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# Section I Introduction

This section of your Owner's Manual contains general hints and recommendations for using your motorhome. Checklists and suggestions are offered which cover just about every phase of motorhome travel.

The remaining sections of this manual, Sections II through XI, describe in detail the operation and use of the individual items and systems which comprise your motorhome. The following paragraphs summarize the contents of these sections:

**Section II Operation** — Covers driver's instrumentation, operating controls, gauges and indicators.

General data on operation of coach vehicular systems are also covered in this section.

**Section III Living Area Facilities** — Covers operation of heating and air conditioning systems, use of accessories and appliances and related general coach facilities data.

**Section IV Electrical Systems** — This section describes operation of coach electrical systems; ac/dc operation and generator switching are also covered.

**Section V Water Distribution and Drainage Systems** — Covers internal supply and distribution, plumbing, city water hookups, tank fill and sanitizing, holding tank dumping and operation of hot water supply system.

**Section VI LPG System** — This section describes LPG internal supply and distribution, tank filling procedures, system component locations, and precautions to observe regarding LPG handling.

**Section VII Air Brake Systems** — This section covers operation of the service brakes and spring brake systems, fail/safe features and general brakes system operation.

## **Section VIII Owner Maintenance Data** —

Includes information on maintenance procedures which may be within the scope of the owner. Coverage is provided for preventive maintenance schedules, specifications and system capacities, cold weather operation, storage and winterizing.

Interior/exterior appearance care and emergency maintenance procedures are also described.

**Section IX General Information** — A list of major components, including model numbers, name and address of manufacturer.

**Section X Diagrams** — Contains wiring, schematic, piping and general-purpose diagrams to assist in troubleshooting and understanding how these systems function.

**Section XI Optional Equipment** — This section provides you with information on optional equipment and features used in your motorhome.

We hope that this manual will help answer any questions that may arise about the use, operation and maintenance of your motorhome. Any suggestions or recommendations that you might have for including or expanding on material of interest will be carefully considered for incorporation in periodic supplements. We are always interested in providing our coach owners with the most current and comprehensive information about our product.

Your satisfaction is our assurance that we are fulfilling our responsibilities to our owners.

## **Checklists**

A little preliminary planning will go a long way to help make your trips successful and enjoyable. As an aid to planning your travels, review the following checklists. If there are any additional items that you should be reminded of, add them where you see fit. These lists are only recommendations based on the experience and suggestions of sources well-versed in motor-coach expertise. You will eventually find that a short "walk-around" the coach, outside and inside, will be adequate and comprehensive enough to ensure that you're ready for travel.



### **Before You Leave:**

- Store valuables and important papers in a safe place.
- Arrange care for your pets.
- Cover all food to keep out mice and insects.
- Store oil, gasoline, matches and other inflammables properly; get rid of newspapers, magazines and oily rags.
- Connect timers to several inside lamps and outside lights; keep some shades open for a lived-in look.
- Discontinue newspaper, milk and other deliveries; store trash cans and outside equipment.
- If weather permits, shut down hot water and heating systems; close main water supply.
- Ask the Post Office to hold your mail.
- Have your lawn, garden and house plants cared for.
- Arrange with the Telephone Company for discontinued or "Vacation Service".
- Lock all windows and doors securely.
- Leave your key with your neighbor; let him know your basic itinerary.
- Notify police.

### **Checkout Your Coach — Outside:**

- Disconnect and stow:
  1. Electrical cord.
  2. Sewer hose (flush out)
  3. Water hose.
- Check all exterior lights for damage.
- Check wheel lug nuts for tightness. (450-500 ft.-lb.)
- Check tires for correct pressure. (See Chapter 8).
- Check that all external compartments and filler openings are properly closed and/or locked.
- Check that items stored on exterior of coach are secured. (Be sure that these items present no clearance problems.)

### **Note**

**If the trip you are planning will take the coach well past suggested maintenance intervals listed in Section VIII, it may be advisable to perform these procedures before leaving. This may avoid unscheduled stops or interruptions during your trip.**

- Check that there are no obstacles to avoid above or under the coach. Be sure that there is sufficient clearance front and rear.

### **Checkout Your Coach — Inside:**

- Turn off water pump switches.
- Close windows and vents.
- Check that cabinet doors and drawers are secured.
- Check that refrigerator door latch is in locked position.
- Check that no heavy item is stored in an overhead cabinet.
- Store large items in base cabinets.
- Check that counter tops, range top, table tops and shelves are clear of unsecured items.
- Turn off interior lights; check that entrance step is retracted.
- Secure and lock the entrance door.
- Adjust exterior and interior mirrors.

### **Warning**

**Mirrors provide needed additional driver visibility. To be effectively used mirrors must be properly adjusted for each driver and the driver must be aware of the limitations on viewing area that exist even when mirrors are properly used.**

### **Check Your Automotive Systems:**

- Check that fluid levels are normal (oil, power steering, engine coolant, windshield washers, transmission, etc.).
- Check generator oil level, coolant level, battery condition.
- Check operation of turn signals, emergency flasher, stoplights and backup lights.
- Check that headlight high- and low-beams operate.
- Check horn operation.
- Check fuel gauge, and add fuel if needed.
- Start engine and check gauges for signs of trouble.
- Check operation of foot brakes, emergency brake. (See that brake pressure builds up and steadies at about 100 to 120 psi.)

### **And, Before Driving Away:**

- Check operation of appliances and special equipment.
- Check that fire extinguishers are fully charged.
- Check operation of interior and exterior lighting.
- Start generator and check 120v ac system and wall outlets.
- Adjust driver's seat so that all controls are within easy reach.



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- Make sure that seat is locked in position. Do not adjust driver's seat swivel or foreaft mechanism while vehicle is moving or seat could move unexpectedly, causing a loss of control.
- Check that front passenger's seat is locked in position.
- Fasten seat belts. Belts should be placed as low as possible around the hips. This places the load of the body on the strong hip bone structure instead of around the soft abdominal area and prevents sliding out in case of an accident.

### **Caution**

**Child restraint systems are designed to be secured in vehicle seats by lap belts or the lap belt portion of a lap-shoulder belt. Children could be endangered in a crash if their child restraints are not properly secured in vehicle. According to accident statistics, children are safest when properly restrained in the center of vehicle and in a rear facing seating position, rather than a front facing position.**

- Check that warning lights are lit when the ignition key is turned to **on** or **start** position.

### **Some Items You Might Want to Take Along On Your Trip**

#### **Note**

**You may find that many items taken were not needed and that some items that were needed were overlooked during planning of your last trip. Make notes of these items to prevent duplicating the same errors.**

- Adequate supply of prescription medicines.
- Prescription sunglasses or reading glasses.
- Camera equipment and film supply.
- Heating pads, ice bags, etc.
- Stationery, envelopes, stamps.
- Telephone number list.
- Reading material.
- Special pet supplies.
- Extra toilet chemicals and toilet articles.
- Spare belts for engine – operated equipment.
- Spare parts for generator: suggested spares include oil filter, fuel pump, air filter, solenoid. Five quarts of approved motor oil.
- A professional-type double-action tire pressure gauge.

- Under the heading of **Emergency Equipment**, it is advisable to consider outfitting your coach with these items:
  1. First aid-kit
  2. Emergency highway flares
  3. Flashlight or lantern (with extra batteries)
  4. Tool kit
  5. Replacement lamp assortment
  6. Replacement fuse assortment
  7. A trouble light with a long cord

### **And Some Other Thoughts To Consider**

- Automobile insurance to cover you and your family.
- Avoid cash. Use traveler's checks and credit cards wherever possible.
- Confirm reservations well in advance of arrival.
- Make a clothing check list for everyone.

### **Citizen's Band Transceiver**

You might also bear in mind that your coach is equipped with a CB unit (Citizen's Band receiver-transmitter). In the event of an emergency situation which requires outside assistance, remember to call for help on Channel 9. This channel is restricted to emergency use only and it is monitored 24 hours per day! Don't hesitate to use your CB if you see someone else in need of assistance.

### **Hot Weather Operation**

Wherever possible, choose a shaded parking site so that the coach will be cooler during the hottest part of the day. The full-length side awning will be especially useful in lowering inside temperature. Air conditioning units are indispensable in hot climates. Keep in mind that their proper operation depends on adequate line voltage. Low voltage causes motors to run hotter and reduces compressor motor life. Supply voltage in some campgrounds may not be as high as necessary, especially when there are heavy loads on the lines from other air conditioners. Check the right hand overhead panel 120 vac meters when in doubt.

### **Cold Weather Operation**

LPG appliances, furnaces, and the gas refrigerator are designed with sealed combustion areas. This is for your protection to prevent danger from carbon monoxide or depletion of oxygen. Your motorhome is equipped with a highly accurate and sensitive gas/smoke alarm. Heed alarm indications!



If frost or condensation accumulates in closets or cabinets during long periods of cold weather operation, leave the doors to these areas slightly ajar to provide air circulation. Be sure that roof vents are open when using oven or burners.

### **Campground Courtesy**

Don't forget the "Golden Rule". Being considerate of your neighbors will help make friends. A few of the "Do's" and "Don'ts" are:

- Good housekeeping — put all litter in the proper receptacles and leave your site neat and clean.
- Don't allow your water or sewer hook-ups to leak.
- Respect your neighbor's desire to retire at an early hour. Avoid loud noises and bright lights after dark.
- Drive slowly through camp areas at any hour for the safety of pedestrians.

### **Insurance**

As with your automobile, it is important that you have adequate protection with insurance coverages for personal liability, theft, collision, overturn, property damage, etc.

#### **Canadian and Mexican Insurance**

Insurance for travel in Canada can usually be covered by your present U.S. policy for the recreational vehicle, often at no extra cost. Consult your individual company for procedures and be sure of your coverage before entry.

For travel in Mexico (at the present time) there are no U.S. insurance companies that can provide recognized Mexican coverage, with the exception of that required for travel through a narrow strip of Mexican territory in and around ports of entry and the U.S./Mexican border.

Mexican insurance is controlled, and rates are set, by the Mexican government. There are several reliable companies handling Mexican insurance, with similar rates for the necessary coverages. The principal differences between them are the "fringe benefits", received in the form of informational travelogs and other helpful information, such as dining places considered acceptable for sanitary conditions, fuel stations, and so on.

Some insurance services include detailed route maps with "where to stay" recommendations and "things to see" mile-by-mile (or kilometer-by-kilometer post). While the rates set by Mexico may seem quite expensive at first glance, you usually

end up not spending quite as much as expected because you can usually arrange to hold your state-side policy in abeyance during the same period you are in Mexico, thus not having to pay unnecessarily for double coverage. In addition, you may be able to obtain substantial refunds on the Mexican collision insurance after your return to the U.S. Be sure to obtain a certification from the park operator at each location in Mexico to certify the dates that your coach was parked there. If your coach is parked for most of the time, instead of constantly traveling, your refund may be a major portion of the original cost. This feature is referred to as the "in-storage" credit. (It is a good idea to always check with your insurance company before taking a trip to find out whether applicable insurance rules and regulations have changed. Keep up to date on your coverage.)

Carry insurance papers at all times!

### **Safety Considerations**

#### **Using LP Gas**

Check for leaks at the connections on the LP gas system soon after purchase and initial filling of LP tank; continued periodic checks of the system are recommended. Even though the manufacturer and dealer have already made tests for leakage, this check is advisable because of the vibrations encountered during travel. Apply a soapy water solution to the outside of gas piping connections to find gas leakage (bubbles). Usually, tightening of connections will close leaks. (Be sure to first shut off the gas supply!) If not, ask your authorized dealer service to make the needed repairs.

Liquefied Petroleum Gas (LPG) is heavier than air. Leaking gas tends to flow to low places, such as does water. It will sometimes pocket in a low area. LP gas can usually be detected by an identifiable odor characteristic to onions or garlic.

### **Caution**

**Never light a match or allow any open flame in the presence of leaking gas!**

Be sure that the main LP gas supply valve is closed during refueling to prevent accidental ignition of gas fumes by appliance pilot lights.

### **Warning**

**When coach is to be stored in a confined area, turn off the LPG at the main tank shutoff valve (figure 6-1).**





Your Wanderlodge® has been provided with an automatic 80% fill valve to protect you from the dangers of an overfilled LPG tank.

### Electrical Systems

Your coach has been engineered and checked for your complete electrical system safety. Circuit breakers and fuses are installed to protect electrical circuits from overloading. Before making modifications or additions to the electrical system, consult your dealer for assistance in obtaining a safe and secure installation.

Do not "jump" circuit protectors!

### Attached Power Cord

Your coach is supplied with a permanently attached 50 A power supply cord for hookup to an external power source.

Note that the cord has a ground pin which provides proper electrical system grounding. The ground pin is your personal protection from electrical shock hazards. Do not use any adapter, cheater, or extension cord that will break the continuity of the grounding circuit. **Never** remove the grounding pin for convenience of being able to make a connection to a non-grounded receptacle!

The power cord adapter allows connection of one 30 ampere 120 volt line to the shoreline plug in the rear of your coach. This will permit use of some motorhome appliances without overloading the supply lines.

**Never** operate your coach with a "hot skin"! If you can feel even a slight "tingling" shock from touching the coach body while standing outside on the ground, immediately disconnect the electrical hookup until the trouble is located. This fault is usually caused by a break in the grounding circuit, which should be continuous from the coach skin or frame to the distribution panel board to the third (ground) pin on the power supply cord, and from there to the park receptacle and earth ground. Your motorhome is equipped with dual polarity-protector monitor panels, located on the right hand overhead panel and in the power supply cord storage area. These panels are for your protection in ensuring against improper grounding or reversed hookups.

### Emergency Stops

Always carry road flares and/or reflective triangular highway warning markers for emergency

warning display. Pull off the roadway as far as possible when changing flats or for other emergency situations. Turn on your hazard warning flashers when parked alongside a roadway, even if only for a short while. Have your coach occupants leave the vehicle and stand clear of the area when parked on the edge of a highway.

### Engine Exhaust Gas

Avoid inhaling exhaust gases because they contain carbon monoxide, which by itself is colorless and odorless. Carbon monoxide is a dangerous gas that can cause unconsciousness and is potentially lethal. If at any time you suspect that any exhaust fumes are entering the passenger compartment, have the cause determined and corrected as soon as possible.

The best protection against carbon monoxide entry into the vehicle body is a properly maintained engine exhaust system, body and ventilation system. It is a good practice to have the exhaust system and body inspected by a competent mechanic each time the vehicle is raised for lubrication or oil change. It should also be inspected whenever a change is noticed in the sound of the exhaust system and if the exhaust system, underbody or rear of the vehicle has been damaged.

To allow proper operation of the vehicle's ventilation system, keep ventilation inlets clear of snow, leaves, or other obstructions.

Sitting in a parked vehicle with the engine on for extended periods, without proper ventilation, is not recommended!

### More Safety Considerations

- Sanitize fresh water supply system periodically. See Section V.
- Prevent water connection fittings from contacting the ground or drain hose to reduce chances of contamination.
- Consider using a qualified technician for repairing gas or electrical appliances.
- Check fire extinguishers periodically for proper charge.
- Avoid overloading your vehicle.
- Be careful not to cause an improper load distribution which can adversely affect roadability.
- Insure that tires are in good condition and properly inflated at all times. Under-inflated tires overheat and are blowout-prone!
- Check and tighten wheel lug nuts every 1,000 miles (torque to 450-500 ft.-lbs.)



- Check brake operation in a safe area — not while traveling on a busy highway!
- Use seat belts!

### Emergency Exits

Sliding windows, which can be easily opened, may be used as an emergency exit. Squeeze the screen latch and slide it to the rear enough for access to the window latch. Squeeze the window latch and slide window open. Emergency exit windows are identified by an **EXIT** decal on the glass.

### Vehicle Loading

#### Weight Distribution and Load Rating

The Federal Certification Label, located inside and above the drivers windshield between the sunvisor mounting brackets describes the maximum weight-carrying capacities of your motorhome and for each axle, respectively abbreviated by "GVWR" and "GAWR". A typical identification plate is shown in figure 1-1.

MANUFACTURED BY	
<b>BLUE BIRD BODY COMPANY</b>	
DATE OF MFR _____	
SUITABLE TIRE RIM CHOICE	
GVWR _____	
GAWR: FRONT _____	WITH _____ TIRES
_____ RIMS, AT _____	PSI COLD SINGLE
GAWR REAR _____	WITH _____ TIRES
_____ RIMS, AT _____	PSI COLD DUAL
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.	
VIN _____	CLASSIFICATION _____

Figure 1-1. Federal Certification Label

The Gross Vehicle Weight Rating (GVWR) is the maximum motorhome weight allowable with all systems filled and with passengers and supplies aboard.

Each axle also has a maximum load-bearing capacity referred to as the Gross Axle Weight Rating (GAWR).

A typical motorhome rating might be as follows:

GVWR .....	37,400 lbs
GAWR front .....	14,400 lbs
GAWR rear .....	23,000 lbs

Generally, a 35-foot unit will weigh about 37,000 pounds. If optional equipment is installed, add the weight of these items to determine the total weight.

The load capacity is the difference between the GVWR and the actual weight. This means the total weight of all food, clothing, other supplies and pas-

sengers, must not permit the load capacity to be exceeded.

To find the actual weight, with the motorhome fully loaded, drive to a scale and read the weight on the front and on the rear, separately, to determine axle loading. The load on each axle should not exceed its GAWR. If weight ratings are exceeded, move or remove items to bring all weights below the ratings.

Additional data plates located in the engine compartment provide information useful for identifying your coach if you are planning on ordering parts. Identification plates, figure 1-2, provide information such as:

1. Body Serial Number
2. Chassis Serial Number
3. Model Year
4. Model Number of Axle (if axle parts are to be ordered)

FURNISH INFORMATION BELOW WHEN ORDERING AXLE PARTS	
CHASSIS SERIAL _____	ENGINE SERIAL _____
FRONT AXLE _____	BRAKE LINING FMSI NO. & FRICTION CODE _____
BRAKE DRUM _____	
REAR AXLE _____	BRAKE LINING FMSI NO. & FRICTION CODE _____
BRAKE DRUM _____	
REAR AXLE RATIO _____	
CHASSIS SERVICE NO. _____	
<b>BLUE BIRD BODY CO.</b>	
BODY NO. _____	CAP. _____ MODEL YR. _____
FORT VALLEY, GEORGIA, USA	
BODY SERVICE NO. _____	

Figure 1-2. Identification Plates

When loading your motorhome, store heavy gear first, keeping it on or as close to the floor as possible. Heavy items should be stored centrally so as to distribute the weight more or less evenly between the front and the rear axles. Store only light objects on high shelves. Distribute weight to obtain even side-to-side balance of the loaded unit. Secure loose items to prevent weight shifts that could adversely affect the balance and roadability of the vehicle.



## **Economical Driving**

How you drive, where you drive and when you drive — these factors all have an effect on determining how many miles you can get from a gallon of fuel. The careful attention you give your vehicle, as far as maintenance and repairs are concerned, will also contribute to fuel economy.

## **Stop-And-Start Driving**

Frequent stops and starts during a trip diminish miles per gallon. Plan even short shopping trips so you can take advantage of through-streets to avoid the traffic lights. Pace your driving like the professional drivers to avoid unnecessary stops.

## **Excessive Idling**

An idling engine also consumes fuel. If you are faced with more than a few minutes wait, and you are not in traffic, it may be advisable to shut off the engine and re-start later on.

## **Fuel and Additives**

The fuel recommended for your coach is # 2 diesel along with a suitable algae inhibitor additive. See section 8 for recommended additive and quantities.

## **Lubrication and Maintenance**

A properly lubricated vehicle means less friction between moving parts. Consult the maintenance schedules in Section VIII for proper lubricants, lubrication intervals and general coach maintenance scheduling.

## **Air Cleaner**

The air for engine combustion is taken into the system through the air cleaner. Replace the air cleaner at required intervals to maintain peak engine efficiency.

## **Excess Weight**

Fuel economy is also related directly to the amount of work accomplished by the engine. Heavier loads require more power. Keep excess weight to a minimum.

## **Tire Inflation**

Under-inflation causes needless tire wear and promotes excessive fuel consumption. Check tire pressures on a regular basis.

The Federal Certification Label, figure 1-1, shows the cold tire inflation pressures necessary to support the Gross Axle Weight Ratings.

These pressures can be reduced to greatly improve the ride qualities after the actual axle weights have been determined (see previous section on Vehicle Loading).

A Michelin Tire Data Book is included in your Owner's Kit. In the Specifications – Truck Tires (tubeless) section can be found the recommended tire inflation pressures for various axle weights and tire sizes. If any axle weight is on the borderline, always use the higher pressure.

In addition, a tire inflation information plate is located on the inside of the generator battery door, figure 4-8. These are **normal** pressures as long as the axle weights are not in excess of those shown.

## **Traveling in Your Motorhome**

### **Overnight Stops**

There are many modern recreational vehicle parks with good facilities, including State, County and Federal Parks, where electrical, water and sewer connections are readily available. Directories are published which describe these parks in detail and list available services and hookups.

On overnight or short weekend trips, your motorhome has more than adequate holding tanks and water supply capacity in the event that campgrounds or parking sites are not equipped with these facilities.

On longer trips, where sewer connections and utility hookups are unavailable, it will be necessary to stop from time to time to dispose of holding tank wastes and replenish the water supply. Many gas stations (chain and individually-owned) have installed sanitary dumping stations for just this purpose.

When stopping for the night, park the coach in a location that is relatively level and where the ground is firm. This will ensure your comfort as well as the leveling of your refrigerator (for most efficient operation).

### **Extended Stays**

Making a long trip is not very different from making a weekend excursion since everything you need is right at hand and you are home wherever you travel. When packing for an extended trip, try to avoid taking non-essential items.



When planning to stay in the same location for several days, weeks, or even months, be sure to maintain the motorhome level. Use leveling jacks system controls for this purpose.

Hook up to the water supply by attaching the water hose to the commercial water supply inlet.

Plug the electrical cable into the shoreline receptacle. Be sure to observe all grounding and connection precautions!

Connect sewage hookup into the disposal facility.

### Winter Traveling

Certain precautions should be taken when traveling in your motorhome during the cold winter months. Keep these suggestions in mind:

- Provide heat in the coach at all times.
- Have a plentiful supply of LPG.
- If your stay is longer than overnight, and you do not use the generator, try to have a shoreline hooked up to outside ac power.
- Minimize your use of electricity if 120v ac is unavailable.
- Leave cabinet doors and wardrobe doors slightly open at night to allow for proper air circulation.
- Freeze protection heaters and heat tapes greatly decrease the chances of frozen water lines **provided the coach is plugged into outside power or the generator is run continuously during cold weather periods.**

Remember that low temperatures in combination with high winds will cause an equivalent chill temperature much below that indicated by your thermometer. For instance, with an outside temperature of zero degrees, and a wind velocity of 10 miles per hour, the equivalent chill temperature would be -20 degrees F!

There is no substitute for common sense when traveling in cold weather.

### General Storage Notes

Drawing draperies will reduce fading of rugs and upholstery. Leaving an air freshener agent will minimize odors from plastics and other materials. Slight opening of windows and vents will allow air circulation without worry of water entering. Covering wheels to eliminate direct rays of the sun on tires will reduce sidewall cracking.

### Note

**Remove all items from the coach which may freeze, including canned foods, miscellaneous liquids, etc. Remove all contents of the refrigerator/freezer, clean unit and leave doors ajar.**

### Emergency Assistance

To locate the closest Caterpillar dealer or other authorized repair shop, call toll free (800) 447-4986 except in Illinois call (309) 673-3252.



## Section II Operation

This section provides information on the operation and function of the controls, indicators and gauges located in the pilot/co-pilot compartment that are used in connection with the coach automotive systems. Figure 2-1 illustrates the pilot/co-pilot compartment, high-lighting the instrumentation and panels covered in this section.

### Instrumentation

All essential operating controls and gauges used to monitor and control associated engine, generator and coach systems are located conveniently on and adjacent to the electroluminescent dash panels, figure 2-2.

Associated instrumentation, accessible on the bulkhead above the pilot, includes generator ON-OFF switch, altimeter and diesel fuel filter monitors. Refer to figures 2-2 through 2-12 and the following paragraphs for locations and functions of associated operating controls and indicators.

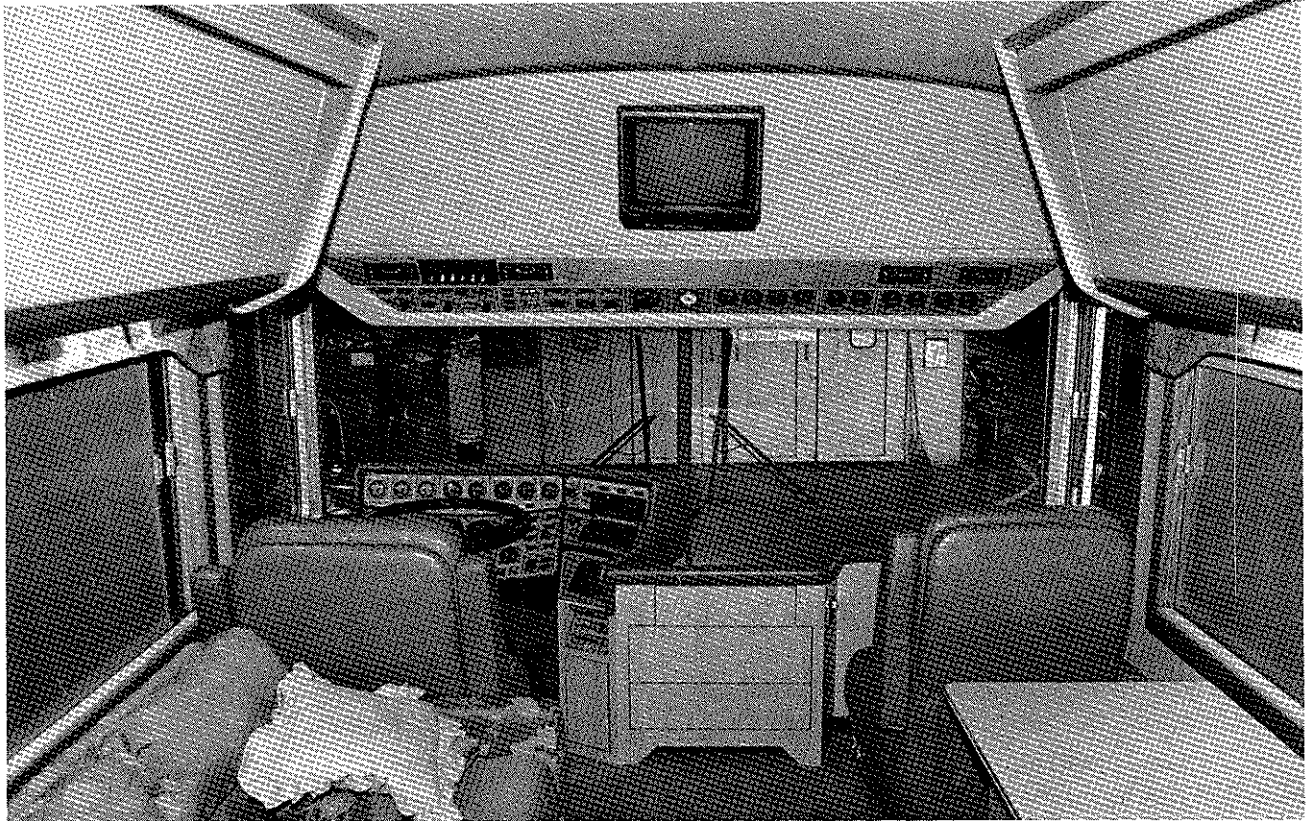


Figure 2-1. Pilot/Co-Pilot Compartment

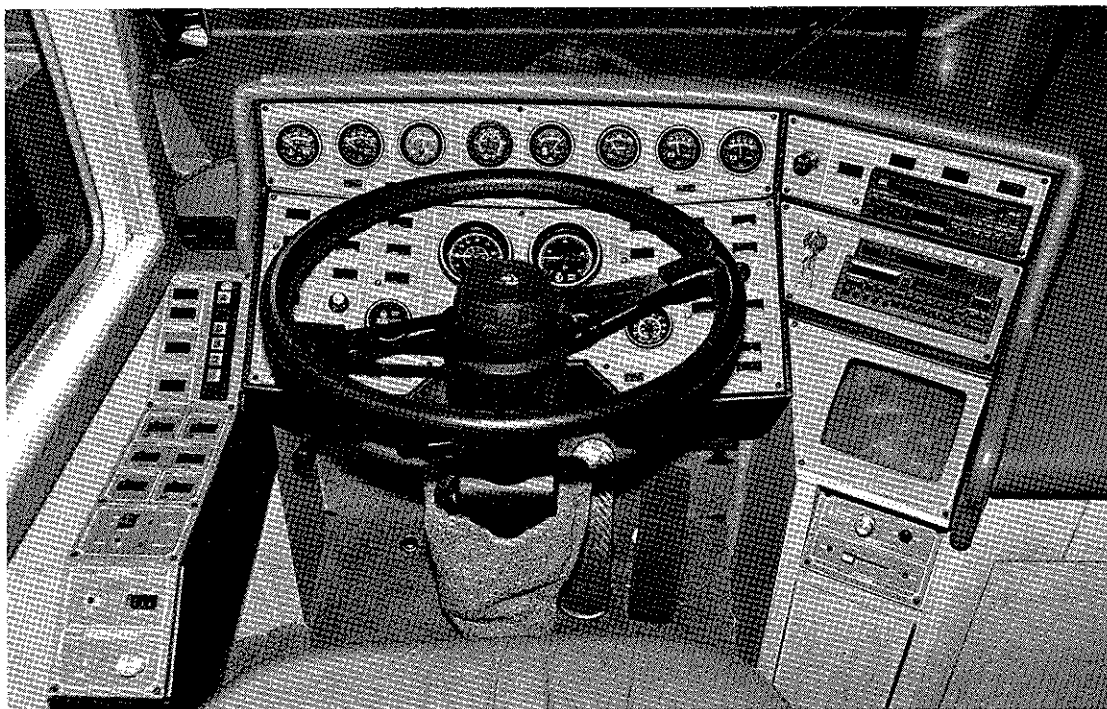


Figure 2-2. Dash

### Pilots Control Center

You are now seated in the control center of your new coach. You have control of all engine functions, generator functions as well as all accessory functions at your fingertips.

