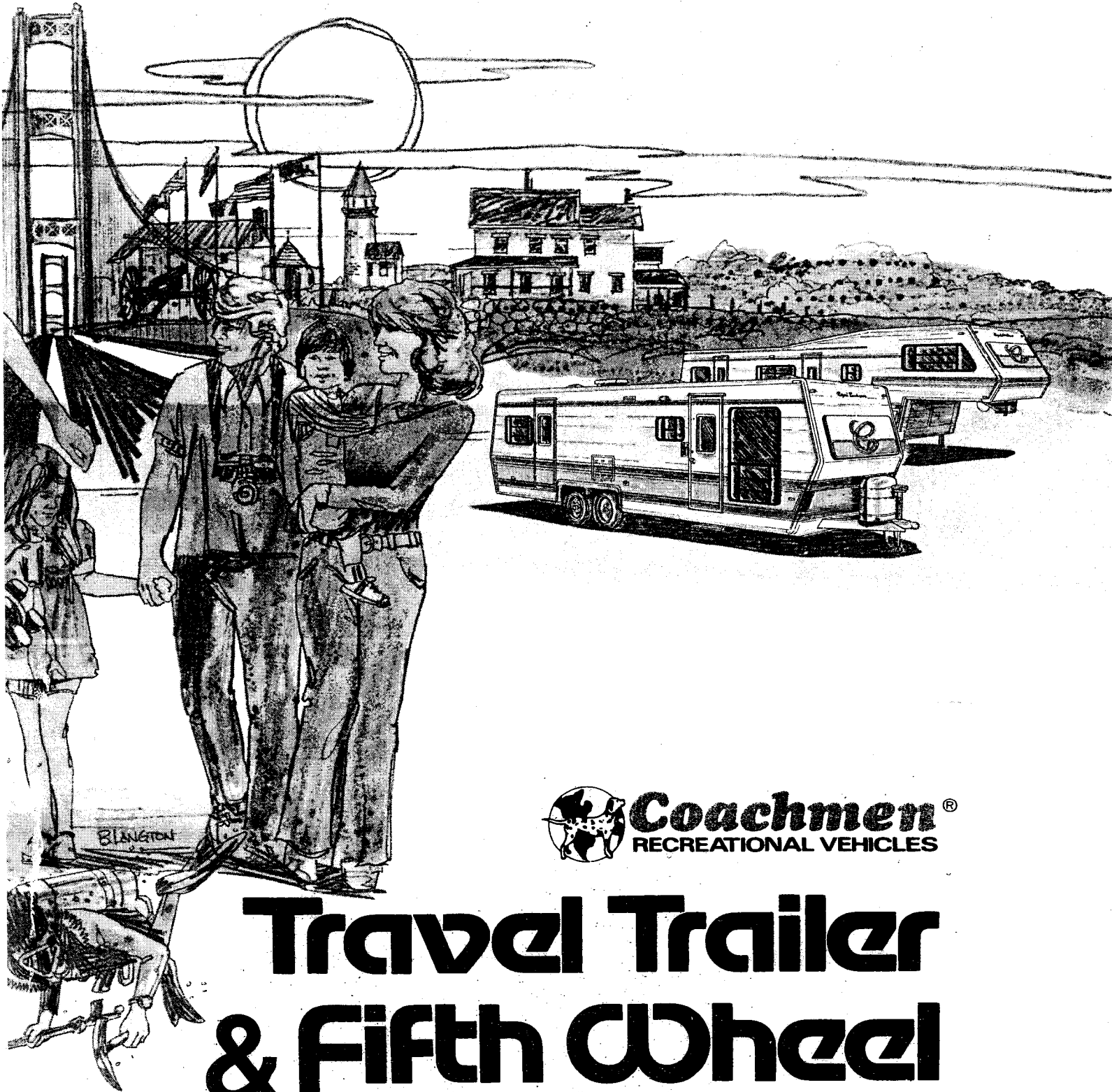


1983 - 1986



Travel Trailer & Fifth Wheel

owner's manual

Welcome to Coachmen's ever-growing family of happy RV owners. Hours of relaxation, adventure and enjoyment are possible for you in your new Coachmen unit. Thousands of Coachmen RV owners have been enjoying their units for many years.

This Owner's Manual has been prepared to help you and your family enjoy your new Coachmen RV to its fullest, by providing basic instructions for the operation and maintenance of its appliances, accessories and RV systems. Read it carefully and follow the instructions. Also read and follow the instructions contained in the appliance and accessory instruction booklets provided by various manufacturers which also are a part of the "Coachmen Information Packet".

Operating and maintenance instructions pertaining to appliances in this Owner's Manual were obtained from and are used with the permission of the various manufacturers. We reserve the right to present edited portions of their material.

Coachmen Industries, Inc., works year-round to improve its products. Accordingly, all specifications, equipment, and prices set forth in Coachmen literature are subject to change without notice or obligation.

Coachmen offers a wide variety of Recreational Vehicle models and choices of standard and optional equipment; therefore, certain descriptions in this manual may not apply to your unit. Ask your Coachmen dealer, or see the current brochure, for information concerning available standard or optional equipment.

JOIN the INTERNATIONAL COACHMEN CARAVAN!

The International Coachmen Caravan is your owner's club. It's designed solely to help you get the most pleasure from owning a Coachmen Recreational Vehicle. For complete information on how to join the Caravan, just write to The International Caravan, P.O. Box 30, Middlebury, IN 46540.

HERE'S WHAT YOUR CARAVAN MEMBERSHIP WILL BRING YOU:

1. CARAVAN IDENTIFICATION PACKAGE

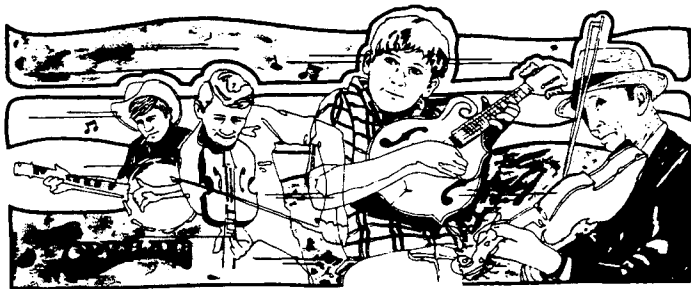
The first benefit a member receives is a complete Caravan Identification Package. The package includes a membership card and Coachmen Caravan decals and unit numbers.

These are all-important items to identify you as a full-fledged Caravanner eligible for all other Caravan benefits.



2. MEMBERSHIP ROSTER

Wherever your RV adventures lead you, you'll find friends with the Coachmen Caravan Roster. The list is organized by Caravan Identification numbers. When you spot another Caravan member — and there are more than 10,000 of them! — refer to your roster. You'll find the members' names, city, state and CB call letters. It's a great way to break the ice and open conversation.



3. MAP SERVICE

Caravan means travel and lots of it! To smooth the road for you and help you plan your trips, Caravan offers a special discount on the Rand McNally Road Atlas.

4. MAGAZINE DISCOUNTS

To help you enjoy all the aspects of RV'ing, Caravan offers its members special discounts on the best enthusiast magazines.

Subscription cards will be furnished at no charge, to be mailed from the Caravan office.

5. CARAVAN TRIPS AND RALLIES

Nova Scotia! Alaska! Florida! California! Interesting places and events are a big benefit of Caravan membership. Each year, the International Coachmen Caravan has several special trips as well as an International Rally.

The professional Caravan staff is constantly striving to develop outstanding tours and events. Traveling to special places with a Caravan of friends is always a memorable experience. It's a great way to get the family together.

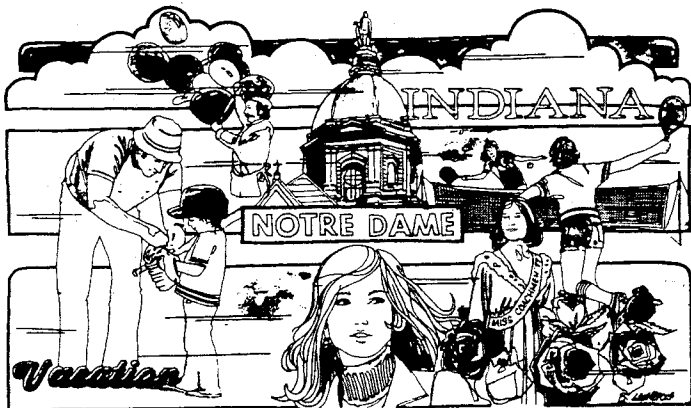
6. CAPERS — YOUR MAGAZINE

Capers is a bi-monthly magazine written for — and largely by — Caravan members. Capers will bring you news of Caravan chapters across the continent as well as news of upcoming trips and rallies, feature articles on the many aspects of owning an RV, recipes for outdoor cooking, etc.



7. PETE'S MARKET

Pete's Market is the Caravanner's mail-order store, chock-full of special items to make your RV adventures more fun. Special decals, patches, clothing, accessories and jewelry featuring our symbol, Pete the Dalmation, are available at very reasonable prices exclusive to Caravan members.



8. DISCOUNT FILM PROCESSING PROGRAM

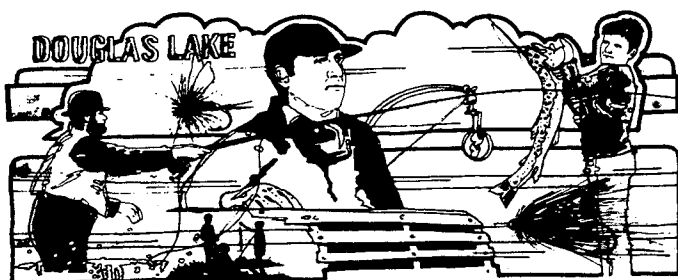
Photographs are the best way to preserve all those memories you'll be making on your Caravan trips and other RV travels. To help you have all the pictures you'll want, Caravan offers members a special discount film processing program. You'll receive an envelope to mail in your film for processing at low, low rates.

9. CAR RENTAL PROGRAM

Wherever you travel, you'll benefit from the Caravan Car Rental Program. All Caravan members are eligible for a discount on car rentals. As a Caravan member, you'll receive a special card identifying you as eligible for this discount. Your family can travel more — for less!

10. DISCOUNTS ON TRAVEL ACCESSORIES

To help you enjoy your travels even more, Caravan members will receive discounts on travel accessories. These items, featured regularly in your Capers magazine, may be purchased through your Caravan office. Write for more information.



11. CAMPGROUND MANUAL DISCOUNTS

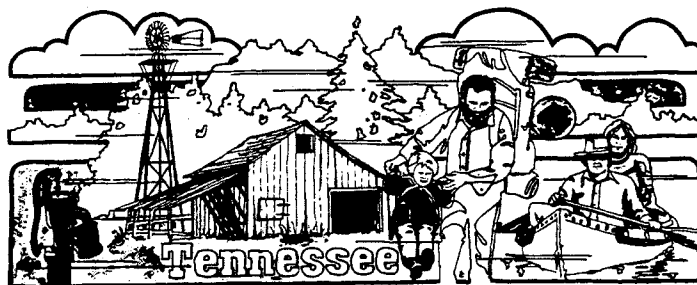
The well-known Campground Guide can really help you on your RV travels, and you can receive them at discount rates.

12. LOCAL, STATE & DISTRICT ACTIVITIES

In Addition to International Caravan trips and rallies, you can enjoy your local, state and district Caravan Chapter activities all through the year. Whenever you feel like getting together with other Caravanners, chances are one of these groups will have an activity planned!

13. PERSONALIZED TRIP ROUTING

Caravan's Personalized Trip Routing Guide will help make your trip planning easier and your travels more enjoyable. Prepared especially for you by the Rand McNally Company, this trouble-free guide provides easy-to-read details on routes you request. Your customized route includes a National Inter-state map, individual state-by-state map routings, as well as maps of major cities on your way.



14. SPECIAL OFFERINGS

Caravan's professional staff is constantly on the watch for extra benefits, in addition to those regularly offered. These may include specials on items or services which may be limited by quantities or seasons. When such benefits do become available, you will be notified by mail, through the Capers magazine or your chapter newsletter.

One, two or three-year memberships are available in Coachmen Caravan. Write or call the Caravan office for details.

Coachmen Caravan-sponsored programs, trips and prices are subject to change without notice or obligation.

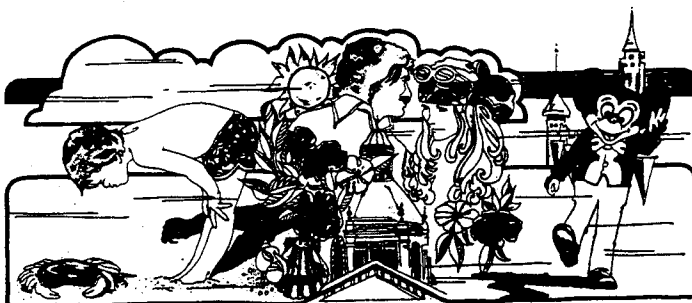


TABLE OF CONTENTS

INTRODUCTION	2	120-VOLT SYSTEM	12
GENERAL.....	2	GENERATOR.....	12-13
LICENSES.....	2	12-VOLT SYSTEM.....	13-14
INSURANCE.....	2	FRESH WATER SYSTEM	14-15
TOW VEHICLE SELECTION	2	GENERAL.....	14
GENERAL.....	2	CITY WATER.....	14
ENGINE SIZE.....	2	WATER TANK.....	14
BRAKE CONTROL/VEHICLE OPTIONS.....	2	WATER PUMP.....	14
HITCH SELECTION.....	2	SINKS.....	14-15
TRAVEL PREPARATIONS	2-4	LEAKS.....	15
GENERAL.....	2-3	DRAINAGE/SEWER SYSTEM	15-16
AIR QUALITY.....	3	GENERAL.....	15
CLOTHING.....	3	TOILET.....	15
CAMP HYGIENE.....	3	HOLDING TANKS.....	15-16
PERSONAL HYGIENE.....	3	DRAIN PIPING.....	16
SAFETY.....	3	LP GAS SYSTEM	16-18
FOOD AND WATER.....	3	GENERAL.....	16-17
MEAL PREPARATION.....	3	CLIMATE DIFFERENCES.....	17
TOOL CHEST.....	3	REGULATOR/CHANGEVER.....	17
ADDITIONAL TOOLS.....	3	FILLING THE LP GAS BOTTLES.....	17
EQUIPMENT.....	3	LP GAS LINE CHECK.....	17
SLEEPING GEAR.....	3	REGULATOR PRESSURE.....	17
ENTERTAINMENT.....	3	LP BOTTLE CARE.....	17
IMPORTANT DOCUMENTS.....	3	LP GAS REGULATOR FREEZEUPS.....	18
TOURIST INFORMATION.....	3-4	APPLIANCES AND ACCESSORIES	18-26
HOME SECURITY.....	4	RANGE, RANGE HOOD, OVEN.....	18-20
TOWING HOOKUP	4-5	WATER HEATER.....	20-21
FIFTH WHEEL.....	4-5	FURNACE.....	21-23
PRE-TRAVEL CHECK	5-6	REFRIGERATOR.....	23-25
GENERAL.....	5-6	ICE BOX.....	25
LOADING	6-7	ROOF AIR CONDITIONER.....	25-26
GENERAL.....	6	AM/FM RADIO AND 8-TRACK OR CASSETTE TAPE PLAYER.....	26
WEIGHT DETERMINATIONS.....	6	TV ANTENNA.....	26
FEDERAL STICKER.....	6	MAINTENANCE	26-28
DEFINITIONS.....	6	GENERAL.....	26-28
TRAVEL TRAILER WEIGHING.....	6-7	STORAGE	28
FIFTH WHEEL WEIGHING.....	7	GENERAL.....	28
DRIVING	7-8	LP GAS SYSTEM.....	28
GENERAL.....	7	WATER HEATER.....	28
CLEARANCE.....	7	WATER TANK.....	28
PULLING INTO TRAFFIC.....	7	WATER PUMP.....	28
TURNING.....	7	ELECTRICAL SYSTEM.....	28
PASSING.....	8	EXTERIOR.....	28
BRAKING.....	8	INTERIOR.....	28
BACKING.....	8	WINTERIZATION	28-29
DOWNGRADES.....	8	GENERAL.....	28-29
UPGRADES.....	8	FIRE SAFETY	29
PARKING ON AN UPGRADE.....	8	SMOKE DETECTOR.....	29
FREEING A STUCK VEHICLE.....	8	EMERGENCY EXITS.....	29
CHANGING TIRE.....	8	VISITING CANADA OR MEXICO	29-30
SWAYING OR FISHTAILING.....	8	GENERAL.....	29-30
CAMPING	8-9	VEHICLES.....	30
CAMPSITE SELECTION.....	8	CB RADIO.....	30
COURTESY.....	9	HUNTING AND FISHING.....	30
LIVING AREA	9-11	DOGS AND CATS.....	30
CONDENSATION.....	9	EMERGENCY CONTACTS	30
SETUP.....	9-10	OUR WARRANTY	31
FIFTH WHEEL SLIDEOUT.....	10	MAINTENANCE SCHEDULE	32
TABLES.....	10	APPLIANCE IDENTIFICATION FORM	33
BEDS.....	10-11	ELECTRICAL SPECIFICATIONS	33
BASIC SYSTEMS	11	EXTERIOR COMPONENTS	34-35
GENERAL.....	11		
ELECTRICAL	12-14		
GENERAL.....	12		

INTRODUCTION

GENERAL

Now that you've purchased your new RV, you're anxious to try it out. And we want you to. We also want you to enjoy every outing, be it an overnight, weekend, or cross-country excursion. Thus, we've included some tips and suggestions besides the basic operation and maintenance of the systems and appliances to help you get started. You may want to try a short trip first. The experience you gain and the hints other RV'ers are usually eager to share will help make your future RV'ing more enjoyable.

You bought your unit with the standard and optional equipment of your choice. There are countless other accessories available. Experience is invaluable before you invest in these. What may be a necessity for another RV'er may not be to you. Remember, your dealer is ready to assist you in anyway he can.

THIS MANUAL INCLUDES MANY ILLUSTRATIONS TO ASSIST YOU. EXTERIOR FEATURES OR COMPONENTS ACCESSIBLE FROM THE OUTSIDE OF THE VEHICLE ARE ILLUSTRATED ON THE FOLDOUT AT THE BACK OF THIS MANUAL AND ARE IDENTIFIED BY A FIGURE NUMBER. BECAUSE OF THE LARGE VARIETY OF MODELS, HOWEVER, YOUR RV MAY NOT HAVE ALL OF THE COMPONENTS ILLUSTRATED OR DESCRIBED. ASK YOUR DEALER FOR DETAILS CONCERNING SPECIFICS ABOUT YOUR UNIT.

LICENSES

The vehicle licensing laws vary from state-to-state. Check with your state license bureau or nearest branch office for the requirements of your state. Be sure to renew your driver's license if it has or will expire during your trip.

INSURANCE

Personal liability, property damage, collision and theft of contents may be features of your automobile policy which apply to your RV. Talk to your insurance agent about details of your coverage. Always carry your policy card.

TOW VEHICLE SELECTION

GENERAL

Selection of an adequate tow vehicle is essential. If you plan to use an automobile or truck you already own, contact the vehicle manufacturer or representative for information about the capacity of your vehicle. If you will be purchasing a new tow vehicle, be certain to tell your dealer the type and size of the RV you will be towing.

ENGINE SIZE

The engine must have enough horsepower to handle the tow vehicle, passengers, your RV and all its cargo. Most automotive manufacturers offer a trailer towing package which may include: larger alternator and battery, heavier ply tires, sideview mirrors, heavier electrical wiring, larger engine and transmission cooling systems. Consult the tow vehicle manufacturer's owner's manual for recommendations.

NOTE: The use of heavier suspension components (springs, shocks, axles) or heavier ply tires DOES NOT increase the weight ratings printed on the tow vehicle's Certification plate. The Gross Axle Weight Rating (GAWR) of each axle is determined by the components within the axle system with the lowest weight-carrying capacity. To avoid overloading, consult the Gross Vehicle Weight Rating (GVWR) and the Gross Axle Weight Rating (GAWR) of your tow vehicle.

BRAKE CONTROL/VEHICLE OPTIONS

A brake control system must be installed in your tow vehicle to operate the electric brakes of your unit. Automotive air conditioning, automatic transmission, power brakes and power steering are features which could make your trips more enjoyable.

HITCH SELECTION

The travel trailer coupler fits a ball hitch and the fifth wheel, a pin-type connection. Ask your dealer about the proper class and type of hitch for your unit. For a travel trailer, a weight-distributing (load-equalizing) hitch may be recommended. This type of hitch helps keep both vehicles level by distributing part of the hitch weight forward to the tow vehicle's front axle and back, to the trailer's axle(s). The selection of the hitch is important since it affects towing and handling characteristics. The ball diameter and hitch weight for your unit are listed in the sales brochure; be certain your tow vehicle can carry the hitch weight. We encourage you to read the information supplied by the hitch manufacturer to achieve best possible performance.

NOTE: The fifth wheel unit can be towed only by a pickup truck. Be sure the truck can carry the hitch weight of your unit. Hitch weights are listed in the sales brochure.

Sway-control devices, also, are available to reduce sway caused by cross-winds, other vehicles passing you, or the tires dropping off the pavement.

TRAVEL PREPARATIONS

GENERAL

When planning a trip, determine various items of equipment, clothing, food and other supplies required for the length and destination of your trip. Each moment spent loading is time lost from the length of your stay. You may want to reduce loading time by purchasing plastic dinnerware, stainless steel

flatware, pots, pans, towels and bedding, which can remain in your unit at all times. The following is a guide to help in your travel preparation.

AIR QUALITY

State of the art construction and energy conserving methods have made indoor air quality a matter of increasing concern. Air infiltration and air exchange rates have been substantially reduced. Thus, certain airborne contaminants, which were previously dissipated by normal air infiltration and air exchange, tend to accumulate in your recreational vehicle. These contaminants may be generated by building products emissions, smoking, cooking, fuel-burning appliances and human activity. Adequate ventilation will reduce the level of air contaminants. Such periodic airing is required on a regular basis and particularly during periods of high temperature and high humidity and after prolonged storage.

CLOTHING

Compile a clothing list for each person. Consider the season and areas through which you intend to travel. Basic articles: Underwear, socks, footwear, shirts, blouses, trousers, slacks, dresses, shorts, sweaters, jackets or coats, rainwear and swimsuits.

CAMP HYGIENE

Dishsoap, dishcloths and dishtowels; garbage and trash bags; mop, broom and dustpan.

PERSONAL HYGIENE

Toilet paper, soap, washcloths, towels, toothpaste, toothbrush, deodorant, and shaving kit.

SAFETY

Flares and reflectors, first aid kit, tow rope and/or chain.

FOOD AND WATER

Don't try to take enough food for an extended trip. Take what you need for two or three days and replenish supplies along the way. Take a basic supply of seasonings: sugar, salt, pepper and spices. Plan meals so that fresh or refrigerated items are used before they spoil. Fill your fresh water tank before leaving (when traveling in winter, it is recommended that the water tank not be filled until the interior of your unit is thoroughly warmed or until you reach your destination).

MEAL PREPARATION

Bottle cap and can opener; matches, lighter or igniter device; pots, pans, plates, glasses, and cups (paper or plastic are lighter and less likely to break while the vehicle is in motion); silverware and carving knife.

TOOL CHEST

Include an assortment of wrenches and screwdrivers, pliers, hammer, tire pressure gauge, small level, electrical and masking tape.

ADDITIONAL TOOLS

Hatchet, saw, shovel, and 12-volt portable tire pump.

EQUIPMENT

Fresh water hose (garden) and bucket; "Y" type water hose fitting; 20-foot 3-prong power cord; 3-prong adapter with grounding wire; fuses; wheel chocks, leveling ramp, blocks or jack stands.

SLEEPING GEAR

Sleeping bags are ideal for cold climates, but are not as well suited for warm weather as are sheets and blankets. Take along an extra blanket or two for sudden drops in temperatures such as can be expected in mountain areas even during summer. Be sure to take pillows, pajamas and mattress pads, if normally used.

