1978 Avion Owner's Manual

Introduction

Welcome to the world of Avion Coach. Whether you're a driver, a mechanic, or a fleet manager, you're about to learn more about your vehicle than you ever thought possible.

Avion Coach Corporation is a relatively young company. We've been in business for only 20 years. But we've grown rapidly, and we've grown because we've built a reputation for quality and reliability.

Fleetwood has one of the most modern and efficient bus manufacturing facilities in the world. Our plants in Fleetwood, Pennsylvania and Bristol, Tennessee are models of efficiency. Each unit is carefully inspected at every stage of production. Our quality control program is the most stringent in the industry.

Fleetwood has also been an innovator in the field of mass transportation. Our engineers have developed many advanced features that have become standard equipment on buses throughout the world. Fleetwood was the first to introduce the rear-engine transit bus. We were also the first to offer a diesel-powered school bus. And we were the first to offer a bus powered entirely by natural gas.

Fleetwood's success is due in part to our policy of constantly improving our product. We're always looking for ways to make our buses more reliable, more comfortable, and more economical to operate. Many of these improvements originate right here in our own factories. Others come from our customers. Our engineers work closely with fleet managers and drivers to develop new features that will help them do their jobs more efficiently and economically.

Fleetwood has a long history of innovation. We've been building buses since 1927, when Charles Fleetwood founded the Fleetwood Body Company. In 1953, Fleetwood merged with the Avion Coach Company to form the Avion Coach Corporation. Avion Coach was founded in 1925 by Thomas Avion, a pioneer in the field of mass transportation. Avion was the first company to build a bus with an all-steel body. Avion was also the first to offer a bus with an automatic transmission.

Fleetwood has been under the management of Avion Coach since 1953. Avion Coach is now a subsidiary of Transportation Industries, Inc., a conglomerate with interests in a wide variety of industries. Transportation Industries is headquartered in Chicago, Illinois.

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This Owner's Manual is your guide to the operation and maintenance of your Avion Coach. It has been written to help you get the most out of your new vehicle. We've tried to make it as easy to read and understand as possible, and to keep it as brief as possible. We've also tried to answer all of the questions you're likely to have about your new vehicle. If you have any questions that are not answered in this manual, please write to us. We will always be happy to hear from our customers, and we welcome your comments and suggestions.

Avion incorporates latest state-of-the-art engineering and fine craftsmanship into every coach it builds. All systems and appliances function together to provide home-like conveniences for your traveling and camping enjoyment. Like all fine equipment, your Avion requires care and regular maintenance to keep it performing at peak efficiency. A basic understanding of how Avion's systems operate will enable you to accomplish many service and maintenance functions yourself, if you wish.

John Crean

Your 1978 Avion is protected by Fleetwood's full warranty for a period of one year from date of purchase. See page 100 for warranty information. For more information about your nearest Avion authorized service representative, please call our nationwide 24-hour toll-free number: *(800) 854-4755.* In California, call toll-free *(800) 442-4804.*

Due to variations in the availability of materials, and our continuous program of product development and refinement, Avion Coach Corporation reserves the right to change specifications without notice. All information contained in the Owner's Manual is based on the latest product data available at time of publication. If you have any questions regarding changes that may be incorporated into your trailer, please call the manufacturing plant for details (616) 927-2271.

Contents

Preparation

Tow Vehicle

There is no substitute for proper equipment when it comes to towing the additional weight of a trailer. Your tow vehicle must be adequately equipped and maintained to insure both safety and continued trouble-free performance.

Proper equipment includes an engine with sufficient power to safely pull your Avion up long grades even under the most adverse conditions, as well as the correct drive and axle ratios, cooling system capability, tires, suspension and electrical system. Your Avion dealer will be happy to discuss tow car specifications with you.

Whether you plan to buy a new car or use your present one for towing purposes, we recommend that you purchase a trailer towing package. A typical package consists of heavy-duty springs, shock absorbers, radiator, alternator and battery. Many new car packages also feature heavy-duty fan and flusher units, and an automatic transmission cooler. Availability of these items may vary with vehicle manufacturer. Tires of the correct size and load capacity to carry the added hitch weight must also be used.

In addition, you should seriously consider installing a load equalizing-type trailer hitch with sway control, such as those manufactured by Reese Products, Inc. and Eaz-Lift Spring Corporation. This type of hitch spreads the weight of the coach as evenly as possible over all the wheels and axles, as well as providing for increased driving stability. Always inspect your tow hitch regularly. Tighten loose nuts and bolts, and immediately repair or replace any cracked or worn parts.

