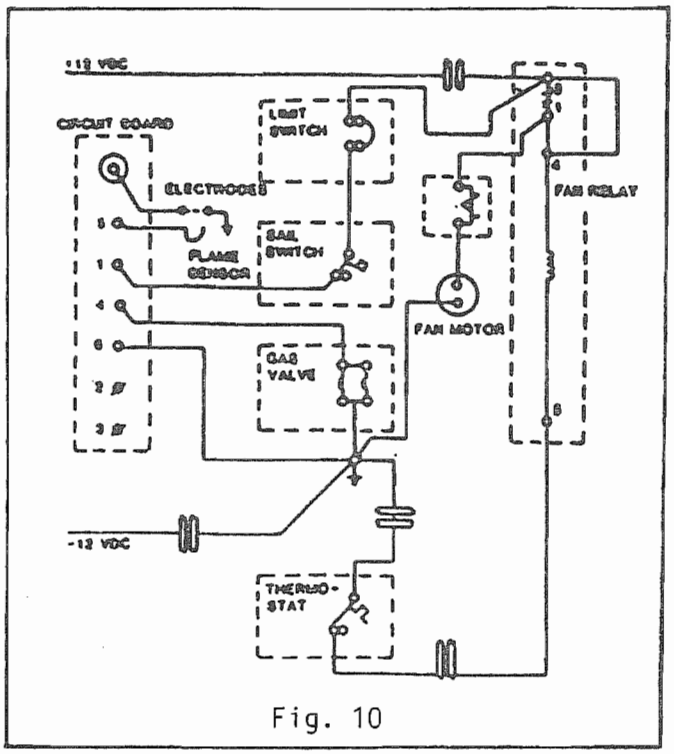


Fig. 10

G. When the temperature of the RV rises above the thermostat set temperature, the thermostat will open and disconnect the -12 VDC to terminal #5 of the fan relay. Then the gas valve will close and the fan relay contacts will open, after a cool down period of 1 to 2 minutes for the heat in the fan relay coil to be extracted. See Fig. 11.

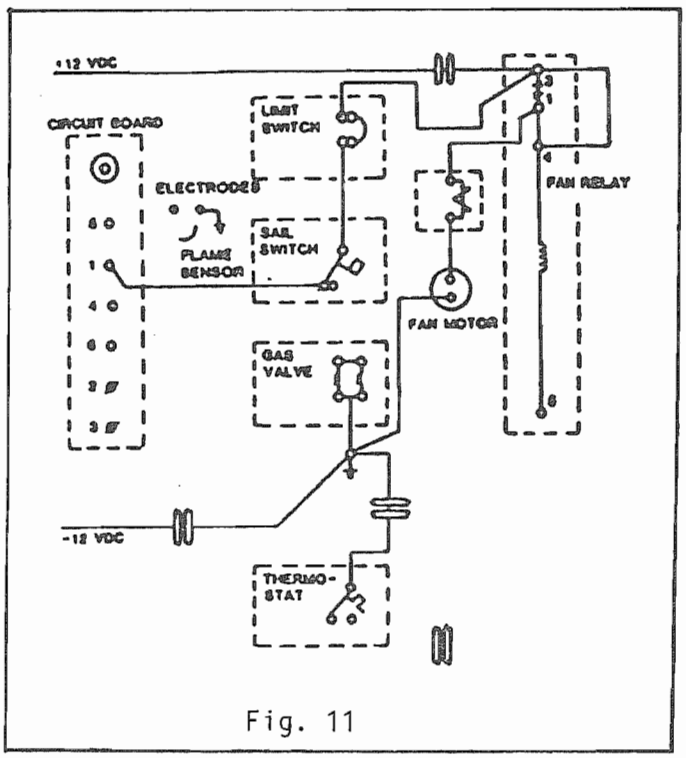


Fig. 11

The complete wiring diagram, with all switches in their normal positions, is shown in Fig. 12.

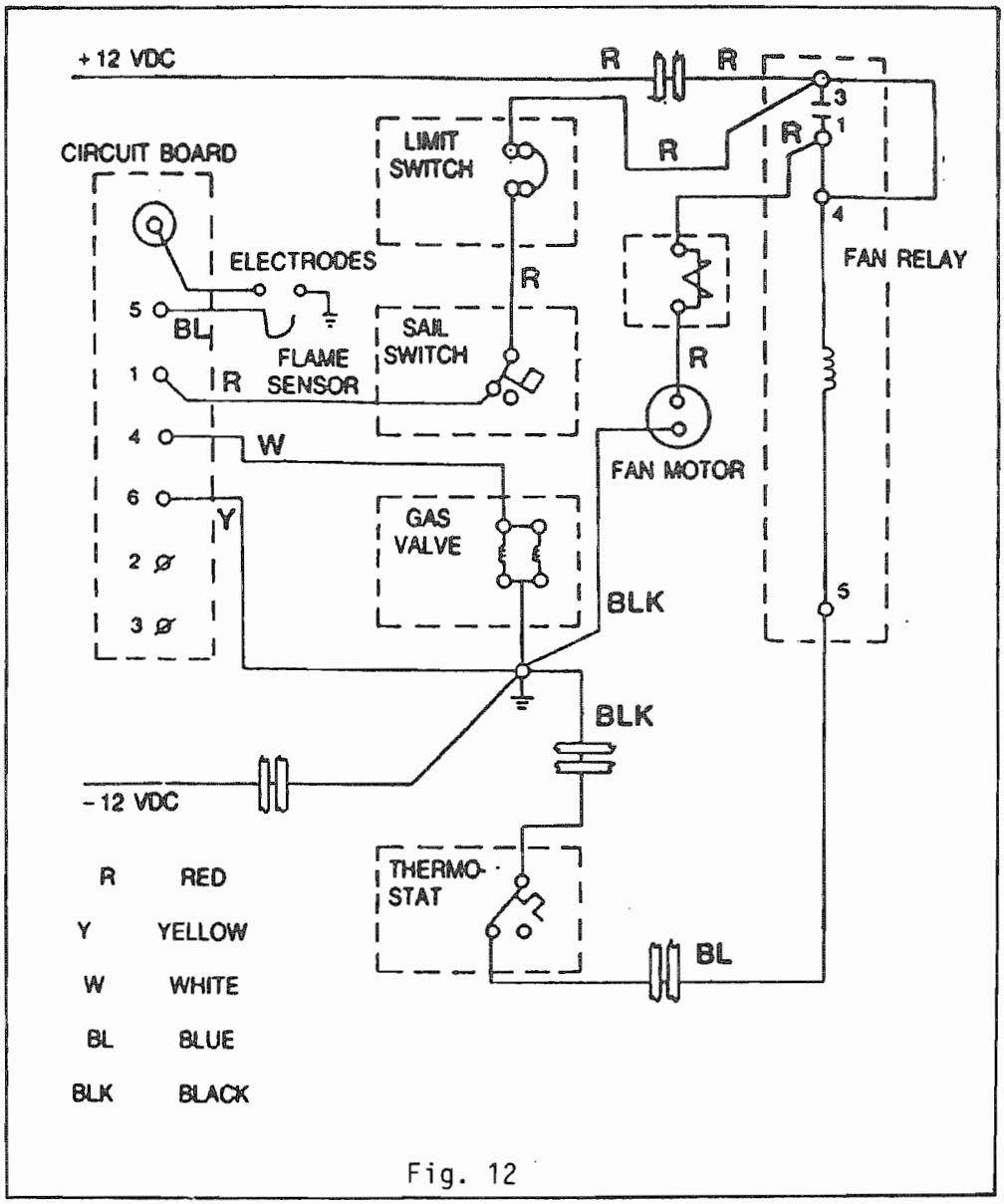
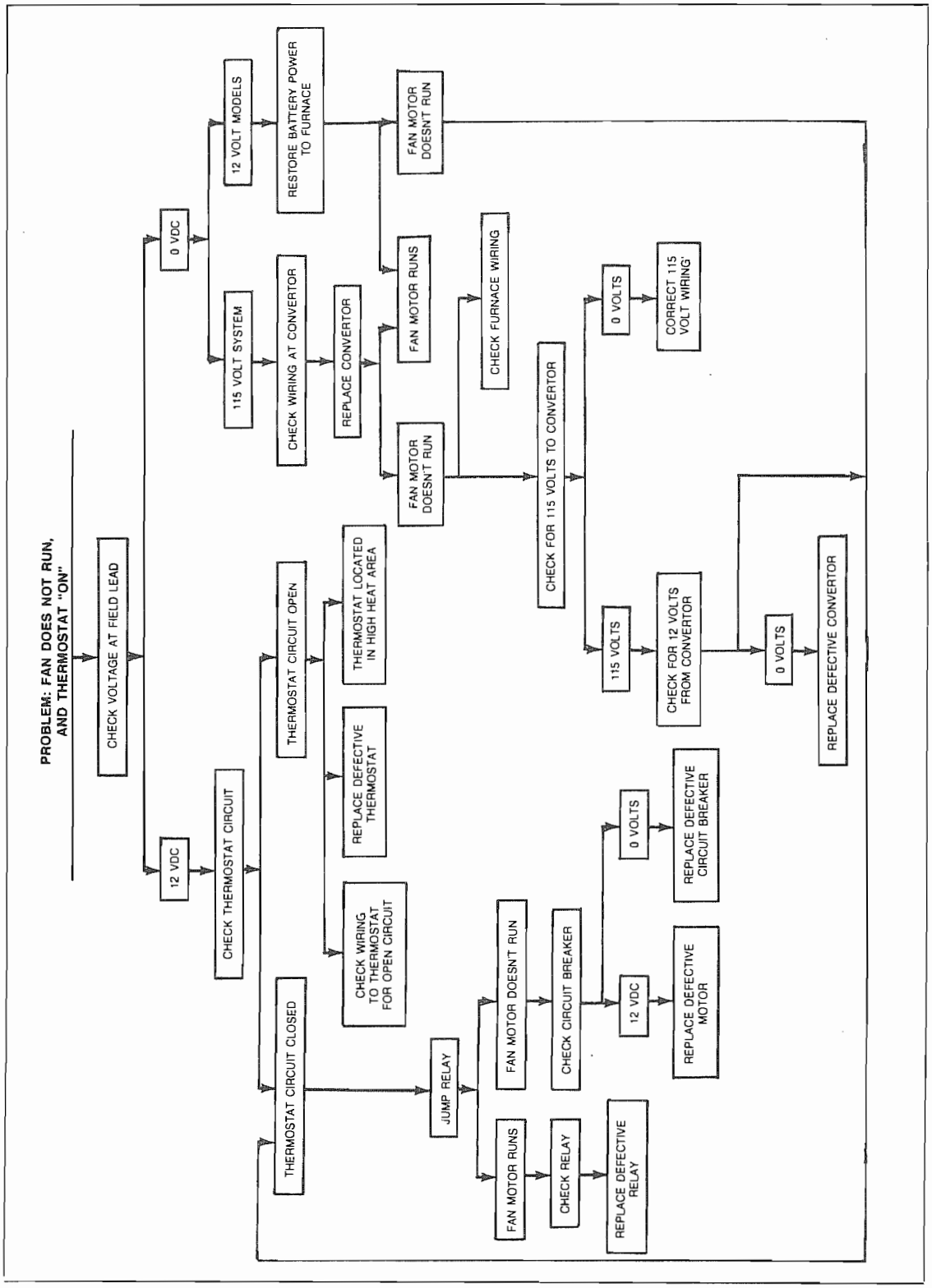
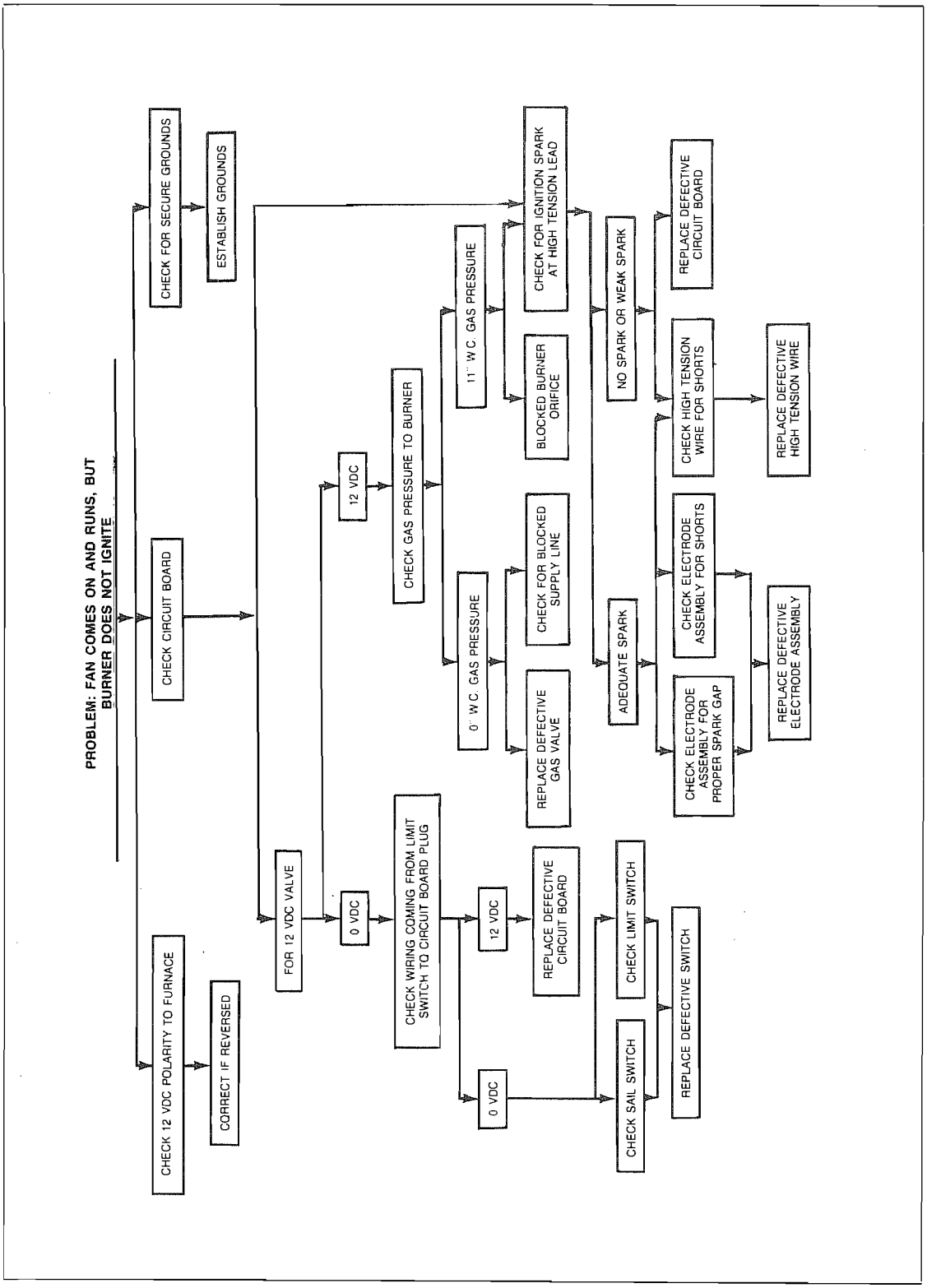


