REVCON
ALL-TERRAIN MOTORCOACH

OWNERS MANUAL

REVCON
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REVCON, Motorcoach Inc., has prepared this Owner's Manual to ensure that you will derive the most efficient operation and trouble-free experience with your motor home. The manual includes descriptions and instructions on the use and operation of the various systems and appliances.

Should any questions arise regarding any function of your new motor home, please contact your REVCON dealer, or call REVCON Motorcoach (714) 955-5340.

REVCON maintains a continuous product improvement program and reserves the right to modify specifications without notice or obligation.

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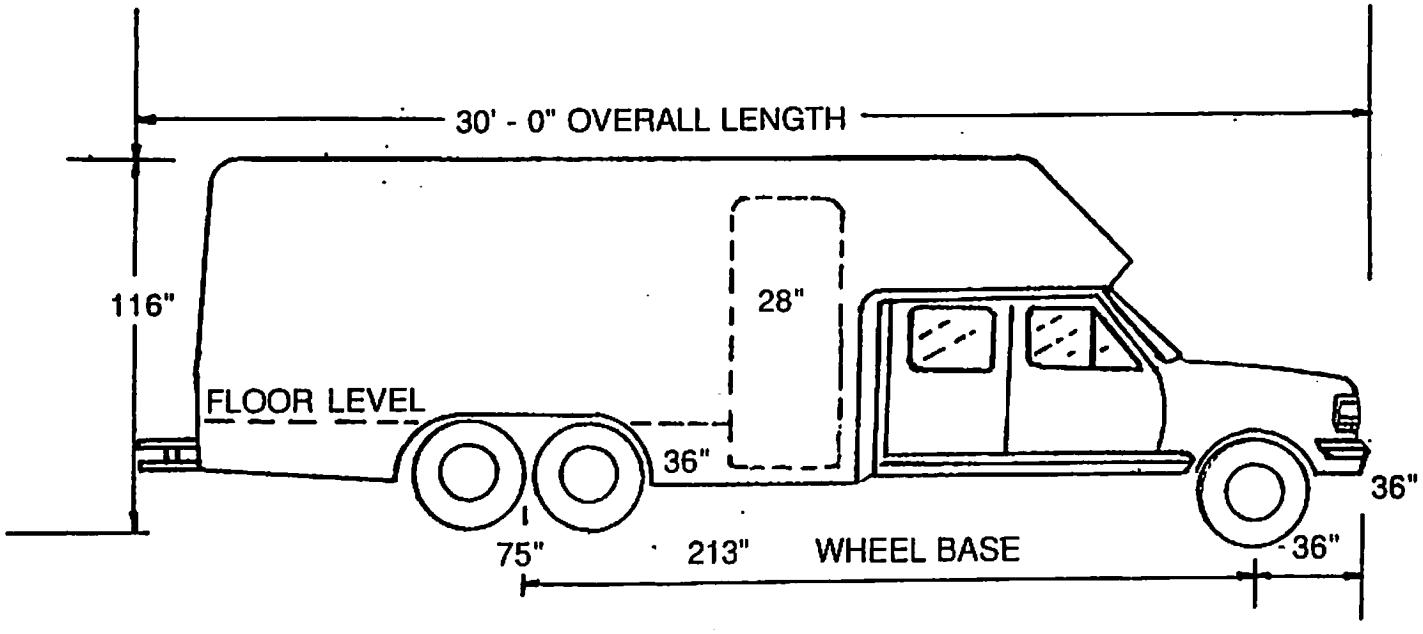
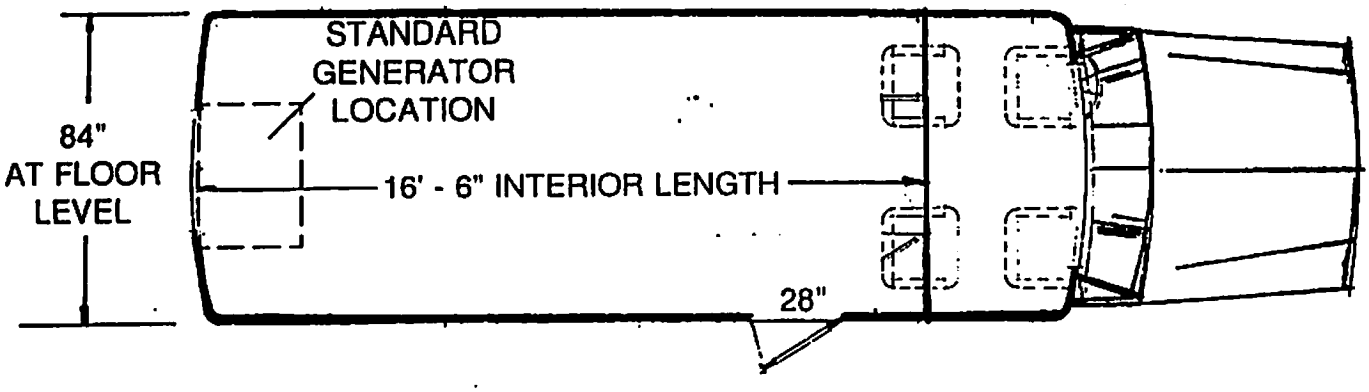
*See Ford Owner's Guide

SPECIFICATIONS





WIDTH OVERALL:	96"
HEIGHT OVERALL:	116"
INTERIOR WIDTH:	92"
INTERIOR HEIGHT:	77"
FLOOR HEIGHT:	36"
FIRST STEP HEIGHT:	12"
STEP RISER:	7"
G.V.W.R. (LBS.):	14,500

IMPORTANT INFORMATION ON VEHICLE LOADING

Overloading

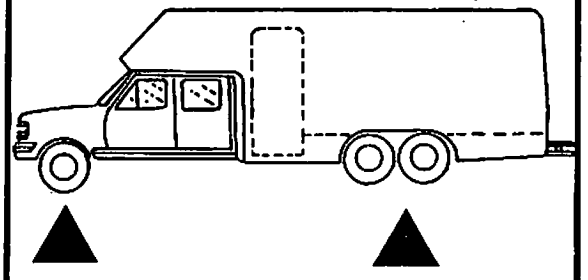
CAUTION: the components of your vehicle are designed to provide satisfactory service if the vehicle is not loaded in excess of either the Gross Vehicle Weight Rating (GVWR) or the maximum front and rear Gross Axle Weight Ratings (GAWR's). These ratings are listed on the Vehicle Identification Number (VIN). This plate is located on the side door post next to the driver's seat.

Overloading can result in loss of vehicle control and personal injury either by causing component failures or by affecting vehicle handling. It can also shorten the service life of your vehicle.

Your dealer can advise you of the proper load conditions for your vehicle. The use of selected heavier suspension components for added durability purposes does not increase any of the weight ratings printed on the VIN Plate and/or Vehicle Certification Label.

LOADED – MAXIMUM GVWR: 14,500 LBS.

FRONT GAWR: 5,000 LBS. REAR GAWR: 10,000 LBS.



*Front Curb	4000 lbs.	*Rear Curb	6700 lbs.
Front Cargo & Pass. Load	700 lbs.	Rear Cargo & Pass. Load	1300 lbs.
	4700 lbs.		8000 lbs.

TOTAL WEIGHT AT GROUND: 11,000 LBS.

*Curb weight equals the weight of the vehicle without driver, passenger or cargo, but including fuel and coolant.

EXAMPLE ONLY

Maximum Front and Rear Axle Weights

The weight of the cargo load must be properly distributed over both the front and rear axles. The VIN Plate and/or Certification Label shows the maximum weight that the front axle (front GAWR) can carry. It also shows the maximum weight that the rear axle can carry. The GVWR represents the maximum permissible loaded weight of the vehicle and takes into account the engine, transmission, frame, springs, brake, axle and tire capabilities. Actual loads at the front and the rear axles can only be determined by weighing the vehicle. This can be done at highway weigh stations or other such commercial places. Consult your dealer for assistance. The cargo load should be distributed on both sides of the centerline as equally as possible.

***IMPORTANT NOTE:** The weight to the axles is distributed evenly over the front axle and rear axle of the tandem. The gross weight rating of the rear is the total capacity of all four rear wheels and the tandem assembly complete.

Effect on Warranty

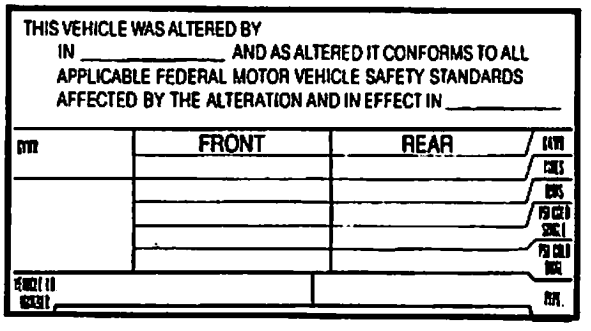
Your New Vehicle Warranty does not apply to any part of your vehicle "which has been subject to misuse." Any part which fails because of overloading has been subject to misuse.

(VIN) Vehicle Identification Number Plate And/Or Certification Label

Your VIN Plate and the Certification Label shows the GVWR and the front and rear GAWR's for your vehicle.

Gross Vehicle Weight (GVW) is the weight of the originally equipped vehicle and all items added to it after it has left the factory. This would include bodies, winches, booms, etc.; the driver and all occupants; and the load the vehicle is carrying. The GVW must not exceed the GVWR. Also, the front and rear gross axle weights must not exceed the front and rear GAWR's.

CAUTION: Luggage or other cargo should be secured in place. This will help keep such things from being thrown about and injuring people in the vehicle in the event an accident should occur.


THIS VEHICLE WAS ALTERED BY
IN _____ AND AS ALTERED IT CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS AFFECTED BY THE ALTERATION AND IN EFFECT IN _____

	FRONT	REAR

Tires

The tires on your vehicle must be of the proper size and properly inflated for the load which you are carrying.

The Vehicle Certification Label shows the tire size and recommended inflation pressures.

BEFORE DRIVING YOUR REVCON

DRIVER DAILY CHECKLIST

Before Entering Vehicle

Be sure you know your vehicle and its equipment and how to use it safely.

1. See that windows, mirrors, and lights are clean and unobstructed.
2. Check tires for proper pressure, and inspect for damage.
3. Check that all outside lights work.
4. Look for fluid leaks.
5. Be sure everything is properly stowed.
6. Check that area to rear is clear if about to back up.

Before Driving Off

1. Lock all doors.
2. Check that all windows and vents are in suitable position for travel.
   See "Engine Exhaust Gas Caution (Carbon Monoxide) on page 4
3. Position seat.
4. Check adjustment of inside and outside mirrors.
5. Check that warning bulbs light when key is turned to "Start,"
6. Check all gauges (including fuel, if so equipped).
7. Fasten seat belts.
8. With engine running, check that warning lights are now out.
9. Release parking brake.

See body or motor home manufacturer's information for additional items that may require checking.

OUTSIDE REARVIEW MIRROR

Adjust the outside mirror so you can just see the side of your vehicle in the side of the mirror closest to the vehicle. This helps you determine your relation to objects seen in the mirror.

CONVEX MIRROR

Your vehicle may have an optional convex outside rear view mirror. (A convex mirror has a curved surface.) Adjust the convex mirror so you can just see the side of your vehicle in the portion of the mirror closest to the vehicle. This type of mirror is designed to give a much wider view to the rear, and especially of the lane next to your vehicle. However, cars and other objects seen in a convex mirror will look smaller and farther away than those seen in a flat mirror. Therefore, use care when judging the size or distance of a car or object seen in this convex mirror. Use your inside mirror to determine the size and distance of objects seen in the convex mirror.

TRAILER TOWING

Since this vehicle is designed and intended to be used mainly as a load carrying vehicle, towing a trailer will affect handling, durability and economy. Your safety and satisfaction depend upon proper use of correct equipment. Also, you should avoid overloads and other abusive use.

The maximum loaded trailer weight you can pull with your vehicle is 6,500 lbs (Class 1 hitch.)

CAUTION: Do not try to tow a trailer over 6,500 pounds gross trailer weight no matter what trailer towing equipment is installed. This could seriously affect your vehicle's performance, durability, or handling, and could result in personal injury.

TIRES

When towing trailers on dead-weight hitches, inflate tires to the pressures shown on the Certificate Label affixed to this vehicle.

It should be remembered that when a trailer is connected, the trailer tongue weight is part of the load being carried by the vehicle and, therefore, is included in the GVW of the vehicle.

TRAILER TOWING CAUTIONS

Brakes – To avoid towing and/or driving problems due to poor braking action, observe these precautions:

Trailer brakes of adequate size are required on trailers over 1000 pounds (450 kilograms) loaded weight.

If you install trailer brakes on your REVCON, follow the installation and balance instructions of the trailer brake manufacturer.

Do not tap into the vehicle brake system if the trailer brake system uses more than 0.02 cubic inch (0.3 centimeters) of fluid from the vehicle's master cylinder. In this case, the vehicle's brake fluid capacity will not be enough to operate both the vehicle and the trailer brakes under all kinds of use.

All brake fluid parts must be able to stand

TRAILER TOWING (CONTINUED)

3000 psi (20 685 kPa). The brake fluid tap must be made to the master cylinder port supplying fluid to the rear brakes. Copper tubing is subject to fatigue failure and must not be used.

Hitches – To avoid towing and/or driving problems due to sway caused by such things as crosswinds, big trucks passing or road toughness, or due to separation of the trailer, observe these precautions:

Excessive tongue weight on the trailer hitch on changes the weight distribution of the REVCON and the trailer combination as a whole as the REVCON is a rearwheel drive vehicle. This can cause control problems. To avoid these problems, observe this recommendation:

Don't tow trailers in excess of 6,500 pounds.

ENGINE EXHAUST GAS CAUTION (CARBON MONOXIDE)

Avoid breathing exhaust gas because it contains carbon monoxide, which by itself has no color or odor. It is a dangerous gas. Carbon monoxide can cause unconsciousness and can be lethal.

If at any time you think that exhaust fumes are entering the vehicle, have the cause determined and corrected as soon as possible. If you must drive under these conditions, drive only with ALL windows fully OPEN.

The best way to protect against carbon monoxide entry into the vehicle body is to keep the engine exhaust system, vehicle body, and body ventilation system properly maintained. We recommend that the exhaust system and body be inspected by a competent mechanic:

Each time the vehicle is raised for oil change.

Whenever a change is noticed in the sound of the exhaust system.

Whenever the exhaust system, underbody, or rear of the vehicle is damaged.

WARNING: Do not run the engine in confined areas such as garages any more than needed to move the vehicle in or out.

Special care should be taken to prevent the chance of carbon monoxide exposure if a change is made to the vehicle or other equipment is added for recreational or other usage. Also, some recreational vehicle appliances, such as lights, refrigerators, stoves, or heaters, may also give off carbon monoxide. These appliances should be used only if there is enough ventilation.

SITTING IN A PARKED VEHICLE WITH THE ENGINE RUNNING FOR A LONG TIME IS NOT RECOMMENDED.

JACKING INSTRUCTIONS

Park on level surface and set parking brake firmly.

Set automatic transmission in "Park."

Turn on hazard warning flasher.

Remove any wheel opening cover, if equipped.

Loosen, but do not remove, wheel nuts by rotating wrench counterclockwise.

NOTE: Capped chrome nuts can be damaged if wheel nut wrench is not fully seated on wheel nuts.

Locate jack beneath vehicle (base must sit flat).

Block front and back of wheel diagonally opposite jack position.

Pump jack up and down so tire just clears surface. (Always operate jack with a slow smooth motion.)

Replace wheel and slightly tighten wheel nuts. Wheel must be seated on hub.

Turn hydraulic release on jack to lower vehicle, then fully tighten wheel nuts in a criss-cross sequence.

Wheel nut torque should be set to specifications 140 FT-LB

TOWING YOUR REVCON

If the vehicle is to be towed by a wrecker, use only equipment designed for this purpose following the instructions of the wrecker manufacturer. A safety chain system must be used for all towing.

APPEARANCE CARE

CAUTION: Many cleaners may be poisonous or flammable, and their improper use may cause personal injury or damage the inside of the vehicle. Therefore, when cleaning the inside of the vehicle, do not use volatile cleaning solvents such as: acetone, lacquer thinners, enamel reducers, nail polish removers; or such cleaning materials as laundry soaps, bleaches or reducing agents (except as noted in the manufacturers cleaning instruction on stain removal.) Never use carbon tetrachloride, gasoline or naphtha for any cleaning purpose.

Because fumes are more dangerous in a small, enclosed space, be sure the vehicle is well ventilated while using any cleaning agent. Follow the manufacturer's advice in using such products.

CARE AND CLEANING OF INTERIOR TRIM

With the use of modern trim materials, it is VERY IMPORTANT that proper cleaning techniques and cleaners be used. Failure to do this on the first cleaning may result in water spots, spot rings, or setting of stains or soilage, all of which make it more difficult to remove in a second cleaning. If in doubt about cleaning interior items, ask your REVCON dealer's advice.

EXTERIOR

Frequent washing and a thorough cleaning after exposure are recommended to prevent damage to vehicle finish from calcium chloride and other salts, road tar, insects, tree sap, factory chemical and other foreign matter. Use either cold or lukewarm water. Never wash vehicle in the direct rays of the sun. Be very careful if you climb on the roof to stand on rivet "lines," where the reinforcement structure is attached to the outside skin, otherwise you may dent or damage the "stressed skin" of the vehicle.

UNDERBODY MAINTENANCE

Corrosive materials used for ice and snow removal and dust control can collect on the underbody. If these materials are not removed, accelerated corrosion (rust) can occur on underbody parts such as fuel lines, frame, floor pan, and exhaust system.

At least every spring, flush these materials from the underbody with plain water. Take care to clean well any areas where mud and other debris can collect. Sediment packed in closed areas of the frame should be loosened before being flushed.

If desired, your dealer can perform this service for you. Your dealer can also recommend additional underbody rust preventive materials which will help protect your vehicle from the corrosion.

SERVICE & MAINTENANCE

CAUTION: As with any machine, care should be taken when making any check, doing any maintenance, or making any repair to avoid being injured. Improper or incomplete service could also lead to the vehicle itself not working properly which may result in personal injury, or damage to the vehicle or its equipment. If you have any question about carrying out some service, have the service done by a skilled mechanic.

MAINTENANCE SCHEDULE

For owner convenience, a complete maintenance schedule will be found on the chart in the Ford owners guide. It also briefly describes the safety, emission control, lubrication, and general service that your vehicle requires.

BODY SPECIFICATIONS

Body Shell
Aircraft aluminum structure. (.050 6061 T3)

Frame & Stringers
Heat-treated, stretch-formed aluminum (.075" 6063)

Insulation
11/2" 'high density, temperature resistant, made of fiberglass, impervious to flame, vermin or settling.

Weather Proofing
All joints are sealed with non-hardening waterproof caulking.

Floor
3/4" exterior 5 ply fir, grade A-C. Sealed and waterproofed on the bottom and edges.

Exterior Skin
Heat-treated, high-tinsel strength, load bearing aircraft aluminum.

Wheel Wells
Rear wheel wells are 12 ga steel with formed panels.

Exterior Finish
Dupont acrylic enamel paint.

SUSPENSION

TOLAR SUSPENSION WITH RIDE-RITE HELPER SPRINGS OPERATING INSTRUCTIONS

GENERAL INFORMATION

Ride-Rite helper springs are heavy duty, quality air springs designed to become an additional weight supporting element of your vehicle's suspension system when it is loaded. Like any product, the life and performance you get from your Ride-Rite springs depends on proper use and operation. These instructions are designed to help you get the maximum benefits from your Ride-Rite kit.

BASIC OPERATION

As a vehicle is loaded, the steel suspension springs are pushed own. Your vehicle's suspension system is designed to give optimum performance and handling at one load. Often, with an RV or truck you lose some of the performance when the unit is too heavily loaded. As the springs deflect, the ride may become "mushy" and you may encounter sway and handling problems. Ride-Rite air springs become an active part of the suspension as load is added to the vehicle. The more air pressure in your Ride-Rite air spring bellows, the more load they support. Ride-Rite air springs utilize this principle to keep your vehicle level and aid in reducing the sway and handling problems found in a heavily loaded vehicle.

(NEVER EXCEED 100 P.S.I. IN THE RIDE-RITE AIR SPRING BELLOWS OR LOAD YOUR VEHICLE OVER ITS MAXIMUM RATED CAPACITY)

SETTING UP YOUR RIDE-RITE AIR SPRINGS SYSTEM

When you first obtain your Ride-Rite air springs, or a vehicle equipped with Ride-Rite air springs, a few minutes establishing some basic operating guides will be worthwhile. The following provides some guidelines for use of the Ride-Rite kit:

1. Check the torque on bracket bolts. Use a torque wrench and torque to specified limits. Guidelines for torque are as follows:

For studs and taped holes on bellows	10-15 ft lbs
For nuts on axle bracket straps	10-15 ft lbs
For nuts used on 3/8" ribbed neck bolts used for bracket attachment to frames	28-32 ft lbs
For nuts used on "U" bolts	15-20 ft lbs

As a general rule hex nuts and bolts in the Ride-Rite kit are backed up by helical type lock washers. In order to adequately secure these fasteners it is only necessary to tighten until the washers flatten out. Over tightening will not improve the "holding power" and may, in fact, damage the fastener.

2. The tubing nuts (where the tubing attaches to the elbow or valve) should be finger tight plus 3-1/2 turns.
3. Take your unloaded vehicle to your local service station and park it on a level spot near the air pump. Check the level of your RV or truck visually. If it is not level, either from front to back or from side to side, level it up by inflating your Ride-Rite air springs. (If your vehicle is equipped with a cab control unit refer to the directions for that device.) There is one valve for each Ride-Rite air spring bellows. To level from front to back, add air pressure to both bellows equally. For side to side, add air pressure to the bellows on the side of the vehicle that is low. When adding air pressure to the units, remember that they have a much smaller volume of air than a tire so they will inflate much quicker. Add air pressure in short bursts until the vehicle is level. **(NEVER EXCEED 100 P.S.I. IN THE RIDE-RITE AIR SPRING BELLOWS)**
4. Inflate the units until you achieve a measurement as identified in the above figures. Do not exceed 100 p.s.i. if the proper clearance has not been obtained by 80 p.s.i. on class 'A' motor homes and 50 p.s.i, on pickups and vans, it is possible that there is an obstruction in the system. It is also possible that your vehicle may be grossly overloaded. Consult the factory.
5. Select a point on the vehicle as a reference. The bumper or a fender will make good reference points. Measure the distance from your vehicle reference point to the ground. Record this measurement and keep it handy, this will become your guide for future leveling of your vehicle. Read the pressure in your Ride-Rite air spring bellows. Record this figure also and keep it handy for future use.
6. Now you are ready to travel. Load up your vehicle with your gear and return to your air supply pump. Add air pressure to the air springs until the measurement from the ground to reference point is the same. Care should be taken not to exceed the gross vehicle weight (GVW) as indicated on the vehicle identification label. The vehicle identification label can be found on the door panel of your light truck. If you have an RV the label can be found on the chassis or in the owners manual. The maximum load carrying capacity of your tires is molded on the sidewall of the tire. **NEVER OVERLOAD YOUR VEHICLE OR TIRES.** Operating a vehicle that exceeds this weight figure is dangerous and may cause damage to the vehicle, the tires, or the Ride-Rite helper springs.

IMPORTANT SAFETY TIPS FOR RIDE-RITE SPRINGS BY FIRESTONE

As with tires, Ride-Rite helper springs are a pneumatic device that supports a portion of your vehicles's load. Failure may occur as a result of punctures, impact damage, improper inflation, vandalism, misinstallation or improper usage. Ride-Rite air spring failure may create a risk of property damage or personal injury. To reduce the risk of failure we strongly recommend the following:

1. Check the bellows frequently for rubbing on vehicle components. Inspect for heat checking due to exhaust pipe exposure, scrapes or cuts due to use and the proper torque on bolts and nuts.
2. Never overload your vehicle. The manufacturer's GVW (Gross Vehicle Weight) is stated on the specification plate located on the chassis. You should weigh your vehicle fully loaded and level to determine if you are exceeding the GVW.
3. Check the inflation of your air springs periodically (no more than once a week). The air spring bellows will permeate (lose pressure through the rubber wall) at the approximate rate of 3 to 4 p.s.i. per week when initially inflated at 50 p.s.i. This is considered normal for Ride-Rite helper springs. Leakage of pressure at a higher rate is a sign of a minor leak in the pneumatic system. Each time you check the pressure you will also lose 3 to 5 p.s.i. in the checking process.
4. Never inflate the air springs above 100 p.s.i.
5. **NEVER ATTEMPT TO REMOVE ANY COMPONENT OF THE RIDE-RITE AIR SPRING ASSEMBLY WITH THE BELLOWS INFLATED.**
6. Operate your vehicle at reduced speed if a Ride-Rite air spring has failed. High speed or rough road operation will result in severe bottoming of the bellows which may damage other vehicle components.
7. Never operate your vehicle with one Ride-Rite air spring inflated when the other is deflated. This could result in a dangerous tipping of the vehicle.
8. Never attempt to drive the vehicle in an unlevel condition. Failure to re-level your vehicle could result in a severe tipping of the vehicle and possible damage or injury.
9. If other problems exist with your Ride-Rite helper springs kit or you are unable to identify your problem contact:

Firestone Industrial Products Co.
Ride-Rite Division
1700 Firestone Blvd.
Noblesville, IN 46060
(317) 773-0650

MAINTENANCE

The following will help you obtain the maximum potential life from your Ride-Rite helper springs:

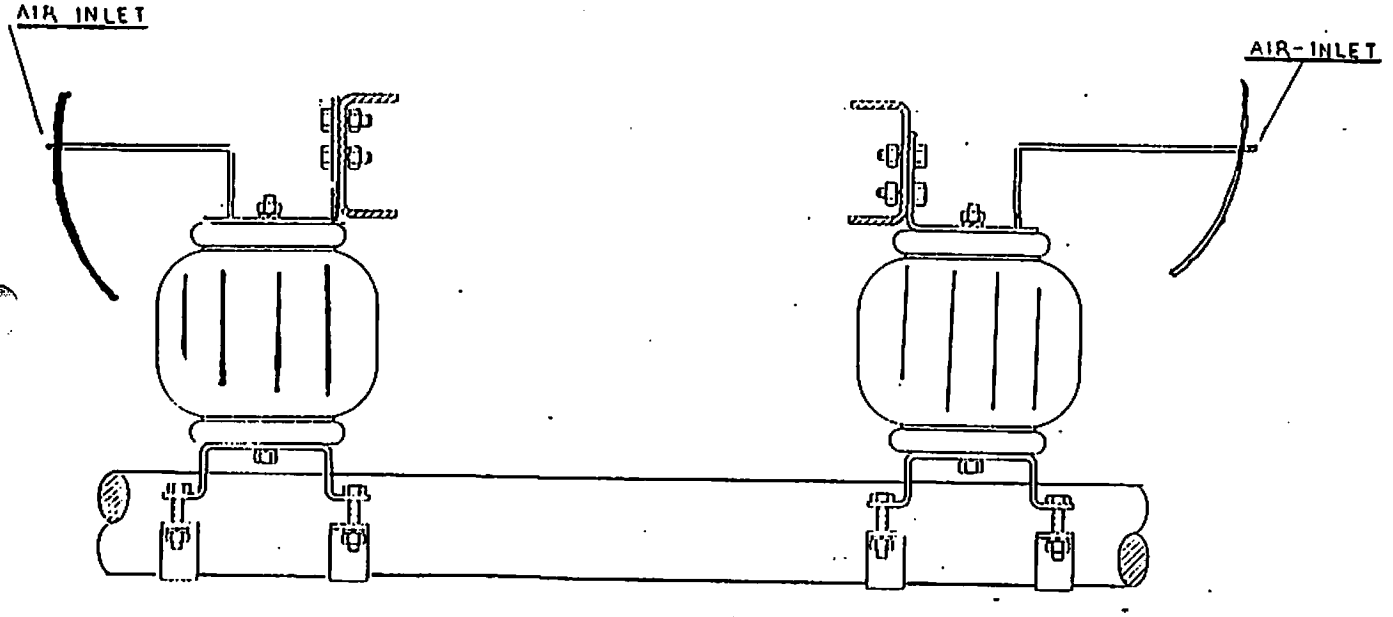
1. Since the bellows will experience some permeation of air, you should check the air pressure at periodic intervals. We recommend the following times:

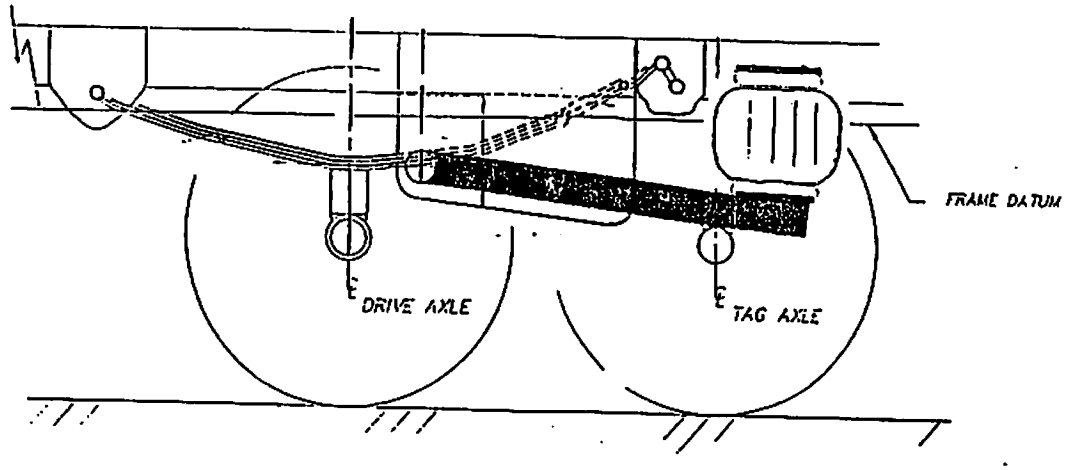
   a. Whenever the vehicle has not been in use for two weeks.
   b. At one week intervals during the continuous operation of the vehicle.
   c. Before leaving the campsite.