ENTERTAINMENT

Take along games, toys, books, magazines, tape player/recorder, binoculars, camera, film and flash equipment, sports gear, or other items of entertainment to enjoy at stops, while traveling or in the event of inclement weather.

IMPORTANT DOCUMENTS

Carry your vehicle registration and insurance policy card(s). If you are borrowing a vehicle, it is best to have a notarized letter of approval from the owner with you.

TOURIST INFORMATION

Obtain current road maps and tourist information from each state through which you intend to travel. You also may want to purchase a tourist guide book.

If you will be visiting federally-operated national parks, monuments and recreation facilities, you may wish to look into the Golden Age Passport and the Golden Eagle Passport. They can help families cut spending at those areas where fees are involved.

GOLDEN AGE PASSPORT — The Golden Age Passport is a free lifetime pass for persons 62 and over and covers all admission fees and a 50 percent discount on use fees (except fees charged by private concessionaires). It may be obtained only at park service offices and at parks where entrance fees are charged. It cannot be obtained by mail or at post offices. To obtain the Golden Age Passport you will need proof of age, such as a driver's license, or be prepared to sign an affidavit swearing that you are 62 or over. NOTE: Medicare cards are not accepted since in some cases they are issued to younger persons.

GOLDEN EAGLE PASSPORT — The Golden Eagle Passport costs \$10 and is designed for persons who plan to visit several parks or federally operated facilities in a single year. It covers all admission charges, but does not cover use fees and is good only during the calendar year in which it is issued. It may be purchased in person or by mail at the

National Park Service headquarters, Department of the Interior, Washington, D.C. 20240; at regional offices and at facilities where entrance fees are charged.

Both the Golden Age and Golden Eagle Passports cover admission fees for the permit holder and any persons accompanying him or her in a private vehicle. Where entry is not by vehicle, the passport covers the permit holder and members of his or her immediate family.

HOME SECURITY

Make arrangements for someone to check your house periodically. Stop mail and newspaper delivery. If you intend to be away for more than 2 weeks, request police surveillance. Carry an extra set of vehicle and house keys on a separate key ring.

TOWING HOOKUP

COUPLER — Turn the front jack crank clockwise (or activate your power jack) to raise the coupler above the hitch ball. Maneuver the tow vehicle to position the ball directly under the coupler. Push the coupler lever down and then pull it up to its fullest extent (Figure 1). Turn the front jack counterclockwise (or activate your power jack) to lower the coupler onto the ball. Secure the connection by pushing the coupler lever down until the two latch shoulders rest on the top surface of the coupler. For theft protection, you may purchase a locking device to insert through the coupler lever and the bracket holes.

FRONT JACK — Turn the crank counterclockwise (Figure 1) until the dolly wheel is off the ground. Remove the wheel and store. Continue turning the crank until the front jack is as high as possible to prevent it from hitting the ground while you are traveling. If you have a power front jack, activate the switch and fully retract the jack. Depending upon the model of power jack, you may have to remove the switch cover before activating the switch; be sure to replace the switch cover.

SAFETY CHAINS, ELECTRICAL CONNECTIONS — Cross the safety chains under the "A" frame and attach them to the tow vehicle's hitch platform. Plug the pigtail (Figure 1) into the tow vehicle's electrical harness. Leave enough slack in the chains and pigtail to permit the unit to turn freely. Safety chains and pigtails should not be touching the ground.

BREAKAWAY SWITCH — This safety device (Figure 2) will automatically activate the electrical brakes of your RV if it should accidentally become separated from the hitch.

Attach the switch activating cable either to the tow vehicle bumper or the towbar portion of the hitch platform. **DO NOT** loop the cable around the hitch ball; this is the weakest part of the hitch platform. Adjust the cable length so it pulls the pin out of the switch before the coupler drops onto the safety chains. Allow enough slack so that

both vehicles turn freely without pulling the pin from the breakaway switch.

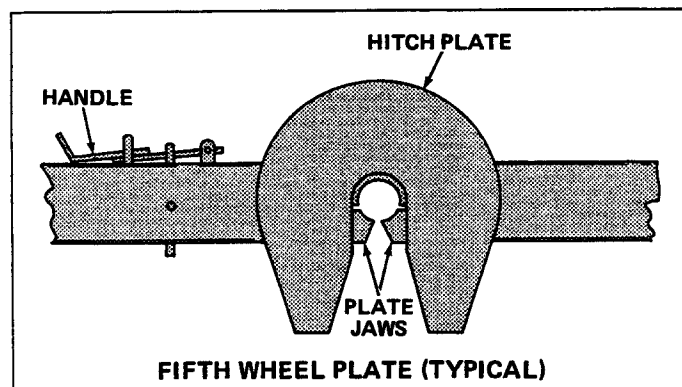
Lubricate the pin periodically to ensure good separation. Make certain the pin is securely in place each time before using your trailer.

NOTE: *The tow vehicle battery will supply power to your unit's brakes if a separation occurs. However, if the pigtail also disconnects, the unit's brakes WILL NOT work unless an RV battery has been installed. DO NOT use the breakaway switch as a parking brake; it is intended for emergency use ONLY! Keep batteries charged at all times to ensure safe operation.*

HITCH BALL HEIGHT — When the loaded trailer is hitched to the tow vehicle, check the hitch ball height, which can be determined by measuring from the top of the curved portion of the coupler to the ground (Figure 1). Adjust the equalizing bars of the hitch assembly to achieve proper height. A high hitch will transfer weight behind the axle(s), causing the unit to fishtail. A low hitch will transfer additional weight to the hitch. See the sales brochure for proper hitch ball height. If you cannot obtain a copy of the brochure, contact the Service Department at the address on the back cover of this manual.

FIFTH WHEEL

HITCHING — Lower or remove the truck tailgate. Release the plate jaws by pulling the handle until a snap is heard. Back the truck up until the pin (Figure 3) is caught by the jaw plates; another snap will be heard. It may be necessary to activate your electric jacks or to turn the jack crank (Figure 4) clockwise to raise the unit or counterclockwise to lower the unit to align the pin with the jaw plates. Once connected, activate your electric jacks or turn the jack crank counterclockwise to raise the jacks as far as possible.



ELECTRICAL CONNECTION — Plug the pigtail (Figure 3) into the electrical harness of the truck. Be sure there is enough slack to allow the vehicle to turn without disconnecting the pigtail.

BREAKAWAY SWITCH — Attach the activating cable (Figure 3) to the truck body. **DO NOT** attach the cable to the plate handle, hitch plate base or plate mounting brackets. Adjust the cable so both

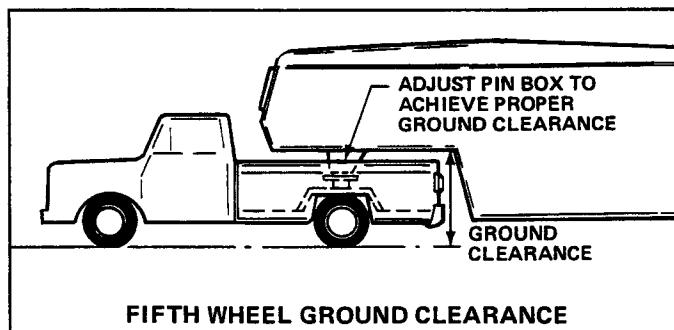
vehicles may turn freely without pulling the pin from the switch.

Lubricate the pin periodically to ensure good separation. Make certain the pin is securely in place each time before using your trailer.

NOTE: The tow vehicle battery will supply power for your unit's brakes if a separation occurs. However, if the pigtail also disconnects, the unit's brakes **WILL NOT** work unless an RV battery has been installed. **DO NOT** use the breakaway switch as a parking brake; it is intended for emergency use **ONLY!** Keep batteries charged at all times to ensure safe operation.

GROUND CLEARANCE — When the loaded unit is connected to the tow vehicle, check the ground clearance. The proper height is listed in the sales brochure. If you cannot obtain a copy of the brochure, contact the Service Department at the address on the back cover of this manual.

If the front of the unit is too high, weight will be transferred behind the axle(s) causing the unit to fishtail. If the front of the unit is too low, additional weight will be transferred to the truck. To achieve proper height, adjust the pinbox by removing the bolts on each side; raise or lower the box until the proper holes are aligned, then reinsert and tighten the bolts.



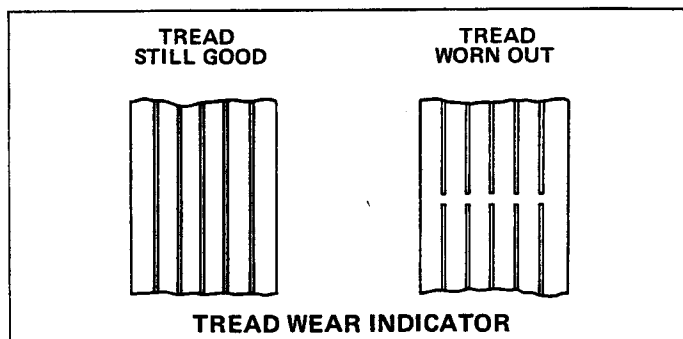
PRE-TRAVEL CHECK

GENERAL

Whether departing from your home, rest area, or campsite, you should perform these pre-travel checks:

TIRES should be inspected before each trip. Replace a tire when it is worn to 1/16" depth in two or more adjacent grooves, or to the level of tread indicators molded into the bottom of the tread grooves, when the indicators appear in two or more adjacent grooves at three locations around the tire. Check tire for uneven wear, road damage, foreign objects, or excessive peeling or bulging.

When purchasing a new tire, be certain it is the same size and has the same ply rating and load range as the old tire. **DO NOT** mix radial ply with bias or bias-belted tires.



Each morning inspect tire condition and pressure on your unit. Heat generated by surface friction will increase the tire's air pressure approximately 6 to 9 psi; therefore, do not bleed air out of a hot tire. Inflate tire to recommended pressure as indicated on tire or in tire manufacturer's instruction booklet.

NOTE: Proper tire inflation is extremely important.

WHEEL LUGS must be tightened before departure and the first 50, 150 and 300 miles during your initial trip and after each tire change. Thereafter, tighten lugs periodically and before using unit after a storage period.

LIGHTS should be tested on both the RV and the tow vehicle, including brake lights, warning flashers, clearance lights, taillights and tow vehicle headlights. Clean all lens covers.

REARVIEW MIRRORS should be adjusted so the driver can see both the right and left side of the unit.

POWER CORD (120-Volt Shoreline) must be unplugged from the external source, pushed into its compartment and the cord hatch secured.

WATER FILL hoses must be disconnected and the caps secured.

SEWAGE TERMINATION VALVES must be closed and locked. The sewer hose must be removed from the termination valve outlet and stored in the rear bumper. Termination caps must be securely fastened to the termination valve outlet(s).

DOOR STEP (Figure 23) must be returned to its traveling position by lifting front edge of step and pushing it under the unit.

WINDOWS AND VENTS should be closed and secured or adjusted as desired.

TV ANTENNA must be cranked down to its traveling position.

LP GAS BOTTLES and connections should be secured.

NOTE: Some states prohibit vehicles equipped with LP gas bottles from using tunnels. A few other states prohibit traveling with the Service valve open and the pilots lit. Check the regulations of the states through which you intend to travel.

AWNING should be lowered and secured (Figure 5). To raise awning, pull retaining pins out and slide awning up. Tighten wing nuts to secure at desired height. To lower awning, loosen wing nuts and slide awning down. Pull retaining pins and seat in latch hole.

PIGTAIL should be properly connected to the tow vehicle's electrical harness.

HITCH AND COUPLER OR PINBOX should be inspected to be sure they have not loosened.

SAFETY CHAINS AND BREAKAWAY SWITCH ACTIVATOR CABLE must be properly attached to the tow vehicle.

FRONT JACKS must be raised as far as possible.

DOLLY WHEEL must be removed and stored.

AUTOMOTIVE SYSTEM should have pre-travel check as outlined in tow vehicle manufacturer's owner's manual.

INTERIOR DOORS AND DRAWERS should be closed and secured. Loose items should be lashed down or stored away.

EXTERIOR ACCESS DOORS for storage and equipment should be closed and locked.

REFRIGERATOR DOOR should be secured with the travel latch.

STABILIZING JACKS should be removed and stored, or if permanently attached, completely retracted and snugged up.

LOADING

GENERAL

A properly-loaded vehicle is safer and easier to tow. Distribute your cargo evenly from side-to-side and front-to-back.

Heavier items should be stowed on or near the floor and as centrally as possible. They should be secured so they cannot slide during a panic stop, causing damage — but also because loose cargo can upset the careful balance you had when you started. Lighter items can be stored in overhead cabinets or other areas. Remember to leave space and weight allowance for souvenirs and other items you may purchase during your travels. A properly-loaded unit can help you conserve fuel and prevent excessive wear on your tow vehicle's automotive system.

WEIGHT DETERMINATIONS

It is extremely important that you weigh your unit BEFORE leaving on a trip to determine whether your cargo load is within the allowable limits for the various suspension components of your RV and tow vehicle. Check the Gross Axle Weight Rating (GAWR) and the Gross Vehicle Weight Rating (GVWR) found on the Federal Certificates attached to each vehicle.

FEDERAL STICKER

The Federal Sticker (or certificate) lists the unit Serial Number, the front and rear GAWR and the GVWR. It is affixed to the left front corner of your RV. Your tow vehicle has a similar sticker and the ratings shown on each sticker are for the specific wheel and tire sizes listed.

MFD. BY (RV MANUFACTURERS NAME) _____ GVWR _____ GAWR FRONT _____ GAWR REAR _____ WITH 8.55-15 STIC() _____ RIMS, AT 50 PSI COLD SINCE _____ THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE. VEHICLE ID. NO. _____ TYPE: TRAILER

FEDERAL STICKER

DEFINITIONS

GAWR — The allowable weight, including cargo, which can safely be supported by each axle.

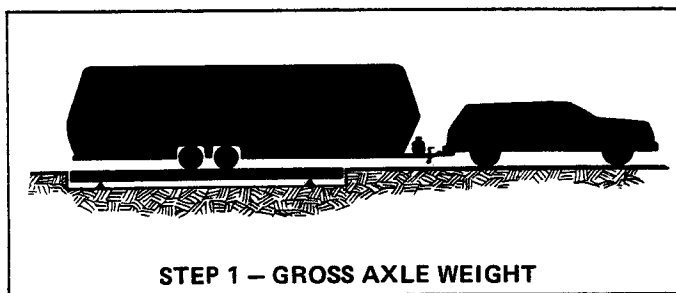
GVWR — The maximum permissible weight of your unit, all options, passengers and cargo.

GVW and GAW — These are found by weighing the vehicle fully-loaded. GVW is the actual weight of the unit and all standard and optional equipment, cargo and passengers. GAW is the portion of the fully-loaded vehicle which is transferred to each axle.

TRAVEL TRAILER WEIGHING

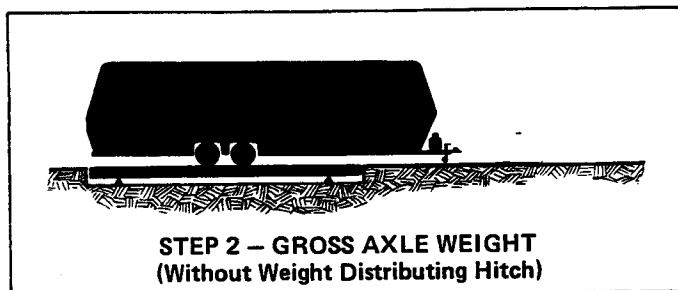
You can weigh your vehicle at a nearby grain elevator, sand and gravel dealer, coal company or government weighing station (they are listed in the yellow pages of your telephone book). Make an appointment to weigh your unit, fully-loaded. The small fee is an investment in safe traveling and peace of mind.

STEP 1 — As shown, pull your fully-loaded and hitched-up trailer onto the scale, stopping with the trailer axle(s) on the scale. This will give you the Gross Axle Weight. The figure must not exceed the GAWR of your unit. If it does, shift or remove cargo to achieve proper tolerance.

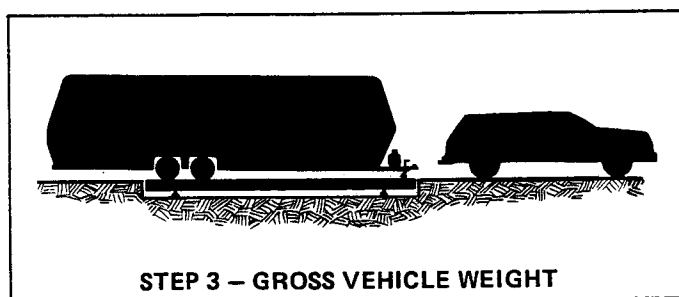


STEP 2 — Lower your front jack and unhitch the trailer so that the trailer axle(s) are on the scale, but the front jack is off the scale. This will give you

the Gross Axle Weight, without any of the weight being shifted by a weight-distributing hitch (if one is used). Note this weight; it will be used later to determine Hitch Weight.



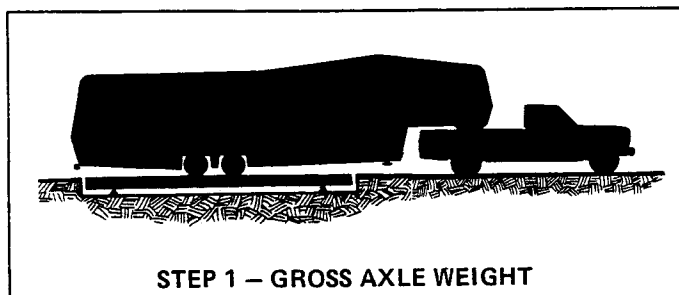
STEP 3 - Move the trailer so that the axle(s) AND front jack are on the scale. This will give you the Gross Vehicle Weight. This figure must not exceed the GVWR. If it does, remove cargo to achieve proper tolerance.



STEP 4 - Subtract the figure you obtained in Step 2 from the figure you obtained in Step 3 to arrive at the Hitch Weight. If the Hitch Weight exceeds 15% of the GVW, shift some of the trailer load rearward to arrive at the proper hitch load. If the Hitch Weight is below 10% of the GVW, shift some of the trailer load forward to arrive at the proper hitch load.

FIFTH WHEEL WEIGHING

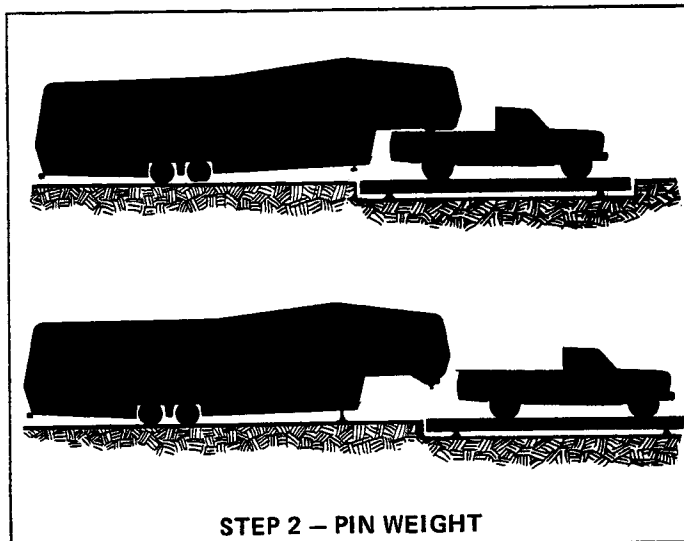
STEP 1 - As shown, pull fully-loaded and hitched-up fifth wheel onto the scale, stopping with the axle(s) on the scale. This will give you the Gross Axle Weight. The figure must not exceed the GAWR of your unit. If it does, shift or remove cargo to achieve proper tolerance.



STEP 2 - To determine the pin weight of the fifth wheel, first weigh the tow vehicle, fully-loaded with cargo and passengers and the fifth wheel connected. Then disconnect the fifth wheel and weigh the tow vehicle alone. The difference will be the

pin weight, which should not exceed 25% of the Gross Vehicle Weight of the fifth wheel. If it does, move articles to achieve proper tolerance. GAW plus Pin Weight equals GVW.

The procedure for finding fifth wheel GVW is the same as for travel trailers, Step 3.



TIPS ON RE-LOADING - Avoid a drastic change in load placement when you break camp. Try to have "a place for everything and everything in its place."

NOTE: Refer to your tow vehicle owner's manual for additional information on towing and weight allowances or procedures to follow.

DRIVING

GENERAL

Get to know how your tow vehicle handles with the added weight of your RV. The brakes and steering operation will be different. Before leaving on a trip practice making right and left turns, braking, backing up and accelerating. Below are tips to help you in your driving.

CLEARANCE

Watch out for overhanging tree branches, awnings, or similar obstructions which can damage your vehicle's roof or equipment or accessories mounted on the roof. Refer to the brochure for the clearance measurements of the unit.

PULLING INTO TRAFFIC

Check for oncoming traffic in all directions. Signal before entering the traffic flow. Accelerate slowly and smoothly.

TURNING

The wheels of your RV are set wider than those of your tow vehicle. Pull several feet farther ahead before turning to allow for this extra width and the length of your RV to avoid hitting curbs or parked vehicles.

PASSING

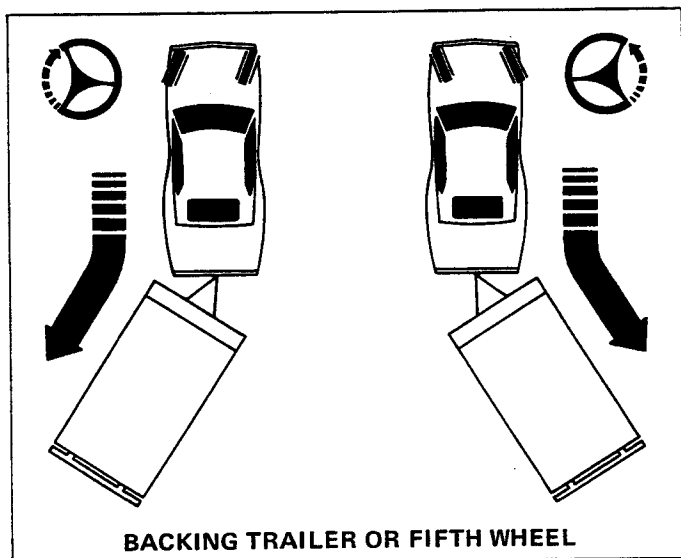
Avoid sudden maneuvers when passing a slower moving vehicle. Remember that additional time and distance are required to pass safely. Wait until the road is clear of oncoming traffic for at least 1/2 mile. Check the outside rearview mirrors and signal lane change before passing. When you have safe clearance, signal lane change and return to your original lane.

BRAKING

Allow a safe distance to stop; follow no closer than one combined tow vehicle-RV length for each 10 mph. Pump the brake pedal lightly to stop on wet or icy roads. If you start to slide, turn the steering wheel in the direction of the slide. **DO NOT** tromp the brake pedal — a panic stop may increase the slide and could cause your unit to jackknife.

BACKING

When backing your RV, place your right or left hand at the bottom of the steering wheel. To move your trailer to the left, move your hand to the left; to move the trailer to the right, move your hand to the right. If the trailer starts to jackknife, stop, pull forward and start again. This maneuver may require stationing someone behind the unit to guide the driver.



DOWNGRADES

Speed should be reduced, shift the transmission to a lower range to assist in braking on long or steep downgrades.

UPGRADES

Reduce speed to 45 mph or less when climbing a steep upgrade. Shift the transmission to a lower gear to avoid engine overheating.

PARKING ON AN UPGRADE

Parking vehicles on an upgrade is not recommended. If it is necessary, apply the brakes and have a passenger place wheel chocks behind the tires of

your RV. When in place, slowly release brakes until unit is stopped by chocks. Apply parking brake and place transmission in park position (place in gear for stick-shift vehicles).

FREEING A STUCK VEHICLE

To pull your unit out of the mud, sand or snow, apply light pressure on the accelerator pedal and move the gear selector rhythmically between 1st gear and reverse. If possible, keep front wheels pointed straight ahead. Avoid sharp turns which could cause the unit to jackknife. Once you start to move, do not stop until the tow vehicle and RV are on firm ground.