Fig. 12

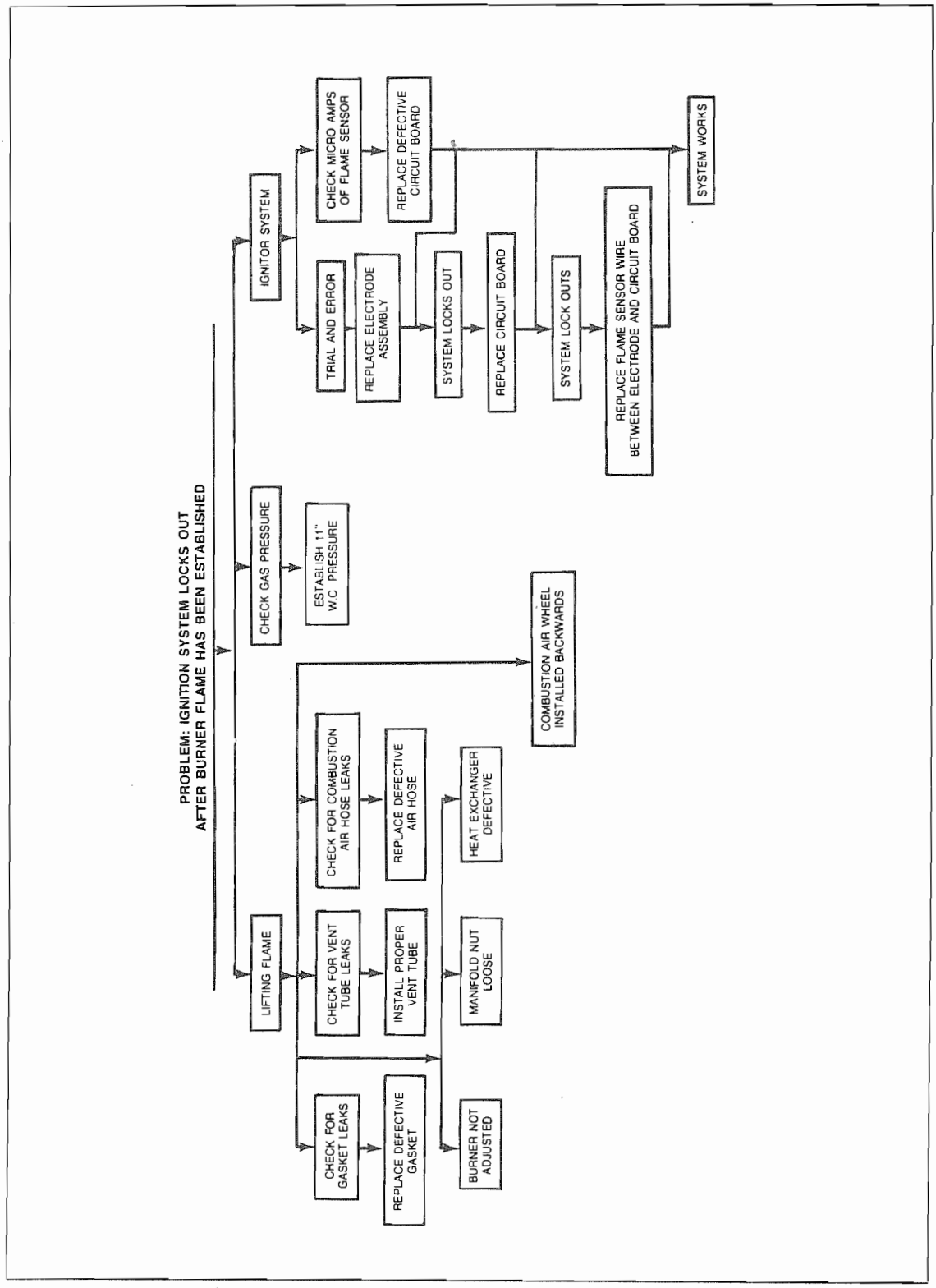
SERVICE CHART #1



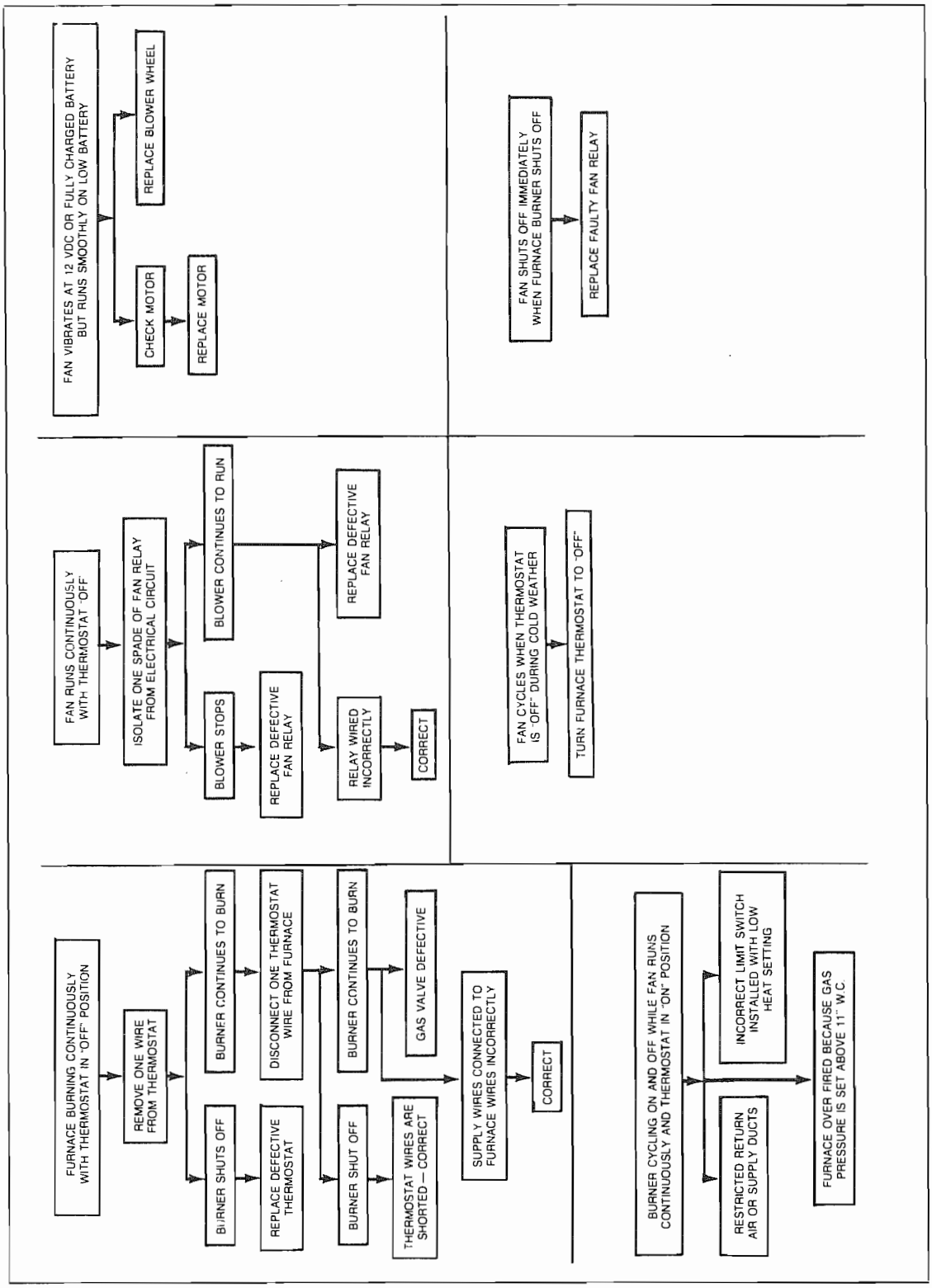
SERVICE CHART #2



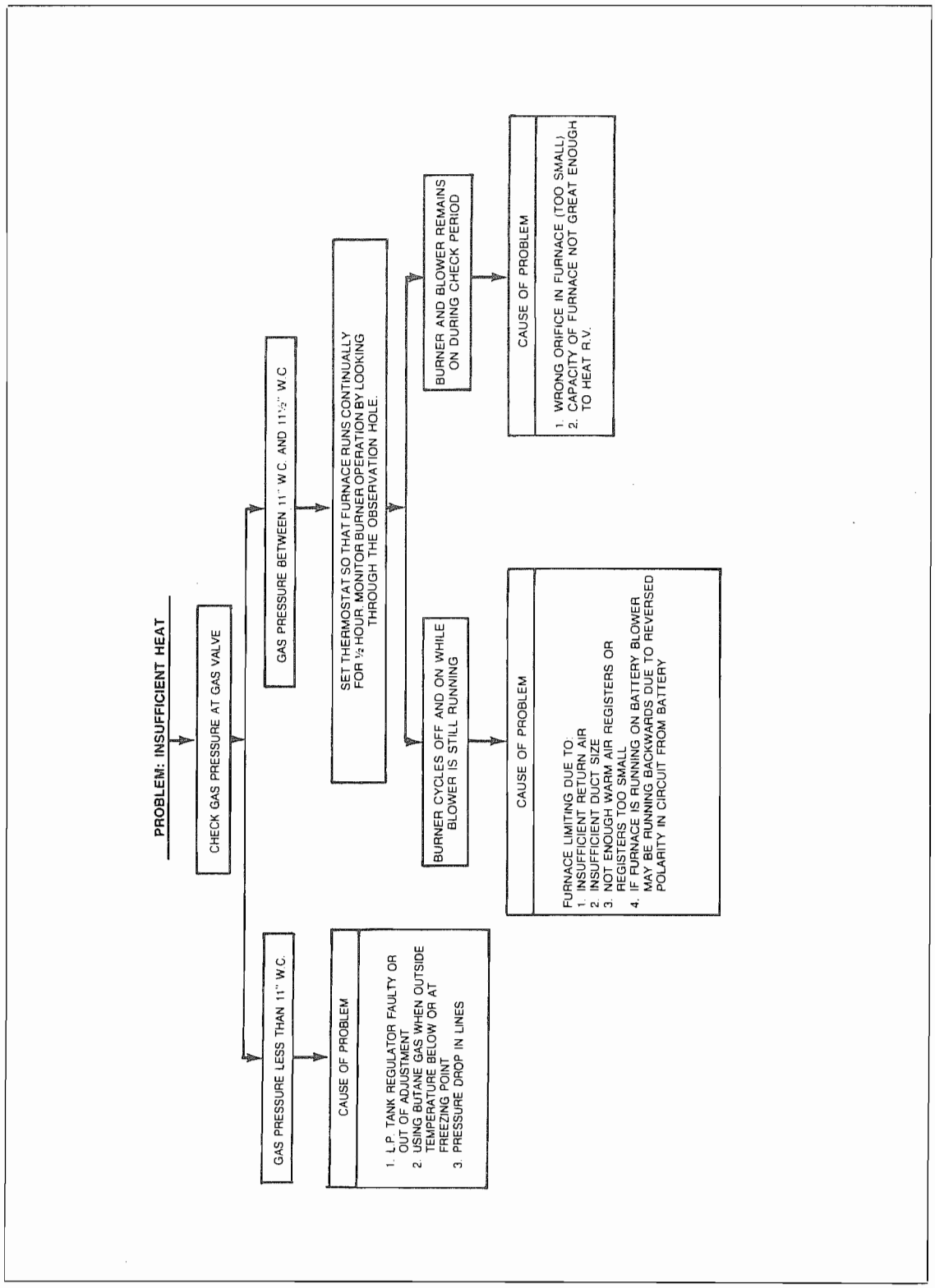
SERVICE CHART #3



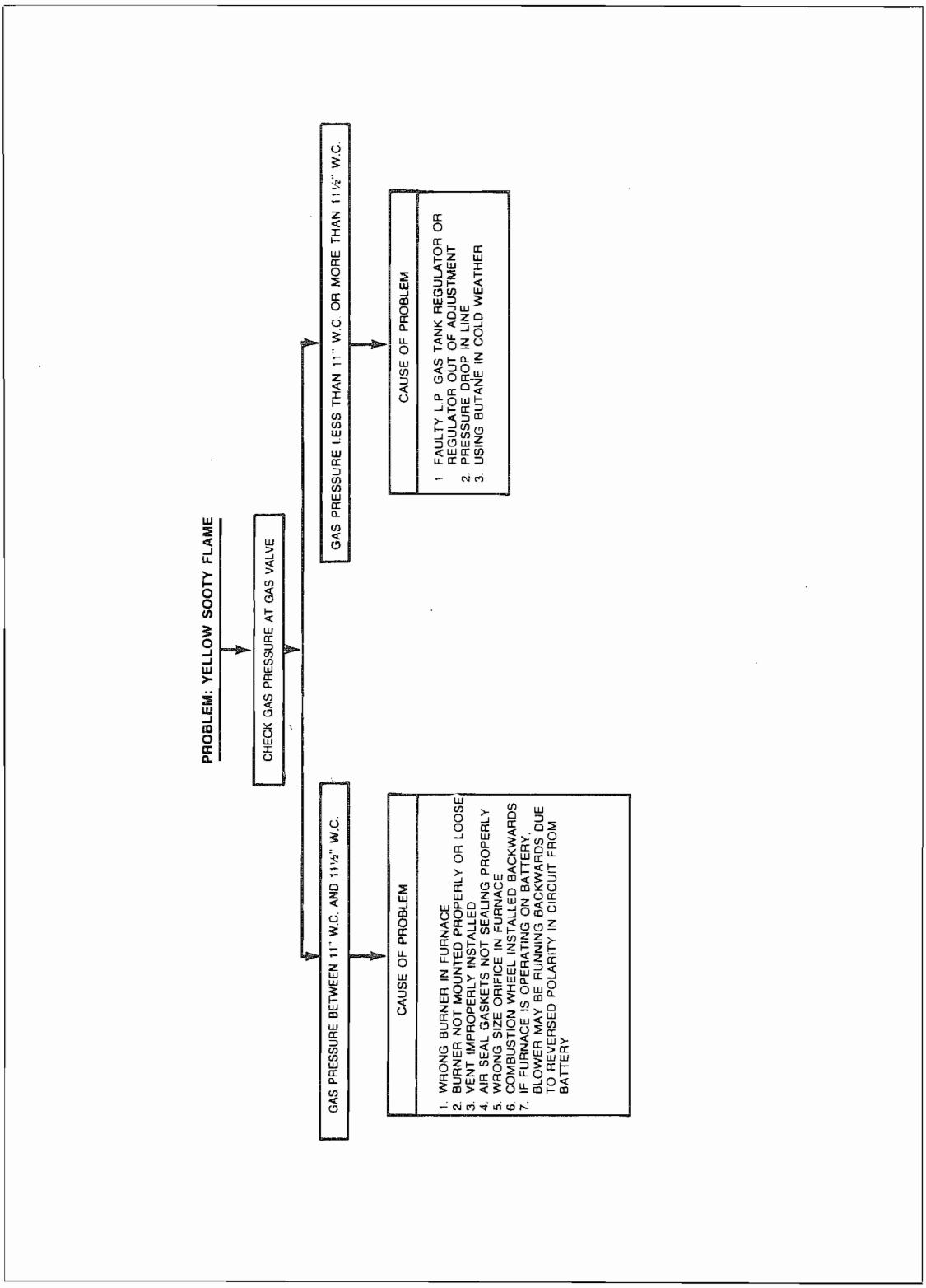
SERVICE CHART #4



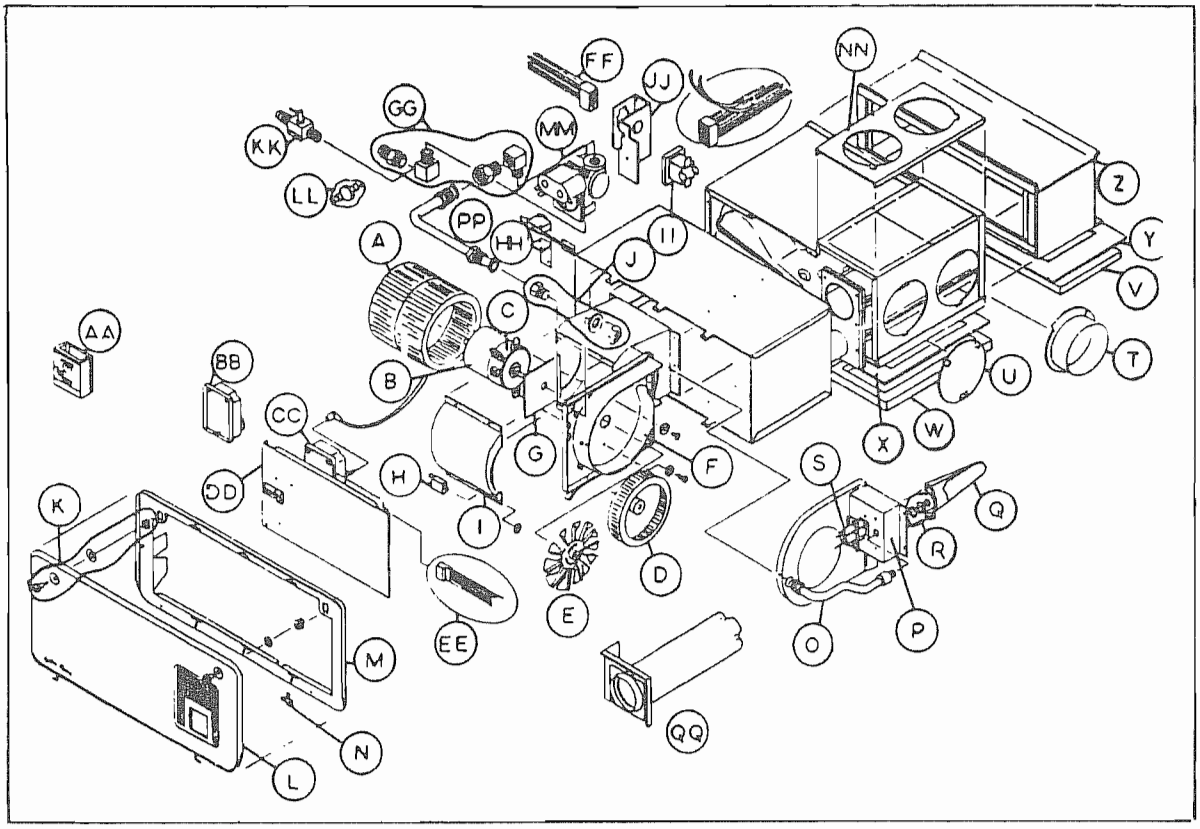
SERVICE CHART #5



SERVICE CHART #6



FURNACE PARTS LIST



A. Blower Wheel
B. Motor
C. Motor Bracket Assembly
D. Combustion Wheel
F. Motor Mounting Wall Assy
G. Motor Gasket
H. Circuit Breaker
I. Blower Housing Back Cover
J. Motor Wall Brass Fitting
K. Door Catch and Latch Assy (2)
L. Front Door Panel Assy
M. Outer Bezel Assy
N. Door Hinge Clip (20
O. Manifold Right Side
P. Burner box Assy
Q. Burner Assy
R. Orifice and Manifold nut
S. Electrodes
T. Duct Adapter
U. Duct Cover Plate
V. Large Bottom Gasket
W. Small Bottom Gasket
X. Top Bottom Plenum Plate
Y. Bottom Plenum Plate
Z. Bottom Extension Adapter
AA. Thermostat
BB. ITT DSI Board
DD. Electrical Panle Assy
EE. Electrical Panel Wiring Assy
FF. Electrical Field Hookup
GG. Valve Brass Fittings
HH. Sail Switch Assy
II. Relay
JJ. White/Roger Valve Bracket
KK. Brass Shut off 3/8 x 3/8
LL. Limit Switch
MM. White/Roger Valve
NN. Bottom Discharge Cover
PP. Manifold Left Side
QQ. Draft Cap Assy

NOTES

REFRIGERATOR

Manufacturer: Dometic Sales Corporation
2320 Industrial Parkway
P.O. Box 490
Elkhart, Indiana 46515
Phone: 219-295-5228

The refrigerator in your motorhome is an absorption type that works on either 110 volt city power, LP gas or optional 12 volt. For proper operation the refrigerator should be close to level in order for the refrigerant to circulate properly. ~~In each refrigerator a round level has been provided. When parking the motorhome set the level in the freezer box (it may be left in the freezer without being damaged) and adjust the motorhome until the bubble stays within the circle.~~

Operation instructions are in your Owner's Packet and by the refrigerator controls. The manufacturer can provide a detailed parts list along with a diagnostic guide.