Our dash layouts are designed for viewing continuity as well as function and beauty. You will notice as you drive that viewing angle changes only slightly from the road to any part of the dash.

The dash is divided into eight main panels, (fig. 2-2) which are the upper dash panel, lower dash panel, shifter panel, upper right hand dash panel, lower right hand dash panel, monitor panel, monitor control panel and remote mirror panel. The gauges, switches and warning lights installed in these panels will be explained as far as function and operation in the following text.

### Note

Some items operate at all times, some require the 12 volt master to be on, while others need the 12 volt master and the ignition on. Gauges marked with an \* require the engine to be at normal operating temperature for correct readings.

### Upper Dash Panel

① \* ENG. WATER TEMPERATURE Gauge — Normal water temperature should be between 180° and 210° for safe operation.

### Caution

If the Engine Temperature gauge indicates excessively high temperatures, the engine may be over-heating and should be stopped to prevent damage. Allow the engine to cool before checking the radiator coolant level.

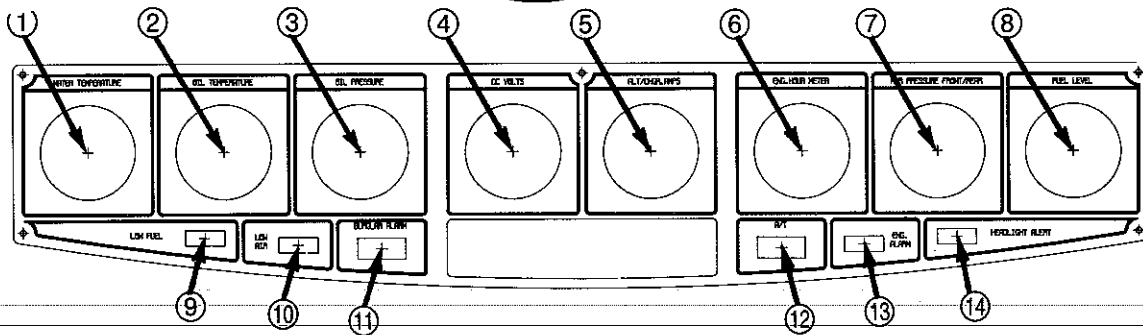


Figure 2-3. Upper Dash Panel

② \* **ENG. OIL TEMPERATURE** Gauge — Gives a constant reading of the engine oil in the supply line from the pump. The normal operating temperature is from 200°F to 250°F. If the temperature goes over 250° the engine may be low on oil or there is overheating of the cooling system.

### Caution

Your Wanderlodge® is designed to operate at ambient temperatures up to 100°F with no problems. If temperatures greater than 100°F are encountered, the operator must closely observe engine water and oil temperature and transmission oil temperature to avoid overheating conditions. If overheating conditions occur at ambient temperatures less than 100°F, the cooling system must be checked and problem corrected.

③ \* **ENG. OIL PRESSURE** Gauge — Indicates the pressure of the oil, not the amount of oil in the engine reservoir. This gauge will normally read between 50 and 70 psi during cruising speeds; and drop to a minimum of 5 psi when the engine is idling.

### Caution

No oil pressure, or low oil pressure readings (below 25 psi) when engine is operating at cruising speeds are trouble indications! **Do Not Operate the Engine Under These Conditions!**

④ **AIR PRESSURE FRONT/REAR** Gauge — The dual air service brake pressure systems are engine operated and supply independent brake system air pressure for front and rear service brakes and the parking brake. During normal operation, each air pressure gauge reading will build up to 100 psi to 120 psi shortly after the engine is

started. Note that, as a safety feature, the parking brake cannot be released until air pressure readings are at least 65 psi.

⑤ **FUEL LEVEL** Gauge — Indicates the amount of diesel fuel remaining in the 200 gallon fuel tank. Note that the 8.0 kw generator also gets its fuel supply from the 200 gallon tank. This gauge reads only when the ignition switch is in **ON** or **ACCESSORY** position. As a precaution against generator operation draining the fuel supply, the generator fuel pickup is shorter than the engine pickup. Separate fuel filters are provided for each fuel line.

⑥ **ALT. CHARGING AMPS** — Shows total charging current in amperes. With the engine running, total alternator output is shown. when parked, with a source of 120 volt ac, (outside power or generator), the gauge will show total output of the battery chargers.

⑦ **DC VOLTS** (coach) — Registers the actual voltage at the coach batteries. With the engine running, gauge should read 13 volts (+ or - 0.5).

⑧ **DC VOLTS** (engine) — Registers the actual voltage at the engine batteries. With the engine running, gauge should read 14 volts (+ or - 0.5).

⑨ **LOW FUEL** — When this light comes on it is an indication that the operator should be looking for the nearest refueling station.

⑩ **LOW AIR** Warning Indicator — This light is associated with a buzzer. These warn the driver that there is an insufficient supply of air (65 psi or less) to properly operate the coach. If the air pressure is low, when the ignition key is turned on, the light and buzzer will come on immediately. Both warnings will continue until the air pressure is built back up, or the ignition key is turned off.



⑪ **BURGLAR ALARM** Switch — There are two switches that turn the Burglar Alarm on and off. The switch on the dash is used when you are inside the coach. The weather proof key switch, outside the coach next to the entrance door, is used when you are going to be leaving your coach for awhile.

Note that both switches operate independently of one another. If the Burglar Alarm is turned on at the dash, then it must be turned off at the dash. The outside switch works on the same principle.

⑫ **A/T** Switch — (Anti-Theft) deactivates the starting system for protection against unauthorized cranking and theft. This switch also provides 12V master switch operation to shut off 12V battery power to all circuits except digital clocks, radio memory, monitoring panel functions, refrigerator control system, and burglar alarm.

⑬ **ENGINE ALARM** Indicator — This indicator, along with a Buzzer Alarm, monitors engine operation. If the oil pressure or the coolant level drops too low or if the coolant temperature gets too high, the engine alarm light and buzzer will be activated.

⑭ **HEADLIGHT ALERT** — When the ignition switch is turned off and the headlight switch is on, this red warning light, along with a buzzer, will come on. These will remain on until the headlight switch is turned off or the ignition switch is turned back on.

### Lower Dash Panel

① **SPEEDOMETER** — Indicates speed and accumulated mileage (odometer). This is a solid-state electronic monitor, with an RPM sensor located at the right drive axle brake drum.

② **TACHOMETER** — Indicates actual engine RPM (Revolutions Per Minute) when scale (0-25) reading is multiplied by 100. Idle RPM should be 600 and full load (uphill) 2100 RPM.

③ **TRANS. OIL TEMP.** Gauge — Measures temperature of the transmission oil. If the gauge registers a temperature over the 330°F maximum safety range, reduce use of transmission retarder. See information on use of transmission retarder later in this section.

④ **HIGH BEAM** Indicator — The Blue Bird logo is illuminated when high beams are selected using steering column switch.

**ACCESSORY WARNING** Lights — These three (3) warning indicators light to alert you of the following conditions:

⑤ **WATER IN FUEL** — This light comes on when there is an excess of water in the bottom of the fuel tank.

⑥ **SUSP. DUMP** — Light flashes to tell you that the suspension system has little or no air, and that the suspension needs to be pressurized before the coach is driven.

⑦ **LEVEL WARNING** — This light comes on when any of the four (4) leveling jacks is not fully retracted.

⑧ **TURBO PYROMETER** — Registers the temperature of the exhaust gas output of the Turbo. The correct temperature of the exhaust should be around 740°F at maximum power.

⑨ **REAR LANDING** Light Switch — At the **ON** position this switch turns **ON** the landing lights in the front right and left panels just behind the front tires. These lights shine toward the rear of the coach so are called Rear Landing Lights. Note that a small red indicator lights when the switch is **ON**.

⑩ **FRONT LANDING** Light Switch — To turn on the front Landing lights, located in the rear side panels just in front of the rear wheels, push this switch to the **ON** position. The indicator next to the switch should be lit when the switch is on.

⑪ **REAR PARKING** Light Switch — This switch controls the on-off operation of the rear parking lights (rectangular halogen lights above the rear bumper) when transmission selector lever is in **R**. An indicator next to the switch lights when the rear parking lights are on.

⑫ **COMP. LIGHT MASTER** Switch — This switch in the **ON** position provides power to all of the exterior compartment light switches. As each compartment door is opened, the light automatically comes on; closing the door turns the light off.

⑬ **RADAR MASTER** Switch — Turns on power to radar detector receptacle.

⑭ **HEAT** Switch — To turn on the heater blower for the pilot's area press this switch to either the **HI**— or **LOW** position. Note that when the front heat control is in cool position the heat switches (14) and (17) can be used to provide cool air circulation by turning on the blowers.



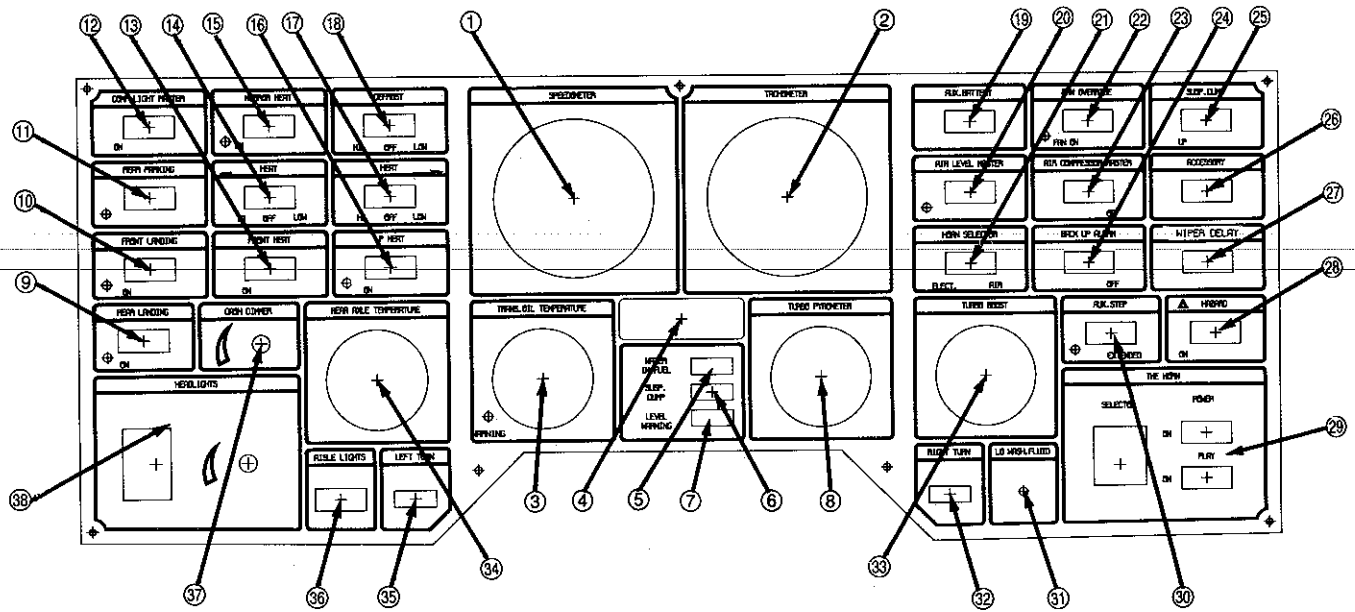


Figure 2-4. Lower Dash Panel

⑮ **MIRROR HEAT** Switch — This switch turns on a thermostatically controlled heater in the right and left outside mirrors (convex mirrors excluded). With the switch **ON** the Mirror Heaters will automatically come on to defog the mirrors.

⑯ **L.P. HEAT** Switch — When in the **ON** position, 12v. power is supplied to the L.P.G. furnaces.

⑰ **HEAT** Switch — To turn on the heater blower for the co-pilot's area press this switch to either the **HI**— or **LOW** position. Note that when the front heat control is in cool position the heat switches (14) and (17) can be used to provide cool air circulation by turning on the blowers.

⑱ **DEFROST** Switch — Turns on the blower for defrosting or defogging the front windshield. Set to **HI**— or **LOW** speed as desired.

⑲ **AUX. BATTERY** Switch — When this switch is pressed, a jumper solenoid connects the engine and coach batteries together (in parallel) to provide extra power for cranking the generator or coach. Releasing the switch immediately isolates the two battery systems.

⑳ **AIR LEVEL MASTER** Switch — Allows you to level the coach to a certain extent using the air suspension. This is an optional system and should only be used for short periods of time.

㉑ **HORN SELECTOR** Switch — Allows selection of the air or electric horns when the steering wheel horn button is depressed.

㉒ **FAN OVERRIDE** — This switch operates the engine cooling fan in the engine compartment. Normally, this fan will operate at 125 to 400 RPM from an engine RPM of idle to 2100. If the coolant temperature reaches 195°F, the fan will be thermostatically controlled to run at 1800 RPM. To override the thermostat turn the Fan Override switch **ON**, and the engine cooling fan will turn 1800 RPM continuously at any temperature.

㉓ **AIR COMPRESSOR MASTER** Switch — This switch operates the auxiliary air compressor (optional equipment) which is a 120 vac operated back up air compressor.

㉔ **BACK UP ALARM** Switch — This switch turns the back-up alarm buzzer off.

### Air Suspension System

Your motorhome is equipped with air suspension bags which **cushion** the front and rear. Dumping these air bags when the vehicle is parked allows the rubber bumpers to come together and eliminate vehicle **springiness**. The **SUSP. DUMP** switch controls the dumping and filling of the front and rear axle suspensions.



## Note

The accessory air tank must contain at least 65 PSI pressure for the air switch to function. The accessory air tank pressure does not register on the dash air pressure gauges.

Moving the **SUSP. DUMP** switch to the **UP** position applies air pressure to three air pilot-operated valves on the suspension system. Two of these valves are located on the rear axle; and one is located on the front axle. The pilot air shifts the valves, cutting off the air supply to the air bags and allows the air in the bags to escape. After the suspension system has been dumped, and the ignition is turned on, a warning pilot light is illuminated on the dash to warn the driver that the system is dumped and not to drive the vehicle until the **SUSP. DUMP** switch is set to the up position.

②⑤ **SUSP. DUMP** Switch — This switch controls the inflation of the air suspension systems for the front and rear axles. Move switch to the right to dump the bags. Note that **SUSP. DUMP ACCESSORY WARNING** light is lit: set switch to **UP** position to re-inflate the air bags before driving away. (System air pressure must be at least 65 psi.)

②⑥ **ACCESSORY POSITION** — These blank positions may be used for the installation of additional switches and indicator lights for customer add on equipment.

②⑦ **WIPER DELAY** — Knob adjusts wiper speed from 2 to 20 sweeps per minute when intermittent operation is selected at steering column switch lever.

②⑧ **HAZARD** Switch — This switch turns on the emergency flashers. When switch is used both turn signals will flash in unison.

②⑨ **THE HORN** — This corner of the dash has 3 different switches for use with the musical horn.

The **SELECTOR** switch incorporates 2 thumb-wheels for selecting the tune to be played. Use **The Horn** manual to select a tune. Then set the thumb-wheels to the corresponding numbers or number and letter. Note, that if a tune is playing, making a new selection on the selector switch will not affect the tune playing.

The **POWER** switch provides power to the musical horn. When this switch is turned **ON** the horn will immediately start playing the tune that corresponds to the digits on the selector switch.

The **PLAY** switch (momentary) resets the horn to the beginning of tune chosen by the Selector switch. If the **PLAY** switch is pressed while a tune is playing, that tune will stop instantly and the horn will reset to the beginning of the tune that corresponds to the digits on the **SELECTOR**.

③⑩ **AUXILIARY STEP** Switch — An **On-Off** switch that, when set to the **EXTENDED** position, activates a relay automatically locking the outside entry step in the out position. The indicator light comes on when the ignition switch is turned on to remind you that you need to retract the step before proceeding.

③⑪ **LOW WASHER FLUID LIGHT** — Light indicates when there is approximately 1/4 contained in the fluid reservoir.

③⑫ **RIGHT TURN** Indicator — When the turn signal lever, (steering column control section), is pushed up into the right turn position this indicator flashes in conjunction with the outside directional lights. The right cornering light will come on continuously if the headlights or the parking lights are turned on while the turn signal lever calls for a right turn.

The indicator, along with the left turn indicator and all outside directional lights, flash in unison when the **HAZARD** switch is pressed to the on position.

③⑬ **\*TURBO BOOST** Gauge — Registers the psi of the Turbo Compressor outlet. The gauge should read a maximum of 23.2 psi at maximum power.

③⑭ **ENGINE HOUR METER** — Indicates the number of hours engine has been in operation.

③⑮ **LEFT TURN** Indicator — When the turn signal lever is pulled down into the left turn position, this indicator flashes in conjunction with the outside directional lights.

The left cornering light will come on continuously if the headlights or the parking lights are turned on while the turn signal lever calls for a left turn.

③⑯ **AISLE LIGHTS** — This switch allows you to turn on or off the fluorescent aisle lights from the pilot's chair.

③⑰ **DASH DIMMER** — This control will only operate when the headlight switch is on. The background lighting (electroluminescent) for the dash can be brightened by turning counter-clockwise and dimmed by turning clockwise.



③ **HEADLIGHTS** — The Headlight switch serves two functions. Press **P** for parking lights and gauge illumination. Press the bulb symbol for headlights, parking lights and gauge illumination. The dimmer controls brightness of all gauges in dash. Turn counter-clockwise to increase or clockwise to decrease the brightness.

### Shifter Panel

① **TRANSMISSION SHIFT SELECTOR** — A lighted transmission (6) six pushbutton shift selector. Five forward gears with reverse and neutral.

(See Operating Manual and Owners Maintenance Data Section VIII for further information.)

② **AC/HEAT MASTER** Switches — These switches allow the driver to control roof air conditioners or the electric heaters.

③ **ACCESSORY** Position — These blank positions may be used for the installation of additional switches and indicator lights for customer add on equipment.

④ **COCKPIT LIGHT** Switch — This switch controls On-Off operation of the fluorescent lights.

⑤ **MARKER LIGHTS** Switch — Press this switch to **ON** to turn on the clearance, side marker and identification lamps located on the top sides and ends of the coach. This switch may also be flipped on and off to flash the marker lights as a courtesy signal.

⑥ **DRIVING LIGHTS** Switch — Location for optional driving light switch.

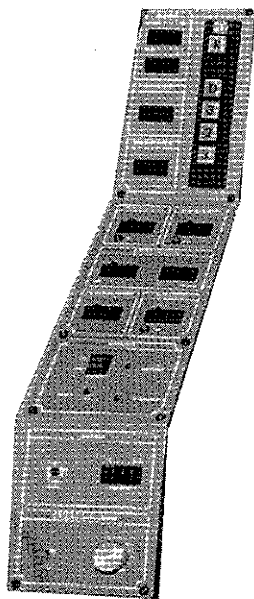


Figure 2-5. Shifter Panel

⑦ **CRUISE CONTROL** Switch — These two switches operate in the following manner: The switch on the right turns the cruise control on or off. The switch on the left locks the cruise control in on the desired cruising speed.

Note that the coach must be traveling at least 20 mph before the cruise control will activate. When the desired speed is reached press the **ON-OFF** switch to the **ON** position then press the **SET-RESUME** switch to the **SET** position and hold for 2 seconds before releasing. The coach should automatically remain at that speed.

Note that the accelerator can be used to increase the speed of the coach, but the speed cannot be decreased unless the brake pedal is depressed, or the **ON-OFF** switch is turned **OFF**. If you use the brake to disengage the cruise control, and you would like to pick back up to your original cruising speed, press the **SET-RESUME** switch to the **RESUME** position for 2 seconds. The coach should automatically return to that original speed.

/Engine idle speed can be increased, while parked, by means of the cruise control switches, push the **ON-OFF** switch to **ON**; then push and release **RESUME** switch rocker until desired RPM is attained. RPM will return to normal idle speed when:

1. **CRUISE CONTROL ON-OFF** switch is turned off.
2. Transmission selector is moved from **N** position.
3. Parking brake is released.

### Note

Pressing on brake pedal will decrease RPM but speed will return to higher setting as soon as pedal is released.

⑧ **POWER/ECONOMY** Switch — Changes the shift point in the transmission to increase low end torque (power) or to increase ending efficiency (economy).

⑨ **RETARDER** Switch — Provides power to Transmission Retarder/Brake System. The adjacent indicator lights when the retarder is operational. Use of **RETARDER HAND CONTROL** will be covered later in this chapter.

⑩ **INVERTER** — Space for optional inverter controls. See section XI for information.



⑪ **STEREO** — Stereo jack for headphone use with AM/FM Stereo Tuner/Cassette player and optional disk player. Privacy switch when turned on cuts power to all front speaker. Use switch when stereo headphones are used.

⑫ **C.B.** — Jack for headphone listening with volume control.

**REMOTE CONTROL HEATED ELECTRICAL MIRRORS** — Switch for remote control is located to the rear of the shifter panel. This switch controls both left and right mirror heads by rotating the switch either left for the left mirror or right for the right mirror. Pushing the switch knob to the left rotates the selected mirror to the left, pushing the switch knob to the right rotates the selected mirror to the right, pushing the switch knob up rotates the selected mirror up, and pushing the switch knob down rotates the selected mirror down. Only the flat mirror portion of the mirror will rotate. The mirrors also contain a heating element to help prevent fogging over in inclement weather. The switch for the heater element is located in the lower dash panel.

### Upper Right Hand Dash Panel

**LIGHTER** — Depress to heat the element; pops out when hot.

**SECURITY LOCK Switch** — Dual switches used to lock and unlock the deadbolt lock on the entrance door. A switch is also located on bedroom control panel.

**COLD START** — When switch is pressed to on it sends a timed pulse of ether into the air intake of engine to help starting in cold weather.

**LEFT VENT** and **RIGHT VENT** Switches — Operate the air cylinder controlled air vents to direct fresh air to the pilot and co-pilot areas.

**COMPACT DISC PLAYER** — Space available for optional disc player with premium sound system.

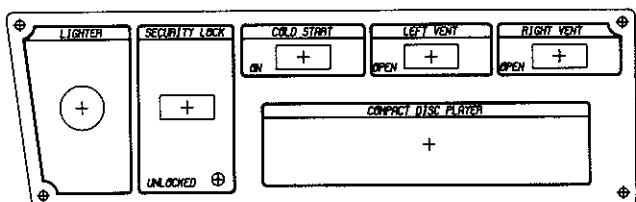


Figure 2-6. Upper Right Hand Dash Panel

### Lower Right Hand Dash Panel

**Ignition Switch** — A four-position, standard-type key switch. In **OFF** position (center), ignition and accessory positions are disabled and the key can be inserted or removed. In **ON** position (right) the battery is connected to the engine-run ignition circuits and the key can be advanced to **START** to start the engine, providing that the transmission selector is in neutral **N** position and toggle switch in engine compartment is up (front). **ACCESSORY** position (left) allows operation of accessories without activating the engine-run circuits.

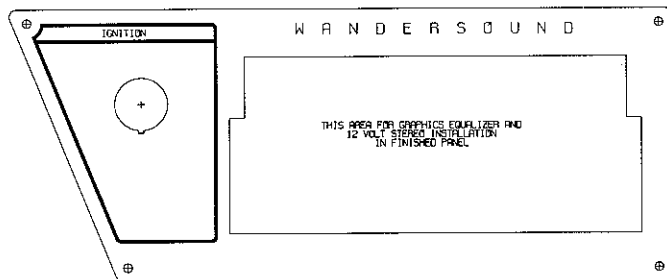


Figure 2-7. Lower Right Hand Dash Panel

**Wandersound Stereo** — is comprised of the BLAUPUNKT Tuner/Cassette with four (4) 6 x 9 inch coaxial pyle driver speakers and two (2) 6½ inch coaxial pyle driver speakers. The BLAUPUNKT Tuner/Cassette has auto reverse, electronic tuning sensor, Dolby noise reduction and metal tape capabilities.

The speakers are located four (4) in the living room and two (2) in the bedroom. A privacy switch is located on the overhead panel above the driver's head. The privacy switch turns the livingroom speakers off. Headphone jacks are located on the hood table and in the bedroom. There is a volume control in the bedroom controlling the volume of the bedroom speakers.

**CLOSED CIRCUIT TV MONITOR PANEL** — The monitor enables the operator to view behind the coach for purposes of backing, or passing other vehicles on the highway.

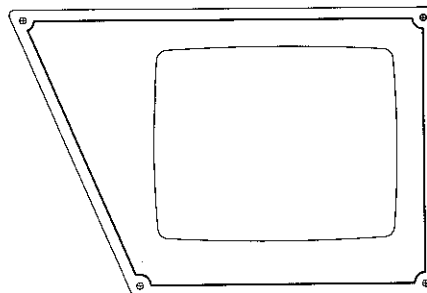


Figure 2-8. Closed Circuit TV Monitor Panel.



## MONITOR CONTROL PANEL

**MONITOR CONTROLS** — Brightness contrast and On/Off controls adjust in the same manner as any black and white TV.

**FRONT HEAT CONTROL** — This slide control opens or closes the valve in the front heater hose line for heating or cooling. With this modulated heat valve you can adjust the temperature at varying levels between cool and warm.