   Be sure that the inflation valves have the cores secure and also that the valve caps are replaced after inflating or deflating the system.

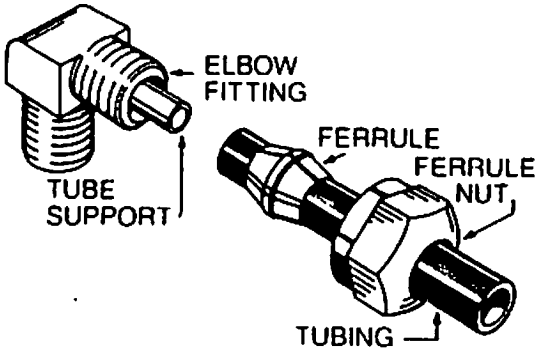
2. You should routinely check the bracketry of your Ride-Rite air spring kit for any loose bolts or damaged brackets. A check for clearance on the air line, (especially any contact with the exhaust system) is also in order. We suggest that this be checked during other routine maintenance of your vehicle such as lubrication and/or oil change.

3. If you find any accumulation of sand, gravel, etc., on the bellows or brackets you should remove it. A quick spray with your garden hose is adequate.

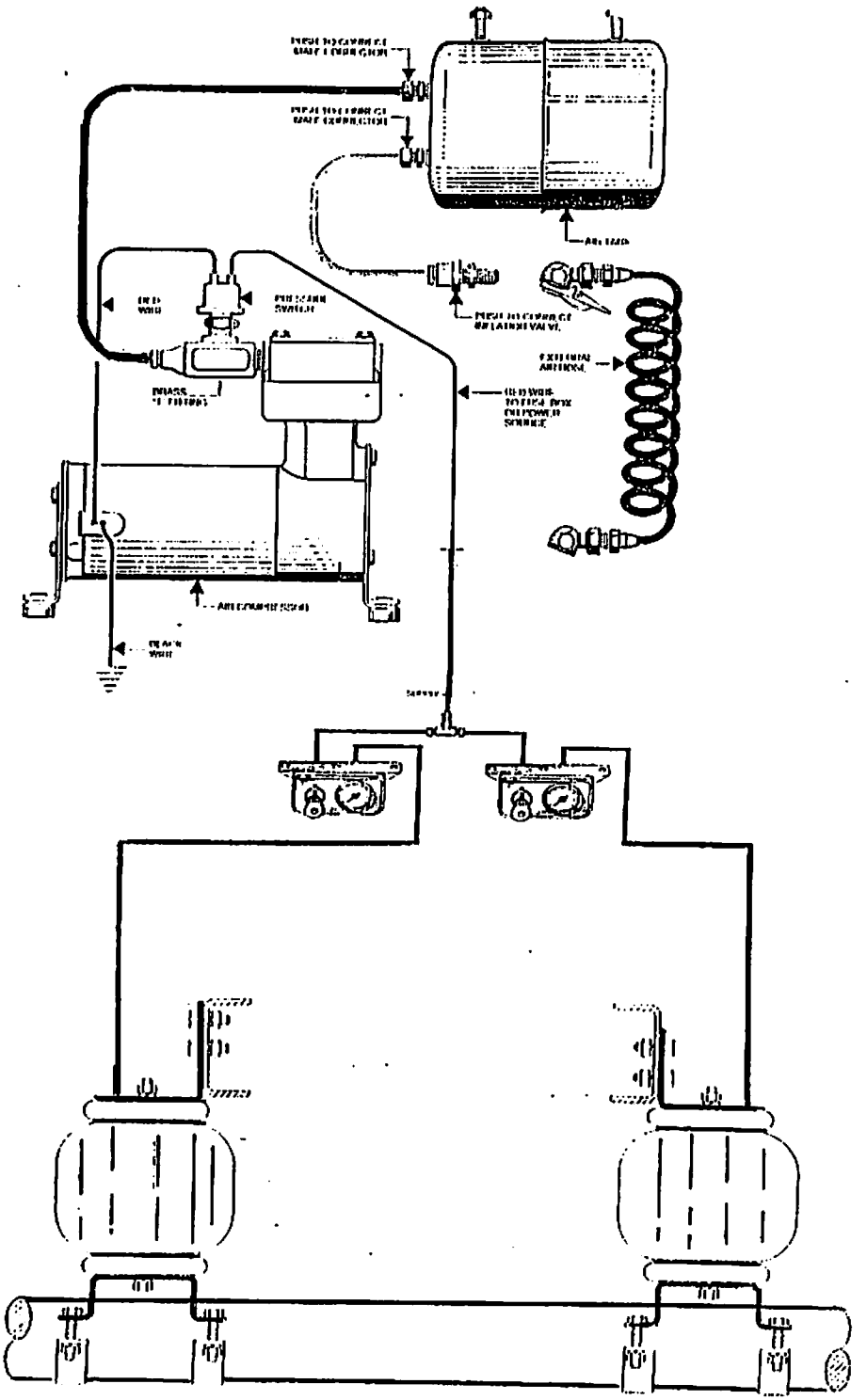




TROUBLE SHOOTING

VEHICLE IS NOT LEVEL	Check proper inflation of bellows each side
BELLOWS WILL NOT INFLATE	a. Check for dirt in the valve core. b. .Check to see if tubing has melted together near the exhaust. c. Check for air leaks in tubing and fittings (can be checked using a soap and water solution)
BELLOWS WILL NOT HOLD AIR	Normal air pressure loss is 3-5 p.s.i. per week when bellows is initially inflated to 50 p.s.i.
HOW DO YOU DETERMINE YOU HAVE A LEAK?	If leak is determined to be more than this the system should be inspected.
WHAT TO DO IF YOU HAVE AN AIR LEAK	If your air loss is more than 5 p.s.i. per week. Inflate the bellows to at least 30 p.s.i. start from one end of the airline and inspect for leaks. A solution of soap and water can be applied, watch for growing bubbles.
WHERE ARE THE MOST COMMON LEAKS AND HOW DO I FIX THEM?  	a. Pipe fittings where elbows thread into the bellows. Remove the elbow and clean the threaded portion and apply fresh thread sealant. Reinstall the elbow being careful not to back the elbow out once it is installed. b. The tubing connection to the elbow. Tighten the sleeve nut 1/2 turn. If this doesn't work, remove the nut and tubing, cut the tubing and install a new ferrule. Reinstall finger tight plus 3-1/2 turns. c. The tubing connection on the valve is handled the same as item 'B' above. d. Inspect the valve core in the inflation valve to see if its obstructed or loose. The procedure for cleaning this valve is the same as a tire valve.
WHAT IF I CAN'T FIND A LEAK AT THE CONNECTIONS?	a. Check tubing to see if it is rubbing on something or it is too close to the exhaust. b. As a last report, check the bellows, remove the bellows from your vehicle. Put 20 p.s.i. (not more) in the bellows. Submerge the bellows in water and look for bubbles. A leak in the bellows does not automatically mean that it was defective. Look for obvious rub marks or punctures. If you see them, do not replace the bellows without correcting the problem.
WHAT IF YOU STILL CAN'T FIND A LEAK?	Some leaks are so small that they defy detection. In that case Firestone recommends that the entire airline system be replaced. Firestone has an "Airline Service Kit" (part no. W21-760-2012) that contains all necessary hardware. A careful installation of new airlines and fittings should solve your problems.

AIR COMPRESSOR ACCESSORY KIT



HYDRO-BOOST SYSTEM

ALL VACUUM UNITS
BLEEDING PROCEDURES

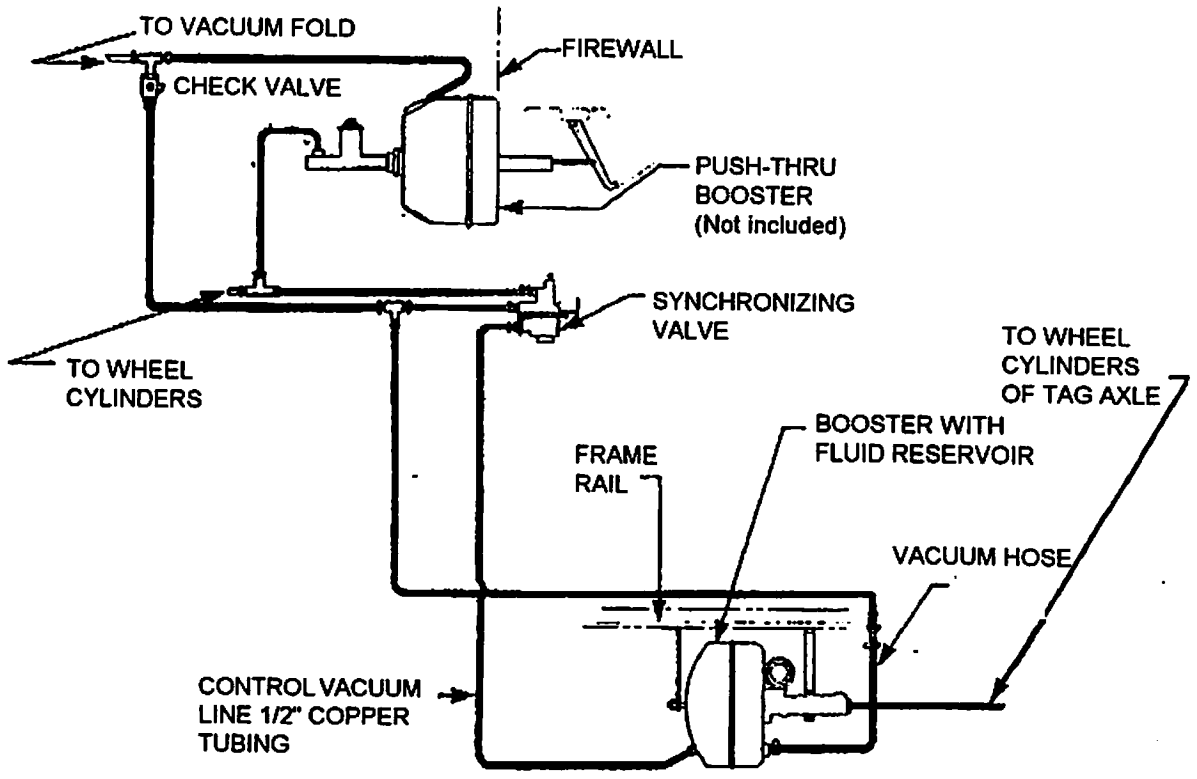
It is recommended that all brake bleeding be performed with a pressure bleeder. If one is not available, use the following procedure.

FRAME MOUNTED: 2 LINE UNITS. DO NOT RUN ENGINE WHILE PERFORMING BLEEDING OPERATIONS.

1. Fill the reservoir of the new, rebuilt, or flushed out master cylinder with new, clean, heavy duty brake fluid.
2. During bleeding check frequently to make certain that fluid in master clyinder reservoir maintains at least 1/2 inch of fluid. Failure to do so may require starting all over.
3. Pre-bleed master clyinder by loosening tube nut and slowly pump master clyinder until fluid runs clear. Re- tighten nut.
4. Bleed power unit as required. Pump pedal slowly to avoid creating air bubbles in fluid. Bleeder screws should be opened on the pressure stroke of the master cylinder and closed on the return stroke.
5. Continue around vehicle wheels until all bleeder screws run clear.
6. Refill master cylinder reservoir and slowly pump pedal with no bleeders open. This allows master cylinder to evacuate any air bubbles that may remain in cylinder bore. Air will escape through compensating port in the bottom of the reservoir.
7. Start engine and pump pedal two or three times. Then allow time for fluid to return to the reservoir. If pedal is firm but has excessive stroke. Adjust brakes at all wheels. If pedal is "spongy" it still has air in the hydraulic system. See step 8.
8. Some vehicles may require "serge" bleeding. To accomplish this have engine running at idle make a firm pedal application. Open and close wheel cylinder bleeder screws very quickly. Do not let the pedal go clear to the floor. Repeat this step at each wheel. Remember to check brake fluid level in reservoir.
9. Proceed with road test.

FRAME MOUNTED: 3 LINE UNITS. Three line units, (with third line connected to master cylinder reservoir) can not be properly bled without a pressure bleeder. Set bleeder pressure at 50 to 60 p.s.i. be sure reservoir on master cylinder is filled above third line connection port. Do not run engine while bleeding.

FIREWALL MOUNTED (push through boosters) all makes. The bleeding procedure is essentially the same except that the engine should be running at the very beginning and throughout the entire process. If a pressure bleeder is not used.



SUSPENSION

TOLAR WARRANTY

WARRANTY: LIMITATION OF LIABILITY

TOLAR warrants the products and materials manufactured by it when properly assembled and installed to be free from defects in materials and workmanship, when under normal use and service, for a period of one (1) year. If any products or materials manufactured by TOLAR MANUFACTURING COMPANY, INC. are found to be defective upon inspection after shipment at sender's cost to TOLAR MFG. TOLAR will repair or replace, at its sole option, the defective products or materials, subject to the following conditions:

(a) TOLAR is notified in writing within the applicable warranty period of any product or material defect;
(b) The product or material is returned to TOLAR at sender's expense;
(c) The product or material has not been misused, abused, or improperly maintained by the user;
(d) The product or material has not been repaired or altered except by written authorization of TOLAR; and
(e) The defect is not attributable to normal wear and tear.

The limited warranty herein described constitutes the entire obligation of TOLAR, and the maximum liability of TOLAR is limited to the purchase price of each defective product or material. NO OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, ARE GIVEN AND ALL SUCH OTHER WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED. In no event shall TOLAR be liable for any consequential, indirect, incidental or special damages of any nature whatsoever arising from the sale or use of its products or materials. TOLAR shall have no further liability or obligation whatsoever to any distributor or any other person or entity with respect to TOLAR products or materials other than the obligations expressly set forth above.

COVERAGE PERIODS AND PROVISION – 12 MONTHS

LABOR CONSIDERATION

If TOLAR, in its sole discretion, determines that an authorized TOLAR distributor, or repair facility shall perform the warranty work, TOLAR will pay a specified labor amount for repair or replacement as determined and approved by TOLAR Service Department before any such work has started, and in accordance with the coverage periods.

STARTING DATE

The STARTING DATE shall be determined as that date shown as the manufactured date on the Vehicle Certification Label for new vehicles, and on used vehicles, that date which can be verified to TOLAR'S satisfaction as the product installation date, or if not verified, then the date on which the product was sold by TOLAR to the original purchaser.

ADDITIONAL RESPONSIBILITIES TOLAR MANUFACTURING CO., INC.

TOLAR will provide, or make available from its Factory, such information or instruction as is needed to install, service, operate, and maintain its products.
TOLAR will provide the replacement parts or materials, freight prepaid, and reimburse distributor for freight charges on returned components which are warranted.
TOLAR will make every attempt to respond to warranty claims within sixty (60) days after their receipt.

PRODUCT INSTALLER RESPONSIBILITIES

Installer is responsible for installing the product in accordance with the TOLAR Specifications and Installation Instructions. Installer is responsible for providing proper vehicle components and attachments as well as required or necessary clearance for suspension components, axles, wheels, tires, and other vehicle components to insure a safe and sound installation and operation.
Installer is responsible for obtaining certification and approval, for use with TOLAR products, of all other components such as axles, brakes, wheels, tires, and etc.
Installer is responsible for advising the owner of proper use, service and maintenance required by the product.
Installer is responsible for giving at lease one copy of this Warranty to the product owner for each purchase order from the owner.
Installer is responsible for keeping such records as are necessary to locate the product and determine its installation date and vehicle mileage at time of installation.
Installer is responsible for proper product certification and compliance with all Federal and State laws and Federal Motor Vehicle Safety Standards and Regulation.

PRODUCT OWNER RESPONSIBILITIES

Owner is solely responsible for pre-operation inspection, daily inspections, periodic inspections, maintenance, and use of the products in accordance with governmental requirements and as specified in the particular TOLAR instructions available for the product and in the TOLAR Service Manuals, except as provided in this Warranty, and the maintenance of other vehicle components.

Owner is responsible for communication expenses, meals, lodging, and incidental costs incurred by Owner or employees of Owner as a result of warrantable failure.

Owner is responsible for "Down Time" expenses, cargo damage, and all business costs and losses resulting from a warrantable failure.

Owner must give notice of a warranted failure and deliver the product to a TOLAR Authorized Distributor or to the TOLAR Service Department in Anaheim, California.

ADDITIONAL WARRANTY LIMITATION

TOLAR is not responsible for products which have failed as a result of owner or operator abuse or neglect, such as lack of maintenance, product alteration, overload, excessive speed resulting in loss of vehicle control, accident, or dynamic overload damage, or any failure due to driving off road or outside the Continental United States, or as a result of use which in any way adversely affects its operation.

TOLAR does not warrant the product when it is used with accessories not approved by TOLAR when other than genuine TOLAR Replacement Parts have been installed on the product.

TOLAR does not warrant accessories supplied by TOLAR which bear the name of another company, beyond the Warranty provided by that Company.

TOLAR shall not be responsible for expenses due to owner's requirements, inspections, or modification of components, or other handling requirements.

TOLAR shall not be responsible for parts returned without prior authorization or without proper identification, including claimant's name and TOLAR claim number.

WARRANTY CLAIM PROCEDURES

HOW TO MAKE A CLAIM

To make a claim under this WARRANTY, the Owner must take the product to an Authorized TOLAR Distributor, and the Distributor shall write directly to the TOLAR Service Department, 501 South Rose Street, Anaheim, CA 92805.

Emergency claims can be handled by calling the TOLAR Service Department at (714) 520-0522 and providing subsequent written notification.

For a claim to be considered it must contain adequate documentation which states product modes, starting date, TOLAR serial number as shown on the serial tag installed on the product, where and how used.

THESE WARRANTIES ARE THE SOLE WARRANTIES OF THE TOLAR MANUFACTURING COMPANY, INCORPORATED. THERE ARE NO OTHER WARRANTIES EXPRESS OR IMPLIED.

WATER SYSTEMS

WATER STORAGE & DISTRIBUTION SYSTEMS - - In the demand system, a non-pressurized supply tank is used and the water is pumped by a motor-driven pump from the tank directly to the outlet faucets. A pressure-sensing device is placed between the pump and the faucets. After the faucets are turned off, the pump continues pumping for a fraction of a second until the sensing device is triggered to turn off the pump. Each time a faucet is turned on, the pressure is momentarily reduced and the sensing device turns the pump on until the faucet again is turned off.

In the system there is a switch connected in series with the pump so the user can deactivate the pump so it will not operate when the motorhome is being stored. It also is good policy to turn this switch off when the motorhome is traveling on the highway. During such periods there is very little demand for water, and any malfunction of the water system might not be detected.

City Water Hook-Up -- In addition to the water system described above, your motorhome has a city water hook-up system. This simply is a fitting connected to the high-pressure system of the motorhome which will accept the end of a high-pressure hose which can, in turn, be connected to a city water supply. A pressure regulator is connected to prevent possible damage to the system due to extremely high outside water pressure. When the city water supply is connected to the motorhome, this valve is activated to stop the demand from the fresh water storage tank.

CAUTION: Never run the water pump when hooked up to a city water source or when the tank is empty. Damage to the pump will result.

Water Purification – Water which is questionable can be purified by allowing it to boil at least five (5) minutes or by proper treatment with chlorine, iodine, or Halazone or Globaline tablets. Of these methods, chlorination is used by most motorhome owners. Chlorine bleach in the amount of two (2) drops of 5.2% solution of each gallon of water will purify against most bacteria and viruses. Super chlorination does introduce the unpleasant taste of chlorine in the water, but water purifiers are now available which will eliminate this problem. The following treatment is recommended for super chlorination to protect against all organisms.

Before refilling the water tank, pour sufficient household bleach into it to produce an ultimate solution which will amount to 20 drops of 5.2% chlorine for each gallon of water. Then fill the tank with water and run the motorhome several miles to be sure that the chlorine solution has been thoroughly mixed with the water. Then draw all drinking water through the purifier which is basically a filter charged with activated charcoal or other substances.

Some additional facts relative to water treatment might be informative. Bacterial activity increases in 100 degrees water. Freezing does not destroy bacteria; they merely remain dormant.

Optional Water Filter – The water filter installed in your coach is located in the under-counter cabinet below the sink. The filter is installed with a cartridge.

Each time water passes through the filter, dirt particles are trapped and held in the tiny pores of the coating on the filtering element inside the cartridge. As the filter actively removes the impurities from the water, its microscopically small pores slowly fill and the amount of water from the filter gradually lessens. When the flow of the water from the unit becomes too slow for convenience, it should be serviced. If the cartridge is not changed, eventually the flow will stop entirely. It would be wise to carry a spare cartridge with you when you are traveling, just in case you fill the water tank from an exceptionally dirty source.

Even when decreasing flow does not demand it, at least one cartridge change per year is recommended for reliable performance from your water purifier system.

Filling the Tank – Using the method of super-chlorination followed by treatment with a water purifier, water can be taken on board from almost any source.

Experienced motorhome users usually carry their own water hose. Special hoses which will withstand continuous high pressure, and which will transfer drinking water without adding unpleasant tastes and odors, can be purchased from RV dealers. One or two 50' lengths of such hose should be made a part of the standard motorhome equipment.

For each system, after the tank is full, the pump switch should be turned on. After using the hose, it should be sealed by screwing the male and female ends together prior to storage.

Water Heater – Your water heater has a capacity of up to approximately 6 gallons, more than sufficient for a normal supply of hot water.

When operating the water heater with LP gas, use the controls located on the heater itself. Temperature may be set from warm to very hot. The water may be heated through the automotive heat exchanger system (see page 18).

For proper operation and maintenance, study the instructions on the heater, in addition to those provided in your Owner kit. Access to the water heater is gained

WATER SYSTEMS (CONTINUED)

through the exterior compartment.

Draining and Sanitizing Water Tank – It is a good policy to drain the water from the system at the end of each trip. After draining the tank, it is wise to close all valves so that air-borne contamination or small insects cannot enter the system.

After purchasing a new motorhome, or after a unit has been out of use for any extended period of time, the water system should be sanitized by the following procedure. Use 2/3 cup of 5% bleach solution for each 10 gallons of water, in the tank. To insure a thorough mixing of the bleach, figure out beforehand the amount of bleach required. Place a portion of it in the tank intermittently between the adding of each five or six gallons of water. When the tank is full, open the faucets and fill all waterlines. Allow the solution to stand in the system for approximately one hour. Then drain and flush the system thoroughly with fresh water.

Freeze-Proofing Water System – The use of the water system in freezing weather is a matter that must be given careful attention. Freezing can cause extensive damage to a water system.

To make sure the system is totally purged, the following procedure may be followed. Turn off the water pump and water heater. Then open all drain valves, including the valves at the bottom of each tank, at the bottom of the water heater, and at low points in the water lines. Permit water to drain out.

After all water appears to have drained out, depress the foot pedal of the toilet.

Also remove the hose connection cover on the city water hook-up fixture, and depress the button on the check valve to permit that line to drain. Turn on water pump to insure that water is expelled.

A new procedure has recently been developed using non-toxic, non-flammable anti-freeze, which can be purchased from RV dealers. The procedure is as follows: Add an adequate amount of anti-freeze to the tank to enable the pump to run it through all the lines. The motorhome is equipped with a hot-water heater that has a storage tank, enough anti-freeze will have to be used to fill the tank and allow the solution to come through all of the hot-water lines. Each faucet or water-using device should be opened one at a time until the solution begins to flow through it.

The anti-freeze can be saved and used year after year. Some users eliminate the need to fill the water-heater by disconnecting the water-heater lines and then connecting them together with a by-pass connection.

Water Disposal Systems -- Wash basins, showers, bathtubs and the kitchen sink all produce waste water which must be disposed of. Since the volume of liquid that passes through these sinks and basins is relatively high, these wastes are collected in the sewage holding tank.

Holding Tank Systems – The primary principle of operation of the holding-tank systems used in your motorhome is simply that of collecting waste water and sewage into tanks and then emptying these tanks from time to time at suitable disposal stations. At the outlet of this tank there is 3" diameter plastic tubing; then a slide valve, which can be opened or closed; then another piece of tubing and tightly fitting cap.

All primary drain outlets of holding tanks are located on the left side of the coach and are equipped with the watertight cap. This cap must be in place while the vehicle is in motion.

Each sink, wash basin, shower, or bathtub in the motorhome empties through a water-type gas trap, called a P-trap.

The wash-water drainage system is designed with plumbing lines having a dropping 1/4" per running foot. These lines all converge at a common outlet.

The shower basin or bathtub is the lowest disposal plumbing facility in the motorhome. If the holding tanks are not emptied when they are full, flooding could occur which would involve wash water and/or sewage backing up into the shower or tub.

Approved dumping stations may be found at private campgrounds, gasoline stations, state parks, national parks, roadside rest parks, etc. A book listing the locations of many approved dumping stations may be obtained from most RV dealers.

Your REVCON motorhome has been equipped with the latest sanitation system available, including:

1. A suds, or gray tank into which the tub/shower and sinks drain.
2. A sewage, or solids, tank, into which the toilet drains.

The solids tank is mounted directly to the base of the toiler. Holding tank plumbing is designed to allow each tank to be drained separately, by using the Push-Pull valve.

It is recommended that the solids tank be drained first. Leaving the suds tank full until all solids are drained will cause the suds tank water to act as a wash, thereby cleaning the drain hose and helping to dislodge any waste that may build up.

WATER SYSTEMS (CONTINUED)

To empty the holding tank of sewage:

1. Be sure the Push-Pull valves are closed.
2. Remove the drain tube plug.
3. Attach drain hose to drain tube.
4. Insert open end of drain hose at least two feet into the sanitary station connection.
5. Remove the metal wire retainers from the handle of the Push-Pull valve. When opening the valve, use a quick jerk to create the necessary flushing action.
6. When the tanks are drained, shut the valves and replace the retainers.
7. Remove the sewer drain hose, and rinse it thoroughly. Place it into storage.

When connecting your drain hose to an in-park sewer system, keep holding tank valves closed. Empty the tanks when necessary, as stated above. This will prevent liquid run-off which causes tank clogging of solids.