When loading your refrigerator always allow some space between articles so the cold air can circulate properly. Before traveling make sure all lids are securely on containers.

Make absolutely sure the refrigerator door is latched. It is not fun to clean up a mixture of eggs, jelly and leftover baked beans.

When storing the motorhome and the refrigerator is turned off, it is a good idea to leave the door partially open so air can circulate. The latch on the door has a storage position to secure the door slightly ajar.

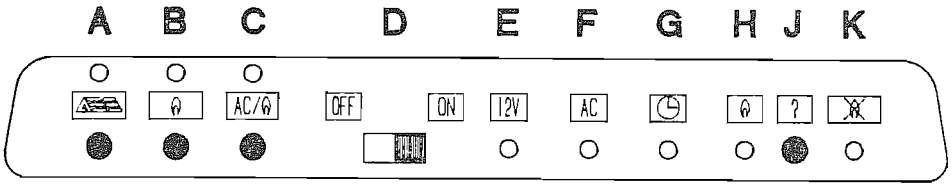


Fig. 11 AES control panel on refrigerator

INSTRUCTIONS FOR USE

How to start the refrigerator

Leveling

In an absorption refrigerant system ammonia is liquified in the finned condenser coil at the top of the refrigerator. The liquid ammonia then flows into the evaporator (inside the freezer section) and is exposed to a circulating flow of hydrogen gas, which causes the ammonia to evaporate, creating a cold condition in the freezer.

The tubing in the evaporator section is specifically sloped to provide a continuous movement of liquid ammonia, flowing downward by gravity, through this section. If the refrigerator is operated when out-of-level when the vehicle is not moving, liquid ammonia will accumulate in portions of the evaporator tubing. This will slow the circulation of hydrogen and ammonia gas, or in severe cases, completely block it, resulting in a loss of cooling.

Any time the vehicle is parked for several hours with the refrigerator operating, the vehicle should be leveled to prevent this loss of cooling. The vehicle needs to be leveled only so it is comfortable to live in (no noticeable sloping of floor or walls). When the vehicle is moving the leveling is not critical, as the rolling a pitching movement of the vehicle will pass to either side of level, keeping the liquid ammonia from accumulating in the evaporator tubing.

Operation (Fig. 11)

Before starting the refrigerator check the gas valve in the piping. Do not forget the valve on the rear of the refrigerator.

1. **To start the refrigerator** set the switch D to position ON. The lamp above push-button A will now turn green.

2. Turn the thermostat knob inside the cabinet to a suitable setting, e.g. start with normal position.

3. **To shut off the refrigerator** set the switch D to position OFF.

General Information

This refrigerator is equipped with an Automatic Energy Selector (AES) control system, which can automatically select the most suitable energy source which is available - either 120 volt AC, 12 volt DC, or LP gas operation. The system can be set by the user to be fully automatic, or if desired, it can be set to limit operating modes to AC and LP gas only, or LP gas only.

Fully Automatic Mode
When switch D is set to ON the lamp above push button A will light up (green) indicating that the control system is in the fully automatic mode. In this mode 120 volt AC operation has first priority, meaning the refrigerator will operate on 120 volt AC whenever it is available. If 120 volt AC is not available, and if the vehicle engine is running, the refrigerator will operate on the 12 volt DC power being produced by the alternator on the engine. If neither 120 volt AC or 12 volt DC is available the system will switch to LP gas operation.

LP Gas only
If push button B is pressed the refrigerator will operate only on LP gas, even if 120 volt AC or 12 volt DC is available.

120 Volt AC and LP Gas Only
If push button C is pressed, the control system will select only between 120 volt AC and LP Gas operaton. First priority is 120 volt AC, which means the refrigerator will operate in this mode whenever 120 volt AC is available.

Mode Indicator Lamps
At the right side of the AES control panel are 4 indicator lamps which give you information about the operation of the AES system. When the push button J is depressed one of the indicators will light up, showing which operating mode the system is using.

There is an additional indicator lamp K at the far right side of the control panel. This indicator will light only when there has been a flame failure in the LP gas operation mode. (For further information see Flame failure during LP gas operation).

12 Volt DC Operation
The refrigerator contains an additional heating element for use with 12 volt DC power, however, due to the high amperage draw (15 to 18 amps depending on model) it would not be practical to operate the refrigerator with only a 12 volt battery, unless the battery is constantly being recharged. The AES system is therefore designed to switch to the 12 volt DC mode only when vehicle engine is running, and the battery has been charged to 13.3 volts or higher. If the battery supply voltage should drop below 11.6 volts (due to demands of other 12 volt devices in the vehicle) the 12 volt DC mode will shut off to protect the battery from further drain. After about 25 minutes the 12 volt DC model will resume again, provided the voltage is at least 13.3 volts. If the voltage is lower than 13.3 volts, the AES system will switch to LP gas operation.

The thermostat inside the refrigerator cabinet also controls power on and off the 12 volt heating element to maintain the desired temperature.

120 Volt AC Operation

Since 120 volt AC is usually the most economical energy source for operation of the refrigerator the AES control system is designed to select this mode whenever it is available (except when the push button B, LP Gas only, mode is selected). A 120 volt heating element attached to the boiler tube provides the heat to operate the cooling system. The thermostat inside the refrigerator cabinet turns power on and off to this element as required to maintain the desired temperature.

LP Gas Delay Mode

When the vehicle engine is turned off the AES system initiates a delay cycle which prevents the refrigerator from operating on LP Gas for about 25 minutes. The purpose of the delay cycle is to avoid having a gas flame present during a refueling stop at a gas station. (See WARNING).

If the vehicle engine is restarted during this delay period the 12 volt DC mode will resume operation and the delay period will be reset to 25 minutes. This means that each time the vehicle engine is stopped, the complete 25 minute delay cycle will take place.

If 120 Volt AC becomes available during this delay cycle the AES system will start operating in the 120 volt AC mode immediately.

If the RV is stopped somewhere other than at a gas station you may wish to cancel the delay cycle. To do this, set the main system switch D to OFF for several seconds, then back to ON, and the system will start operating in the LP Gas mode.

WARNING:

Most LP gas appliances used in recreational vehicles are vented to the outside of the vehicle. When parked close to a gasoline pump it is possible that gasoline fumes could enter this type of appliance and ignite from the burner flame, causing a fire or an explosion. For your safety it is recommended that all LP Gas appliances that are vented to the outside should be shut off when refueling.

The AES system is designed to avoid an LP flame during refueling stops by use of the delay cycle explained above. However, you must remember that this delay cycle will be activated ONLY if the refrigerator is properly connected to the vehicle engine electrical circuit.

If the refrigerator is not connected to the engine electrical circuit the refrigerator must be shut off during refueling stops. Set the main system switch D to OFF, and after the vehicle has been moved away from the refueling area set the switch back to ON.

LP Gas Operation

When there is no electrical power available (120 volt AC or 12 Volt DC or if the indicator lamp above push button B is lit, the AES system will switch to LP gas operation. When the thermostat in the refrigerator cabinet calls for cooling the following sequence takes pace:

1. A high voltage spark is created above the burner.

2. Power is sent to a solenoid which opens the gas control, allowing LP gas to flow to the burner. The spark ignites the LP Gas, and a small flame then provides heat for the boiler, and the cooling process begins.

3. A sensor electrode mounted above the burner tube monitors the flame continuously. If the flame should fail for any reason, the high voltage spark will start immediately, and relight the flame.

When the desired temperature is reached the thermostat will shut off the gas flame completely, and the system will remain on standby until cooling is required again.

Flame Failure During LP Gas Operation

If the gas flame does not ignite when the burner cycle begins, or if the flame fails during the burner cycle, the high voltage spark will continue sparking up to 3 minutes. At that time the gas control will completely shut off the gas flow, the high voltage spark will cease and the indicator lamp K will light up. LP gas operation will not restart as long as this indicator is lit. This shutdown is to make sure that the LP gas flow does not continue for a long time.

To restart LP gas operation, turn the main system switch D to OFF for 5 seconds, then back to ON. The flame failure indicator will go off, and the system will start another cycle for ignition.

If the refrigerator has not been used for some time, or if the supply tanks have just been refilled, air may be trapped in the LP gas upply line. To purge this air from the lines may require resetting the ON/OFF switch three or four times.

If repeated attempts to start LP gas operation are not successful, check to make sure the LP supply tank is not empty. Also check all manual shut off valves in the LP gas supply line to make sure they are open.

If the problem is still not corrected contact a service center for assistance.

When the flame failure indicator lamp K comes on, the mode indication lamp (green light) will go off, indicating that all operation has stopped. However, if 120 volt AC or 12 volt DC becomes available during this period the mode selection lamp (green light) will come on, indicating that the refrigerator is operating on another energy source, the indication lamp K will remain lit until there is an ON/OFF operation of the main system switch D.

Low Voltage Monitor on 12 Volt DC Control System

The AES system requires 12 volt DC power at all times to operate on any energy source, and to operate properly this DC power must be at 9.5 volts or higher. If this voltage should drop below 9.5 volts the AES system will switch to an emergency cooling mode:

1. The mode indicator lamp (green light) will go off.

2. The system will revert to continuous LP gas operation with no thermostat control.

The refrigerator will continue operating in this mode, without the thermostat in the circuit, until the DC power supply is increased to 10.5 volts. At that time the mode indicator lamp (green light) will come on and normal operation will resume. During this low voltage condition the interior light will continue to operate normally.

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

Quick frozen soft fruits and ice cream should be placed in the coldest part of the compartment which is on or just below the freezer shelf. Frozen vegetables, on the other hand, may be stored in any part of the compartment.

This compartment is not designed for the deep or quick freezing of food. Meat or fish foods, whether raw or prepared, can however, also be stored in the frozen food storage compartment, provided they are precooled in the refrigerator. They can then be stored about three times as long as in the fresh food storage compartment. To prevent food from drying out, keep it in covered dishes, containers, plastic bags, or wrapped in aluminum foil.

Ice Making

Ice cubes can be made in the ice trays. These 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 food in the lower cabinet may be frozen.

Defrosting

Shut off the refrigerator by setting switch D to OFF. 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 trays with hot water and placing them on the freezer shelf. 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 and set the thermostat to MAX for a few hours. Then reset the thermostat to its normal position. NOTE: On the RM3804 the drip tray is placed on the rear side of the refrigerator.

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 damaged. It is important to always keep the refrigerator clean.

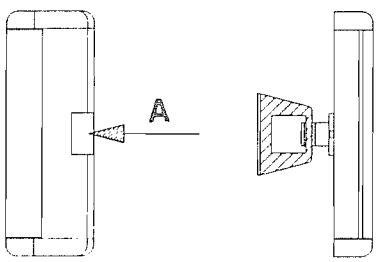
To Shut Off the Refrigerator

To shut off the refrigerator, set switch D to the OFF position. If the refrigerator will not be in operation for a period of weeks it should be emptied and cleaned and the doors left ajar. Use the travel latch, integrated in the handle, to lock the doors in the open position. (See Fig. 12)

To activate the airing position of the hook, push the square button A forward at the same time as you fit the hook into the clamp. To release the door from airing position, pull the handle, release, and the hook will return to rest position.

CAUTION: Do not store explosive substances in the refrigerator, such as cigarette lighters, gas, petrol, either or the like.

Fig. 12



NOTES

NOTES

Flue Cap and Baffle

1. The flue cap on the top of the flue tube must be in position to guide the flue away from the condenser.

2. The flue baffle is suspended from the top of the flue tube and must be in position in the flue tube of the cooling unit.

The Flame Failure Safety Device (Fig. 13)

The tip of the thermocouple shall reach in over two slots of the burner. To replace the thermocouple proceed as follows:

1. Remove the cover.

2. Disconnect the thermocouple connection and pull the thermocouple straight out. (See Fig. 13)

3. Remove screw and retainer.

4. Remove the thermocouple by pulling it left, then outward.

5. Bend the new thermocouple to the same shape as the old one.

6. Reassemble in reverse order. Check that the tip of the thermocouple has been correctly refitted in relation to burner.

7. Tighten the thermocouple connection finger tight plus 1/4 turn. The plug must be properly tightened to the solenoid valve to ensure good contact. Do not over-tighten.

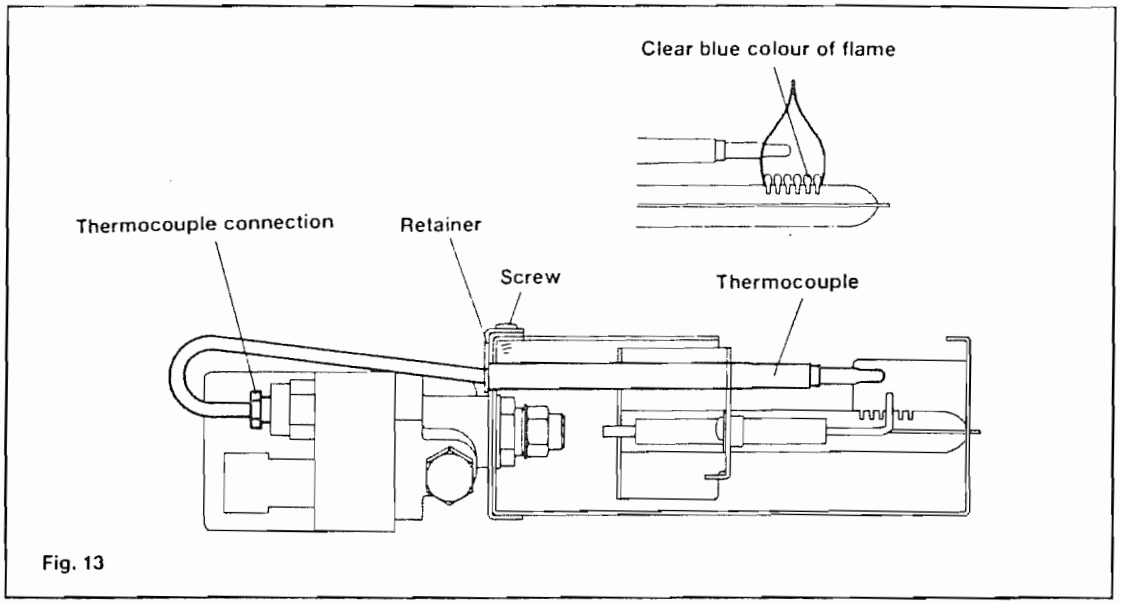


Fig. 13

The Thermostat Knob (inside the cabinet)

The refrigerator is equipped with a thermostat which is regulated by turning the knob to different settings in order to obtain the desired cabinet temperature.

By choosing a setting from MIN to MAX various temperatures can be obtained. 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. At MAX the burner is running continuously at full gas rate. Lowest cabinet and freezer temperatures are obtained at this setting.

ELECTRIC EQUIPMENT

Cartridge Heater

These models are equipped for both 120 volt AC and 12 volt DC operation. There is an electric heater mounted in a pocket of the boiler system.

To Replace the Heater:

1. Disconnect the wall plug and the 12 volt wires.
2. Remove the cover.
3. Remove the cover item 19.
4. Disconnect the heater leads.
5. With a pair of pliers unfold the lug holding the lid of the boiler casing and open the lid.
6. Remove some insulation wool so that the heater is accessible.
7. Turn and lift the heater out of its pocket.
8. Fit the new heater into the pocket.
9. Connect the leads and put on the cover.
10. Reset the insulation and close the lid of the boiler.
11. Replace the cover.

PERIODIC MAINTENANCE

NOTE: Before working on the refrigerator make sure that 120 volt AC and 12 volt 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. Remove cover.

2. Disconnect the electrode wire from the spark electrode.

3. Remove the two burner mounting screws, and remove the burner assembly.

4. Clean burner tube with a brush. Blow with compressed air.

5. Remove the burner jet item 48 and clean with alcohol. Blow with compressed air. Never use a wire or pin to clean the burner jet.

6. Reassemble.

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 flue tube.

The Electrode

For a proper ignition function it is necessary to keep the electrode insulation dry and free from dirt. The gap between burner tube and electrode shall be max 3/16" and min. 1/8".

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 that the flue baffle is clean and reasonably free from soot. Heavy soot formation indicates improper functioning for the burner. Clean baffle and flue. Further, clean cooling unit and floor under the refrigerator. The entire gas installation should be checked for leaks at intervals. Test all pipe connections with soapy water, not with an open flame.

Check the energy selector system by connecting/disconnecting main voltage, start/stop the engine etc.

FAULT TRACING

The Refrigerator Does Not Cool Properly

Causes and Remedies

A. Burner jet clogged. Unscrew burner jet and blow clear or wash in alcohol. Do not use a wire or pin to clean the burner jet.

B. Flame has gone out. Remedy: 1. Gas in bottles used up. 2. Tip of thermocouple is not heated enough by flame. 3. Clogged by pass screw. Clean or exchange it.

C. Air circulation around cooling unit is restricted. Be sure that the refrigerator is properly ventilated.

D. The evaporator is heavily coated with frost. Defrost.

E. Flue baffle not in flue tube.

F. The thermostat is incorrectly used. See paragraph on thermostat. In hot weather the setting should be closer to MAX than usual.

G. Burner head clogged. Clean.

H. Burner damage. Replace.

I. Burner not located under center of flue tube. Relocate.

J. Wrong gas pressure at the burner. Have pressure checked at burner and at gas bottle. Pressure at burner must not fall below 11" W.C.