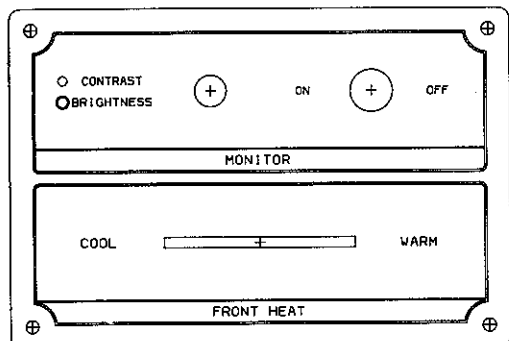


Figure 2-9. Monitor Control Panel.

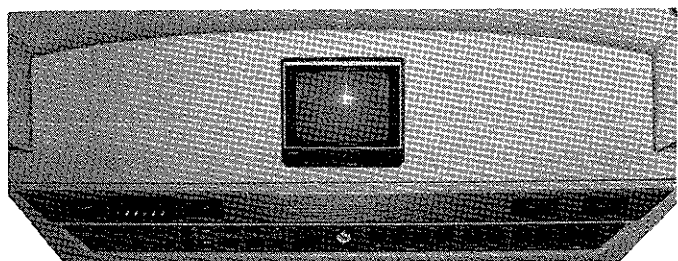


Figure 2-10. Overhead Control Center.

## Overhead Control Center

**UHF/VHF TELEVISION RECEIVER** — Is a standard TV. Operation is covered in the owner's manual supplied with set.

## Pilot's Area Overhead Dash

① **HEAT SELECTOR Switch** — Operates solenoid valves in engine coolant line to divert coolant flow through hot water heater and chassis heaters when this switch is in **WINTER** position. Setting the switch to **SUMMER** position causes the coolant to flow through the hot water supply heater coil only.

② **AUX. PUMP Switch** — Controls the auxiliary water pump (in right front luggage compartment) that boosts the circulation of engine coolant through the water heater heat exchanger and chassis heaters in the bedroom, bathroom, dinette and livingroom.

③ **DASH DIMMER** — This control will only operate when the headlight switch is on. The background lighting (electroluminescent) for the upper dash can be brightened by turning counter-clockwise and dimmed by turning clockwise.

## Remote Spotlight Controls

The optional roof-mounted remote-control high intensity spotlight is operated by the **SPOTLIGHT** controls located in the overhead dash. The spotlight produces 100,000 BCP (beam candle-power) and can be turned on and off, positioned horizontally or vertically at an adjustable rate of speed, and can be used for spot- or flood-lighting. The following controls operate the spotlight.

④ **SPOTLIGHT SELECTOR Switch** — Depressing switch, left or right, selects LH or RH light operation.

⑤ **SPOTLIGHT BEAM SELECTOR Switch** — Depressing left side of switch activates **FLOOD** while right side pressure selects **SPOT**. Center position is **OFF**.

⑥ **SPOTLIGHT SPEED Control** — Adjusts speed of light head movement.

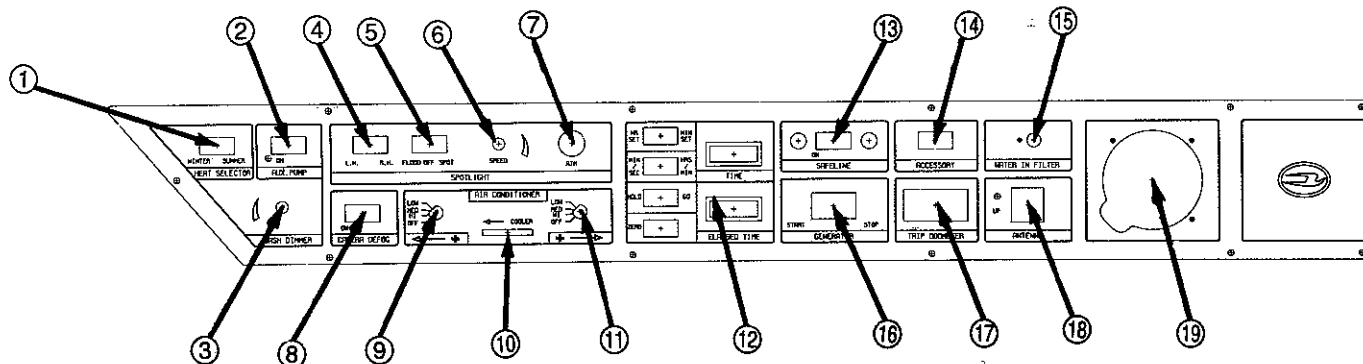


Figure 2-11. Pilot's Area Overhead Dash.



⑦ **SPOTLIGHT AIM** Control — Controls horizontal and vertical beam position.

⑧ **CAMERA DEFOG** Switch — Energizes fan in compartment for Closed Circuit TV (CCTV) camera.

⑨ **AIR CONDITIONER LEFT FAN** Switch — Three speed blower for left front area of coach. Left fan switch must be in either **HI**, **MED**, or **LOW** to energize compressor.

⑩ **AIR CONDITIONER** Temperature Selector — Thermostat setting controls temperature by cycling compressor.

⑪ **AIR CONDITIONER RIGHT FAN** Switch — Three speed blower for right front area of coach.

⑫ **CLOCK PANEL** — This panel includes a digital readout. Four switches to the left of the display set clock timing. To set **TIME** display set clock timing, to set **TIME** display, press **HR SET/MIN SET** switch to **HR SET** position and hold until correct hour is displayed; repeat with switch in **MIN SET** position until correct minutes are displayed.

The **ELAPSED TIME** display will show elapsed time in terms of hours and minutes, or in minutes and seconds, depending on the position of the **HRS/MIN - MIN/SEC** switch. Set this switch as desired, press **ZERO** to reset the display to a 00:00 readout, and the elapsed time will count. The **HOLD/GO** switch may be set to **HOLD** position to suspend operation of the elapsed time display; for elapsed time operation, leave switch in **GO** position.

⑬ **SAFELINE ALARM** — The Safeline alarm operates whenever the shoreline is connected to the coach and the ignition switch is in **ON** position as a reminder to disconnect the shoreline before driving away.

With the Safeline switch **ON**, the alarm is given by buzzer sound and red light. The buzzer can be deactivated in favor of a flashing amber light by turning off the switch.

⑭ **ACCESSORY** Position — These **Blank** positions may be used for the installation of additional switches and indicator lights for customer add on equipment.

## Caution

Use existing panel holes for installation of additional controls or indicators. Drilling new holes will destroy the electroluminescent features.

⑮ **WATER IN FILTER** — Light and buzzer alarm.

⑯ **GENERATOR START/STOP** Switch — Provides local control for generator operation. Press this center-off momentary switch to **START** position and hold until generator starts, as indicated by the switch indicator illuminating. If generator does not start within 2 to 5 seconds, release switch, wait 30 seconds, then try again. To shut down the generator, press to **OFF** position and hold until light extinguishes.

## Caution

Do not start the generator when a heavy circuit load is on-line, such as the air conditioners. This can cause an excessive strain on the generator rotating components and may result in equipment damage.

## Note

When starting the generator during cold weather, press the switch to **STOP** position for 15-20 seconds. This activates the glow plugs for easier starting.

⑰ **TRIP ODOMETER** — Depress bar to reset.

⑱ **ANTENNA** Switches — Both switches must be pushed simultaneously to cause raising or lowering of TV antenna. Indicator will light when TV antenna is up from its secured position when ignition switch is turned on.

⑲ **ALTIMETER** — Indicates coach height above sea level. (Zeroing adjustment can be used to calibrate unit at known elevations.)

⑳ **FUEL VACUUM GAUGE** — Racor fuel filter element should be changed when pointer goes into red.

## Co-Pilot's Overhead Dash

**GENERATOR OIL PRESSURE** Gauge — Shows the oil pressure, not amount of oil in the generator engine reservoir. This gauge will normally read between 30 and 60 psi. Low oil pressure indications are often a symptom of possible generator failure. Oil level should be checked on a regular basis. Note that the generator has a low-oil pressure shut-off switch which operates if the generator oil pressure falls below 15 psi.

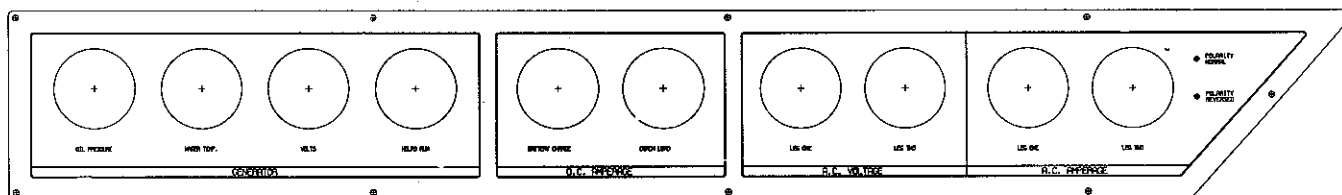


Figure 2-12. Co-Pilot's Overhead Dash

#### **GENERATOR WATER TEMP. Gauge —**

Displays generator engine coolant temperatures from 100 to 240 degrees. Normal operating temperatures vary from 175 to 190 degrees. If consistently high temperatures are indicated, shut down the generator, wait for the engine to cool, then check radiator coolant level. Note that the generator has a high-temperature shut-off switch which operates if the generator temperature reaches 225 degrees F.

**GENERATOR VOLTS** — Expanded-scale voltmeter, with scale graduations from 10 to 16 volts, shows the condition of the coach batteries. Normally, the battery voltage varies from 12 to 13 volts; under starting load it may drop to about 10.5 volts and then rise to about 14.0 when the generator starts and begins charging the battery through the external isolator unit and battery chargers. Battery voltage readings less than 10.5 or more than 15 are usually a symptom of an electrical system failure or impending battery breakdown.

**GENERATOR HOURS RUN Meter** — Indicates total hours of generator operation.

**D.C. AMPERAGE** — Ammeter on left (labeled **CHARGE**) shows net current flow to or from batteries. Needle movement from the center of the gauge indicates discharge to the left and charge to the right. When parked, following highway travel, it is normal to see a needle position to the left of center even when plugged into shore power (or running generator). This will gradually diminish and should eventually show some movement to the right with coach loads turned off.

Ammeter on right (labelled **DISCHARGE**) shows current demand of 12 volt load.

**A.C. VOLTAGE** — Voltmeter on left monitors LEG ONE while that on right monitors LEG TWO of 120 volt alternating current circuits.

#### **Caution**

**Appliances can be damaged by low voltage. Loads should be balanced so voltage does not drop below 110 volts for either leg. Low campground (shorepower) voltage can be detected quickly from gauge readings. If cause of low campground voltage can not be corrected, generator power will have to be used during periods of high appliance demands.**

**7 A.C. AMPERAGE** — Ammeters show current flow in LEG ONE (left) and LEG TWO (right) of 120 volt alternating current circuits. **Polarity Normal** indicator (green), lit whenever the shoreline hookup is properly connected and grounded and line polarity is compatible with coach wiring and a **Polarity Reversed** indicator (red) which lights when hookup is reversed.

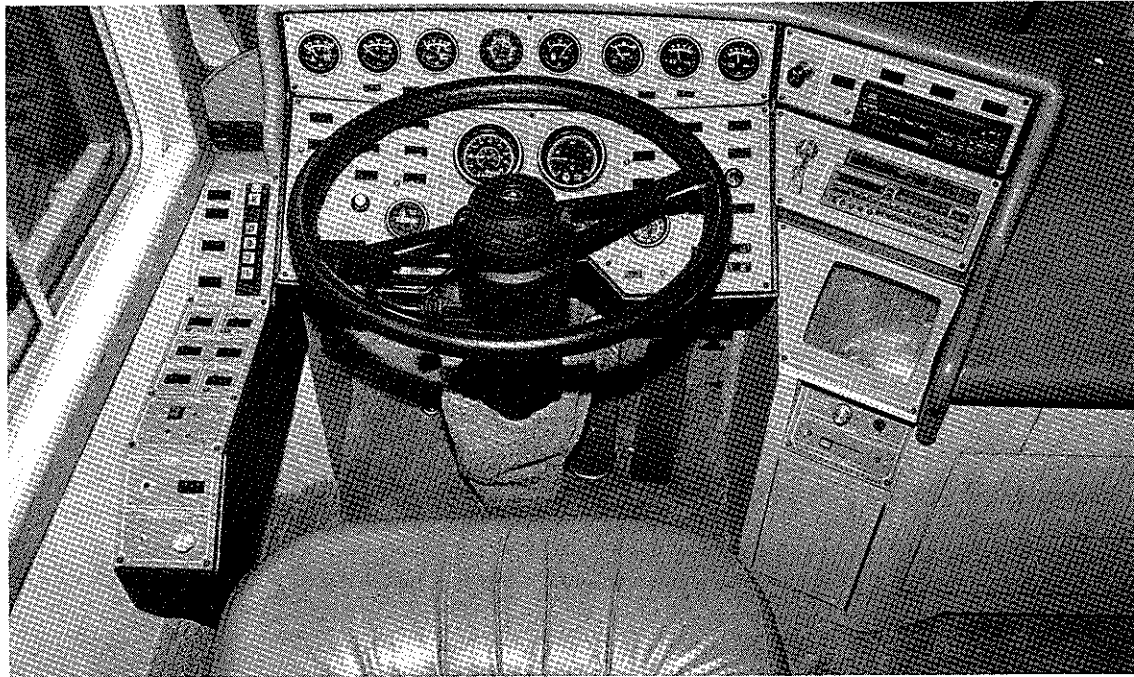
A faulty ground connection is indicated in none of the LEDs is lighted.

#### **Steering Column Area**

The steering column area, figure 2-13 includes controls located on the steering column, and under the dash.

**HORN** — Operate the horn by pressing in on the center section of the wheel. Select air or electric horn with the **HORN SELECTOR** switch on the dash.

**COMBINATION TURN SIGNAL/High BEAM and WASHER/WIPER SELECTOR** — Push lever toward dash for right turn signal, pull lever away from dash for left turn signal. Pull lever up toward steering wheel and hold for momentary high beam. When lever is released low beams are activated. Push lever down until switch is activated for high beam operation. Pull lever back toward steering wheel to go to low beam operation. The washer ring is located at the end of the lever and when pushed activates the windshield washer, but only when the wipers are activated. To activate the



**Figure 2-13.** Steering Column Area

wiper twist lever from – O – position to I or II for continuous speeds or to INT for intermittent operation. When in INT position the delay of the wipers can be changed by the wiper delay knob on the lower dash panel. Twist lever back to – O – position to turn wipers off.

**TILT LEVER** — Pull lever up to release lock mechanism. While holding lever up, adjust the steering wheel to a comfortable position and release lever. Move the steering wheel slightly to make sure the column locks into position.

## Caution

**Always make sure that lever is in the fully locked position in whichever detent setting is used. Do not change the wheel tilt setting while the coach is in motion.**

**TELESCOPING STEERING WHEEL** — to unlock telescoping wheel twist center section of steering wheel counter-clockwise and adjust wheel to comfortable position. While holding steering wheel at desired position with one hand lock it into position by turning the center section of wheel clockwise.

**PARKING BRAKE** — The **Parking Brake** control is located under the lower dash, to the right of the steering column. Note that the parking brake

cannot be released unless the system air pressure is at least 65 psi.

**ENGINE SHUTOFF CONTROL** — (Only on California model) This control is located under the lower dash just to the left of the steering column. In the event that turning the ignition switch to **OFF** does not shut down the engine, pull this control (**PULL TO STOP**) fully outward. This operates a positive mechanical linkage to shut off fuel to the engine.

## Floor Controls

**AIR HORN FOOT Switch** — Operates **highway** horns. Close to steering column.

**ACCELERATOR PEDAL** — Controls engine fuel flow to select power output. See Diesel Engine/Transmission Operation later in this section for detailed description.

**BRAKE PEDAL** — The coach is equipped with a dual air brake system which includes independent systems for the front and rear service brakes. A separate reservoir and panel-mounted pressure gauge is provided for each service brake system. (Air Pressure Front and Rear).

## Radar Detector

A high-sensitivity superheterodyne microwave radar detector is installed as standard equipment





on your coach. This unit, is designed to activate when transmissions are received from radar-type speed detection equipment. The radar master switch (on the lower dash panel) is used to supply power to the radar detector.

### Note

**Because some states have ruled radar detection equipment illegal, it is the responsibility of the driver or owner to obey the appropriate laws. (There are quick-disconnect features provided which allow for easy removal of the unit.)**

**CONTROLS AND INDICATORS** — See Radar Detector Owner's Manual.

### Seat Controls

Electrically and air-operated six-way seat adjustments are built into the pilot's and co-pilot's seats. A typical control panel is shown in figure 2-14.

Three electric **SEAT CONTROLS** are used to control seat bench tilt, up-down and front-back seat movement, and seat back tilt.

These seats may be rotated by releasing the lever underneath the seat base on the right side.

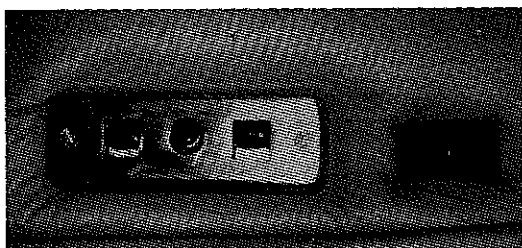


Figure 2-14. Seat Controls

### Closed Circuit TV Monitor System

#### System Components

Besides the TV receiver on the lower dash, the CCTV Monitor receiver system also includes:

- CCTV camera, located in the rear of the coach, figure 2-15.
- Picture brightness, contrast and ON/OFF switch on lower dash.

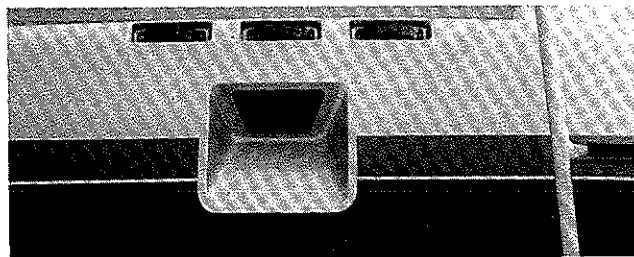


Figure 2-15. CCTV Camera Port

### CCTV Operation

The rear-facing CCTV camera transmits images directly to the monitor via coach cabling.

Note that the system requires a brief warmup period before achieving full resolution. CCTV camera controls are preset and the standard lens supplied with the unit is designed to focus from about two feet to infinity.

### TV Antenna and Rotator System

The control components of the antenna and rotator are a hand-held switch-operated rotator, radome-type TV roof antenna, switcher for the antenna or cable inputs and a switch for raising and lowering the antenna.

The **A-B** switch, switches antenna **A** or cable **B** input via connections in shoreline compartment at the rear of the coach to the TV receptacles via the VCR (if present).

The antenna rotator controls the position of the TV antenna within the radome. The three-position momentary switch (center **OFF**) provides right/left antenna rotation.

The radome includes an amplifier and rotator mechanism. The remote power supply operates from 12 volts dc. Low-loss coaxial cable and three-wire rotator control cable interconnect the antenna and power supply.

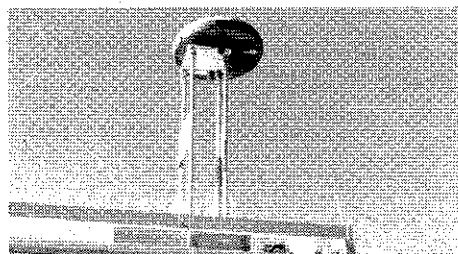


Figure 2-16. Extendable TV Antenna Radome

Note that the system is protected by a fuse in the overhead load center. In the event that the TV set exhibits problems relating to low antenna input (**ghosts, etc.**) check this fuse before servicing the TV set.

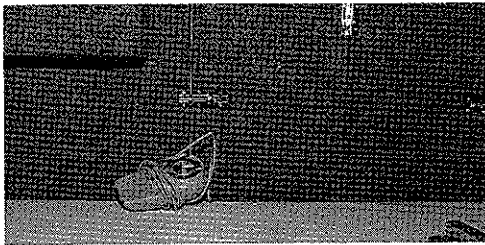


Figure 2-17. Antenna Control Location.

### Antenna Operation

With the TV on and a station tuned in, rotate the antenna by pressing the rocker switch located on the control unit. Press the right side of the switch to turn the antenna clockwise; press the left side to turn the antenna counter-clockwise. Although the actual antenna movement is not visible, the indicator arrow on the control unit lights and shows the direction of movement. When the antenna has made one full turn (360 degrees), the End of Rotation light comes on. Observe the picture while rotating the antenna, first in one direction, then the other, to obtain best picture quality.

The switches for raising or lowering the antenna are located in the right hand overhead cabinet.

### CB Transceiver Unit

The CB transceiver utilizes a wireless remote microphone which should be aimed towards the CB radio while transmitting.

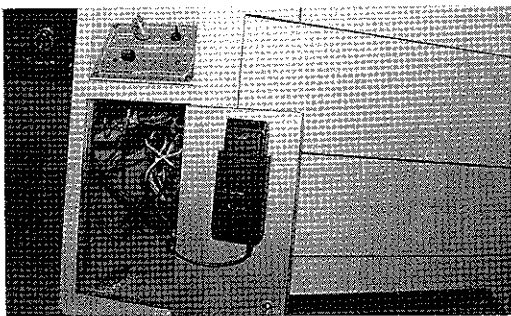


Figure 2-18. CB Transceiver Unit

### Controls and Indicators — See CB Owners Manual.

### Diesel Engine/Transmission Operation

Proper operation and maintenance are key factors in determining the useful life and operating economy of a diesel engine. Follow these directions for trouble-free, economical operation.

#### To Start Engine

Caterpillar 3208 Engines will start at temperatures above 10 degrees F (– 12 degrees C) with-

out using a starting aid. However, for colder temperatures it may be necessary to activate the engine block heater (120 volt ac-operated). The **ENGINE BLOCK HEATER** switch is located on the wall in front of the engine cover on the co-pilot side. Remember to turn switch **OFF** after starting.

1. Place transmission in **NEUTRAL**.
2. Push the accelerator pedal to the floor one time and release.
3. Turn ignition switch to **START**. Engine should start within 5 seconds. If engine fails to start within 30 seconds, release the starter switch and wait two minutes to allow the starter motor to cool before trying again.
4. As soon as the engine starts, reduce engine speed to low idle, After normal oil pressure is indicated, speed may be increased to build up air pressure more rapidly.
5. Do not apply a load to the engine or increase engine speed until oil pressure gauge indicates normal.
6. Operate the engine at low load and low rpm until the temperature gauge starts to move. Check all gauges during warmup period.

#### To Stop Engine

### Caution

**Before stopping the engine, operate at low idle for a minute or so. This will allow hot areas in the engine to cool gradually and extend engine life.**

With the vehicle stopped, apply the parking brake and place the transmission shifter in **NEUTRAL**. Turn the ignition switch to the **OFF** position. This shuts off the fuel supply to the engine.

#### Using the ZF Transmission Retarder

The retarder is a hydrodynamic brake and application is recommended on lengthy gradients or when slowing down from high speeds. This saves wear on the service brakes and in an emergency the full braking effect (no fading) of the service brakes is available.

The system is electrically controlled by operation of the lever on the retarder hand control located on the Transmission Gear Selector Console or by pressure on the brake pedal.

Turn on **RETARDER** Switch, (figure 2-5) and select desired amount of braking action by moving lever from **OFF** to positions 1-4 for progressively



increasing braking action. Any selected setting is in full time. When acceleration is desired move lever to **OFF**.

### **Important!**

by accident the accelerator is depressed when the retarder is engaged, the retarder automatically disengages. **Only when the accelerator has been released does the retarder come back into operation.**

To use the brake pedal for retarding, you must have the **RETARDER** switch (figure 2-5) engaged. When the brake pedal is used the retarder and the service brake will engage. When the brake pedal is released the retarder will also disengage.

### **Caution**

Since the **RETARDER** raises the temperature of the oil, it is possible that the permissible oil temperature will be exceeded. Check transmission oil temperature using dash gauge (item 3, figure 2-4). The green section is normal operating temperature. The yellow section is normal retarder range. If excessive oil temperature is indicated, the vehicle must be slowed with the service brake until a downshift is made into a lower gear. **IF** this precaution is insufficient to lower the oil temperature below the danger zone, the retarder must be switched off completely.

#### **Trailer Hitch**

Hitch capacity is 7,500 pounds tow and 750 pounds tongue weight.

### **Note**

**Trailer hitch ball capacity is 5,000 pounds, torque nut to 200 ft.-lb.**

#### **Towing**

Two towing eyes are provided behind the front bumper.

### **Caution**

**Do not tow a vehicle equipped with ZF ECOMAT automatic transmission unless the drive shaft has been removed, or the rear wheels raised from the ground. Do not attempt to tow unit by front axle or cross-member. Damage to wiring and/or air lines can result be-**

**cause of proximity of these items to front cross-member. Do not tow by the bumpers. Air pressure is required to release air brakes.**

#### **Transmission Operation**

The ZF ECOMAT transmission provides five forward ranges and one in reverse. Speed selection is provided through the transmission shift selector located on the SHIFTER PANEL (figure 2-5).

The selector must be in **N** (neutral) position when the engine is started. If the engine can start in any other position, the neutral start switch deficiency should be corrected as soon as possible. Use **D** position for all normal driving conditions so that the coach begins moving in first gear and upshifts automatically into 2nd, 3rd, 4th and 5th gears. As the coach shows, a the transmission automatically downshifts to the correct gear. Use a low gear **2, 3** or **4** when road, load or traffic conditions make it desirable to restrict automatic shifting to a lower range; or use the retarder, as previously described. Use **1** or **2** when pulling through mud and snow or driving up steep grades. The vehicle should be completely stopped before shifting into reverse.

#### **Driving Tips**

##### **Accelerator Control**

Foot pressure on the accelerator pedal influences the automatic upshifting or downshifting within each driving range. When the pedal is fully depressed against the floor pedal stop, the transmission automatically upshifts near the recommended governed speed of the engine. A partially-depressed position of the pedal causes the upshifts to occur sooner at a lower engine speed. Shift timing is accomplished by using an electronic automatic shift control unit in conjunction with pressure modulation linkage. This throttle-modulation method provides the accurate shift spacing and control necessary for maximum performance.

##### **Transmission Oil Temperature**

Extended operation at low vehicle speeds, with the engine at full throttle, can cause excessively high temperature in the transmission. These temperatures may tend to overheat the engine cooling system as well as cause possible damage to the transmission. If excessive temperature is indicated by the engine coolant temperature gauge, stop the vehicle and determine the cause. If the cooling system appears to be functioning properly,



the transmission is probably overheated. Shift to **N** and accelerate the engine to 1,200 to 1,500 RPM.

This should reduce the oil sump temperature to operating level within a short time. If high temperatures persist, stop the engine and have the overheating condition investigated by service personnel.

### Caution

**Do not operate the engine for more than 30 seconds at full throttle with the transmission in gear and the unit stationary. Prolonged operation of this type will cause the transmission oil temperature to become excessively high and may result in severe overheating damage to transmission components.**

If the transmission overheats during normal operation, check transmission oil level.