A 2-5/16-inch hitch ball should be mounted on your tow vehicle. The distance from the top of the ball to the ground, measured with tow vehicle unloaded, will differ according to the model of your trailer: **20 inches** for Models C, D, F, H, J and M; **19 inches** for Models P, R, W and V. At the proper height, and with an equalizing-type hitch correctly adjusted, your Avion will ride level. Although the trailer design permits safe towing even when it is not perfectly level, and your tow car may ride slightly lower at the rear, we recommend that both vehicles sit as level as possible.

If your tow car is equipped with adjustable load-leveling air shocks, the rear wheels may become overloaded. This can be corrected easily by weighting the car with a simulated typical load of passengers and luggage, then resetting the shocks to "level." To be sure you do not exceed the tow vehicle's rear Gross Axle Weight Rating (GAWR), weigh the trailer tongue and add this figure to the total load on the rear axle. See **Loading,** page 4.

Caution: Follow your vehicle manufacturer's recommendations on load limits, wiring modifications, and hitch and brake controller installation. If you are in doubt, consult your Avion dealer for assistance.

Accessories

Your 1978 Avion comes factory-equipped with a wide variety of comfort and safety items that contribute to the full enjoyment of trailering. Some additional equipment is required for your tow vehicle, and you will probably want to consider outfitting your coach with a number of the many convenience items on the market, designed to meet your personal needs. Following is an alphabetical list of these items, many of which are available from your Avion dealer.

1. Avion Accessory Kit
   - 25-foot electrical extension cord with adaptor plug
   - 25-foot water hose
   - Hose pressure regulator
   - Lynch pin (hitch safety pin)
   - 20-foot sewer hose with clamp
   - Solid waste holding tank chemical (6-pack)
   - Tool kit (pliers, claw hammer, #2 Phillips head screwdriver, clutch head screwdriver, slotted head screwdriver, 12-volt test light, flashlight, 2 C-size batteries)
2. Avion Spare Tire Kit
   - Steel wheel with spare tire
   - Scissor jack
   - Lug wrench
   - Mounting bracket
3. Battery Booster Cables
4. Battery Hydrometer
5. Brake Controller (with optional dash indicator light)
6. Camber Gauge
7. Electric Broom
8. Emergency Road Flares
9. Exterior Hook-Up Mirror
10. Exterior Side-Mounted Rear View Mirrors
11. Fire Extinguisher (A-B-C type)
12. First Aid Kit
13. Fuses (assorted sizes; see page 105)
14. Hitch Ball Lubricant
15. Leveling Ramps (see page 21)
16. Light Bulbs (assorted sizes; see page 104)
17. Short Handled Shovel
18. Spirit Level
19. Stabilizing Jacks
20. Sway Control
21. Tire Chocks
22. Tire Pressure Gauge (100 psi capacity)
23. Spray Lubricant/Cleaner
24. "Y"-Type Hose Connector

Loading

Correct loading of your Avion is necessary to avoid damage to equipment carried inside, as well as to the tow vehicle and the trailer itself. The suggestions below are designed to assure safe loading and to prevent possible overloading of the coach.

Inside Your Avion

1. Make certain that everything in the trailer is stored properly... especially breakable items.

2. Prepare the refrigerator by wedging rolled-up towels around containers so they will not move or topple. We recommend using square plastic containers with tight-sealing lids for maximum stability and safety. **Do not** leave ice cubes in the freezer compartment unless the refrigerator is operating while you travel. Be sure the travel latch is engaged to prevent refrigerator doors from opening.

3. Latch all drawers, cabinets and closet doors securely.

4. Do not place objects on top of beds while traveling. The vibration of the mattress and springs has a tendency to move everything forward. If the brakes are applied too quickly, items may be thrown to the floor and damaged.

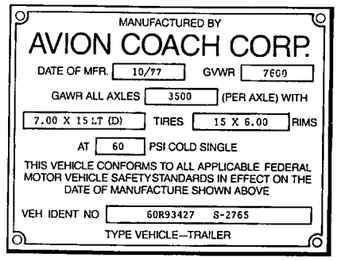
5. Place heavy gear as close to the floor as possible, and forward of the center of the trailer.

6. **Do not overload.** Refer to **Weights,** page 7, for maximum cargo weight, hitch weight and gross vehicle weight.

7. Do not carry passengers in the coach while it is in motion. It was not intended for this purpose. Furthermore, many states have laws which prohibit this practice.