ODOR FROM FUMES

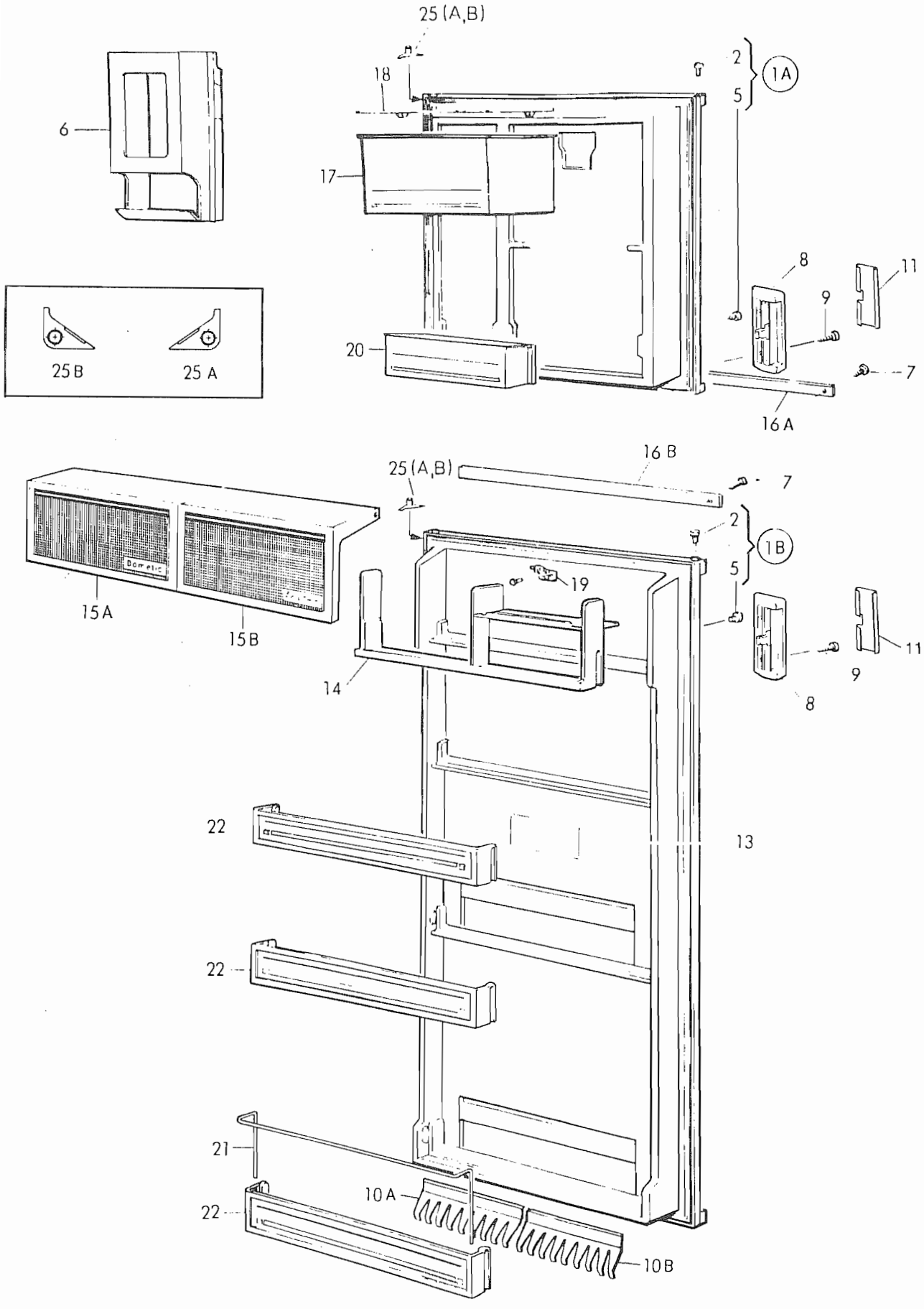
Causes and Remedies

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.

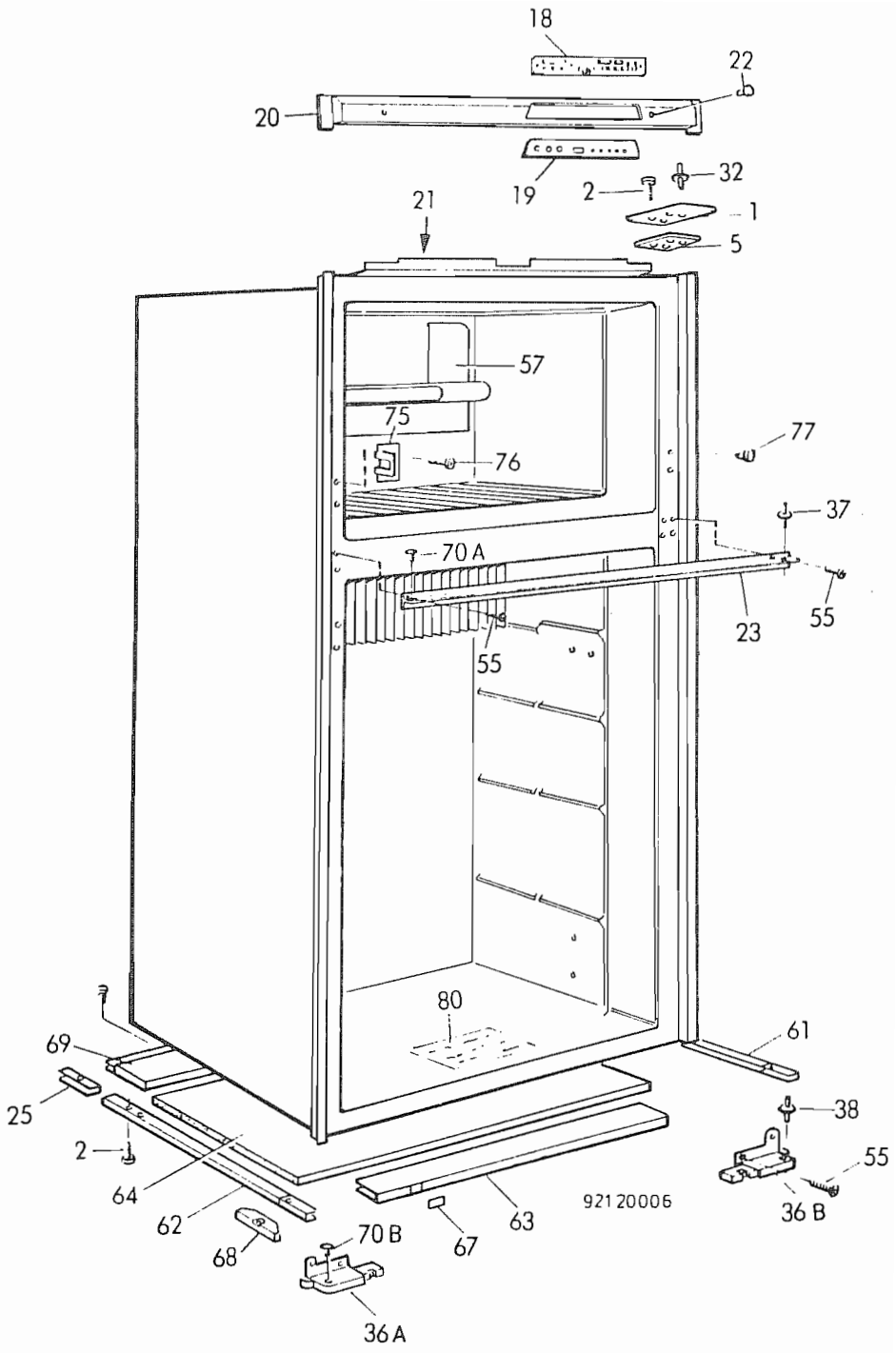
C. The flue tube is dirty. Clean flue as follows: Cover burner and jet. Remove the flue cap from the top of the flue tube, and lift out the flue baffle. Clean the flue from the top using a flue brush. Clean baffle before putting back in place.

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.


25 (A,B)
18
2
1A
5
6
17
8
11
9
20
7
25B
25 A
16A
16 B
25 (A,B)
7
2
1B
5
15A
15B
19
11
9
14
8
22
13
22
21
10A
22
10B

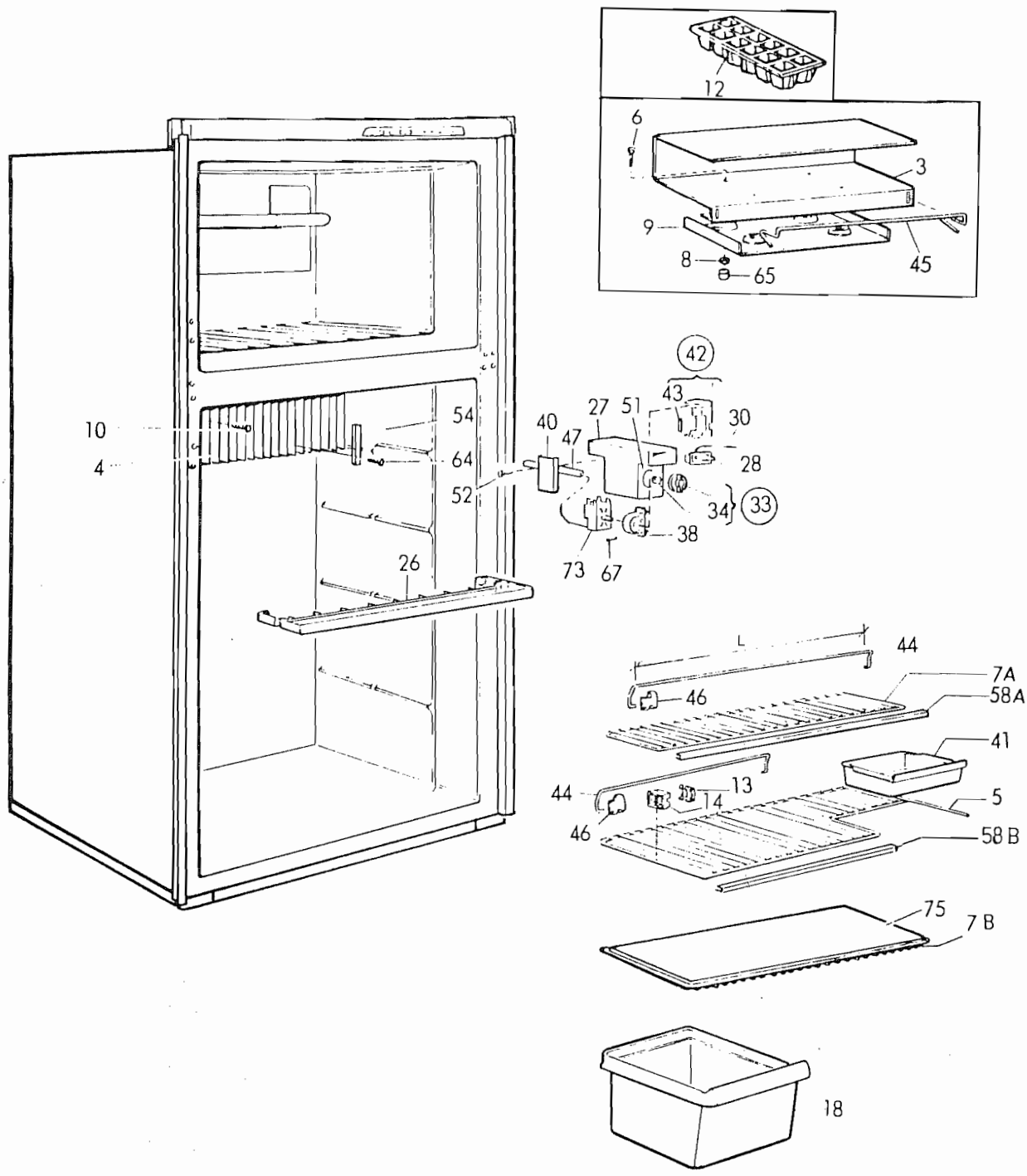
PARTS DESCRIPTION PRECEDING PAGE

1A	Door, upper
1B	Door, lower
2	Bushing
5	Plug
6	Retainer
7	Screw
8	Handle
9	Screw
10A	Holder Bottle approx 7 1/2
10B	Holder bottle approx 8"
11	Coverplate
13	Label
14	Shelf
15A	Cover butter compartment
15B	Cover butter compartment Dairy
16A	Strip decoration
16B	Strip decoration
17	Box
18	Lid
19	Flap bracket
20	Shelf door
21	Rack
22	Shelf door
25A	Washer
25B	Washer


18
22
20
19
2
32
21
1
5
57
75
76
77
37
70 A
23
55
55
80
61
69
25
38
2
64
62
68
70 B
67
63
92120006
55
36 B
36 A

PARTS DESCRIPTION PRECEDING PAGE

1. Hinge upper
2. Screw
5 Washer
18. Printed assembly
19. Operating Panel
20. Front
21. Label
22. Plug
23. Center beam
25. Reinforcement
32. Hinge pin, upper
36A. Hinge, lower left
36B. Hinge, lower right
37. Hinge pin, middle
38. Hinge pin, lower
55. Screw
57. Plate cover
61. Runner, right
62. Runner, left
63. Base front
64. Isolation
67. Coverplate
68. Reinforcement
69. Protection Plate
70A Plug, light grey
70B. Plug, dark grey
75. Bracket
76. Screw
77. Plug
80. Sign plate

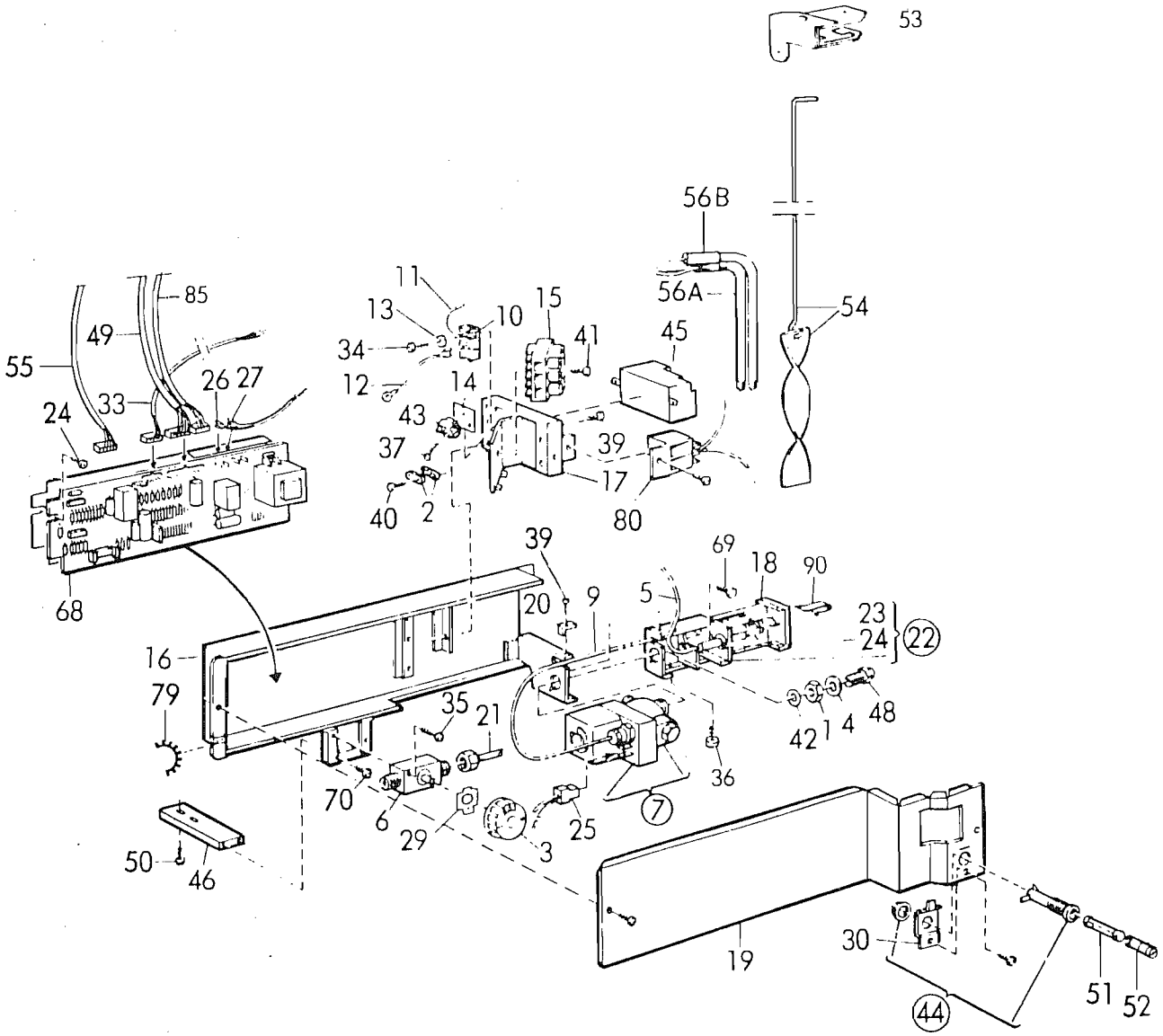

12
6
3
9
8
65
45
42
43
27
51
30
40
47
28
54
64
52
34
33
38
73
67
10
4
26
L
44
7A
46
58A
41
44
13
14
5
46
58 B
75
7 B
18

PARTS DESCRIPTION PRECEDING PAGE

3. Shelf
4. Cooling flange
5. Shelf
6. Screw
7A Shelf approx 7.5"
7B Shelf, approx 12"
8. Nut
9. Plate
10. Screw
12. Ice tray
13. Shelf lock, outer
14. Shelf lock, inner
18. Box vegetable
26. Drip tray
27. Cover
28. Switch door
30. Conductor
33. Knob
34. Spring
38. Support thermostat
40. Lamp screen
41. Box
42. Lighting
43. Lamp, 10W, 12V
44. Rack,L
45. Rack
46. Retainer
47. Cover
51. Index
52. Screw
54. Clamp
58A Strip decoration
58B Strip decoration
64. Screw
65. Lid
67. Locking pin
73. Thermostat
75. Shelf