If an obstruction should occur in the drain system, do not use lye or commercial drain products. A toilet flush-through or a wire drain cleaner should clear the drain.

To clean and sanitize your holding tanks, flush with a hose through toilet valve, then pour in a 1/4 cup of household bleach, diluted in two gallons of water, let the solution stand, and rinse thoroughly. Be sure to use plenty of water for rinsing to thoroughly clear tank and valves.

The sewage holding tank should be deodorized each time it is emptied, using a chemical deodorant recommended by your dealer. Add a gallon of water and pour the solution into the bowl of the toilet. Follow directions on the deodorant container. Misuse of chemicals may cause damage to your sanitation system.

A REVCON motorhome with a 'ZAP' system does not require any chemical deodorant. The 'ZAP' system produces a very small electrical voltage in the holding tank material. This electricity kills the odor-producing bacteria.

Wintertime Use of Holding-Tank Systems – Obviously, in cold weather the contents of the holding tank might freeze and damage the plumbing. The holding tank can be used at below freezing temperatures if an appropriate anti-freeze is placed in the tank. The owner should consult with the dealer service department from where he purchased the motorhome, to determine whether or not automotive-type anti-freezes can be used. Inquiry should also be made into the use of sodium chloride or calcium chloride as an anti-freeze agent.

TOILET –

Your REVCON motorhome uses the "Aqua-Magic," toilet unit by Thetford. It features the unique "Micro Rinse" flush, and dual pedal fill. It comes in ivory and white decorator colors, and there is a padded seat model available.

Toilet Operating Instructions –

1. To add water to bowl, step on small pedal until water reaches desired level, then release pedal slowly.
2. To flush, step on large pedal until rinse clears bowl, release pedal slowly.

Toilet Maintenance – No routine maintenance is required. To clean toilet, use Thetford Aqua Bowl or any other high grade, non-abrasive cleaner. **Do not use highly concentrated or high acid content household cleaners or scouring powders, as they damage seals and finish.**

Winterizing –

1. **Draining Method** – Completely drain the toilet water supply line leaving the water supply valve open. This valve may be kept open by inserting a round object, like a soft drink bottle into the flush hole in the bowl.

CAUTION: When using air pressure to drain water line, toilet valve should be held in open position.

2. **Anti-freeze Method** – Use potable water system type anti-freeze to winterize the fresh water plumbing system.

CAUTION: Never use automotive type anti-freeze in fresh water system. These are highly toxic.

CAUTION: Do not use household detergents or cleaning compounds. They may contain chemicals that would damage the plastic drain system or termination valve seals.

NOTE: If water is inadvertently frozen in the toilet, do not attempt to flush until the ice is thawed. Otherwise damage to toilet could occur.

Holding Tank Hints – After hook-up to sewer line at campgrounds, leave the vehicle termination valve on the blackwater (toilet waste) holding tank **closed until the tank is at least 3/4 full.** This provides sufficient water in the tank to insure complete flushing of waste material into the outside sewer line.

Unlike the toilet at home which uses between 4-7 gallons of water per flush, the average RV uses from 1 cup (8 oz.) to several quarts of water per flush, which is enough water to flush the waste from the toilet into

WATER SYSTEMS (CONTINUED)

the holding tank. If there is not sufficient water in the holding tank, waste materials may not evacuate properly when the termination valve is opened and clogging could eventually result.

To empty the blackwater holding tank, open the termination valve. When holding tank is empty, rinse it thoroughly using Aqua-Bowl Cleaner, (or a comparable cleaner recommended by your RV dealer). Use the cleaner with several gallons of fresh water. Be sure to close termination valve after emptying and thoroughly rinsing out the holding tank.

NOTE: With two holdings, one for blackwater (toilet waste) and one for graywater (sink and shower waste), there are two vehicle termination valves, one for each holding tank. You may leave the graywater termination valve open during hookup to an outside sewer line. Graywater contains few solid particles and will not clog the holding tank. But it is a good practice to rinse the graywater tank with clear water and the Aqua-Bowl Cleaner before closing the termination valve.

Toilet Trouble-Shooting --

1. **Symptom:** Water keeps running into bowl.
   Correction: Clean out foreign material in groove where water valve blade seats in bottom of bowl. If blade cannot close completely, neither will water valve.

2. **Symptom:** Toilet leaks, water on floor.
   Correction: If vacuum breaker leaks while flushing, replace vacuum breaker. If vacuum breaker leaks when not flushing, replace water valve. If leak is at bowl to mechanism seal, replace mechanism. If leak is at closet flange to floor seal, check flange nuts for tightness. If leak continues, remove toilet, check closet flange height. (1/4" to 7/16" above floor). Adjust accordingly. Replace flange seal if it is damaged.

3. **Symptom:** Foot pedal operates harder than normal or blade sticks.
   Correction: Apply light film of silicone spray on blade.

Toilet Service and Parts -- See warranty in owner's packet for service information. Refer to your local Thetford dealer for parts and service. If it becomes necessary to send parts to a Thetford Certified Service Center for warranty consideration or to contact the factory, please include the following information:

1. Your name and address.
2. The product name, model, serial number and color.
3. The type of recreational vehicle (brand name and year) on which the product is used.
4. The reason for return.
5. Proof of date of purchase.

For Best Results Use Thetford Convenience Products --

Wherever your travels take you, Thetford offers three holding tank products:

1. Aqua-Kem, a liquid concentrate deodorant.
2. Dri-Kem, a granular holding tank deodorant.
3. Aqua Zyme, an enzymatic waste treatment liquid.

All three products are highly effective and are quick and easy to use when the label instructions are followed.

When adding Aqua-Kem, Dri-Kem, or Aqua Zyme to holding tank, be sure the vehicle termination valve is closed. Then add 8 oz. of Aqua-Kem or two, 2 oz. packets of Dri-Kem, with enough fresh water to cover the bottom of your empty holding tank. When using Aqua Zyme, add 2 oz. to toilet and flush, using two gallons of water. Variations in time periods, temperatures or usage may require changes in amount of product used. For more complete information, see label instructions on the Aqua-Kem, Dri-Kem and Aqua Zyme containers.

To prevent holding tank clogging by toilet tissue, use Aqua Soft toilet tissue. Specially formulated by Thetford, Aqua Soft fights clogs because it disintegrates and dissolves rapidly in holding tanks.

CAUTION: Aqua-Kem contains methyl alcohol and formaldehyde. It cannot be made non-poisonous. Avoid contact with skin, eyes and mucous membranes. Avoid prolonged or repeated breathing of vapor. Prolonged or repeated contact my cause allergic irritation.

FIRST AID: In case of skin or eye contact, immediately flush affected area with plenty of water for at least 15 minutes. For eyes, get prompt medical attention. If swallowed, give one or two glasses of water or milk. Induce vomiting and call your physician or Poison Control Center immediately.

WATER PUMP -- The water supply system for the REVCON incorporates an ITT Jabsco water pump which operates on 12-volt DC electrical power. The pump is capable of delivering three (3) gallons per minute under 16 psi pressure, a pressuring-sensing device, in the line between the pump and the faucets or water outlets, turns the pump on when a faucet is turned on. The pump continues to operate for a fraction of a second after the faucet is turned off until the sensing devices triggers to turn off the pump.

AUTO WATER HEATER EXCHANGE SYSTEM -- The REVCON motorhome is equipped with a unique

WATER SYSTEMS (CONTINUED)

system which provides heated water directly from the automotive engine. The advantage of this system is that it provides hot water whenever the vehicle engine is operating to the coach outlets, thus eliminating the use of the regular water heater except when the vehicle is parked. For a schematic of this system, see figure 2

HOT WATER HEATER – The REVCON is equipped with a 6 gallon hot water heater. The heater is equipped with a fail-safe pilot which will automatically shut off the gas supply if the pilot flame is extinguished. When the water reaches the pre-determined temperature, the water heater will automatically shut off. When the water heater switch is turned "ON" the spark should begin and the burner will light. If the spark stops before the burner lights, then turn the switch to "OFF." Wait five (5) seconds and then switch to the "ON" position. This will re-start the ignition cycle. The first start-up of the heater may require several ignition cycles before all air is purged from the gas lines.

If the burner will not come on, check the following:

1. Switch turned off.
2. Gas supply to heater empty or turned off.
3. Reset button tripped.
4. Fuse blown.

WATER HEATER THERMOSTAT AND MANUAL TEST – The water heater is provided with a high-temperature cut-off device in the event of thermostat failure. Temperature above 190°F will cause the manual reset button to trip shutting down the main burner. To activate the burner, the water temperature must be below 100°F. Push the reset button to reactivate the burner.

WATER HEATER BURNER – All air shutters are pre-set to obtain a blue or orange-blue flame. If it is necessary to adjust the air shutter, be sure to maintain the blue or orange-blue flame color. Do not allow the burner plate to burn with a yellow flame, because sooting will occur.

In cases where sooting has occurred, there is a possibility that this condition may be corrected by making the correct air shutter adjustment. If the burner flame continues to burn yellow after adjusting the air shutter, check for an obstruction in the burner or the flue box. A stiff brush is recommended for the removal of soot deposits. If there is soot in the burner, check to make sure the gas valve is shutting off clean. This can be checked by turning the OFF-ON switch to the OFF position. There should be no flame at the burner orifice at the burner.

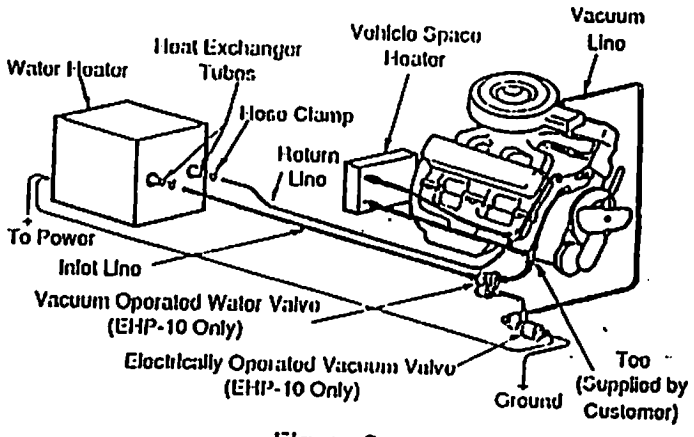
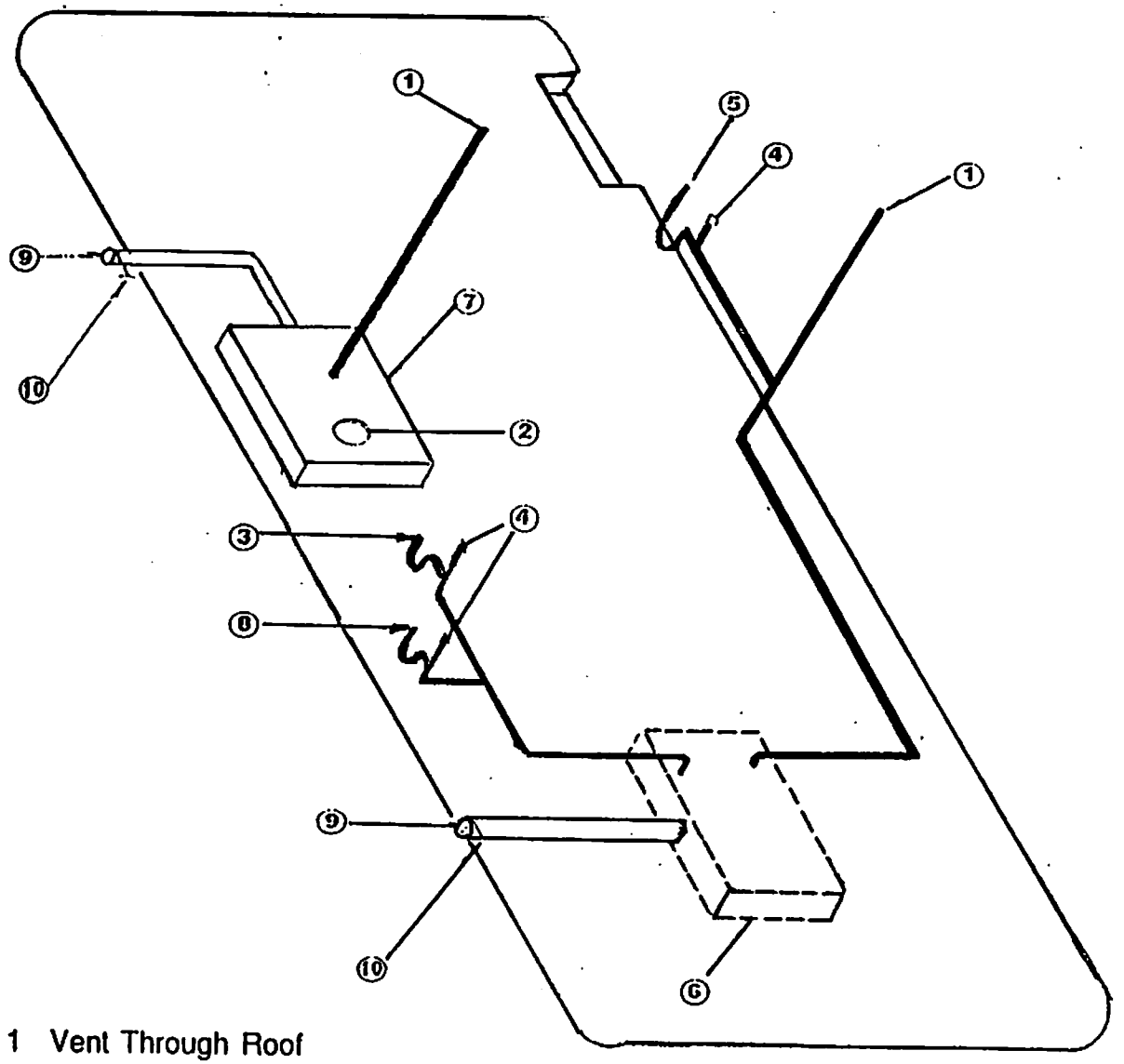


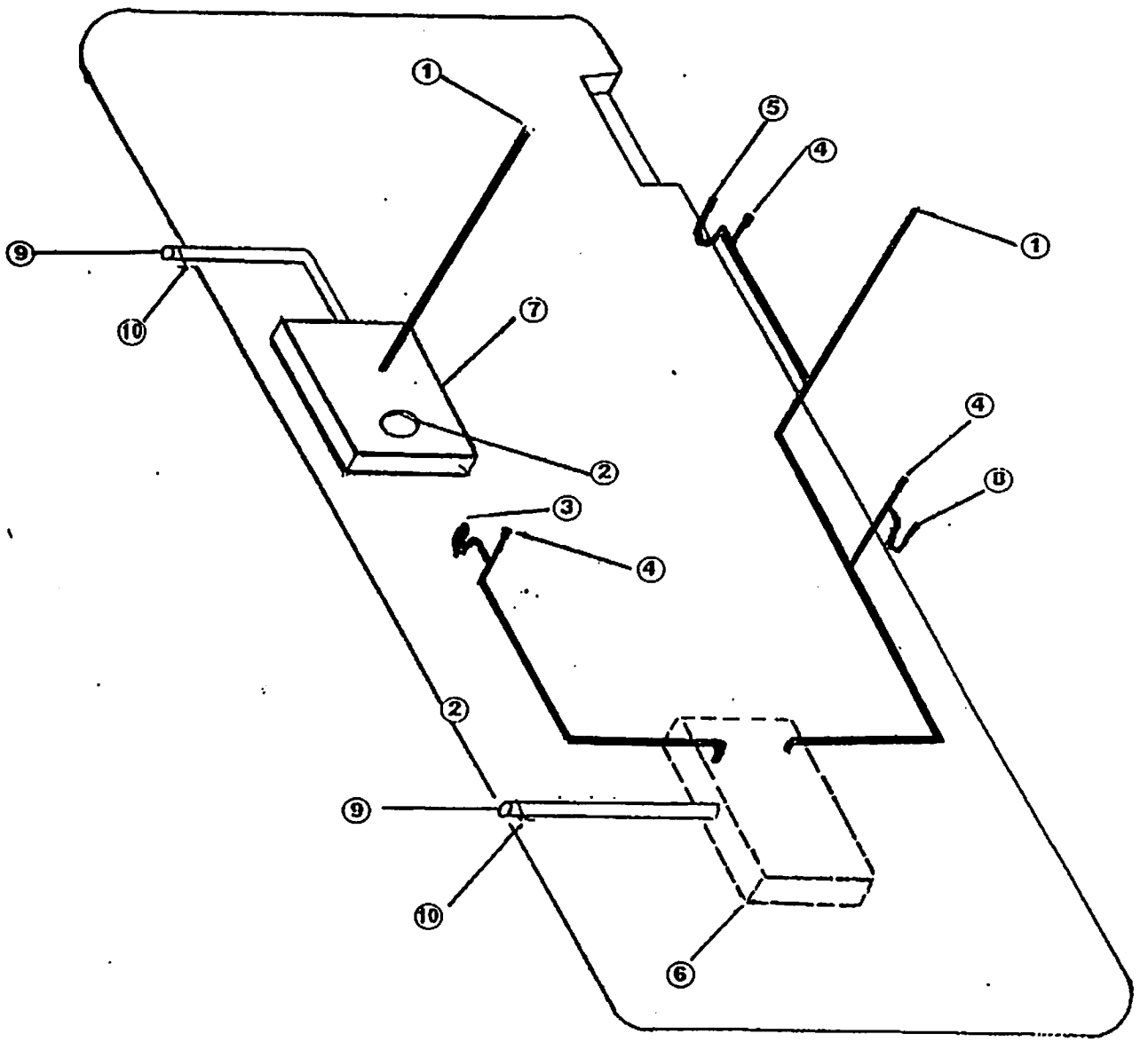
Figure 2
Heat Exchange Connection

WATER DRAINAGE SYSTEM
ISLAND BED



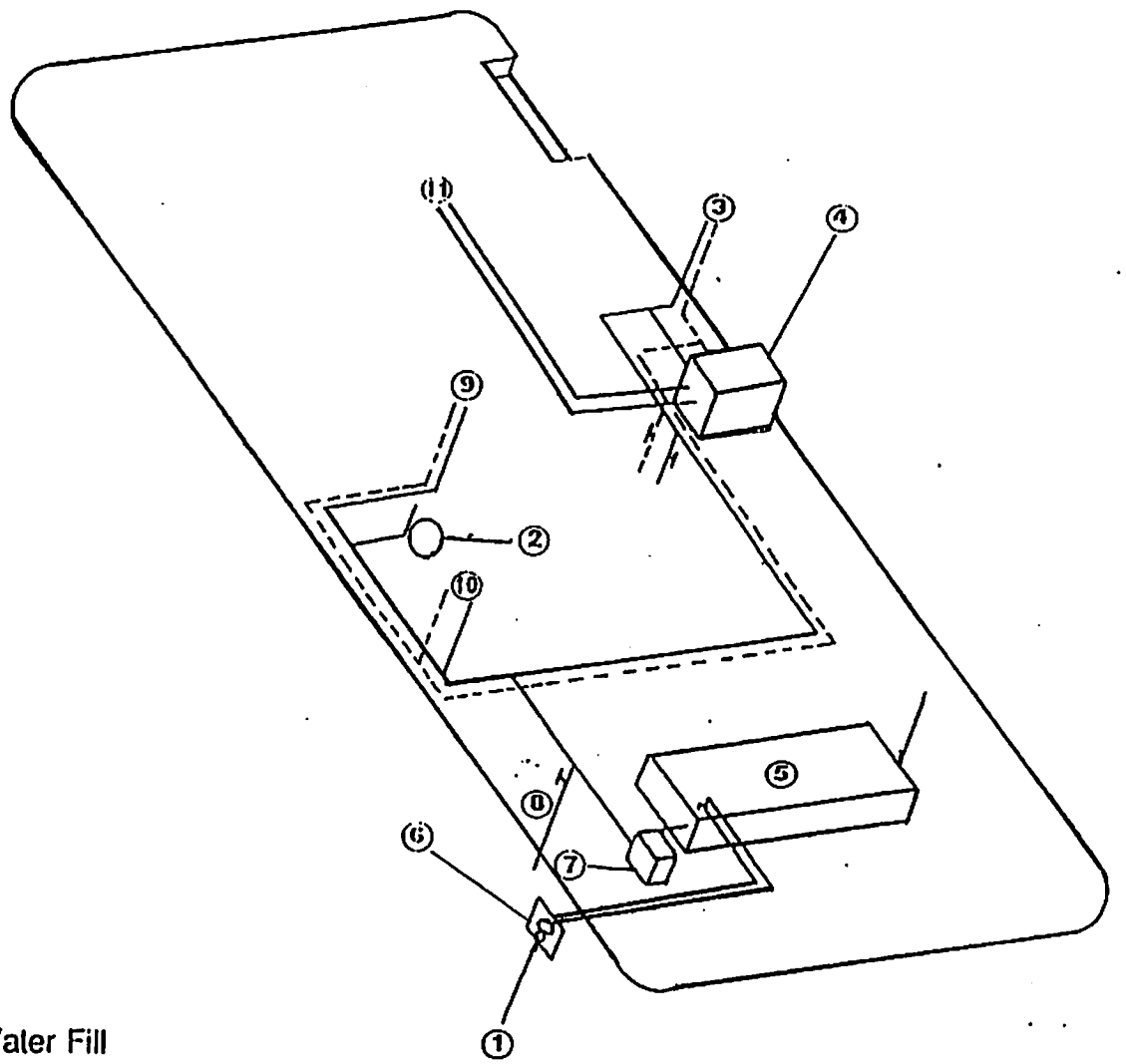
1 Vent Through Roof
2 Toilet
3 Shower
4 Anti-Siphon Vent
5 Galley Drain
6 Grey Tank Below Floor
7 Black Tank Above Floor
8 Lavy Drain
9 Waste Tank Drain
10 Dump Valve Handles

WATER DRAINAGE SYSTEM
FAMILY ROOM/TWIN BED



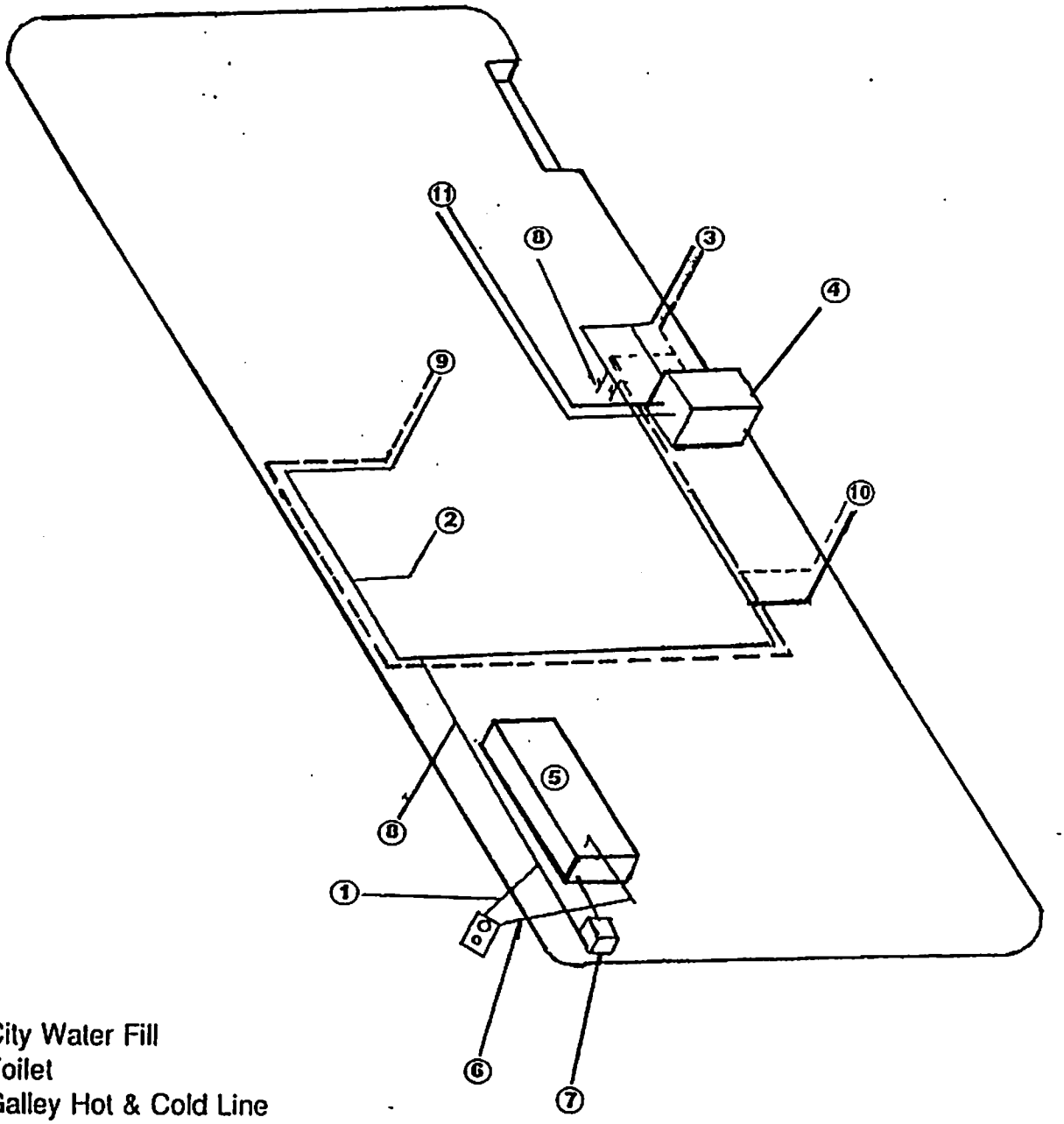
1 Vent Through Roof
2 Toilet
3 Shower
4 Anti-Siphon Vent
5 Galley Drain
6 Grey Tank Below Floor
7 Black Tank Above Floor
8 Lavy Drain
9 Waste Tank Drain
10 Dump Valve

WATER SUPPLY SYSTEM
ISLAND BED



1 City Water Fill
2 Toilet
3 Galley Hot & Cold Line
4 Water Heater
5 Water Supply Tank
6 Water Tank Fill
7 Water Pump
8 Drain Lines
9 Shower Line's
10 Lavy Lines
11 Auto Heater Lines

WATER SUPPLY SYSTEM
FAMILY ROOM/TWIN BED



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6 Water Tank Fill
7 Water Pump
8 Drain Lines
9 Shower Line's
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LP GAS SYSTEMS

LP Gas Systems – Your coach uses liquid-petroleum (LP) gas as a fuel for all the appliances which require heat, such as the water heater, furnace, range, oven, and absorption-type refrigeration. LP gas is economical and effective for these purposes; when proper precautions are taken, it is a safe form of energy. There are two types of LP gas in common usage, propane and butane. If the temperature is below 32°F, butane will not vaporize. It can be used only in warm climates. Propane, on the other hand, will vaporize at any temperature above – 40°F. Most LP gas used in motorhomes is propane.

Storage Tanks for LP Gas – LP gas is stored in cylindrical-shaped welded steel or aluminum tanks, having hermispherical-shaped ends. These tanks are designed to withstand the high pressure necessary to contain the LP gas in liquid form.

All LP-gas tanks are mounted to the underside of the floor of the coach and vented freely to the atmosphere so that in the case of leakage the gas will not be discharged into the interior of the coach where it might be ignited by a pilot flame and cause an explosion.

When any appliance is not being used, the gas shut-off valve controlling that appliance should be placed in the "OFF" position. When the motorhome is to be stored for any period of time the main shut-off valve at each tank should be closed. For maximum safety, all LP-gas valves should be turned off when the motor home is traveling on the highway.

Checking for Leaks -- The LP-gas distribution system should be checked for leaks at frequent intervals. An oily substance having a pungent odor is always mixed with LP gas so that if there is a leak, you will be able to smell it.

There are a wide assortment of gas leak-detecting instruments available, but one of the best methods to determine where the gas is leaking is to use a soap solution. Such a solution can be made by mixing ordinary liquid dishwashing detergent with water. This can be applied with a small paint brush to gas lines and connections. Bubbles will appear at any place where gas is leaking out of the system. Most leaks occur at fittings and the leak can usually be stopped by tightening the fitting. Where such tightening fails to stop the leak, the fitting must be replaced.
WARNING: No flammable material should ever be used to check for leaks in an LP-gas system.