Vehicle Weights

Overloading places undue stress on the trailer and can cause it to become awkward and unsafe. Your Avion has been engineered to function at its **Gross Vehicle Weight Rating (GVWR)** when fully loaded with all necessary traveling supplies. Thus, trailer weight and load distribution are major factors in safe and economical operation.



GVWR Plate

The GVWR is located on a metal plate mounted on the road side of the coach near the front. See illustration. Also shown on this plate are the front and rear **Gross Axle Weight Ratings (GAWR).** These are the maximum allowable weights per axle when the trailer is hitched to the tow vehicle. The ratings help you establish the proper weight and balance for efficient, safe towing. Traveling as lightly as possible provides for better fuel economy, decreased engine loads, and ease of handling.

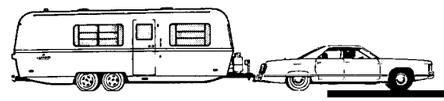
The recommended method for determining whether your Avion is within the prescribed limits is to weigh it **fully loaded.** Public scales for this purpose may be located by checking the Yellow Pages under "Weighing—Public," or by contacting a truck service center.

The following step-by-step procedure should be used for weighing the trailer and tow car. The vehicles must first be properly hitched together and fully loaded for travel, including fresh water holding tank, water heater, LPG bottles, supplies, gear and passengers.

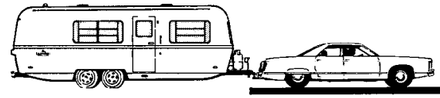
1. Drive the tow car forward until the **front wheels** are on the scale, and take a reading. **The load on the front wheels must not exceed the tow vehicle front GAWR as specified in the tow vehicle owner's manual or weight tag.**

Vehicle Weighing

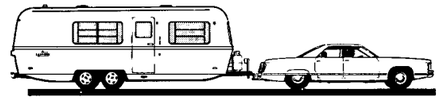
1st Reading



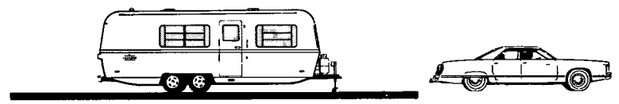
2nd Reading



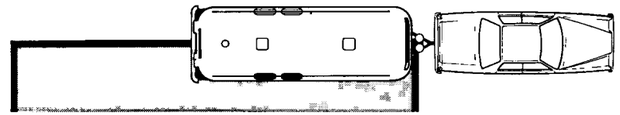
3rd Reading



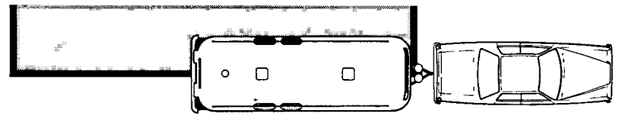
4th Reading



5th Reading



6th Reading



1st Reading	Load on front axle of tow vehicle
2nd Reading	Gross connected tow vehicle weight, including trailer tongue weight
2nd Reading minus 1st Reading	Load on rear axle of tow vehicle
3rd Reading	Total weight of tow vehicle and trailer
3rd Reading minus 2nd Reading	Load on front and rear axles of trailer
4th Reading	Gross vehicle weight of trailer
5th Reading	Weight of one side of trailer, while connected to tow vehicle
6th Reading	Weight of opposite side of trailer, while connected to tow vehicle (should nearly equal 5th reading)

ull forward until **both the front nd rear wheels** of the tow ehicle are on the weighing latform, and take a second eading. The first figure represents ne load supported by the **front xle** of the tow car; the second gure is the **gross connected tow ehicle weight, which must not xceed the tow vehicle GVWR.** he load on the **rear axle** of the w car is determined by ubtracting the first reading from ne second reading. The fference, which includes the ailer tongue weight, **must not xceed the tow vehicle rear xle GAWR.**

ow drive forward until **both the w car and trailer** are on the eighing platform, and take a third eading. This figure is the **total eight** of the combined tow ehicle/trailer configuration. To rrive at the trailer's axle load, ubtract the second figure (gross onnected tow vehicle weight) om this third figure. **The load on e coach axles must not xceed the total of the coach's ont and rear GAWR.**

ne **gross weight** of the loaded ailer can be obtained by ncoupling the tow car and driving off the scale, leaving only the each on the platform. This fourth ading is your Avion's **Gross ehicle Weight. It must not be ore than the GVWR listed on e plate.**

de-to-side weight distribution ould be as nearly equal as ssible. It can be ascertained by eighing first one side of the ailer and then the other, **while it properly hitched to the tow ehicle.**

gue Weight

maximum recommended figure our Avion's trailer tongue weight 00 pounds, and should be within 5% of coach weight. Trailer ue weight can be calculated g public scales, or you can rmine it at home as an aid to ing using the following method. photo.