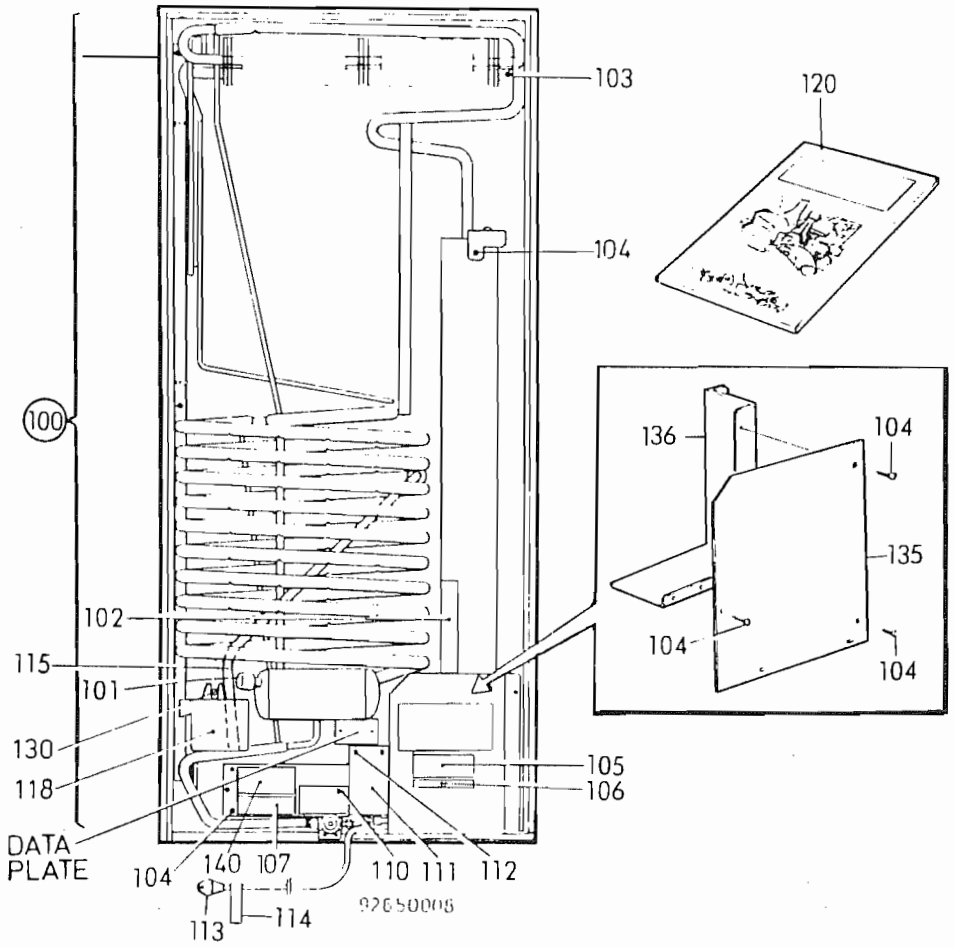
NOTES

NOTES

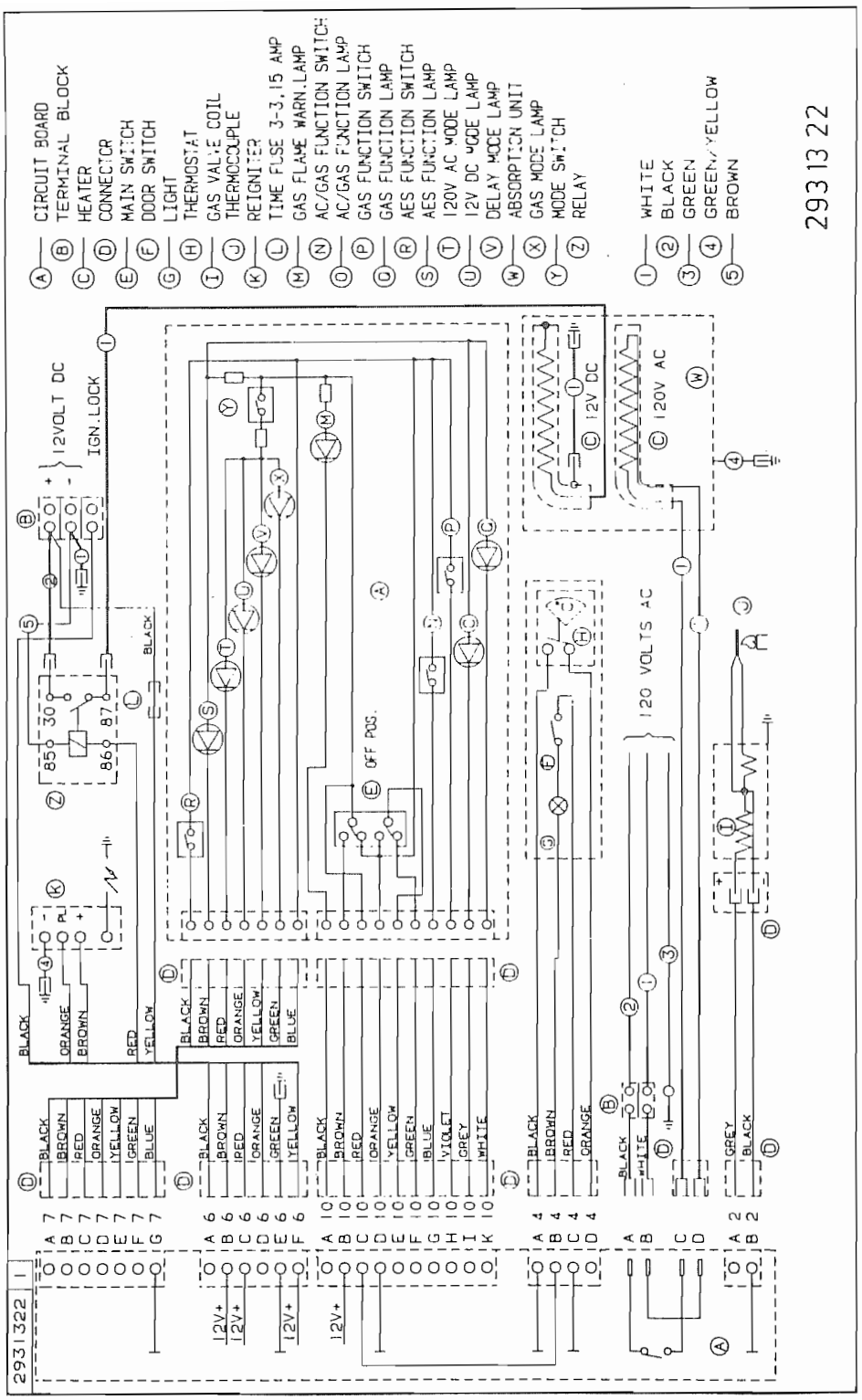

53
56B
56A
54
85
49
55
24
33
26 27
11
13
10
15
34
12
14
41
45
43
37
39
17
40
2
80
68
39
69
18
90
20
9
5
23
24
22
16
79
35
21
42
1
4
48
70
6
29
3
25
36
7
50
46
19
30
51
52
44

PARTS DESCRIPTION PRECEDING PAGE

1. Nut
2. Anti-strain clip
3. Knob
4. Washer
5. Conductor
6. Cock gas
7. Valve solenoid
9. Thermocouple
10. Terminal rail
11. Conductor, cpl
12. Conductor
13. Washer
14. Insulating plate
15. Terminal block
16. Box
17. Mounting plate
18. Burner housing
19. Lid
20. Retainer
21. Tube gas
22. Burner
23. Electrode
24. Screw
25. Conductor, cpl
26. Conductor, cpl
27. Conductor, cpl
29. Protect washer
30. Retainer
33. Conductor, cpl
33. Conductor, cpl
34. Screw
35. Screw
36. Screw
37. Screw
39. Screw
40. Screw
41. Screw
42. Washer
43. Terminal block
44. Retainer fuse
45. Spark ignition device
46. Retainer
48. Jet
49. Conductor
50. Screw
51. Fuse
52. INsert
53. Flue
54. Baffle
55. Conductor, cpl
56. Immersion heater
68. Printed assembly
69. Screw
70. Screw
79. Strip
80. Relay
85. Conductor
90. Clips



100. Cooling unit
101. Cap
102. Flap
103. Screw
104. Screw
105. Sign plate
106. Sign plate
107. Label
110. Label
111. Protection
112. Screw
113. Cord set
114. Label
115. Hose
118. Evaporation tray
120. Instructions for use
130. Screw
135. Protection plate
136. Protection plate
140. Label



PRODUCT NO.	MODEL	MARKET	VOLTAGE	REMARKS
921 60 01-01	RM3804	US, CA	120V, 12V	2931322-00
921 60 02-01	RM3804	US, CA	120V	2931321-00

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 by the 12 volt oven light in some models.

People using gas ranges in the home will find little difference in the operation of the range in the motorhome. 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 motorhome and the climate in which most motorhomes are used. The pilots are very small, but, of course, produce heat that may be noticeable in the motorhome. 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 PRINCIPLE

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 in 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 applicable) 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 newer 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 "pilots 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 degrees, 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)

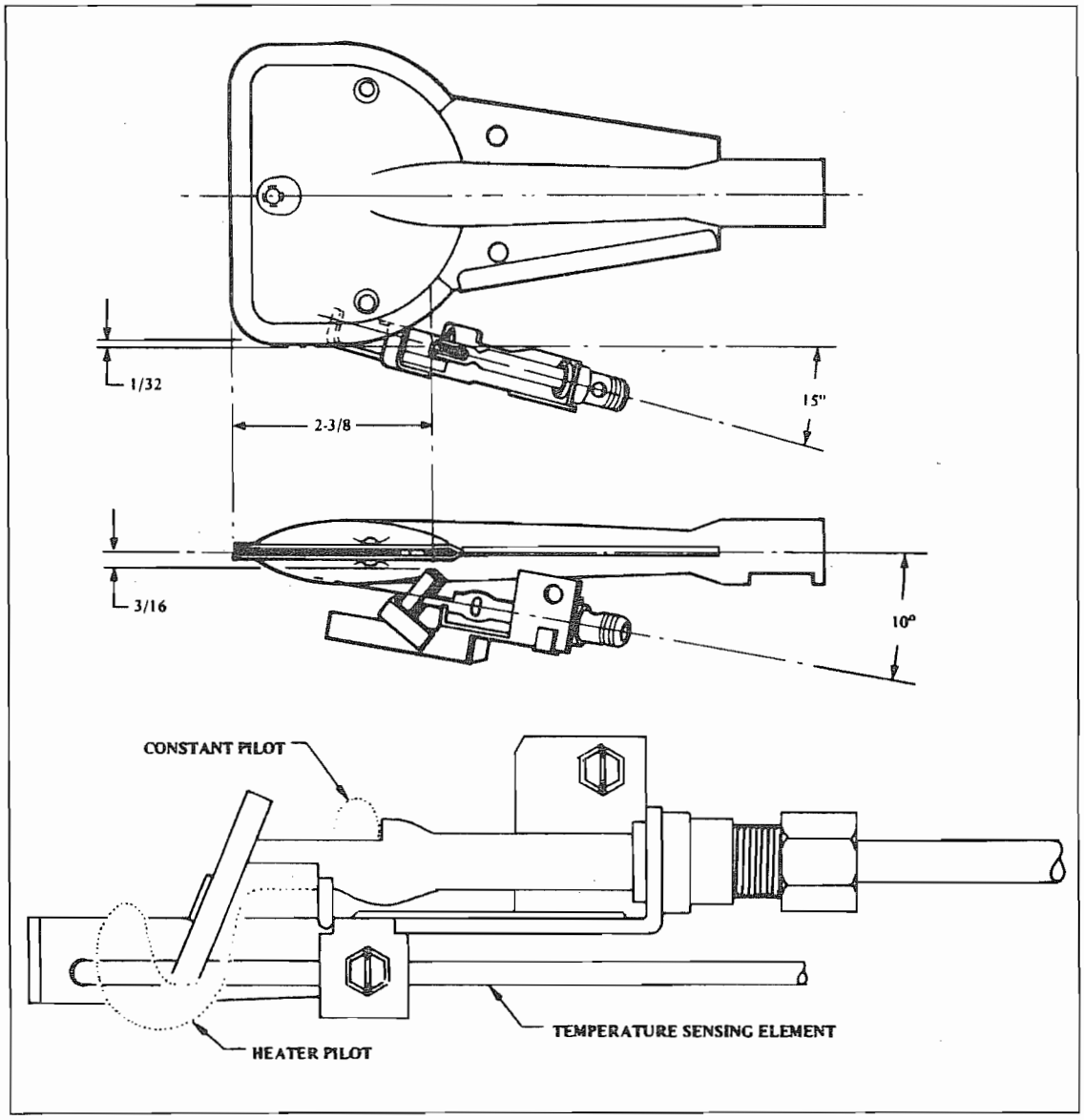
The possibility that a service call on the top burner portion of the range will require anything more than minor adjustments and/or cleaning is very remote.

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.

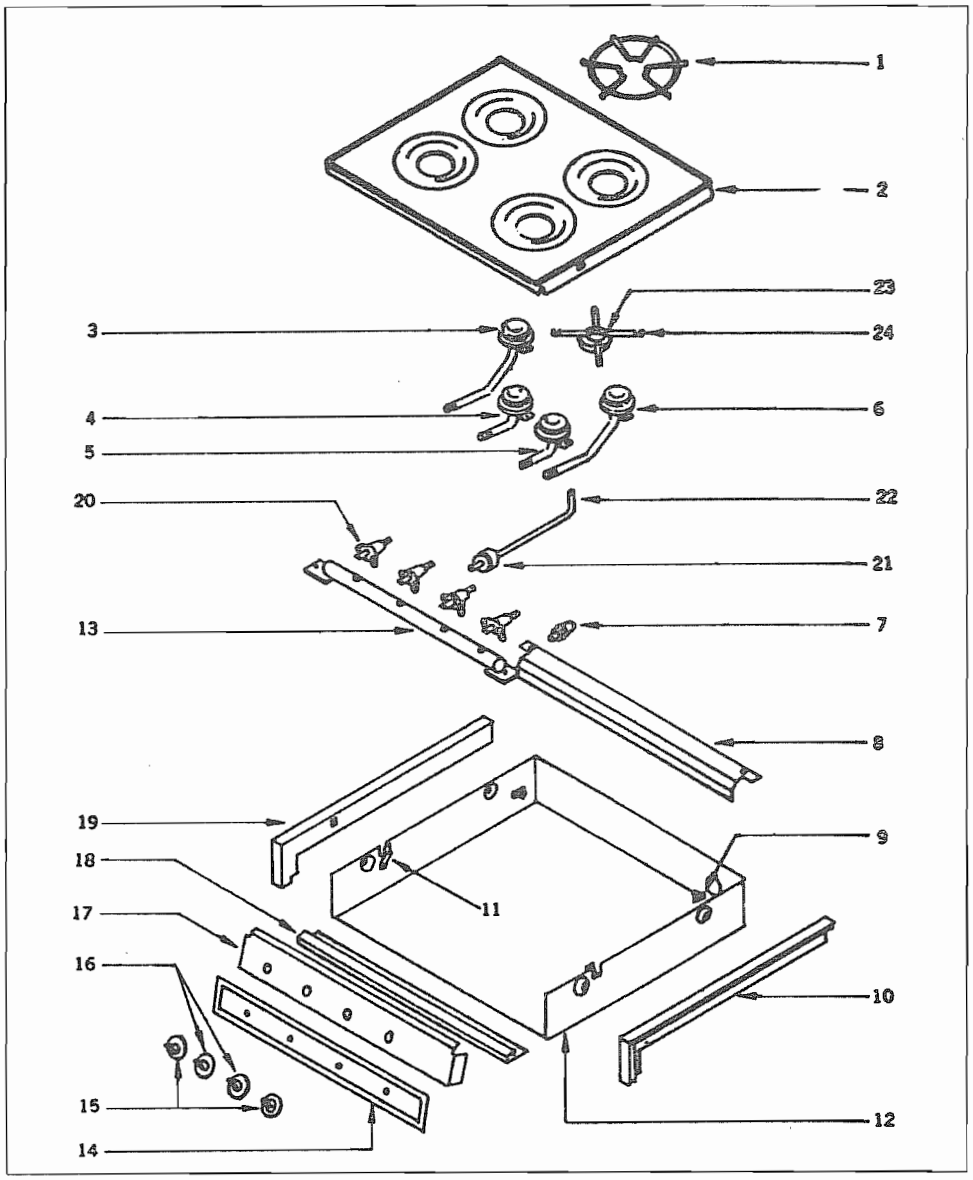
(Pilot Adjustment)

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.