CHANGING TIRE

Turn on tow vehicle's hazard warning flashers. Set up flares or warning lights. Chock opposite tire and unhitch trailer from tow vehicle. Place scissors-type or hydraulic jack, on a block of wood, directly **UNDER THE FRAME**, close to the tire you intend to change. **DO NOT** use a bumper jack; it may damage the sidewalls or floor board. Raise the jack to take some of the weight off the tire. Loosen the lug nuts. Raise the jack until the tire clears the ground, then remove lug nuts. Pull off the old tire and put spare on hub. Replace and tighten nuts. Lower the jack until the tire just touches the ground. Tighten lug nuts to a torque of 85 to 95 ft.-lbs. Lower and remove jack. Stop at the nearest service facility and have the torque checked.

You may have to replace the lug nuts after changing tires five times. These nuts may lose their self-locking feature after that many changes.

SWAYING OR FISHTAILING

If this happens, accelerate, then gradually slow down. If you have an automatic brake controller installed by your hitch assembly dealer, apply only the brakes of your RV. If your unit is still swaying, pull off the road and check the tire pressure, cargo location, or tow vehicle front end alignment and suspension.

CAMPING

CAMPSITE SELECTION

Some campgrounds do not accept reservations, but make one whenever you can. If possible, arrive early so you may inspect and choose a site during daylight hours. Try to avoid sites near a swamp, stream or other bodies of water which may harbor mosquitoes or other insects. Avoid parking under dead trees or loose limbs which might fall and cause injury or damage. Stay away from areas which show signs of flash flooding. **DO NOT** park on private property without first obtaining permission.

In winter, park behind a grove of trees, bushes or similar type of windbreak. Close the gap between the ground and the bottom of your vehicle's outside walls with plastic, canvas or similar material. This will cut down cold drafts which can affect interior temperatures.

COURTESY

Common courtesy will help make your stay more pleasant. Campsites are often close together and RV walls are not as thick as those in your home, so loud noises may disturb your neighbors. Follow the posted rules of the campsite. Open fires may not be permitted. If you can build a campfire, clear the area of flammable materials; never leave a campfire untended and always make certain the embers are completely extinguished.

LIVING AREA

CONDENSATION

Condensation can be a problem in modern, tightly-constructed, well-insulated recreational vehicles. When the unit is tightly closed, especially in cold weather, the relatively-small air volume in the RV can absorb only a certain amount of moisture. When the saturation point is reached, the moisture is released in the form of condensation. Certain amounts of condensation should be expected, especially on cool surfaces such as windows and metal door frames. However, excess condensation can damage walls and ceilings.

Bathing, dish washing and laundry, appliances and unvented gas burners are among causes of added moisture in the air. You can control this by allowing the moisture to escape to the outside. Use your vent hood and fan when cooking; keep bathroom door closed and the vent or window open when bathing (and for even a period of time when you have finished bathing, to allow for dissipation of all the moisture); don't hang wet clothes in your unit to dry; and if you have a clothes dryer, be certain it is vented to the outside.

In hot weather, air conditioning can help make you more comfortable because it removes excess humidity from the air, while lowering the air temperature.

You can check on the humidity in your unit by installing a humidistat or hygrometer, which measure relative humidity. If humidity levels are persistently high, particularly in winter, a dehumidifier may be necessary.

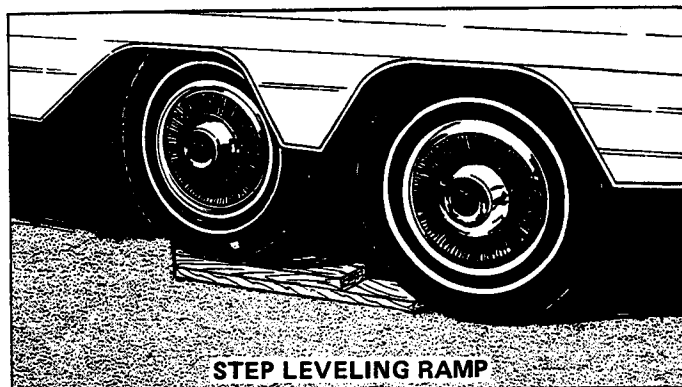
If you use skirting on a temporary basis, be sure that it is ventilated adequately.

SETUP

You'll want your unit to be level for your own comfort (you don't want items sliding off counters and tables and out of cabinets). But more importantly, the unit must be level in order for your refrigerator and drainage system, both of which function by gravity, to operate properly. Place a level on the bottom of the refrigerator's freezer compartment or in a normally level location inside the vehicle to determine levelness.

NOTE: Once the unit is level side-to-side and front-to-back, you may wish to permanently attach levels on the front and/or back and sides

of the RV. This will allow you to tell at a glance if you've stopped on a level site and will help speed up the leveling process.



If the unit needs side-to-side leveling, dig a shallow hole under the tire(s) on the high side, or you may make a step leveling ramp using 1" x 6" or 2" x 6" boards of varying lengths. Pull forward or back onto the leveling ramp until the tire(s) on the low side are level.

To level a travel trailer from front-to-back, unhitch the unit from the tow vehicle, install the dolly wheel and crank or run the front jack down (Figure 1). Never rest the unit on the front jack without the dolly wheel attached, or without a board under it (a dolly wheel is not recommended with a power jack). If the ground or surface is soft, place a board under the dolly wheel or jack. Disconnect the safety chains, the pigtail and breakaway cable from the tow vehicle. Move the front jack up or down until the unit is level.

Jack stands (available from your dealer) may be placed under the frame to eliminate sway when persons move about inside the unit (some RV's will have permanently-mounted stabilizing jacks). For jack stands, lower the front jack about 2" below level. Place a jack stand under both main frame members — **NEVER AGAINST THE FLOOR** — at the rear of the trailer. Raise each jack until it touches the frame. Raise the front jack about 2" above level and place jack stands under the main frame members near the front of the unit. Raise the jacks until they touch the frame, then lower the front jack to level.

If your unit has the power front jack (Figures 20 and 21), you may have to remove the switch cover to run the jack up or down. The switch is spring-loaded and will return to the OFF position when released. If your power jack has a switch cover, be certain to replace it when not using the switch. Familiarize yourself with the direction of travel of the jack post and the corresponding switch direction. If a power failure occurs, remove the power head by loosening the two allen set screws. The jack post then may be operated manually by inserting the emergency handle into the coupling on top of the post.

If your unit has permanently-mounted stabilizing jacks (Figure 22), unhitch the unit, then obtain a fore and aft level using the unit's front jack. Check

level for low side of trailer (some parking areas will require the use of a leveling ramp on the low side of the trailer). Lower the stabilizing units on the LOW side of the trailer, bringing the trailer to a FINE LEVEL position. Lower the stabilizers on the opposite side of the trailer to the ground and FIRM UP. An angle of 55 to 60 degrees provides best stabilization. Before moving your trailer, crank stabilizers to FULLY CLOSED position, then give another quarter turn to snug up.

CAUTION: Stabilizer jacks are designed for FINE LEVELING AND STABILIZING ONLY. Do not attempt to use them for jacking purposes or to support the full weight of the trailer.

To level the fifth wheel, lower front jacks (Figure 4). Place a board under each jack skid on soft or frozen ground. Disconnect pin hitch, pigtail and breakaway cable. Drive tow vehicle away. Level unit by moving jacks up or down. Install jack stands at the rear of the fifth wheel by lowering the front jacks 2" below level and placing jacks under the rear main frame members — NEVER AGAINST THE FLOOR. Raise jacks until they touch the frame, then raise front jacks to level.

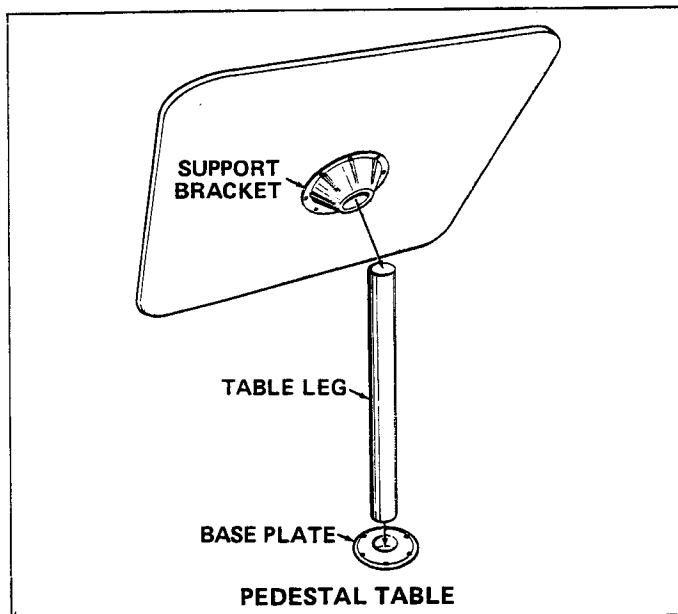
FIFTH WHEEL SLIDEOUT

Some models of fifth wheels may have slideouts. They should be set up according to the instructions on the insert provided with this manual. Be certain to set up and level your fifth wheel before setting up the slideout.

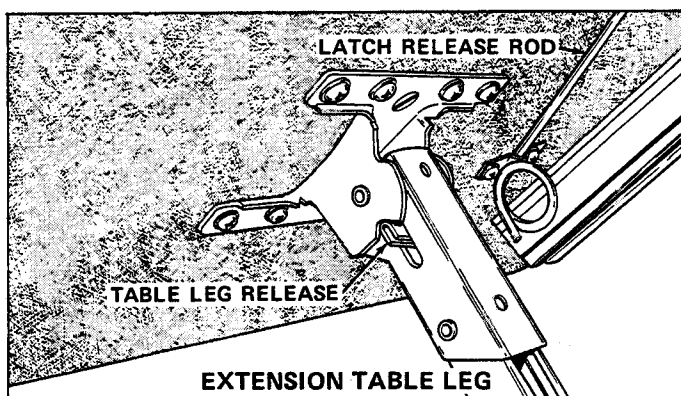
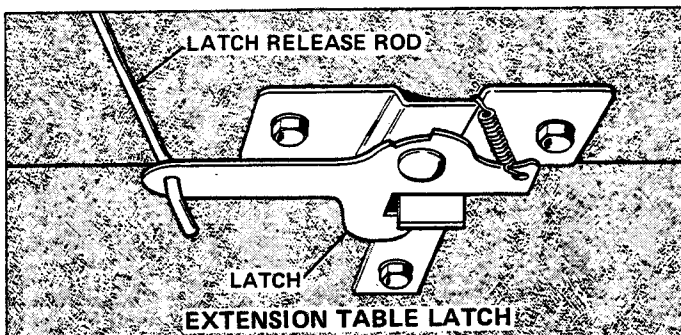
TABLES

A variety of tables are installed in the manufacturer's RV's. Some are stored in box enclosures, which may allow the table to swing out or may require that the table be lifted from the top. Some table tops have extensions. Have your dealer demonstrate the setup of the table(s) in your unit.

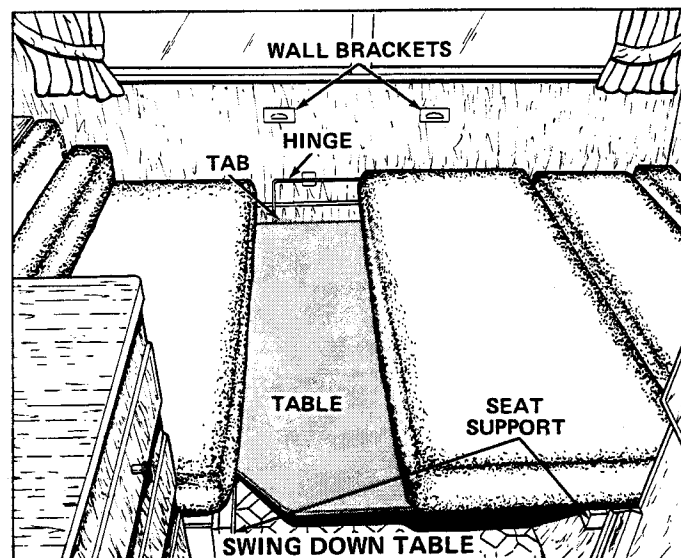
PEDESTAL TYPE — Insert table leg(s) into the base plate(s). Lower table support bracket onto the legs.



EXTENSION TYPE — Swing table up (some tables may have travel latches, which must be unfastened first) and pull leg down. If table has an extension leg, push the release and allow the inner leg to drop to the desired length, then let lock pin seat in hole to hold leg at proper height. To add table leaves, pull on the latch beneath the table and pull out the sliding portion of the table. Insert leaf or leaves and push table together.

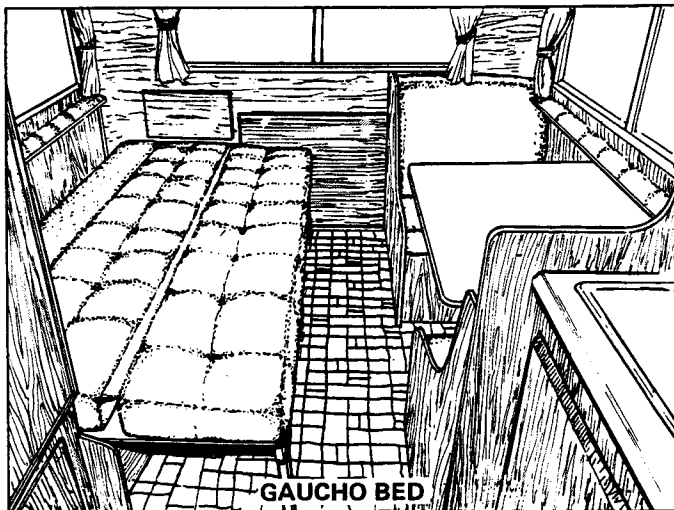


SWING DOWN TABLE — Pull table toward you and up, then push it toward wall. Insert brackets at back of table into the wall supports. Pull the leg down.



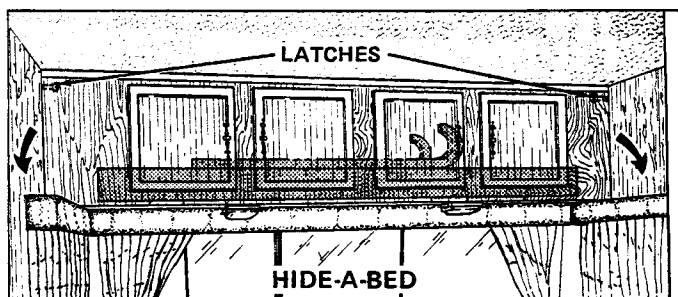
BEDS

GAUCHO TYPE — Remove table. Lift front edge of lounge platform and slide it out. Arrange cushions on platform.



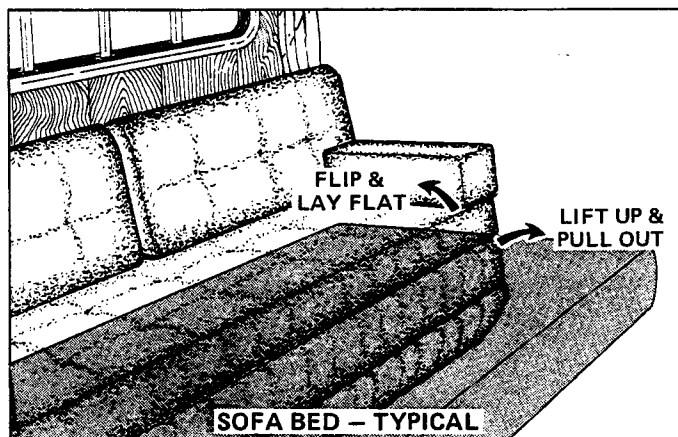
GAUCHITO BED

HIDE-A-BED TYPE — Release latches located at each end of cabinet front. Close and latch the cabinet doors. Swing cabinet face down so that it rests on the supports. Position the reinforcing boards on top of the cabinet face. Arrange cushions on platform.



HIDE-A-BED

SOFA — Several types of sofas are used. Some are ready to be used as a bed when the bottom is pulled out and the back folded down; others need to have the back cushions removed and the bottom of the seat flipped back as part of the mattress. Be certain your dealer instructs you in the proper operation of the type of sofa bed in your unit.

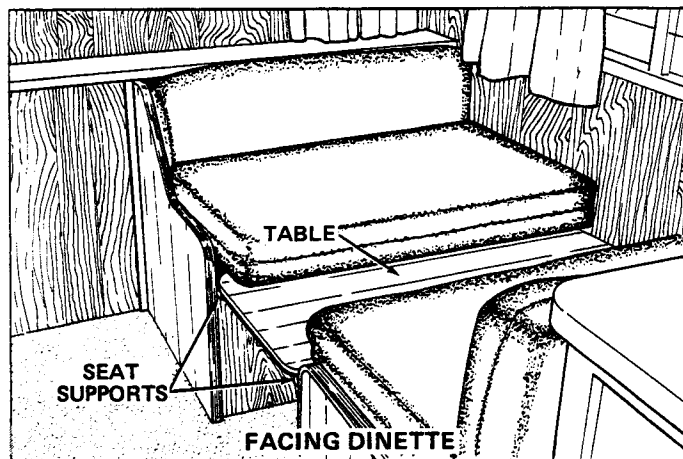


SOFA BED — TYPICAL

CABINET BUNK — Open both end cabinet doors. Release latches (one is located on each inside end of cabinet). Close and latch the cabinet doors. Swing cabinet face down so that it rests on its sup-

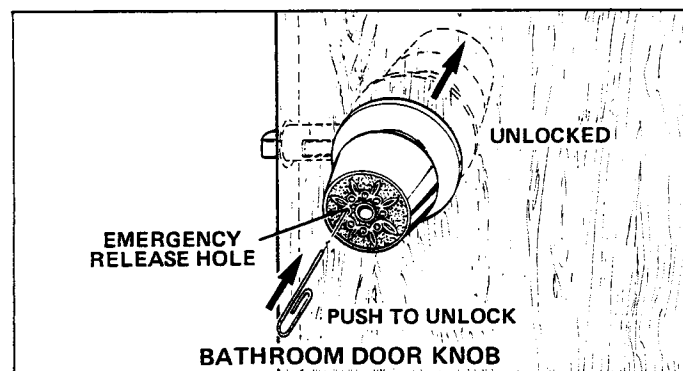
ports. Position the reinforcing board on top of the cabinet face. Arrange cushions on platform.

FACING DINETTE TYPE — For those with swing down tables, pivot the table downward to the dinette seat supports. Arrange cushions on platform. For those with pedestal tables, lift table and remove leg. Place table on seat braces and arrange cushions on top. Store the table leg under the bed or in a closet.



FACING DINETTE

BATHROOM DOOR LOCK — Bathroom doors equipped with the plastic knob shown, can be locked or unlocked from the inside by pushing in or pulling out on the inside knob. It can be unlocked from the outside by pushing a small metal object, such as a paper clip, into the emergency release hole.



BATHROOM DOOR KNOB

CARE OF UPHOLSTERY FABRICS — The manufacturer uses a variety of fabrics in its recreational vehicle models. The following is a general procedure. Regular vacuuming will help keep colors fresh and prolong wear. Apply a quality upholstery shampoo, mixed to the manufacturer's instructions, to a small inconspicuous area of the fabric. If there are no adverse effects, clean the remaining area. Use suds, not water, and apply with a soft brush in a light, circular motion. When dry, vacuum. If the shampoo does not clean the test area properly, contact a professional cleaner.

DRAPES, CURTAINS — Drapes and curtains should be dry cleaned only.

VALANCES, BLINDS — Valances and blinds should be vacuumed or wiped with a damp cloth.

NOTE: Cushion, seat and drapery fabrics are subject to normal deterioration and to wear

and exposure. Normal protective measures can help ensure longer fabric life.

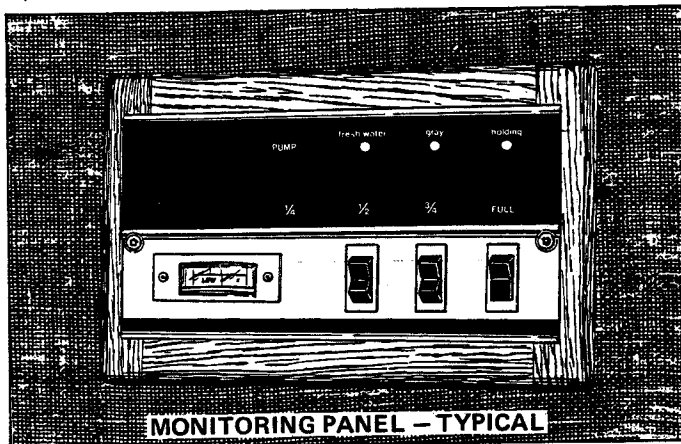
CARE OF WOODWORK and floor coverings is covered in the Maintenance section of this manual.

BASIC SYSTEMS

GENERAL

The basic utility systems in your unit can be classified under four general titles: Electrical, LP Gas, Fresh Water, and Drainage/Sewer. This section outlines these systems, describing their function, operation, and simple maintenance. This section is not intended as a service guide. Your unit has been engineered and built to provide trouble-free operation. Should a problem arise, we recommend that you contact your authorized dealer.

A monitoring panel allows you to check some of these systems: the volume of fresh water, waste and gray water in your holding tanks, and the condition of your RV battery. The panel also may include a clock, the water pump switch, and a radio with tape deck or cassette. The monitoring panel shown is typical; the one in your unit may look and function differently. Be certain your dealer explains the operation of the monitoring panel in your unit.



MONITORING PANEL — TYPICAL

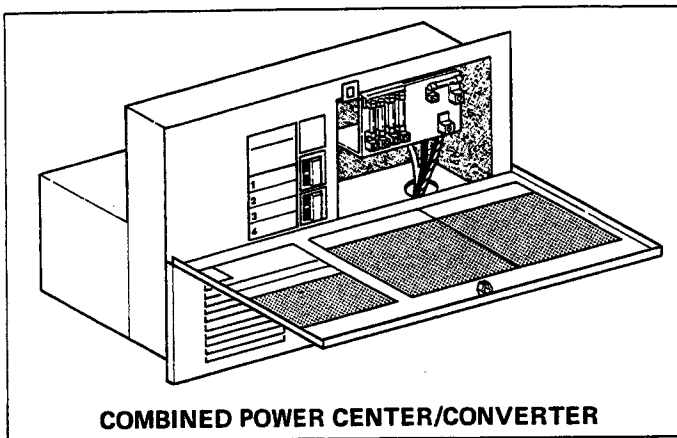
ELECTRICAL

GENERAL

The travel trailer or fifth wheel contains two separate electrical systems, providing you with power while you are camped or traveling. There is a 12-volt direct current system, similar to the one in automobiles, and a 120-volt alternating current system, similar to the one in homes. Your 120-volt system requires an external source of 120-volt electricity. This is provided by a connection to a campsite or household receptacle or by the auxiliary generator. The 12-volt system is supplied by batteries or the power center converter. The 120-volt system is used whenever a 120-volt hookup is available, to reduce the 12-volt load on your RV battery. Although most components in your unit, such as the water pump, range hood light and fan and interior lights, operate only from a 12-volt source, the power center converter changes 120-volt AC to 12-volt DC power.

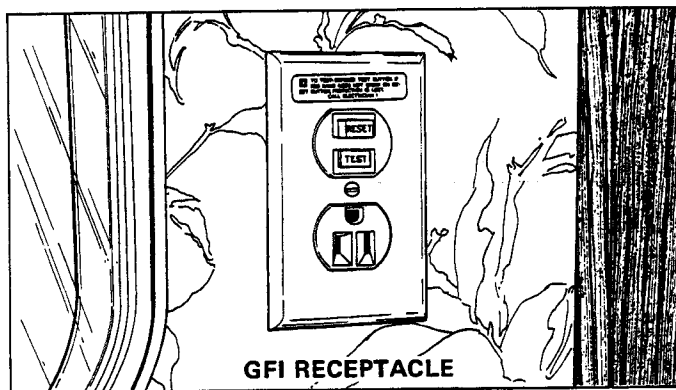
120-VOLT SYSTEM

The 120-volt system supplies power through the power center for the optional roof air conditioner, refrigerator, exterior receptacles (Figure 6) and interior receptacles (shown below) which are used to operate regular household appliances. The converter section of this power center provides 12-volt power for all of the unit's 12-volt components. When you use the external 120-volt power cord, the power is connected directly into the main electrical service panel of the power center and is distributed through circuit breakers.