Occasionally water may find its way into an LP-gas system and if this water freezes, the operation of the system is impaired. The injection of anhydrous methanol into the LP-gas system, using approximately one ounce for each 20 lbs of fuel, will usually eliminate this problem. The anhydrous methanol absorbs the water it then passes out of the system as the gas is used.

Most of the gas appliances which have a continuously operating pilot light, and which go on and off intermittently and automatically are required to have a safety device which minimizes the possibility of explosion in case one pilot light should accidently become extinguished. The appliances which usually have this device include the furnace, hot-water heater, refrigerator, and oven. Without such a device, an explosion would be likely to result if one pilot light went out and it continued to emit propane.

Lighting Gas Appliances – The water heater, furnace, and refrigerator all have automatic or built-in pilots and do not require a flame to light the pilot.

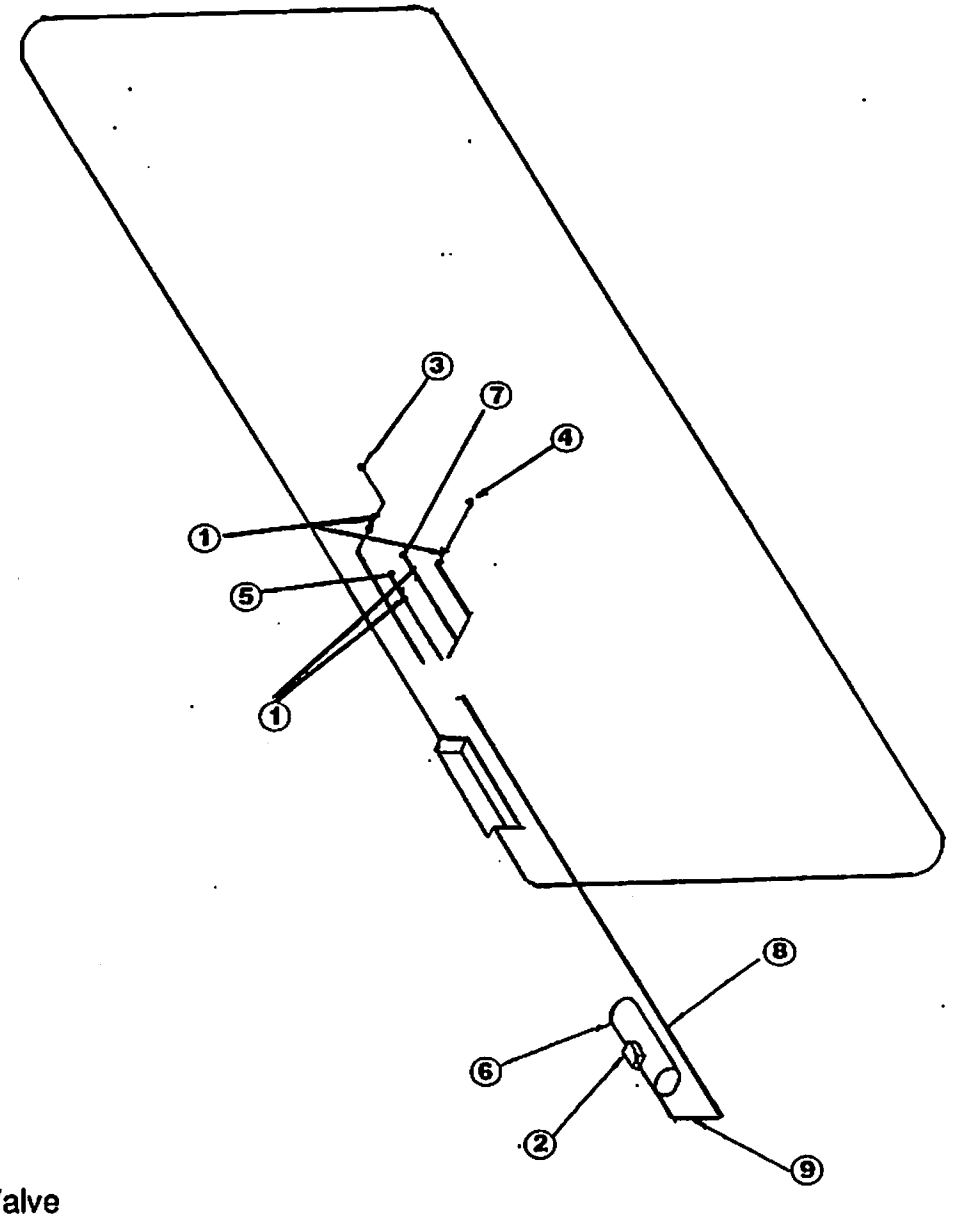
Maintenance of LP-Gas Systems -- LP-gas systems normally operate for periods of time with a minimum of maintenance. However, a few tips on maintenance will be useful.

After an extended period of use, the safety devices which are actuated by pilot lights will sometimes become inoperative. If difficulty is encountered getting a main burner to ignite, the safety device should be replaced.

One of the worst enemies of LP-gas systems is the spider. Spiders are attracted to tunnels and holes. They frequently spin webs across or through the orifices of gas-fired appliances. These webs restrict the air flow and produce a weak yellow flame which typically deposits carbon. If a defective flame is observed, spider webs should be suspected, and all parts of the burner should be wiped clean and orifices should be blown clear with compressed air.

If spider webs are not present and the flame is still too yellow and filled with carbon, it is probably that the air adjustment of the burner should be modified. This can be done by trial and error until the bluishness of the flame is maximized.

L.P.G. GAS SYSTEM'S
ALL MODELS



1 Gas Valve
2 Regulator
3 Refrigerator
4 Range
5 Water Heater
6 Propane Tank
7 Furnace
8 1/2" Main Gas Manifold
9 Gas Hose From Tank

FURNACE

FURNACE – The Suburban furnace in your Revcon is a direct vent system furnace design certified by the American Gas Association and the Canadian Gas Association for safety and performance. The Suburban SF-365 Furnace operates on LP gas only. The blower uses 12 volts DC, and the furnace is rated at 35,000 BTU per hour input.

NOTE: Preventive maintenance to the furnace is recommended at least once a year.

OPERATING INSTRUCTIONS

NOTE: During initial firing of this furnace, a burn-off of excess paint and oils remaining from manufacturing process may cause "smoking" for 5-10 minutes.

1. Turn the manual valve (if so equipped) or the valve at the outside LP tank to the "OFF" position. Do not force.
2. Move "OFF" lever located at bottom of thermostat to the right if set on "OFF" position.
3. Set thermostat above room temperature to begin blower operation. A slight delay will occur before the blower comes on. Allow blower to run for 5 minutes of combustion chamber purge cycle.
4. After 5 minutes, move thermostat lever below room temperature. Blower will remain on. Wait approximately 2 minutes for blower to go off.
5. Open manual shut-off valve (if so equipped) or the valve at the outside LP tank. Correct operating characteristics depend on the valve being positioned fully open. Never attempt to operate with a valve partially closed.
6. Set thermostat lever to desired setting. If set above room temperature, blower will come on.
7. Allow 30 seconds for main burner to light after blower comes on. This furnace is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
8. If burner does not light, repeat Steps 1 through 5.
9. If after three (3) attempts with no ignition, go to shut down and contact your dealer or a local recreational vehicle service agency. Do not continue to cycle furnace through thermostat in an attempt to get ignition.

TO SHUT DOWN

1. Set thermostat to positive off position. (Move "OFF" lever on bottom of thermostat to "OFF" position.)
2. Turn manual shut off valve (if so equipped) to the "OFF" position. Do not force.

PREVENTIVE MAINTENANCE

Your furnace should be inspected by a qualified service agency yearly before turning the furnace on. Particular attention should be given to the following items:

1. Inspect furnace installation and vent termination to be sure furnace is properly secured in place (see installation instructions), that vent terminates to the atmosphere, and that vent tubes overlap properly (see installing Vent Assembly).
2. Inspect combustion chamber for restrictions in exhaust or intake. It is imperative that the flow of intake combustion air and the flow of exhaust gases being expelled to the outside atmosphere not be obstructed. Any soot or loose debris should be blow out using compressed air. (See Figure ????.)
3. Inspect all gaskets. If any gaskets show signs of leakage or deterioration, replace them. Safe operation of the furnace depends on all gaskets being tight.
4. Inspect return air inlet openings to the furnace. Remove any restrictions to assure adequate air flow.
5. Periodically inspect the vent for obstructions or presence of soot. Soot is formed whenever combustion is incomplete. This is your visual warning that the furnace is operating in an unsafe manner. If soot is present, immediately shut furnace down and contact your dealer or a qualified service person.
6. Keep furnace clean. More frequent cleaning may be required due to excessive lint from carpeting, bedding material, etc. It is imperative that control compartments, burners and circulating air passageways of the appliance be kept clean.
7. The motor is permanently lubricated and requires no oiling.

You, as the owner/user, should inspect the furnace monthly during the heating season for presence of soot on vent. Operating the furnace under this condition could lead to serious property damage, personal injury or loss of life. If soot is observed on the vent, immediately shut the furnace down and contact a qualified service agency.

Listed below are several safety related items that you should follow during the heating season to assure continued safe operation of the furnace.

1. Inspect furnace venting. Venting must be free of obstructions, void of soot, and properly terminated to the atmosphere. (See Installing Vent Assembly.)

WARNING! Do not install screens over the vent for any reason. Screens will become restricted and cause unsafe furnace operation. Accessories are being marketed for RV products which we do not recommend.

FURNACE (CONTINUED)

.For your safety, only factory authorized parts are to be used on your furnace.

2. Keep the furnace area clear of any combustible materials, gasoline or other flammable vapor and liquids.

3. Before operating furnace, check the location of the furnace vent to make sure it will not be blocked by the opening of any door on the trailer. If it can be blocked, do not operate the furnace with the door open.

4. Do not restrict the flow of combustion air or the warm air circulation to the furnace. To do so could cause personal injury and or death.

5. Never operate the furnace if you smell gas. See warning on front cover of this manual.

6. Immediately shut furnace down and call a service agency if furnace cycles erratically or delays on ignition.

WARNING! Should overheating occur, or the gas supply fail to shut off, shut off the manual gas valve to the appliance before shutting off the electrical supply.

7. Never attempt to repair damaged parts. Always have them replaced by a qualified service agency.

8. Never attempt to repair the furnace yourself. Seek the help of a qualified service person.

9. Never restrict the ducting installed by your coach manufacturer. To do so could cause improper furnace operation.

10. Do not install air boosters in the duct system. Such devices will cause the furnace to cycle on limit and to have erratic sail switch operation.

11. Clothing or other flammable material should not be placed on or near the appliance.

12. Always follow the Operating Instructions. Do not deviate from the step-by-step procedures.

13. Do not use this appliance if any part has been submerged under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control that has been submerged under water.

14. When considering add-on rooms, porch or patio, attention must be given to the venting of your furnace. For your safety, do not terminate furnace vent inside add-on rooms, screen porch or onto patios. Doing so well result in products of combustion being vented into the room or occupied areas.

INSTRUCTIONS FOR USE

HOW TO START THE REFRIGERATOR

Leveling

In an absorption refrigerator system, ammonia is liquified in the finned condenser coil at the top rear of the refrigerator. The liquid ammonia then flows into the evaporator (inside the freezer section) and is exposed to a circulating flow of hydrogen gas, which causes the ammonia to evaporate, creating a cold condition in the freezer.

The tubing in the evaporator section is specifically sloped to provide a continuous movement of liquid ammonia, flowing downward by gravity through this section. If the refrigerator is operated when it is not level and the vehicle is not moving, liquid ammonia will accumulate in sections of the evaporator tubing. This will slow the circulation of hydrogen and ammonia gas, or in severe cases, completely block it, resulting in a loss of cooling.

Any time the vehicle is parked for several hours with the refrigerator operating, the vehicle should be leveled to prevent this loss of cooling. The vehicle needs to be leveled only so it is comfortable to live in (no noticeable sloping of floor or walls).

When the vehicle is moving, the leveling is not critical as the rolling and pitching movment of the vehicle will pass to either side of level - keeping the liquid ammonia from accumulating in the evaporator tubing.

OPERATION

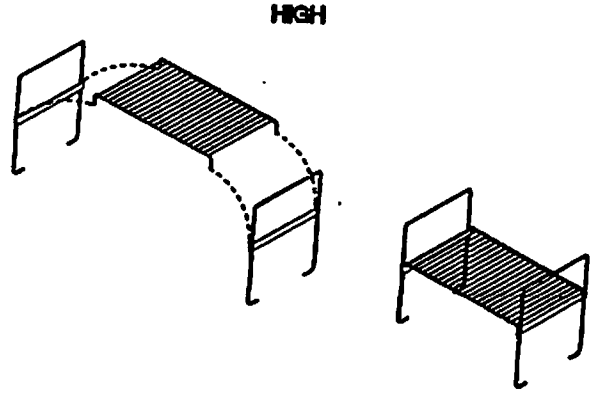
Before starting the refrigerator, check that all the manual gas valves are in the ON position. DO NOT forget the manual shutoff valve on the rear of the refrigerator, see FIG. 1.

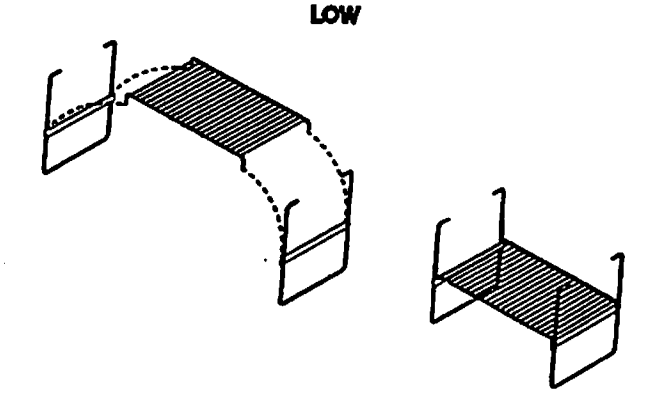
This refrigerator is equipped whith a semi Automatic Energy Selector (AMES) control system, which can be set to automatically select either 120 volt AC or LP gas operation, or if desired LP gas only. On 3-way models the control system can manually be set to DC operation. The refrigerator controls will work down to 9.6 volt DC.

WARNING

Most LP gas appliances used in recreational vehicles are vented to the outside of the vehicle. When parked close to a gasoline pump, it is possible that gasoline fumes could enter this type of appliance and ignite the burner flame, CAUSING A FIRE OR AN EXPLOSION.

FOR YOUR SAFETY, it is recommended that all LP gas appliances which are vented to the outside should be shut off when refueling.





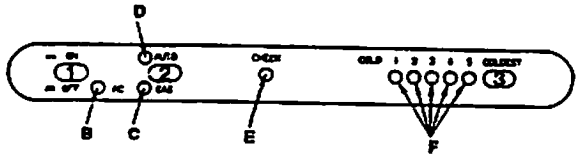
Freezer shelf

The freezer shelf can be used in two different ways:
As a **high** shelf or a **low** shelf.

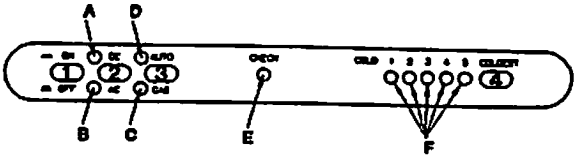
High shelf: Turn the shelf support so that the open part of the support is at the bottom.
Press the shelf in place

Low shelf: Turn the shelf support so that the open part of the support is at the top.
Press the shelf in place.
See Figures above.

2 - WAY display panel.



3 - WAY display panel.



START UP INSTRUCTIONS

A. A 12 volt DC supply must be available for the electronic control to function.
B. Press the main power ON/OFF button (1) to the DOWN position.
C. Press the TEMPERATURE SELECTOR BUTTON (3) 2-WAY Model or (4) 3-WAY Model until the lamp at the desired setting is illuminated.

2-WAY MODEL

AUTO MODE

1. Move the AUTO/GAS mode selector button (2) to the DOWN position. (If 120 volts AC is available, the AC mode indicator lamp (B) will illuminate indicating AC operation. If 120 volts AC is not available, the GAS mode indicator lamp (C) will illuminate and the control system will automatic switch to GAS operation.
2. If the CHECK indicator lamp (E) illuminates and the GAS mode indicator lamp (C) is off, the controls have failed to ignite the burner in the GAS mode. GAS operation may be reset by pressing the main power ON/OFF button (1) to the OFF than ON position. (see step 2 under GAS MODE)
3. Press the TEMPERATURE SELECTOR button (3) until the lamp at the desired position is illuminated.

GAS MODE

1. Move the AUTO/GAS mode selector button (2) to the UP position. The GAS mode indicator lamp (C) will illuminate. After 45 seconds the burner should be ignited and operating normally.
2. On the initial refrigerator start-up, it may take longer than 45 seconds to allow air to be purged from the gas line. If the gas does not ignite within 45 seconds the CHECK indicator lamp (E) will illuminate and the GAS mode indicator lamp (C) will go off. To reset when the CHECK indicator lamp (E) is illuminated, press the main power ON/OFF button (1) to the OFF and then ON position.

NOTE: Do not continue to reset GAS operation if the CHECK indicator lamp continues to be illuminated after several tries.

3. Press the TEMPERATURE SELECTOR button (3) until the lamp at the desired position is illuminated.

TO SHUT OFF THE REFRIGERATOR

The refrigerator may be shut off while in any mode of operation by pressing the main power ON/OFF button to the UP (OFF) position. This shuts off all DC power to the refrigerator,including the interior light.

3-WAY MODEL

AUTO MODE

1. Press the DC mode selector button (2) to the UP (OFF) position.
2. Move the AUTO/GAS mode selector button (3) to the DOWN position. (If 120 volts AC is available, the AC mode indicator lamp (B) will illuminate indicating AC operation. If 120 volts AC is not available, the GAS mode indicator lamp (C) will illuminate and the control system will automatic switch to GAS operation.
3. If the CHECK indicator lamp (E) illuminates and the GAS mode indicator lamp (C) is off, the controls have failed to ignite the burner in the GAS mode. GAS operation may be reset by pressing the main power ON/OFF button (1) to the OFF than ON position. (see step 2 under GAS MODE)
4. Press the TEMPERATURE SELECTOR button (4) until the lamp at the desired position is illuminated.

GAS MODE

1. Press the DC mode button (2) to the UP (OFF) position.
2. Move the AUTO/GAS mode selector button (3) to the UP position. The GAS mode indicator lamp (C) will illimunate. After 45 seconds the burner should be ignited and operating normally.
3. On the initial refrigerator start-up, it may take longer than 45 seconds to allow air to be purged from the gas line. If the gas does not ignite within 45 seconds the CHECK indicator lamp (E) will illuminate and the GAS mode indicator lamp (C) will go off. To reset when the CHECK indicator lamp (E) is illuminated, press the main power ON/OFF button (1) to the OFF and then ON position.

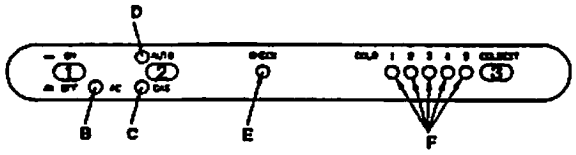
NOTE: Do not continue to reset GAS operation if the CHECK indicator lamp continues to be illuminated after several tries.

4. Press the TEMPERATURE SELECTOR button (4) until the lamp at the desired position is illuminated.

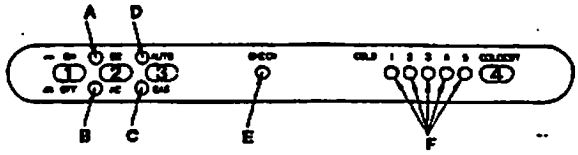
DC MODE

1. Press the DC mode indicator button (2) to the down position.
2. Press the TEMPERATURE SELECTOR button (4) until the lamp at the desired position is illuminated.

2 - WAY display panel.



3 - WAY display panel.



DESCRIPTION OF OPERATING MODES

THERMOSTAT

The thermostat on the refrigerator controls both the gas and electric operation, thereby eliminating the necessity of resetting each time a different energy source is employed.
After the initial start-up, the thermostat should be moved from "COLDEST" to the desired temperature setting, usually about mid setting.

AUTO MODE

When operating in the AUTO mode, the AUTO mods indicator lamp (D) will illuminate. The control system will automatically select between AC and GAS operation with AC having priority over GAS. Either the AC indicator lamp (B) or the GAS indicator lamp (C) will illuminate depending on the energy source selected by the control system. If the control system is operating with AC energy and it then becomes unavailable , the system will automatically switch to GAS. As soon as AC becomes available again the control will switch back to AC regardless of the status of GAS operation.

GAS MODE

When operating in the GAS mode the AUTO mode indicator lamp (D) will be off and the GAS mode indicator lamp (C) will be illuminated. This mode provides LP gas operation only. The control system will activate the ignition system and will attempt to light the burner for a period of approximately 45 seconds. If unsuccessful, the CHECK indicator lamp (E) will illuminate and the GAS mode indicator lamp (C) will turn off.

To restart GAS operation, press the main power ON/OFF button (1) to the OFF and then ON position. The control system will attempt a new 45 second ignition sequence.

If the refrigerator has not been used for a long time or the LP tanks have just been refilled, air may be trapped in the supply lines. To purge the air from the lines may require resetting the main power ON/OFF button (1) three or four times. If repeated attempts fail to start the LP gas operation, check to make sure that the LP gas supply tanks are not empty and all manual shutoff valves in the lines are open. If the problem is still not corrected, contact a service center for assistance.
If the control is switched to AC or DC operation while the CHECK indicator lamp is on, it will function properly, but the CHECK indicator lamp will not go off until the main power ON/OFF button is pressed to the OFF then ON position.

DC.MODE (3-way models only)

When operating in the DC mode the DC mode indicator lamp (A) will be illuminated. All other mode lamps will be off. The DC mode overrides all other operating modes. If one of the other operating modes is desired, the DC selector button (2) must be in the UP (OFF) position.

BATTERY PROTECTION SYSTEM

The control system is equipped with a battery protection system. A steady illuminated DC mode lamp (A) indicates that sufficient voltage is present at the terminal block connections to operate the refrigerator normally. If the input voltage is below approximately 12.8 volts DC or should it drop below 12.8 volts DC during operation, the DC mode lamp (A) will flash ON and OFF to signal a low battery condition. In this condition the control will continue to operate in DC mode for a maximum 10 minutes.
If the input voltage has not returned above 12.8 volts DC within this time, the control will terminate DC operation. A second battery protection system will terminate DC operation immediately if the input voltage drops below 10.6 volts.
The DC mode lamp will continue to flash as long as the input voltage remains below 12.8 volts. The input battery voltage must rise above 12.8 volts for 25 minutes before DC operation can resume.
As soon as the input voltage rises above the required 12.8 volts, the DC mode indicator lamp will stop flashing, however, the control system will remain in the 25 minute delay mode. This delay is to allow sufficient time for the vehicle charging system to recharge the battery.

LIMP MODE OF OPERATION

This control system contains a feature where it will continue to operate the cooling system in the event of a failure of a major operating component. Two different modes of operation can occour in this category.
If for some reason the display module becomes non functional, the control system will revert to full automatic operation selecting the best energy source available with AC,DC (3-way only) and GAS priority. The temperature of the refrigerator will be maintained at the MID position within normal temperature tolerances. The power module will continually attempt to re-establish operation of the display module.
The second limp mode of operation will execute when a failure of the temperature sensing device or associated electronic circuitry occurs. If this should occour, the control system will operate on the energy source selected via the control panel. The cooling unit will run continuously on the selected energy source. The refrigerator will continue to operate in this mode indefinitely or until a new sensor is installed and the system is reset.

HOW TO USE THE REFRIGERATOR

FOOD STORAGE COMPARTMENT

The food storage compartment is completely closed and unventilated, which is necessary to maintain the required low temperature for food storage. Consequently, foods having a strong odor or those that absorb odors easily should be covered. Vegetables, salads etc. should be covered to retain their crispness. The coldest positions in the refrigerator are under the cooling fins and at the bottom of the refrigerator. The warmer areas are on the upper door shelves. This should be considered when placing different types of food in the refrigerator.

FROZEN FOOD STORAGE COMPARTMENT

Quick frozen soft fruits and ice cream should be placed in the coldest part of the compartment which is on or just below the freezer shelf. Frozen vegetables, may be stored in any part of the compartment.

This compartment is not designed for deep or quick freezing of food. Meat or fish, whether raw or prepared, can be stored in the frozen food storage compartment provided they are pre-cooled first in the refrigerator. They can be stored about three times longer in the frozen food compartment as compared to the fresh food compartment. To prevent food from drying out, keep it in covered dishes, containers, plastic bags or wrapped in aluminium foil.

ICE MAKING

Ice cubes can be made in the ice tray placed in the freezer compartment. The tray should be filled with water to within 1/4" (5mm) from the top. For faster ice making, the tray should be placed in direct contact with the freezer bottom.

To release the ice cubes, seize the tray with both hands and twist the tray. Cubes not required should be replaced in the tray. Refill the tray with water and replace the tray on the freezer shelf.

Ice will be made more rapidly if the thermostat is set at its highest position.

It is a good idea to do this a few hours before the anticipated need for ice, but be sure to move back to normal setting, usually about mid setting when the ice is formed. Food in the lower compartment may be frozen if the setting is left on "COLDEST" position.

DEFROSTING

Shut off the refrigerator by pressing the main power ON/OFF button to the UP (OFF) position. Empty the refrigerator, leaving the drip tray under the finned evaporator, and the cabinet and freezer doors open. Defrosting time can be reduced by filling the ice tray with hot water and placing it on the freezer bottom.

CAUTION

DO NOT use a hot air blower. Permanent damage could result from warping the metal or plastic parts. DO NOT use a knife or an ice pick, or other sharp tools to remove frost from the freezer shelf. They can create a leak in the ammonia system.

When all frost is melted, dry the interior of the refrigerator with a clean cloth. Replace all food and set thermostat to the COLDEST temperature setting for a few hours. Then reset the thermostat to the desired setting, usually at mid setting.

NOTE: On these models the drip tray/cup is on the rear side of the refrigerator. (see FIG. 1)

Move the plastic drain tube in to a water tight bucket or container. (Access through louvered service panel on the outside of the vehicle.) As the frost melts, the water will flow into the container. When all the frost has melted wipe up the excess moisture and empty the accumulated water from the bucket. Replace the drain tube to its original position.

CLEANING

Cleaning the refrigerator is usually done after it is defrosted or put into storage. To clean the interior liner of the refrigerator, use lukevarm weak soda solution. Use only warm water to clean the finned evaporator, ice trays and shelves. **NEVER** use strong chemicals or abrasives to clean these parts as the protective surfaces will be damaged. It is important to always keep the refrigerator clean.

SHUT OFF - STORAGE PROCEDURE

Shut off the refrigerator by pressing the main power ON/OFF button to the UP (OFF) position.

If the refrigerator will not be in operation for a period of weeks, it should be emptied, defrosted, cleaned and the doors left ajar. The ice tray should also be dried and kept outside the cabinet.

CAUTION

DO NOT store explosive substances in the refrigerator, such as cigarette lighter gas, petrol, ether or the like.