OVEN PILOT LOCATION

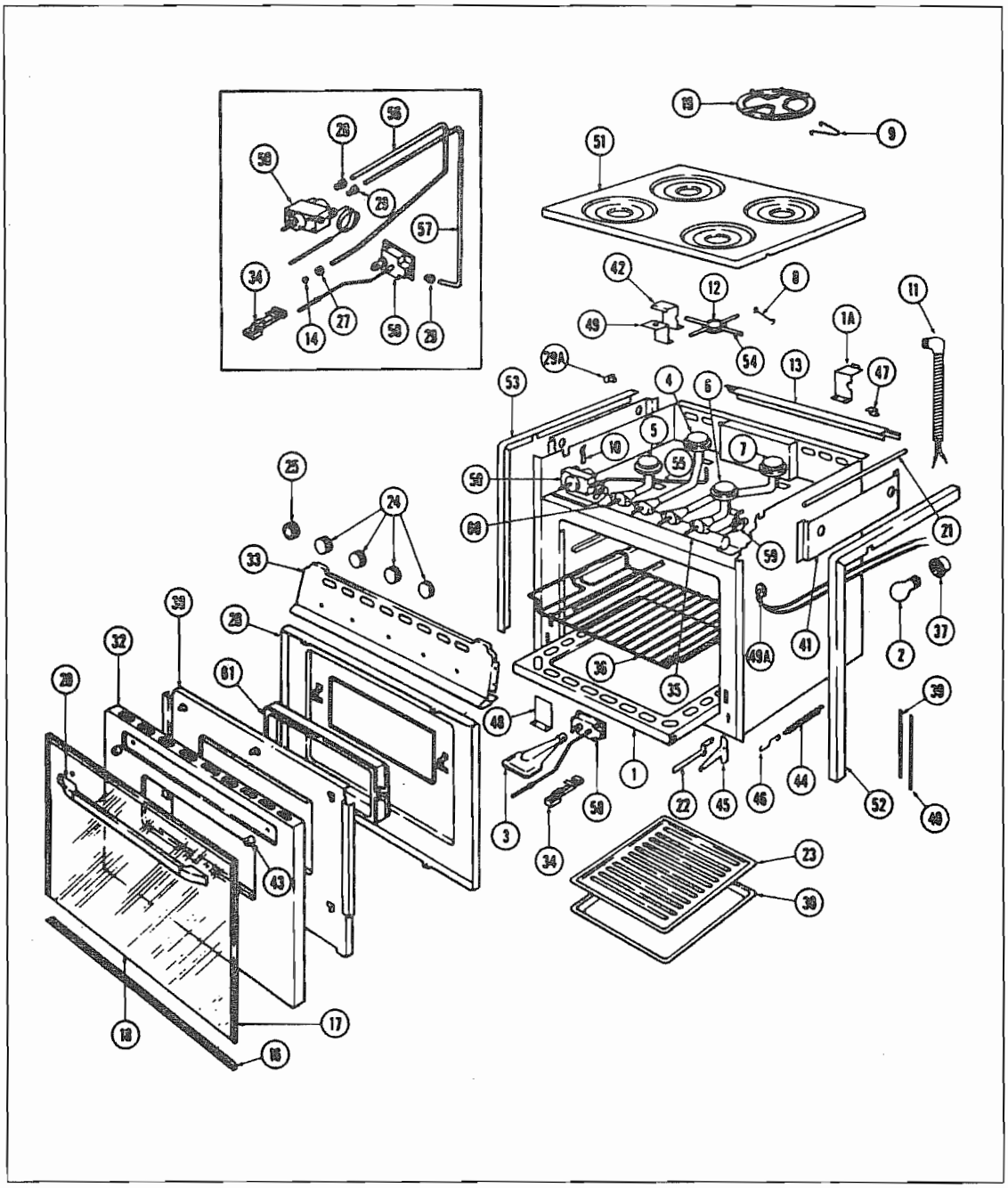


RANGE TOP



1. Burner grate
2. Main top
3. Burner, Left Rear
4. Burner, Left Front
5. Burner, Right front
6. Burner, Right Rear
7. Half Union
8. Top rear trim
9. Tee nut
10. Burner box trim, right
11. Main top hold down clip
12. Burner box
13. Mainfold pipe
14. Mainfold panel trim
15. Burner Knob, rear
16. Burner knob, front
17. Mainfold panel back-up
18. Mainfold panel lower trim
19. Burner box trim, left
20. Burner valve
21. Top pilot filler
22. Pilot tube
23. Lighter cup assembly
24. Flashtube extension

RANGE AND OVEN ASSEMBLY



PARTS DESCRIPTION FOR PRECEDING PAGE

1. Bottom, oven
1A. Junction Box
2. Bulb, oven light
3. Burner, Oven
4. Burner top, left rear
5. Burner top, left front
6. Burner top, right front
7. Burner top, right rear
   Button, plug (not shown)
8. Clip, flashtube
9. Clip, grate
10. Clip, main top
    Clip, thermostat bulb (not shown)
11. Conduit assembly and service cord
12. Cup, lighter assembly
13. Deflector, flue
14. Ferrule - 1/8"
    Fitting, thermostat-inlet
    (not shown)
16. Frame, lower glass
17. Frame, upper glass
18. Glass, outside
19. Grates, top
20. Handle, oven door
21. Harness, tube, oven light
22. Hinge, oven door, RH
    Hinge, oven door, LH
23. Insert, broiler pan
    Insert, burner (not shown)
24. Knob, top burner
25. Knob, thermostat
26. Liner, oven door
27. Nut, compression 1/8"
    Nut, compression 3/16"
28. Nut, loxit, 3/16"
29. Nut, loxit, 1/4"
29A. Nut, tee
30. Pan, broiler
32. Panel, oven door, black
33. Panel, manifold
34. Pilot, oven
35. Pipe, manifold
36. Rack, oven
37. Receptacle, oven light
38. Retainer, insulation
39. Retainer, seal
    Screw, door frame (not shown)
    Screw, main top clip (not shown)
    Screw, door handle (not shown)
    Screw, frame (not shown)
40. Seal, door, top
    Seal, door, side

MICROWAVE OVENS

Only federally certified technicians are permitted to service microwave ovens. For this reason the only service instructions contained in this manual are for removal of the complete oven. If you have a microwave problem please contact the appropriate manufacturer.

Magic Chef
28812 Phillips Street
Elkhart, Indiana 46514
219-264-9578

Sharp Electronics Corporation
10 Sharp Plaza
Paramus, New Jersey 07652
201-512-0055

Litton
2530 North 2nd Street
Minneapolis, Minnesota 55411
605-336-5377

Airstream has used two different methods of holding the ovens in place. The most common is a set screw configuration where two bolts apply downward pressure on top of the range. The bolts can be found in the cabinet directly above the oven, and out toward the front. Back them out a few turns and the front of the oven can be lifted up and out over the lower ledge.

The second method was to slide a piece of 3/4" pine board under the mircowave in front of the rear supports. Once in place screws were run up through the bottom shelf into the 3/4" pine.

You will note neither method makes any holes in the microwave cabinet. The microwave is simply captured in its cabinet. Usually you will be able to move the microwave around in the cabinet, but it won't come out.

WATER HEATER

Manufacturer: Atwood Mobile Products
4750 Hiawatha Drive
P.O. Box 1205
Rockford, Illinois 61105
Phone: 815-877-7461

Note: Review the water heater literature supplied in your Owner's Packet before proceeding.

CAUTION: Hydrogen gas can be produced in a hot water system served by the 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 beings to flow. There should be no smoking or open flame near the faucet at the time it is open.

Electronic Ignition

Atwood has made the electronic ignition as simple to operate as possible. In your bathroom there is a black switch with a red indicator light. After making sure the water heater is full and the LP gas is on, simply turn on the switch. The red light will come on indicating it is in a "try" mode. When the burner ignites the red light goes out. You are done. The water heater is operating.

Principle of Operation

When the switch is turned on, power is supplied to the thermostat (located inside the junction box at the back of the water heater). When the thermostat senses the water in the tank requires heat (below 120°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), then flow out 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 beings. When the water in the tank drops below 120°F the process will automatically repeat itself.

Note: A complaint sometimes received at Airstream is the fact the water heater will not light for a while when the motorhome is first parked. The explanation is easy. The water is already hot! The motorhome water heater has a heat exchanger plumbed in to the engine radiator system. As you are driving, the water is being heated without you having to do a thing.

Safety

ECO SWITCH: The unit is equipped with an ECO (Energy Cut-Off) switch. This is located next to the thermostat and should the water exceed 190°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 201°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 built-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 petcock 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.

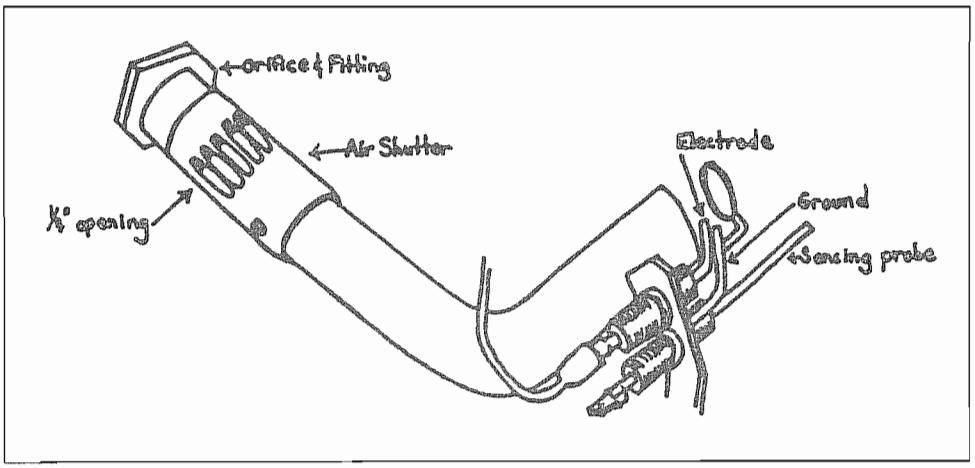
2. Once the unit has been thoroughly drained, approximately two quarts of water will remain in the base of the tank due to the position of the petcock drain valve. Strictly for winterization precautions, these remaining two quarts of water will not harm the unit. As these two quarts of water freeze, 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 capabilities.



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.

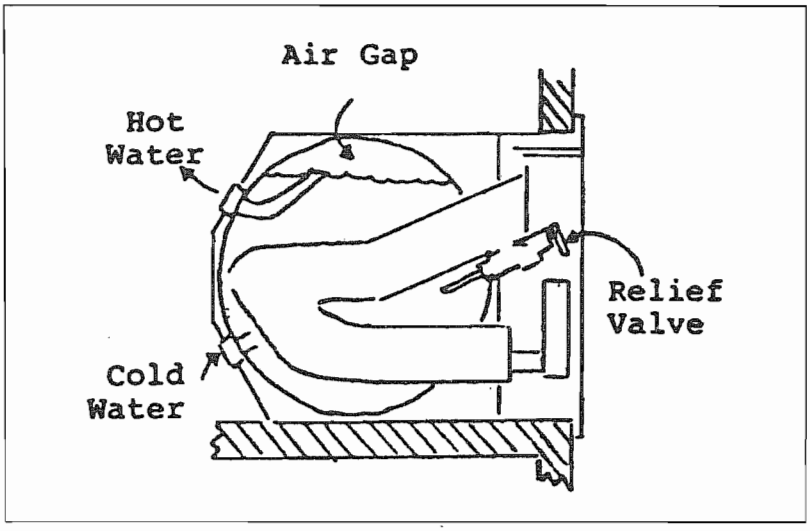
Electrode Positioning

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 1 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.

Remedy:

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 plug located at right front of solenoid valve. Insert 1/8" MPT pipe nipple. Hook up manometer turn on unit.

G. Grille in upper left hand side of grille obstructed. Filters, tape, etc. should not be used to block any portion of this grille.

E. Gas solenoid bracket bent. Orifice not pointed up center of main burner.

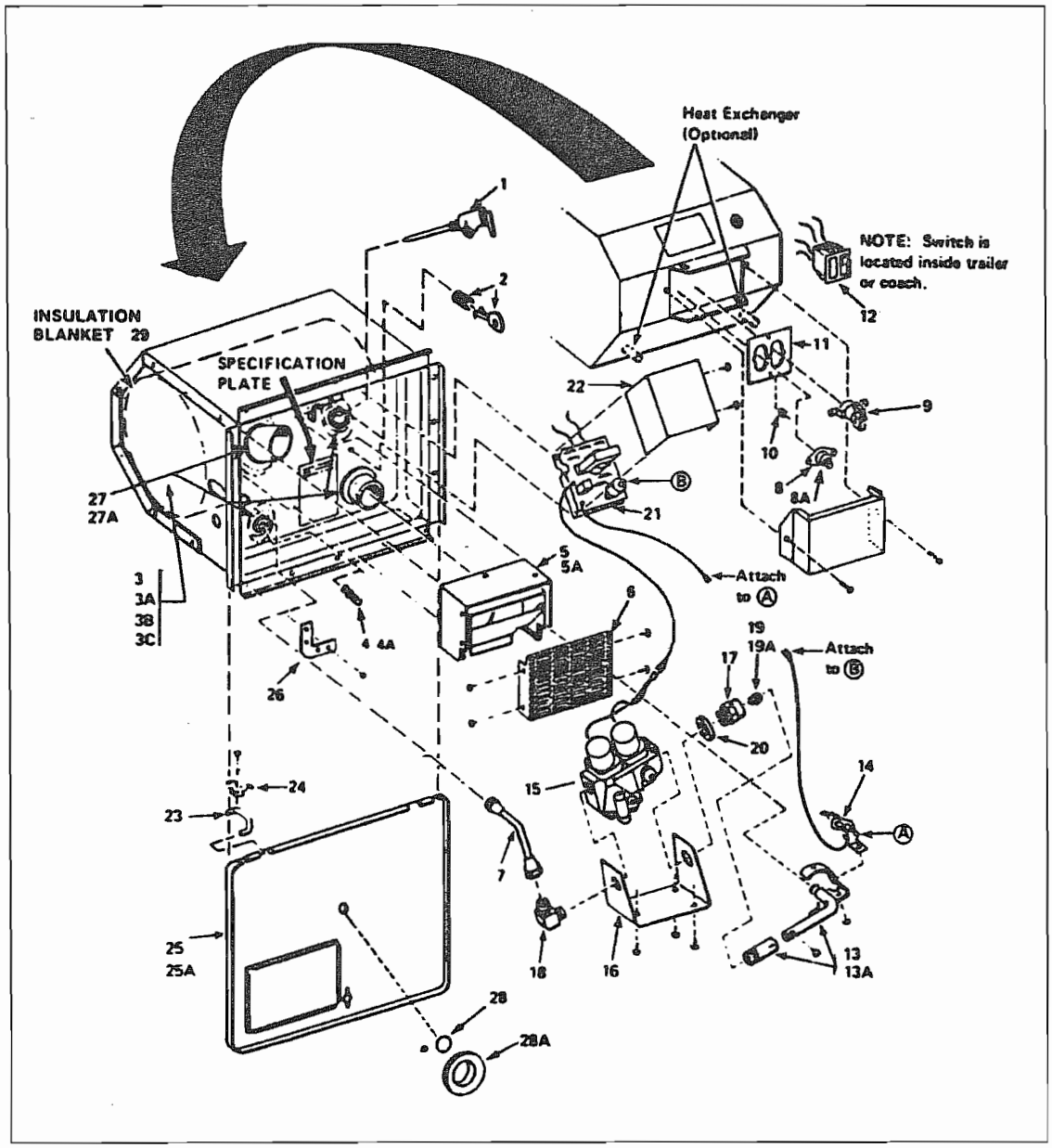
Problem: Tank leaks water.

Remedy: A. Check all plumbing fittings for leaks.

B. Tank corrision. Refer to warranty with unit.

Problem: Spark igniter continues to spark while burner is on.

Remedy: A. Flame sensor not correctly positioned in flame.


Heat Exchanger
(Optional)
NOTE: Switch is
located inside trailer
or coach.
INSULATION
BLANKET 29
SPECIFICATION
PLATE
Attach
to Ⓐ
Attach
to Ⓑ
1
2
3
1A
3B
3C
4
4A
5
5A
6
7
8
8A
9
10
11
12
13
13A
14
15
16
17
18
19
19A
20
21
22
23
24
25
25A
26
27
27A
28
28A

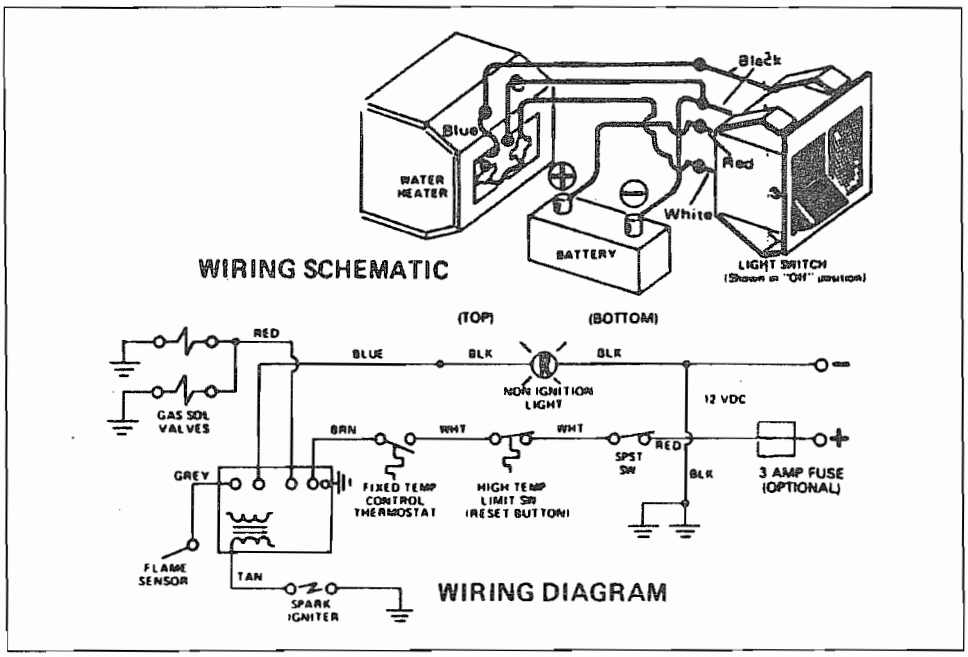
PARTS DESCRIPTION FOR PRECEDING PAGE

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

WIRING SCHEMATIC/DIAGRAM



REMOVAL

In order to remove the water heater, access must be gained to the water lines on the back of the heater. The carpeted panel next to the panel is only held in with about three screws - two in the top and one in the bottom corner. They can be difficult to see buried in the nap of the carpet, but if you feel with your finger tips you won't have any problem finding them. Once you have access to the lines the removal is basic:

1. Turn off LP gas at the bottles.
2. Disconnect city water or turn off water pump.
3. Remove drain plug in the face of the heater and open a faucet so water will drain.
4. Mark and disconnect wires if it has electronic ignition.
5. Remove perimeter screws around the face of the heater.
6. Use a putty knife or similar tool to break the seal between the water heater and the side of the trailer. Be careful not to damage paint.
7. After heater has drained remove water lines next to toilet.
8. Remove gas line.
9. Work the heater side to side as you are pulling out.