COMBINED POWER CENTER/CONVERTER

GROUND FAULT INTERRUPTER — The bath and exterior receptacles are protected by a GFI (Ground Fault Interrupter). This highly sensitive circuit breaker, built into the bath receptacle, protects against severe electrical shock if a ground fault occurs in that circuit. The GFI senses the fault and breaks the circuit to the bath and exterior receptacles. If this happens, unplug all appliances on that circuit and reset the breaker in the bath receptacle.



GFI RECEPTACLE

GFI RECEPTACLE — The receptacle shown above is installed in the bath and is connected to the outside receptacle. Test the GFI system at least once a month. Push the TEST button in the receptacle with a test light plugged into the outlet. The test light should go out. To restore power, push the RESET button in the receptacle.

NOTE: If the button does NOT pop out or if the test light indicates a live circuit, DO NOT use the outlets. Call your dealer.

CAUTION: The GFI does not eliminate electrical shock completely. Small children and persons with heart conditions or other disabilities that make them especially sensitive to electrical shock may still be injured by a ground fault on the bath or exterior receptacles.

SHORELINE CONNECTION — The Shoreline (Figure 7) is a heavy-duty cable with a 3-prong grounding plug on one end, permanently attached at the other end, to the power center. It can be pulled from its storage compartment through a hatch in the sidewall of your vehicle and connected to an external receptacle. Some campsites and trailer parks still have two-slot outlets. If it is necessary to use a three-to-two adapter, be certain its grounding wire is fastened securely to the outlet grounding screw. If in doubt, you may attach a No. 6-AWG copper wire to the frame of the vehicle and fasten it to an 8-inch copper or brass stake driven into the ground.

The 120-volt system is protected by the circuit breakers. If a circuit breaker opens, unplug the appliances on that circuit, allow a short period for the breaker to cool, then reset the breaker. If the breaker continues to open, contact your dealer.

GENERATOR

GENERAL — The optional auxiliary generator (Figure 8) is a gasoline powered appliance which will supply 120-volt electricity. It can be operated when your vehicle is stopped or while you are traveling. It draws its fuel from the gasoline tank in the jack compartment. A remote generator starter switch is located inside your unit; there also is a START/STOP switch mounted on the generator. An automatic transfer switch incorporated into the service panel prevents the simultaneous use of both the generator and the Shoreline connection. When the generator is started, the transfer automatically switches from Shoreline to generator power. Likewise, when the generator is shut down, the transfer automatically switches to Shoreline power.

CAUTION: When running, the engine powering a generator can discharge carbon monoxide gas, which can cause death if inhaled even for a short period. Although exhaust fumes are usually readily evident, carbon monoxide is particularly dangerous because it is colorless and odorless. When operating a generator, **DO NOT** open roof vents, windows, or doors which could draw fumes into your unit. **DO NOT** operate the generator where an object such as a tree, bush, or building may deflect exhaust fumes inside your unit. **DO NOT** operate the generator inside a building unless the exhaust is vented safely outside. **DO NOT** operate the generator where exhaust gas could accumulate and seep back inside an occupied vehicle, tent, or building.

STARTING — Before starting your generator, make sure the air intake and exhaust outlets are free of obstructions; check the oil level. Depress

the generator START/STOP switch to START and hold until the generator is running (when released, the switch will return to the neutral position). When using the generator for the first time, apply the electrical load gradually to break-in the engine. Operate the generator at one-half load for 30 minutes, then an additional 30 minutes at three-quarters load before applying a full electrical load.

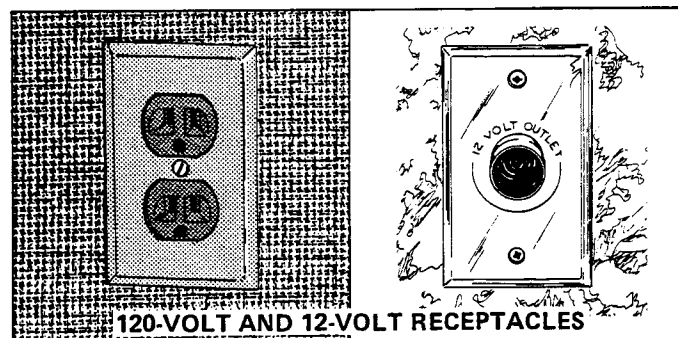
If the generator cranks, but will not start, the fuse on the generator has probably blown. Replace the fuse with one of the same ampere rating.

SHUT DOWN — To shut down the generator, press the START/STOP switch to STOP and hold until the generator stops running.

CARE OF GENERATOR — The complete operation and care procedures for your generator are in the generator manufacturer's manual, but below are a few of the basic requirements:

Check the oil level daily or at least every 8 hours of operating time. Change oil in a new generator after the first 25 hours of operating time and every 100 hours, or six months, thereafter. Clean the cooling fins at least every 200 hours; remove any dust, dirt, or oil which may have accumulated. Check the air cleaning element every 100 hours; clean it by tapping against a flat surface. Change the air cleaning element at least every 200 hours.

The schedules above are only a guide; when the generator is used in extremely dusty or cold conditions, all maintenance steps may need to be more frequent.



12-VOLT SYSTEM

The 12-volt system, which includes the automotive battery and optional RV battery (Figure 9), plus the 12-volt converter, supplies power to the exterior and interior lights, the range hood fan and light, the furnace blower, water pump, interior 12-volt receptacles, porch light and monitoring panel. The 12-volt receptacles can only be used for appliances specifically designed for that type of energy. The 12-volt energy is supplied by the automotive battery (through the pigtail connection), the RV battery, or the power converter.

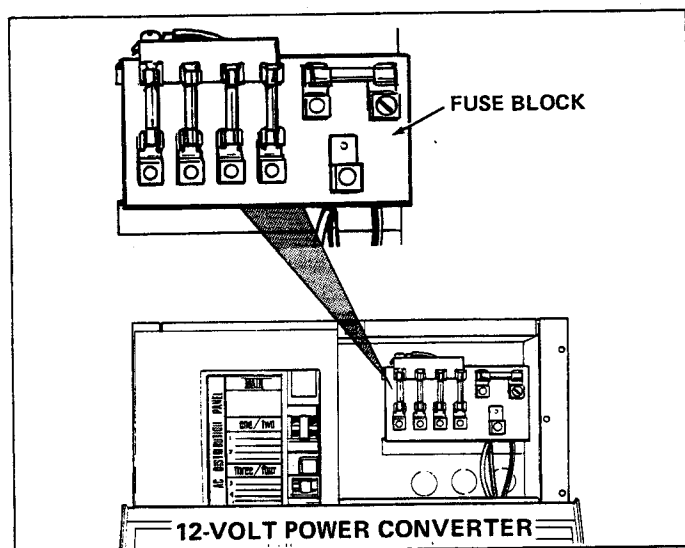
The automotive battery and alternator supply 12-volt power to the tow vehicle's lights and components and the RV's 12-volt system, including running lights, brakes and appliances, when the pigtail is connected. The automotive alternator also will charge the RV battery.

The RV battery supplies power to the furnace blower, monitoring panel, water pump, interior 12-volt receptacles, optional power vent(s), range hood fan and light and interior lights. The RV battery also is charged by the power converter, whenever you are using a Shoreline connection.

BATTERY — Check the liquid level at least once a month. It must be above the plates. The battery manufacturer recommends using a good grade of drinking water, excluding mineral water. Keep terminals free of dirt and corrosion. You may use a battery hydrometer to check the charge level of the battery. When specific gravity is below 1.225, recharge the battery until 1.265 is indicated. To check the battery using the monitoring panel, disconnect the Shoreline and turn on at least three interior lights: a discharged battery will show full charge unless some electricity is being drawn.

NOTE: If the battery must be "quick charged", turn off the refrigerator.

CONVERTER — The power converter section of the power center transforms 120-volt AC into 12 volt DC, supplying power to all of the 12-volt systems. Each 12-volt circuit is protected by a fuse in the power center. Turn the twist-lock to open the door and check the fuses. A listing of the circuits is on the inside of the door. Some fuses protect circuits with more than one function, others may be for specific appliances. If a fuse breaks, turn off or unplug all appliances on that circuit. Replace the broken fuse with one of the same ampere rating. If the fuse continues to break, contact your dealer. See the power center manufacturer's manual for specifications and operation and testing procedures.



FRESH WATER SYSTEM

GENERAL

Fresh water for your unit is supplied either by the vehicle's fresh water tank or an external pressurized source. Both supply water to the sinks, lavatory, tub/shower, toilet, and water heater.

CITY WATER

Connect a hose to a "city" pressurized water faucet and to the vehicle's water inlet (Figure 10). When using the city water hookup, the water tank and pump are bypassed. You cannot fill the water tank through the city water inlet.

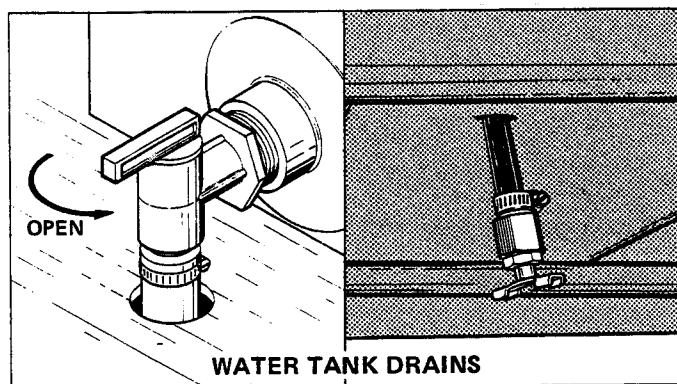
Although a common garden hose can be used to fill the water tank and connect to city water, long time RV'ers recommend a hose specifically manufactured for this purpose.

CAUTION: *In areas where city water pressure exceeds 60 pounds-per-square-inch, you should use a pressure regulator. Excessive water pressure may damage lines and connections. See your authorized dealer for further details.*

WATER TANK

Open the gravity water fill by pulling out the fill spout (Figure 11). Use a hose or vessel to fill the water tank. Water will flow out the water fill when the tank is full. The water tank in some models is beneath a gauchio, dinette or kitchen cabinet; on others, it is under the floor of the unit.

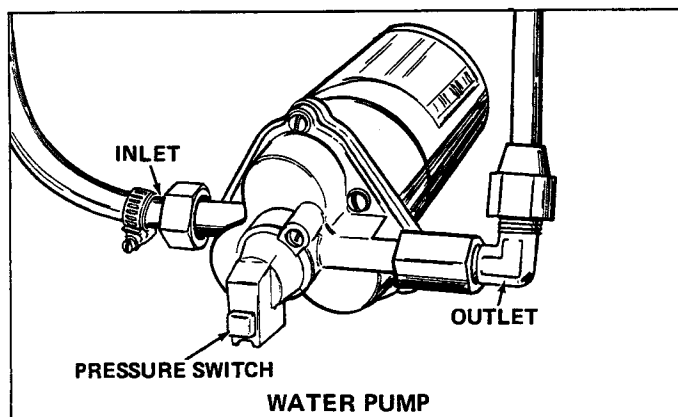
SANITIZING WATER TANK — Sanitize your unit's water tank before initial use, after a period of nonuse, and whenever the tank is suspected of being contaminated. Open the drain cock and let the water drain out. The drain cock is attached to a port near the bottom of the water tank. If the tank is above the floor, the drain cock can be reached from inside the unit. If the tank is under the floor, the petcock connected to the drain hose is reached from under the unit (Figure 12). In both instances, the drain line extends to the outside of the unit. When the tank is empty, close the drain cock or petcock. Mix 3 gallons of water with 3/4 cup of liquid household bleach. Pour solution into the tank through the gravity water fill. Wait 3 hours. Drain and flush the tank with fresh, potable water. If a chlorine taste lingers, pour 1 quart of vinegar and 5 gallons of water into the tank. Wait several days before draining tank. Flush tank with fresh, potable water.



WATER PUMP

Your water pump is a 12-volt DC appliance, activated by a switch on the monitoring panel or one mounted in the kitchen area. You may leave the switch ON while camping. This arrangement is known

as a demand system. When you want water, simply open a faucet, the pump supplies water from the fresh water tank and will run only as long as needed. If the pump fails to start when the switch is ON, check the fuse located in the converter. If the pump continues to operate, whether the faucets are opened or closed, check the water tank, it may be empty, or there may be a leak in the system.



SINKS

Clean the kitchen and bathroom sinks with non-abrasive cleanser. Stainless steel cleaner may be purchased at most grocery stores. ABS cleaner, such as Aqua K-7, may be purchased from your authorized dealer.

LEAKS

Traveling over bumpy or rough roads can cause pipe fittings to loosen. Check pipe fittings regularly for signs of leakage.

DRAINAGE/SEWER SYSTEM

GENERAL

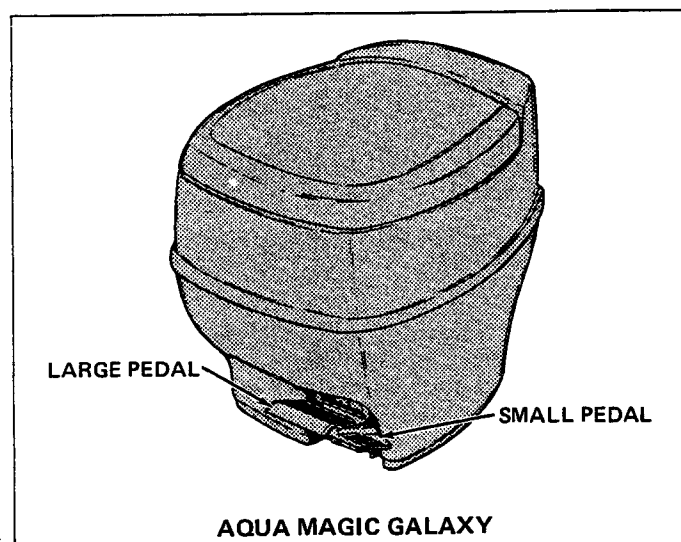
Your vehicle is equipped with a Drainage/Sewer system that functions much the same as the one in your home. It includes drain lines from the kitchen sinks, lavatory and tub/shower to a gray water holding tank and a marine type toilet that empties directly into a separate waste holding tank. The drainage system also includes vents which carry odors (caused by drain water and waste) out through the roof, while equalizing air pressure. The latter is necessary to maintain a water barrier against odors in the P-traps and to ensure smooth flow and escape for your drainage system.

TOILET

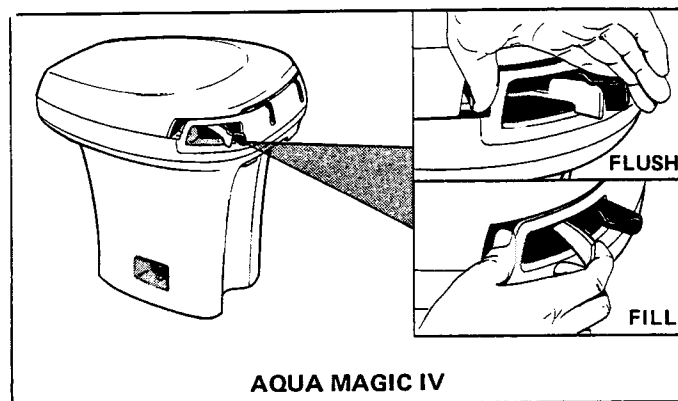
Your toilet will be an Aqua Magic Galaxy or an Aqua Magic IV. The Galaxy has two pedals near the front base for flushing and adding water. The Aqua Magic IV has a black lever for flushing and a white lever for adding water.

Before initial use and after emptying the holding tank, flush the toilet. When the bowl is filled, pour in an 8-ounce bottle of Aqua Kem concentrate, then flush the toilet again. This will help control odors.

To operate the Galaxy, step on the small pedal to add water to the bowl. When the desired amount has entered, release the pedal slowly. To flush, step on the large pedal until the water swirls, then release pedal slowly.



To operate the Aqua Magic IV, pull the black lever forward, which simultaneously activates the white lever, and hold until all contents have been swept into the holding tank. Always open for a minimum of 3 full seconds. When you release the black lever, the bowl will automatically fill with water for next use. If you desire to add more water to the bowl, pull the white lever forward.



CARE OF TOILET — Use Aqua Bowl Cleaner as directed. DO NOT use highly-concentrated or high-acid household cleaners (NO scouring powder). If the slide valve does not move freely, apply silicone spray.

HOLDING TANKS

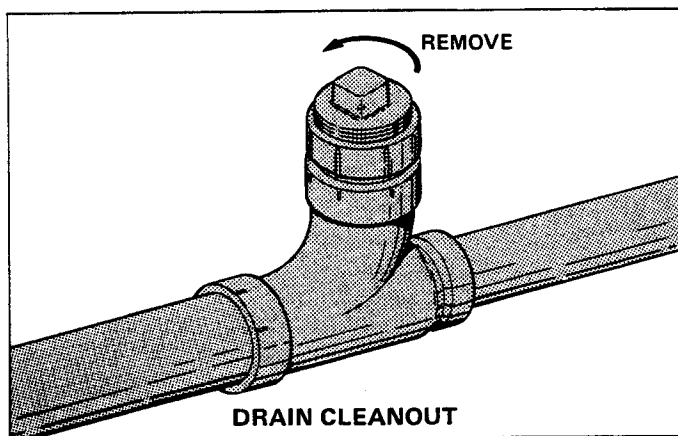
A gray water holding tank is for kitchen sink, lavatory and tub/shower water; a waste holding tank is for the toilet. Holding tanks should be emptied frequently, but always into a specified dumping station. Most campgrounds are equipped with dumping stations, often at each campsite; many service stations also have waste dumping stations. You can prevent unnecessary accumulation of solids in the waste holding tank by not putting facial tissues or similar items into the toilet.

EMPTYING HOLDING TANKS — Be certain your vehicle is level, since the emptying of holding tanks depends on gravity. Remove the sewage drain hose (Figure 13) from its storage area in the rear bumper or trunk. Remove the cap from the termination outlet and connect the sewage drain hose. With hose connected while you are camped, you can leave the GRAY WATER dump valve open. **DO NOT** open the waste water dump valve until you want to empty the holding tank. The toilet is not like the one at home which uses many gallons of water to flush wastes directly into the sewer system. Instead, if the dump valve is left open, the rinse and flush water will run off, leaving the solids to collect and harden in the bottom of the tank.

To drain a holding tank, pull out the dump valve slide handle (Figure 14, typical). Before pulling the slide valve handle out on some units, it is necessary to unfasten or unlock a holding device. Some have a locknut, others wire retention clamps, while some merely slide in and out, seating in place automatically. Close the valve (and lock in place, if so equipped) after the tank has drained. Flush or pour about 2 gallons of water through the toilet when emptying the waste holding tank and drain again. This flushes the tank and helps clean the drain hose. Repeat as necessary. Follow the same procedure for gray water holding tank, although a repeat flushing may not be necessary. When the tank is empty, push the dump valve handle in until it seats (or lock as required). Remove the hose, wash it and replace it in its storage holder. Replace termination cap securely.

DRAIN PIPING

If your unit does not have a gray water holding tank, it will have a drain pipe which terminates on the road side of the vehicle. To drain, remove the termination outlet cap and attach a drain hose. Some campsites will have septic service for the disposal of gray water at each site. If the site is not so equipped, collect the gray water in a bucket or container and dispose of as required by park rules. To avoid contaminating your water system, use different hoses for fresh water and drainage. Hoses of different colors will help you avoid interchanging them. The same is true for buckets or other vessels used for fresh water and drainage; paint or mark them to prevent contamination.

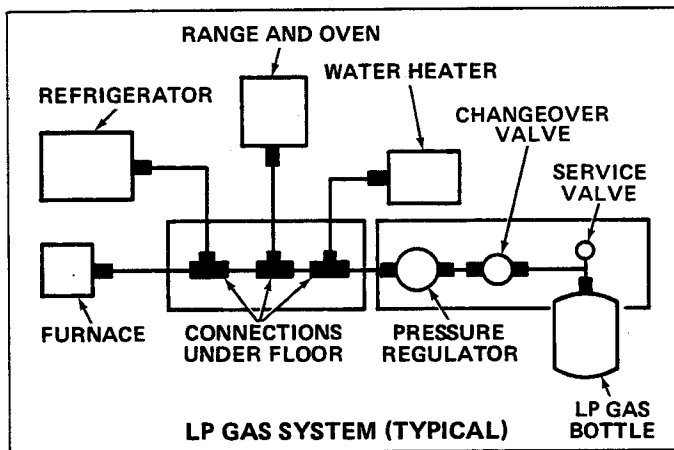


DRAIN CARE — Use clear water to clean exterior pipe surfaces. **DO NOT** use harsh drain cleaner chemicals or solvents in drains. Drain cleanouts are installed at intervals to facilitate drain line cleaning or unclogging. Use a wrench to remove and replace drain cleanout plug.

LP GAS SYSTEM

GENERAL

The Liquefied Petroleum (LP) Gas System in your unit furnishes fuel for hot water, heat, cooking, and refrigeration. LP gas, a by-product of the petroleum refining process, provides a portable, efficient and inexpensive source of energy. It is stored in a bottle or bottles on the "A" frame of travel trailers or inside a front compartment on fifth wheels. Under pressure in the bottle, the LP gas turns to vapor; it is the latter which burns. Each bottle has a 20% liquid level gauge which allows space in the bottle for vapor expansion. The high pressure of the vapor in the bottle is reduced in two stages through a regulator (Figure 15). The tank pressure will vary with temperature and altitude, but may be 100 to 250 pounds per square inch or more. It is reduced to about 12 psi in the first stage then to about 6-1/4 ounces in the second stage (the 6-1/4 ounces per square inch also is expressed as 11 inches of water column). The LP gas is propane or a blend of propane and butane, depending upon your locale.



The LP gas system is designed and built to rigid standards and tested before leaving the factory. Your dealer also tests the system prior to delivery to you. Except for simple maintenance and occasionally tightening a connection, you should take your vehicle to an authorized dealer for LP gas problems. The LP bottles should always be filled by an authorized LP supplier.

NOTE: *The manufacturer is not responsible for personal injury or property damage resulting from improperly maintained LP gas appliances and systems.*

LP gas burns readily and with intense heat. *With proper care and maintenance, it is safe and efficient.* However, there are certain characteristics of LP gas of which you should be aware. In its natural state,

LP gas is odorless, but an additive gives it a distinctive garlic odor so that leaks may be readily detected.

WARNING: *For your safety, 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.*

LP gas is heavier than air and tends to collect in low pockets. As LP gas settles into any closed area, it displaces air and thus could cause suffocation if not detected. It could also create a fire or explosion hazard.

WARNING: *LP gas containers shall not be placed or stored inside the vehicle. LP gas containers are equipped with safety devices which relieve excessive pressure by discharging gas to the atmosphere.*

Before using any LP gas appliance, read the respective manufacturer's instruction manual.

CLIMATE DIFFERENCES

The appliances will not function if the LP gas does not vaporize. Butane will not vaporize below 32 degrees F. (the freezing point of water), but propane will continue to vaporize down to 44 degrees below zero. Propane has become the main type of LP gas used in RV's in recent years. Your LP supplier will have the correct type or blend for your locale. If your travels will take you into an area where climate differs, ask your LP dealer for his recommendations. The names of LP suppliers can be found in the yellow pages of your telephone directory under "Gas-Liquefied Petroleum - Bottled & Bulk". Many campgrounds now have LP gas fill facilities, as do some service stations.

To operate any LP gas appliance, the LP gas bottle's Service valve(s) (Figure 15) must be OPEN. When first used, or after a refill, there may be some air in the gas lines which will escape when you first open a range burner or similar LP gas valve. The air may extinguish your match or igniter the first time or two, before you get ignition. Remember, too, that when you close the bottle's Service valve some of the gas will remain in the lines. To completely bleed the lines of gas, CLOSE the bottle's Service valve and light a range burner to use up the excess. When the flame burns out, turn the range burner OFF.