#### General Information — Caterpillar 3208 Engines

### Caution

**Cooling fan operation is controlled electrically by a thermostat which senses engine coolant temperature. Any time the engine is running the fan may engage and start to run without warning. The engine must be shut off and the fan stopped before servicing.**

Check crankcase oil level before starting and when refueling. Always check oil level with engine stopped. The dipstick has 2 markings, **FULL** and **ADD**. Maintain oil level between these marks. Do not overfill. Refer to table 8-2 for recommended oil

- Check (with engine stopped) drive belts for cracks, breaks and frayed edges. While checking belts, look for oil, water or fuel leaks.
- Check (with engine stopped) for water in the fuel. Drain a cupful of fuel from the bottom of the tank to remove water or sediment. Fill fuel tanks after completing a run. Partially-filled tanks will collect moisture if the coach is allowed to sit for an appreciable length of time. Use number 2-D diesel fuel (with a minimum Cetane number of 40). Keep fuel clean. Inspect Racor filter bowl periodically and observe **WATER-IN-FUEL** indications on the dash gauge. Remove and clean filter bowl as necessary.

Number 1-D diesel fuel may be used in cold temperatures or when operating in altitudes above 5,000 feet.

- Check coolant level (with engine cool and off). Fill to the proper level with water and permanent-type anti-freeze, adding one quart of Nalcool 2000 cooling system conditioner with replenisher coolant. Use clean water that is low in scale-forming minerals, not softened water. Leave space for expansion. (Note that Nalcool 2000 is compatible only with ethylene-glycol base coolants.)

#### Racor Fuel Filter

A Racor fuel filter/preheater is incorporated in the diesel fuel supply line and processes the fuel supply for maximum purity.

The fuel filter also includes a built-in preheater, which operates from the 12-volt battery supply and a water sensor, which lights a dash indicator when the water level in the filter bowl is high enough to require drainage.

#### Leveling Jacks Controls

The motorhome is optionally equipped with four heavy-duty leveling jacks; one at each corner of the chassis.

Overall system operation is controlled and monitored at the leveling jack controls, while each jack is independently operated by one of four respective **EXTEND-RETRACT** levers located on the floor to the left of the driver, figure 2-19. A dash indicator and a buzzer (when ignition switch is on) provide visual and audible signals to show that the associated leveling jacks are not stowed to a safe travel position.

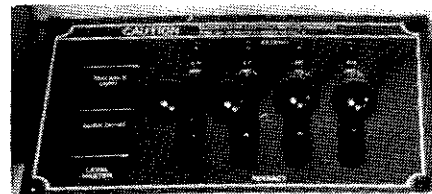


Figure 2-19. Leveling Jack Controls



## Caution

Severe injury or death may result. **Do not use the leveling system for changing tires or working under the vehicle. Keep the rear wheels in firm contact with the ground with the parking brake set. With the leveling jacks extended, there is a possibility the vehicle may move either toward the front or the rear.**

Use the following procedures to operate the leveling jacks:

## Note

**12 Volt master switch must be on to operate leveling jacks.**

- ① Set **LEVEL MASTER** switch (see figure 2-20) to **ON** position. Note that the **LEVEL WARNING** indicator will light. **LEVEL SYSTEM** indicators **LF**, **RF**, **LR** and **RR** are lit only when the respective corner of the coach is low.
- ② De-pressurize front and rear axle by setting associated **SUSP. DUMP** switch to **DUMP**.
- ③ Lower the front leveling jacks by setting the **LF** and **RF** floor controls to **EXTEND** position. As soon as the jacks contact the ground, as indicated by the characteristic landing gear **thump**, release the respective control lever to prevent further jack movement.

④ Operate the **EXTEND-RETRACT** levers for the rear leveling jacks (**LR** and **RR**) as necessary to level the rear end of the coach. The blue **LR** and **RR LEVEL SYSTEM** indicators will extinguish when the respective corners are leveled.

⑤ Operate the **EXTEND-RETRACT** levers for the front leveling jacks (**LF** and **RR**) as necessary to level the front of the coach.

⑥ To restow the leveling jacks prior to moving the coach, start engine to initiate air compressor operation, repressurize the air suspension system for the front and rear axle by setting the **DUMP** switch to the **FILL** (up) position, in the following sequence.

First pressurize front and rear axle suspensions by setting the **DUMP** switch to **FILL** position. Check that **AIR PRESSURE REAR** and **AIR PRESSURE FRONT** gauges each read between 100 psi and 120 psi.

⑦ When the air suspension is once again stabilized, pull all four leveling jacks controls back to the **RETRACT** (locked) position. The red warning indicator will extinguish when the jacks are in the stowed position.

## Note

**If the jacks are not withdrawn before driving away, the buzzer will sound.**

⑧ Set **LEVEL MASTER** switch to **OFF** position. This completes one full operating cycle for the leveling jacks system.



(1)

(1)

(1)



## Section III

# Living Area Facilities

This section provides information on operation of the appliances and systems which contribute to the comfortable living conditions within your motorhome.

### Sofa

Your sofa converts into a double bed sleeper. The sofa converts in much the same way as a sofa bed in your home. Pull up and out on the seat until the sofa is fully extended and the back of the sofa is lying in the flat position. To fold the sofa back up into the sitting position pull up on the sofa seat and at the same time push in on the sofa seat until the sofa is locked into the sitting position.

### Dinette Area

The dinette area, figure 3-1 includes the Gas/Smoke Alarm, Systems Monitor Panel and four place bench type dinette.

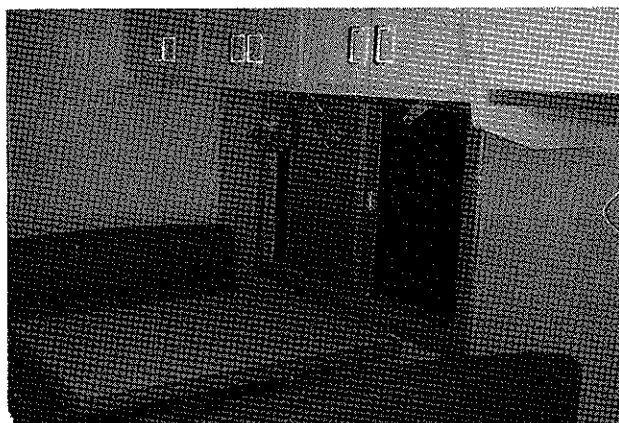


Figure 3-1. Dinette Area

### Galley Facilities

The galley, figure 3-2, includes a double sink, food center, refrigerator/freezer, two burner gas cooktops and micro/convection oven. The refrigerator operates from the LP gas supply, from the 120 volts ac supply, or from 12 volt alternator output while in transit. The cooktop also operates from the LP gas supply. Operating procedures for these appliances, given in the following paragraphs assume that the main LPG valve is on. An LPG leak detector, located under the rear dinette seat continuously monitors the area for LPG leakage, shutting off the LPG supply and sounding an alarm if leaks are detected.

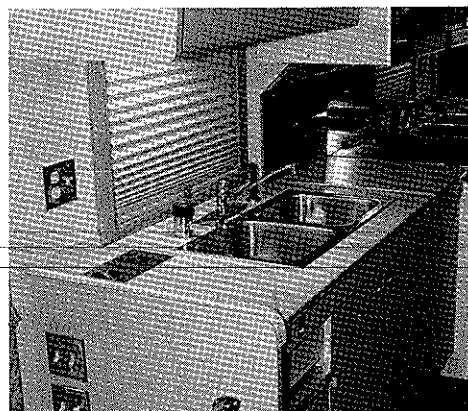
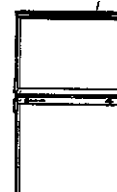
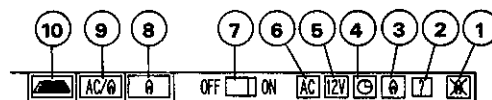


Figure 3-2. Galley Facilities

### Refrigerator

Understanding just how the refrigeration process operates will help to explain one of the important reasons why it is necessary to level a parked motorhome. The gas-fired (or electrically-heated) boiler converts the ammonia-water solution to distilled ammonia vapor, which is carried to the finned condenser, where it liquifies. The liquid flows to the evaporator, where it creates a cooling effect by evaporating into a circulating flow of hydrogen gas. If the evaporator coil is not level, the liquid accumulates, forming pockets which do not readily evaporate and impair or block gas circulation, inhibiting the cooling process.

When the coach is parked, it must be leveled to assure comfortable living accommodations. The refrigerator will then also perform well. Place a bubble level (furnished with unit) on the freezer shelf. When the vehicle is moving, the continuous rolling and pitching movement will not affect the refrigerator as long as the movement passes either side of level; but when the coach is parked, the refrigerator must be level (within 6 degrees).



- Fig 4.
1. Orange, continuous light indicating gas ignition failure, = no gas
  2. Push-button for indication of mode. Mode indication is only made while the button is pressed.
  3. Flame symbol, yellow, indicating gas mode.
  4. Clock symbol, yellow, indicating delay mode.
  5. Text 12V, yellow, indicating 12 V DC mode.
  6. Text AC, yellow, indicating main voltage mode.
  7. Main switch.
  8. Push-button, green, giving gas operation only.
  9. Push-button, green, giving energy selection between AC and gas. No 12 V power selection possible.
  10. Push-button, green, giving full AES operation.

Figure 3-3. Refrigerator Operating Controls



## Operation:

Before starting the refrigerator, check the gas valve in the piping. Do not forget the valve on the rear of the refrigerator.

1. To start the refrigerator set the switch 7 to position **On**. Lamp **10** shall now be green.
2. Turn the thermostat knob inside the cabinet to suitable setting, e.g. start with normal position.
3. To shut off the refrigerator set the switch 7 to position **Off**.

## General Information on the Operation of the Refrigerator

This refrigerator is equipped with an Automatic Energy Selector (AES) system. The control system selects the most suitable available energy source. The selection will be made with highest priority to 120 V AC, second priority is to 12 V DC from the alternator, and lowest priority has gas operation. No manual operation is necessary for change of energy source unless desired. The automatic energy control will, when switched on, start up in AES mode. The AES mode follows the above mentioned priority list and will select the best energy source available.

### Note

**The refrigerator also has a built in Battery Protection System.**

With this feature, battery voltage will not be allowed to energize the 12V. heater coil until there is 13.6 volt at the + terminal of the refrigerator. This means that not only must the ignition switch be on but the alternator must be providing charging voltage to the batteries. This was designed to prevent burnout of a marginally rated alternator with consequent battery discharge and premature travel termination (highway breakdown). If, after starting, there is so much of a coach load that the alternator can't put out 13.6V. then the refrigerator will not go into the 12V. mode but run on L.P.G. only.

If the coach was previously plugged into shore power and had the L.P.G. shut off (either at the refrigerator or main valve) then the unit would not operate while in transit. There must be LPG available for refrigeration assurance. Lamp **1** will come on if there is no gas light up. Whenever this light comes on there is no refrigeration as LPG is the lowest priority.

When the alternator provides voltage in excess of 13.6, the unit will operate satisfactorily with the 12V. heater. If, however, because of some additional load during travel, the voltage should drop below 11.6, then unit will switch to LPG. See Refrigerator Owner's Manual for complete operating and care instructions.

## Gas Cooktop

The gas supply for the cooktop burners is provided from the LPG tank. Make sure that the main valve (on tank) is turned **On** before use. The cooktop is equipped with an electric igniter instead of pilot light.

### Lighting Cooktop Burner

1. Depress knob and turn counter clockwise to HI position. **Note** — A faint popping noise will be heard during step 1. 120 volts required to light burner.
2. After burner has lit, turn knob a few degrees clockwise until popping stops.
3. Turn knob to desired setting.

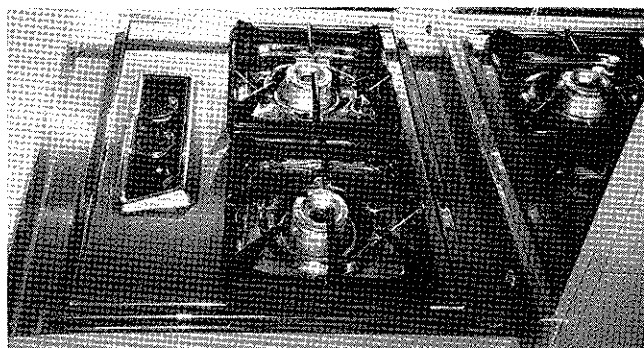


Figure 3-4. Gas Cooktop

## Microwave/Convection Oven

The microwave/convection oven provides programmed microwave cooking, convection operation for crisp, even browning, or a combination of both. (See owner's manual for operation and caution notes.)

## CORIAN Counter Tops

Even stubborn stains — such as grape or beet juices — wipe off with a damp cloth and household cleanser. Because CORIAN is solid all the way through, it cannot be harmed by abrasive cleansers and normal household cleaners.

CORIAN is strong and tough, but slicing on it with knives can cause scratches. Use a cutting board.





While CORIAN does provide an extra measure of protection (better than ordinary countertops), it is **not** recommended as a hot pad. Do not place hot pots and pans directly on your CORIAN countertop.

Since it's a solid material with color and pattern all the way through, unusual damage such as cigarette burns, scratches, or other surface abuse can usually be removed using ordinary household cleansers or fine sandpaper. If the stain persists, or if the scratch is particularly deep, first use a medium sandpaper (120 or 240 grit) then fine sandpaper (320 or 400 grit) followed by circular motion buffing with a scotch Brite pad to match the gloss of adjacent surfaces. Household cleanser, steel wool or Du Pont No. 7 polishing compound can also be used if higher gloss levels are needed.

### Caution

**Certain chemicals found in the home — such as paint removers, paint brush cleaners, acid drain cleaners and certain brands of nail polish and polish removers — can harm CORIAN if left in contact even for short periods of time. These materials should be wiped away promptly and flushed with water. Depending on time of exposure, surface damage caused by these materials can sometimes extend too deeply for practical repairs.**

### Food Center

A built-in variable-speed motor-driven unit, figure 3-5, may be used with blending attachments for a large variety of food preparation tasks. The food center is designed for ac operation and is operable only when the generator is on; or when coach systems are connected to an external shoreline hookup.



Figure 3-5. Food Center

## Bathroom

### Water Pump Switch

Two **Water Pump On-Off** switch/indicators are provided for separate control of water pump operation. One switch is located on the control panel in the galley area; the second is located in the bathroom. The pump may be operated **On** or **Off** from either location. The associated indicator is lit whenever power is being supplied to the pump. Setting either switch **On** pressurizes the water system, with the pump operating on demand to maintain constant pressure. Continuous or erratic pump operation can indicate an empty water tank, system leakage, or air lock in hot or cold water lines. (Air locks are normally caused by movement of water in the tanks during pump operation.) Since tank water level and water pressure can vary with road movement, leave water pump switch **Off** while the coach is moving. The water pump and air accumulator are located in the bed base cabinet.

### Toilet

The toilet, figure 3-6, operates from the fresh water supply, flushing wastes directly into the sewage holding tank. The double-flush foot pedal located at the bottom of the bowl controls the amount of water delivered into the bowl and opens the sliding valve to the tank. After use, depress bowl drain pedal until water swirls, draining wastes into tank, then release pedal. A water-saver feature, consisting of a manually-operated spray hose, is located inside cabinet at side of bowl. To raise the level of water in the bowl, press on the small foot pedal. A water shut off valve is located in supply line to toilet and used to stop water flow to toilet.

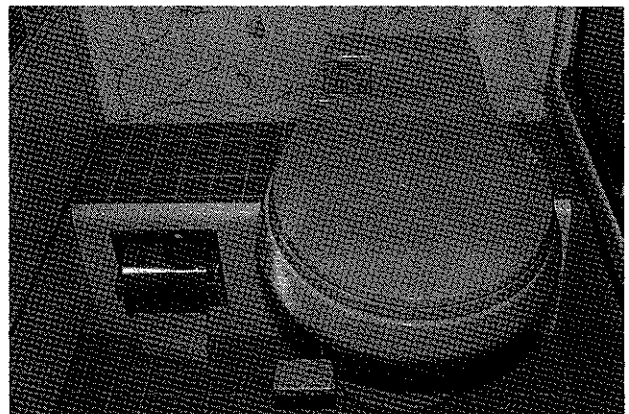


Figure 3-6. Toilet



## Vent and Exhaust Fans

A fan is located in the galley and has controls built into the housing. The lid must be raised to desired position before fan is turned on. The fan can be used as an exhaust fan by pressing the **OUT** side of rocker switch or as a vent fan by pressing the **IN** side of rocker switch.

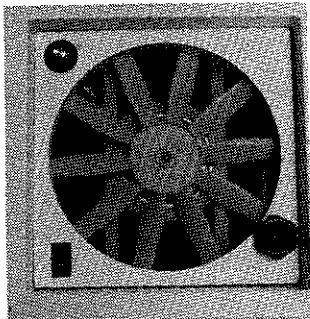


Figure 3-7. Vent and Exhaust Fan

## Heating Systems

Three types of comfort heating systems are used in your motorhome: gas/hot air heat; electric heat; and engine hot water circulating heaters.

Three gas/hot air furnaces are used in the coach. Each unit has a separate zone thermostat, figure 3-8.

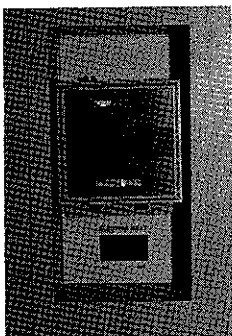


Figure 3-8. Heater Thermostat

One furnace is located in the living room, another is in the kitchen area. The bedroom furnace is also used to supply hot air to the bathroom via a separate duct.

Separate heating can also be provided by circulating hot-water heaters (chassis heaters) when the engine is operating and the **Winter-Summer Heat Selector** switch (located on the pilot's area overhead dash) is in **Winter** position. These heaters share the area thermostat with the LPG furnace.

Four electric convection heaters (120 volt) are located in the bedroom, bathroom, galley area, and liv-

ing area. An **On-Off** switch is located by each thermostat. One freeze-protection heater (120 volt) is used to protect plumbing in kitchen area.

## Gas/Hot Air Furnace

To operate the furnace, proceed as follows:

1. Turn manual gas valve (at furnace front) to **Off** position.
2. Set thermostat above room temperature. A 10 seconds delay will occur before the blower starts.
3. Allow blower to run for five (5) minutes for combustion chamber purge cycle.
4. After five (5) minutes, set thermostat to the **OFF** position.
5. Turn manual gas valve to **ON**.
6. Set thermostat on desired temperature.
7. Allow 24 seconds for ignition to occur.
8. If burner does not light, set thermostat on **OFF** and repeat steps 1 through 7.
9. If after three (3) attempts with no ignition, go to shutdown and contact a qualified service agency. Do not continue to cycle furnace through thermostat in an attempt to get ignition.

When coach temperature drops below the thermostat setting, the internal relay contacts close to operate the blower. The air flow created by the blower closes an air-actuated switch that, in turn, energizes the main burner gas line solenoid valve which then lights from the electronic ignition.

## Caution

**Do not store items in or near the burner compartment.**

When the coach temperature exceeds the thermostat setting, the relay contacts open. This shuts off the burner gas supply but the blower continues to operate until residual heat within the furnace is dissipated, when a thermostatically-controlled relay turns off the blower. Air for the sealed combustion chamber is pulled in from outside the coach, routed around the heat exchanger, then exhausted through the outside vent. Recirculated fan-forced air blowing across the heat exchanger is used to heat the coach interior.

Switch at bottom of thermostat must be **Off** (to left) if operation of furnace at lower temperatures is not desired.



## Hot-Water Heating Systems

Five sources of hot water heating are provided which depend on heat generated from engine operation. One heater (90,000 BTU), which serves the pilot's and co-pilot's area, is controlled by the **Front Heat** switch on the dash; and three chassis heaters, (50,000 BTU) under the dinette seat, livingroom sofa and in the bedroom rear storage area, are controlled by the thermostat in that area. The bathroom chassis heater (15,000 BTU) is controlled by the bathroom thermostat.

The engine coolant is normally routed through the engine cooling system and the water heater, which also can be heated electrically, to provide the hot water supply for the coach. However, by operating the **Winter-Summer Heat Selector** switch, the engine coolant can also be diverted through the previously-mentioned area heaters, via a solenoid valve. The coolant level in the engine radiator should be checked after these valves are opened. Note that two pumps are used to circulate hot water through the coolant lines. One pump is controlled by the **Aux. Pump** switch (located on the pilot's overhead dash), the second pump is turned on automatically whenever the **Front Heat** switch is on.

Chassis heater blower motors (dinette seat, front sofa and bedroom rear storage area), are controlled by **On-Off Heat** switches adjacent to the heater louvers as well as the area thermostats. **HI-LO** blower speed switches are also provided. The front heater is equipped with three squirrel-cage dual-speed blowers, operated from separate dash controls. One blower provides defroster air; one provides air to the pilot's side; the third provides air to the co-pilot's side. Use **Defrost Hi-Off-Low** switch for setting the defroster blower speed; use the left and right **Hi-Off-Low Heat** switches to control air flow to the pilot's and co-pilot's sides, respectively. To supply heat, the dash **Front Heat** switch must be **On**.

### Note

If additional defrosting action is needed, turn auto air conditioning temperature control to the warmest position and turn auto air conditioning fans to highspeed. This will circulate additional hot air about the windshield area.

Engine heat is picked up by the engine coolant which is pumped through the heaters inside the coach and back into the engine. A typical heater consists of a heat exchanger, or core, and a fan which moves the air across the core, transferring heat from the engine coolant into the room.

## Heating System Operation

Satisfactory performance of the hot-water circulating type of heating system depends on the following conditions:

1. Engine Coolant Temperature — Coolant temperatures vary between 180 and 195 degrees F, during normal engine operation.
2. Coolant Flow — Coolant flow varies with the engine speed. Setting the **Aux. Pump** switch (located on the pilot's overhead dash) to **On** turns on the auxiliary pump (located in the engine compartment) to increase the coolant flow through the system. This feature may also be used to reduce engine overheating during normal driving conditions.
3. Proper Fan Operation — All fan motors are two-speed and can easily be checked for proper operation by listening to the motor speed change as the switch is operated.

More heat will be generated by the engine when it is also used to move the coach. Be sure that the engine radiator is full and that all coolant flow valves are open. Warm engine to operating temperature and set heating system switches as follows:

- 1) **Winter-Summer Heat Selector** to **Winter** position;
- 2) **Aux. Pump** to **On**;
- 3) **Front Heat** switch to **On**;
- 4) Left and right **Heat** blower switches to **Hi** or **Low**;
- 5) Thermostats to desired temperature.

## Hot Water Supply Heater

See Section V.

## Air Conditioners

Two 13,500 BTU roof air conditioners are located in the livingroom and bedroom. The 12 volt master **ON/OFF** switches are located on the shifter panel. Fan and thermostat controls are located on the roof air conditioners. Each air conditioner is equipped with a 1,000 watt heat strip. A drain line, which runs inside the wall is installed to let condensate drain under the coach instead of running down the side.

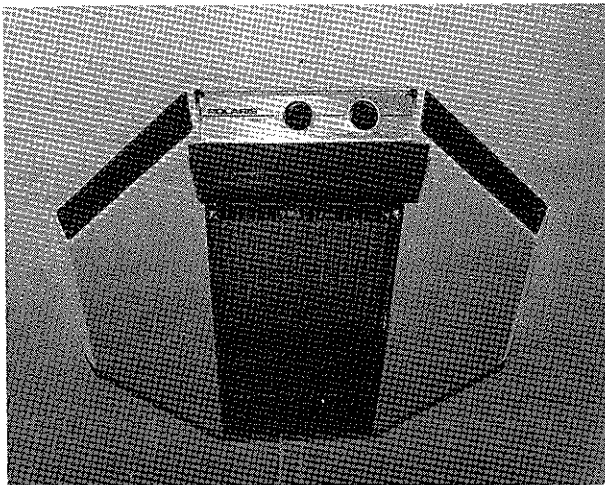


Figure 3-9. Roof Air Conditioner

### Systems Monitoring and Control Panel

The systems monitoring and control panel, figure 3-10, is located above the entrance door. This panel provides a convenient means of displaying inside and outside temperature, time, level of potable water supply, holding tanks, and LPG supply, as well as other monitoring and alarm functions discussed in the following paragraphs.

**Water Pump** — The water pump switch is one of two switches that can be used to turn the water pump on or off. The **ON** indicator will be lit when power is being supplied to the pump.

**Refrigerator Alarm** — When the switch is on the refrigerator temperature is being monitored. Normally, the **ON** indicator is lit; if the refrigerator temperature increases to an unsafe level, the **WARM** indicator lights with an accompanying audible alarm.

**Gas/Smoke Alarm** — The gas/smoke alarm is a gas leak detector designed to sense dangerous concentrations of LP gas or carbon monoxide within the coach. There are four (4) sensors mounted at floor level (LP gas is heavier than air) for the three furnaces and the refrigerator. One sensor is located above the 120 volt ac distribution panel (Load center) to monitor carbon monoxide. Carbon monoxide, of course, is the most deadly of the products of combustion. It will provide an alert in the event of a short circuit at the load center.

The alarm has been factory-calibrated to an alarm point of 2,000 PPM propane for standard conditions (temperature, 20 degrees C +/- 2 degrees; relative humidity 65% +/- 5%). This provides for a minimum of false alarms consistent with providing reasonable safety.

To turn on the unit, set **On-Off** switch to **On** and observe that **Power On** indicator is lit. Excessive propane PPM conditions are indicated by the sounding of the audible alarm and lighting of an indicator associated with the danger area. The alarm, if left turned off for a period of time, has a warmup period of about one minute. During this time, the alarm may sound. This is a normal response and should stop once the unit is warm.

**Clock/Thermometer** — The clock/thermometer provides, on demand, a digital display of inside and outside temperature, digital time display, and an alarm function. Operate the panel controls as follows:

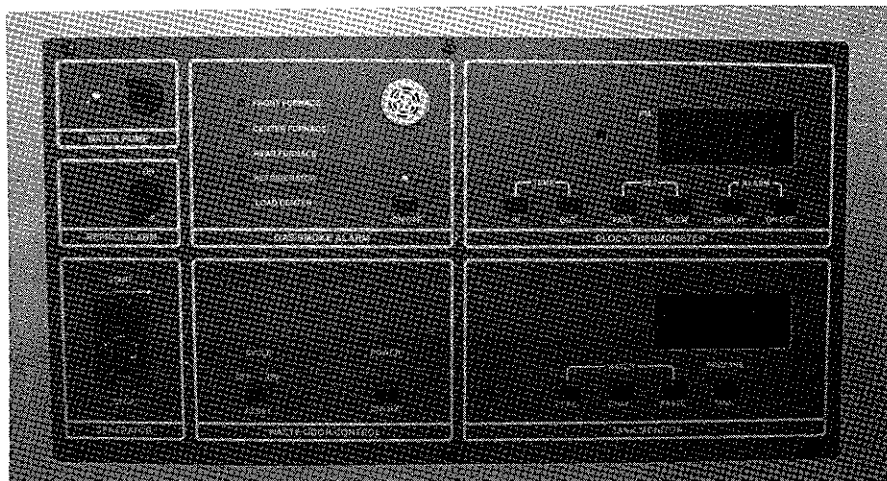


Figure 3-10. Systems Monitoring and Control Panel



1. Monitor inside or outside temperature (°F) by pressing the **Temp In** or **Temp Out** buttons. There is an internal adjustment, at the rear of the unit, which may be used to calibrate the temperature readings. (Calibration of this unit is described in Section VIII.)
2. Set the clock by depressing the **Fast** or **Slow Set** button until the correct time is shown. **PM** is indicated by lighted dot in the upper left corner. The dot in the center of the display marks the seconds.
3. Set alarm as follows: depress **Alarm Display** button then depress the **Fast** or **Slow** button to set the alarm time. Dot in upper left corner will light when alarm is set for **PM**. After setting the alarm, release **Alarm Display** button to return to the normal time mode. To activate the alarm feature, depress **Alarm On/Off** button to **On**; to shut off the alarm, depress **Alarm On/Off** button and release so it pops out to **Off**.
2. LPG tank level can be monitored in the same manner as the water tank level by depressing the **Propane Tank** button. Note that this display is pre-calibrated. However, if it is necessary to re-calibrate the display, this can be done when the tank is full by setting a rear-panel adjustment. Note that the display will read **Full** when the LPG tank float reads 80% because the remaining 20% volume is needed for expansion.