1. Chock all trailer wheels, in front of and behind the tires.

2. Place a lifting jack under trailer tongue rail and raise the coach. Remove the dolly wheel from the jack post.

3. Face the front of the coach and position an ordinary bathroom scale on the ground to the **left** of the trailer hitch jack post and in line with it. The center of the scale should be exactly **two feet** from the centerline of the jack post.

4. Place a block of wood (about the same thickness as the scale) on the ground to the **right** of the jack post, in direct line with the post and the scale. The center of the block should be exactly **one foot** from the centerline of the jack post.

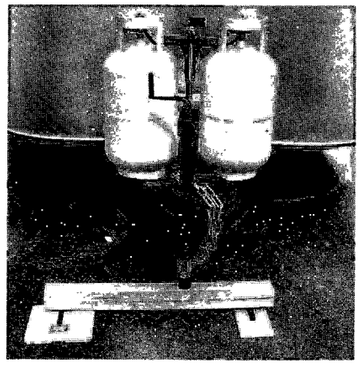
5. Position a short piece of pipe on the center of the scale and another on the center of the wood block, both at right angles to the front of the trailer.

6. Lay a 4′ x 4″ x 4″ piece of wood across the two pieces of pipe. This cross member should be exactly under the jack post.

7. Lower the trailer tongue until the jack post rests on the cross member and is fully supported by it.

8. Level the trailer front and rear.

9. Check the scale and **multiply the weight reading by three** (the total number of feet along the cross member between the wood block and the scale). If the weight exceeds the limit of the bathroom scale, simply increase the distance between scale and jack post by one-foot increments until a reading is obtained (you will also have to use longer cross members to span the increased dimension). **Always remember to multiply the weight reading by the exact number of feet between the bathroom scale and the wood block.** The resulting figure is the **trailer tongue weight.** This method can also be used to weigh your supplies while loading, in order to develop a well-balanced pattern.



Tongue Weight

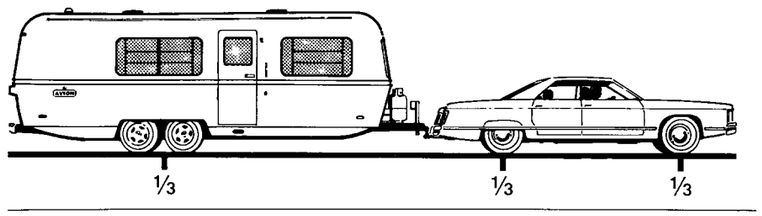
Selecting a Hitch

We recommend the use of a top-grade load-equalizing hitch similar to the types manufactured by Reese Products, Inc. and Eaz-Lift Spring Corporation. A properly coupled load-equalizing hitch divides the trailer's tongue weight into three equal parts and saves wear and tear caused by uneven weight distribution. One-third of the weight is supported by the trailer's axles and the other two-thirds are supported equally by the tow car's front and rear axles. **If any axle weight rating is exceeded, equalizer settings must be changed and/or cargo eliminated, to bring all axles within prescribed limits.** Periodically reweigh your coach and tow car to guard against overloading.

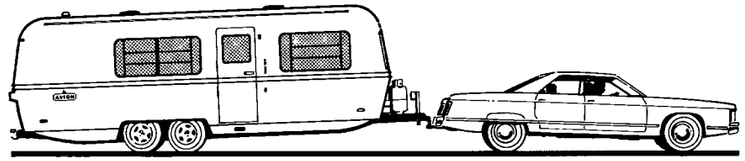
Tow Vehicle Tire Pressure

Correct loading also means correct tow car tire pressure. An equalizing hitch increases the load on each wheel of the tow vehicle, and additional tire pressure is required to compensate for the extra burden. Refer to your tow car operating manual for instructions, and in no case exceed the recommended pressures.