REGULATOR/CHANGEOVER

Each LP gas bottle, or pair of gas bottles, will have a regulator. Double 20-pound bottles also have a manual changeover valve and double 30-pound bottles may have an automatic changeover valve. With the manual valve, open only one bottle's Service

valve. When the bottle is empty, close that Service valve and open the Service valve on the other bottle.

With the automatic changeover valve, open the Service valves on both bottles. The bottle to which the arrow on the changeover knob points is the one in service. As long as there is fuel in the bottle, the full-empty indicator on top of the regulator will show white. When the bottle is empty, the automatic regulator will begin using fuel from the "reserve" bottle. When this happens, the full-empty indicator will change from white to red.

At this point, the empty bottle should be shut off and the indicator knob turned so that the arrow points to the bottle in service. The full-empty indicator again will show white. The empty bottle may now be disconnected for refilling.

Check the indicator flag regularly to avoid running completely out of fuel. You also can check the volume of LP gas by weighing the bottle, comparing the known weight of an empty and a filled bottle. The Tare (empty) Weight is stamped on the LP gas bottle handle.

FILLING THE LP GAS BOTTLES

Before removing an LP gas bottle, be certain all burners and pilot lights are OFF. Close the Service valve and turn the gas line connector clockwise to disconnect. The retention system for the bottles may vary. Have your dealer explain the proper method of removing and replacing your LP gas bottles. Transport upright LP gas bottles in an upright position (some units may have LP gas bottles which are designed for horizontal installation; they should always be transported in a horizontal position).

Take your bottle(s) to an authorized LP supplier for filling. He will connect the fill nozzle to the gas line connector. The Service valve and the 20% liquid level gauge must be open. When liquid appears at the liquid level gauge, the bottle is filled to its LP capacity. Close the Service valve and the 20% liquid level gauge. DO NOT use a wrench to tighten the Service valve or the 20% gauge; they are designed to be closed leak-tight by hand. If you cannot hand-tighten properly, the valve probably needs repair or replacement.

WARNING: *A warning label has been located near the LP Gas container. This label reads:*

DO NOT FILL CONTAINER(S) TO MORE THAN 80% 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. If the container is overfilled, have the LP Gas dealer bleed out the excess. DO NOT smoke, strike a match or ignite a lighter when the LP Gas container is being filled. A spark or flame could ignite fumes. Be certain all burner and pilot flames are out and the Service Valve is closed when filling your vehicle's LP Gas or fuel tanks.

LP GAS LINE CHECK

Always check the gas line connection after each refill and inspect other connections regularly, at least every 30 days or 5,000 miles of travel. To check, turn off all burners and pilot lights. Open all doors and windows. Open the LP Gas bottle Service Valve and use soapy water, a bubble solution or approved leak detector to test all line connections. Do not use products that contain ammonia or chlorine. Bubbles indicate a leak. Tighten the connections with two open end wrenches until bubbles stop. If leak persists, contact your dealer.

REGULATOR PRESSURE

Check the LP Gas regulator at the beginning of each season, or whenever a problem is indicated. Correct line pressure is 11 inches of water column. Your dealer or LP Gas supplier can perform this check.

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 BOTTLE CARE

After each trip, inspect the LP Gas bottle(s). Sand off traces of rust and apply a rust preventive paint. Always use white paint, which reflects heat. When the LP Gas system is not in use, the Service Valve should be closed.

LP GAS REGULATOR FREEZEUPS

LP gas regulator freezeup is a problem RV owners can prevent if they are aware of its causes. Freezeup is usually caused by one of three things: moisture in the bottle, an overfilled bottle, or a greater vapor withdrawal demand than the bottle can deliver at a particular temperature. Freezeups occur more frequently in cold weather when equipment can freeze and there is a lower rate of vaporization and a higher rate of demand.

Moisture can enter the bottle in the LP gas or through condensation if air is allowed into the bottle through an open valve. Avoid these conditions by using moisture-free LP gas and keeping all bottle valves closed during storage. If moisture is present, have an authorized dealer purge the bottle and add anhydrous methanol, the dealer will know the correct amount for your size bottle.

An overfilled bottle can allow liquid gas, instead of vapor, to flow through the regulator. This can result in erratic regulator delivery pressure, improper appliance operation or burner outage, and possible frosting of the regulator and LP gas lines. This can be avoided by following the previously cited precaution about overfilling.

Liquid gas does not vaporize as rapidly in cold weather, so you may place too great a demand on your bottle's capacities in certain conditions. This

can cause a refrigeration effect resulting in frosting of the bottle and regulator. Check with your dealer or LP supplier about the appliance demands which can be met by your bottle at various temperatures. Always have your LP supplier add anhydrous methanol before filling the bottle in cold weather.

APPLIANCES AND ACCESSORIES

RANGE, RANGE HOOD, OVEN

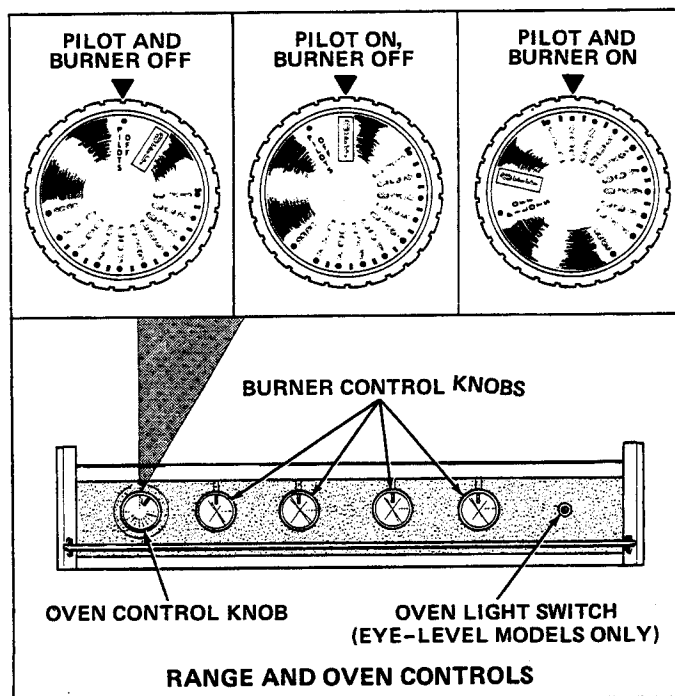
GENERAL — Your RV may have a three- or four-burner range; it may have an oven beneath the range or at eye-level, and it may have a gravity range hood with a light, a power range hood with fan and light, or a range hood with fan only. The range burners and oven are LP gas appliances. Read the range manufacturer's manual carefully for complete details on the operation and care of the range, range hood and oven.

WARNING: IT IS NOT SAFE TO USE COOKING APPLIANCES FOR COMFORT HEATING.

Cooking appliances need fresh air for safe operation. Before operation:

1. Open overhead vent or turn on exhaust fan and;
2. Open window.

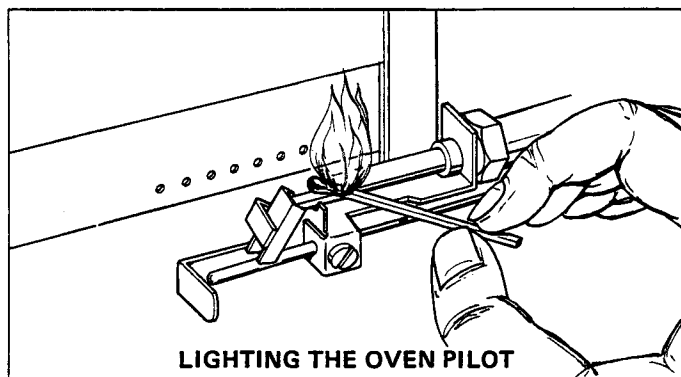
This warning is to remind you to provide an adequate supply of fresh air for combustion. Unlike homes, the amount of oxygen supply is limited due to the size of the recreational vehicle. Proper ventilation when using the cooking appliance(s) will avoid dangers of asphyxiation. It is especially important that cooking appliances not be used for comfort heating as the danger for asphyxiation is greater when the appliance is used for long periods of time.



LIGHTING THE PILOTS — There are pilot burners on all LP gas ovens and the eye-level range/oven also has a pilot for the range burners. All pilot lights, including the range burner pilot, are turned on and off by the oven control knob. If you have the eye-level range/oven, you must light BOTH the oven pilot and the range top pilot.

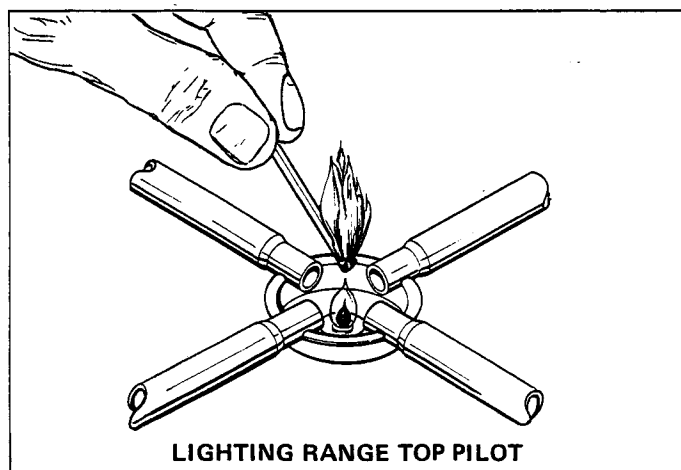
CAUTION: *The oven control knob must be in the PILOTS OFF position unless the pilot or pilots are lit. Once lighted, the pilots will continue to burn when the oven control knob is in the OFF position.*

To light the oven pilot, be certain the LP gas container Service valve is OPEN, then depress and turn the oven control knob from PILOTS OFF to OFF. Open the oven door and hold a lighted match next to the constant pilot area (it is near the rear of the oven compartment, just below the main oven burner). Relight the pilot if air in the line extinguishes the flame. When the pilot remains lit, adjust the oven control knob to the desired temperature. If the oven is part of the eye-level model, light the range burner pilot before lighting the oven pilot.



LIGHTING THE OVEN PILOT

To light the range burner pilot (eye-level range/oven models only) lift the main top panel and touch a lighted match to the pilot. Turn a range control knob full ON; if the burner lights, the pilot is operating properly.



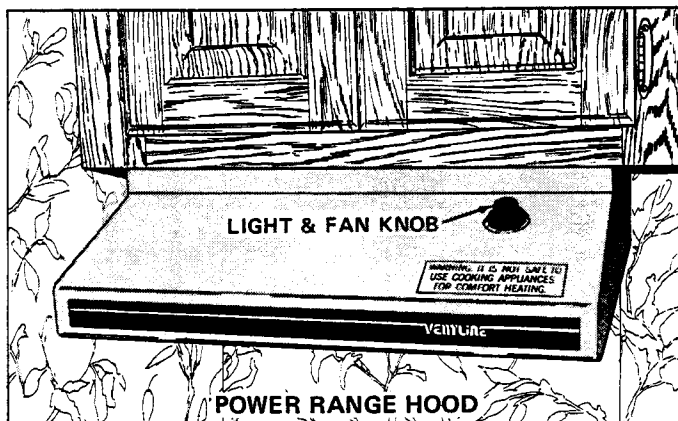
LIGHTING RANGE TOP PILOT

LIGHTING THE RANGE — Be certain the LP gas Service valve is OPEN. Light a match and hold it close to the range burner, then turn the burner's

control knob to full ON. Air in the line may cause a blowing noise and may extinguish the match. When the line is free of air, the burner will light readily. Adjust the burner flame with the control knob.

BROILER — Your oven is equipped with a broiler. To use it, light the oven and set the control knob to "BR". Place the broiler pan in the area below the oven burner. Do not place meat too close to the flame, grease or fat may ignite. Use foil only as recommended: Never cover the holes in the broiler pan or the air openings in the oven bottom with foil. Always remove the broiler pan as soon as you have finished broiling. If the pan is not removed and the oven is used, the grease may bake onto the surfaces or the grease may ignite.

RANGE HOOD — The light and/or fan of a power range hood is controlled by a switch on the top. The range hood also has a damper, which must be open during use. Pull the ring on the right side of the filter to release the damper. Use the fan to draw smoke and cooking fumes out of the unit. To secure the damper, push the ring in. Keep the damper closed when traveling.



POWER RANGE HOOD

CARE OF RANGE AND OVEN — Allow the range top to cool, then clean it with hot, soapy water. Use a damp cloth to clean chrome surfaces. Grease splatters, which may bake onto the surfaces, should be wiped off before they have time to harden. Use chrome polish to remove stubborn stains. Use a toothpick to clean clogged burner orifices. DO NOT use metal objects, such as an ice pick or wire, to unclog burners. They may distort the opening and adversely affect burner operation.

Clean the oven with commercial cleaner after each trip, or as necessary. DO NOT apply cleaner to aluminum gas tubing, thermostat sensing bulb or electrical components.

CARE OF RANGE HOOD — For metal surfaces, use the same procedure as for the range top. For the power hood, clean the plastic light cover by removing and washing it. If the light burns out, replace the bulb. To clean the power hood filter, push slot located in center front of screen and pull down. If not greasy, simply tap the filter to shake out the dirt. If the filter is greasy, run hot, soapy water over it until grease dissolves. Allow the filter to drain and dry, then replace by positioning the

flanges and push into place. The gravity hood can be cleaned by gently rubbing a soapy cloth over the screen.

MICROWAVE OVEN — A microwave oven is a 120-volt appliance used to cook, defrost or simmer foods in less time than other cooking methods. Several types of microwave ovens are installed by the manufacturer, but only one is illustrated and explained here. Be certain to read carefully the oven manufacturer's owner's manual for specific instructions for the model which may be installed in your unit.

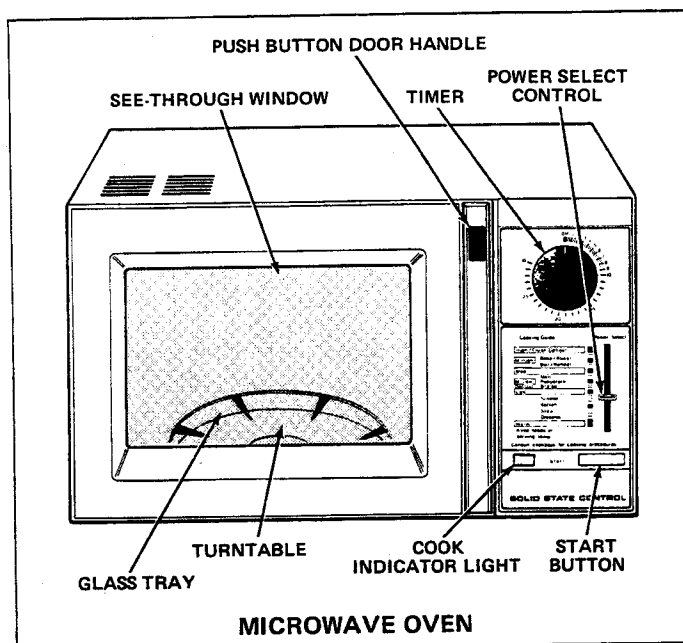
The control panel has a timer, Power Select heat control, Start button and an On/Off indicator light.

To use the oven, make sure the glass tray is in place and rotates freely on the magnetic turntable. Place container of food on the glass tray. Close the door securely. Slide Power Select Control up or down to desired position. Highest heat position is at top; lowest, at bottom. Determine proper time from cookbook or other guide and set timer. Timer provides up to 30 minutes. For times less than two minutes, turn timer past two minute mark and then back to desired time. When timer is turned ON, oven light turns ON. Press START button. The COOK indicator light turns ON, turntable begins to rotate and microwave energy begins cooking food.

While the food is cooking, you may open the door to check it. As soon as the door is opened, six safety mechanisms automatically and instantly stop microwave power. The timer and oven light also turn OFF. To continue cooking, close the door and press the START button again. To change the cooking time, simply adjust the Timer. When time has elapsed, a bell rings and the unit shuts off. If additional cooking time is needed and the door has not been opened, reset the Timer and the oven will start. If door was opened, set Timer and press START button. ALWAYS SET THE TIMER AT ZERO WHEN YOU ARE NOT USING THE OVEN.

CAUTION: DO NOT use metal utensils if sparking occurs. Consult section in manufacturer's literature on cooking utensils. Also read the section on paper and plastic containers since some types may spark or catch fire. DO NOT pop corn or attempt to dry clothing or other materials in the oven; overheating may cause the food or fabric to ignite. NEVER place your watch directly on the turntable; the watch could be magnetized permanently, unable to run.

CARE OF MICROWAVE OVEN — Clean the outside and inside with a soft cloth, mild detergent and warm water. Thoroughly wipe the top, sides, shelf and back walls of the inside. Rinse well. Wipe spills off the inside every time you use the oven. To replace oven bulb, unplug the oven, loosen the screw on the rear access panel and open. Use a 25-watt "bayonet base" bulb. Fasten the rear panel and plug the oven in.



Occasionally, the glass tray, turntable and roller ring should be removed, when cool, for cleaning in warm, sudsy water. Note the position of the roller ring to be sure you reinstall it correctly. While these parts are soaking, wipe the bottom of the oven with mild detergent water or a liquid window cleaner and wipe dry.

CAUTION: DO NOT dip HOT glass tray in water to cool or clean it; you may crack it instead.

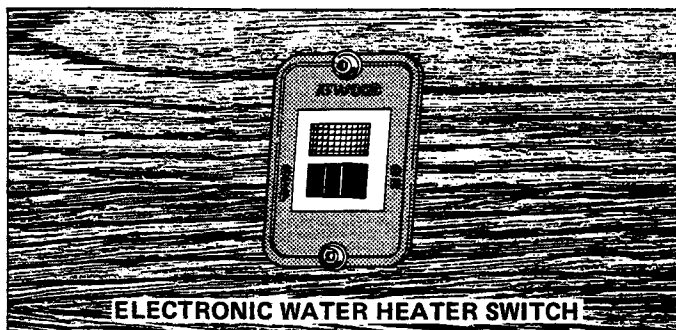
WATER HEATER

GENERAL — The water heater is an LP gas appliance capable of heating 4 or 6 gallons of water to a preset temperature. The water heater may be a match light or electronic ignition. When the system is connected to city water, fill the water heater by opening a hot water faucet. When filling the fresh water tank, turn the water pump ON and open a hot water faucet. In either case, when water flows steadily, turn the faucet OFF. Any air still in the tank can be removed by opening the relief valve in the outside access compartment (Figures 16, 17 and 18).

Before attempting to ignite any of the water heater models, be certain to OPEN the LP gas bottle Service valve.

ELECTRONIC IGNITION — Place the switch in ON position. If switch light comes on, place switch in OFF position and wait 5 minutes. After required delay, again place switch in ON position. For complete shutdown, place switch in OFF position. It may take more than one start attempt when unit is being used for the first time or after the LP gas bottle has been refilled.

This model is equipped with a manual reset, automatic gas shutoff system, actuated by high water temperature. To reset, position switch in OFF position, then depress red button on limit switch through hole in junction box cover (Figure 18). The switch must be OFF before servicing.



LIGHTING PILOT — Open gas bottle's Service valve. Turn the gas cock knob to OFF. Always wait 5 minutes to allow LP gas, which may have collected in the burner compartment, to dissipate. Your water heater will be equipped with a Robertshaw "UNITROL" thermostat (Figure 16) or an ITT General Control Thermostat (Figure 17).

CAUTION: *DO NOT light pilot unless water heater is full of water.*

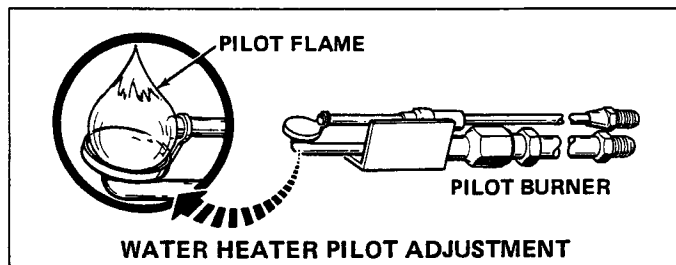
ROBERTSHAW "UNITROL" THERMOSTAT — Turn the gas cock knob counterclockwise to PILOT. Press and hold the reset button while you apply a lighted match to the pilot burner. Release the reset button after pilot has burned one minute (repeat procedure if pilot goes out). Turn the gas cock knob to ON.

ITT GENERAL CONTROL THERMOSTAT — Turn and hold the gas cock knob to the PILOT position as you hold a lighted match to the pilot burner. Release the gas cock knob after one minute (repeat procedure if pilot goes out). Turn the gas cock knob to ON.

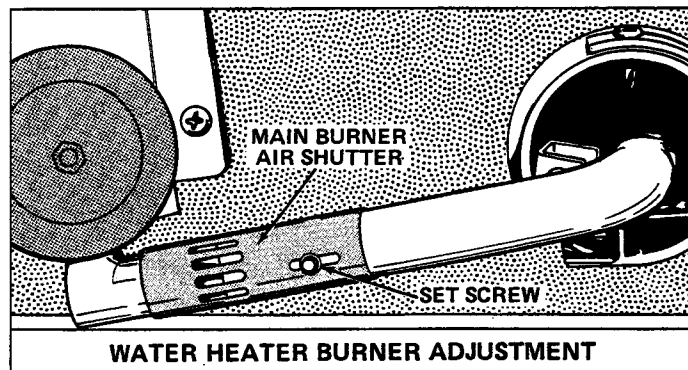
TEMPERATURE CONTROL — Adjust the Temperature Control Dial (UNITROL), or the Temperature Selector Lever (ITT) to the desired temperature as marked on the control.

NOTE: *The main burner will light automatically and burn as needed to maintain the temperature you have selected. It is a good idea to light the water heater the night before you leave and turn it off in the morning. The water will remain hot for some time while you are traveling.*

PILOT ADJUSTMENT — Remove the pilot adjustment screw protective cap and turn set screw to adjust the flame so it is 1/2" high or has a yellow tip. The procedure for the ITT is the same, but the adjustment screw does not have a cap over it.



BURNER ADJUSTMENT — Loosen the set screw which holds the air shutter in place. Slide the main burner air shutter to the right until the flame has a yellow tip. Slowly slide the shutter to the left until the yellow tip disappears. Tighten set screw.



EXTINGUISHING BURNER — Turn the gas cock knob to OFF.

DRAINING — The water heater will have a drain cock or drain plug, which may be opened or removed in order to drain the water heater tank. To facilitate drainage, open all hot water faucets. When water ceases to drain, close the drain outlet. Because of the location of the drain outlet, about two quarts of water will remain in the bottom of the tank. This can be flushed as described in CARE OF WATER HEATER.

CARE OF WATER HEATER — Be certain the exterior compartment is clean and does not contain combustible materials. Never obstruct the relief valve or vent. If the water heater has a drain cock, use a metal object to scrape away the sediment. Periodically drain and flush the water heater tank. After draining, the remaining water can be removed by flushing the tank with water or blowing dry with air. In either case, close all hot water faucets and open the drain cock or plug. The water hose or air hose can be connected to the water inlet or outlet (inside the unit) or to the relief valve port (in exterior compartment). To use the relief valve port, the relief valve must be removed. Use a pipe or crescent wrench to turn the valve counterclockwise. Attach water or air hose and flush until water ceases to drain. Replace the water inlet or outlet hose or the relief valve and close the drain cock or replace the plug. The water heater is now ready for refilling or storage.