### Note

**When 12 V. power has been interrupted (batteries disconnected or Electronic Master switch turned off) clock display will flash "12:00". Reset clock to eliminate flashing. Alarm will also have to be reset.**

**Tank Monitor** — The Tank Monitor panel provides an illuminated readout of the content level of the pure water, gray and waste water tanks, and the LPG tank level. When full, each of these tanks has the following capacity: pure water supply, 116 gallons (See Table 8-4); gray water holding tank, 100 gallons; body waste tank, 100 gallons; and LPG tank, 43.5 gallons (148 lb.). Use the features of this panel as follows:

1. Monitor **Pure**, **Gray** or **Waste Tank** levels by depressing the respective button. The content level remaining in the tank is indicated by five sets of lit readings. The E lamp, at the left of the display, is lit all the time; if the next indicator is lit, the level is approximately 1/4 tank; if the center indicator is lit, tank level is between 1/2 and 3/4 full; if the 3/4 indicator is lit, tank level is between 3/4 and full; and if the F indicator is lit, tank level is full. If only the E indicator is lit, the tank level is between empty and 1/4.

**Waste Odor Control Panel** — This panel controls the cycling and electrolysis action of two pairs of stainless steel electrodes contained within the body waste holding tank. A 12-volt current is passed between each pair of electrodes for a 16-minute **On** period (green LED); and switched off for a 48-minute **Off** period (red LED). For each cycle, the current is reversed so that the electrolytic action does not excessively erode the steel electrodes.

As current flows through the waste liquid, it oxidizes the organics and eliminates associated odor. To increase odor control effectiveness, a tablespoonful or two of salt may be added through the toilet if desired.

The electrodes (probes) are replaceable.

**Generator Switch** — The generator **Start-Stop** switch provides the same features as the generator switch located above the driver. Press switch to **Start** position and hold until generator starts as shown by the switch indicator light. Press switch to **Stop** to shut-down the generator (light extinguished). Press switch to **Stop** (and hold for pre heat).

### LP Gas Leakage Detector

The gas leakage detector, figure 3-11, is located beneath the rear dinette seat. In the event of an LP leak, the unit sounds an alarm and closes down the main LPG supply by activating the leak detector solenoid shutoff valve located in the gas line just after the low pressure regulator. If it is necessary to reset the solenoid (red band is visible inside clear plastic valve housing), open the outside refrigerator vent compartment door, remove plastic housing by gripping locking levers and lifting upward, push valve plunger down until it remains down, then replace the cover. To test alarm operation, press the test switch located on top of the detector unit. Alarm must sound for at least 15 seconds before the shutoff valve will be activated.

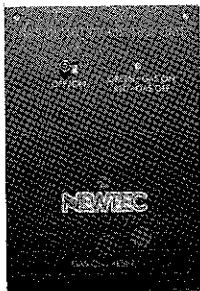


Figure 3-11. LP Gas Leakage Detector

## Burglar Alarm/Anti-Theft Features

The security of your motorhome and contents are assured by an intruder alarm system which protects windows and entry door. Each window is protected by a magnetic proximity switch which triggers an alarm if the window is opened. The entry door uses a door jamb switch which operates when the door is opened. When the system is **secured** it may be activated from outside the coach by a key-switch adjacent to the entry door. From inside the coach, a master burglar alarm switch may be operated at the front instrument panel.

## Electronic Door Chime

The door chime is located in a removable compartment in the right hand overhead storage compartment, figure 3-12.

The door chime can be preset to play any one of 60 different tunes when the doorbell button is pressed. As shown, all controls for tune selection, volume, tone and tempo are easily accessible. Tunes may be selected as follows:

1. Refer to tune index, at bottom of chime, and note the code number for the desired tune. For example, "William Tell Overture" is identified by D8.
2. Press in the left-hand tune selector button and move it to position D.
3. Press in right-hand button and move it to position 8.
4. Press test button to play selected tune and adjust volume, tone and tempo as desired. Note that tunes identified with an asterisk (\*) will play longer if the button remains depressed.

## Caution

**Do not use a lighted door button with this chime or chime may be inadvertently activated.**

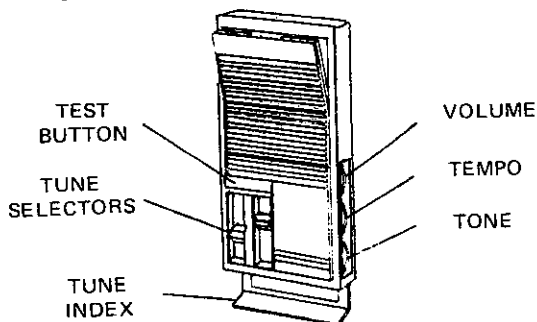


Figure 3-12. Electronic Door Chime

In addition to the alarm system, an anti-theft switch for the ignition circuits (A/T switch on dash) can be operated so that the unit cannot be started.

## Fire Extinguisher

A portable, multi-purpose dry chemical fire extinguisher is located behind livingroom companion chair. A second fire extinguisher is located in an outside coach compartment. To use, release the clamp and remove the fire extinguisher from the bracket, pull safety pin from handle, squeeze handle and apply chemical under flame.

## Smoke Detector

A smoke detector (now code mandated) is installed in a ceiling location just outside the entrance to the bedroom area. Operator instructions are attached inside the overhead cabinet where the warning label is displayed on the exterior door trim.

It is possible for the smoke detector to be activated by the cold air coming from a roof air conditioner outlet. Slight downward rotation of the outlet louvre is all that is necessary to discontinue activation.

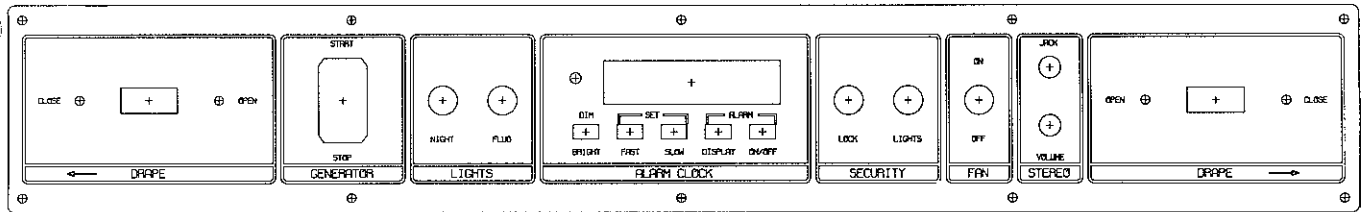


Figure 3-13. Bedroom Overhead Panel.

### Bedroom Overhead Panel

(See Figure 3-13)

The bedroom panel is in headboard behind bed and contains the following:

**Generator** switch — is used to start or stop generator.

**Lights** switches — **Night** switch controls the aisle lights and **Flouo** controls the flourescent lights in bedroom only.

**Alarm Clock** — see Systems Monitoring and Control Panel.

**Security** switches — **Lock** switch controls the deadbolt entrance door lock. **Light** switch illuminates front and rear landing lights, driving lights and rear Halogen parking lights.

**Fan** switch — master switch for vent fan in bedroom.

**Stereo** — the **Jack** is used for privacy headphone use and **Volume** controls the sound level.

**Drape** switch — opens or closes the drapes on the side of bedroom pointed to, when optional electric drapes are used.







## Section IV Electrical Systems

There are actually two interrelated electrical systems used in your motorhome: the 12 volt dc supply system; and the 120 volt ac supply system. The 12 volt dc supply system is divided into several branches, or zones, each functioning from the common 12 volt battery source. One branch provides the 12 volts required for the automotive starting, ignition and lighting systems; remaining branches supply those motorhome circuits and appliances which require 12 volts dc for operation.

The 120 volt ac system includes those motorhome appliances which require 120 volts for their operation, supplied from either the internal generator, or from the external 120 volt ac (or a split 240 volt ac) supply, via the shoreline hookup. An optional inverter unit will supply 120 volt power from the coach batteries to selected circuits.

### 12 Volt DC Supply System

Wiring diagrams of the 12 volt supply and distribution system are included in Section X.

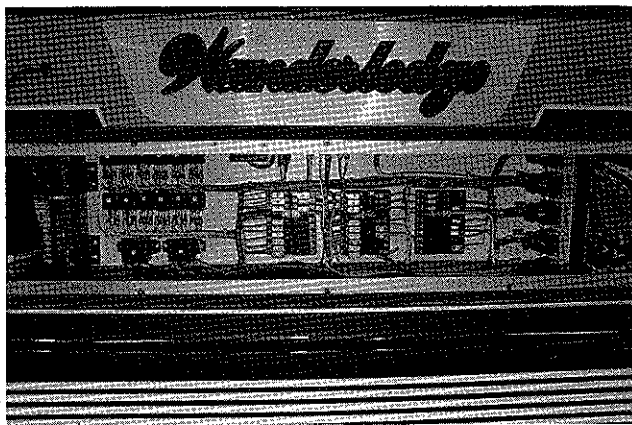


Figure 4-1. Typical Load Center

The 12 volts supplied to all motorhome appliances, outlets and accessories is routed from the batteries through a main 12 volt master switch and routed through busses to the individual branches, or zones, that are serviced from this supply. Circuit breakers are located behind the access panel at the top front left side of the coach, lower front load center (behind removable panel outside front of coach) and at each of the zones. The circuits supplied and fuse or circuit breaker protection at each zone are shown on diagrams included in Section X. A typical load center is shown in figure 4-1.

### Battery Heaters

120 volt ac battery heater pads provide faster engine starts during cold weather conditions by increasing the available cold cranking power. Heaters operate only from the ac supply line via the **Battery Heater** switched by 120 volt breaker only.

### Note

**To avoid premature deterioration of the batteries, heaters should be used only when the temperature is below 32°F.**

### Battery Charger

The 12 volt coach battery supply, figure 4-2, and the engine battery supply are maintained fully-charged by either the engine alternator (when engine operates); or by battery charger. The coach and battery systems are separated by a diode isolator to prevent deterioration of voltage in the event of one or the other supplies becoming defective.

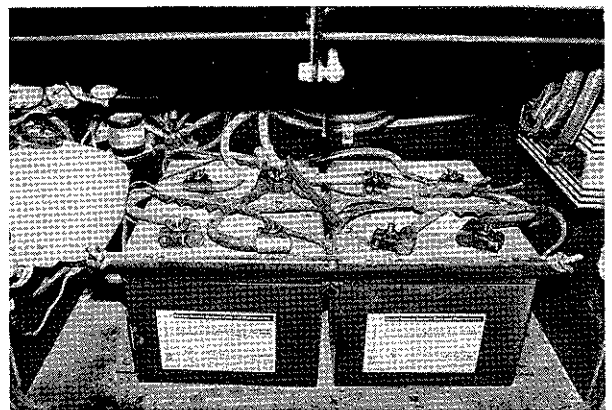


Figure 4-2. Battery Compartment

Batteries can become discharged because of coach 12 volt loads, while parked, without a 120 volt ac source. For overnight stops this presents no problem, with judicious use of 12v. service, because the engine alternator will recharge the batteries rapidly during the next day's travel. When operating from shoreline or generator power, the batteries obtain the major portion of the charge during "sleeping" time, while coach loads are low, so that the battery charger can "top off" the batteries.

If it is planned to leave the coach parked without exterior power for two days or longer turn off the **Electronic Master** switch in overhead cabinet adjacent to left front load center. This will ensure that there is no drain from the circuits which remain on



when the **Master** (under dash) switch is **Off** (clock, memory and LPG leak detector).

### DC Supply Monitors

The **ALT/CHGR METER**, located on the lower dash, indicates the total current flow from the charging source (engine alternator or battery chargers).

The **BATTERY CHARGE** ammeter, located on the co-pilot's overhead dash, shows the current flow to or from the coach batteries.

The **COACH LOAD** ammeter, also located on the co-pilot's overhead dash, shows the load drawn by coach circuits.

**ENG. VOLT METER**, located on lower dash, shows voltage at the batteries.

While in transit, this should reflect an alternator regulated setting of 14v. When parked, with 120v. source supplied, this should read between 12.5 and 14.0v. depending upon load. When parked, without 120v. source, do not permit voltage to drop below 11.5.

After a trip, **CHARGE** ammeter may show some discharge reading, even when 120v. source is supplied, if there is a load on the 12v. coach circuits. The **Float** type battery charger allows a voltage of 12.5-13 when there is a load.

### AC Supply System

Motorhome ac-operated appliances are supplied from either an external shoreline hookup or from the on-board generator. Selection of shoreline or generator power source is determined automatically by a remote change over switch located adjacent to the 120V breaker/distribution panel. The 120 volt AC circuits are normally supplied by the shore line power cable. Whenever the generator is started the changeover switch will detect the generator voltage and will switch to the generator in approximately 25 seconds.

### Power Line Monitors

A dual power line monitor is located on the co-pilot's overhead dash to monitor the voltage in both legs of the ac shoreline supply (or generator supply). The monitors have a polarity and ground detector circuit to indicate possible electrical hazards due to incorrect hookups.

A power line polarity monitor is located in the shoreline/utility box (figure 4-4).

### AC Circuit Breaker Panel and Distribution Panel

The main ac circuit breaker panel is located in the end table adjacent to the entrance door.

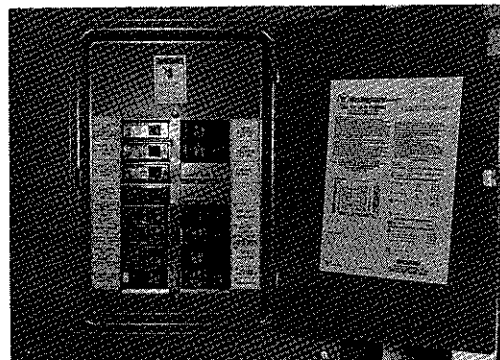


Figure 4-3. AC Circuit Breaker Panel

### Generator Operation

The generator plant is connected to the coach batteries so that it can be started independently of the engine 12 volt batteries.

The generator can be started and stopped from any of three locations within the coach: at the driver's instrument panel, at the systems Monitor Panel, or at the bedroom panel. In addition, the generator can also be operated from the controller box in the generator compartment.

To start the generator, push the **Generator** switch to the **Start** position and hold until the generator starts, as indicated by the generator **On** indicator light. **Do not hold switch on for longer than 5 seconds at a time!** If the generator does not start the first time, wait a minute and try again. Release the switch when the indicator light in the switch glows. The generator may be stopped at any time, by holding the switch to the **Stop** position until the generator stops (light in switch extinguishes).

In cold weather, it is necessary to activate the cylinder glow plugs before starting. Push **Start-Stop** switch to **Stop** position and hold for 15 to 20 seconds.

It is not advisable to start the generator under a heavy load, especially with the high current demands made by the air conditioners. This may cause hard starting and possible damage to the generator electrical system.

The generator is housed within an electrically operated extendable tray. To open, operate the **Out-In Gen. Tray** switch in the left front battery storage compartment.



## Caution

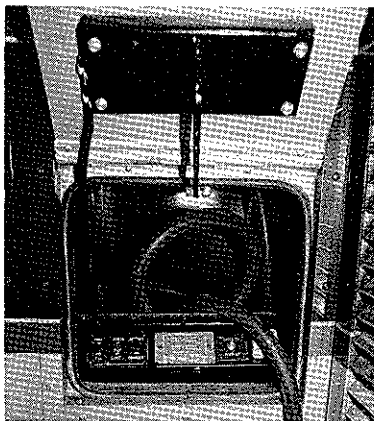
The generator tray is heavy and moves in and out with a great deal of force. **Keep Hands Off Tray When Operating Switch!**

### Shoreline Operation (Commercial Power)

## Caution

Your motorhome has been wired in accordance with the National Electrical Code. All 120 volt ac wiring is two-wire service with ground; all 240 volt wiring is three-wire service with ground. If the motorhome is connected to an external hookup which has only a two-wire circuit, ground the third wire on the adapter to the external supply metal junction box or conduit. For personal safety, check the polarity detector indicators on the power line monitors to be sure that lines are properly connected and grounded.

For purposes of safety, observe all precautions when making these connections. Connect the other end of the shoreline to the power source. Poor grounding or incorrectly-wired receptacles can cause personal harm as well as equipment damage or fire hazards. Check reverse polarity indicator in shoreline/utility compartment to verify correct polarity and grounding of hookup.



**Figure 4-4** Shoreline/Utility Compartment

In many instances, the shoreline hookups will not be rated to operate all electrical appliances in your coach. Check with facility personnel to determine the maximum current capability of the hookup. Sometimes, only one air conditioner may be operated. The current ratings for appliances de-

signed for standard or optional (identified by \*) usage in your coach are listed in table 4-1.

**Table 4-1.** Electrical Ratings for Motorhome Appliances

Item	Current Rating (Amperes)
Air Conditioners	
14,500-BTU	(Start) 19.0
Water Heater	10.0
Television Receivers	
Black-and-white	.5
Color	1.0
Battery Charger (depends on battery condition/load)	0 to 14.0
Engine Block Heater	10.0
Electric Heaters	
Interior Heater	12.5
Battery Heaters	1.2
Heat Tapes	3 watts/ft
Microwave Oven	15.0
Food Center	4.0
Refrigerator	2.7
*Ice-Maker	Start 15, Run 2.5
*Washing Machine/Dryer	14.0
Instant Hot Water	6.5
	<b>*Optional item</b>

### Shoreline Operation — Troubleshooting

Your coach is designed and tested to make sure the 120v. ac **Neutral** (white) wire and the **Ground** (bare copper or green) are not tied together (no continuity). This will prevent any danger of a "hot skin" if the source of power has reversed polarity (red LED lit).

#### Problem

— Probable Cause

— Corrective Action

#### Green LEDs lit - Normal (desired)

#### Red LEDs lit

— Reversed Polarity at power source.

— Convince park management to correct or change lot assignment.

#### Neither red or green LED lights

— No ground connection with park service

— Use jumper lead from ground pin on shore cord to service box.



Power source (park) circuit breaker trips.

- Reversed polarity in park and coach neutral and ground tied together.
- Use on-board generator until qualified electrician can correct coach problem. (Generator polarity is correct).

Green LED's lit plus Red LED's glow when additional load is turned on (Air Conditioner or Water Heater).

- Poor ground connection at park (floating ground).

### **Safeline Alarm**

Your coach is equipped with a shoreline disconnect alarm, which is located on the upper left auxiliary dash. This device will provide an audible or visual alarm whenever the shoreline is left connected to the coach at the same time that the ignition switch is turned **On**. This assures that the coach is not inadvertently driven away while still connected to the shoreline hookup.

### **Audio System Wiring**

Low-voltage audio system wiring is run throughout the coach between the stereo radio, speakers, head-

phone jacks, volume controls and amplifiers. These interconnections are shown on wiring diagrams provided in Section X.

### **Electronic Master Switch**

Most of the electronic circuits are de-energized when the main **A/T** switch is turned **Off** (relay action). Circuits that still receive power when the **A/T** switch is off serve the monitor panel, clocks, radio memory, and LPG leakage detector. If coach is to be stored for two days or more without external power, the **Electronic Master** switch in the front overhead kitchen cabinet on driver's side should be turned off.

### **Battery Storage in Freezing Weather**

Batteries that are not kept full-charged must be given protection against freezing. Partially-charged batteries will freeze at low temperatures, so batteries must either be left charged or removed from the vehicle and stored in a warm location.

The motorhome can be left connected to the shoreline ac supply and the coach battery chargers will keep all batteries charged. Note that even in a warm location it is advisable to keep the batteries charged to prevent deterioration. The four main coach batteries are sealed type batteries and should require no electrolyte service.



## Section V

# Water Distribution and Drainage Systems

Your motorhome is equipped with a completely self-contained water system which includes piping, heating and drainage facilities similar to those used in home installations. Refer to Section X for potable water system and plumbing drainage system piping diagrams.

### Water Supply and Distribution System

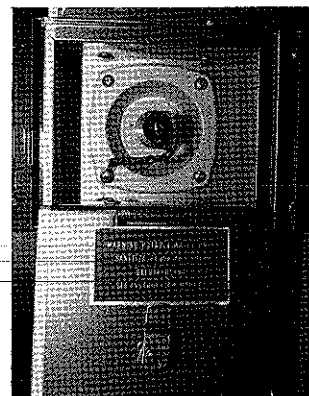
As shown in figure 5-1, the dual purpose **Tank Water Fill/Commercial Water** inlet connection is located in a small compartment at the road side rear above the shoreline/utility compartment. The **Tank Fill On-Off** switch, located in the shoreline/utility compartment, controls a solenoid-actuated water valve to divert the commercial water input to fill the pure water storage tank. Located beneath the wardrobe, the tank is of the non-pressurized type so that system water pressure is developed by pumping action directly into the supply lines, rather than by tank pressurization. A bacteriostatic water purifier system purifies all the water supplied to the coach.

### Commercial Water Hookup

When facilities are available, the **Commercial Water** hookup can be used to supply all coach water system requirements. In this manner, the coach water tank and pump system are automatically bypassed and water pressure is developed by the external connection. Water inlet pressure is regulated to 40-psi by a valve which is part of the combination city (commercial) water fill, check valve, and regulator shown in figure 5-1.

### Note

**The Tank Fill switch should be On only when the water tank is being filled. This switch must be in Off position at all other times.**



**Figure 5-1.** Location of Commercial Water Hookup

### Filling and Sanitizing

**Filling the Tank** — To fill the water supply tank, connect the water hose to the commercial water inlet, set **Tank Fill** switch to **On**, then turn on the water supply. When tank is full, as indicated by water overflow beneath the coach, set the **Tank Fill** switch to **Off** position, shut off the water supply and disconnect the hose. At this time, check that the Monitor panel readout indicates a full water tank. To check, press the **Pure** tank switch and observe that the **E** through **F** indicator segments are lit.

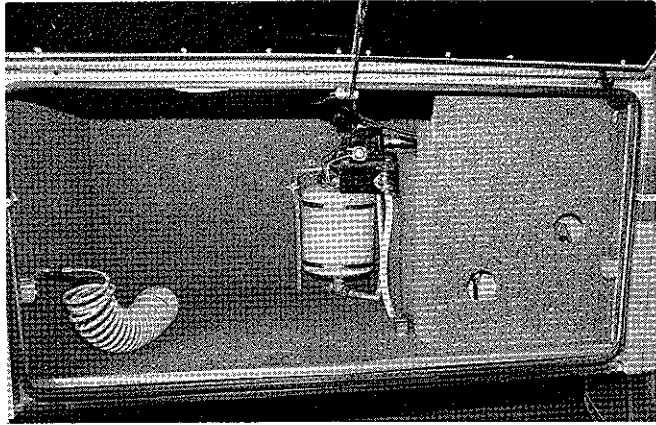
**Sanitizing the Water System** — Water system sanitizing procedures should be followed before the system is used for the first time, after long idle periods, where water may become stagnant; or after any suspected contamination of the water supply. Whenever possible, use a commercially-approved tank sanitizer and follow the procedures on the product package. If it is not possible to use a commercial product, prepare your own mixture and sanitize the tank in accordance with the following procedures:

1. Empty the Water Tank — To drain tank, open **Water Tank Drain** valve in right (curb) rear compartment, figure 5-2. After tank is completely drained shut off **Water Tank Drain** valve.

2. Prepare the sanitizing solution using ¼ cup of household bleach (sodium hypochlorite solution) for each gallon of water. Use one gallon of the solution for each 15 gallons of tank capacity. This procedure will result in a residual chlorine concentration of 50 ppm in the water system. If a 100 ppm concentration is required use ½ cup of household bleach with one gallon of water to prepare the



chlorine solution. Nine gallons of solution will be most adequate for the largest tank(s) (128 gallons).



**Figure 5-2.** Air Accumulator, Water Pump and Water Tank Drain Valve.

3. Add sanitizing solution to water tank — Lift access door in floor of wardrobe and disconnect overflow hose from tank and pour solution into vent fitting. A curved piece of 1 ¼ I.D. hose, clamped to the vent fitting, will facilitate this process. Reconnect overflow hose.

4. Fill tank to Capacity — Connect the hose to the commercial water inlet, set the **Tank Fill** switch to **On** and fill water tank completely. Shut off hose, and set **Tank Fill** switch to **Off**. Turn on water pump. Open each faucet (hot and cold) and run the water until a distinct odor of chlorine can be detected. Shut off water pump.

5. Allow the system to stand for at least 4 hours when disinfecting with 50 ppm residual chlorine. If a shorter time period is desired, then a 100 ppm chlorine concentration should be permitted to stand in the system for at least 1 hour.

6. Drain Tank — Open the **Water Tank Drain** valve and allow the tank to drain completely.

7. Refill Tank — Close the **Water Tank Drain** valve, and turn on the water supply to the commercial water inlet, set **Tank Fill** switch to **On** and fill tank completely. When the tank is full, set **Tank Fill** switch to **Off**, shut off water supply and disconnect hose, replace fill cap and turn on water pump. When water flows from opened faucets, close them and open other faucets until water flows. This

flushes the system, removing trapped air from the piping and ensures that the fresh water supply is ready for use.

## Note

**Residual tastes or odors can be removed by again draining and rinsing the system with a vinegar solution mixed to the ratio of one quart of vinegar to five gallons of water.**

## Potable Water Distribution System

The major components of the potable water distribution system are the bacteriostatic water purifier, water tank, water pump, air accumulator, water heater, piping and fixtures.

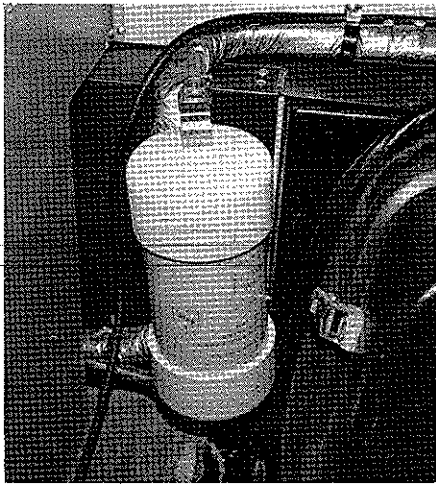
The air accumulator, water pump and water tank drain valve are shown in figure 5-2; the water purifier is shown in figure 5-3.

## Water Pump

The water pump, figure 5-2, is equipped with a factory-calibrated pressure control switch which is preset to turn the pump on when the system pressure falls below 20 psi; and turn the pump off when the pressure reaches 35 psi. If the pump has been out of service for a period of time, it is advisable to open a faucet before turning the pump on. When water flows steadily from the opened faucet, close faucet and observe that pump shuts off when system becomes pressurized. (it may also be necessary to bleed the air from the other faucets as well.) When the potable water supply tank level is low, or empty, shut the pump off to prevent possible damage to the pump motor. In addition to integral motor overload protection, the pump mechanism is also protected from jamming by the presence of an inline filter (pump guard) between the pump and the supply tank.

## Water Purifier

The bacteriostatic water purifier, figure 5-3, filters and purifies the potable water supply to eliminate tastes, odors and coloration produced by chlorine, rust, insecticides, detergents, sediment and other foreign objects. Satisfactory elimination of water-borne disease-carrying bacteria is accomplished by a hygienic filter bed which consists of silver ions absorbed on sponge silver metal which is deposited in a finely divided form on granular activated carbon of high surface area.