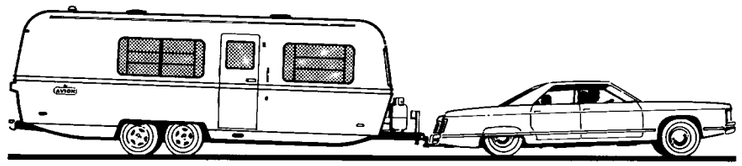
Proper Load Distribution



Improper Load Distribution



Hitch Too High



Hitch Too Low

Trailer Weights and Ratings

Model	Gross Vehicle Weight Rating (GVWR)	Gross Axle Weight Rating (GAWR)	Cargo Capacity
C	6800	6750	1900
D	6800	6750	1900
F	7500	6930	1950
H	7500	6930	1935
J	7600	7000	2080
M	7600	7000	2080
P	8540	7880	2100
R	8540	7880	2200
V	9440	8775	2200
W	9440	8775	2400

Towing

Hitching Up

Hitching up your Avion in preparation for travel will become routine procedure with experience. You should follow the recommended step-by-step method the first time and every time you hitch up the trailer. Additional measures to observe in preparing the coach for travel after a lengthy stop are covered in the **Travel** section, page 22.

For ease of operation and minimum effort in hitching up the coach, we recommend installation of the optional trailer hitch power jack.

Hitch-Up Procedures

1. Raise the front of the trailer with the post jack.

2. Back your tow car into position, with the hitch ball under the trailer hitch socket. If you are working alone, we suggest using a hook-up mirror to give you a view of the trailer hitch while backing up.

3. After the hitch ball has been positioned under the hitch socket, make sure the locking lever has been raised and pushed to the rear, then lower the front end of the trailer onto the hitch ball. Rock the tow vehicle back and forth several times to seat the socket and ball fully, then place the ball lock into position. The lock should be secured by inserting a hitch safety pin or small lock through the hole immediately to the rear of the latch.

4. Raise the front of the coach again (the tow car will come up with it), and attach the leveling bars. When the trailer is then lowered to the ground, the hitch ball should be approximately level. If it is not, adjust the leveling bars as needed. When properly leveled, the hitch load is equally distributed for optimum steering control and balance, with one-third of the weight on the tow vehicle's front wheels, one-third on its rear wheels, and one-third on the trailer's wheels. The hitch bar will have a noticeable arc or "bowing" effect when it has been correctly installed. You can save time on subsequent hitch-ups by marking the appropriate chain links with tape, so you will know exactly how high to raise the bar.

5. Remove the dolly wheel or any blocks that may have been used under the post jack, and retract it to the highest position. Hook up electrical connections from tow vehicle to trailer and anchor the break-away switch cable to the tow vehicle hitch frame.

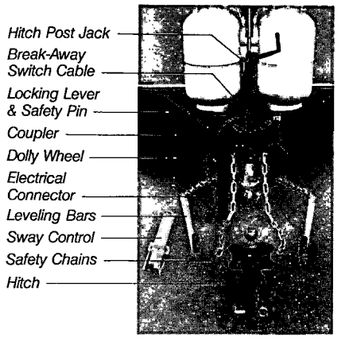
6. Your Avion is equipped with two safety chains that are attached to the trailer tongue. Cross the chains under the hitch and thread them through their respective eyes on the hitch, adjacent to the side of the tow car's centerline. Each chain should then be hooked back on itself, using the special terminal links provided. Adjust each chain length so that it is as short as possible while still permitting full "jack-knife" turns without becoming taut. Both chains should have the same amount of slack, and they should be short enough to hold the trailer tongue off the ground in the event it becomes uncoupled.

7. Inspect tire condition on trailer and tow car, and make it a practice to check air pressure on a regular basis.

8. Recheck all previous steps, and then pull forward 20 or 30 yards to test the brakes.

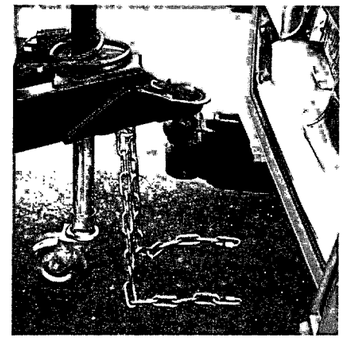
Final Check List

- Wheel lug bolts tight
- Coupler latched and secured with hitch safety pin
- Safety chains secured to tow car
- Break-away switch cable attached to tow car hitch frame
- 7-way connector plugged into tow car electrical system
- Trailer batteries connected and charged
- Jacks stored and blocks removed
- Trailer running lights working
- Brake controller operating
- Mirrors adjusted

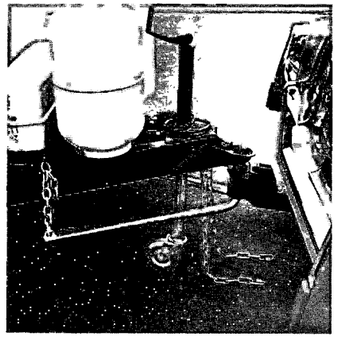


Hitching Up Equipment.