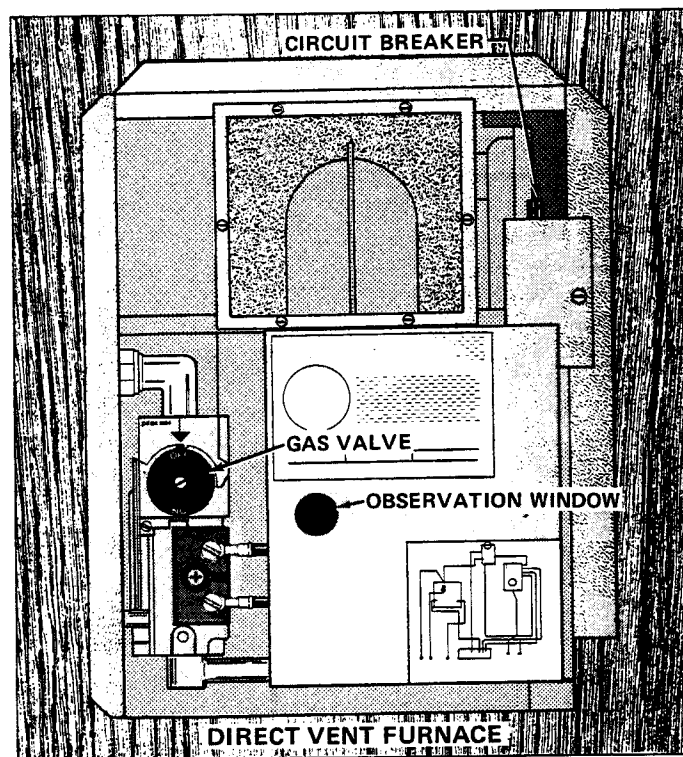
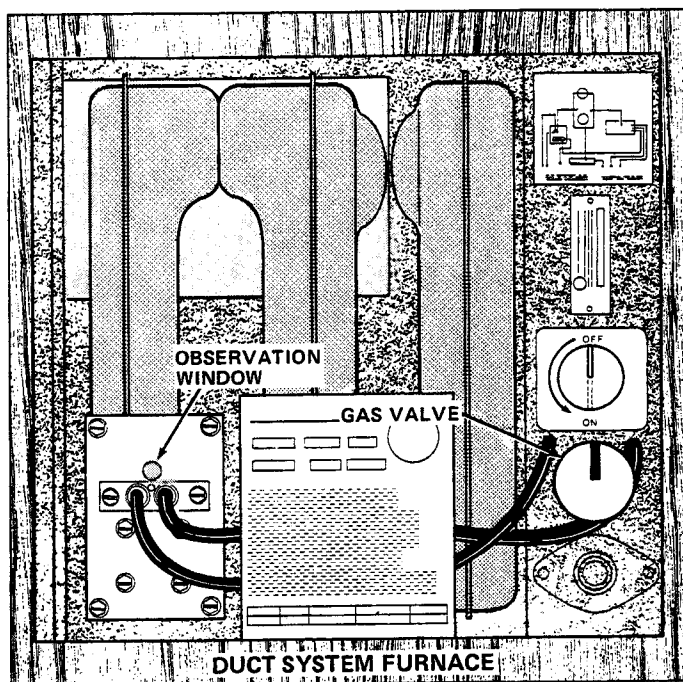
NOTE: *The relief valve must be replaced securely. Use pipe compound to assure a water tight seal.*

FURNACE

GENERAL — Furnaces may be piezo or automatic ignition, controlled by a wall thermostat. Heat is delivered through a duct system or directly through the front grille.

NOTE: *Although the furnace's fuel source is LP gas, the blower operates on 12-volt DC electricity. DO NOT operate the furnace for*

prolonged periods unless the Shoreline is connected, the generator is running, or the tow vehicle alternator is supplying 12-volt power. If you do, you could run down your RV battery.

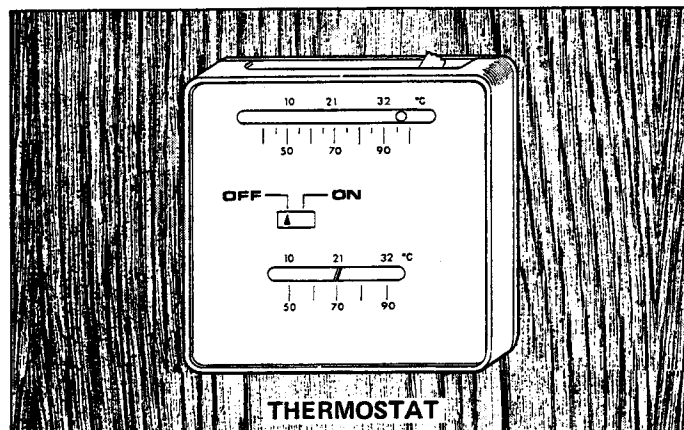


CAUTION: DO NOT use portable fuel-burning heating appliances, including kerosene heaters, wood and charcoal grills and stoves, in your recreational vehicle. Such appliances produce excessive moisture, consume oxygen and may emit dangerous products of combustion.

IGNITION — Before lighting a furnace, be sure the LP gas bottle Service valve is OPEN and the

thermostat ON/OFF switch is ON, and remove the furnace's front panel.

Piezo Model (Not Illustrated) — Press gas valve dial on furnace in and turn to OFF. Turn thermostat to lowest setting and wait 5 minutes. Press gas valve knob in and light by pushing in on igniter repeatedly until pilot lights. Hold gas valve knob in for one minute or until pilot remains lit. Turn the gas valve ON. For best results, fan should be in operation when turning the gas valve to ON. Set thermostat to desired temperature. For complete shutdown, turn gas valve knob to OFF and thermostat to lowest setting or OFF.



Automatic Models — Turn gas valve to ON (some models may be equipped with a gas valve that does not have a gas control knob). Set thermostat to lowest temperature setting, then to desired temperature (if thermostat has an ON/OFF switch, turn to ON). An automatic relay in your furnace provides a time delay. Therefore, when you turn up the thermostat there will be a pause prior to startup of the blower. At blower startup, your furnace air will enter your living quarters at room temperature. For complete shutdown, turn gas valve to OFF and the thermostat to lowest setting or OFF.

Your furnace will start warming quickly, and continue getting warmer for the next several minutes. If your RV is cold throughout, it may take from one to several hours to heat all interior walls, ceilings, floors and fixtures to a comfortable temperature. Once reached, your furnace will automatically maintain steady warmth.

On initial lighting, the burner may not ignite due to air in the gas lines. If this occurs, set the thermostat back to lowest setting and wait 30 seconds; then reset thermostat to the desired temperature.

NOTE: If the furnace does not light after several attempts, while allowing each time for a delay pause, turn the thermostat and the furnace gas control valve OFF and contact your RV dealer or service center. DO NOT attempt to repair or adjust the furnace yourself.

Front grille models are equipped with a manual circuit breaker (see illustration). If your furnace blower does not come on, reset the circuit breaker

by depressing the button. If the problem persists, contact your RV dealer or furnace service center.

CAUTION: When changing your unit's electrical source, as from 12-volt to Shoreline or generator, turn the thermostat off. This will preserve the life of your furnace's electronic system. Carefully read the furnace manufacturer's manual for other important Do's and Don'ts of service and operation.

PREVENTIVE MAINTENANCE — Clean the complete furnace and air box passageways periodically to remove dust, lint and other foreign materials. Check the gas system for leaks at least once each year by using a soap and water solution. Do not check with a flame. Check and clean the blower wheel annually.

CARE OF FURNACE — Before each heating season, clean the circulating air blower, the combustion air blower, the inside of the furnace casing and the burners. Blow pressurized air through the slots and remove any contamination. Check all piping joints and furnace controls with a soap solution to detect leaks. The control compartment must be kept clean at all times. Check furnace Inlet/Exhaust Cover (Figure 19) on the outside of your unit periodically to be certain it is free of objects which might block the openings.

NOTE: Suburban Furnace Model N-30M (not illustrated) operates on 120-volt AC power only.

REFRIGERATOR

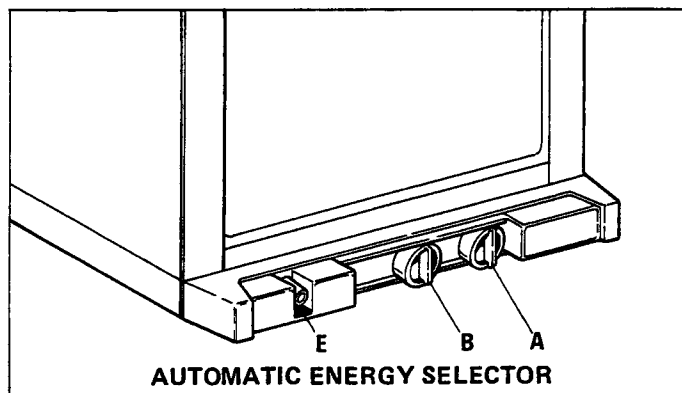
GENERAL — If your unit has a refrigerator, it could be of several types. Refrigerators are either two-way (LP gas and 120-volt electricity) or three-way (LP gas, 120-volt AC or 12-volt DC). All come with operational instructions and most have instructions posted near the controls. Ask your dealer to demonstrate the operation of the refrigerator in your unit. The instructions given here are for your convenience; in case of a difference, use the instructions furnished with your refrigerator.

The refrigerator operates on the gravity flow of chemicals, so it must be level. If you must stop on an uneven site, turn the refrigerator OFF. Use a level on the freezer compartment floor to check levelness.

Before starting on a trip, use the Shoreline connection to cool the refrigerator the night before departing. Keep items to be stored in the RV refrigerator in your home refrigerator or freezer until you are ready to leave. This will reduce the cooling load on your RV refrigerator and help keep perishable foods fresh longer. Always store food in sealable containers or suitable wrapping. When traveling, switch to LP gas (or 12-volt DC, if so equipped) operation. Use door lock during travel.

AUTOMATIC OPERATION — This model has an automatic energy selector system, which selects the most suitable available energy source. The selec-

tion is made with highest priority to 120-volt; second priority to 12-volt from the vehicle alternator, and lowest priority to LP gas. To start the refrigerator, turn Knob "A" to ON. Lamp "E" will be green. Turn the thermostat, Knob "B", to the desired setting. Turn the refrigerator off by turning Knob "A" to OFF.



The control system shuts off the LP gas when the refrigerator has correct temperatures. The LP gas flame will be lit by the control system when the temperature increases above the preset one.

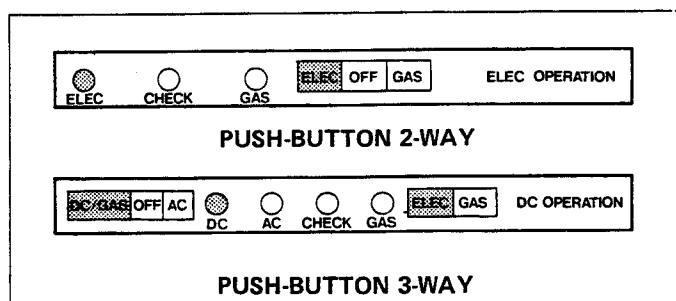
To avoid an LP gas flame at gasoline stations, the refrigerator is programmed to delay LP gas startup for about 30 minutes after 12-volt operation. This delay occurs even after only one minute of 12-volt operation from your engine. If you want a quick LP gas startup after 12-volt operation, you can switch off the refrigerator for a few seconds and then switch back to ON. This operation is only available when the refrigerator is connected for three-way use.

If battery voltage drops, the control system will start continuous LP gas operation. The lamp will not be lit and the thermostat will not be in operation. When the voltage increases, normal operation will start up again.

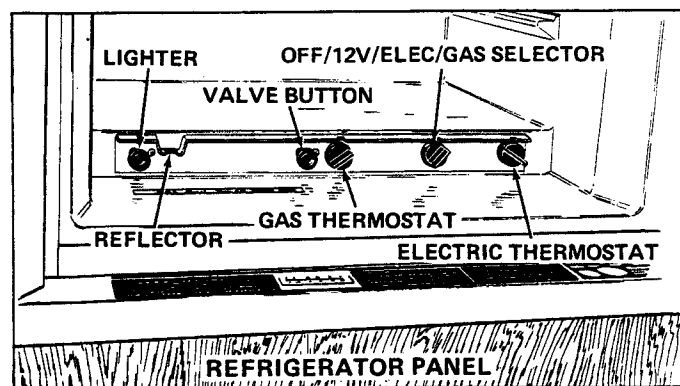
If the refrigerator does not succeed in lighting the LP gas, the Lamp "E" will change from continuous green into red flashing light. If this occurs, the refrigerator manufacturer recommends that you turn Knob "A" to OFF then back ON. The lamp will be green and the control system does a new start attempt. If the refrigerator has not been in operation for awhile or you have just refilled with LP gas, this operation may have to be repeated several times. Each start attempt will last up to three minutes. If the starting is not successful the lamp will turn red again.

If still unsuccessful after several attempts, check your LP gas supply. If you have LP gas, make sure the LP gas valves are open, including the one on the back of the refrigerator. If you have LP gas and the valves are open, contact a service center.

Read the refrigerator manufacturer's instructions for details on use, operation and maintenance.



PUSH-BUTTON OPERATION — This model has switches near the top of the refrigerator for you to select the type of operation you desire. A colored light will come on to indicate that the type of energy you have selected is operating properly; amber for 12-volt, blue for LP gas, and green for 120-volt. Many refrigerators now being installed are two-way, without the 12-volt mode. On all modes, turn the thermostat to Max. Cold position when starting, then later adjust the thermostat to the desired temperature. When using LP gas, if ignition does not occur, a Check (CK) Light will come on. To restart when Check Light is on, depress the switch to the OFF position and wait 10 seconds. Then depress switch again to the LP gas position. If you have just refilled your LP gas bottles, this operation may have to be repeated several times. Do not continue to reset the LP gas switch if the Check Light continues to come on after several tries. If the Check Light comes on a second time, turn the switch to OFF and check your LP gas supply. If you have an ample LP gas supply, consult your dealer.

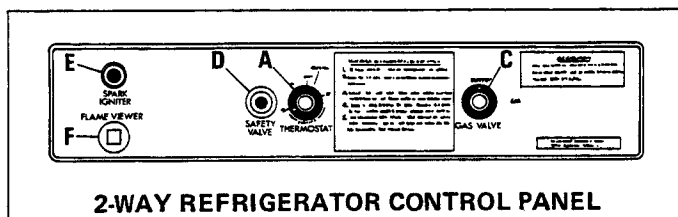


3-WAY/LP GAS OPERATION — Turn the OFF/12V/ELEC/GAS selector counterclockwise to GAS. Pull the valve button out while pushing lighter button in. Repeat this until ignition is observed through the reflector. Turn the gas thermostat to the highest number on the dial. Later adjust temperature to meet your cooling requirements.

3-WAY/ELECTRIC OPERATION — The refrigerator operates on 12-volt or 120-volt electricity. The refrigerator is the only 12-volt appliance which does not draw power from the converter. Even with the Shoreline connected, the refrigerator's only source of 12-volt power is the RV battery. When parked at a campsite, switch to LP gas or to a Shoreline connection to conserve your battery. Make certain the refrigerator power cord, reached through the exterior access door, is plugged into the 120-volt receptacle

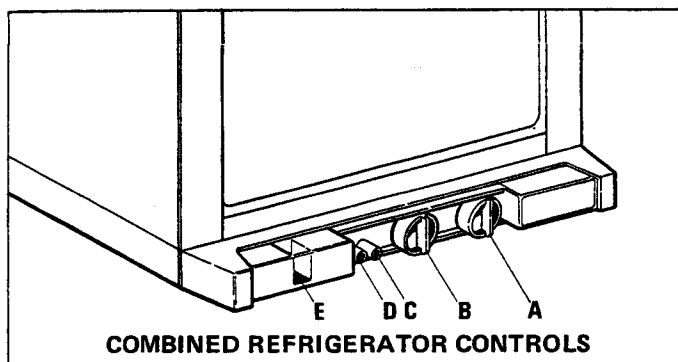
located inside the outside compartment. Be sure the circuit breaker is ON.

Push, then turn OFF/12V/ELEC/GAS selector to the source of power desired, 12-volt or 120-volt (ELEC). Turn the electric thermostat to the highest number on the dial. Later adjust temperature to meet your cooling needs.



2-WAY/LP GAS OPERATION — Turn the thermostat (A) fully clockwise to the maximum cold position. Turn the operational selector knob (C) so that the knob indicator is pointing to the word "Gas". Depress and hold in the safety valve button (D) while at the same time pushing the igniter button (E) at rapid intervals until a flame is visible in the flame viewer (F). On initial startup, the lighting procedure must be repeated until air in the line has been replaced by gas. Continue holding the safety valve (D) in the depressed position for approximately 15 to 30 seconds after the flame is visible. Upon release, the flame should remain on and the unit is on gas operation. Turn the thermostat to the desired temperature setting. To turn off the LP gas operation; turn the thermostat knob (A) to OFF, then turn the operational knob (C) to "electric".

2-WAY/ELECTRIC OPERATION — Turn the thermostat (A) fully clockwise to the maximum cold position. Turn the operational selector knob (C) so that the knob indicator is pointing directly to the word "electric". Set thermostat knob to the desired temperature setting. To turn off the electric operation, turn the thermostat knob (A) to OFF.



COMBINED CONTROL - GAS OPERATION — Turn Combined Control, knob "A", to GAS position. Turn Thermostat, knob "B", to setting 4. Hold Cut-Off, button "C", in and push Piezo Lighter, button "D", several times or until the burner flame can be seen in Reflector "E". After burner ignites, continue holding "C" for 10 seconds. Release "C" and check in reflector to be sure the burner is still lit. If flame is out, repeat the above procedure. Later adjust the thermostat "B" to a setting that meets your cooling needs.

COMBINED CONTROL - ELECTRIC OPERATION — Make sure the refrigerator cord is plugged into its 120-volt receptacle in the outside compartment; then check to see that the Shoreline is connected to outside power and the circuit breaker in the power center is ON. When the refrigerator also is equipped for 12-volt DC operation, the low voltage connection is made at the marked terminals at the rear of the refrigerator. Turn the Combined Control knob "A" to the desired position for electric operation, then turn the Thermostat knob "B" to setting 4. Later, adjust the thermostat to a setting that meets your cooling needs.

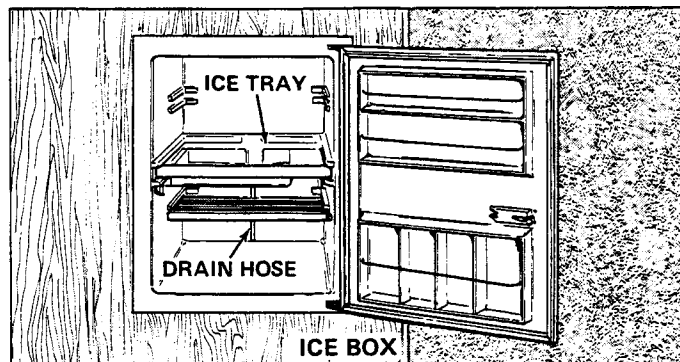
The refrigerator is the only 12-volt appliance that does not draw power from the converter. Even with the Shoreline connected, the refrigerator's only source of 12-volt power is the RV battery. When you are traveling, your automotive alternator will maintain a charge in the RV battery. When you are parked, switch to LP gas or 120-volt electricity to operate the refrigerator.

CARE OF REFRIGERATOR — Remove food and ice after each trip. Clean the interior of the refrigerator with a lukewarm, mild soda solution. The evaporator, ice trays and shelves, must, however, be cleaned with warm water only. Wipe dry with a soft, dry cloth. Never use strong chemicals or abrasives to clean the refrigerator; they can do harm to the plastic and aluminum surfaces. If the refrigerator is not in use for a period of time, turn all power off, empty and clean the interior and leave the door slightly ajar.

To defrost refrigerator freezer, remove food and ice. Turn the thermostat OFF. To speed up the defrosting process, fill the ice tray with hot water. When all frost is melted, empty the drip tray and dry the interior of the refrigerator with a clean cloth. Replace the drip tray and ice tray, replace all food stuffs and set the thermostat at MAX for a few hours. Later, reset the thermostat knob to its normal position.

ICE BOX

Place ice in the top tray. Make sure the hose, located near the back of the tray, is not bent or clogged. Water drains through this hose and onto the ground as the ice melts.



CARE OF ICE BOX — Remove food and ice after each trip. Clean interior with warm water and

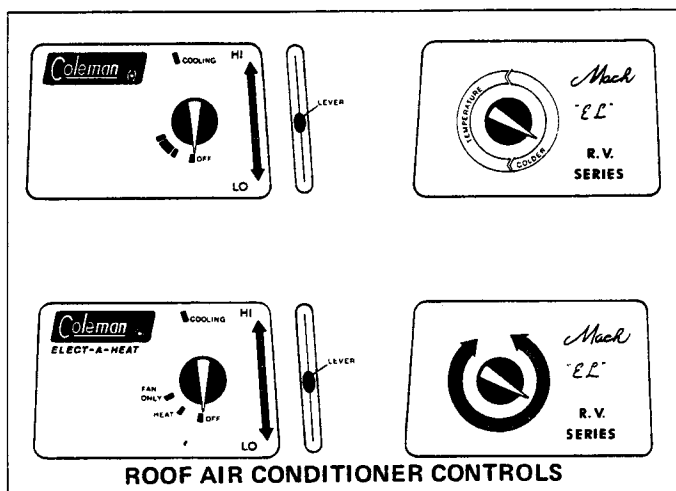
liquid dishsoap. Wipe dry with soft, dry cloth. DO NOT use abrasive cleaning material; it will scratch interior surfaces. Prop the door open during periods of nonuse.

ROOF AIR CONDITIONER

GENERAL — If you did not order the optional roof air conditioner at the time of purchase, your unit may be wired so that one can be installed later; ask your dealer. The roof air conditioner will operate ONLY on 120-volt electricity.

Several types of roof air conditioners are installed at the factory. The operation of two types is described, but consult your dealer and your roof A/C manufacturer's manual for specific instructions for the one installed in your unit.

Before starting any model of roof A/C, close all doors and windows. The optional heat unit on some models is not a substitute for a primary heating system. It is designed to warm the air during moderately cool days or nights.



CONTROLS — The controls for the A/C model illustrated above are on a panel on the portion of the appliance which is attached to the ceiling inside your unit. You can select cooling, fan only, or — with the optional heat package — heating. Refer to the illustration for operating instructions.

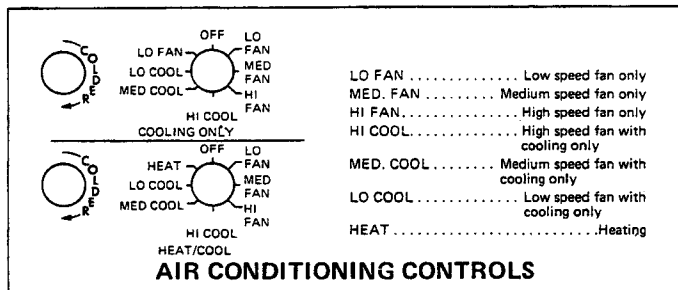
AIR CIRCULATION ONLY — Turn the Selector Switch to FAN (or to FAN ONLY with the optional heat package) and adjust the Damper Lever to the volume of air flow desired.

COOLING — Turn the Selector Switch to COOLING, then rotate the Thermostat to the position that is most comfortable to you and adjust the Damper Lever to the desired volume of air flow. The compressor will cycle on and off, automatically, to maintain the desired temperature.

HEATING — If equipped with the optional heat package, turn the Selector Switch to HEAT and rotate the Thermostat to the position most comfortable to you and adjust the Damper Lever to the desired volume of air flow. The heater will cycle on and off automatically to maintain the desired temperature.

NOTE: On units that do not have the optional heat package installed, this position will circulate the inside air only.

AIR FLOW — Adjust the louvers to the best air distribution.



CONTROLS — The controls for the A/C model illustrated above are on a panel on the portion of the appliance which is attached to the ceiling inside your unit. Refer to the illustration for operating instructions.

CIRCULATE AND FILTER AIR — Set Selector Switch to one of the fan settings.

COOLING — Turn Thermostat clockwise to its highest setting, then set Selector Switch to MED. COOL position. On extremely hot days, when maximum cooling is required, set Selector Switch to HI COOL. If room becomes too cool, turn the Thermostat counterclockwise; if too warm, reset in clockwise direction. Within a short time, you will learn the exact setting that gives you the temperature you prefer.

To reduce the rate of cool air delivered to the room, set the Selector Switch to LO COOL position.

AIR FLOW — Adjust louvers on air box for direction of air desired. Louvers can be closed to direct the desired distribution.