**Figure 5-3.** Water Purifier Location

The water purifier is a self-contained unit, requiring no routine or periodic maintenance.

Each time the filtered water supply is used for drinking or cooking purposes, run the tap for a few seconds to clean out the line prior to using the water. This is particularly important if the water tap is not used on a daily basis. If the water supply has not been in use for extended periods, allow the water to flow for a minute or two before use.

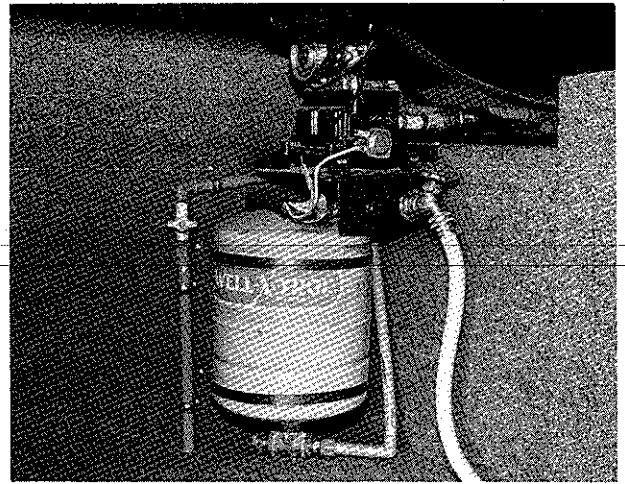
**Purifier Replacement** — Depending upon the condition of the municipal water used, the filter media will normally process 75,000 gallons of water before the purifier will need to be replaced. For the majority of "Wanderers" this means there will be at least five years of useful life.

The only practical way to determine when replacement is required is to go by the sense of taste. If a faint taste of chlorine is detected, it is time for a change. Even when there is a noticeable taste, the bacteria stopping properties have not been compromised.

### **Water System Air Accumulator**

An accumulator in the water system smooths out the water flow, reduces water hammer and pulsations from the water pump.

The accumulator incorporates a butyl diaphragm with the air side (top) being pre-charged to 20 psi. If this is accidentally lost, the accumulator may be re-charged to 20-25 psi through the Schrader valve on top.



**Figure 5-4.** Accumulator.

### **Water Heater**

The 10 gallon Marine Electric Water Heater has a "motor aid" heat exchanger to ensure a supply of hot water while in transit and upon arrival at your destination. Engine coolant circulates through this heat exchanger as shown in the chassis heater piping diagram in Section X. The electrical heater can be used whenever 120 volts ac is available. The heater switch, located under the kitchen sink should not be switched **Off** when outside ambient temperatures are 32°F or lower.

### **Caution**

**Be sure water heater tank is full before turning switch on.**

### **Outside Faucet**

An outside faucet is provided in the right rear compartment (Figure 5-2) so it is not necessary to enter coach to wash hands, etc. This also serves as the low point system drain.

### **Drainage System**

A diagram of the drainage system is provided in Section X. Separate holding tanks for gray water and body waste are located in a pass through compartment front of the rear wheels. The gray water holding tank is the receiver for the water from the kitchen sink and the shower; the waste holding tank stores toilet wastes and waste water from the bathroom lavatory. Each holding tank has a separate drain valve, dumping gray water and wastes through a common single discharge connection. Separate vents from each holding tank extend through the roof of the coach.



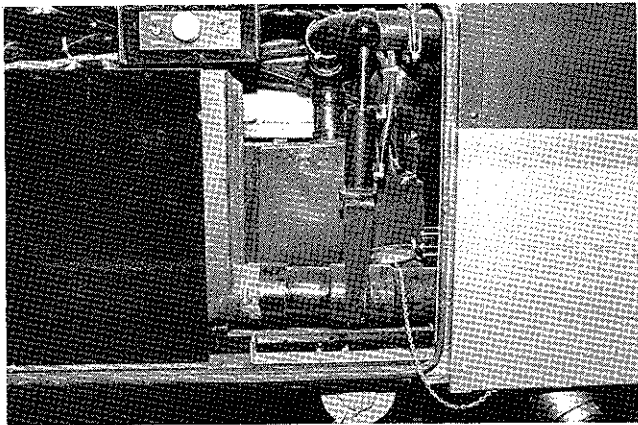
## Draining the Holding Tanks

The waste holding tank is drained first, then the gray water tank. Drain the holding tanks as follows:

### Note

**It is advisable to drive your unit for a short distance to agitate the contents of the holding tank before dumping.**

1. Check that both drain valves are in a closed position before removing drain cap. Note that the valve handles are turned clockwise to lock the valve.



**Figure 5-5.** Location of Holding Tanks Drain Valve

2. Remove the safety cap from the single discharge connection by turning in a counterclockwise direction and connect the sewer hose coupling to the end of the valve. Tighten securely, in a clockwise direction. The sewer hose is stored within a tube below the compartment, figure 5-5.

Place the discharge end of the hose into the sewer opening and check that all connections are secure to prevent accidental spillage.

3. Open the drain valves, by turning the handle to the left (counterclockwise) to unlock and assist in initial opening, then pull the handle straight outward.

4. After contents are emptied, flush out holding tank to dislodge remaining solids.

### Note

**To clean the holding tank, add a detergent solution into the tank after it is emptied. The agitating action from vehicle movement will clean the tank.**

5. Close drain valves by pushing handle inward and turning to the right (clockwise) into the locked position.

6. Disconnect and wash out drain hose, store hose and replace cap.

## Tank Level Detectors

Each of the holding tanks and the potable water supply tank has a level detector which provides an electrical input to the Systems Monitor panel above the entrance door. Activate the display to read the level of liquid remaining in each tank by pressing the appropriate pushbutton switch.

## Winterizing

To prevent freezing of water supply lines, they are wrapped with heat tapes that operate automatically when the temperature drops below 38 degrees F. The heat tapes are connected to the ac outlets below the floor of the rear wardrobe and behind the bathroom vanity.

If you are planning on storing your motorhome in an unheated area during cold weather, it will be necessary to winterize the water system to prevent damage from freezing conditions. Winterizing procedures are covered in the following paragraphs.

## Draining and Winterizing the Fresh Water Supply System

The following procedures show the use of the various drain valves, controls and pressurized air system to remove the water from the plumbing and appliances in the fresh water supply system. Refer to figures 5-2 for the location of controls and valves.

1. Open the main circuit breaker box and set the **Water Heater** and **Instant Hot** circuit breakers **Off**.

2. Turn on **Water Pump** switch and open all faucets (galley sink, lavatory, shower, outside hose connection and toilet). Also, remove drain plug at rear of toilet and drain plug at bottom of **Instant Hot**. If equipped with Ice-Maker refer to **Draining the Ice-Maker** below.

3. Open the outside faucet.

4. Open the **Water Tank Drain** valve, and the **Water Heater Drain Valve**, figure 5-2. Both valves are located in the right rear outside compartment, figure 5-2.

5. Allow water to drain completely before proceeding to the next step.





6. Close the **Water Heater Drain Valve**.

7. Turn on **Water Purge Air Pressure** switch, figure 5-2, to **On** to activate the solenoid which applies air pressure to the input water line to purge the water system. Note that it may be necessary to start the engine to build up air pressure.

8. When only air remains in the lines, close both low-point drain valves and all faucets. Replace drain screw/plug in toilet valve and Instant Hot. Operate the Instant Hot water heater valve to clear the heat exchanger of remaining water.

### **Note**

**When reactivating system make sure Instant Hot and water heater are full of water before switching on.**

9. Turn **Water Purge Air Pressure** and **Water Pump** switch off, and shut down engine.

10. Disconnect both hoses from the water pump to prevent residual water from backing up into the pump.

11. Open all faucets.

12. Drain the holding tanks and add RV anti-freeze (several quarts) to each tank through the toilet (into the sewage tank), and through the galley sink (gray water tank).

13. At this point, the only water remaining in the system is contained in the U-traps (P traps) beneath the lavatory and shower drain. To prevent this water from freezing and damaging the traps, pour one pint of RV system anti-freeze into each trap.

**Draining the Ice-Maker** — If your motorhome is equipped with an ice-maker it will also have to be drained so that no water remains in the line or ice-making mechanism.

1. Remove the cover from the bottom compartment and turn the switch **Off**.

2. Disconnect the water line from the solenoid valve fitting.

3. This line must be blown free of water, and can best be done during step 7 above. Do not reconnect the water line at this time.

4. Turn **On** the ice-maker and allow it to operate until all remaining water is drained (approximately one hour). Remove any water remaining in the ice-maker mold, drip tray, or cube compartment.

5. Turn ice-maker **Off**, reconnect water line, and leave door slightly ajar to prevent interior humidity build-up from corroding the ice-making mechanism micro-switches.





## Section VI LPG System

The coach is equipped with a permanently mounted 43.5 gallon (148 pounds of fuel-net) LP gas tank which is the energy source for the range, three gas furnaces and alternate source for the refrigerator. A piping diagram of the LPG system is shown in Section X.

### LPG Tank and Controls

The LPG supply tank is located in a curbside compartment as shown in figure 6-1. LPG system controls include a main gas service valve, solenoid shut-off valve, two stage pressure regulator, filler connection with Auto Stop (80%) fill valve, 20% vapor (stop filling when liquid appears) valve, and the pressure relief valve.

### Warning

**When coach is to be stored in a confined area, turn off the LPG at the main tank shutoff valve (figure 6-1). With the NEWTEC LPG Leak detector this may now be accomplished by turning the control unit "OFF".**

A flexible hose from the solenoid valve connects to the two stage pressure regulator which carries the LP gas to the manifold to individual appliances.

The solenoid valve is actuated by remote NEWTEC LPG leak detector, located below the refrigerator door. Tank level can be monitored at the Systems Monitor panel. To read the digital display, press the **Propane Tank** button.

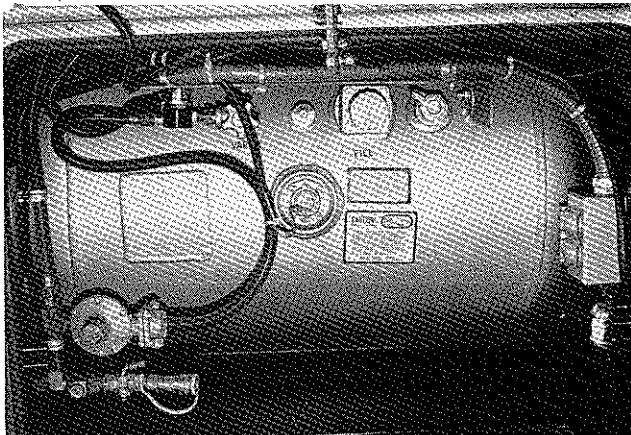


Figure 6-1. LPG Tank Compartment

### NEWTEC LPG Leak Detector

The NEWTEC system has been developed to the point where it is unique; it shuts off the LP gas at the high pressure source, yet holds the valve open to provide ample appliance flow with a minimum amount of current usage.

Two components make up the system:

1. **Gas Detection Control Unit** — is mounted on the face of the drawer below the refrigerator. This is the "brains" of the system and provides an electrical signal to the solenoid valve when LPG service is required.
2. **Solenoid Valve** — installed in the high pressure LPG line feeding the two stage regulator. It is a "normally closed" solenoid valve and has a special winding of 22 ohms (approximate) resistance, so it uses very little current in the "hold open" position. In order to close the valve, it is only necessary to break the circuit. This provides a "fail-safe" feature in the event of loss of 12V power.

The following events will result in an open/low voltage circuit and allow the solenoid valve to close and shut off the LPG supply:

1. Moving lever to **OFF** on the Gas Detection Control Unit. Green light will go out.
2. The Gas Detection Control Unit senses the presence of LP gas (or can be triggered by a propane lighter or even hair spray!) Green light out, red light on, along with audible signal.
3. The **Electronic Master Switch** is turned off. Green light will go out.

### Note

**System is not Master Switch activated.**

4. Low state of charge allows battery voltage to drop below 9.5 (particularly while engine is being cranked). Under these conditions, the green light may stay on even though the valve has closed: Normally the light will change to red.

In order to restore LP gas flow to the coach, use the following procedures corresponding to the events above:

1. Move lever to **ON** on the Gas Detection Control Unit. Red light will come on. Depress **GAS ON/RESET** button. Green light will come on.
2. Correct the cause of LP gas leak, or determine if other fumes caused the shut down. Depress **GAS ON/RESET** button. Green light will come on.



3. Turn Electronic Master Switch on. Red light will come on along with audible signal. Depress **GAS ON/RESET** button. Green light will come on.
4. Charge batteries either from battery chargers with generator/shore power or from engine alternator. Depress **GAS ON/RESET** button. Green light will come on.

### Note

**Because of the presence of an excess flow valve in the LPG tank outlet (safety feature), sometimes an appliance will not relight after a NEWTEC shutdown and reset. In this circumstance, wait five (5) minutes for LPG pressures to equalize before relighting.**

### Caution

**Be sure to shut off all gas appliances before filling the LPG tank. Check gas lines and fittings periodically for tightness and leakage.**

### Fuel Requirements

Liquefied petroleum gas is a material composed of various hydrocarbons such as propane, butane, or a mixture thereof. In its gaseous form (vaporized) it is colorless and has a garlic-scented additive to ensure detection. In addition to being highly inflammable, it is also dangerous to inhale. For ease of transportation and storage, LPG is compressed into a liquid state and stored, in this form, within the LPG tank. As fuel is used, vapor passes from the top of the tank into the two stage pressure regulator and to the various gas appliances.

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.

Prevent condensation and possible regulator or line freeze-ups, when filling the tank, by requesting the dealer to add a small amount of Methyl Alcohol to the fill-up. A common mixture is one ounce of Methyl Alcohol to each 20 pounds of LPG.

### Filling the LP Gas Tank

When the tank is being filled, the Service valve must be **Closed** and the 80% liquid level valve (20% vapor valve) must be **Open**. The 80% **Auto** stop fill valve may close before liquid appears at the 80% liquid level valve, but if liquid does appear, stop filling immediately; the tank is filled to its LP capacity. Close the liquid level valve. Do not use a wrench to tighten this or the **Service** valve; they are designed to be closed leak-tight by hand. If you cannot hand-tighten properly, the valve probably needs repair or replacement.

### LP Gas and Vapor Detectors

The Gas/Smoke alarm, on the monitor panel, has sensors at various locations through the coach and sounds an alarm if the safe amount of LP gas or carbon monoxide in air is exceeded. The LP gas leakage detector below the refrigerator door monitors the area near the refrigerator and the range, sounding an alarm and allowing the LP gas solenoid shut-off valve to close if a leak is sensed.

### Regulator Pressure

The two stage pressure regulator regulates the pressure of the LPG supplied to the appliances. The regulator functions automatically and is factory-preset to provide the correct line pressure. **Do Not** attempt to tamper with or reset the regulator! Even a small variation above the normal gas line pressure can be sufficient to create a dangerous situation and cause possible damage to individual appliance components. If there is any doubt about the regulator setting it can be checked by your Wanderlodge® dealer or LPG supplier. The correct setting is 11-14 inch water column.

### Operation

To operate any LPG appliance, the main gas (Service) valve, figure 6-1, must be **Open**. At each furnace there is a shut-off valve and solenoid valve that must be opened prior to use. When first used, or after a refill, there may be some air in the gas lines which will escape when you 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 tank's Ser-



vice Valve some of the gas will remain in the lines. To completely bleed the lines of gas, **Close** the tank's **Service** valve and light a range burner to use up the excess. When the flame burns out, turn the range burner **Off**.

### Checking For Leaks

Periodically check the LPG system for possible leakage. Do not wait for an alarm condition to occur before correcting a leak! Although the entire system and associated appliances undergo extensive factory testing for leakage, road shocks and heavy vibrations may loosen or damage piping or fittings. Leaks will usually become noticeable by the characteristic odor of the garlic-scented gas additive. To check, turn off all burners and pilot lights. Open all doors and windows. Open LPG tank service valve and use an ammonia & chlorine free soap-bubble solution on all connections. Any bubbles are evidence of leakage.

### Note

**The gas leakage detectors may momentarily sound an alarm when the engine is initially started or when a heavy electrical load is placed on the system. Further, the ultrasensitive response of these units may also cause an alarm to be given in the presence of certain pressurized-can sprays or cleaning agents. Do Not Assume! Always Determine the Reason For This Vital Alarm Being Given!**

### LPG Consumption

Most gas appliances are intermittently operated. However, operation during cold weather conditions does cause a heavy use of the gas furnaces. The amount of LPG consumption depends on the total use and manner of use of these appliances.

Note that each gallon (4¼) lbs of LPG fuel produces approximately 91,500 BTU's of heat energy. The LPG tank used in your coach will furnish over 3 million BTU's.

For your guidance in estimating your anticipated fuel consumption, the following is a listing of typical appliance consumption ratings when the appliance is operated for one hour:

Refrigerator	1,500 BTU's
Cooktop Burners	5,200 BTU's Each
Furnaces (3)	16,000 BTU's Each

### LPG System Warnings

#### 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.**

#### Warning

**It is not safe to use cooking appliances for comfort heating.**

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

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

1. Open overhead vent or turn on exhaust fan.
2. Open Window.

A warning label has been located near the LP gas container. This label reads.

**Do not fill container(s) to more than 80 percent of capacity.**

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

#### Warning

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

#### Warning

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



The following label has been placed in the vehicle near the range area:

**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 regulators must always be installed with the diaphragm vent facing downward. This will minimize any chances of vent blockage which could result in excessive gas pressure causing fire or explosion.

**Warning**

**Never check for leaks with an open flame. Do not check copper plumbing lines for leaks using ammoniated or chlorinated household-type detergents. These can cause cracks to form on the line and brass fittings. If the leak cannot be located, take the unit to your Wanderlodge® dealer or LPG supplier.**



## Section VII

# Air Brake System

Your motorhome is equipped with dual service air brake systems for front and rear brakes, with integral fail/safe operation; and manual/automatic rear spring (parking) brakes. As shown in the air brakes system diagram in Section X, the service brakes are completely independent systems, each including a reservoir and separate distribution lines and valves. A separate reservoir is also supplied for the rear spring brakes, which function independently of the service brakes. All three reservoirs are pressurized from a single compressor. Both service brake systems are brought into operation each time the brake treadle is depressed to slow or stop the coach. Reservoir pressure for each service brake system is monitored by a respective pressure gauge on the front panel; system failure(s) are indicated by low pressure readings, illumination of the **Low Air** failure lamp and sounding of buzzer (item 10, figure 2-3).

### Operation

When the coach is parked, and the engine off, the rear spring brakes will normally be set by operating the parking brake. The spring brakes cannot be fully released until the air pressure is above 65 psi. These brakes are in the released position when the control is pushed in. In the event that there is a loss of air pressure, the spring brakes will set automatically, at the brake-applied position, and will not release until the air reserve has again built up to required value. Consequently, there will be a normal delay, after the coach is first started, before the compressor builds up sufficient pressure in the three reservoir tanks, before the brakes can be released and the coach driven. When the brake treadle is depressed, to slow or stop the coach, reservoir air is applied simultaneously to both front and rear service brakes to effect the braking action. The spring brakes are held in a released position by the air pressure supplied from the associated reservoir tank.

### Caution

**Do not attempt to drive the coach until system pressure is above 90 psi.**

### Brake Failures

To compensate for normal lining wear, each brake system is individually self-adjusting.

A combination of fail/safe features provide protection against brake system failures. Each service braking system, front and rear, has a backup capability in the event of partial or total system failures. If the front brakes fail, operating the brake treadle activates the rear service brakes normally providing sufficient braking action to effectively stop the coach. If a failure occurs in the rear, the front service brakes and rear spring brakes provide braking action. Under these conditions, the spring brakes do not lock in, as in a normal set position, but instead their application is "modulated" in the same manner as the service brakes, thereby providing a normal braking "feel".

In the unlikely event of a failure where both service braking systems are disabled, the rear spring brakes will apply automatically and bring the vehicle to a stop. As a safety factor, the coach should not be moved until brake failures (any type) are corrected.

### Note

**With the front brake system service reservoir fully charged, enough air pressure is available to provide four full releases of the rear spring brakes. This will allow the coach to be brought to a safe position until repairs can be accomplished.**

### Additional Air-Operated Equipment

Besides providing the compressed air supply for the coach braking systems, the compressor also provides the air supply for the entry step, side-slide mechanism on pilot's and co-pilot's seats, front air vents and air suspension system (air bags) — all via separately-controlled solenoid switches operated from the dash, or at other locations throughout the coach. (This compressed air source is furnished from the front right side reservoir.) A compressed air outlet fitting, tire gauge, and spiral hose are contained in the center storage compartment on the left side of the coach, convenient for blowing out the water system, inflating tires, and so on. A Schrader valve (air connection) is available at the rear of the front right side air tank to allow the air system to be pressurized from a "shop" source without the necessity of starting the engine.



## Compressed Air System Air Dryer

The air dryer unit collects and removes moisture and contaminants from the compressor air output before the air reaches the reservoirs. This unit is different from a reservoir drain or an aftercooler in that it provides dry air for the brake system by eliminating the possible accumulation of condensate in the system reservoirs. Note that each reservoir also has a drain cock on the bottom for draining accumulated moisture. This assures a long maintenance-free life for air brake system components due to the removal of system contaminants.

The air dryer is located between the compressor discharge (output) line and the compressed air reservoirs. A safety valve mounted in the air dryer housing assembly protects against excessive pressure buildup. The desiccant cartridge and

pleated paper oil filters are easily removable and replaceable as a complete serviceable unit. The desiccant "beads" which provide the drying action have a large capacity for absorption due to their combined surface area. In addition, an internal thermostatically-controlled heating element prevents freezeups on the purge drain valve when the unit is used during sub-freezing temperatures.

Purging of the dryer is automatic, exhausting combined oil and water residue to the atmosphere. At the same time that the contaminants are purged the reverse air flow across the desiccant material removes the accumulated moisture and reactivates the desiccant. Cartridge replacement should be accomplished at 12-month periods; sooner, if the cartridge has become contaminated.





# Section VIII Owner Maintenance Data

This section provides general information for use in performing scheduled services as well as preventive and routine maintenance on your Wanderlodge®.

## Caution

Cooling fan operation is controlled electrically by a thermostat which senses engine coolant temperature. Any time the engine is running the fan may engage and start to run without warning. The engine must be shut off and the fan stopped before servicing.

## Specifications and Data

**Table 8-1**

### Engine and Chassis Specifications

Engine	
Caterpillar 3208TA	300 HP
Transmission	ZF 5 HP 500 5 Speed
*Chassis GVWR	37,400 lb.
Front Axle	14,600 lb.
Rear Axle	23,000 lb.
Wheelbase	236 in.
Air Brake System	
Front Axle	Self adjusting 16.5 in. × 5 in. brakes
Rear Axle	Self-adjusting 16.5 in. × 7 in. brakes
Air Reservoirs	Three Air Tanks 5,384 cu. in.
Retarder	Transmission Hydrodynamic Brake
Wheels & Tires (6)	Aluminum rim, 12R22.5, 16 PR tubeless steel-belted radial
Tire Inflation	See information plate inside stepwell compartment door (figure 4-1)
Axle Ratio	5.29:1
Leveling Jacks (Hydraulic)	
Front (each)	16000 lb. rating
Rear (each)	16000 lb. rating

A feature of the Wanderlodge® is a swing-out radiator which facilitates engine accessory belt changes.

## Caution

Do not swing out radiator with engine running. Fan could start unexpectedly and cause serious injury.

Alternator Belt—	
W/L P/N 0814038—	Gates 9600 matched set
Power Steering Belt & Water Pump—	
W/L P/N 1333061—	Gates 9525 matched set
Air Conditioning Compressor Belt—	
W/L P/N 1396142—	Gates 9463 (1)
Fan Belt—	W/L P/N 1333053—
	Gates 9480 matched set

**Table 8-2  
Engine/Chassis Capacities**

Diesel Fuel Tank Capacity	200 gallons
Fuel Additive recommended for use with #2 Diesel Fuel	US Borax Biobor JF
Fuel Additive to Use per 100 gallons	2.8 fl. oz.
Lube Oil System	
Refill Volume with Filter Change	20 quarts (dry)
Crankcase Capacity	Low Mark 12 quarts High Mark 16 quarts
Cooling System Capacity	61 quarts (approx. 85 qts. with cockpit & living area heaters)
Specification	low Silicate Ethylene Glycol Base Antifreeze (Formulation Standard GM 6038-M)
Oil Specifications for Engine	
API	CD/SE, CD/SF, CC/SE, or CC/SF
30 degrees to 100 degrees F	SAE 40, SAE 30, SAE 15W-40, or 10W-30
Below 30 degrees F	SAE 10W-30, 15W-40, 5W-20, or SAE 10W
Frequency of Oil Change	
Every 300 engine hours with— CD/SE or CD/SF oil	
Every 200 engine hours with— CC/SE or CC/SF oil	
Frequency of Filter Change	Every oil change
Oil Filter W/L p/n 3743481, CAT 9N6007	
Power Steering	
Specification	Dextron II
Capacity	4 quarts
Leveling Jacks	
Specification	Dextron II
Capacity	10 quarts



Transmission  
 Specification ..... Dexron, Dexron II  
 Capacity (including oil cooler) .... 32 quarts

**Table 8-3**

**Generator Capacities and Specifications**

Electrical Rating ..... 120 Vac 8 k.w.  
 Fuel Supply  
 Diesel: Tee in engine supply line.  
 Coolant System ..... Water-cooled  
 Crankcase Capacity ..... 4 quarts w/ filter,  
 Oil Filter

KABOTA No. DKD-15241-3209-2

Oil Specifications for Generator

API ..... CC/SE, CC/SF, CD/SC  
 CD/SE, or CD/SF

30 degrees to 100 degrees F . SAE 10W-30

0 degrees to 30 degrees F ... SAE 10W-30

Below 0 degrees F ..... SAE 5W-20

**Table 8-4**

**Motorhome Capacities and Specifications**

Potable Water Tanks ..... 96 gallons  
 (92 gallons 35 ft. side bath)  
 Holding Tank, Gray Water ..... 94 ~~92~~ gallons  
 35 ft. side bath  
 Holding Tank, Waste ..... 94 ~~92~~ gallons  
 LPG Tank ..... 148 lbs.-net (43.5 gallons)  
 Water Pump ..... 3.5 GPM  
 Water Heater ..... 10 gallons  
 Batteries

Engine - (2) 12 Volt Batteries Connected  
 Parallel to Provide 1850 CCA

Coach - (2) 12 Volt Batteries Connected  
 Parallel to Provide 400 AH

Battery Chargers . 45 amperes max output each

Air Conditioners\*

Automotive ..... 18,000 BTU

Roof ..... 13,500 BTU ea.

Hot Water Circulating Heaters\*\*

Living Area (3) ..... 50,000 BTU ea.

Cockpit Area ..... 90,000 BTU

Gas/Hot Air Heaters\*

Living Area (3) ..... 16,000 BTU ea.

Electric Heaters

120 volt (4) ..... 1500 watts ea.

\*NEMA Rating

\*\*SBBMA Rating

**Table 8-5  
 Maintenance Schedule Summary**

Item

— Frequency

— Type of Service

and Specification

**Transmission**

See Section X Diagram, Lubrication Guide for service of other Engine/Chassis components

**Batteries**

— Every engine oil change

— Clean & coat coach & engine battery terminals with lubricant

**Air Cleaner**

— Replace when air cleaner indicator shows red after high power run. Loss of power and black smoke also indicate need for change. W/L P/N 3734191, Donaldson P12-9396

**Fuel Filters**

— 10,000 to 15,000 miles

— Replace as required

— W/L P/N 2236677, CAT 1P-2299

Racor Filter and Water Separator

Change when vacuum (Racor) gauge goes to red

Element W/L P/N 2254035  
 (Racor 2040SM)

Gasket (large) W/L P/N 3747359  
 (2) (Racor 11007)

Gasket (T-handle) W/L P/N  
 3747342 (Racor 11350)

**Air Brakes System**

**Reservoir Tanks**

— Daily or depending on usage (not necessary with air dryer)

— Drain each reservoir tank of moisture by opening petcock at bottom of tank.