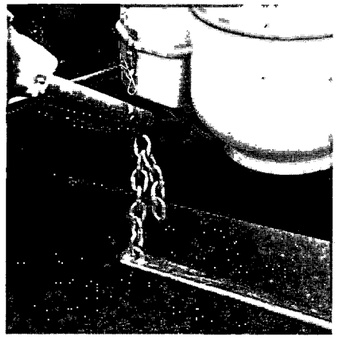
1. Extend post jack, back up car.



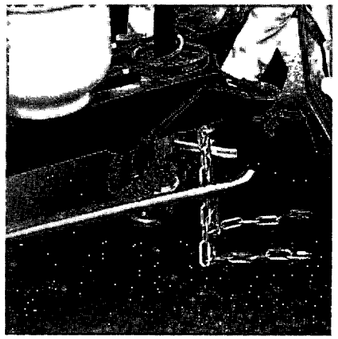
2. Lower trailer, insert safety pin.



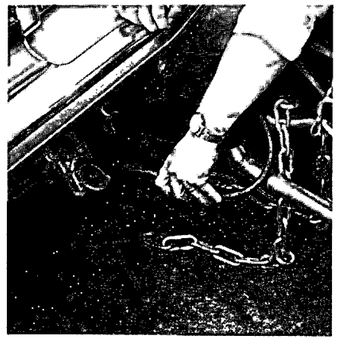
3. Raise trailer and car, attach bars.



4. Adjust leveling bars.



5. Remove dolly wheel.



6. Hook up electrical connector.

7. Connect safety chains.

8. Connect break-away switch cable.

Towing Tips

A thorough knowledge of the proven driving techniques used in trailering will assure many years of safe, carefree operation of your Avion. We urge you to observe these towing tips whenever traveling.

Equipment

1. **Rear View Mirrors.** Your tow car can be outfitted with various types of outside mirrors. Most states require one mirror extending from each side of the tow car to provide the driver with a clear view when passing and when being passed. Check for specific laws in the states where you plan to travel. Adjust outside mirrors to show the side of your trailer and as much of the adjacent rear and side views of the road as possible. Make it a habit to check all rear view mirrors frequently.

2. **Brake Controller.** Your Avion's electric brakes are activated by a brake controller installed in the tow car. When the car brake pedal is depressed, the controller **automatically** applies the trailer brakes at the same time as, or slightly before, the car brakes engage. The brake controller can also be operated **manually** in emergency situations, to correct any excessive sway or skidding of the trailer. For more information about the operation of the brake controller, see **Brakes,** page 38.

3. **Lights.** Inspect all exterior lights on trailer and tow car periodically, to be certain you can see and be seen.

4. **Emergency Equipment.** Before starting any trip, always have on board wheel blocks, lifting jacks, flares, tool kit, flashlight with fresh batteries, first aid kit, and a fully-charged fire extinguisher.

Road Courtesy

1. **Practice Means Proficiency.** Save time and avoid frayed nerves for yourself and other drivers on the road. Learn the feel and handling characteristics of your new Avion by practicing **before** you head into city traffic or onto the highway. A large, empty parking lot is ideal for practicing turns, backing up, and parking, until you feel comfortable and competent.

2. **Turning.** Your Avion coach has a **tighter** turning circle than the tow car, which means you must make **wider** turns than you are accustomed to with your car alone ...especially in city driving and when negotiating sharp turns. You can visualize exactly how the two vehicles move in relation to each other by examining their tire tracks. See illustration.

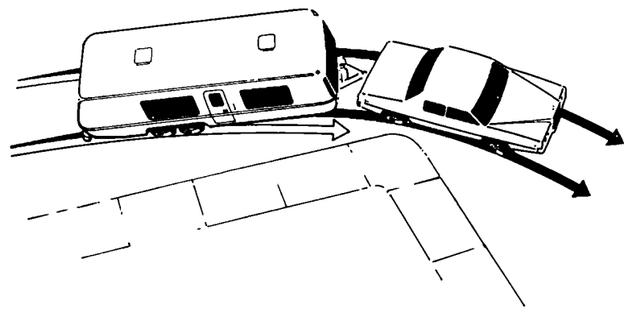
3. **Entering Traffic.** Inspect your brakes, tires and hitch before getting underway. Check traffic in all directions, then signal your intention to pull away. When clear, start slowly while observing the trailer in your mirrors, then move carefully into the appropriate lane.