HEATING — With the optional heat package, set the Selector Switch to HEAT position.

After turning your roof air conditioner OFF, wait at least three minutes before restarting.

CARE OF AIR CONDITIONER — Your air conditioner will operate more efficiently with a clean filter. Either replace or clean the filters every two weeks during times of heavy use. To clean, remove filters and wash with soap and warm water, let dry and reinstall. See your air conditioner manufacturer's operation instructions for details on operation and maintenance.

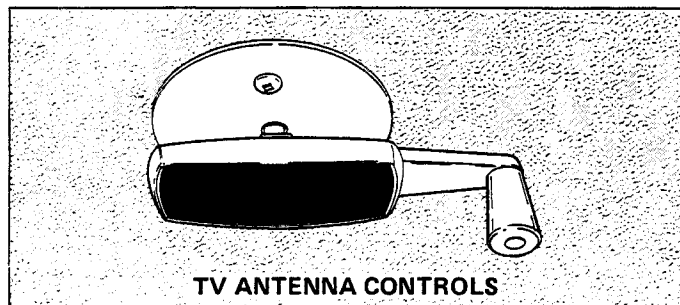
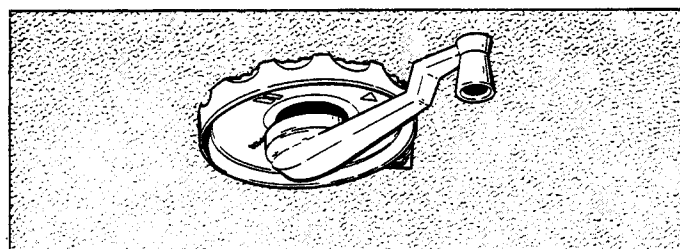
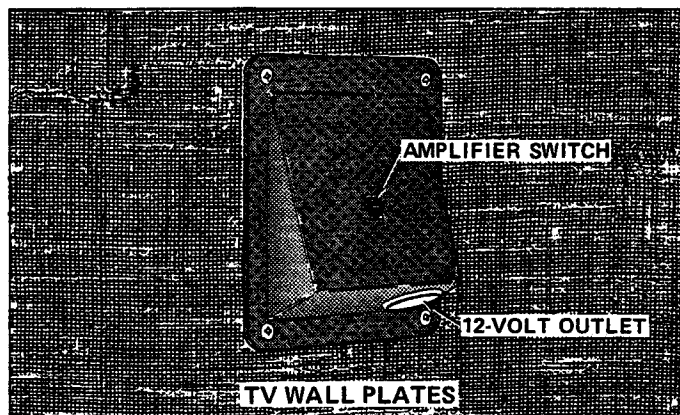
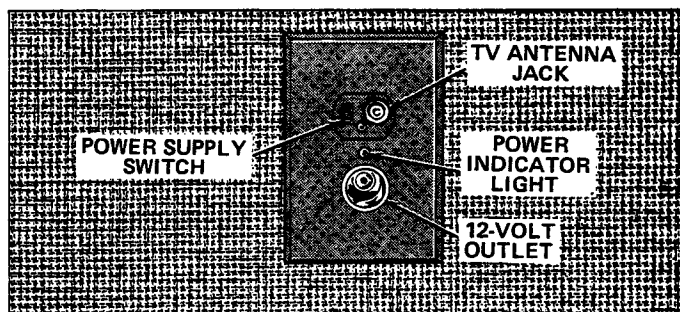
AM/FM RADIO AND 8-TRACK OR CASSETTE TAPE PLAYER

For optimum performance, clean the tape head as often as necessary, depending upon frequency of use and tape cleanliness. Most models can be cleaned with a special "cleaning" cassette cartridge, while others also can be cleaned with isopropyl alcohol on a cotton swab. Keep cassettes away from magnetized objects and follow manufacturer's recommendations for tape types and length. For specific

operating instructions, cleaning, tuning and helpful hints, read your radio/tape player manufacturer's instruction manual.

TV ANTENNA

Television reception can be better in many areas with an optional TV antenna. The TV antenna hookup includes an amplifying system, a coaxial connection for the antenna cable to your TV set, and a TV crank for inside control. Some systems also have 12-volt receptacles for TV sets designed to run on 12-volt DC power. The cable connection, amplifying system switch and power ON indicator light are on a wall plate. Several types are used (two types are illustrated) so refer to the manufacturer's instructions for details. The "Skyliner" antenna is installed with a 300-ohm cable and does not require an amplifier.



Turn the antenna crank handle in the UP direction until some resistance is felt. Pull down the rotating knob to disengage it from the ceiling plate and turn it until you find the best sound and signal.

Always lower the antenna before moving your unit. Turn the rotating portion so that its pointer lines up with the ceiling plate pointer. Turn crank handle in DOWN direction until some resistance is felt. Always turn off the amplifier power switch.

MAINTENANCE

GENERAL

RV owners are noted for the pride they take in the appearance of their units. Proper maintenance will do more than keep your RV looking nice, however. It can help ensure trouble-free operation and maximum efficiency of the various appliances and accessories. Failure to properly maintain the vehicle or its components also may constitute a breach of your warranty obligations. Read the various appliance and component manufacturers' manuals for specific maintenance information.

Unless otherwise noted, maintenance functions should be performed at least annually. All maintenance schedules are the minimum required; heavy use, unusual temperatures or humidity, or other environmental conditions may require more frequent maintenance. At the start of each season, or after a period of storage, thoroughly inspect and test all systems and components and be certain each is functioning properly before putting your RV into use.

AIRING of the unit is essential before you occupy it. See details under Air Quality, Page 3, and Condensation, Page 9.

AWNING RAILS and bright metal parts should be cleaned and coated with silicone annually.

AXLE AND SUSPENSION system should be inspected annually; paint and adjust as necessary.

BATTERIES should be inspected every 30 days and refilled or recharged as necessary; cables and terminals should be checked and cleaned every 90 days.

BRAKES should be inspected every 6 months or 10,000 miles and replaced as necessary.

BODY should be washed to remove dirt, dust, road tar, bird and tree droppings, insects and other foreign material from exterior surfaces. Use a mild soap in cold or lukewarm water. Apply an automotive-type wax at least once a year.

BUMPERS that are painted, or with any exposed painted area, should be inspected for damage and rust; rust should be removed and bumper painted with rust preventive paint annually.

COUNTER AND TABLE TOPS should be cleaned periodically with a mild detergent and can be covered occasionally with furniture polish.

DOORS should be inspected for proper adjustment and weatherproofing every 90 days; adjust door and replace weatherstripping as necessary.

ELECTRICAL SYSTEM should be inspected and tested prior to each trip. Check the Shoreline for damage. Test the 120-volt system for proper polarity and voltage. You may want to purchase a ground monitor and a line voltage tester to perform these checks.

FABRICS (cushions, drapes, curtains) should be washed or dry cleaned, as specified, at least annually.

FLOOR COVERINGS should be cleaned as necessary. Damp mop vinyl floors and vacuum carpeting. Avoid use of heavy moisture, which could enter and damage your floor.

FRAME should be inspected for damage and rust; rust should be removed and frame painted with rust preventive paint annually.

HINGES should be inspected and lubricated with light household oil annually.

HITCH BALL/PIN (latch, coupler, fifth wheel plate) should be inspected prior to each trip and lubricated every 90 days.

JACKS (manually operated) should be inspected prior to each trip and lubricated every 90 days. Power jacks also should be inspected prior to each trip, but lubrication is required annually. See the instructions provided with the power jack installed on your unit for specific details. Stabilizing jacks should have small amounts of WD-40 or similar lubricant applied periodically at friction points.

LOCKS AND LATCHES should be inspected and lightly lubricated with graphite at least annually.

LP GAS system should be inspected and adjusted as outlined in LP Gas section of this manual. Be certain mounting supports for tanks and bottles are secure. Before using, clean all LP gas orifices and vents of spider webs or other foreign matter.

LUG NUTS should be checked, and tightened as necessary, prior to each trip.

PIGTAIL CONTACTS should be inspected and coated with Spra-Kleen every 90 days.

ROOF, BODY, UNDERBELLY should be inspected for damage, rust or corrosion every 90 days and repaired as necessary. You may wish to undercoat the underbelly metal.

SAFETY CHAINS should be inspected for damage prior to each trip; replace if weakened.

SEAL ALL SEAMS or joints around entrance doors, windows, roof and wall vents, access doors, storage compartments, roof edges, luggage racks, ladders, air conditioners, TV antennas, rails and moldings at least once each year with Parbond or a similar high-quality sealant. Inspect all seams and joints at least twice each year and reseal as necessary. Some sealants cannot be applied over other types, so prepare areas to be resealed by scraping off old

sealant. Clean metal areas with a vinegar and warm water solution and fiberglass areas with mineral spirits before applying new sealant.

SHADES AND VALANCES should be cleaned with a damp cloth as necessary.

STEP(S) should be inspected, rust removed, and painted annually; lubricate moving parts.

TIRES should be checked for proper inflation and damage prior to each trip; bias-ply tires should be balanced and rotated annually; radial tires should be balanced as necessary, but rotation, if required, should only be front-to-rear or rear-to-front.

TV ANTENNA exterior moving parts should be lubricated every 30 days.

VENTS should be inspected and cleaned and all moving parts lightly oiled annually.

VINYL-COATED ceiling and wall panels should be cleaned with a mild soap and damp sponge, as necessary.

WATER HEATER control compartment should be kept clean and free of combustible material and flammable liquids. The vent and combustion air grill should be clear of any obstructions. Manually operate the pressure temperature relief valve at least once a year. Operate only when storage water in tank is cool. Should overheating occur, or the gas supply fail to shut off, turn off the manual gas control valve to the appliance. Periodically compare main and pilot burner flame with illustrations in the manufacturer's operating instruction manual. **DO NOT** tamper with the pilot orifice to increase the pilot flame size; this can cause high water temperature and failure of gas control.

WHEEL BEARINGS should be cleaned and repacked at least annually, more often if required by extensive use.

WINDOWS of Plexiglas should be wiped gently with a soft, damp cloth or chamois. Use only pure soap and lukewarm water; dry the surface after washing and rinsing by blotting with a damp cloth or chamois. Apply a good, commercial wax in a thin, even film with a soft, clean cloth. Polish the waxed surfaces lightly with a clean cotton flannel or jersey. After polishing, wipe gently with a damp cloth to ground any electrostatic charges which may attract dust particles. Do not use boiling water, strong solvents or window cleaning fluids which contain strong solvents. Do not use cloths containing grit or abrasive particles or kitchen scouring compounds on Plexiglas. A minor scratch may be rubbed out with a household wax; a deep scratch can be buffed out.

WOOD CABINETRY should be protected and cleaned with a household polish containing natural ingredients, applied 6 times a year for furniture that gets normal use. Use a soft, lint-free absorbent cloth and always work with the grain of the wood. Do not use polish containing waxes or silicones and do not use rubber or vinyl products. Careful control of temperature and humidity will help reduce expansion and shrinkage of doors and door panels. If

shrinkage occurs, exposing unfinished portions of door panels, cover the exposed areas with matching touchup stain, available from your dealer.

STORAGE

GENERAL

You should perform the following procedures if you will not be using your unit for an extended period.

LP GAS SYSTEM

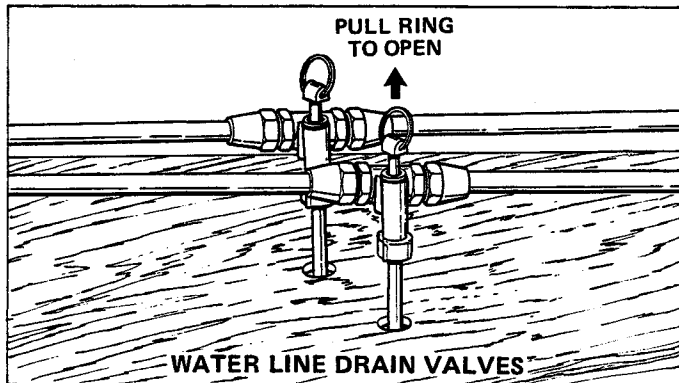
Close the LP gas container's Service valve. Extinguish all pilots and close all appliance LP gas valves (oven/range, water heater, refrigerator, furnace). Light a range burner (or range pilot on eye-level models) to consume any gas remaining in the lines. When the flame burns out, turn the range burner (or pilot) OFF.

WATER HEATER

Drain the water heater. To drain, see water heater DRAINING, in APPLIANCE section.

WATER TANK

To drain the water tank, switch the water pump ON and open all faucets. Remove the water tank's exterior drain cap or open the tank's drain valve. Open all hot and cold water line drain valves. When the tank is empty, close all faucets and drain valves, replace the drain cap (if so equipped).



WATER PUMP

When the water tank and water lines have been drained, remove the outlet hose from the pump. Turn the pump ON, allowing it to pump out any remaining water, usually about a cupful. Use a towel or rag to catch this water. You can reattach the outlet hose now or later.

ELECTRICAL SYSTEM

Turn OFF all circuit breakers at the Service Panel. Turn off generator at switch in generator compartment.

EXTERIOR

Place unit in a garage or other shelter. If this is not possible, cover with a tarpaulin or plastic.

INTERIOR

Close and secure all doors and windows. Open a roof vent or window slightly to allow circulation, but not so far that rain or snow can enter.

WINTERIZATION

GENERAL

You should make special preparations for storing your unit in cold winter climates. All systems and components should be inspected and, if necessary, repaired prior to storage. Winterize the unit before removing the RV battery.

NOTE: If you will be using your vehicle during cold weather, be certain to keep the fresh water system drained or use an approved, non-toxic RV antifreeze to prevent freeze-ups. Have an LP supplier add anhydrous methanol to your LP gas containers. Consult your authorized dealer for other winter usage information.

HOLDING TANKS should be drained and rinsed before antifreeze is allowed to run into them. The dump valve shafts should be inspected and lubricated, if necessary. Be certain the dump valves are CLOSED.

FRESH WATER SYSTEM should be drained as described in STORAGE section, then pour six gallons of approved, non-toxic RV antifreeze into the gravity water fill. This will allow you to winterize the remainder of the fresh water system.

CAUTION: DO NOT use automotive antifreeze in the fresh water system; it is poisonous.

Winterize the fresh water system by briefly opening all water faucets and switching the water pump ON. Close the faucets when antifreeze flows out. Switch the water pump OFF.

WATER HEATER should be drained (see water heater DRAINING in APPLIANCE section). Although about two quarts of water will remain after the heater has been drained, there is ample room for expansion if it freezes. Add antifreeze to the water heater tank by opening a hot water faucet. When antifreeze appears at the spout, close the faucet.

AQUA MAGIC TOILETS should be flushed until antifreeze is present in the bowl. Pour one gallon of antifreeze down the toilet to winterize the waste water holding tank. The toilet water supply line should be completely drained and the water supply valve left open. On models with pedals, this can be done by inserting a round object, like a soft drink bottle, into the flush hole in the bowl. On models with the black and white levers, block the white lever in the open position with a wad of paper. When using air pressure to drain the water line, toilet valve should be held in the open position. If water is inadvertently frozen in the toilet, do not attempt to flush until the ice is thawed. Otherwise, damage to the toilet could occur.

DRAINAGE SYSTEM can be winterized by

pouring one-half gallon of RV antifreeze into each drain.

SHOWER HEAD should be drained until anti-freeze flows from spray nozzle.

LP GAS REGULATOR should be covered to keep moisture out of vent. LP gas system should be prepared as described in STORAGE section. Containers should have anhydrous methanol added by an LP gas supplier.

RV BATTERY should be recharged and water added, if necessary. Disconnect the battery cables and store battery in a cool, dry place. Check regularly and recharge as needed.

NOTE: DO NOT store battery in an area where it could be exposed to extreme heat or sparks. Be sure the room is properly ventilated to prevent accumulation of hydrogen fumes given off by batteries.

WINDOWS should be masked with newspaper or similar material to protect fabrics from exposure.

EXTERIOR VENTS (Range hood, refrigerator, furnace) should be covered.

BODY should be cleaned and waxed; locks and hinges lubricated. Remove snow accumulation from the roof with a long-handled broom or similar tool.

FIRE SAFETY

Prevention is the best form of fire safety. Never smoke in bed. Use care with any open flame inside of your vehicle. Many of the materials in your vehicle are combustible and may produce toxic fumes when exposed to intense heat or open flame. Follow the instructions previously listed for the care, maintenance and operation of the various appliances in your vehicle. Make certain everyone in your party is familiar with the emergency features of the unit, the location of exits and the location and operation of fire extinguishers. A chemical fire extinguisher has been furnished with your unit. Check it regularly to be sure it is ready for immediate use. A fire extinguisher that is discharged, or partially discharged, should be replaced immediately.

WARNING: DO NOT bring or store LP gas containers, gasoline or other flammable liquids inside the vehicle because a fire or explosion may result.

SMOKE DETECTOR

The optional smoke detector in your unit should be tested each week. Push and hold the test button for 5 to 10 seconds until the alarm sounds. The smoke detector will sound a special low battery signal when the battery needs to be replaced. This signal is a short chirping sound that repeats itself at least once a minute for one week. Besides regular testing and battery replacement when necessary, you should vacuum the outside of the smoke detector every six months. The smoke detector will sound an

alarm when visible or invisible particles of combustion enter the sensing chamber.

EMERGENCY EXITS

Vehicles with one entrance door will have an emergency exit installed at one of the windows. To operate the emergency exit window, lift the two small levers located at the side or two latches along the bottom of the window and push out. The emergency exit is identified by a label on the window frame. Fifth wheels have an emergency dome exit installed above the upper level bedroom. To operate the dome exit, raise the handle and push the vent open. The dome exit is also identified by a label.

VISITING CANADA OR MEXICO

GENERAL

Passports or visas are not required for entry into CANADA or MEXICO. However, tourist cards are necessary for MEXICO if you will be staying more than 72 hours or travel farther than 40 miles from the border. Cards can be obtained at the port of entry or from a Mexican consulate. You should carry your birth certificate, voter's registration card, baptismal certificate or similar proof of identity when entering either country. Naturalized U.S. citizens should carry their naturalization papers or other proof of citizenship. Persons under 18 years of age should carry a notarized letter from their parents or guardians giving them permission to travel in CANADA or MEXICO.

The information in this section is general in nature and subject to change by the Canadian or Mexican government. For specific information, including rules for re-entering the U.S., as well as points of interest and campsites, contact the consulate nearest the point at which you plan to enter the country.

VEHICLES

No special driver's license or permit is necessary in either country, but renew your license if it has or will expire during the trip. Proof of vehicle ownership is required at the border. If you are using someone else's unit, you should have a notarized letter authorizing its use. MEXICO requires a vehicle permit for every self-propelled vehicle. The permit can only be obtained from Mexican customs (Aduana) offices upon presentation of tourist card, vehicle registration, and title or notarized statement from owner.

CANADA requires a Canadian Non-Residential Interprovincial Motor Vehicle Liability Insurance card, which is only available from U.S. agents. All provinces in CANADA require evidence of financial responsibility if visitors are involved in an accident. Limits vary from province to province. Contact your insurance agent for details. Your insurance policy is NOT valid in MEXICO. Temporary insurance must be purchased from Mexican companies whose offices are located near the border.

CB RADIO

CB radio operation in CANADA requires a temporary license which can be obtained by writing Regional Director, Telecommunications Regulation Branch, Department of Communications, 20th Floor, 2085 Union Avenue, Montreal, Quebec H3A 2C3, Canada. MEXICO currently prohibits the use of CB radios.

HUNTING AND FISHING

Each province has its own laws and license requirements. You must provide a written description and the serial number of each gun at the border. Revolvers, pistols and fully-automatic firearms are prohibited in CANADA. A license must be obtained from the province in which you intend to hunt or fish. Further information can be obtained by writing the Department of Lands and Forests, Wildlife Branch, in the province you intend to visit. Hunting and fishing laws in MEXICO are extremely complicated. Request further information from Secretaria de Comunicaciones, Estados Unidos Mexicanos, Mexico DF.

DOGS AND CATS

CANADA requires a certificate, signed by a licensed veterinarian in the U.S. or CANADA, attesting that a dog has been vaccinated for rabies in the past 12 months. The certificate must contain a description of the dog and date of vaccination. Puppies under 3 months old need no certificate. There is no restriction on the entry of healthy cats.

A certificate, signed by a licensed veterinarian, describing the pet and attesting that it has had a rabies shot in the past 6 months, is required in MEXICO. A fee is charged for the required verification of the certificate by a Mexican consulate.

OUR WARRANTY

GENERAL — Your new recreational vehicle is backed by our position as an industry leader, achieved through decades of experience in producing RV's noted for their quality and dependability. Our one-year full warranty demonstrates our confidence in our products and is a commitment to customers' continued satisfaction.

Every effort has been made to provide you with a safe, dependable recreational vehicle. Your RV complies with applicable federal and state regulations and the requirements of ANSI A119.2, the nationally-recognized "Standard for Recreational Vehicles — Installation of Plumbing, Heating and Electrical Systems". The Recreation Vehicle Industry Association (RVIA) periodically inspects our production and assists in maintaining strict compliance with installation and safety standards for those systems. Similar periodic inspections of the systems are made by representatives of various states. You, the owner, must perform periodic inspections of the systems and provide a program of preventive maintenance as described in the Owner's Manual and instruction booklets.

WARRANTY SERVICE — We recommend that warranty service be performed by the authorized dealer from whom you purchased your RV because of the dealer's continued and personal interest in your satisfaction. But if you are traveling or in the event that you move, service under the warranty will be performed by any of our authorized dealers. Whenever possible, make an appointment to avoid unnecessary delays.

Always carry your Owner Registration Card, which must be presented to obtain warranty service. The card is proof of purchase and provides the date of retail sale, which are necessary to determine warrantability. If you cannot locate an authorized dealer, contact our Service Department at the address on the back of this manual.

WARRANTY PERIOD — The warranty period shall be for 12 months and begin on the date the new recreational vehicle is delivered to the first retail purchaser, or the first in-service date, whichever is first.

WHO IS COVERED — The first retail purchaser and subsequent owners during the unexpired term of the warranty, provided terms of the warranty are met.

WHAT IS COVERED — The Manufacturer warrants to owners that an authorized dealer or Service Center will make repairs made necessary by defects in material or workmanship during the warranty period. Such repairs will be made without charge for parts and labor to the owner.

WHAT IS NOT COVERED — Our warranty does not cover the motor home chassis, tires, tubes, batteries or optional generators, repairs or adjustments required because of neglect, accident, misuse, failure to follow service and use instructions, normal wear and/or exposure, unauthorized repairs or unauthorized modifications to any part of the systems or body that might cause defective performance.

Your new recreational vehicle is designed as a temporary living quarters for recreational camping, travel or seasonal use and not as a permanent dwelling place. Usage as a permanent accommodation is a breach of warranty and we are not liable for any damage that results because of such misuse.

The manufacturer does not assume responsibility for loss of use of the recreational vehicle, loss of time, inconvenience or expenses due to equipment failures (refer to the warranty statement for other exclusions and limitations).

OTHER WARRANTIES — Be certain to complete and submit to the appropriate manufacturers the warranty forms for motor home chassis, tires, tubes, batteries, and optional generators, which are not covered by our one-year full warranty. If service or parts are required for these products, refer to the furnished list of factory-authorized service centers. If the list is not available, write or call the manufacturer concerned to obtain the location of the nearest authorized service center.

OWNER RELATIONS — Owner satisfaction and goodwill are of primary concern to us. We recognize that our continued success as a leading manufacturer of recreational vehicles depends upon your complete confidence in our products and service. A pleasant and effective relationship through our dealers is as important as maintaining the technical excellence of our product. Your authorized dealer will assist you in providing service, maintenance, selection of options and instructions concerning the operation of your recreational vehicle.

Occasionally, a warranty or service matter may not be handled to your satisfaction. Often it is the result of a misunderstanding and can be resolved at the dealer level. Discuss the situation with the dealership management. If you cannot find satisfaction at the dealer level, we invite you to contact our Owner Relations Department, where we will make every effort possible to provide an agreeable solution. In most instances, we will eventually refer you back to the local dealer with our recommendations.