**Air Compressor Air Dryer**

— 23,000 miles, or every 3 months, or every 900 hours. Refer to Bendix Air Dryer Manual.

— Check/replace air dryer cartridge W/L P/N 2107753 (Bendix 287313)



### Air Suspension System

- 1,000 miles to 3,000 miles, or every month
  - Check air springs for even inflation
  - Check for tightness of nuts, bolts, air connections
  - Check shock absorbers for oil leakage, worn bushings
  - No lubrication is required

- Dinette, Flush, bulb # F15T8/CW . . (2)/3.5
- Kitchen, Flush,
  - bulb# F15T8/CW . . . . . (2)/3.5
- Bedroom Flush bulb # F15T8/CW . . (4)/7
- Ceiling, Flush, bulb # F15T8/CW . . (2)/3.5
- Vent Fans, bulb # 912 @1.0A. . . (3)/4/Vent

### Fuses

Electronic equipment fuses are located in 12 volt load centers. See diagrams in Section X.

**Radio Privacy Switch** — lower front component panel <sup>A</sup>SK20.

**AM/FM Stereo Tuner/Cassette Player** — lower front component panel, <sup>A</sup>SK38.

**Radio Memory Circuit** — lower front component panel, <sup>A</sup>SK38.

**Refrigerator** — overhead front load center SK04.

**Spot Light Rotation** — overhead front load center, SK13.

**Burglar Alarm** — lower front component panel, <sup>A</sup>SK11.

**Turn/Hazard Flasher** — Lower front component panel, <sup>B</sup>SK05.

### Changing Wheels/Tires

The wheel/tire assemblies used on your motorhome are heavy-duty truck-type. They are **heavy** and may be difficult to handle. If at all possible, changes should be accomplished by a service station equipped to handle truck equipment. However, if a situation arises where no service facilities are available, the following procedures may be used.

#### Front Axle Wheels

1. Drive motorhome out of traffic lane onto a level surface capable of supporting jack.
2. Turn on hazard flasher and apply parking brakes before leaving coach.
3. Turn off ignition and set transmission selector to **Neutral (N)** position.
4. Remove white plastic wheel saver, jack, lug wrench and handles from front curb side storage compartment.
5. Place wheel chocks against front & rear of tires on opposite side.
6. Place jack under axle and raise slightly until securely in place. See figure 8-1 for location of typical jacking point.

**Table 8-6**  
**12-Volt Lighting Equipment**

Item	Specification (Qty)/Amperes
Automotive Lighting Marker/Clearance/ Identification, bulb # 1895 . . . . .	(16)/4.5
Stoptlights, bulb upper & lower # 1157 . . . . .	(4)/8.4
Parking Lights bulb # 1157 & # 194 (front inside) . . . . . w/tag	(9)/4.5
Turn Signal Lights bulb # 1157 . . . . .	(2)/4.2
Cornering Lights, bulb # 1156	
Side Turn Lights, 2/side, 2 # 1895 bulbs/light Indicator Light W/L P/N 2271955	
Hazard Warning . . . . .	(6)/12.6
Tag Light, bulb # 168 . . . . .	(1)/.35
Headlights and Taillights (with park & tag)	
Driving Lights, bulb W/L P/N 2126019 . . . . .	(4)/31.2
Instrument Panel—	
Gauges, bulb # 53 . . . . .	(14)/1.7
Spot Light, bulb W/L P/N 2103760 . . . . .	6.8
Stepwell outside, bulb # 53 . . . . .	(1)/.12
Stepwell inside, bulb # 67 . . . . .	(1)/.55
Landing Lights, bulb assy. W/L P/N 2261626 . . . . .	(4)/27.2
Backup Lights, bulb # 1156 . . . . .	(2)/3.8
Rear Parking Halogen . . . . .	(2)/13.4
Engine Compartment Lights bulb # 1416 . . . . .	(1)/.8
Luggage & Stepwell Compartment Lights bulb # 1416 . . . . .	.8A. ea.
Porch light, bulb # F8T5/CW . . . . .	(2)/2.2
Interior Lighting	
Reading Spots, bulb # 1383 . . . . .	(15)/1.54 ea.
Front Living, Flush, bulb# F15T8/CW . . . . .	(8)/14.0
Aisle, Bulb # 53 . . . . .	(3)/.36
Bathroom Mirror bulb # F8T5/CW . . . . .	(2)/2.2
Bathroom, Flush, bulb# F15T8/CW . . . . .	(2)/3.5
Shower, bulb # 1141 . . . . .	(1)/1.5



## Caution

Bumpers are not designed for lifting and/or towing of the vehicle.



Figure 8-1. Locating Jack

7. Remove spare wheel assembly from mounting and place on ground near work area.
8. Pull off lug nut covers.
9. Install wheel saver.
10. Loosen lug nuts slightly, then jack up coach until tire is clear of ground. Solidly support the vehicle under the main frame rails with jackstands before working under or around the coach.

## Caution

Severe injury or death may result. **DO NOT** use the leveling system for changing tires or working under the vehicle. Keep the rear wheels in firm contact with the ground with the parking brake set. With the leveling jacks extended, there is a possibility the vehicle may move either toward the front or the rear.

## Note

Lug nuts on right side of coach are righthand threaded (turn counterclockwise to loosen, clockwise to tighten); lug nuts on driver's side of coach are lefthand threaded (turn clockwise to loosen, counterclockwise to tighten).

11. Remove lug nuts and wheel assembly.
12. Install spare and replace lug nuts. Tighten progressively in the sequence shown in figure 8-2 starting with # 1 and proceeding to # 10. Final torque will be 450 to 500 foot-pounds.

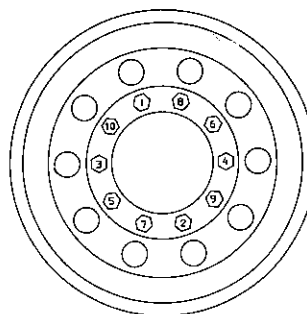


Figure 8-2. Lug Nut Tightening Pattern

13. Snap front hub cover into front wheel opening after front lug nuts have been properly torqued.
14. Place lug nut covers on all lug nuts. Make certain that these nut covers fit snugly. This is accomplished by squeezing the dimpled sides together before installing.
15. Lower coach to ground and remove jack and handle.
16. Replace wheel saver, lug wrench, jack and handles in storage compartment and tie down to prevent road noise. Return damaged wheel/tire assembly to holder and have it repaired as soon as possible.
17. Remove and stow wheel chocks.
18. Turn off hazard flasher before returning to traffic.

## Caution

Check lug nuts for tightness every 1,000 miles. Lug nuts should be torqued to 450 to 500 foot-pounds.

### Drive Axle Dual Wheels

1. Repeat steps 1 through 10, front axle wheels.
2. Loosen inner lug nuts (studs with square heads), if inner wheel is to be replaced.
3. Remove outer lug nuts from the (5) studs which have lock rings and slide hub cover over remaining lug nuts.
4. Remove the (5) remaining lug nuts and wheel.
5. Remove inner lug nuts and inner wheel, if inner wheel is to be replaced.
6. Install replacement wheel and inner lug nuts. Tighten progressively in the sequence shown in figure 8-2 starting with # 1 and proceeding to



- #10. Final torque should be between 450 and 500 foot pounds.
7. Install outer wheel (or replacement wheel) and lug nuts over inner lug nuts marked 1, 3, 7, 9 and 6. Torque nuts in the following sequence 1, 7, 6, 3 and 9 to between 450 and 500 foot pounds.
  8. Install hub cover over the (5) lug nuts holding wheel to hub. Place lock rings and lug nuts on remaining inner lug nuts 10, 5, 2, 4 and 8.
  9. Replace wheel saver.
  10. Torque nuts in the following sequence 10, 2, 8, 5 and 4 to between 450 and 500 foot pounds.
  11. Return to step 14 of **Front Axle Wheels** and continue.

### **Note**

**When checking torque on dual wheels loosen all outside lug nuts. Check torque on inner lug nuts (studs with square heads) for torque value shown above then torque outer lug nuts to value shown above.**

### **Battery Maintenance**

Your motorhome is equipped with separate engine and coach battery systems for greater assurance that there will be sufficient voltage to crank the motorhome engine.

Two batteries are located in the rear engine compartment on the road side. Batteries are also located in the road side front compartment and are used for coach loads.

All batteries are charged from either the engine alternator or battery chargers (when 120 volts ac is available). Note that the generator will supply 120 volt ac to the battery chargers.

### **Caution**

**Avoid sparking of any form in the vicinity of the batteries.**

### **Caution**

**Do not wear metal rings, watches or jewelry when working on or near the batteries, cables, solenoids, or chassis wiring. These can short out electrical wiring and cause injury**

To make sure that the batteries are always ready for use, periodically check and charge as

necessary. Check batteries at least every two weeks in freezing weather; at least every four weeks in warmer weather. A fully-charged battery will not freeze under normal circumstances, so it is imperative that the batteries remain charged during winter. It is advisable to have the coach shoreline connected to the 120 volt ac supply so that the batteries remain fully charged.

A dirty battery may eventually dissipate its charge through conductive surface contamination. Clean battery top surface with a damp cloth and dry thoroughly. Check that battery terminals are tight and free of corrosion. To clean terminals, neutralize corrosive deposits with a solution of baking soda, rinse with clear water, and dry. Note that commercial type spray-on battery cleaners are available at automotive supply stores. Use as directed to keep the batteries clean. Spray-on cable and terminal protective coatings are also available, easy to use, and effective.

### **Exterior Care**

Exterior paint finish life can be extended by periodic cleaning and waxing. This will preserve the paint and allow easier removal of dirt and road tars. Use touch-up paint for small areas to keep the coach finish in like-new condition.

### **Caution**

**Avoid the use of strong detergents, such as those used in commercial truck washes. These detergents can discolor the aluminum trim on your coach.**

Frequent washing of the coach is necessary to prevent corrosion in areas where heavy salt sprays are evident. A clear acrylic spray may be used, with care, to control corrosive effects of salt spray on metal surfaces.

### **Caution**

**Avoid spraying water through the refrigerator vent door.**

### **Interior Care**

The interior can be kept in good condition with the use of approved cleaning agents for vinyl walls and ceilings, plastic fixtures, stainless steel, formica and so on. Never use abrasive cleaning agents on interior of refrigerators, or on the lavatory, tub/shower, or toilet, as they can cause permanent scratches. Be sure that the cleaning agent will not damage the material. Note that some plas-



tics are incompatible with certain cleaners. Read the directions on the container before using. For the most part, the cleaners and polishes that would normally be used in your home are equally well-suited for use in your motorhome.

## Fluid Level Checks

### Crankcase Oil Level

The crankcase oil dipstick and oil fill are located inside the left rear side engine compartment access door, attached to the front of the compartment.

The oil level must be checked only with the engine off. Maintain oil level at the proper fill line. If checking oil level immediately after engine has been operating, allow a few minutes for the oil to drain back into the crankcase before checking the oil level reading.

The best time to check the oil is before getting underway because the engine is cool and the reading will be most accurate.

### Power Steering Reservoir Fluid Level

Regularly check fluid level in the power steering reservoir. Reservoir is located behind rear engine compartment door to right of radiator. Add Dexron II as necessary to maintain the correct dipstick reading, depending on fluid/engine temperature. (Note that the dipstick is attached to the T-handle plug on top of the reservoir). If the fluid is at normal operating temperature — about 150 degrees, and hot to touch — the dipstick should indicate **FULL** or just below. If engine is cool, fluid level should read about 1/2 way between the **ADD** and **FULL** marks.

### Transmission Fluid Level

The transmission dipstick is located inside the left rear engine side access door. It is a "T" handle above left engine valve cover.

### Importance of Proper Oil Level

Since the transmission oil cools, lubricates, and transmits power, it is important that the proper oil level be maintained at all times. If it is too low, the converter and clutches will not receive an adequate supply of oil. This can result in poor performance or transmission failure. If the level is too high, the oil will aerate, causing the transmission to overheat. Check the oil level at intervals specified in your vehicle service instructions, or more frequently, if operating conditions indicate.

## Oil Check Procedure

For oil check procedure refer to **ZF Ecomat Operating Instructions** Section II operation number 8.

## Note

**Always clean around the end of the fill tube before removing the dipstick. Dirt or foreign matter must not be permitted to enter the oil system. It can cause valves to stick, cause undue wear of transmission parts, or clog passages. Check the oil level and report any abnormal oil level to your maintenance personnel. Check for abnormal oil level, milky appearance or any trace of coolant in the oil.**

## Racor Fuel Filter and Water Separator System

### Filter/Separator Operation

The three stages of the Racor filter/separator, figure 8-3, work in series to progressively clean the diesel fuel. Because virtually all water and larger particles of solid contamination are removed in the primary and secondary stages, the effective life of the fine micron replaceable element is 2-3 times longer than standard filters.

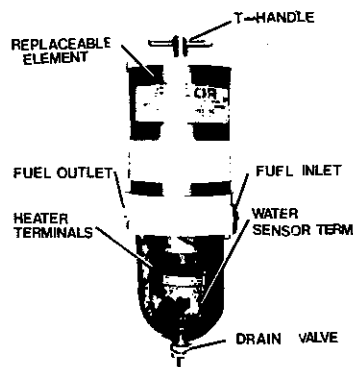


Figure 8-3. Racor Fuel Filter/Separator

**Primary Stage (Separation)** — In the primary stage, liquid and solid contamination down to 30 microns are separated out by centrifugal action created by the turbine centrifuge. There are no moving parts in this highly efficient design. Because the contamination is heavier than the fuel it falls to the bottom of the clear bowl.

**Secondary Stage (Coalescing)** — This stage functions when minute particles of liquid contaminants (lighter than the fuel) remain in suspension and flow up with the fuel into the lower part of the



filter/separator shell. Here the minute particles tend to bead on the inner wall of the shell and the bottom of the replaceable cartridge. As the beads accumulate, they become larger and heavier and will eventually fall to the bottom of the filter/separator bowl.

**Final Stage (Filtration)** — In this stage the fuel enters the replaceable cartridge where the minute solids are removed.

**In-Filter Fuel Heater**

Internal automatic thermostats turn on the Racor in-filter fuel heater as the fuel temperature drops below 35°F. (1.7°C.)

The in-filter fuel heater operates from the 12-volt battery source, supplying heat to the fuel filter just below the replaceable element. This critical placement provides increased fuel temperature as the fuel passes through the fine micron filtering element.

When the engine is not running and the temperature is below 35°F., the heater is operated by turning on the ignition switch for a maximum of 10 minutes prior to starting the engine. With the diesel fuel temperature above 35°F, there is no waxing or icing of the filter element. The in-filter heater is primarily a cold starting aid. Note that the top two terminals imbedded in the glass filter bowl connect to the internal heater.

**Water-In-Filter Alarm**

The electronic water sensor alerts the operator when liquid contaminants filtered out of the system should be drained from the collector bowl, thereby maintaining maximum filter/separator efficiency.

When water reaches a pre-determined level in the collector bowl, sensing probes activate the **Water-In-Filter** alarm circuit. The light illuminates, warning the operator to drain excessive water contamination collected in the bowl. Shut down engine before draining the bowl to avoid sucking air into the system. Note that the bottom two terminals imbedded in the bowl connect to the water sensors.

**Maintenance**

**Filter Element** — Routine maintenance of the Racor unit consists of periodic filter replacement and drainage of the moisture collected at the bottom of the bowl. (Engine is off during maintenance.)

**Filter Element Replacement** — Replace the element as follows:

1. Loosen handle and remove lid.
2. Inspect lid gaskets and replace, if necessary.
3. Remove filter element by grasping bale and lifting upward while rotating.
4. Replace Racor element by positioning over center return tube and twisting downward into place.
5. Top off by pouring clean diesel fuel into filter cylinder until full.
6. Replace lid and hand-tighten handle.

**Draining** — Drain bowl of accumulated moisture by opening petcock on bottom of bowl. Allow to flow until clean fuel appears.

**Fuel Tank Sending Unit Location**

The sending unit is located in the center of the coach directly in line with the living room end table. Access is accomplished by pulling up carpet and pad to expose cut out in plywood floor. Remove plywood cover and sheet metal plate to expose sending unit.

**Leveling Jacks Reservoir**

The leveling jacks oil fill is located beneath the center entry step. Lift up the hinged step top (hinge at door side) and remove the screws attaching the square metal cover plate to gain access to the oil fill to check oil level.

**Engine Cooling System Refill**

Use of low silicate ethylene glycol base antifreeze (formulation standard GM 6038-M) is recommended for summer or winter operation because of it's corrosion inhibition and lubrication properties. A 50-50 solution of antifreeze and water is preferred and it gives freeze protection to about 30°F below zero. Ultimate protection is attained at 68% antifreeze (about 92°F below zero): a higher concentration of antifreeze should never be used. The approximate (dry) cooling system capacities are:

Engine, Radiator,	
& Engine Hoses	15.25 gallons
Right front heater system	2 gallons
Rear coach heater system	4 gallons
<b>Total</b>	<b>21.25 gallons</b>
	(85 quarts)



... so the system would require 10.6 gallons of anti-freeze for a 50% solution or 14.5 gallons for a 68% mixture. Final solution should always be tested with a thermo-hydrometer or equivalently reliable testing device to determine actual protection.

If it becomes necessary to completely re-fill the chassis coolant system, the following procedure must be followed. Pure antifreeze can be used initially until prescribed amount has been installed, and then water for final filling.

### Engine, Radiator, and Engine Hoses

Locate and close the manual gate valves separating the engine from the heater systems. Both pressure and return valves for the coach heaters are located on the engine with access through the LH engine compartment. Remove the radiator cap and fill to the top. Replace radiator cap and run engine @ 1500 to 2000 RPM for one minute to purge air from the engine water jacket. Shut off engine, carefully remove the radiator cap, re-fill the radiator, and replace the cap.

## NOTE

**Use extreme care at all times when removing the radiator cap as hot coolant under pressure can cause injury.**

### Front (Cockpit) Heater and Coach (Chassis) Rear Heater Systems

Air bleeder valves are located on the LH rear bumper bracket for the coach system and on the RH front heater with access through the front access panel (black tubing) for the front heater. Leave the return line gate valves closed and open the pressure line valve for front and coach heaters. Slide the **FRONT HEAT** control (figure 2-9) to warm and the **HEAT SELECTOR** switch (item 1, figure 2-11) to **WINTER**. Press the **AUX. PUMP** switch (item 2, figure 2-11) **ON**.

Set area thermostats to the maximum high temperature position. Using suitable containers to catch coolant, open the bleeder valves and run the engine slightly over 2,000 RPM until a steady flow of coolant passes through the front heater bleed valve. Close front heater bleed valve.

To ensure bleeding of the coach (chassis) heaters, the following additional operations should be performed.

1. Again run the engine slightly over 2,000 R.P.M. until steady flow comes from the bleeder valve on the LH rear bumper bracket.

## Note

**The radiator must be filled often during bleeding procedures.**

2. Close rear bleeder valve and open return gate valve (engine compartment). Refill radiator using coolant recovered from bleeder valves and additional water as necessary.
3. Start and rev engine to maximum governed R.P.M. 2-3 times. Push **HEAT SELECTOR** switch to **SUMMER** and rev engine to max R.P.M. 3-4 times.
4. Return **HEAT SELECTOR** switch to **WINTER** and test heaters to make sure they are blowing hot air.
5. Shut down engine and allow to cool.
6. Fill radiator completely.

### Cooling System Additives

Automotive cooling systems are subject to various types of corrosion, rust, pitting and cavitation-erosion. These are common factors which prevent efficient cooling and contribute to engine overheating and higher maintenance costs resulting from replacement of hoses, fittings, filters and cracked heads. The manufacturer of the engine used in your motorhome recommends the use of Nalcool 2000 — a chemically buffered liquid additive which effectively neutralizes the formation of acids caused by dissolved exhaust gases, and inhibits the cooling system against corrosion and scale formation. This additive is compatible with most commercial automotive anti-freeze solutions containing ethylene glycol; however, its use is not recommended in cooling systems using Dow Therm 209. When refilling the coolant system, add four pints of Nalcool before topping off with anti-freeze solution. To ensure constant system protection, replenish Nalcool 2000 additive, periodically, in accordance with manufacturer's instructions.

### Windshield Washers

Check reservoir fluid level periodically and use a prepared washer solution if possible. (Note that low reservoir levels are indicated by a dash monitor light.) During freezing weather, use a solution additive, or a solution specifically designed for cold weather usage. The washer reservoir is accessible through the front curb side storage compartment.





## Jump-Starting

Proper procedure for jump-starting is as follows:

1. Turn off all main battery-operated accessories in both vehicles — lights, radio, etc.
2. Connect one end of the positive-coded jumper cable to the positive (red) battery terminal, and the opposite end of the cable to the positive (+) terminal on the other battery.
3. Connect one end of the negative-coded jumper cable to the negative (–) terminal on the other battery and the opposite end of the cable to the negative (black) battery terminal.
4. Once the engine of the disabled vehicle is started and brought up to idle, reverse the above procedure to remove the jumper cables. Always remove the jumper cable connected to the Wanderlodge® negative (black) battery terminal first to prevent sparks at the other battery.

## Caution

**Avoid sparks in the vicinity of a charging battery: the gas produced is explosive.**

### Generator 8.0 k.w.

Keep the generator operating at peak efficiency by following a regular schedule for inspections and servicing, based on operating hours. Keep an accurate logbook record of maintenance, service and hours of operation, following regular schedules for normal operating conditions, and a more frequent service schedule for operation under dusty or dirty conditions. Check condition of crankcase oil and change air filter frequently until the proper service/time periods can be determined based on your usage.

After the first 15 to 30 hours of operation, arrange to have the following performed at an authorized service center.

- Drain and refill engine oil.
- Replace engine oil filter.
- Check external nuts and bolts for tightness.
- Torque cylinder head nuts.
- Check and adjust valve tappets.
- Check for fuel or lubricating oil leaks.
- Check radiator coolant level and inspect cooling system for leaks.
- Check and adjust water pump belt tension.
- Check mounting tray bolts and vibro mounts for tightness.

- Operate generator set at full or rated load, checking for proper output and governor operation.

## Maintenance Schedules

Use the generator maintenance schedule in table 8-7 as a guide for routine and periodic maintenance. Neglecting generator maintenance can result in failures or permanent generator damage. Refer to the generator service manual for detailed repair and maintenance.

**Table 8-7  
Generator Maintenance Schedule**

### Frequency

#### — Service

Daily, or before each startup

- Check oil level
- Check coolant level
- Clean radiator intake screen

Every 100 hours, or 6 months, whichever occurs first

- Change lubrication oil
- Change oil filter
- Check engine for oil, water, or fuel leakage
- Check belt tension

Every 200 hours, or 12 months, whichever occurs first

- Check hoses and clamps
- Check and tighten electrical connections
- Check exhaust system for leakage
- Check and tighten mounting bolts
- Check generator brushes, commutator and slip rings
- Replace fuel filter element
- Check electrical system for frayed wires, corroded connections
- Replace air filter

Every 400 hours or 12 months

- Contact authorized service center for tuneup to include:
  - Injector inspection
  - Check and adjust valve tappets
  - Clean sliprings and inspect brushes
  - Check governor operation and adjust as necessary.

Periodically, perform a complete visual inspection of the generator when operating at full load.



## Oil Pressure

Always ensure that with the engine running, oil pressure is registering on the upper dash generator oil pressure gauge.

Pressures do vary according to climatic conditions and even between individual engines, but the oil pressure range at normal working speed and temperature will usually vary between 30 to 60 psi. The pressure will drop while the engine is idling and also a slight drop will be experienced when the oil is hot.

## Oil Filters

To ensure cleanliness of the lubricating oil, a sump strainer and a main full flow type of oil filter are used. The sump strainer consists of a gauze wire container which is fitted over the end of the lubricating oil pump suction pipe. All oil must pass through this strainer before it reaches the oil pump.

The main full flow type oil filter is mounted externally on the side of the cylinder block. All the oil passes through this filter after it leaves the pump, but before it reaches the bearings.

The full flow filter is a spinon cartridge in which the element is an integral part. Filter should be replaced at each oil change.

## Replacing Oil Filter Cartridge

1. Unscrew the cartridge from the filter head.
2. Check that the threaded adapter is secure in the filter head and discard the old cartridge. Clean the filter head.
3. Using clean engine lubricating oil, lightly oil the top seal of the new cartridge. Prime filter by filling with new oil to bottom of threaded hole.
4. Screw the new cartridge on to the filter head until the seal just touches the head and then tighten by hand a further half of a turn. If the cartridge is overtightened, it may be difficult to remove later on.
5. Since the filter cartridge will normally be changed at the same time as the engine lubricating oil, refill the sump with oil, run the engine and check for oil leaks. Recheck the oil level after running the engine and add oil as necessary.

## Oil Check

To be on the safe side, check oil in engine crankcase daily, or before each start, to ensure that the level is in the safe range between the **L** and **F** marks

on the dipstick. Do not operate generator if level exceeds **F** mark, or is below **L** mark.

## Caution

**Do not check oil level while engine is operating. Engine must be stopped to obtain a true reading, as well as for safety reasons!**

## Oil Change

On a new engine, change the oil after the first five hours of operation and, thereafter, at 100 hour intervals, or every six months, whichever occurs first. Whenever possible, drain the oil while the engine is still warm. To drain, place a container below the unit, open the oil drain and allow sufficient time for the old oil to drain completely. After draining, close drain plug and tighten securely.

## Cooling System

To avoid having the inconvenience of the generator shutting down due to overheating, or becoming damaged as a result of an overheat condition, be sure to keep the cooling air inlets to the compartment clean and unobstructed at all times.

When operating in climates subject to freezing temperatures, make sure that enough antifreeze solution is added to the coolant to prevent system freeze-up. (A drain petcock is provided on the underside of the radiator.)

Check coolant level frequently and add anti-freeze mixture as needed to maintain correct level.

**Table 8-8**  
**Anti-Freeze Protection Chart**

Anti-Freeze Protects to:	Mixture Proportions (ethylene glycol)
+ 16 degrees F (- 9 degrees C)	20%
+ 3 degrees F (- 16 degrees C)	30%
- 11 degrees F (- 24 degrees C)	40%
- 31 degrees F (- 35 degrees C)	50%

## Generator Troubleshooting

Refer to the generator service manual for repair and maintenance data. Generator repairs should be accomplished by a qualified repair agency.

## Generator Overloads

If the rated capacity of the generator is exceeded, the safeguard circuit breaker, located in outside compartment just to the rear of the generator compartment, will trip to protect the



generator against damage. This condition could be caused by a short in the coach ac supply circuits, or by operating too many appliances simultaneously, resulting in an overload condition. If the safeguard circuit breaker trips, the generator will continue running but no ac output will be supplied. Before resetting the circuit breakers, turn off some of the coach appliances and lighting to reduce the load to within the operating limits of the generator. If this is done, and the generator breakers still trip, a short circuit is indicated. Turn off the generator, locate and correct the cause of the short circuit.

### Storage Procedures

If the generator is to be out of service for a long period of time, perform the following procedures before placing the unit in storage:

1. Drain oil from crankcase (while hot) then flush with clean lightweight oil. Refill crankcase with regular-weight oil after flushing.
2. Clean exterior surfaces of generator set then spread a light film of oil over any unpainted metallic surfaces which could corrode.