4. **Passing.** When passing another vehicle, remember that your tow car will accelerate more slowly than usual because of the added weight of the trailer. Allow ample passing time and distance, and once past the other vehicle, allow for trailer length clearance before returning to the original lane. Use your outside rear view mirrors to assure safe maneuvering.

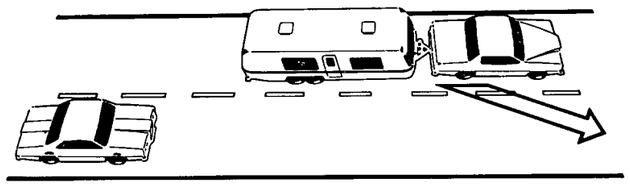
When you are being passed on the left from the rear by a large, flat-fronted vehicle such as a truck or bus, your tow car will have a tendency to move to the right when the air displaced by the passing vehicle blows against the side of the coach. See illustration. This movement to the right will occur as the front of the other vehicle passes the rear of the trailer. The tow car will move back to the left as the front of the other vehicle passes the trailer wheels. If you are being passed on the right, your tow car will move initially to the left. When you see that you are about to be passed by a large truck or bus, maintain control by making as little steering correction as possible, remembering that the tow car will be turned back to its original course as soon as the front of the other vehicle passes the trailer wheels. Avoid quick steering maneuvers that can inadvertently magnify these course changes and start the trailer swaying, and **do not** apply the brakes.

5. **Speed.** Reasonable speed is probably the greatest factor in successful trailering. **Do not hurry!** Traveling at moderate speed reduces stopping distance and increases trailer stability. Besides, the need to reach a motel or restaurant is immaterial now that your "home" is with you as you travel. Adjust your driving speed to road, weather and traffic conditions. If you are new to trailering, drive at substantially reduced speeds until you have gained enough experience to determine maximum safe speeds for all towing conditions.

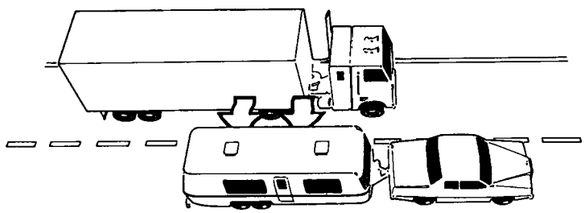
Turning



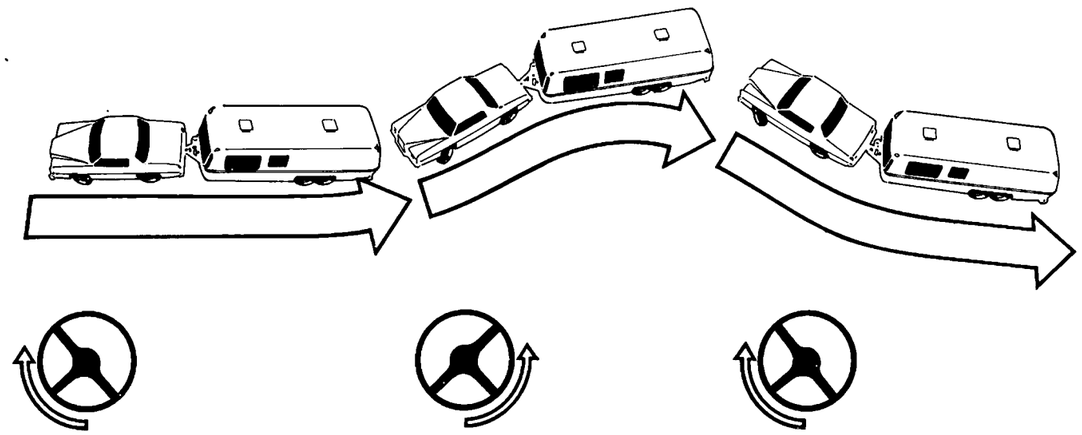
Passing



Being Passed



Backing Up



6. **Backing Up.** Since the trailer turns in the **opposite** direction from the tow car when backing up, caution and care should be exercised at all times. Concentrate on the rear of the coach, using the outside rear view mirrors. Here is an easy way to remember the direction your steering wheel should be turned: Place your hand at the **bottom** of the wheel. To turn the trailer to the **left,** move your hand to the **left** (turn wheel **clockwise**). To turn the trailer to the **right,** move your hand to the right (turn wheel **counter-clockwise**). Always start with both vehicles in a straight line. As you turn, the car will follow the trailer in an arc. To line up the vehicles again, oversteer in the **opposite** direction until they are realigned, then straighten the steering wheel. It is advisable to back to your **left** whenever possible, to take advantage of better visibility from the driver's side.