WARNING: Be sure to check the gas line connection with soapy water when replacing.

ICE MAKER

Manufacturer: U-Line Corporation
8900 N. 55th Street
P.O. Box 23220
Milwaukee, Wisconsin 53223
Phone: 414-354-0330

Operation

Your new ice maker has been designed to provide a continuous and automatic supply of ice cubes. With normal use very little attention is required. The following suggestions are made for best results.

Starting: Since the ice maker must be connected to a water supply line it is possible that dirt or scale will be dislodged in the line. This will cause discolored and dirty cubes during the first few cycles. As a precaution we suggest you throw away all cubes made during the first two to three hours.

Do not cut off air circulation from entering the front grille by putting the unit behind closed doors.

Unit must be installed level to the floor of vehicle.

When the ice maker is full, the ice making mechanism will shut off, but the refrigeration system will continue to cycle to maintain the cube supply. Under this condition the cubes may stick together, however, they may be separated easily by hand or with a blunt tool. NEVER USE AN ICE PICK, KNIFE, OR OTHER SHARP INSTRUMENT WHICH MAY DAMAGE THE PLASTIC INTERIOR.

If the ice maker is not used regularly we suggest the ice be emptied periodically. (every week to ten days) to insure fresh cubes.

AVOID SOLVENT CLEANING AGENTS, ABRASIVES, AND ALL CLEANERS THAT MIGHT IMPART TASTE TO THE ICE CUBES. The exterior may be cleaned with cleaners and polish as used on fine furniture. The condenser behind the grille should be cleaned periodically, generally three to four times per year. To remove the grille, put fingers in the slot and lift up and out.

Your ice maker should be defrosted periodically.

When defrosting or shut off for any period of time, the door must be propped open two inches.

To set colder, turn the screw located through the hole in the rear of the cabinet 1/4 turn clockwise. Turn counterclockwise for warmer setting. The colder the control is set, the slower the ice cube harvest will be.

Shut Down: If the ice maker is to be shut off, the switch located behind the grille should be switched off. The ice must be removed and the DOOR MUST BE PROPPED OPEN at least two inches to permit air circulation to dry the interior and prevent mold and odor.

Once each year, or as often as needed, shut off water, remove large brass nut on water inlet valve, and use toothbrush to clean sediment from inlet screen to prevent sediment and impurities from shutting off water supply.

TROUBLE DIAGNOSIS

Nature of Defect	Cause	Remedy
1. Machine fails to operate	a. Power supply b. Off-on switch	a. Check power supply, replace fuses if needed. b. Check off-on switch for continuity in on position. Replace if defective.
2. Compressor fails to start	a. Temperature control b. Relay c. Overload d. Control	a. Check temperature control for continuity when cube maker contains water only. Replace if defective. b.&c. Eliminate relay and overload by using test cord on compressor. Replace either or both if defective. d. Check control. Replace if defective.
3. Cube maker fails to fill with water	a. Water supply b. Solenoid water valve c. Water valve switch	a. Check water supply at inlet of solenoid water valve. b. Check screen, and clean if needed, also check valve coil by energizing terminals with test cord. c. Check switch for continuity.
4. Ice maker will not eject frozen cubes	a. Cubes too large b. Faulty limit switch c. Faulty control d. Frost accumulation e. Mold heater f. Holding switch g. Cube maker motor h. Shut-off arm switch i. Cam	a. Defrost machine, remove some water from tray, adjust water - fill to 120 c.c. or 4½ oz. (see Fig. 3) b. Test for continuity, replace if defective. c. Test for continuity, replace if defective. d. Defrost, remove some water from cube tray with cloth, check door gasket seal. e. Check for continuity, replace if defective. f. Check for continuity, replace if defective. g. Use test cord to energize motor leads. Replace if motor dead or internal gear stripped. h. Check for continuity, replace if defective. i. Check whether loose wire has jammed in cam.
5. Water fails to freeze	a. See 1 and 2 b. Fan motor c. Temperature control d. Refrigeration system e. Dirty condenser	b. Check fan motor. Replace if not working while compressor is running. c. Test continuity through terminals No. 2 & 3 on control. Clean internal contacts or replace control. d. System shall be serviced and checked only in unit compartment. Attach gauge to process tube and at no time should suction pressure be lower than 0 pounds within 5 minutes of cut-off. e. Clean lint and dust from condenser.

QUESTIONS AND ANSWERS

There is water in the bucket?

a. The machine is not level, and the water runs out of the freezing mold into the storage compartment or bucket.

b. Poor gasket seal, or something holding the door open, like the bucket not being pushed in far enough.

c. A defective water valve switch.

The ice sticks together?

a. Water splashes out of the filler cup during water fill cycle.

b. A faulty door seal, and the ice on top will be frosty and sticking together.

c. The front grille is being blocked by putting it behind closed doors and not letting air through the front grille for circulation.

d. You have it located in a "hot spot" where fresh air cannot enter the grille. You are recirculating the hot air from the unit compartment back through the grille.

Have to defrost it weekly?

a. You have it located in a "hot spot' where fresh air cannot enter the grille. You are recirculating the hot air from the unit compartment back through the grille.

b. You have a poor door seal causing the warm air to enter the storage compartment, which builds up ice, or the door is not closed tightly.

c. The chemical content of the water is different in each locality, and therefore the freezing temperature of ice differs. To lower the temperature, turn the control, located through the rear of the cabinet, one-quarter to one-half turn to the right, clockwise. The reverse should be done if you want to raise temperature to a warmer setting.

The Ice Maker freezes up?

a. A poor door seal, letting the warm air come in.

b. Water splashing out of the ice maker mold into the storage compartment or bucket.

c. Slow leakage through the electric solenoid valve, which would mean a replacement.

The Ice Maker won't make ice?

a. The ejector blades are frozen in and cannot eject the cubes. Defrost the machine.

b. The electricity in the room could have been turned off, or the switch in the unit compartment could be turned to the "OFF" position. Maybe the cord is not tight in the wall socket.

c. Someone has shut off the water supply to the machine.

d. Defective cold control.

The ice is too soft and wet?

a. The control setting is too warm, and it should be turned one-quarter turn to the right. It is located through the rear of the cabinet.

b. The door is not closing completely.

c. The bucket is too far out.

d. Air is being blocked from entering the grille.

e. The condenser needs cleaning with a brush.

It keeps making ice and won't stop?

a. The shut-off arm switch is not working properly.

b. The shut-off arm is frozen in the ice. Remove cubes from the machine.

c. The end of the shut-off arm is stuck under the freezing tray.

It is not making enough ice?

a. The control is set too cold. Back it off half turn to the left. It is located through the rear of the cabinet.

b. The location is bad, creating a "hot spot". Instead of fresh air coming in through the grille, the hot air which has been expelled is being re-circulated.

c. Cubes too large. Adjust water fill.

d. Fan motor is not running.

e. The condenser coil behind the grille is dirty and needs cleaning.

The ice cubes are cloudy?

a. This is nothing more than the air being trapped in the water due to fast freezing. It has nothing to do with the health, taste, or chemical make-up of the water. It is the same air that is in every glass of water you drink.

Too much water is coming out?

a. Water valve switch needs adjusting. Remove front cover and adjust screw. (Fig. 3)

b. The control failed and needs replacing.

c. Leakage through the solenoid valve, which needs replacing.

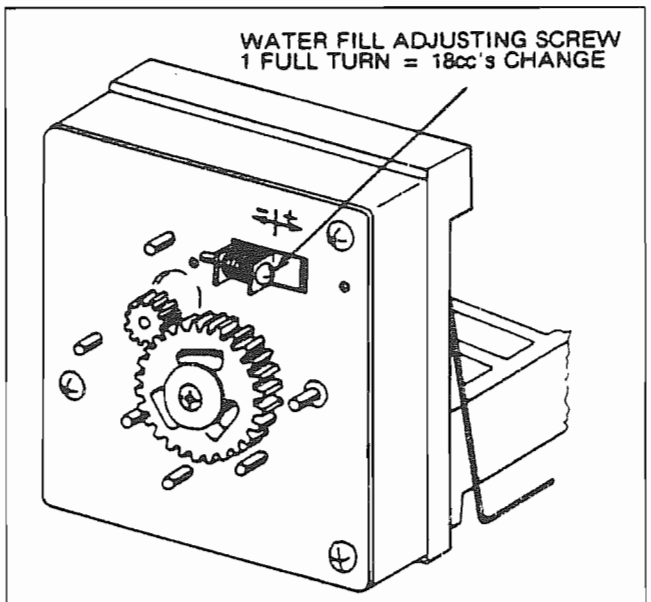


FIG. 3
ADJUSTING WATER FILL

The ejector blades are frozen into the ice cubes?

a. Too much water coming in. Adjust water, as in "Too much water is coming out".

b. Defrost machine.

c. Cubes piled too high melted back into freezing tray. Treat as in b. above.

Why must you install it level?

a. The front cubes will be larger than the rear cubes, thereby taking a longer time to eject.

b. If you tip it to the rear, you will get a "frost back" on the suction line, and you will not be able to eject ice cubes.

How do you level the Ice Maker?

a. Put a level gauge alongside the inside of the Ice Maker mold itself, not on top of the cabinet.

How can I eliminate cubes sticking together?

a. Be sure you have a good gasket seal.

b. Be sure the cold control is cold enough so that the ice is dry and hard, but not too cold, which will cut down the production of the Ice Maker.

c. Be sure the door is kept closed.

d. Be sure it is not behind closed doors, cutting off air circulation.

e. Ruffle the cubes periodically or remove a few cubes. Any loose ice, no matter what the temperature is, will eventually fuse together if not ruffled or disturbed. Weight or compression causes ice to melt together.

What do I if I need service?

a. Contact the dealer from whom you purchased your motorhome, or contact the Airstream Factory Service Department.

The Ice Maker is hooked up but no water comes in?

a. The water has not been turned on at the saddle valve clamp or at the water supply.

b. The two wires to the solenoid valve behind the grille have come off. Reach in and put them on.

c. The Ice Maker is not running, and you must listen for the compressor.

d. Always reach in with your hand and pull the ejector blades in the mold up around one turn to start the ice maker activating.

d. Sediment has plugged the solenoid valve inlet screen. Clean it. Shut off water, remove water line at large brass hose nut on valve inlet, use toothbrush to clean sediment from inlet screen. DO NOT REMOVE SCREEN.

NOTES

NOTES

The Ice Maker is refrigerating but won't make any cubes?

a. Be sure that the water is turned on at the source.

b. The solenoid valve does not work properly.

c. Water line is freezing at top, under rear panel.

d. A defective limit switch or holding switch.

e. The shut-off arm has been put up into the off position.

The Ice Maker won't reject ice cubes?

a. The ejector blades are frozen into the Ice Maker mold. Defrost.

b. A faulty limit switch or shut-off arm switch.

c. The control is not working.

The compressor won't run?

a. Check that you have electricity at the wall outlet.

b. Check to see that the switch behind the front grille is on.

c. Most common cause is that the relay or overload has failed.

The cubes are frosty on top.

a. This is due to a poor gasket seal where air is coming into the unit. (See "Have to defrost it weekly?)

b. If the cubes have not been removed for a long time.

How can you test the switches to see if they are active?

a. Water valve switch, holding switch, shut off arm switch - can be tested by seeing if the little black button clicks when depressed. If it does not, then the switch needs replacing.

How do you get a better door seal?

a. Adjust hinges, bend door into shape, or shim door gasket where needed.

The water keeps running and won't shut off?

a. A faulty water valve switch.

b. Defective solenoid valve.

c. Defective cold control.

d. Set water as in "Too much water coming out?"

The compressor has a knocking noise?

a. Machine is not level. (See "Why must you install it level?")

b. Faulty compressor, and it should be replaced.

c. Fan motor not running.

How can I make smaller cubes?

a. This is not advisable, but you can do so by adjusting the water valve switch to permit less water to enter the Ice Maker mold. (See "Too much water coming out?")

How do you drain the entire system so it won't freeze up?

a. Shut off water supply to the machine.

b. Disconnect the water line where it enters the solenoid valve in the unit compartment. Allow the machine to run for one hour so that all water is drained through the system.

c. Leave disconnected until re-using.

d. Mop out any remaining water in the Ice Maker mold.

e. Leave door propped open two inches so that humidity will not build up inside the cabinet and corrode the micro switches.

Do I need to worry if there is a lot of ice on the Ice Maker?

a. No, as long as the Ice Maker is harvesting ice, this is all that is required.

Is the Ice Maker automatic defrosting?

a. Yes, and this pertains only to the Ice Maker mechanism itself, without which you could not insure continuous ice production.

b. It is not "frost free".

What happens when the ice bucket is full?

a. The Ice Maker ceases to produce more ice, but the unit keeps running to keep the ice cold. The bin arm switch regulates this.

There is a high pitch or ring in the unit compartment?

a. Copper refrigeration tube is touching the cabinet and is vibrating.

The compressor runs all the time?

a. The control is set too cold.

b. The unit is located in a "hot spot" and not enough new fresh air is coming into the unit compartment, or the fan is not running.

c. Something is blocking the front grille and preventing air from entering.

d. The condenser should be clean of lint.

When do the heater elements in the Ice Maker go on?

a. The heaters go on during the harvesting of the ice only.

How do you determine when a solenoid valve is defective?

a. If the water slowly drips into the Ice Maker mold, while the ice is freezing.

b. If there is a restriction in the valve, and no water comes into the Ice Maker mold.

c. There will be no evidence of dripping in the compressor compartment whether the solenoid valve is good or bad.

The Ice Maker ejector motor runs, but the ejector blades do not turn?

a. Stripped gear in the ejector motor.

The Ice Maker ejector motor and ejector blades turn continuously?

a. Defective cold control.

b. Defective holding switch.

What is the size of the cube?

a. The cube is 1/2" wide, 2 1/2" long, 3/4" high.

My Ice Maker leaks?

a. This cannot happen if installed properly.

b. Check to see that the saddle valve to the water pipe and the connection in the compressor compartment are tight.

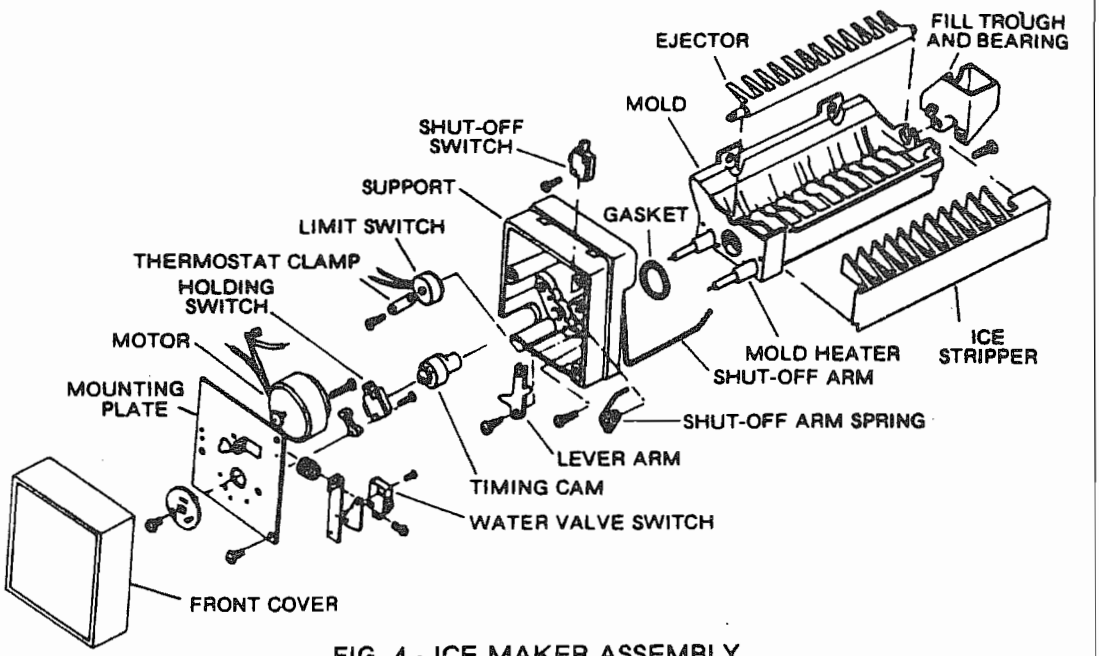


FIG. 4 - ICE MAKER ASSEMBLY

PARTS REMOVAL & REPLACEMENT

Removal and replacement of each component is described on the following pages. The disassembly diagram (Fig. 4) is provided to illustrate the relative position of components and to become familiar with the names of the various parts.

Before attempting any replacement, disconnect the appliance service cord from the power supply. A wiring diagram (Fig. 5) is provided.

Ice Stripper

a. Remove ice maker from cabinet.

b. Remove retaining screw at back of mold.

c. Pull stripper back to disengage from front of mold.

d. Replace in reverse order.

Fill Trough and Bearing

a. Remove ice stripper

b. Push retaining tab back away from mold.

c. Rotate counterclockwise until trough is clear.

d. Pull from back to detach from mold and ejector blades.

e. Replace in reverse order.