Table 4

Models	S 1621, S 1631
Storage Volume (FT^3)	5,9

GAS EQUIPMENT ASSEMBLY

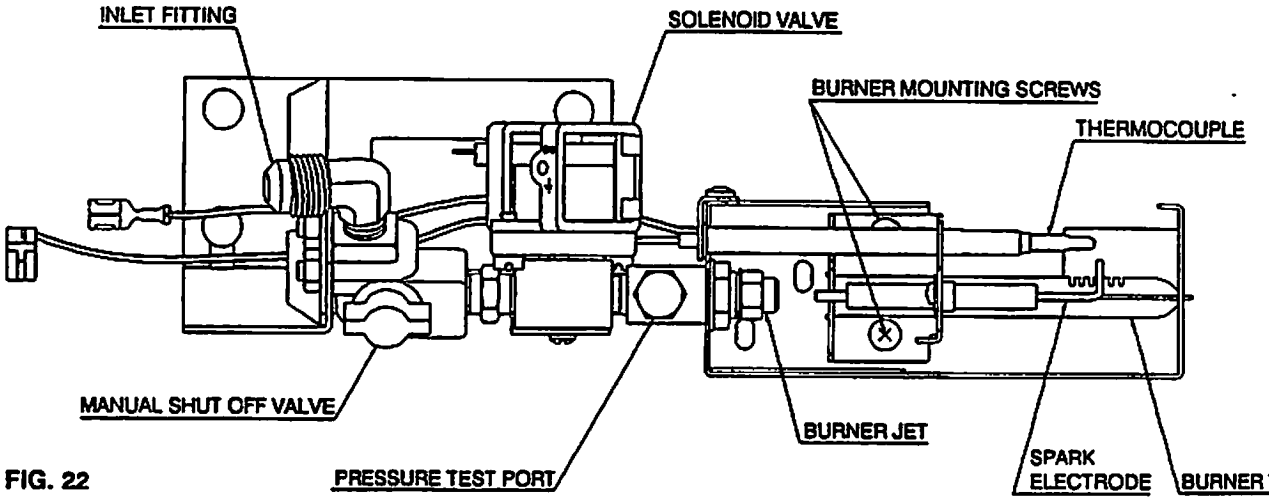


FIG. 22

ELECTRIC EQUIPMENT

CARTRIDGE HEATER

The heat necessary for the operation of an absorption cooling unit is supplied by an electric heater mounted in a pocket of the boiler system.

The 3-WAY Model is equipped with two electrical heaters, one for 120 volt AC and one for 12 volt DC.

The 2-WAY Model is equipped with one electric heater 120 volt AC.

To replace the heater proceed as follows:

1. Disconnect the wall plug, and the 12 volt wires.
2. Remove the protection cover see FIG. 1
3. Remove the pover module cover see FIG. 1
4. Disconnect the heater leads.
5. With a pair of pliers unfold the lug holding the lid of the boiler casing and open the lid.
6. Remove some insulation wool so that the heater is accessible.
7. Turn and lift the heater out of its pocket.
8. Fit the new heater into the pocket.
9. Connect the leads and put on the power module cover.
10. Reset the insulation and close the lid of the boiler.
11. Replace the protection cover.

FUSES

The 2-way AMES models are equipped with 2 fuses, one for the refrigerator control system and one for the AC cartridge heater.

The 3-way AMES models are equipped with a third fuse for the DC cartridge heater. (see table below)

To replace fuse(s) proceed as follows.

1. Disconnect the wall plug, and the 12 volt wires.
2. Remove the power module cover. See FIG. 1.
3. Snap the fuse out of the fuse holder.
4. Fit a new fuse in to the fuse holder.
5. Replace the power module cover.

Control system	3 Amp
AC heater	5 Amp
DC heater	35 Amp

MAINTENANCE & SERVICE

1. REFRIGERATOR REMOVAL

Before working on the refrigerator make sure that 120 volt AC and 12 volt DC leads are disconnected. Close the shutoff valve on the gas supply piping system. Disconnect the outgoing gas line from the gas valve at the rear of the refrigerator. (see FIG. 1.)

Loosen the screws anchoring the refrigerator to the enclosure and slide the refrigerator forward out of the compartment.

When replacing the refrigerator make sure that the sealing strips are properly positioned.

After ressemble the gas connection should be checked for leaks.

2. PERIODIC MAINTENANCE

To keep your Silhouette refrigerator operating efficiently and safely, periodic inspection and cleaning of several components once or twice a year is recommended.

A. It is important to keep the area at the back of the refrigerator clean. Check the lower vent, upper vent and area between these openings for any obstructions such as bird/insect nests, spider webs, etc. Clean the coils on the back of the refrigerator. Use a soft bristled brush to dust off the coils.

It is important to keep the refrigerator area free from combustible material, gasoline and other flammable vapors or liquids.

NOTE: AVOID SPRAYING WATER THROUGH THE REFRIGERATOR VENTS WHILE WASHING YOUR RV.

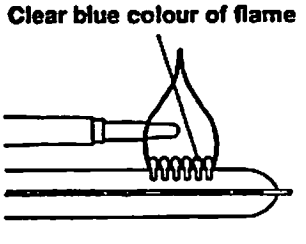


FIG. 23

B. Check all connections in the LP gas system (at the back of the refrigerator) for gas leaks. The LP gas supply must be turned on. Apply a non-corrosive bubble solution to all LP gas connections. The appearance of bubbles indicates a leak and should be repaired immediately by a QUALIFIED SERVICEMAN WHO IS FAMILIAR WITH GAS SYSTEM AND REFRIGERATORS.

WARNING

DO NOT use a flame to check for gas leaks.

C. Check the AMES control system by connecting/disconnecting 120 volt AC power, start/stop the engine, etc. Compare the operation with the operation described in description of operating modes. Side 14.
NOTE: The following maintenance is required once or twice a year, but should only be done by a qualified serviceman who is familiar with LP gas systems and refrigerators.

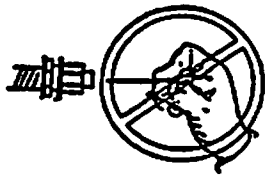
D. The LP gas pressure should be checked and the main regulator re-adjusted if pressure is incorrect. The correct operating pressure is 11 inches of water column. The correct place to take the LP gas pressure is at the test port just ahead of the burner jet. (See FIG. 22).

E. Inspect the flue baffle. It should be reasonably clean and free of soot. Heavy soot formation indicates improper functioning of the burner. The flue and burner both require cleaning in the following manner:

1. Unplug the refrigerator power cord from the 120 volt AC outlet. (See FIG. 3).
2. Disconnect or shut off the 12 volt power to the refrigerator.
3. Turn manual shutoff valve to OFF.(See FIG. 1).
4. Remove cover from the burner housing. (See FIG. 1).
5. Disconnect the wire from the high voltage electrode.
6. Remove the burner mounting screws and remove the burner assembly. (See FIG. 22).
7. Remove the flue cap from top of flue tube and lift out the wire and spiral baffle. Clean the flue from the top using a flue brush. Blowing compressed air into the flue will not properly clean soot and scale out of the flue tube. Replace spiral baffle and flue cap.
8. Clean burner tube with a brush. Blow out burner with compressed air.
9. Before removing burner jet, clean burner area of soot and scale that fell out of flue tube. Remove the burner jet. Soak the jet in wood alcohol and blow it out with compressed air. Re-install and tighten burner jet.
NOTE: The color of the flame shall be clear blue over the slots of the burner. (See FIG. 23).

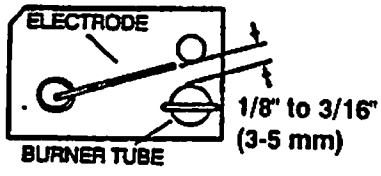
CAUTION

DO NOT use a wire or pin when cleaning the burner jet as damage can occur to the precision opening. This can cause damage to the refrigerator or create a fire hazard.



10. Reinstall burner, being careful that the end of the burner fits into the slot on the burner bracket. Check to make sure slots are centered under the flue tube and the thermocouple is positioned properly (tip of thermocouple extends over two slots of burner).
11. Be sure to reconnect the wire to high voltage electrode. Check the electrode for proper location and gap. (See FIG. 24).

FIG. 24



12. Turn on manual gas shutoff valve and check all fittings for leaks.
13. Connect 120 volt power cord to the outlet and reconnect or turn on the 12 volt DC power.
14. Check LP gas safety shoutoff. See side 6 and 7.

TROUBLESHOOTING

The Refrigerator Does Not Cool Properly

Causes and remeides

Failure of refrigeration does not necessairily indicate that the cooling system is defective. Other factors governing its operation must be checked.

1. Common.

1a. Fuse(s) blown, replace (see side 16).
1b. Check level of refrigerator.
1c. Venting problem. Restriction in air flow across cooling unit.
1d. Heavy frost buildup on evaporator fins, defrost.
1e. If the refrigerator has been operating on gas and a loss of cooling is noted, convert the refrigerator to AC power (see start up instructions side 13).
If the refrigerator has been operating on AC, switch to gas operation. This will determine if a component failure in the electric or gas controls is causing the cooling fault. After the refrigerator has been converted from one power source to the other (gas to AC, or AC to gas) allow time to assure the unit is cycling properly. At the end of the period the freezer plate should start to cool.

1f. A minimum of 9.6 volt DC supply present for the refrigerator control system.

1g. The thermostat can not be moved from MID position to the desired setting. The display module has became non functional. See limp mode of operation (side 14).

1h. The refrigerator is running continuously and cool to much.
The temperature sensing device has became non functional. See limp mode of operation (side 14).

2. **Gas operation only.**

2.1 The refrigerator will not operate on gas when AC is present.
The display module has became non functional. See limp mode of operation (side 14).

2.2 Burner jet clogged. Clean see Section Maintenance/service, Item 2. Periodic maintenance, Paragraph E. Item 9.

2.3 Flue baffle not inserted properly in flue tube (see side 4 FIG. 1).

2.4 Burner dirty. Clean. See Section Maintenance/service, Item 2. Periodic Maintenance, Paragraph E. Item 8.

2.5 LP gas pressure low at burner.
Set main regulator so pressure does not drop below 11 inches water column at pressure test port (see side 16 FIG. 22).

2.6 Burner not located properly under flue tube, relocate.

2.7 Burner damage, replace.

ODOR FROM FUMES

CAUSES AND REMEDIES

A. The flame touches side of the boiler due to dislocation of the burner. Relocate. Burner dislocation may also cause smoke and discoloring of walls and ceiling.

B. Burner damaged. Replace.

All the above instructions are to be followed closely. The refrigerator is quality-guaranteed. However, we are not responsible for any failures caused by improper adjustments and unfavorable installation conditions. Contact service point or distributor service dept. for assistance.

Replacement Parts Suppliers: See page 1.

ROOF AIR CONDITIONING

OPERATING INSTRUCTIONS

A. **CONTROLS:**
   1. The selector switch has eight positions including "OFF", this is the left knob and controls fan speeds, heating mode and cooling mode.

   2. The thermostat is located on the right side and controls the temperature range from 65° on the coldest side to 90° on the warmest side. The compressor ON/OFF is controlled by the thermostat setting in the cooling mode.

B. **COOLING OPERATION:**
   1. Set the thermostat at the desired temperature level.
   2. Select the fan speed that best satisfies your needs:
      a. HI COOL: Selected when maximum cooling and dehumidification are required.
      b. MED COOL: Selected when normal or average cooling is required.
      c. LO COOL: Selected when room is at desired comfort level and needs to be maintained. Normally this speed is used for night time operation.

NOTE: The blower runs continuously to circulate air and maintain an even temperature. The compressor will come on as cooling is required to maintain the selected temperature level.

C. **FAN OPERATION:**
   This will circulate the air in your RV without cooling or heating. There are three positions: HI FAN; MED FAN; OR LO FAN to select from.

D. **HEATING OPERATION:**
   (with optional heat kit installed)

NOTE: This electric heater will not replace a furnace or heating your RV in cold weather. The intent is to remove the chill on cool days or mornings.

Turn the selector switch to "OPT. HEAT."

The fan and heater will run continuously on low speed.

NOTE: If the optional heater is not installed and "OPT. HEAT" is selected, the fan will run as a "LO FAN" operation.

E. **"OFF" POSITION:**
   All power to the air conditioner is off.

F. After shutting the air conditioner down with either the selector switch or thermostat, wait at least two (2) minutes before restarting. This allows the refrigerant pressure to equalize and the compressor to easily restart.

MAINTENANCE

AIR FILTERS: Periodically remove the filter/grille assemblies located in the air box and clean. Remove the assemblies by placing fingers on the long portion of latches and with an over-and-downward pressure, unlatch the catches. After assemblies are removed, wash the filter/grille assemblies with soap and warm water. Let assemblies dry and then reinstall.

FROST FORMATION ON COOLING COIL: Under certain conditions, frost may form on the evaporator coil. If this should occur, inspect the filter and clean if dirty. Make sure air louvers are not obstructed. Air conditioners have a tendency to frost when the outstide temperature is relatively low. This may be prevented by adjusting the thermostat control knob to a warmer setting (counterclockwise). Should frosting continue, operate on low, med, or high FAN setting until the cooling coil is free of frost.

NOTE: Never run the air conditioner without return air filters in place. This may plug the unit evaporator coil with dirt and may substantially affect the performance of the unit.

The ability of the air conditioner to maintain the desired inside temperature depends not only on the heat gain of the vehicle but also some preventative measures taken by the occupants. During extreme outdoor temperatures, the heat gain of the vehicle may be reduced by:

Parking the vehicle in a shaded area;
- Using window shades (blinds and/or curtains);
- Keeping windows and door shut;
- Avoiding the use of heat producing appliances.
-

Starting the air conditioner early in the morning and giving the system a "head start" on the expected high outdoor ambient will greatly improve its ability to maintain the desired indoor temperature.

CAUTION

The manufacturer of this air conditioner will not be responsible for damage caused by condensed moisture on ceilings or other surfaces. Air contains moisture and this moisture tends to condense on cold surfaces. When air enters the vehicle, condensed moisture may appear on air registers, ceilings, windows, etc. The air conditioner removes this moisture from the air during normal operation. Keeping doors

ROOF AIR CONDITIONING (CONTINUED)

and windows closed when this air conditioner is in operation will minimize condensed moisture on cold surfaces.

For a more permanent solution to a high heat gain, accessories like A&E outdoor patio and window awnings will reduce the heat gain by removing the direct exposure to the sun, and add a nice area to enjoy company during the cool of the evening.

SERVICE -- UNIT DOES NOT OPERATE

If your unit fails to operate or operates improperly, check the following before calling your service center.

A. If RV is connected to motor generator, check to be sure motor generator is running and producing power.

B. If RV is connected to power supply by a land line, check to be sure line is fixed properly to run air conditioner load and it is plugged into power supply.

C. Check your fuse or circuit breaker to see if it is open.

D. In the air conditioner air box, check to be sure the air conditioner conduit is plugged into the selector switch box. (Reference Figure on Page ?????)

E. After the above checks, call your local service center for further help. This unit must be serviced by qualified service personnel only.

When calling for service always give the air conditioner Model Number and Serial Number. This information can be found on unit rating plate located on the air conditioner base pan. To locate, remove return air grill from air box and look up through the 14" X 14" opening in the ceiling. (Reference Figure on Page ???)

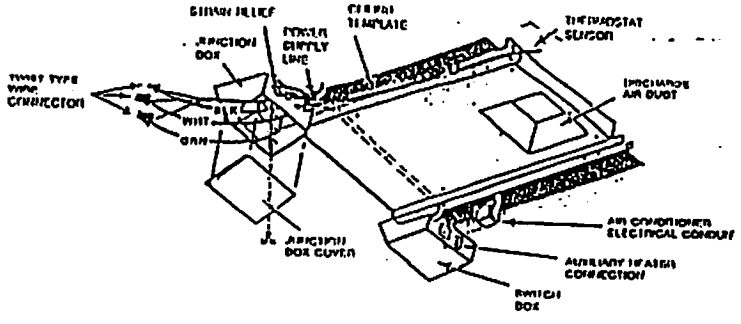
ELECTRIC HEAT
WILL TAKE THE CHILL OFF THOSE COOL

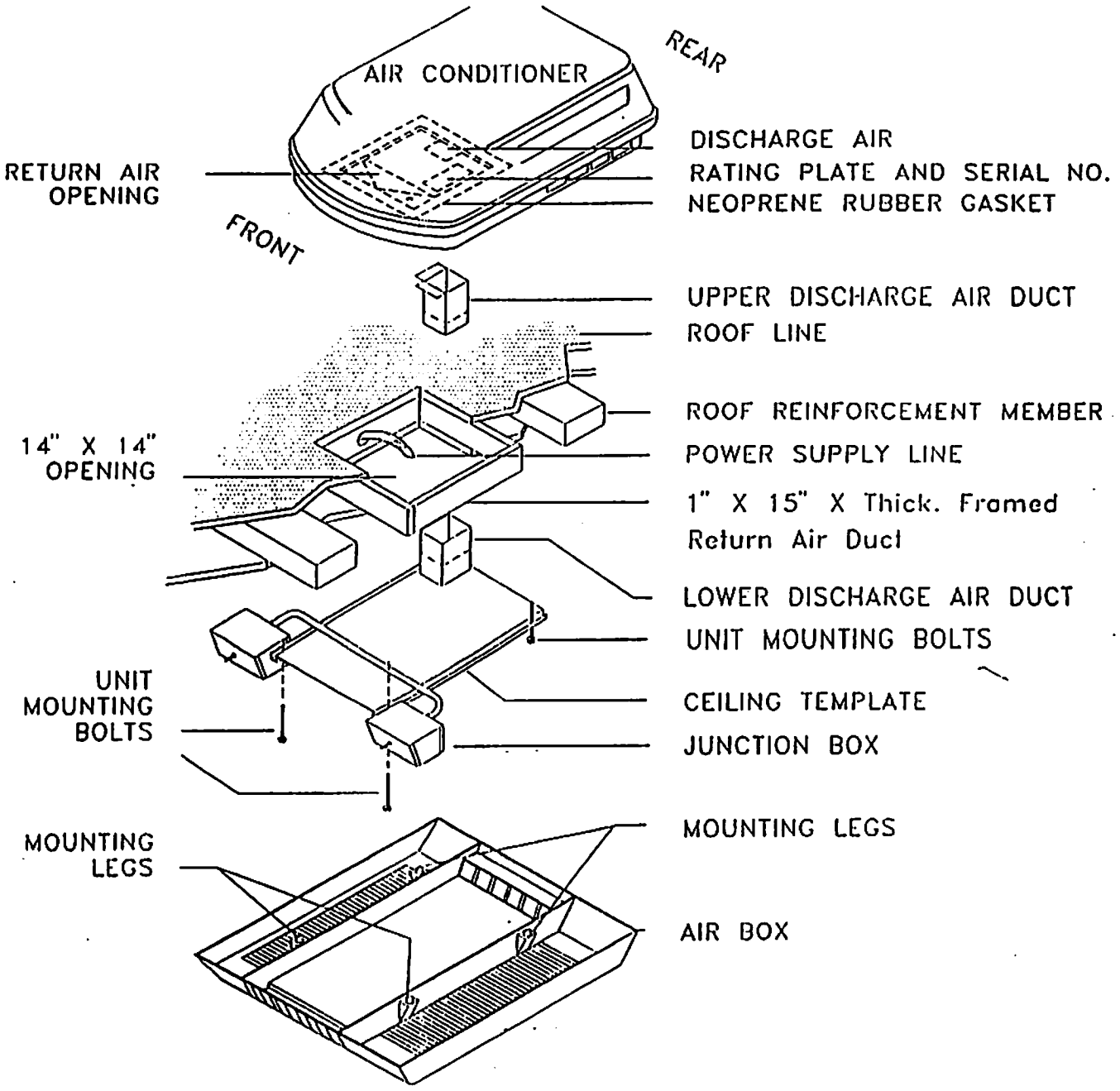
NIGHTS AND MORNINGS

Did you purchase an Electric Heat Strip for your new air conditioner?
Contact your Dealer and ask for a 3101121 Heat Strip.

You won't regret having it to remove the chill from the air on those cool morning and evening hours during the camping season.

It's simple to add our 5600 BTU Heat Strip to your air conditioner as your unit is completely pre-wired.




AIR CONDITIONER
REAR
FRONT
RETURN AIR OPENING
DISCHARGE AIR
RATING PLATE AND SERIAL NO.
NEOPRENE RUBBER GASKET
UPPER DISCHARGE AIR DUCT
ROOF LINE
ROOF REINFORCEMENT MEMBER
14" X 14" OPENING
POWER SUPPLY LINE
1" X 15" X Thick. Framed Return Air Duct
LOWER DISCHARGE AIR DUCT
UNIT MOUNTING BOLTS
UNIT MOUNTING BOLTS
CEILING TEMPLATE
JUNCTION BOX
MOUNTING LEGS
MOUNTING LEGS
AIR BOX

ELECTRICAL SYSTEMS

ELECTRICAL SYSTEMS – The REVCON motor home is equipped with several sources for electrical power, as follows:

1. 12 volt house battery.
2. A 12 volt alternator which is part of the motorhome chassis.
3. A 120 volt alternating current motor generator set.
4. A 120 volt alternating current external power supply.

Batteries -- Your motorhome has two battery systems, one of which is primarily associated with the chassis; and the other, with the coach system. The chassis battery is a heavy-duty, permanently sealed long-life battery, with 500 cold cranking amperes. The coach batteries are heavy-duty 200-ampere hour batteries. Your motorhome electrical system is designed so these batteries may be charged by the motor generator set, or with an external power supply through the DC converter. The chassis battery is charged by the chassis engine-drive alternator.

Dual-Battery System – The house battery system is connected to the 12-volt system of the coach, through a cut-off switch located at left of front entry. The "OFF" position cuts all power to coach 12-volt systems, and should only be used in conjunction with starting the motor generator set. When the motor generator set is running, the house batteries receive a charge from the special battery-charging coils. The batteries are also wired to the DC converter so that they will receive a charge when the converter is operating.

While driving for battery charging purposes, the dual battery system has an isolator which connects the two battery systems together. When using this system, the isolator automatically charges both battery systems while driving. Immediately upon stopping, the isolator will switch so that the chassis battery will disconnect from the coach batteries and retain its full charge.

NOTE: To operate the motor generator set and draw power through the 120-volt circuits, the power cord must be plugged into the 30 amp receptacle located near the power cord.

120-Volt Utility Service – The commercial 120-volt AC utility service outlet provided by the campground should supply enough electricity to meet the needs of the entire motorhome. It is capable of powering the air conditioning, convenience outlets from which 120-volt electrical appliances can be operated, and also through the power-converter, it is capable of supplying current for all of the appliances which otherwise would be powered by the 12-volt battery.

In connecting to the external source, it is extremely important to be sure that the three-wire system is connected so the motorhome will be properly grounded; and especially for operating the roof air conditioner, it is essential that the size of the wire in the power cord be large so that a minimal voltage drop is caused by the power line itself. Roof air conditioners and other appliances will not operate properly if a long power cord of small wire-size is used. Damage to these appliances may result, and the wire itself overheat or burn up.

Power Distribution System – From whatever source the electrical power is derived, it must be converted, controlled, and conveyed to the power using appliances by a distribution system. This system consists of converters, wires, switches, fuses, circuit breakers, etc.

The Power Converter – Your REVCON operates on what is known as the uni-volt system. Under this system almost all of the appliances operate on 12 volts. A power converter transforms 120 volts down to 2 volts between the motor-generator set or the external power source, and the 12 volt circuits of the vehicle. The only major appliances which cannot be made to operate on 12 volts are the roof air-conditioner, and a few high-wattage electrical appliances such as toasters, electric frying pans, irons, etc.

The DC converter is located to the right side of the coach to the rear. The shore power access door may be unlocked with the aluminum Hudson key. The power converter should be kept clear of obstructions which could reduce air flow through and around this unit. Since these units generate considerable heat, keeping them clean eliminates a potential fire hazard.

Main Switches – It is important for the owner to understand the use of various switches, fuses, and circuit breakers which control the distribution of power. The main breaker panel location may be found on the 120-volt electrical distribution schematics. The breaker panel is marked to indicate which breaker controls a particular circuit and the particular appliances and outlets on such circuit.

Fuses and Circuit Breakers – There are four (4) sets of fuses and circuit breakers, as follows:

1. A set that protects the 12-volt house electrical system. These are found in the 12-volt distribution panel.
2. A set that protects the house 120-volt system. These are found in the 120-volt distribution panel.
3. A set that protects the main breaker box and rear air conditioner.
4. A set to protect the generator. These push button

ELECTRICAL SYSTEMS (CONTINUED)

breakers are on the motor generator set.

Ground Fault Interrupt -- This device protects you against hazardous electrical shock caused if your body becomes a path for electricity to travel through to reach ground. This can happen when you touch an appliance or cord that has become "live" through faulty mechanism, damp or worn insulation, etc. You don't even have to be standing on the ground itself to be shocked; you could be touching plumbing or other structural material that leads to ground.

When protected by Ground Fault Interrupt (GFI), you may still feel a shock, but the GVI will cut it off quickly enough to avoid electrical injury to a person in normal health. (Infants and very small children may still be affected.)

WARNING: The GFI will not protect against line-to-line shocks (like the kind gotten by touching metal objects inserted in both straight slots of an outlet); or current overloads or line-to-line short circuits. The fuse or circuit breaker at the distribution box or panel must provide such protection.

GFI Test Procedure -- Like a fire extinguisher or other safety device, your GFI receptacle should be checked every month to make sure it is operating properly to protect you. Follow these simple instructions and then enter the date of the test on the reverse side of your test card:

1. Push the rectangular red "TEST" button. The round white "RESET" button should pop out, exposing its white band. This indicates the device is working properly. Power will now be off at all outlets protected by the GFI. Verify by plugging a test lamp into such outlet. (If this receptacle has a red indicator light to right of the "RESET" button, you may observe it instead of a test lamp.) Lamp and/or indicator light should be unlit.

CAUTION: If "RESET" button does not pop out or if test lamp or indicator light remains lit when "RESET" button does pop out, do not use any outlets on the circuit. Call a qualified electrician.

2. If the GFI tests out okay, restore power by pushing the round "RESET" button back in. Test lamp and/or indicator light should light.

Some REVCON motorhomes have a GFI circuit breaker located in the main breaker box. This device should be checked every month to verify operation. You may test the device monthly by the following procedures:

1. Check to verify that panel is energized.
2. Check to verify that breaker is in "ON" position.
3. Press the "TEST" button. The handle must trip to center position. If it does not, have an electrician check for connection.
4. Reset the breaker by moving the handle to "OFF" and then "ON."
5. Record test date on the test card provided.

Maintenance of Electrical Systems -- Before starting out on a trip, all electrical appliances should be checked to be certain they are in working condition.

Batteries should always be kept near full charge condition. At extremely cold temperatures, a discharged battery may freeze and be ruined. Also, battery fluid level should be checked regularly, particularly in hot water. Low battery fluid will damage battery plates and shorten battery life.

The charge of a battery can be measured either with a volt-meter or with a hydrometer. A fully charged battery should have an open-circuit voltage, after standing idle for about five (5) minutes, of from 12.4 to 12.7 volts at 80°F. The specific gravity of a fully charged battery should be about 1.260 per cell at 80°F. Figures below these levels will indicate a partial discharge.

Distilled water should be added to batteries as necessary to bring electrolyte to the proper level. Chemical accumulations around terminals should be removed with hot water containing baking soda, followed by a thorough flushing with clear water.

CAUTION: Don't get any baking soda solution in the battery itself because the electrolyte will be naturalized and battery will go dead.

Battery cable terminals should be moved from time to time, cleaned and retightened on the terminal posts.

Battery connections to ground and to major terminal junctions should be checked for tightness. If the engine ground wire has been found to be missing, a separate ground wire should be connected to the engine and to the chassis.

Main switches should be normally kept in the off position when the appliances they control are not being used so there is no heavy load on the motor generator set when it is being started or stopped. In general, heavy-power-using appliances should be turned off whenever the motor-generator-set is being started or stopped. In fact, many owners consider it good practice to let the motor-generator set warm-up for a few moments before calling on it to carry the load of a major appliance.

ELECTRICAL SYSTEMS (CONTINUED)

1. **AC PANEL BOARD** – When 120 VAC is connected to Power Center via commercial power or AC generator, the 120 VAC circuits are protected by the breakers contained in the AC PANEL BOARD.

2. **12 V DC FROM POWER CONVERTER SECTION** – When 120 VAC is connected to the Power Center via commercial power or AC generator, and the circuit breaker controlling the POWER CONVERTER Section is "ON," the POWER CONVERTER Section will convert the 120 VAC to 12 VDC and is instantly switched – via the Automatic Relay – into the 12 VDC RV circuits to operate the 12 volt lights and motors. A cooling fan will come on when certain temperatures are reached in the lower section. Equipment limited to operation from 12 volt battery power only – including 12 volt TVs, radios, stereos, infiltrated fluorescent lights – must be connected to the fused battery circuits of DC DISTRIBUTION PANEL OR RV battery line.