### Refrigerator

To ensure that your refrigerator will provide trouble-free operation, the following routine maintenance procedures should be performed at least once each year.

1. Inspect all gas connections for leakage, using a solution of soapy water. Tighten, as necessary.
2. See owner's installation and operating instruction manual for periodic maintenance requirements.

### Water Pump

Under normal usage, the water pump should require no periodic maintenance other than ensuring that the input water supply is properly filtered of particles that could damage the pump mechanism. Pump failures can generally be tied in to the plumbing system, or to electrical wiring. If the pump fails to operate properly, refer to the general trouble-shooting guide given in table 8-9. Note that detail pump repairs and overhaul should be performed by a qualified repair facility.

A pumpguard filter is provided on the suction side of the water pump. This should be cleaned periodically.

**Table 8-9**  
**Water Pump Troubleshooting Guide**

#### Symptom

##### — Possible Cause

##### — Corrective Action

Pump operates but no water flows through faucet.

— Low water level in tank.

— Add water.

— Suction lines or filter clogged.

— Clear water lines and clean filter.

— Kink in water suction hose.

— Check water hose connections to tank and straighten or replace, as necessary.

— Air leak in suction line.

— Replace suction line.

Pump cycles on and off when faucets are closed.

— Water leak in plumbing.

— Check for signs of leakage and tighten or replace fittings, pipe, etc.

— Defective toilet flush valve.

— Repair flush valve.

Pump operates roughly and has excessive noise and vibration.

— Intake line is restricted, kink in suction hose or fittings too small.

— Check input hoses and straighten or replace, as necessary.

— Loosened screws at pulleys and connecting rod.

— Tighten screws.

— Deformed or collapsed pulsation dampener in pump.

— Replace dampener.

Pump fails to start when faucet is opened.

— Clogged pressure piping.

— Blow out water lines with compressed air.

— No voltage to pump.

— Check input wiring, circuit breaker and switches.

Pump fails to stop when faucets are closed.

— Empty water tank.

— Add water.

— Insufficient voltage to pump motor.

— Check battery voltage. If voltage is OK, pump is defective.



## Holding Tank Drain Valves

Periodically the drain valve may become hard to open. It is recommended that the (2) two screws in top of mechanism be removed and pull paddle out. After cleaning paddle a coat of vaseline should be added to both surfaces and valve reassembled.

## Clock/Thermometer Calibration Procedures

The thermometer section of the Clock/Thermometer indicates either the inside temperature or outside temperature, depending on the position of the panel pushbutton. It may be necessary to recalibrate the unit if there are differences between the actual inside or outside temperatures and the corresponding displays.

### Thermometer Calibration

#### Procedures

1. Place an accurately calibrated thermometer unit next to the outdoor temperature probe (located under metal shield on outside of lower roof rail near refrigerator vent) while the coach is in a protected environment away from direct sunlight, rain, winds, etc. Note the thermometer reading.
2. Press in the outdoor panel switch and compare the digital display reading with the actual outside temperature noted previously. If the reading disagrees sufficiently to require calibration, open the monitor panel so that the rear of the thermometer unit is accessible. (If the readings agree, proceed to step 3.) Adjust the outdoor calibration control, located in the extreme left center of the rear panel, as necessary, to make the display agree with the thermometer reading.
3. Place the calibrated thermometer unit next to the indoor temperature probe and note the thermometer reading.
4. Press the **Indoor** panel switch and compare the digital display reading with the actual inside temperature noted previously. If the readings disagree sufficiently to require calibration, open the monitor panel so that the rear of the thermometer unit is accessible. Adjust the indoor calibration control, located on the lower left-hand side of the rear panel, as necessary, to make the display agree with the thermometer reading. Replace the monitor panel.

User maintenance of this equipment is not recommended.

## Tub/Shower Mixing Valve

The water mixing valve used in the tub/shower contains a pressure balancing spool valve, figure 8-4, to make sure there are no sudden temperature changes. Water mineral deposits which can accumulate in the valve body and spool valve will affect the normal operation of the mixing unit. To gain access to the valve body, remove the screws which hold the faceplate to the shower wall. (Water supply must be turned off.) Remove the control knob, then lift off the faceplate.

To remove the spool, unscrew the large center screw and carefully withdraw the spool from the valve body. Inspect O-rings for damage and replace, if necessary. Flush out spool of any foreign material, then replace in valve. Replace faceplate and secure with screws. Replace knob.

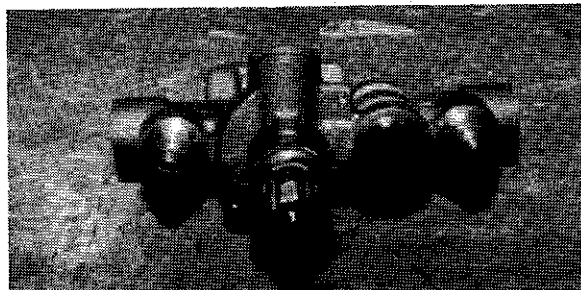


Figure 8-4. Tub/Shower Mixing Valve



## **Section IX**

### **General Information**

#### **Equipment**

#### **Manufacturers**

#### **Equipment**

#### **Manufacturer**

#### **Model or Type Number**

#### **Air Conditioner (Automotive)**

Motive Manufacturing Division  
3657 10th Avenue, North  
Birmingham, AL 35234  
Motivair

#### **Awning**

Zip-Dee Incorporated  
96 Crossen Avenue  
Elk Grove, IL 60007  
Model BB (specify length)

#### **Bath Vent**

Fantastic Vent  
4349 South Dort Hwy.  
Burton, MI 48529

#### **Burglar Alarm**

Kolin Industries, Inc.  
Box 357  
Bronxville, NY 10708  
Cat. No. 120

#### **CB Radio**

Ralph Vickers & Co.  
337 Cobb Parkway  
Marietta, GA 30062

#### **Central Air Conditioner**

Marine Development Corporation  
P.O. Box 8570  
Richmond, VA 23226  
Cruisair Model ACA 14U

#### **Chime**

W.C. Bradley Enterprises Inc.  
P.O. Box 12040  
Columbus, GA 31993

#### **Closed Circuit TV Camera**

Mashnick Associates  
1977 Scenic Highway, Suite 1D  
Snellville, GA 30278  
SANYO Model VDC-3800

#### **Closed Circuit TV Receiver**

Dotronix  
7947 Teak Way  
Rancho Cucamonga, CA 91730  
Model 7D-0959-CV-4-P-O-  
E-15, 7, 12M-50/60

#### **Duct Booster**

Acar Industries  
4563 Hamann Parkway  
Willoughby, OH 44094  
Model 951553

#### **Electric Heaters**

Fasco Industries, Inc.  
810 Gillespie Street  
Fayetteville, NC 28306  
Model 2450  
Livingroom, Galley & Bedroom

#### **TPI Corporation**

P.O. Box T-CRS  
Johnson City, TN 37601  
Model BCIA05  
Freeze Protection

#### **Electric Heat Tapes**

Easy Heat, Inc.  
31977 U.S. 20 East  
New Carlisle, IN 46552  
MT Cables  
W.C. Bradley Enterprises Inc.  
P.O. Box 12040  
5601 Beallwood Connector  
Columbus, GA 31993

#### **Fan, Exhaust**

Fantastic Vent Co.  
4349 South Dort Hwy  
Burton, MI 48529  
Model 1000R

#### **Fan, Portable**

Guest Corporation  
17 Culbro Drive  
West Hartford, CT 06110  
12-volt Oscillating



Fan, Roof

Kool-O-Matic  
1831 Terrace Road  
Niles MI 49120  
RU-12

Faucets

Bathroom

Grohe America Inc.  
900 Lively Blvd  
Wood Dale, IL 60191  
Model 33.031

Kitchen

Stanadyne Moen Division  
377 Woodland Avenue  
Elyria, OH 44036  
Model 7310A

Flourescent Lights

Thin-Light  
530 Constitution Avenue  
Camarilo, CA 93010  
Model 2-411-723

Food Center

Scovill Industries  
NuTone Division  
Madison and Red Bank Roads  
Cincinnati, OH 45277  
Power Unit, Model 251  
Food Processor Model 256

Fuel Filter – Water Separator

Racor Industries, Inc.  
1137 Barium Road  
Modesto, CA 95351  
Model 1000FG  
Detroit Diesel Engine  
Model 500 FG  
Kohler Power Generator

Furnace

Suburban Manufacturing Co.  
P.O. Box 399  
Dayton, OH 37321  
Dyna-Trail Model NT-16SW

Gas/Smoke Alarm

P.M.M.I., Inc.  
Drawer 10  
Old Ocean, TX 77463

Ice Maker

TECO Dist. Inc.  
255 Ottley Dr. NE  
P.O. Box 13005  
Atlanta, GA 30324

Instant Hot Water

Kitchenaid Division  
Whirlpool Corporation  
World Street  
Troy, OH 45374  
Konstant Hot  
KIH-160

LPG Alarm/Control

CAST Prod. Corp.  
29039 Lexington Park Drive  
P.O. Box 212  
Elkhart, IN 46515

LP Gas Grill

W.C. Bradley Enterprises, Inc.  
P.O. Box 12040  
Columbus, GA 31993  
Charbroil  
Model TG110

LPG Tank

Manchester Tank & Equipment Co.  
2738 Lithonia Industrial Blvd.  
Lithonia, GA 30058  
No. 6042

Leveling Jacks

HWH Corporation  
R.R. 1  
Moscow, IA 52760  
AP 3179

Microwave/Convection Oven

TECO Dist. Inc.  
255 Ottley Drive  
P.O. Box 13005  
Atlanta, GA 30324

Power Generator

ONAN  
1400 734-D Ave. NE  
Minneapolis, MN 55432

Radio (AM/FM Stereo Cassette)

Robert Bosch Sales  
2800 South 25th Ave.  
Broadview, IL 60153  
Equalizer-Model BEQ08E  
Compact Disc Player-  
Model CDP05  
Radio Cassette  
Model ASQR06



Range and Oven  
Modern Maid  
6075 Corners Parkway  
Norcross, GA 30092  
Model KGT-341

Reading Lights  
Wemac/Puritan Bennett Div.  
18475 Pacific St.  
Fountain Valley, CA 92708  
Model 2510

Refrigerator  
Dometic  
P.O. Box 490  
Elkhart, IN 46515  
RM 3801

Safeline Warning Device  
Omnifac Corporation  
1700 East Whipp Road  
Dayton, OH 45440  
Model 2

Shower Hose Kit  
Alsons Corporation  
42 Union Street  
Hillsdale, MI 49242  
500 PB59

Shower Valve  
Stanadyne Moen Division  
377 Woodland Avenue  
Elyria, OH 44036

Tank, Water  
Riblet Plastics  
11555 Packard Drive  
Middlebury, IN 46540

TV Antenna  
Tandy Distributor Products  
Swannanoa, NC 28788  
Model 5MS550

Toilet  
Microphor Inc.  
P.O. Box 1460  
Hillits, CA 95490

Washer/Dryer  
Norcold Inc.  
1501 Michigan St.  
Sidney, OH 43365

Water Heater  
Atwood Vacuum Machine  
P.O. Box 95780  
Chicago, IL 60694  
Model EHM-11

Water Pump  
ITT JABSCO  
1485 Daleway  
Costa Mesa, CA 92626  
Model 36950-1180

Water Purifier  
Pure Water Enterprises, Inc.  
343 Broad Street  
Lake Charles, LA 70607  
Model 7550



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**Prints Not Available  
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Printing.**





## Section XI

# Equipment Options

### Awnings

The awnings are standard equipment on your coach and designed for simplicity of operation and long-term use. To open the awning, refer to the figures below and proceed as follows:

#### Open Awning

1. Pull down on **Z** lock lever, as shown in **figure 11-1**, to permit awning to be unrolled.



**Figure 11-1.**

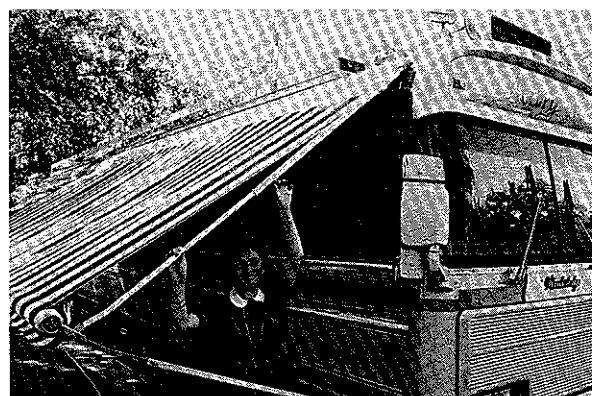
2. Completely unroll awning by first pulling the tab toward you with the hook and then grasping strap with hands as shown in **figure 11-2**. Fold or roll the strap so the Velcro strips meet and hold tab in place next to the roller. Now move beneath the awning and proceed with step 3.
3. Release the ratchet stud on the rafter arm. Swing the arm toward the case and engage the hook section of the claw in the rafter lock, **figure 11-3**. Lock the rafter arm by pressing down on main arm bar, making the fabric taut, until the ratchet stud engages.
4. Referring to **figure 11-4**, raise awning to desired height by releasing snap stud on main arm and pushing up and out on roller assembly. Lean, so that body weight — rather than arm strength — carries out this step.

### Caution

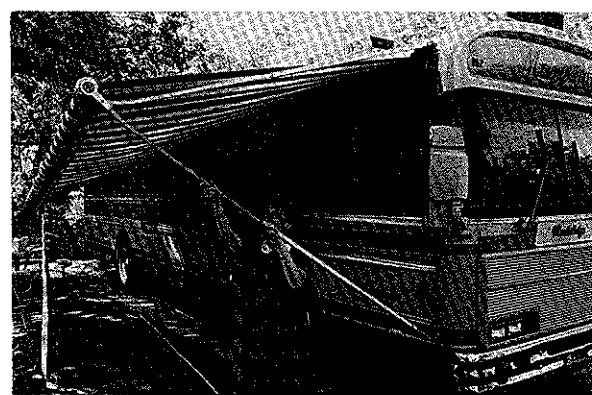
**Be sure to raise high enough to allow for clearance with the top of the door.**



**Figure 11-2.**



**Figure 11-3.**



**Figure 11-4.**

5. Repeat steps 3 and 4 at other end of awning.

#### Close Awning

1. Lower awning to bottom position by releasing snap studs and dropping roller assembly.
2. Release ratchet stud on rafter arms and lift the claws out of the rafter locks.



3. Place arm claw casting end against protruding screw. To lock assembly, push rafter tube toward coach body until ratchet stud engages. Repeat at other end of awning.
4. Roll awning against coach using the pull tab to guide.
5. Lock the awning in place for travel by pushing up the **Z** lock lever.

### Note

**The tab must be spiraled around the roller to prevent a loose roll and the bunching-up of fabric.**

6. Observe if the roll-up is even and in-line with clamps. If not, then unroll and give roller a slight push toward the direction required to line up the roller. If you wish to have the awning roll up more in either direction spiral the pull tab in that direction.

### Fabric Care

The fabric of your awning is made of acrylic fibers which cannot rot or mildew. Your awning can be rolled up wet if necessary, but be sure to open it to dry as soon as possible.

The acrylic fabric of your awning is a synthetic and cannot support mildew or other plant growth. However, mildew can find a home on any pollen, grain dust, plant spores, or other airborne plant material that can accumulate on the awning. If mildew forms on any of these elements, it can leave a stain which can be unsightly and difficult to remove, even though it will not weaken the fabric itself. To minimize the chance of a stain, keep your awnings as clean and dry as possible by hosing it down frequently between seasonal washings.

### Washing

On a monthly basis, loosen hardened dirt and dust with a dry, medium bristle brush, then thoroughly rinse both top and bottom with a hose. For more stubborn stains, use a mild solution of 1/2 cup bleach and 1/2 cup soap flakes diluted in one gallon of lukewarm water.

Wash both sides of the awning with the solution while scrubbing with a soft brush. Saturate the fabric and leave the solution on for 15-20 minutes. (Keep the fabric saturated by reapplying solution as needed.) Rinse **thoroughly**. Repeat if necessary until most of the stains disappear.

### Caution

**Never use a strong detergent (super spray) or stain remover on your awning. These can destroy the water repellency of the fabric.**

### Water Leaks

If leaking occurs after washing, it is usually the result of insufficient rinsing. If water drips through the needle holes in the stitching, you can use a commercial seam sealer available in canvas and trailer supply stores. You may also apply a paraffin wax to the top of the seams. However, as the awning **weathers**, these holes will normally seal themselves.

It is normal for slight leakage to occur through the fabric where water is allowed to accumulate or **pocket** on the fabric. See **Storm Precautions** for information on awning settings for proper water drainage. Sometimes soap or chemical residue, such as from active agents in insect fogs or sprays, can wet the fabric so that it appears unable to repel water. Rinse the fabric thoroughly and test for water repellency after it dries. If leakage continues, wash the fabric or contact the manufacturer for information on treating the fabric.

### Storm Precautions

Because there is no warranty for damage caused by acts of God, steps should be taken to prevent damage from occurring due to wind, rain or storm.

If you are leaving or retiring for the night, close the awning. This takes only a few seconds (less time than closing your windows) and gives you the best protection. If for some reason you can't close the awning, lower both ends of it as far as you can without removing the spring arms. This will create a sufficient slope for water run-off. If you are remaining with the awning, you may lower one end only sufficiently to divert water.

### Hardware and Mechanism Maintenance

Although your awning requires less maintenance than any other awning, a little care (about the same amount that you give to your coach) will keep the metal parts in top shape. The rafter arm assemblies, main arm tubes, and the awning case are bright-anodized aluminum; the castings are polished, high-strength aluminum alloys. To keep these parts new looking they should be cleaned once a year with a good quality chrome or aluminum polish.



The main arm bar and all fasteners and stress bearing shafts are stainless steel. These need only be cleaned occasionally to remove accumulated grime that might hinder their operation.

#### At the end of each season:

- Tighten any loose bolts or screws. (Replace missing parts only with factory authorized replacements.)
- Polish accessible hardware.
- Use a silicone lubricant only on the 1/2" round shafts that protrude from each end of the roller.
- Extend all telescoping arms as far as possible to wipe off accumulated sand and dirt that can clog and scratch the protective aluminum finish.

#### Ice-Maker

The ice-maker, figure 11-5, is designed to provide a continuous automatic supply of ice cubes. It will operate unattended providing that the water supply line is open and the ac power is applied to the unit. This may be supplied from shorepower, the power generator, or from the optional motor generator (Redi-Line).

#### Ice-Maker Operation

The power on-off switch is located on the front grillework. When the ice cube supply is full, the ice-making mechanism shuts off automatically. However, the refrigeration system continues to operate to prevent the prepared ice cubes from melting. When removing cubes, do not use a sharp instrument to separate the cubes that are frozen together or the interior may be damaged.

Note that the ice-maker may supply small cubes the first time that it is used. This is due to accumulated air in the water line and subsequent batches will be normal-sized.

If the machine is used only intermittently, empty the ice periodically (every week to 10 days) to ensure a fresh supply of cubes.

Do not clean the cabinet interior with solvent-type cleaners, abrasives, or other cleaners that might cause ice cubes to acquire a bad taste. The exterior should be cleaned with a furniture-type cleaner/polish. Clean condenser (behind grille) with a blower/vacuum at least 3 to 4 times each year, depending on usage.

## Caution

The ice-maker grille must be free from all obstructions. Any interference with free air flow to the grille will cause faulty operation.

To shut down the ice-maker, set power switch to off, and remove all cubes. Leave the door slightly ajar for ventilation to avoid mold or odors.

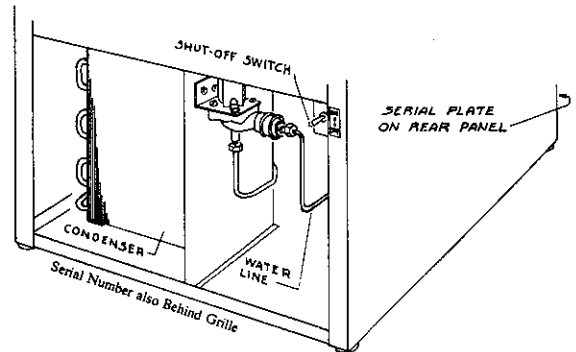


Figure 11-5 Ice-Maker Details.

#### Ice-Maker Maintenance

Other than periodic cleaning of grillework, condenser and interior, no other maintenance procedures are required. Remove the grille as follows: take out screw at top, put fingers in slots and lift up and out.

#### Winterizing

Follow procedure in Section V. To facilitate draining of water line, remove garden hose type fitting shown in figure 11-5

#### Kool-O-Matic Ventilation Fan

This 12 volt dc power ventilator has the capacity to move a large volume of air.

In many low humidity regions it will eliminate the need for operating air conditioning units.

#### Operation

Remove the magnetically attached fabric cover and open inlet dampers.

Be sure windows are open to provide proper air flow cooling and ventilation.

A heat-cool thermostat is located near the Kool-O-Matic fan. It also serves the area LPG furnace and chassis heater. In order to activate the fan, the selector switch (at the bottom) must be moved to **COOL** and the temperature lever set so the fan will operate. The fan will then start automatically whenever the temperature rises above the desired level.



## Auxiliary Air Compressor

This unit provides a quick source of air so there is no need to wait for pressure to build up after starting engine; you just drive right off! It can be used to operate air tools and accessories without starting the coach engine. It also serves as a standby unit in the rare case of a malfunction in the engine driven air compressor system.

The compressor and starting relay are located in an outside compartment while the 12 volt switch to operate the relay is in an **ACCESSORY** position on the dash.

### Operation

The compressor operates from 120 volt ac power so the coach must be plugged into shore power or the generator must be running. Press dash switch (in **ACCESSORY** position) ON.

For intermittent use, enough air will be supplied by the luggage compartment. If, however, it is to be used for an extended period, such as to power air tools, it is suggested that the luggage compartment door be opened.

### Maintenance

No lubrication is required for the life of the unit.

The air inlet filters should be inspected once or twice a year. The black plastic air inlet covers can be removed by turning counter-clockwise. This will reveal the felt filters. If there is evidence of dirt on filters and covers they may be washed in a solvent and air dried.

### Driving Lights

The optional driving lights are mounted behind the front bumper in a retracted position. When the switch (item 6, figure 2-5) is energized the driving lights are lowered into position (if the suspension is at ride height). The driving lights do not come on unless the high beam light switch is energized and the driving lights are in the down position. The driving lights go out when the lights are switched to low beam or when the driving lights switch is turned off. When the driving lights switch is turned off the driving lights retract back to the stored position.

### Skylight

A skylight with sliding covers, roof mounted, is offered in the first body section. To open the skylight for fresh air or light, slide covers to the left and right by applying pressure on the cover handles. To adjust cover for optimum sliding tension,

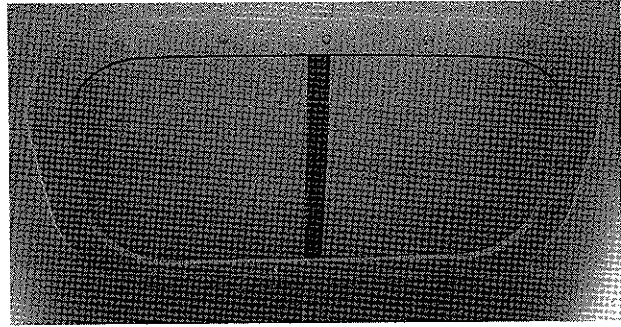


Figure 11-6. Skylight.

### To Adjust Covers For Optimum Sliding Tension:

1. Remove caps over the screws which hold the white skylight trim in place. Using a pointed object with a blunt tip (Figure 11-6) and pry them off.
2. With a phillips screw driver turn the screws two turns maximum clockwise for more tension and counterclockwise for less tension.

### Note

**Do not adjust the two screws on each end for slide tension purposes.**

Occasional glass adjustment may be required to maintain weatherproof integrity.

### To Test Glass Adjustment:

1. Place sheet of typing paper between glass and seal at rear pivot corner and close.
2. Pull on paper. If there is a slight drag no adjustment is needed.

### To Adjust For A Weather Proof Seal:

1. Open the skylight and push the two snap-link latches back toward handle. (See figure 11-7).
2. Lift snap-link arms off the hinge pins and tap the handle pivot pins out; this enables you to remove the handle from the glass so you can adjust the two tension studs under the handle. (See figure 11-7).
3. Adjust by turning tension studs clockwise and retry the paper test for weatherproofing.

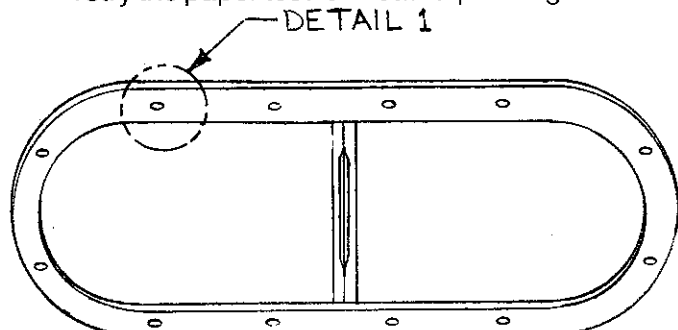


Figure 11-7. Glass Adjustment Detail



## Caution

Improperly installed glass can lift while vehicle is in motion.

### Inverter

A 1500 watt inverter is offered to provide auxiliary power to operate ice maker, front overhead television, one kitchen receptacle, and electric drapes while in transit from 12 volt source. The inverter is located in the right front compartment. See owner's manual for operating instructions.

### Microphor Toilet

Toilet includes a vitreous china toilet, ultra-low flow water use, and electric assisted flush. Available on 38 foot and 40 foot models. See microphor owner's manual for operation.

### Power Dump Valves

Air operated cylinders with a control panel located on left side of coach behind holding tank access door. Panel includes toggle switch for each tank and an air pressure gauge for the system. Manual operating tool is attached to control panel in case of low air pressure.

### Quick Start Aid

An ether injection system is used to aid starting the engine in cold weather. The switch for the system is located in the accessory position on upper right hand dash panel. To activate valve depress switch for three seconds to fill valve then release switch to inject charge into engine. Allow three seconds before starting engine.

## Caution

Use only for starting engine and inject prior to cranking.

### Intercom System

The intercom system used in your motorhome, figure 11-8, is a master-to-master system so that any station can originate calls to any other station. Just lift the handset, push in the button corresponding to the called station, and carry on your conversation. Intercom stations are located on the floor to the left of the driver; in the bathroom (except walk through bath); and on the rear bedroom wall.

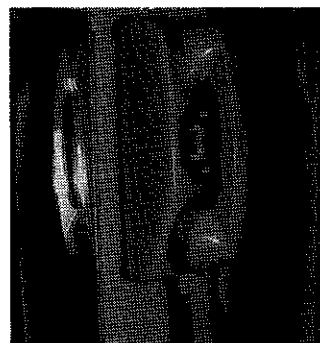


Figure 11-8. Intercom System

### Heated Holding Tanks

Provides UL listed heaters and thermostats for both holding tanks to prevent freezing of liquids down to 0°F.





## **LOWER RIGHT HAND DASH PANEL**

### **IGNITION SWITCH**

A four-position, standard-type key switch. In OFF position (center), ignition and accessory positions are disabled and the key can be inserted or removed. In ON position (right) the battery is connected to the engine-run ignition circuits and the key can be advanced to START to start the engine, providing that the transmission selector is in neutral N position, and toggle switch in engine compartment is in FRONT position.

### **WANDERSOUND STEREO**

See Video and Audio Section along with operator's manual for information.