Write or telephone Owner Relations at the address or telephone number on the back of this manual.

MAINTENANCE SCHEDULE *

ITEM	Every Trip	Every 30 days or 1,000 miles	Every 60 days	Every 90 days or 2,500 miles	Every 6 months or 5,000 miles	Annually or 10,000 miles	REFERENCE
Airing	X						Air Quality, Condensation, Maintenance, this manual
Appliances	X					X	Appliances, this manual; Appliance Manufacturers' instructions
Awning Rails						X	Maintenance, this manual
Axle & Suspension						X	Maintenance, this manual
Batteries		X		X			Maintenance, this manual
Brakes					X	X	Maintenance, this manual; Brake Manufacturer's manual
Body						X	Maintenance, this manual
Bumpers						X	Maintenance, this manual
Counter, Table Tops	X						Maintenance, this manual
Doors				X			Maintenance, this manual
Electrical System	X						Maintenance, this manual
Fabrics						X	Care of Fabrics, this manual
Floor Coverings	X						Maintenance, this manual
Frame						X	Maintenance, this manual
Hinges						X	Maintenance, this manual
Hitch Ball/Pin	X			X			Maintenance, this manual
Jacks	X			X			Maintenance, this manual; Jack Manufacturer's manual
Locks & Latches						X	Maintenance, this manual; Lock/Latch Manufacturer's manual
LP Gas	X	X					LP Gas, this manual; Appliance Manufacturers' instructions
Lug Nuts	X						Maintenance, this manual
Pigtail Contacts				X			Maintenance, this manual; Pigtail Manufacturer's instructions
Roof, Body, Underbelly				X			Maintenance, this manual
Safety Chains	X						Maintenance, this manual
Seams (Seal)						X	Maintenance, this manual
Shades, Valances	X						Maintenance, this manual
Steps	X					X	Maintenance, this manual; Step Manufacturer's instructions
Tires	X					X	Pre-Travel Check, Maintenance, this manual; Tire Mfg's instructions
TV Antenna		X					TV Antenna Manufacturer's instructions
Vents						X	Maintenance, this manual; Vent Manufacturer's instructions
Vinyl Ceiling & Wall Panels	X						Maintenance, this manual
Water Heater	X					X	Maintenance, this manual; Water Heater Manufacturer's instructions
Wheel Bearings						X	Maintenance, this manual; Axle Manufacturer's instructions
Windows	X						Maintenance, this manual; Window Manufacturer's instructions
Wood Cabinetry	X		X				Maintenance, this manual

*Maintenance schedules listed are minimum requirements; heavy use, unusual temperatures or humidity, or other environmental conditions may require more frequent maintenance.

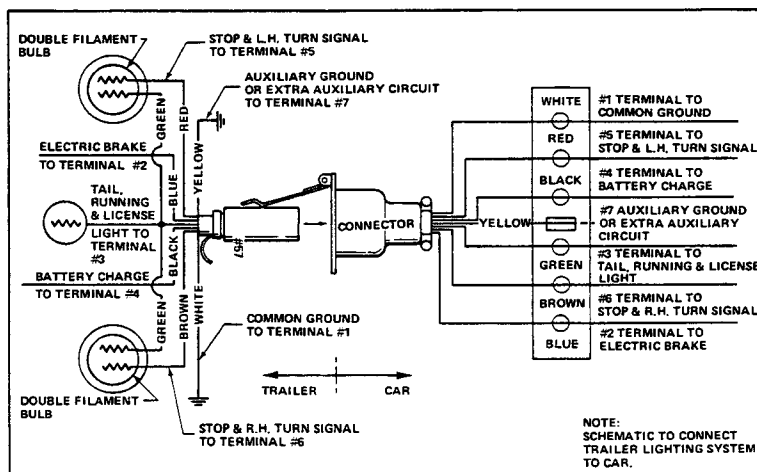
APPLIANCE IDENTIFICATION FORM

Should your unit or one of the appliances require warranty service, you will have to identify the manufacturer, model designator and serial number. Fill in this form as soon as possible. It will help you meet our identification requirement. Depending on your unit, certain items listed below may not be offered as either optional and/or standard.

EQUIPMENT	MANUFACTURER	MODEL DESIGNATOR	SERIAL NUMBER
Travel Trailer/or Fifth Wheel	_____	_____	_____
Furnace	_____	_____	_____
Range and Oven	_____	_____	_____
Microwave Oven	_____	_____	_____
Converter/Power Center	_____	_____	_____
Refrigerator	_____	_____	_____
Washer	_____	_____	_____
Dryer	_____	_____	_____
Water Pump	_____	_____	_____
Water Heater	_____	_____	_____
Roof Air Conditioner	_____	_____	_____
Roof Air Conditioner	_____	_____	_____
Radio	_____	_____	_____
8-Track or Cassette Player	_____	_____	_____
Antenna	_____	_____	_____
Generator	_____	_____	_____
Toilet	_____	_____	_____
Door Keys	_____	_____	_____
Exterior Storage Compartment Keys	_____	_____	_____

ELECTRICAL SPECIFICATIONS

PIGTAIL WIRING DIAGRAM



COLOR CODE FOR PIGTAIL

White	—	Common to Ground
Red	—	Stop & Left Turn
Brown	—	Stop & Right Turn
Green	—	Tail, Running & License Plate
Blue	—	Electric Brake
Yellow	—	Backup
Black	—	Converter/Interior

LIGHT BULBS

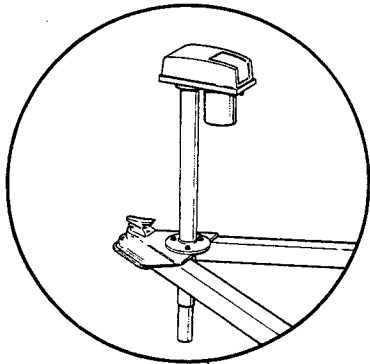
Interior 12 VDC	—	#1141
Range Hood	—	25 W, 12 VDC
Turn, Tail & Stop	—	#1157
Backup	—	#1156
License Plate	—	#67
Clearance, Grab Handle	—	#67
Patio —	—	#93

WATER PUMP FUSE

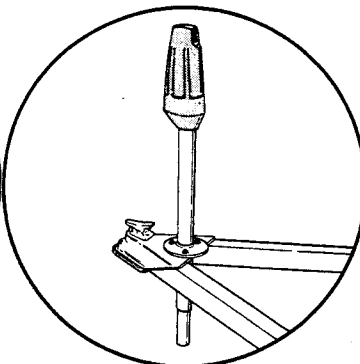
15 Amp. Slo Blo

MISCELLANEOUS — See the advertising brochure for the exterior dimensions, weight ratings and wheel/tire ratings which pertain to your unit.

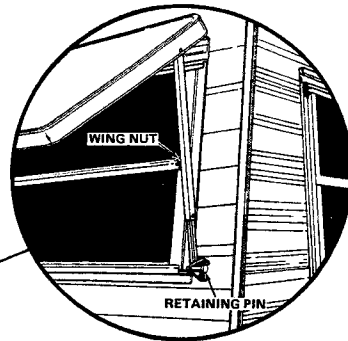
POWER JACK
FIGURE 20



POWER JACK
FIGURE 21



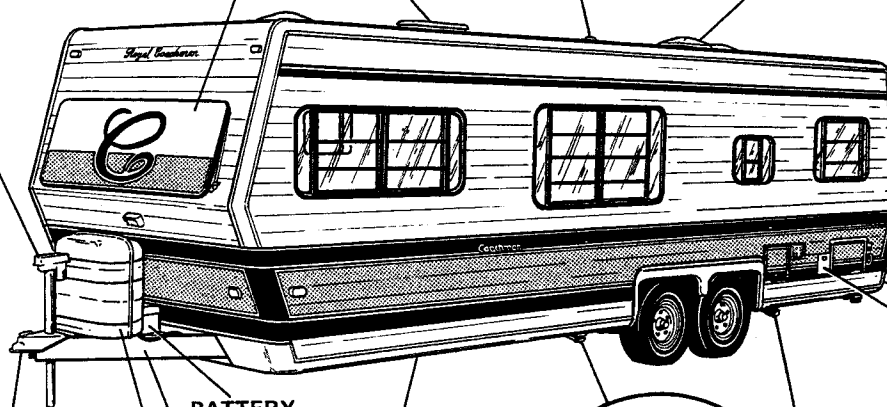
AWNING
FIGURE 5



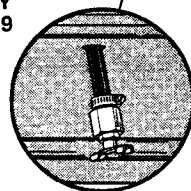
REFRIGERATOR
VENT

SEWER VENT

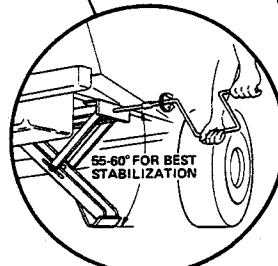
ROOF VENT



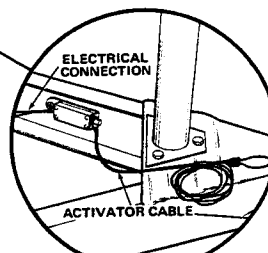
BATTERY
FIGURE 9



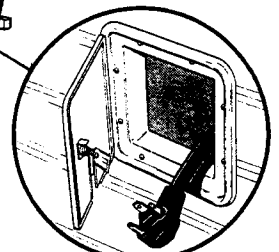
WATER TANK DRAIN
FIGURE 12



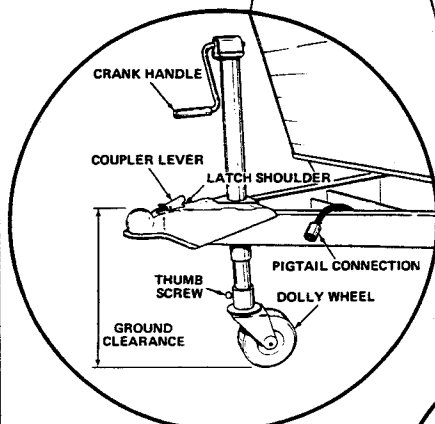
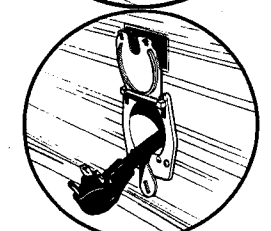
STABILIZATION JACKS
FIGURE 22



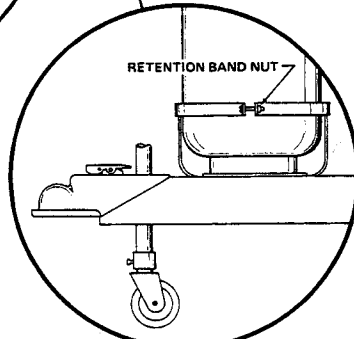
BREAKAWAY SWITCH
FIGURE 2



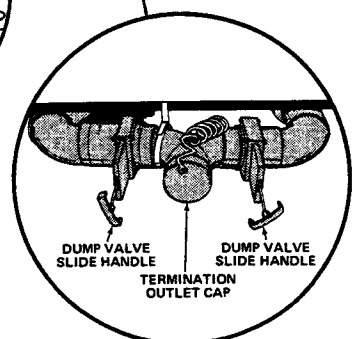
SHORELINE
FIGURE 7



FRONT JACK
FIGURE 1

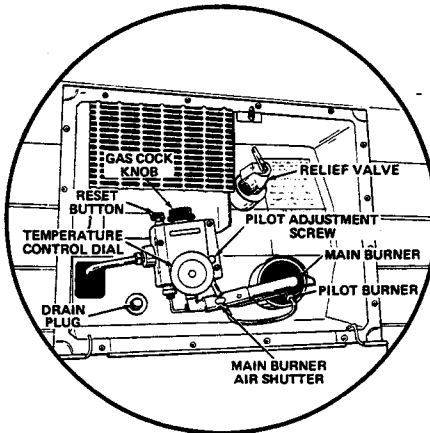


SINGLE LP GAS BOTTLE
FIGURE 15

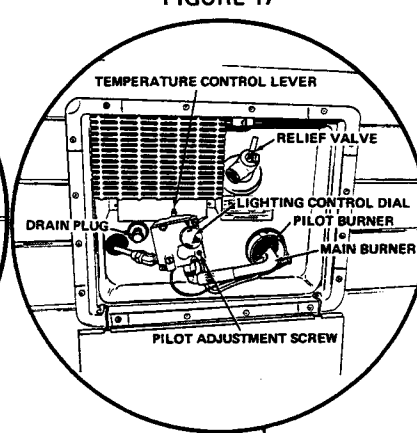


TERMINATION, OUTLET
FIGURE 14

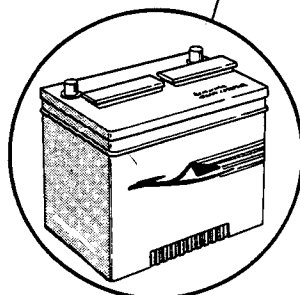
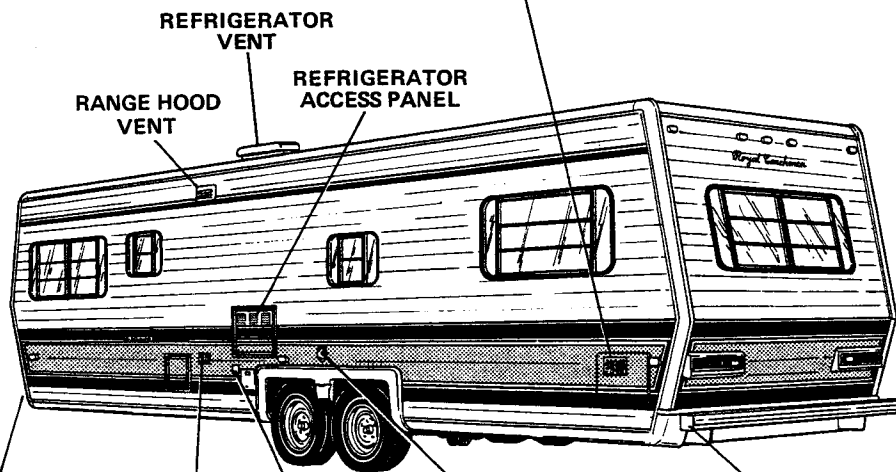
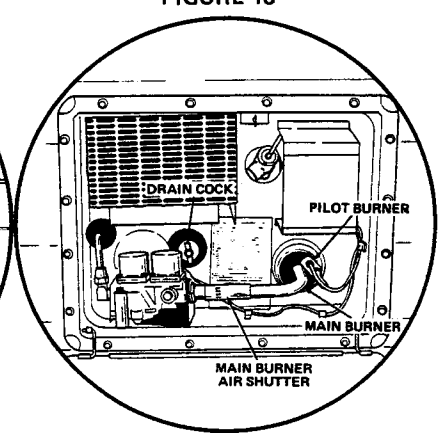
**WATER HEATER (UNITROL)
FIGURE 16**



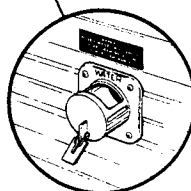
**WATER HEATER (ITT)
FIGURE 17**



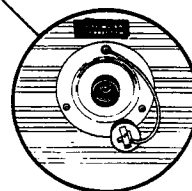
**WATER HEATER
(ELECTRONIC IGNITION)
FIGURE 18**



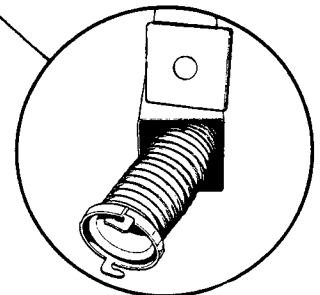
**BATTERY
FIGURE 9**



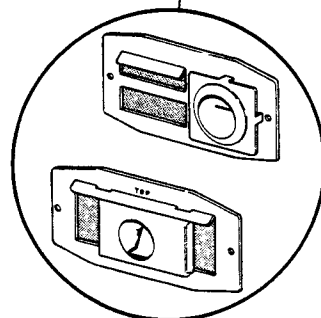
**GRAVITY WATER FILL
FIGURE 11**



**CITY WATER FILL
FIGURE 10**

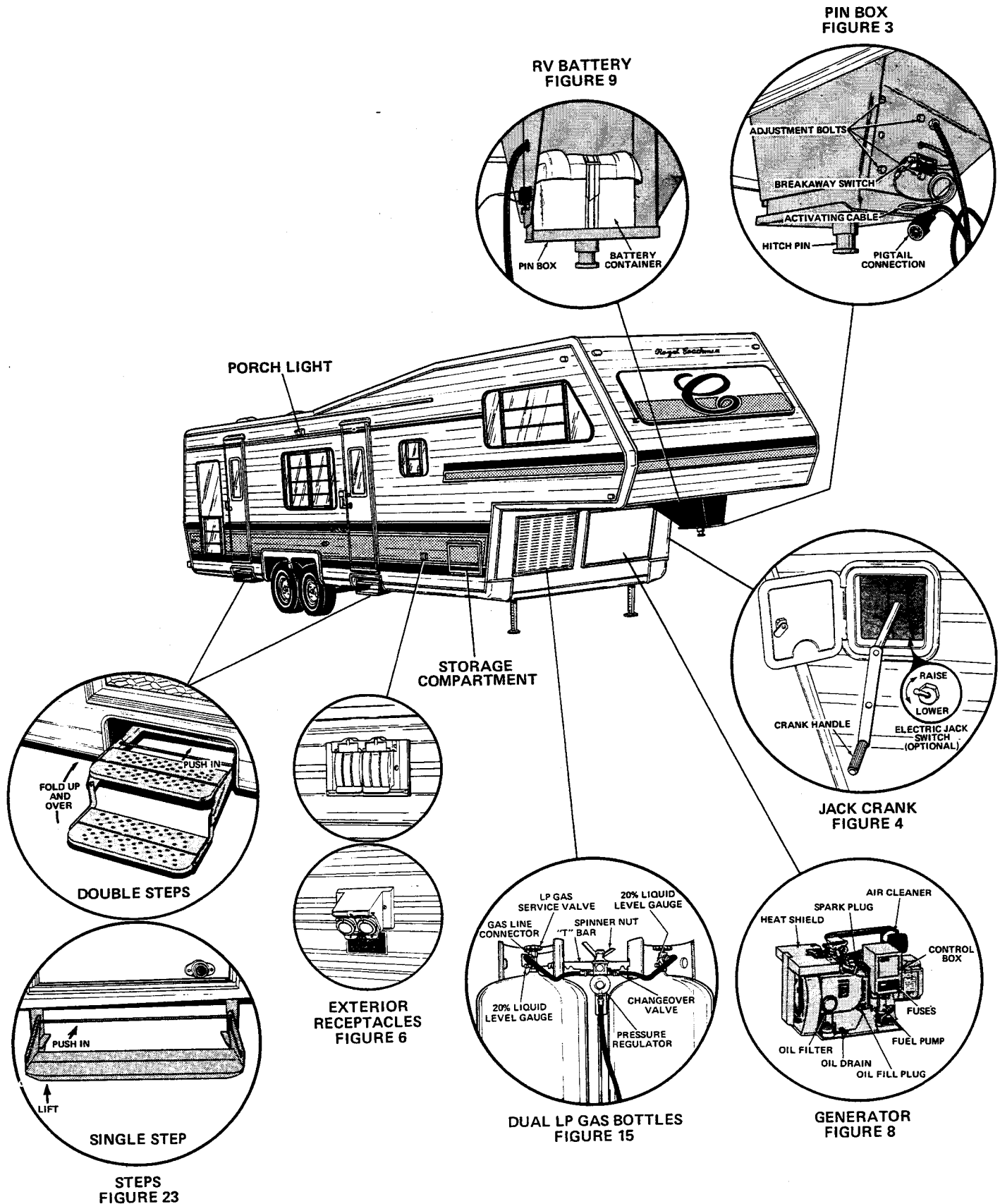


**SEWAGE DRAIN HOSE
FIGURE 13**



**FURNACE INLET/EXHAUST
FIGURE 19**

COACHMEN TRAVEL TRAILER & FIFTH WHEEL



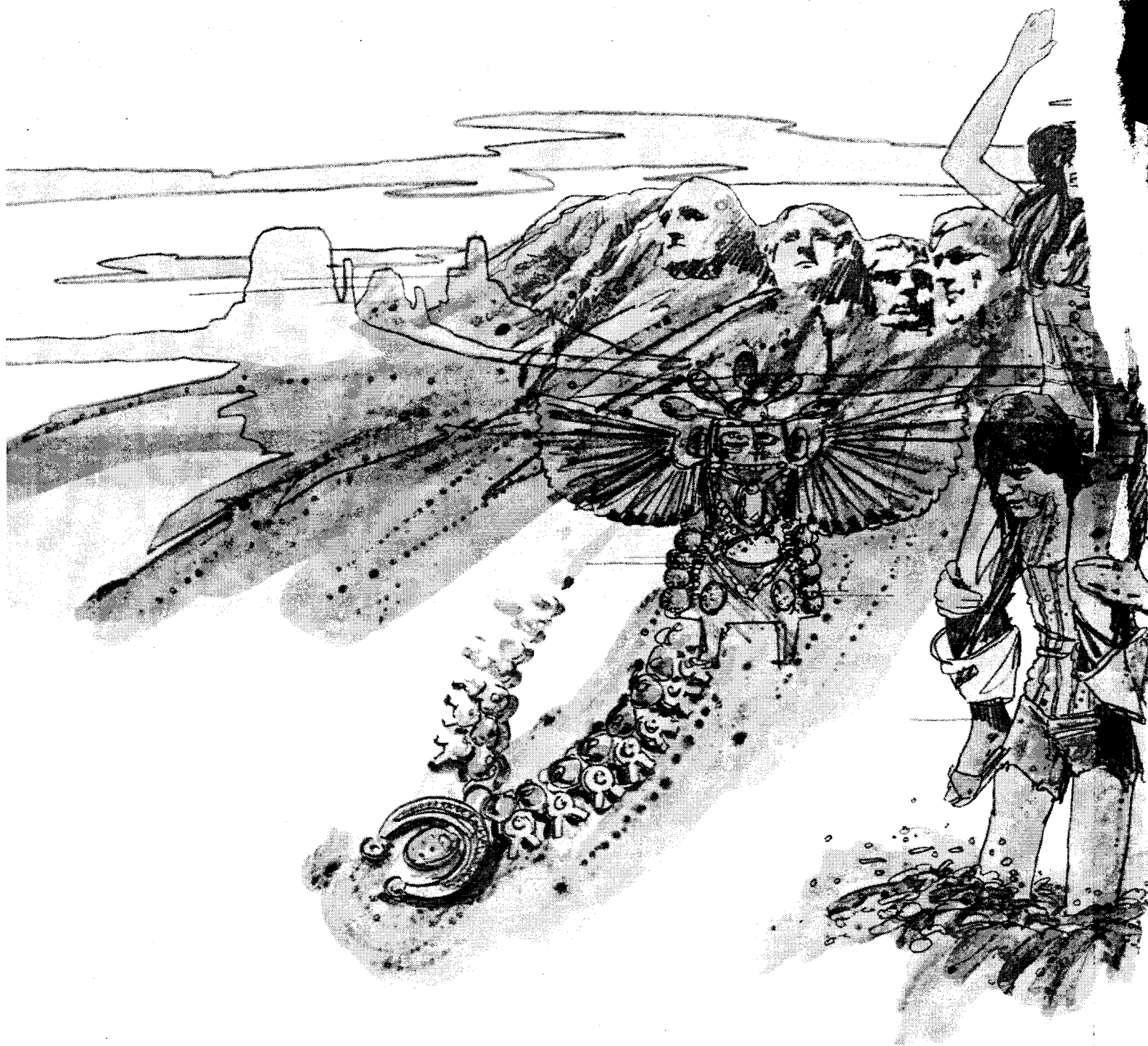
VEHICLES SHOWN ARE FOR ILLUSTRATION PURPOSES ONLY: SOME ITEMS SHOWN ARE NOT AVAILABLE ON CERTAIN MODELS AND MAY BE OPTIONAL ON OTHERS.

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- Traditional high trade-in value for any recreational vehicle built by Coachmen!

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