   DO NOT connect equipment requiring more than 3 amps to terminal "B."

   AUTOMATIC-RESET THERMAL BREAKER – A protective Thermal Braker will "break" the 120 VAC power to POWER CONVERTER Section of Power Center if POWER CONVERTER becomes overheated – by operation above its maximum limit for an extended period of time or obstruction of ventilation to unit.

   POWER CONVERTER Section will instantly switch 12 volt light and motors to battery.

   In either case, the Thermal Breaker will reset itself after a period of time, and the lights and motors will again resume operation from POWER CONVERTER Section – only to shortly again "break." When this occurs, take immediate steps to correct cause of overheating. A portion of RV 12 volt load – lights or motors or both – should be turned off to reduce total load. Also, inspect POWER CONVERTER Section to make certain ventilation is not obstructed.

3. **12 V DC FROM STORAGE BATTERY** – When 120 VAC is NOT connected to Power Center via commercial power or RV generator, the POWER CONVERTER section – via its Automatic Relay – will switch RV battery into the circuit for power to operate 12 volt lights and motors.

   When 120 VAC is again available, connect it to Power Center. The POWER CONVERTER Section – through its Automatic Relay – will be brought back into circuit.

   When operating RV 12 volt equipment from RV battery, it is recommended that the amount of equipment in use by reduced – to conserve battery. Gradual dimming of lights and slowing of motors indicates low battery voltage. If 12 volt equipment will not operate from RV battery, check wiring between 12 DC DISTRIBUTION PANEL in Power Center and battery. If this line is fused and fuse is "blown," inspect for overload or "short." DO NOT install oversize fuse. Make certain battery is fully charged – see No. 5 below.

4. **DC DISTRIBUTION PANEL** – The DC DISTRIBUTION PANEL is located behind hinged door of Power Center. This panel contains circuits with replaceable fuses for protection of RV 12 volt light and motor lines.

   If any line is loaded beyond the capacity of its fuse, the fuse will "blow." A portion of the 12 volt load on the line – lights and/or motors – should be turned off to reduce total load on the line below the capacity of the fuse. Replace fuse with same size fuses. DO NOT install larger fuse than indicated.

   If this reduction of load on the line does not stop the "blowing" of the replaceable fuses, there may be a "short" along the 12 volt line or at a nonfused 12 volt motor on the line. Check the RV 12 volt line and equipment on the line. Locate the "short" and take the necessary steps to repair it.

IMPORTANT

If 12 volt lights and motors will NOT operate as indicated above, check to make certain 120 VAC power is properly attached to RV. Also, make certain the AC breakers in the AC PANEL BOARD indicate "ON."

5. **BATTERY CHARGING SECTION** – Units with Option C contain an automatic, solid-state Battery Charging Section. When 120 VAC power is connected to Power Center, the Charging Section will automatically "sense" the condition of RV battery. If it is below "full charge," the Charging Section will start changing the battery.

   If RV battery has been drawn down quite low, it will be charged at a relatively high amperage rate. If battery has not been severely drained, it will be charged at lower amperage rate. The rate of charge will decline as the battery reaches "full charge." After battery reaches "full charge," the Charging Section will drop back to "maintenance" level. It will not resume active charging until battery again falls below "full charge." If your storage battery cannot be charged as described

ELECTRICAL SYSTEMS (CONTINUED)

above, it is possible the battery is defective – see "Battery Maintenance" below.

STORAGE BATTERY MAINTENANCE

WARNING: Before inspecting or servicing storage battery, read and follow battery manufacturer's cautions and directions.

Your RV storage battery must be properly maintained so it can perform its functions. The following suggestions – plus those of battery manufacturer – will help your storage battery:

1. The battery must be in good condition with water at proper level when first installed in RV.
2. When 120 VAC is connected to Power Center, check battery once a week. As battery ages, it will usually need water added more often.
3. If 120 VAC is not connected to Power Center, it should be reconnected to Power Center once a month for 8-12 hours to "recharge" battery.
4. If you store battery outside of RV, a battery charger should be connected to it at least once a month to recharge battery.
5. Do not allow battery to remain in discharge condition – it will become sulfated and not accept a proper "charge."

Some situations which may indicate need for battery replacement are:

1. The loss of more water in one cell than others.
2. Continuous loss of water in all cells – perhaps accompanied by overheating of battery, gassing and extreme bubbling.
3. A marked difference in the specific gravity reading between one cell and others.

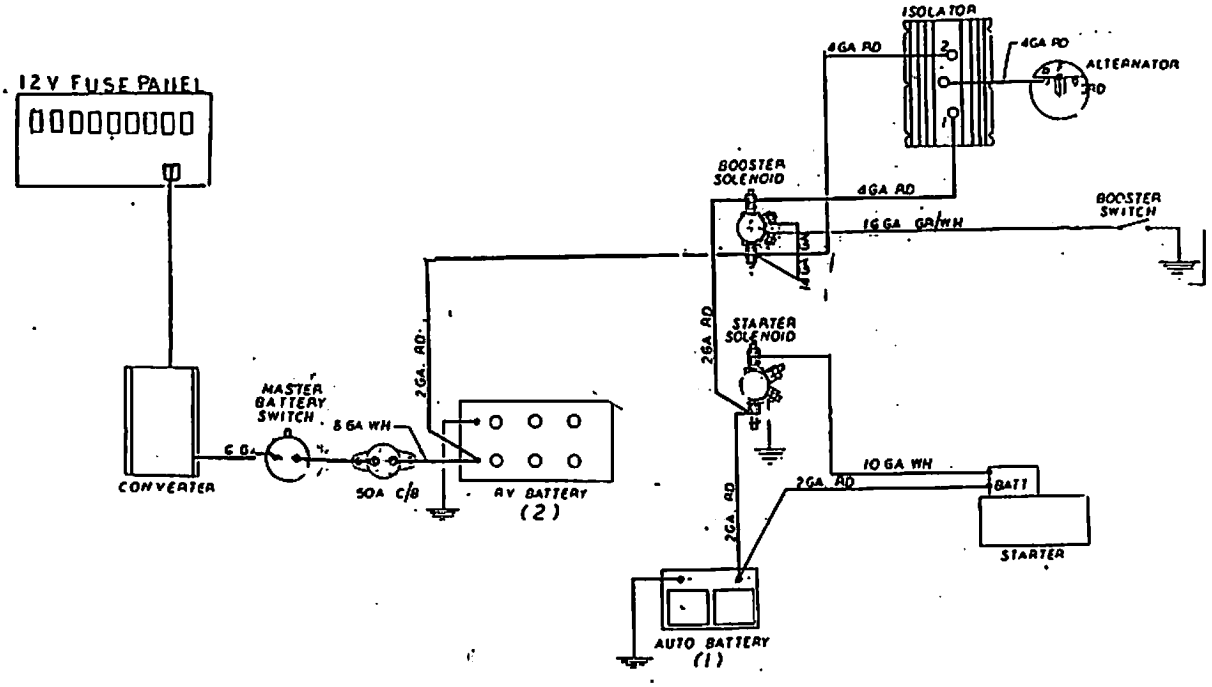
6. **LIMITED WARRANTY** – The Limited WARRANTY covers each new Power Center – for original owner only – for one year from date of purchase against defects in original parts or workmanship. It agrees to repair or replace such defects – without charge for parts or labor – if the defective unit is returned prepaid to Kokomo, IN within this first year.

   Responsibility is not assumed for damage due to accident, faulty wiring of RV 12 volt electrical system to Power Center, use of incorrect wire sizes in conjunction with Power Center, installation of oversize fuses, overload of Power Center beyond the specified maximum continuous load limit, or installation of Power Center other than recommended or approved by manufacturer.

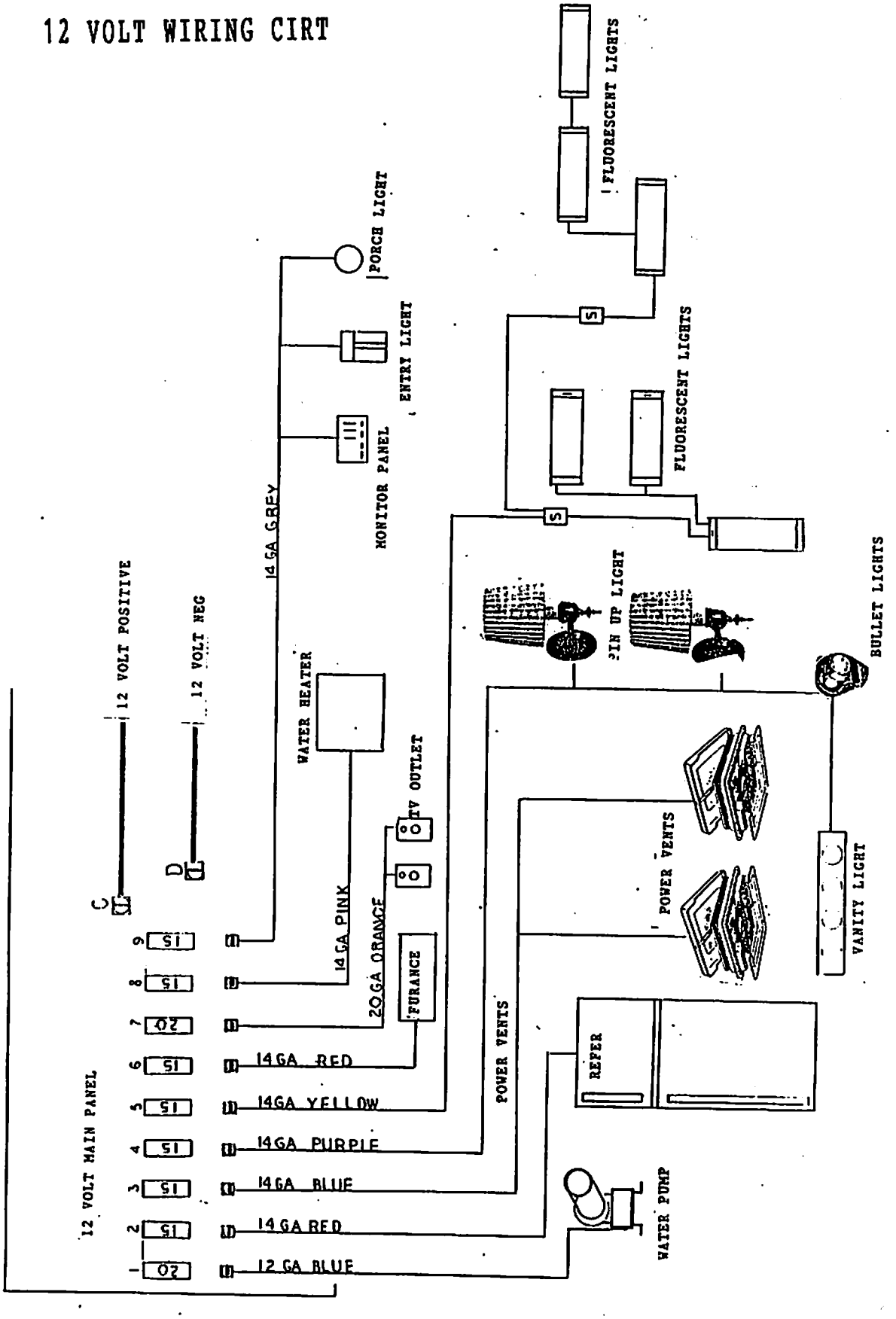
   For assistance, contact our Customer Service Department – include series and model numbers, option code and date of RV purchase, plus make and model of RV. Repair work not covered by the above Warranty Program – and repair for secondary owner – will be made at a nominal charge.

   Customer Service Department
   721 North Webster Street
   Kokomo, IN 46901
   Telephone: (317) 452-5444

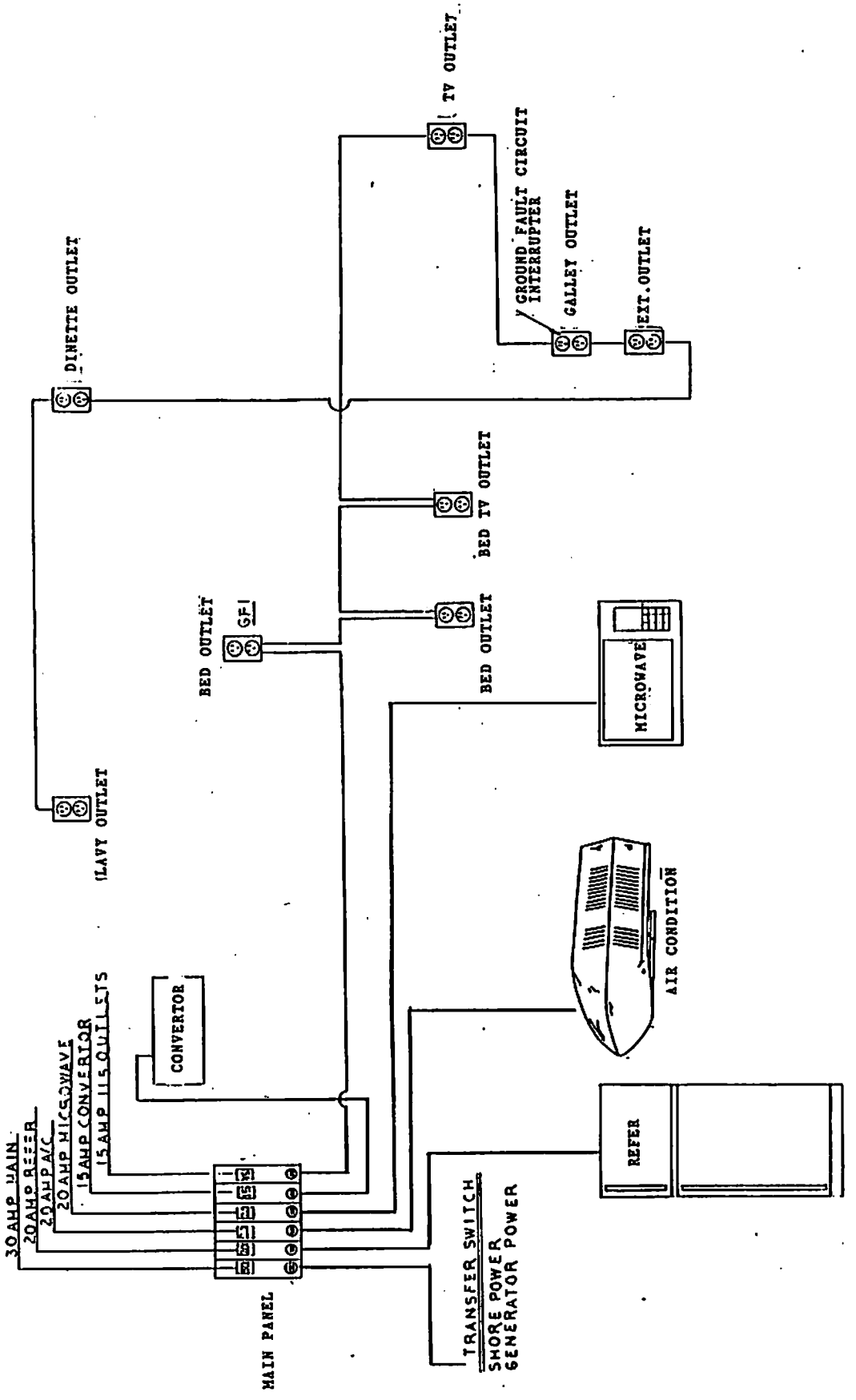
12 VOLT BATTERY LAYOUT



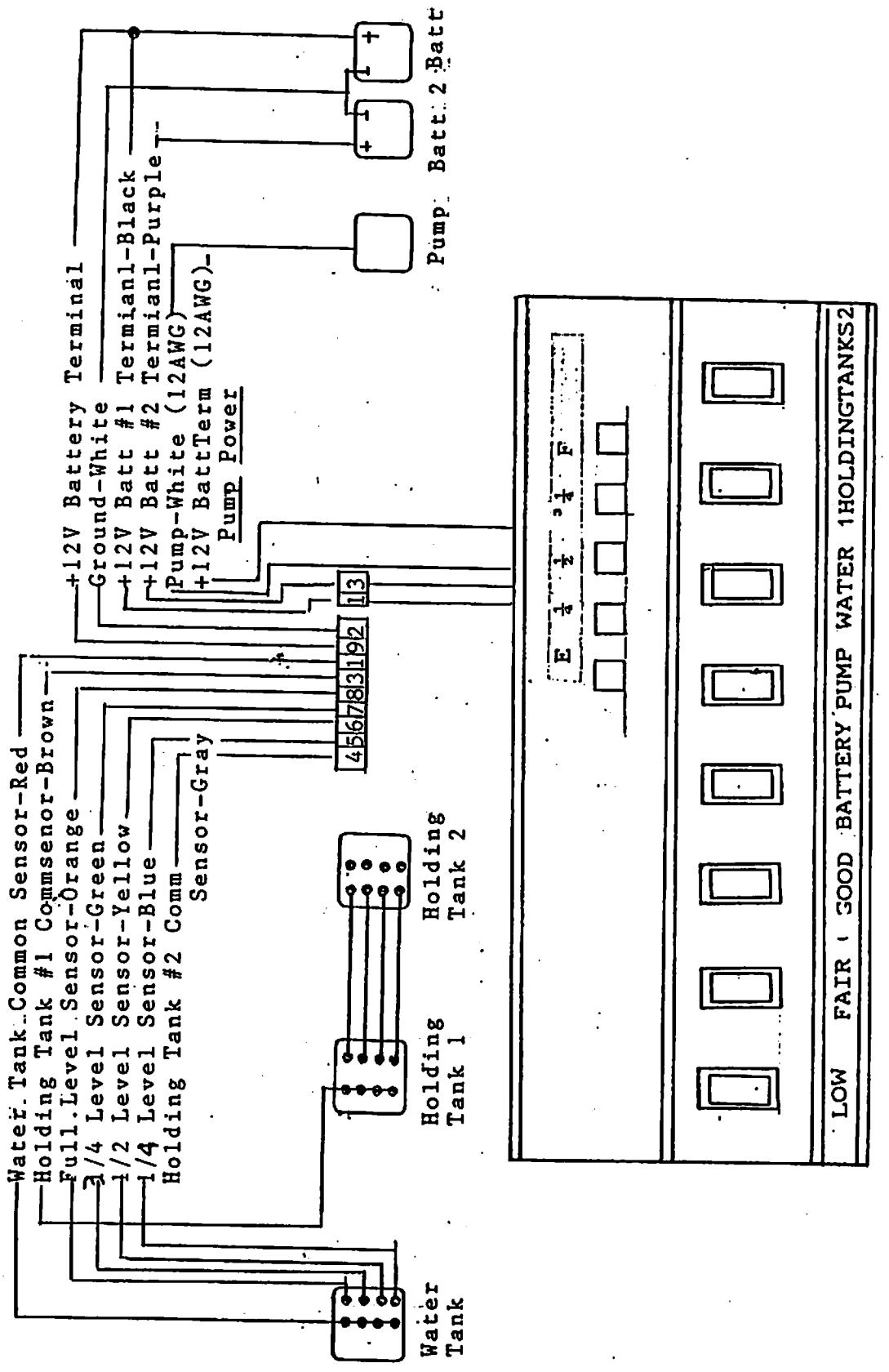
12 VOLT WIRING CIRT

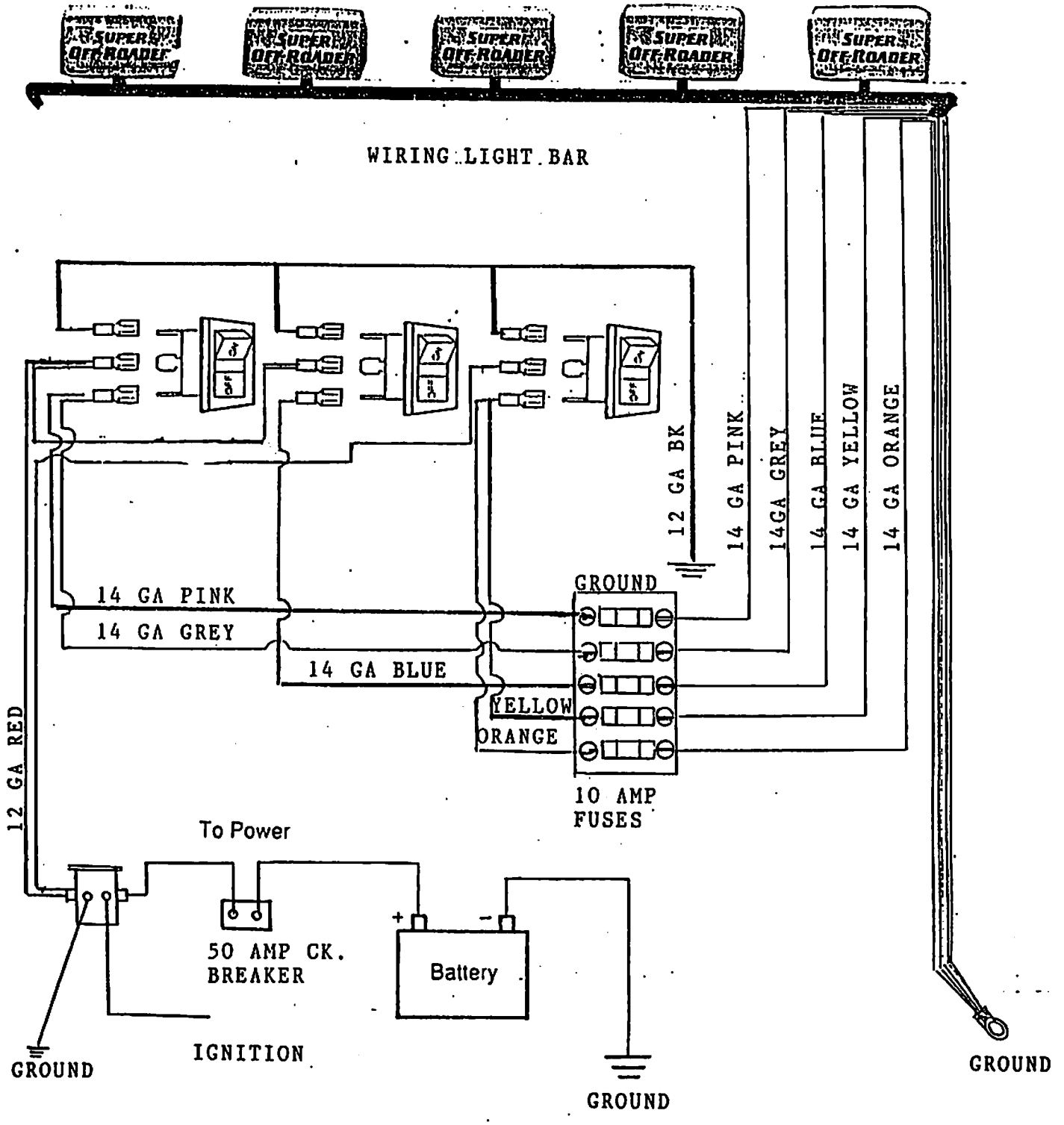


115 VOLT MAIN PANEL LAYOUT

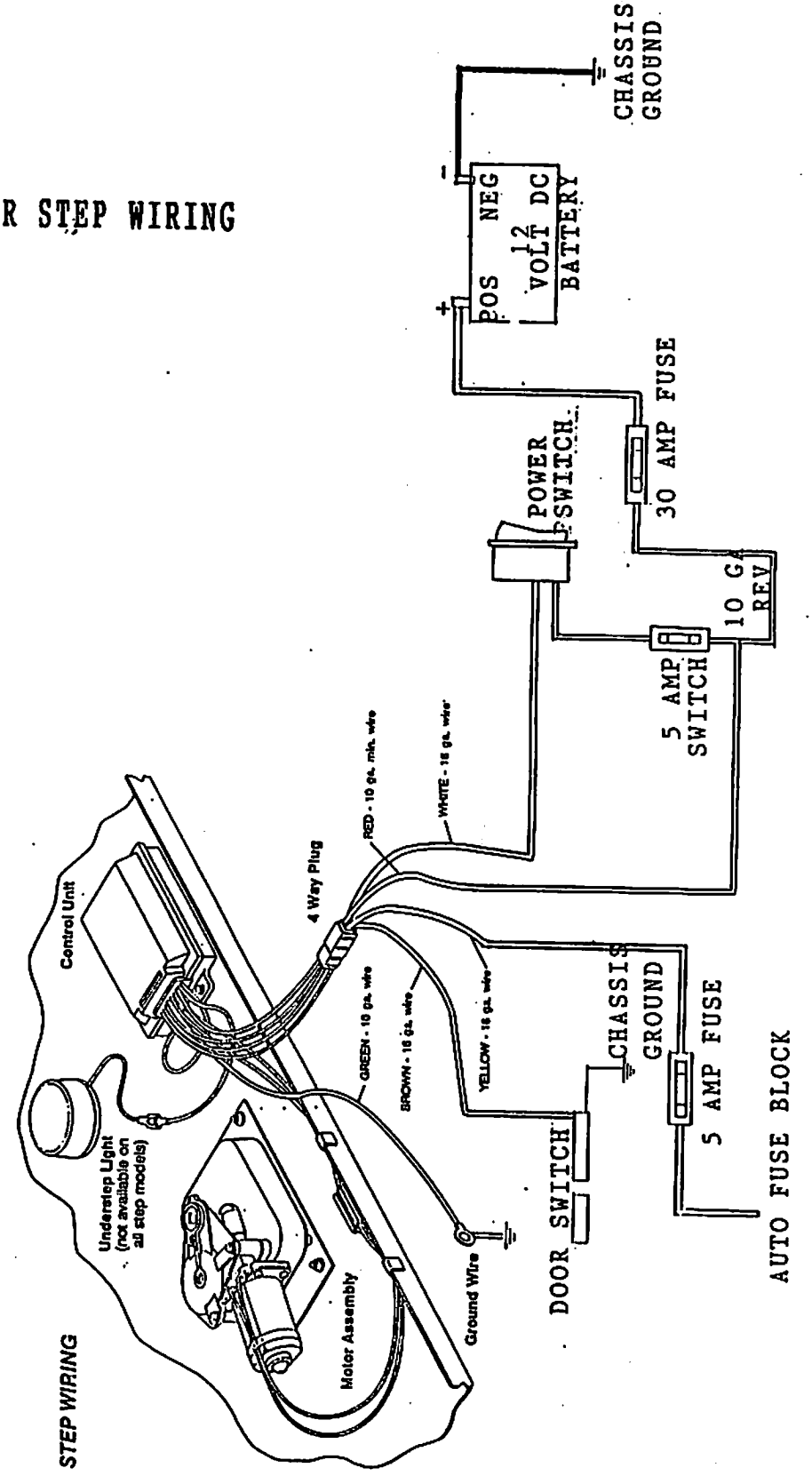


TANK MONITOR PANEL




WIRING LIGHT BAR
12 GA BK
14 GA PINK
14GA GREY
14 GA BLUE
14 GA YELLOW
14 GA ORANGE
GROUND
14 GA PINK
14 GA GREY
14 GA BLUE
YELLOW
ORANGE
10 AMP
FUSES
12 GA RED
To Power
50 AMP CK.
BREAKER
Battery
+
-
GROUND
IGNITION
GROUND
GROUND

ENTRY DOOR STEP WIRING



MOTOR GENERATOR SET

This manual covers operation and maintenance for the MicroLite (KY) generator set. Study this manual carefully and comply with each of its warning and cautions. The owner is responsible for maintaining the generator set according to the maintenance schedule. Using the generator set properly and performing regular maintenance can result in longer generator set life, better performance, and safer operation.

The Operating Recommendations section covers the break-in procedure and the effects of high altitude and variations in climate. The Wattage Requirements section describes the wattage capacity of the generator set and lists typical wattage use of common appliances and tools. Familiarize yourself and others who will operate this set with this information.

This manual also covers generator set storage, basic troubleshooting, maintenance, how to obtain service, and generator set specifications. Keep this manual and the installation manual (981-0627(with the other vehicle manuals.