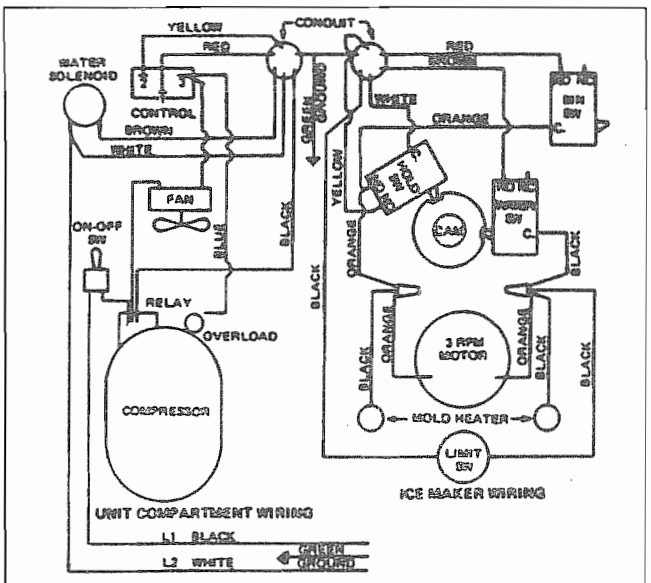


FIG. 5 - WIRING DIAGRAM

Ejector Blades

a. Remove ice stripper.

b. Remove fill trough & bearing.

c. Force back and up to detach from front bearing.

d. Place small amount of silicone grease on bearing ends of replacement.

e. Replace in reverse order, noting the blades are in same position as original.

Front Cover

a. Place coin in slot at bottom of mold support and pry cover loose.

b. To replace, be sure retaining tabs inside cover are located on top and bottom, then snap in place.

Mounting Plate

a. Remove front cover.

b. Remove 3 retaining screws holding plate in place.

c. Carefully remove plate, disengaging end of shut-off arm and noting relative position of shut-off arm spring.

d. Before replacing plate be sure all wiring is orderly and shut-off arm spring is in place.

e. Replace in reverse order.

Motor

a. Remove front cover.

b. Remove mounting plate (3 screws).

c. Disconnect wiring.

d. Remove motor (2 screws)

e. Replace in reverse order.

Water Valve Switch

a. Remove front cover.

b. Remove mounting plate (3 screws).

c. Disconnect wiring.

d. Remove switch (2 screws).

e. Replace in reverse order, making sure switch insulator is in place.

f. Check water fill and adjust if required.

Holding Switch

a. Remove front cover.

b. Remove mounting plate (3 screws).

c. Disconnect wiring.

d. Remove switch (2 screws).

e. Replace in reverse order, making sure switch insulator is in place.

Shut-Off Switch

a. Remove front cover.

b. Remove mounting plate (3 screws).

c. Raise shut-off arm.

d. Disconnect wiring.

e. Remove switch (2 screws).

f. Replace in reverse order.

Limit Switch

a. Remove front cover.

b. Remove mounting plate (3 screws).

c. Loosen limit switch clip mounting screw.

d. Disconnect wiring and remove limit switch.

e. Apply alumilastic to sensing surface of replacement limit switch and bond to mold.

f. Replace in reverse order.

Mold Heater

a. Remove stripper (1 screw).

b. Remove front cover.

c. Remove mounting plate (3 screws).

d. Detach limit switch from mold.

e. Detach heater leads.

f. Remove mold from support (4 screws).

g. With a flat bladed screwdriver, pry defective heater from bottom of mold.

h. Clean all alumilastic from groove in bottom of mold.

i. Apply new alumilastic to groove in mold.

j. Install replacement heater, using 4 screws in holes adjacent to heater groove.

k. Replace parts in reverse order of removal.

Control (Thermostat)

a. Remove rear panels from cabinet.

b. Remove mounting plate (2 screws).

c. Remove control from plate (2 screws).

d. Remove wires (3 terminals).

e. Remove control element from upper rear cabinet.

f. Straighten 12 inches of element on new control to insert into small diameter aluminum tube control well. CONTROL WILL NOT WORK IF NOT INSERTED IN CONTROL WELL.

g. Assemble in reverse order.

Solenoid Water Valve

a. Shut off water supply.

b. Remove mounting screws (2).

c. Remove electrical connector.

d. Replace in reverse order.

Ice Maker

a. Remove formed rear panel.

b. Disconnect 6 wires.

c. Use allen wrench to remove 2 screws holding Ice Maker to left side wall.

d. Remove 3 hex head screws from bottom of Ice Maker.

e. Carefully pull Ice Maker out of cabinet.

f. Apply alumilastic and assemble in reverse order.

Timing Cam

a. Remove front cover.

b. Remove large white plastic gear.

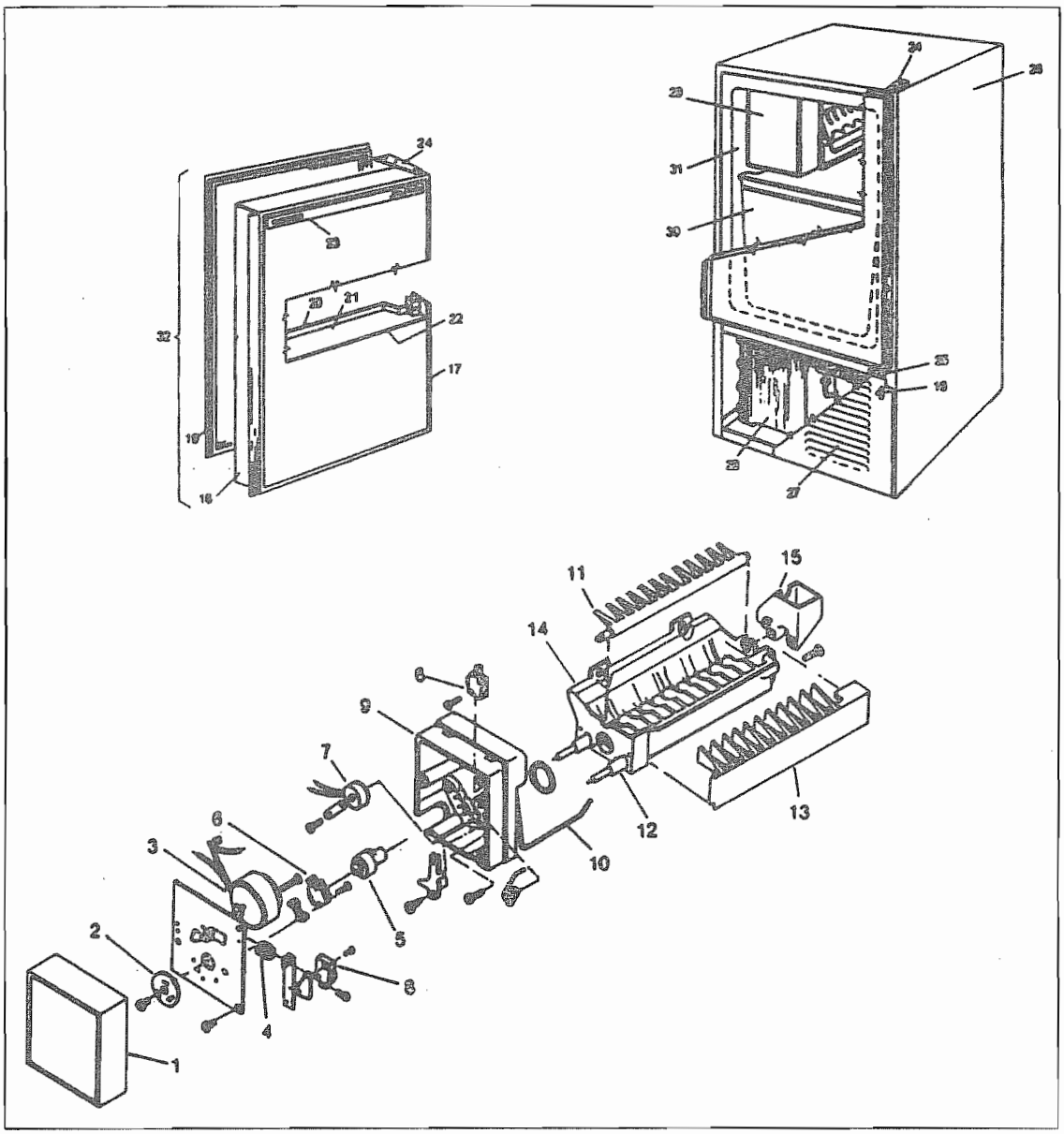
c. Remove mounting plate.

d. Remove plastic timing cam.

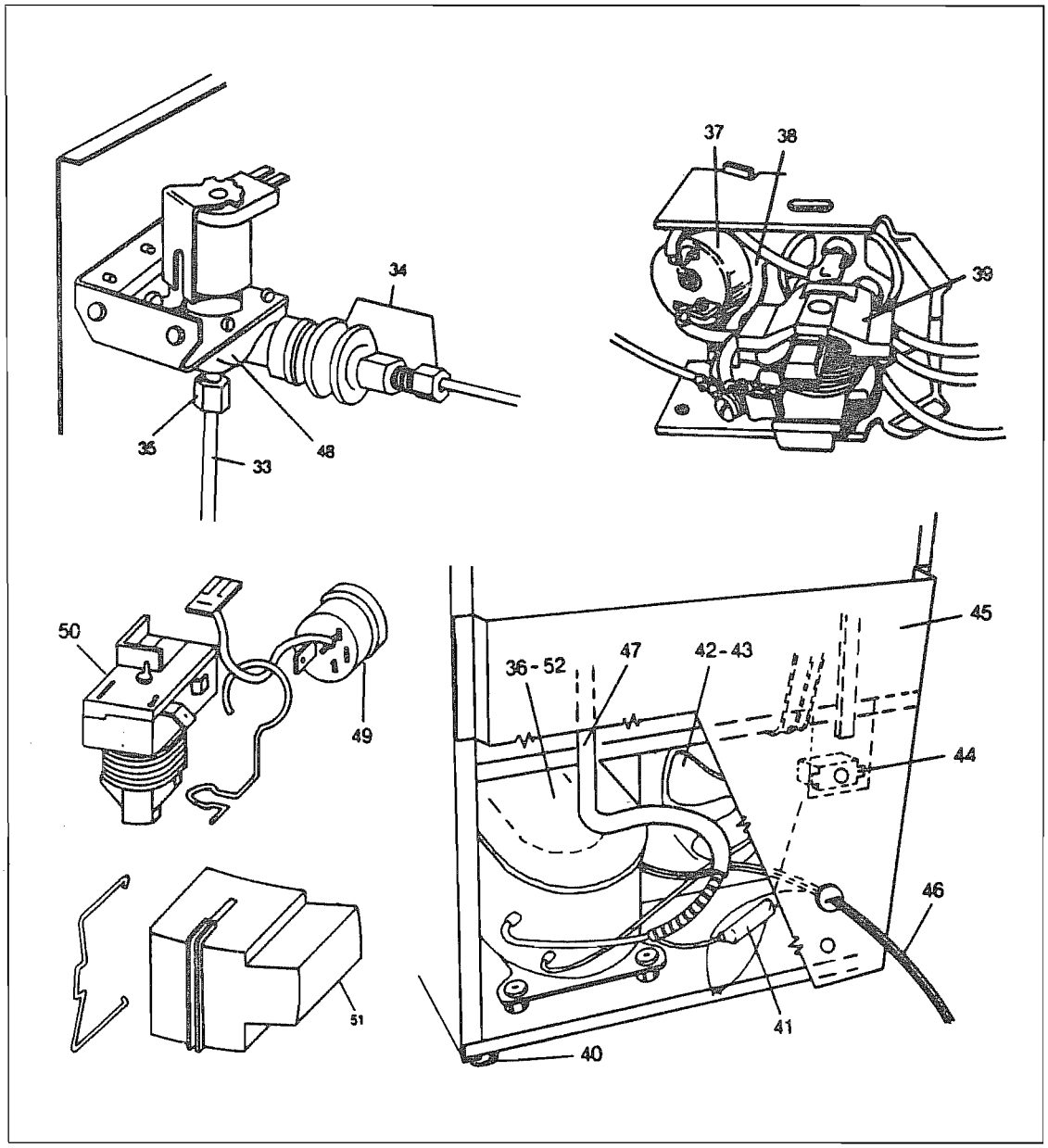
e. Grease new cam with silicone grease.

f. Assemble in reverse order.

ICE MAKER PARTS DESCRIPTION



1. Cover
2. Gear
3. Motor
4. Spring
5. Cam
6. Switch, S.P.D.T.
7. Limit Switch
8. Switch, S.P.D.T.
9. Support
10. Arm, Shut-off
11. Ejector
12. Mold Heater
13. Stripper, Ice
14. Mold & Heater Assy
15. Fill Trough & bearing
16. Switch On-Off
17. Door Frame
18. Handle
19. Door Gasket
20. Inner Door Panel
21. Door Foam
22. Outer Door Panel
23. Name Plate
24. Pivot Hinge, top and screws
25. Pivot Hinge, bottom
26. Outer Shell
27,. Grille (vinyl coated)
28. Condenser Assy
29. Ice Maker Assy
30. Ice Bucket
31. Inner Liner Assy/Evap
32. Complete Door Assy



33. Water LIne
34. Water Line Connection
35. Plastic Nut and Sleeve Assy
36. Compressor
37. Overload
38. Overload Spring
39. Relay
40. Cabinet Foot
41. Dryer
42. Fan Motor
43. Fan Blade
44. Control
45. Back Panel - Formed
46. Power Cord
47. Insulator Tube
48. Solenoid Valve
49. Overload
50. Relay
51. Cover
52. Compressor

HIGH VOLUME ROOF VENT (OPTIONAL)

Manufacturer: Kool-O-Matic
1831 Terminal Road
Niles, Michigan 49120
Phone: 616-683-2600

The optional Kool-O-Matic vent system is designed to quickly exhaust stale, hot air and draw in fresh air. It is great to use when the outside temperature really doesn't call for air conditioning, but has built up in your motorhome.

There are three positions shown on the wall mounted control: OFF, ON and AUTO. Before turning on make sure the "winter" cover, held in place magnetically, has been removed from the vent louvers.

In the ON position the fan will run whenever current is available. The AUTO position makes use of the temperature control. In AUTO the fan will only come on when the temperature setting is reached. When the motorhome is cooled lower than the setting, the fan will shut off automatically until the temperature rises again. The AUTO setting is especially useful as a bedtime setting.

When operating the ventilator open forward and rear windows a few inches to provide flow through ventilation and cooling. The grille dampers should always be open during ventilator operation for proper operation and control cooling.

Cold Weather Grille Cover

The plastic inside grille cover furnished is provided for winter close-off to eliminate back drafts during fall or winter use of your motorhome. Place the cover over the grille, snapping the cover into the two plastic retainers. The cover with the magnetic strips on the outer edge will provide a seal against outside back drafts. During winter storage of your recreational vehicle, the cover should be removed and the dampers opened for ventilation to control condensation inside the vehicle.

A control knob for adjusting the speed of the fan is located in the vent grille.

The only maintenance would be to occasionally wipe the vent grille off with any household type cleaner.

NOTES

SPECIFICATIONS

EXTERIOR DIMENSIONS

Revised

*Height - 290, 325, 345, 350 Series	9 ft.	2 in.
Width - 290, 325, 345, 350 Series	10 ft.	8½ in.
Length - 290 SEries	29 ft.	10 in.
Wheel Base - 290 Series		198 in.
Length - 325 Series	32 ft.	6 in.
Wheel Base - 325 Series		198 in.
Length - 345 Series	34 ft.	6 in.
Wheel Base - 345 Series		204 in.
Length - 350 Series	35 ft.	10 in.
Wheel Base - 350 Series		208 in.

*Roof Air Conditioner - add 14 inches

*CAPACITIES

Potable water, 290, 325 Series	60 gal.
Potable water, 350 Twin	60 gal.
Potable water, 345 Double	60 gal.
Potable water, 350 Island Double	80 gal.
Potable water, 345 Twin and Corner Double	80 gal.
Wash Water Tank, 290	28 gal.
Wash Water Tank, 325, 345, 350	43 gal.
Toilet Holding Tank - 290	25 gal.
Toilet Holding Tank, 325, 345, 350	45 gal
LPG Tank, 290	100 lbs.
LPG Tank, 325, 345, 350	125 lbs.
Fuel Tank, 290	60 gal.
Fuel Tank, 325, 345, 350	80 gal.

*The Rota-molded plastic tanks will vary in actual capacity.

TIRE INFLATION (PSI) COLD

	Front	Rear	Tag
All Models	70 PSI	60 PSI	60 PSI
Chevrolet Front Air Bags	70 PSI		
Airstream Rear Air Bags		Controlled by Leveling Valve	

BULBS

	Lamp No.
12 Volt Incandescent	
Map light, cab	906
Reading light, living room	1139G
Bath light	1141 Clear
Wardrobe light	F95561
Bath light, large	J12BFW
Reading light, bedroom	MR-16
12 Volt Fluorescent	
In direct lighting	F30T8-CW
Ceiling light, long	F15T8-CW
Ceiling light, short	F8T5-CW

CHEVROLET BELTS

Crank, water pump, alternator	GM-10085787UJF DAYCO - GPK1340
Crank, compressor, power steering	GM-14007704XJ DAYCO - .380x59.5 (Hi-ride)
Crank, power steering	DAYCO - 15410

FUEL FILTER (CHEVROLET

In-Line at Fuel Tank	NAPA 3033 or GM854619

WEIGHTS

Model	GVWR
290 Series	14,500 lbs.
325 Series	16,500 lbs.
345 Series	16,500 lbs.
350 Series	17,000 lbs.

I N D E X