MODEL IDENTIFICATION

Always use the complete model and serial number when contacting an Onan dealer or distributor for parts, service or product information. The model number (which includes the specification number) and the serial number are printed on the nameplate located behind the access cover (Figure 1).

To make your model and serial number easy to find when you need them, record all of the numbers that appear in the model number and serial number area on your Onan nameplate in the area provided in Figure 1. It is important to record every number and letter in order to identify the set correctly.

COMPONENT LOCATIONS

The standard control panel and routine maintenance items are located behind the access cover (Figure 2).

To remove the access cover: Rotate the fasteners on the access cover one-quarter turn clockwise so the arrows point to the right. Pull the top of the cover away from the housing.

To secure the access cover: Position the bottom of the cover over the base. Push the top of the cover in and turn fasteners one-quarter turn counterclockwise so the arrows point up.

WARNING: Operation of the generator set with the access cover removed can result in severe personal injury or equipment damage. Hot components are exposed when the access cover is removed and generator set cooling air does not circulate properly. Do not operate the generator set with the access cover removed.

Control Panel

This section describes the features of the standard control panel and the optional remote control panel.

STANDARD CONTROL PANEL

The standard control panel is mounted behind the access cover on the generator set (Figure 3). The standard control is used for starting and stopping the set from the generator set compartment.

Control Component Descriptions

Start/Stop Switch: Starts and stops the set. The set can also be operated from an optional remote control (if equipped).

Control Fuse: Provides protection for the control wiring and remote wiring from a short circuit.

Line Circuit Breaker: Protects the generator from a short circuit or an overloaded circuit. If the breaker opens (trips), remove the load from the genset before resetting.

REMOTE CONTROL PANEL (OPTIONAL)

An optional remote control enables the generator set to be operated from inside the RV living quarters or driver's compartment. Two remote control panels are available: The Standard Remote Control and the Deluxe Remote Control (Figure 4). The control features for these two models are described below.

Standard Remote Control: This model has a start/stop switch with an indicator lamp that lights when the set is running.

Deluxe Remote Control: This model has the same features as the Standard Remote Control plus a running time meter and a battery condition meter.

The Running Time Meter indicates the total operating hours on the generator set. Use this meter to keep a record of periodic maintenance.

The Battery Condition Meter indicates the condition of the battery and the battery charging circuit. The indicator should remain in the normal zone. If it reads consistently high or low, contact an Onan service center for assistance.

PRE-START CHECKS

MOTOR GENERATOR SET (CONTINUED)

ENGINE OIL

Check the engine oil level before each start. If adding oil between changes, use the same brand because different brands might not be compatible when mixed. Be careful not to overfill the crankcase. Overfilling will cause the oil to foam, resulting in engine shutdown.

Use premium quality motor oil with the API (American Petroleum Institute) designation SG on the container.

Checking Engine Oil Level

Make sure that the generator set is level and that it has cooled down. Do not check the oil level while the generator set is running.

WARNING: Hot oil can cause severe personal injury. Do not check the oil level while the generator set is running because hot oil could blow out of the oil fill tube causing burns.

1. Remove the oil level indicator and wipe it with a clean rag.
2. Insert the oil level indicator into the oil filler neck. It is not necessary to screw the indicator in to obtain an oil level reading.
3. Remove oil level indicator and check the oil level on the indicator stem.
4. Add oil very slowly until the Full mark is reached.
5. Insert the oil level indicator into the filler neck and screw in securely to prevent oil leakage.

EXHAUST CHECK

Thoroughly inspect the exhaust system for leaks or corrosion. Have any problems repaired before operating the generator set.

WARNING: Exhaust gas presents the hazard of severe personal injury or death. Make certain that all exhaust components are operational and that there are no exhaust leaks.

Do not start the set if exhaust gases will not effectively expel away from the vehicle. Be aware that any vent, window or opening that is not permanently sealed form the vehicle living space can be an avenue for carbon monoxide.

WARNING: Exhaust gases can cause severe personal injury or death. Never operate the generator set unless the exhaust outlet is clear of walls, snow banks, or any obstructions that can prevent exhaust gases from dissipating. Never operate any exhaust fan in the vehicle when the generator set is running: an exhaust fan can drawn exhaust gas into the vehicle.

FUEL CHECK

Carefully inspect the fuel system for leaks or corrosion. Have any problems repaired immediately.

WARNING: Gasoline presents the hazard of fire or explosion that can result in severe personal injury or death. Make sure that there are no fuel leaks. Do not smoke or allow any flame, spark, pilot light, arc-producing equipment or other ignition source near the fuel system. Keep a type ABC fire extinguisher nearby.

Make sure that the fuel tank is full and that the fuel line supply valve (if equipped) is open.

Gasoline fuels deteriorate over time causing fuel system corrosion and the formation of gum and varnish-like deposits. Fuel deposits cause hard starting and rough engine operation. If the generator set will not be operated for more than 120 days, a fuel preservative and stabilizer should be used to protect the fuel system (refer to the Generator Set Storage section).

Recommended fuel

Use clean, fresh regular unleaded gasoline. Regular leaded gasoline can also be used; however, leaded gasolines cause increased engine deposits and shorter spark plug life.

Gasoline that is blended with alcohol (gasohol) can be used if it contains the correct mixtures and additives as follows:

Ethanol Blend: This fuel must not contain more than 10 percent ethanol.

Methanol Blend: This fuel must not contain more than 5 percent methanol and it must contain cosolvents and corrosion inhibitors for methanol.

GENERAL INSPECTION

Check the generator set for damaged or loose parts. make sure the air inlet and outlet areas are not blocked. Investigate any abnormal operating noises. Make sure that the generator set is securely mounted in its compartment or under-floor housing.

Check to see that the vehicle is not parked in high grass or brush.

WARNING: Do not operate the generator set when the vehicle is parked in high grass or brush. Hot exhaust can ignite grass or brush resulting in a fire, which can cause severe personal injury or death.

MOTOR GENERATOR SET (CONTINUED)

Starting and Stopping

WARNING: EXHAUST GAS IS DEADLY

Exhaust gases contain carbon monoxide, an odorless and colorless gas. Carbon monoxide is poisonous and can cause unconsciousness and death. Symptoms of carbon monoxide poisoning can include:

- Dizziness
- Nausea
- Headache
- Weakness & Sleepiness
- Throbbing in Temples
- Muscular Twitching
- Vomiting
- Inability to think Coherently

IF YOU OR ANYONE ELSE EXPERIENCE ANY OF THESE SYMPTOMS, GET OUT INTO THE FRESH AIR IMMEDIATELY. If symptoms persist, seek medical attention. Shut down the unit and do not operate until it has been inspected and repaired.

Never sleep in the vehicle with the generator set running unless the vehicle interior is equipped with an operating carbon monoxide detector. Protection against carbon monoxide inhalation also includes proper exhaust system installation and visual and audible inspection of the complete exhaust system at the start of each generator set operation.

STARTING PROCEDURE

Perform each of the checks described in the Pre-Start Checks section before starting the generator set. The set can be started and stopped from the standard control panel on the generator set or from an optional remote control panel inside the vehicle.

Make certain that the vehicle AC distribution panel breakers are off (open). Place the output switching device on the vehicle (if present) in the "Utility" position.

CAUTION: Contact with hot engine parts can cause severe burns. Use caution when starting or stopping the generator set from the standard set mounted control panel. The access cover should always be on the generator set during operation.

1. Turn air conditioners and large electrical loads off.
2. Hold the Start/Stop switch in the START position (Figure 6). Release the switch when the generator set starts.
   (On the remote control Start/Stop switch, starting is indicated by a steady glow from the lamp on the switch.)

   Release the switch after 10 seconds if the engine does not start. Wait 30 seconds before repeating the start procedure.

CAUTION: Cranking the starter for longer than 10 seconds can overheat and damage the starter. If the engine does not start after 10 seconds, release the Start/Stop switch and wait 30 seconds before repeating the start procedure.

3. Let the set warm up for a few minutes before connecting a load. Make sure that the set is running smoothing and that there are no fuel or exhaust leaks.

See the Wattage Requirements section to determine how much wattage (load) can be used with the generator set.

If the engine stops running shortly after starting, check to see if the oil level is too high or too low. Make sure that the access cover is securely installed during operation.

STOPPING

1. Turn off air conditioners and large electrical loads before stopping to allow the generator set to cool down.
2. Let the set run three to five minutes. Failure to let the generator set cool down can cause engine run-on or backfire.
3. Push the Start/Stop switch to the STOP position.

If the generator set can be started or stopped from the genset but not from the remote control, contact an Onan service center for assistance. Refer to the How to Obtain service section.

Wattage Requirements

AC WATTAGE CAPACITY

The 120-volt AC power output from the generator can be used to power appliances and other electrical equipment. (Appliances and other electrical equipment are referred to as "electrical loads" or "loads" when they are connected to the generator.)

A 30-amp circuit breaker, on the standard set mounted control panel, protects the generator from an overloaded circuit. An overloaded circuit occurs when too many appliances, tools, lights, etc., are operated at the same time.

The 30-amp circuit breaker on the generator set is used to match the 30-amp circuit breaker used in the vehicle. The 30-amp circuit in the vehicle limits the

MOTOR GENERATOR SET (CONTINUED)

total amount of continuous load to 3,600 watts.

Connecting a Load

To determine the maximum amount of electrical appliances or loads that can be used at one time, follow these steps:

1. Determine the maximum amount of wattage that can be used with the 30-amp vehicle circuit. Maximum load (wattage) is obtained by multiplying the circuit breaker size times the AC output voltage:

   30-Amp Breaker X 120V = 3600 Watts

2. Check the wattage usage of each item that you plan to connect to the generator set. Table 1 lists typical wattages for common electrical appliances. Look at the appliance nameplate to obtain the actual wattage for each item.

3. Add the wattages of all the items to be operated at the same time. Make sure that the total wattage does not exceed the limit of the vehicle circuit breaker (3600 watts).

Example: In our example we will use a 13,500 BTU air conditioner with a nameplate wattage of 1,800. In addition, a few common appliances are used.

Air Conditioner	1800	Watts
Converter	500	Watts
Coffee Percolator	600	Watts
Television	300	Watts
Total	3200	Watts

4. Start the generator set and allow it to warm up for a few minutes before adding electrical loads.

Make sure that each of the appliances and tools are properly grounded and that they are in good working condition before using them.

WARNING: Electrical shock can cause severe personal injury or death. Appliances should be in good working condition and be properly grounded to provide additional protection from electrical shock.

Appliances with Motors

Appliances with motors consume more power during start-up than they do when they are operating at normal speed. (Some motors draw up to three times their operating power during start-up.) If you plan to use an appliance with a motor, turn it on before starting other appliances. Once the motor is running at normal speed, additional appliances can be added.

Circuit Breakers

Circuit breakers on the electrical distribution panel or on the generator set will trip (open) if their current ratings are exceeded. This can be caused by using too many appliances at one time or by a short in the electrical circuit.

The generator set will continue to run after a circuit breaker trips. Turn off all of the appliances and other electrical loads, then reset the breaker (Figure 7). If the circuit breaker trips again, a short circuit in the wiring is indicated. Turn off the generator set and contact a qualified electrician for assistance.

If the circuit breaker does not trip, turn on only as many appliances as the circuit breaker size will allow (see Connecting a Load in this section). If the circuit breaker trips again a defective appliance or circuit breaker is indicated.

Connection to Utility Power

Connect utility power (power from a commercial source such as plug-in outlet) only through an appoved device to protect against the possibility of generator power connecting to the utility power.

WARNING: Connecting the generator set directly to the public utility or any other power system can cause electrocution, damage to equipment, or fire. Hazardous voltages can flow from the generator set into the utility line. An approved switching device must be used to prevent interconnections.

High Altitude Operation

Operating the generator set at a high altitude will lower the output power of the generator set and decrease fuel efficiency. Refer to the Operating Recommendations section for high altitude carburetor adjustments.

Maximum power decreases about 3.5 percent for each 1,000 feet 9305 m) above the rated altitude of 500 feet 9152 m). When operating the generator set at an altitude above 500 feet, calculate the loss of power to determine maximum power capacity.

Example: Operation at 4,500 feet (1371 m), or 4,000 (1219 m) feet above the ratted altitude will result in a power loss of 14 percent or 560 watts: 0.14 x 4,000

MOTOR GENERATOR SET (CONTINUED)

watts (set rated power) = 560 watts. Subtract 560 watts from the set rated power of 4,000 watts and the maximum power at 4,500 feet is 3,440 watts.

DC POWER

A 12-volt DC output (one ampere maximum) from the generator is used to prevent discharge of the generator set starting battery during genset operation. The battery is normally charged by the converter/charger in the vehicle, not by the genset DC power. The battery is charged when the generator set is running or when the vehicle is plugged into utility power.

Operating Recommendations

BREAK-IN PROCEDURE

Performing the following break-in procedure will prevent glazing of the engine cylinder and high oil consumption.

1. Start the generator set and apply a load of 50 percent of its wattage capacity (1800 watts or one air conditioner). Run the set with this load for two hours. Refer to Table 1 for the wattage usage of common appliances and tools.
2. Increase the wattage load to 75 percent capacity (2700 watts or one air conditioner and an additional load of 900 watts) and run the set for another two hours.
3. Disconnect the load and allow the generator set to run for 3 minutes, to cool down the generator set before stopping.
4. Change the engine crankcase oil after the first 20 hours of operation, and every 150 hours after that.

OPERATING IN HOT OR COLD WATER

Hot Weather

Make certain that nothing blocks the airflow to and from the generator set. See that the set is maintained according to the Maintenance Schedule and keep the engine clean.

Cold Weather

Use the correct oil weight for cold weather conditions. See the Recommended Engine Oil section for oil recommendations. Change the oil after the engine has been warmed up. If a sudden temperature change occurs and the oil is not the correct weight, change the oil.

HIGH ALTITUDE

Performance will decrease and fuel consumption will increase at high altitudes due to a rich air-fuel mixture. If operation is inhibited by high altitude (above 2000 feet or 610 m), adjust the carburetor main fuel adjustment limiter cap for a slightly leaner fuel mixture. See Figure 8. Return the adjustment screw to the original setting before operating the set at lower altitudes or performance problems can occur due to a lean air-fuel mixture.

CAUTION: Operating the generator set with a lean air-fuel setting a low altitude can cause power loss, overheating and engine damage. Return the carburetor main fuel adjustment to its original setting before operating the generator set at low altitudes.

OPERATING IN DUSTY CONDITIONS

1. Keep the generator set and its cooling surfaces as clean as possible.
2. Service the air cleaner frequently.
3. Increase the engine crankcase oil change interval to every 50 operating hours.
4. Keep oil in a dust-tight container.

GENERATOR SET EXERCISE

Infrequent operation of the generator set can allow harmful moisture to condense in the engine. Moisture accumulates because the engine does not run often enough to reach normal operating temperature. Also fuel in the carburetor will evaporate and leave deposits that can cause hard starting and unstable running.

To prevent harmful moisture accumulation and fuel deposits, run the generator set at 50 percent capacity (1800 watts or one air conditioner) for two hours every four weeks. A long exercise period is preferable to several short periods.

MAINTENANCE SCHEDULE

Following the maintenance schedule and using the generator set properly will result in longer generator set life, better performance, and safer operation. Perform each maintenance procedure at the time period indicated or after the number of operating hours indicated, whichever comes first. Refer to the following Maintenance Procedures section for instructions.

If the generator set will be subjected to extremely hot or dusty conditions, consult an Onan service center to develop a more frequent maintenance schedule. Log all service and maintenance for warranty support (see the Maintenance Record section).

WARNING: Accidental starting of the generator set during maintenance can cause severe per-

MOTOR GENERATOR SET (CONTINUED)

sonal injury or death. Disconnect both generator set starting battery cables, before performing maintenance. Remove the negative (-) cable first to reduce the risk of arcing.

1. Check for oil, fuel and exhaust system leaks. Check exhaust system audibly and visually with the generator set running. Temporarily remove the access cover to check muffler. Repair any leaks immediately. Replace corroded exhaust and fuel line components before leaks occur.
2. Perform after first 20 hours of operation on new sets.
3. Clean spark arrester every 50 hours.
4. Replace more often in dusty conditions.
5. Service sooner if performance problems occur.
6. Have the Onan service center perform.

MAINTENANCE PROCEDURES

GENERAL INSPECTION

Inspect the generator set daily or after every eight hours of operation, whichever comes first. Perform the following exhaust, fuel, and electrical systems checks. Also check the mechanical condition of the set.

Exhaust System

Examine the exhaust system for leaks. Inspect the set compartment for holes that might allow exhaust gas to enter the vehicle. If the genset compartment has holes to the interior of the vehicle or if the generator set runs louder than usual or has an exhaust system leak, do not operate the generator set until the problem is corrected.

Replace worn, damaged, or corroded exhaust components before leaks occur.

WARNING: Exhaust gas presents the hazard of severe personal injury or death. If there are any exhaust leaks, do not operate the generator set, and have the exhaust system repaired before using the generator set.

Fuel System

With the generator set running, check the fuel supply line, filter and fittings for leaks. Check flexible section for cuts, cracks or abrasions, and make sure fuel line does not rub against anything. Replace worn or hardened fuel line components before leaks occur.

WARNING: Fuel presents the hazard of fire or explosion that can result in severe personal injury or death. If any leaks are detected, have them corrected immediately.

DC Electrical System

With the genset off, check the battery terminals for clean and tight connections. Loose or corroded connections create resistance that can impede starting. Clean and reconnect loose battery cables. Remove the negative (–) battery cable first and install it last to reduce the risk of arcing.

WARNING: Batteries present the hazard of explosion that can result in severe personal injury. Do not smoke or allow any flame, spark, pilot light, arc-producing equipment or other ignition sources around the battery area. Do not disconnect battery cables while the generator set is cranking or running because explosive battery gases could be ignited.

Mechanical

Check for any signs of mechanical damage. Start the set and listen for any unusual noises that may indicate mechanical problems. Have any problems corrected immediately.

Check the mounting fasteners to make sure the set is secure in its compartment. If an under-floor housing is used, make sure that the set is secured to the housing. Check the condition of the housing components and make sure they are sure to the vehicle.

Make sure that the generator set air inlet and outlet areas are not blocked with debris.

Clean the generator set whenever dust and dirt begin to accumulate. Dust and dirt can usually be removed with a damp cloth. Steam cleaning may be needed to remove road contaminants. Do not clean the generator set while the engine is running. Protect the generator, air cleaner, control panel, and electrical connections from cleaning solvents. Cleaning solvents can damage electrical connectors.

OIL CHANGE

In dusty or dirty conditions, change the oil more frequently than the interval specified in the maintenance schedule. Figure 9 shows the location of the oil drain, oil filler neck and oil level indicator.

WARNING: Hot oil can cause severe burns if

MOTOR GENERATOR SET (CONTINUED)

spilled or splashed on skin. Keep fingers and hands clear when removing oil drain plug, and wear protective clothing.

1. Place a pan under the oil drain plug. Run the engine until it is warm, then shut it off.
2. Remove the oil level indicator.
3. Unscrew the oil plug and allow all of the oil to drain from the engine.
4. Install the oil plug and tighten it securely to prevent an oil leak.
5. Use a premium quality motor oil. The engine oil capacity is 1.7 quarts (1.6 liters). See the following Recommended Engine Oil section to select the proper weight oil.
6. Pour the oil into oil filler neck slowly. Check the oil level by inserting oil level indicator into filler neck. It is not necessary to screw the oil level indicator in to obtain an oil level reading. Add oil until the full mark is reached.
7. Insert the oil level indicator in the fill tube and screw it in securely to prevent oil leakage.

Used oil is harmful to the environment. Pour used oil into a sealed container and deliver it to the nearest recycling center or automotive service station.

Recommended Engine Oil

Use premium quality motor oil with API (American Petroleum Institute) designation SG on the container. Figure 10 shows the recommended oil weight for the temperature range that the generator set will be operated in. Make sure the engine oil weight is correct for the expected temperature range.

The engine oil capacity is 1.7 quarts (1.6 litters).

Oil consumption may be higher with a multigrade oil than with a single-grade oil. For this reason, single-grade oils are preferable unless wide temperature variations are anticipated.

BATTERY CARE

Service the battery at the intervals shown in the maintenance schedule. Check the electrolyte level more frequently during hot weather.

WARNING: Batteries present the hazard of explosion that can result in severe personal injury. Do not smoke or allow any flame, spark, pilot light, arc-producing equipment or other ignition sources around the battery area. Do not disconnect battery cables while the generator set is cranking or running because explosive battery gases could be ignited.

WARNING: Battery electrolyte can cause severe eye damage and burns to the skin. Wear goggles, rubber gloves and a protective apron when working with batteries.

1. Keep the battery case clean and dry.

2. Make certain that the battery cable connections are clean and tight. Use a terminal puller tool to remove the battery cables.

   Remove corrosion from the battery terminals. Wash the terminals with an ammonia solution or a solution consisting of 1/4 pound (about 100 grams) of baking soda in 1 quart (about 1 liter) of water. Be sure the vent plugs are tight to prevent cleaning solution from entering the cells. After cleaning, flush the outside of the battery and the surrounding areas with clean water.

3. Identify the cable as positive (+) or negative (-) before making the battery connections. Always connect the negative (-) cable last, to reduce the risk of arcing.

4. Maintain the electrolyte level by adding distilled water. Fill each cell to the split-level marker in the battery. The water component of the electrolyte evaporates, but the sulfuric acid component remains. For this reason, add water, not electrolyte to the battery.

5. Use a battery hydrometer to check the specific gravity of the electrolyte in each battery cell (Figure 11). Charge the battery if the specific gravity measures less than 1.215. Do not overcharge the battery. Stop charging the battery when the electrolyte specific gravity reaches 1.260, at approximately 80°F (27°C).

AIR FILTER REPLACEMENT

In dusty conditions, change the air filter more frequently to prevent equipment damage. use a genuine Onan replacement filter only. Contact the nearest Onan dealer or distributor for replacement filters.

To change the air filter, remove the 7/16-inch bolt from the left side of the air filter housing (Figure 13). Bring the housing forward and pull the air filter straight out of the housing.
Replace the air filter and reinstall the housing. Align the air filter housing with 7/16-inch bolt from the left side of the air filter housing (Figure 13). Bring the housing forward and pull the air filter straight out of the housing.

Replace the air filter and reinstall the housing. Align the air filter housing and secure the housing with 7/16

MOTOR GENERATOR SET (CONTINUED)

inch bolt until snug. Do not over-tighten mounting bolt or filter housing will become distorted.

CAUTION: Incorrect replacement of service parts can result in damage to equipment. Use genuine Onan replacement air filters only.

SPARK PLUG

The generator set has one spark plug. The plug must be in good condition for proper engine starting and performance. A spark plug with heavy combustion deposits can cause the generator set to misfire, operate erratically, or stop when a load is applied.

The spark plug can be removed through the access cover (Figure 14). Inspect and regap the plug. Replace the spark plug if it is discolored or fouled.

- Black deposits indicate a rich mixture.
- A wet plug indicates misfiring.
- A badly or frequently fouled plug indicates the need for a major tune-up.

SPARK ARRESTER SERVICE

WARNING: A hot exhaust system can cause severe burns. Allow the generator set to cool down before servicing the muffler.

The spark arrester requires periodic cleaning for maximum genset performance and to meet USDA requirements. A new O-ring gasket must be installed each time the resonator is removed to obtain a good seal.

Spark Arrester Cleaning Procedure:

1. Remove the U-bolt clamp securing the exhaust pipe to the resonator (Figure 15). Lower the exhaust pipe.
2. Remove the four mounting bolts that secure the resonator to the genset.
3. Inspect the spark arrester screen for damage and replace resonator assembly if defective.
4. To clean, lightly tap the screen and remove any deposits with a wire brush. A commercial solvent can be used to loosen deposits (Follow manufacturer's instruction and safety precautions carefully.) Allow the screen to dry before reinstalling.

WARNING: Exhaust gas presents the hazard of severe personal injury or death. Replace the O-ring gasket whenever the resonator is removed. Install the O-ring gasket with the seam facing the resonator.

5. Install a new O-ring gasket with the seam facing the resonator. Install the resonator and secure all four mounting bolts.
6. Reinstall the exhaust pipe with the U-bolt clamp.

Generator Set Storage

Perform the storage procedure if the generator set cannot be exercised regularly and will not be in use for more than 120 days. Failure to provide out-of-service protection can result in difficult starting, rough engine operation and reduced engine life.

Generator Set Storage Procedure

1. Add a fuel preservative and stabilizer, such as OnaFresh, to the fuel supply. Follow the label instructions for using the fuel additive. Run the set at 50 percent load (1800 watts) for 30 minutes.

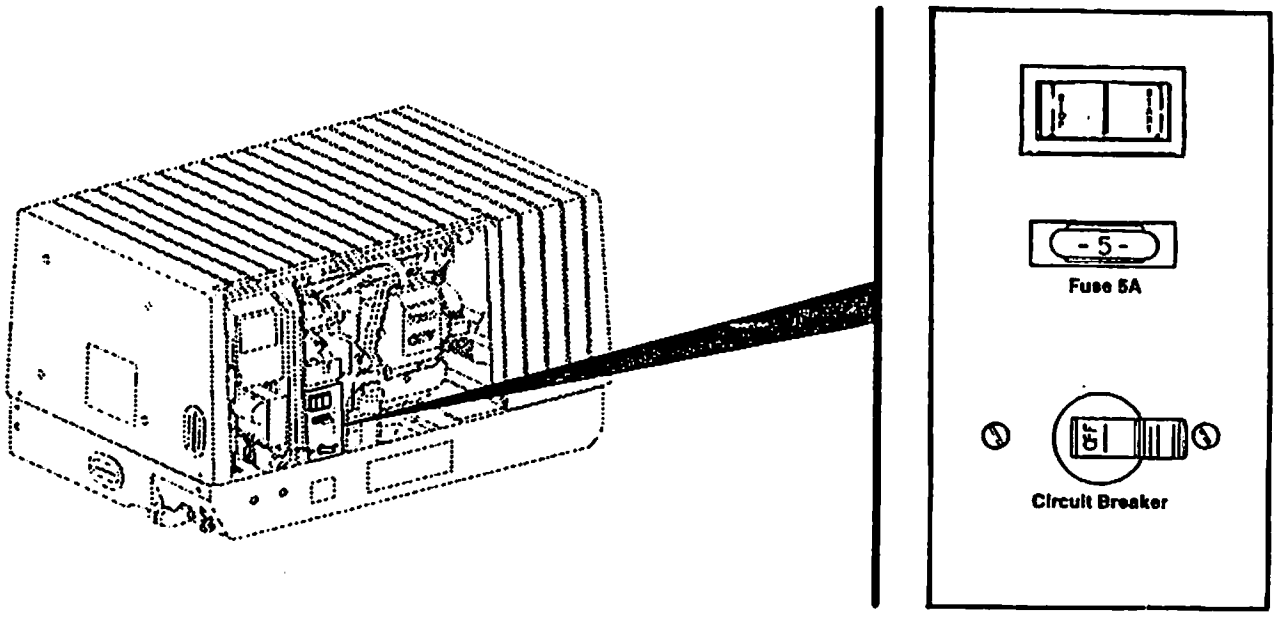


FIGURE 3. STANDARD CONTROL PANEL

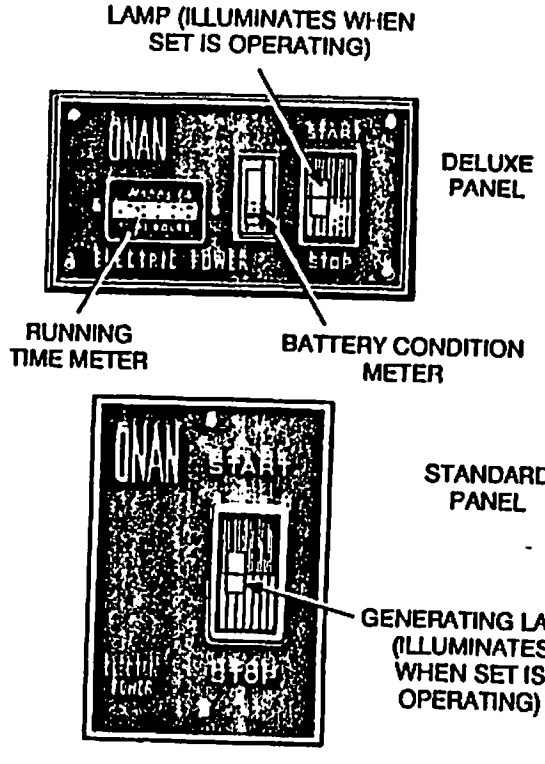


FIGURE 4. REMOTE CONTROL PANELS

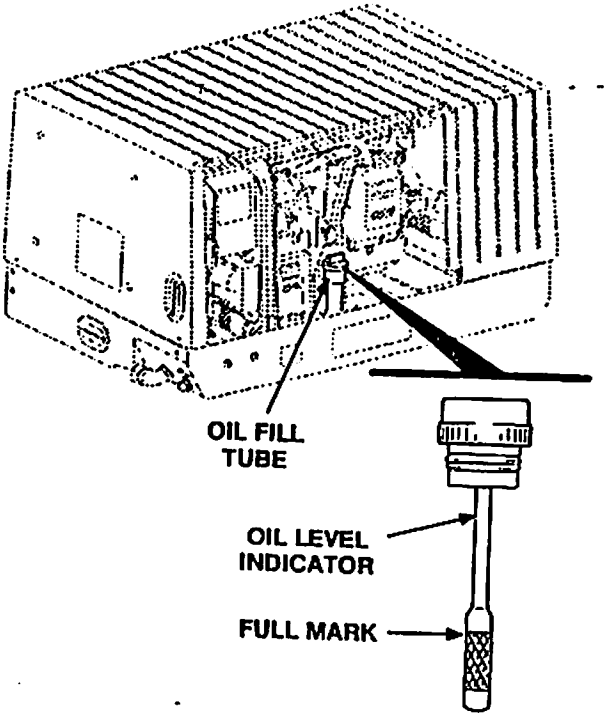


FIGURE 5. OIL LEVEL CHECK

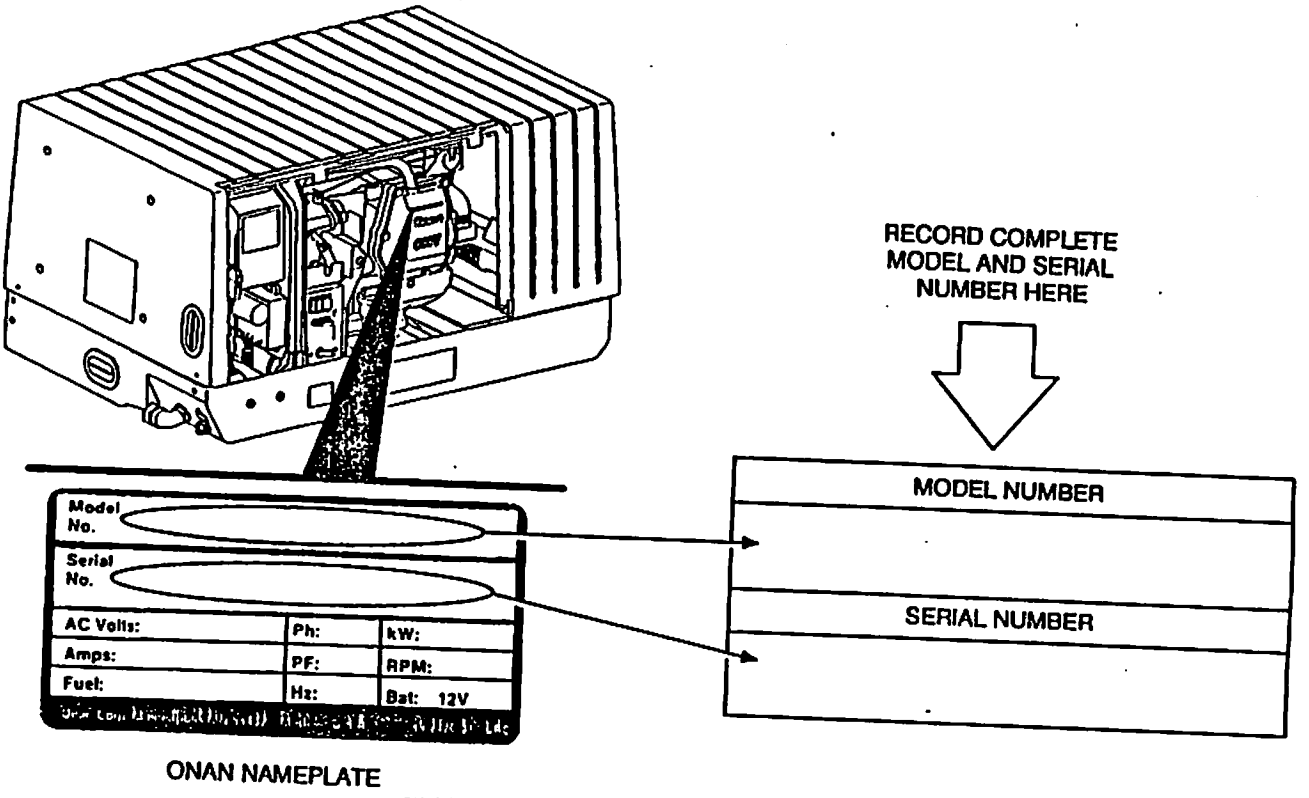


FIGURE 1. MODEL IDENTIFICATION

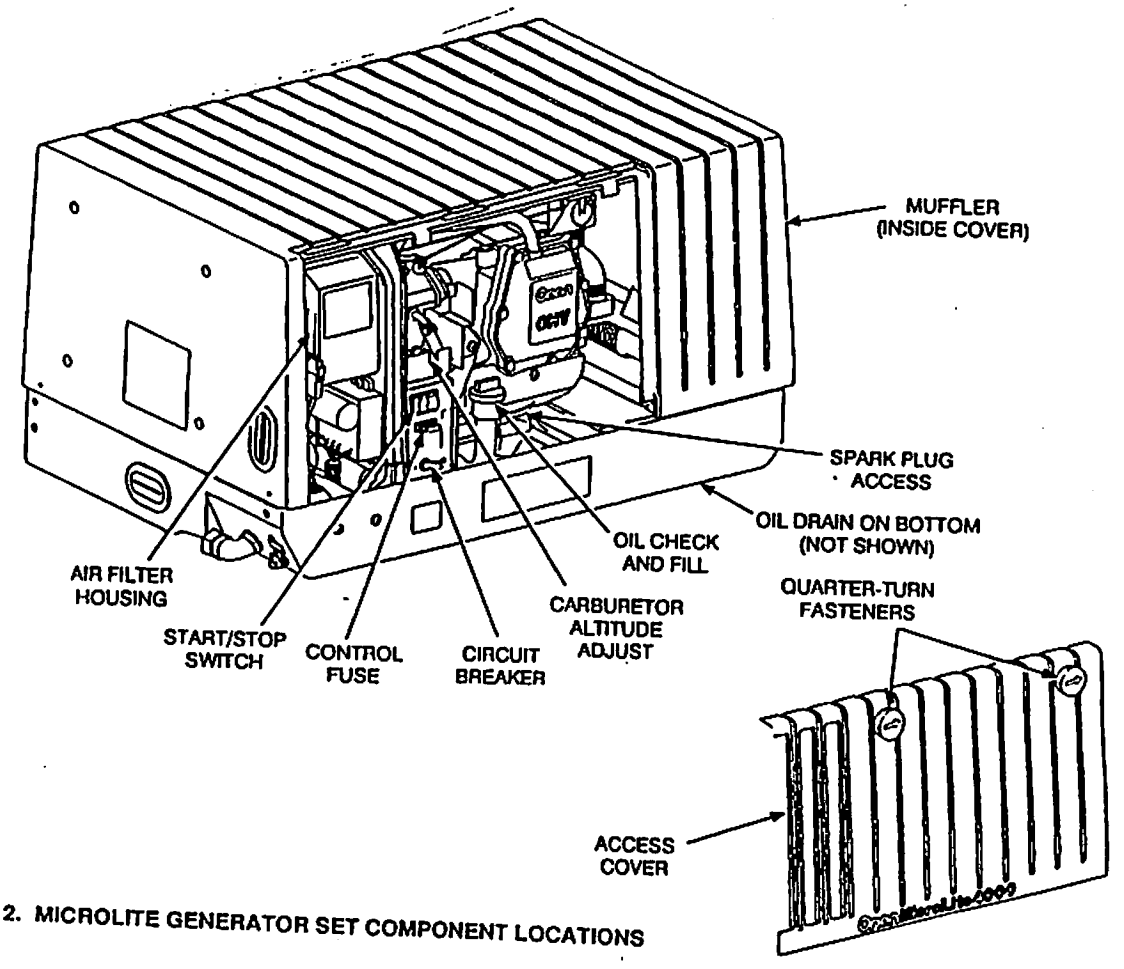


FIGURE 2. MICROLITE GENERATOR SET COMPONENT LOCATIONS

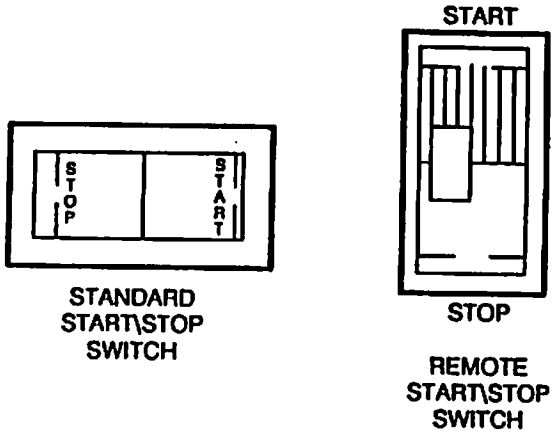


FIGURE 6. START/STOP SWITCH

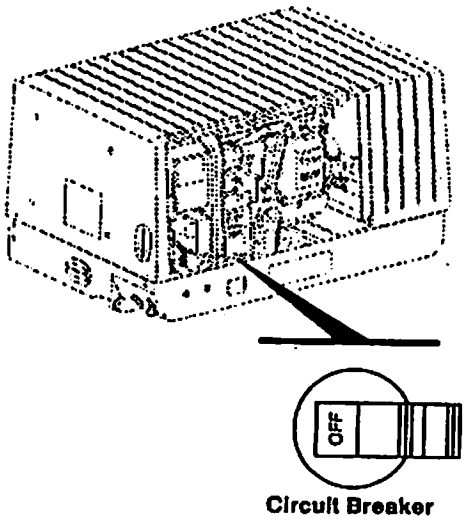


FIGURE 7. SET MOUNTED CIRCUIT BREAKER

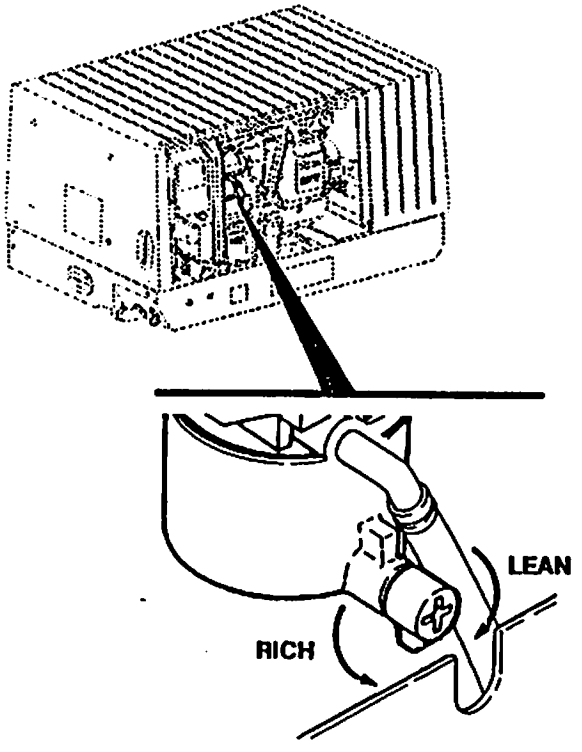


FIGURE 8. CARBURETOR ALTITUDE ADJUSTMENT

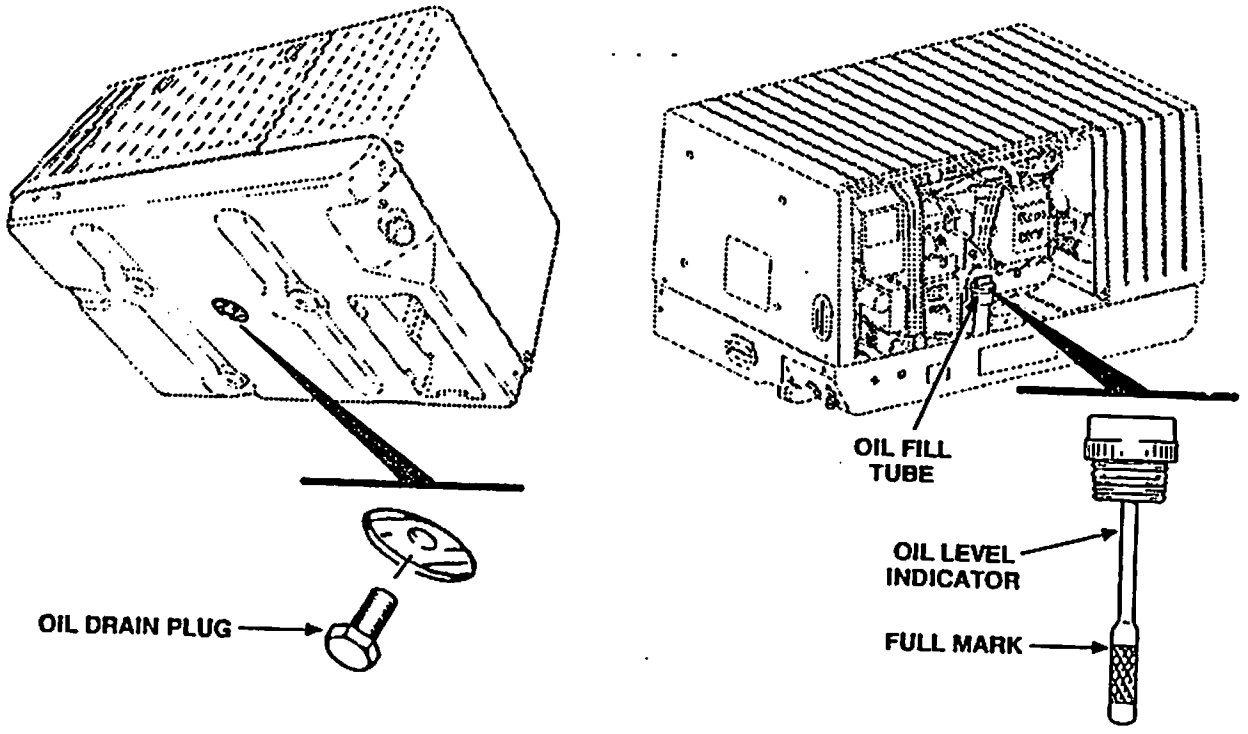


FIGURE 9. OIL CHANGE

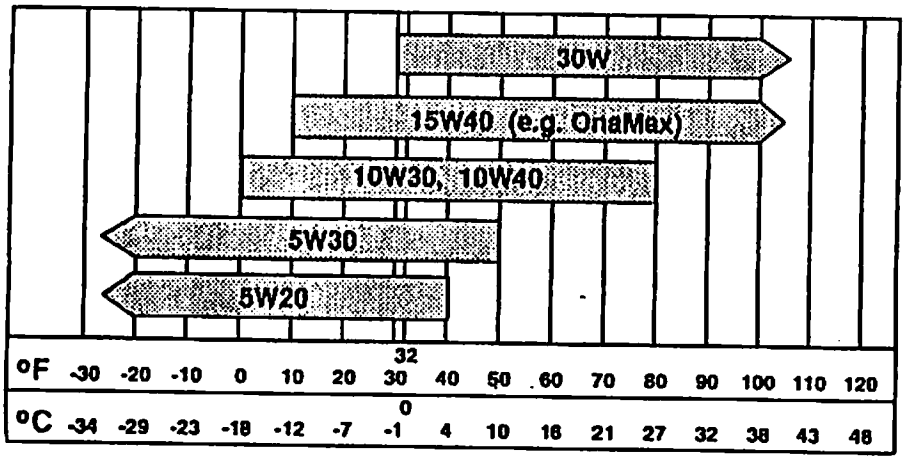


FIGURE 10. OIL VISCOSITY VS. TEMPERATURE

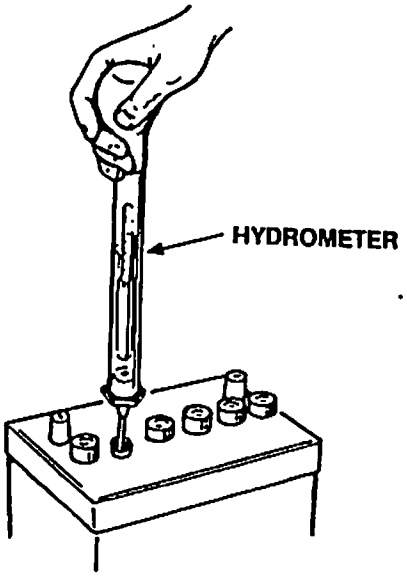


FIGURE 11. BATTERY CHECK

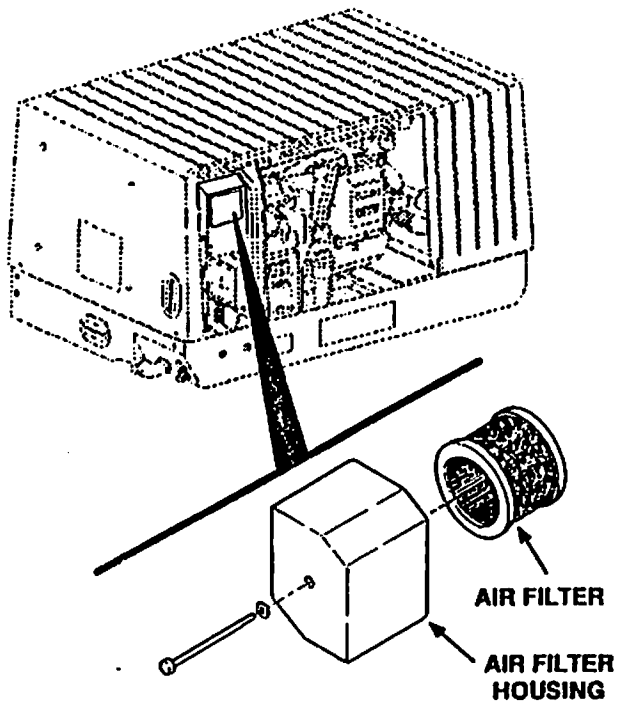


FIGURE 13. REPLACING THE AIR FILTER

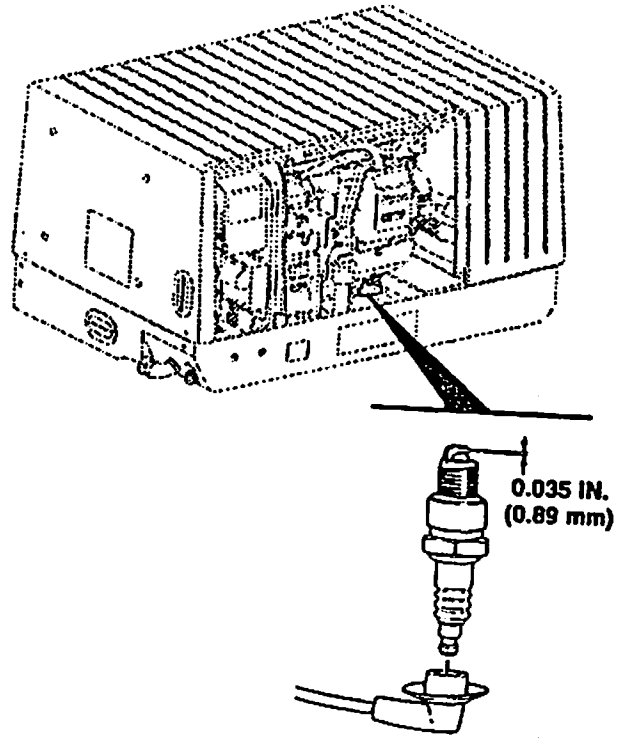
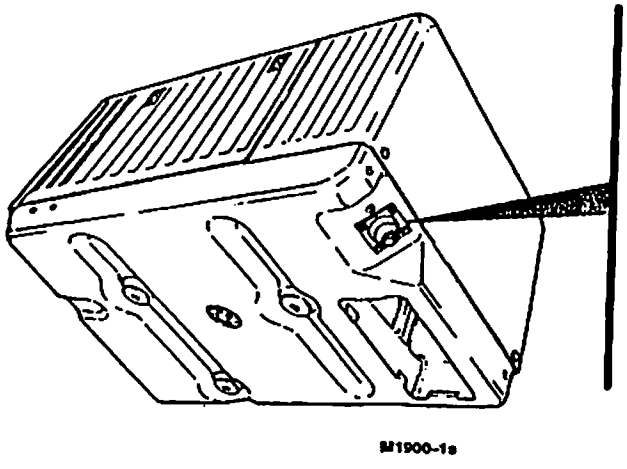


FIGURE 14. SETTING SPARK PLUG GAP



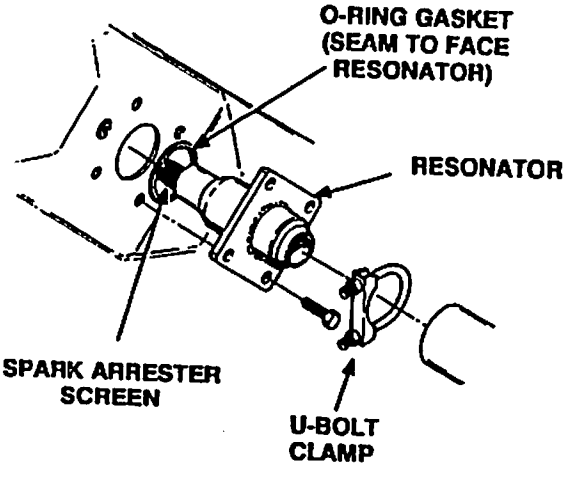


FIGURE 15. SPARK ARRESTER CLEANING

TABLE 3. TROUBLESHOOTING GUIDE

Problem	Probable Cause	Solution
FAILS TO CRANK	1. Low battery. 2. Bad battery connection. 3. Blown fuse.	1. Check battery electrolyte level. 2. Clean and tighten all battery and cable connections. 3. Replace fuse on control panel.
CRANKS SLOWLY	1. Low battery. 2. Bad battery connection. 3. Oil is too heavy. 4. Load connected.	1. Check battery electrolyte level. 2. Clean and tighten all battery and cable connections. 3. Replace with lighter oil. 4. Disconnect load while starting.
CRANKS BUT WON'T START	1. Fuel below genset pickup level in tank. 2. Fuel supply shutoff valve closed. 3. Carbon deposits on spark plug. 4. Low oil level.	1. Add fuel. 2. Fully open fuel supply valve. 3. Remove spark plug and clean. 4. Add oil if necessary.
EXHAUSTING BLACK SMOKE	1. Rich fuel mixture. 2. Dirty air filter. 3. Choke stuck or misadjusted.	1. Turn main fuel adjustment in (cw) 1/8 turn (location of adjustment is shown in Figure 8, page 11). 2. Replace air filter. 3. Contact an Onan service center.
UNIT RUNS THEN STOPS OR STOPS WHEN DRIVING AROUND A CORNER	1. Low on fuel. 2. Low oil level. 3. Excess oil.	1. Refill fuel tank. 2. Add oil if necessary. 3. Reduce engine oil level.
UNIT RUNS THEN SURGES	1. Loose or worn spark plug lead. 2. Ignition coil, wiring, or control components defective. 3. Faulty spark plug. 4. Governor out of adjustment. 5. Combustion air preheat malfunction. 6. Carburetor icing.	1. Check security of spark plug lead at spark plug and ignition coil. 2. Contact an Onan service center. 3. Remove and clean or replace 4. Contact an Onan service center. 5. Contact an Onan service center. 6. Stop the genset and move the carburetor throttle to free it.
CIRCUIT BREAKER TRIPS (GENSET CONTINUES TO OPERATE)	1. Overloaded circuit. 2. Hot weather increasing load.	1. Remove a portion of the load. 2. Air conditioners and other appliances consume more power in hot weather, remove some of the load.

TABLE 2. PERIODIC MAINTENANCE SCHEDULE

SERVICE THESE ITEMS	SERVICE TIME				
	Dally or Every 8 hours	Every 150 Hours	Every 250 Hours	Every 500 Hours	PAGE
Inspect Set	X[1]				14
Check Oil Level	X				5
Change Crankcase Oil		X[2]			15
Clean Spark Arrester		X[3]			19
Clean and Check Battery		X			17
Replace Air Filter			X[4]		18
Clean Spark Plug				X[5]	18
Check Valve Lash Clearance				X[6]	–
Change Fuel Filter				X[6]	–
Clean and Adjust Carburetor				X[6]	–

1. Check for oil, fuel and exhaust system leaks. Check exhaust system audibly and visually with the generator set running. Temporarily remove the access cover to check muffler. Repair any leaks immediately. Replace corroded exhaust and fuel line components before leaks occur.
2. Perform after first 20 hours of operation on new sets.
3. Clean spark arrester every 50 hours.
4. Replace more often in dusty conditions.
5. Service sooner if performance problems occur.
6. Have the Onan service center perform.

INTERIOR FEATURES

Interior Features – The interior of your new Revcon motorhome has been designed for easy contemporary living. Coordination of texture and color are all a part of the smartly styled interior features, that promise long wear and easy maintenance.

The floor area is covered with high quality cut pile carpeting, for comfort and warmth.

The ceiling paneling is covered. Periodic cleaning of the panelling should be done with a mild liquid detergent.

The safety plate glass windows lend to an open airy feeling throughout the coach. When the windows are open, the screens let in the fresh air and keep the winged pests out. When the windows are closed, the window seals eliminate the problem of airborne outside dirt creeping in.

Power exhaust vents are found in the galley and the bath areas.

The heavy use areas, like countertops and cabinetry, are surfaced with quality high-pressure plastic laminate. It is attractive, tough, scuff resistant, and easily maintained. The cabinetry is functionally designed, with ample storage space for all your needs.

Galley – Your REVCON motorhome has a complete self-contained galley with an array of features that will make cooking a pleasure. A large sliding window with interior screen, will bathe you in sunlight and fresh air. An overhead power exhaust vent keeps the stale air and cooking odors out. You have a burner gas range and conventional microwave oven. A single baked enamel sink features a single-throw faucet handle. A double-door refrigerator/freezer.

Dinette Seating – Dining seating is by the four place, finely upholstered dinette. The table top is covered with high-pressure plastic laminate, for long life and low maintenance.

TV Antenna System – There are two television antenna outlets pre-wired into the coach. One is located just aft of the co-pilot's seat behind the chair. The other is within the rear bedroom on the forward side above the refer. Your Mini-State TV antenna is a unique antenna system which has a built-in UHF/VHF color TV antenna in an closed housing, with amplifier and power supply.

Shower – The personal shower is made of color impregnated fiberglass. With this unit it is possible to take a luxurious bath, yet conserve your valuable water supply.

To use the shower, the hot and cold water handles at the right of the shower unit may be adjusted to obtain the desired temperature. The on-off push button on the shower head may be used intermittently. You can remove the shower head from the holder by lifting up from the holding pin. It is important that the shower head is firmly attached to the wall holder, otherwise a sudden movement could cause the head to swing into the fiberglass walls, causing damage.

Entry Step – The power-assisted entry door step will extend when the door is opened and retract when the door is closed. Operation of the power step may be double-checked and/or locked in or out manually from the control switch. Located at the edge of the galley. With the entry step switch ON; the step will automatically actuate to the forward (OUT) position. Close the door and the step will retract. When the switch is turned OFF, the step will lock into its position, whether it is OUT or IN.