   If your first try is unsatisfactory, move forward until the vehicles are again in a straight line and repeat the maneuver, instead of attempting to correct a false start. In time, and with practice, backing will take little effort. Always be aware that you have poor visibility to the rear. It is advisable to have someone positioned at a safe distance behind the coach to guide your actions.

7. **Stopping.** The added weight of your trailer will result in greater stopping distances than for the tow car alone. Always maintain an adequate distance from the vehicle ahead... **at least one car and trailer length for each ten miles per hour.** Signal your intentions before pulling off the road to stop.

8. **Driver Alertness.** Set reasonable distance goals for each day and do not deviate from them. Make numerous rest stops to stretch your legs and restore concentration. Above all, avoid driving when you are tired. Fatigue reduces alertness and contributes to driver error and accidents.

Weather and Road Conditions

1. **Towing in Hot Weather.** High outside temperature alone is usually insufficient to cause overheating of your tow car. However, additional factors such as pulling up a long or steep grade, slowing after sustained high-speed driving, or idling in traffic, can cause a temporary cooling system overload. When this happens, turn off the air conditioning in your car and pull into a turnout or rest stop as soon as possible. With the transmission in "neutral" and the parking brake engaged, step on the accelerator to increase engine idling speed. Run engine at fast idle for five minutes. Also open the hood to check for cooling system leaks, broken fan belts and other possible malfunctions, such as a broken thermostat.

   Caution: Do not check radiator coolant level while engine is hot. Automobile cooling systems operate under high pressure, and the radiator cap should never be removed while engine is overheated.

   If no problems are evident, the radiator fan will reduce cooling system temperature sufficiently to have you underway again in a few minutes. Drive slowly for several minutes before resuming normal speed. If overheating recurs or persists, have it corrected at the earliest opportunity.

2. **Towing in Inclement Weather.** Do not downshift to slow the trailer and tow car on wet or icy pavement. The rear wheels may skid if you do so. In the event of a skid, switch your brake controller to **manual** and gently apply the **trailer brakes only,** in order to realign the vehicles. When snow chains are required, place them on the **tow car only**. Chains are of no use on trailer tires.

3. **Towing in Wind. Do not** attempt to compensate for sway or "fishtailing" by turning the steering wheel. Drive straight ahead and **do not** apply the brakes. Continue under control and your Avion will follow. If it is necessary to continue under high wind conditions, slow down until control can be maintained. The trailer/tow vehicle combination will have greater stability and handle better if it is equipped with a load-equalizing hitch and sway control. See pages 6 and 32.

4. **Towing Downhill.** Shift the transmission into low gear, if possible. Engine compression will then act to slow both vehicles. If speed begins to increase again, lightly pump the brakes several times. **Do not ride the brakes or pump them forcefully.** Take dips and road irregularities slowly and carefully. Remember: Your Avion's wheels must clear these road hazards, too.

5. **Parking on Hills.** Chock all trailer wheels, leave the transmission in gear, and apply the hand brake on your tow car. **Do not use trailer brakes for parking.** Always turn the front wheels of the tow car into the curb to prevent possible runaway.

6. **Towing in Mud and Sand.** Use your forward momentum with as little additional power as possible. Roll into the tracks of the vehicle ahead in the highest gear you can maintain without the engine lugging. If your rig should become mired, **do not** unhitch the coach. Call for road service and have the vehicles pulled out together.

7. **Towing on Gravel or Dirt Roads.** Plan your route to avoid driving long distances over inferior roads. Stones and other debris thrown onto the front of your Avion by the tow car's rear tires can scratch or dent the aluminum surface. If you find it necessary to travel under such conditions, we suggest taping heavy sheets of plastic or cardboard to the lower front end portion of the coach.

8. **Towing in Traffic.** On two-lane roads, other vehicles will rapidly line up behind you unless normal speed is maintained. Safety and courtesy dictate that you signal, pull into a turnout, and allow others to pass. **Avoid pulling onto shoulders except in cases of emergency.** On freeways, expressways and other multi-lane roads, pick the lane you want and stay in it. You should not drive in the high-speed (inside) lane when pulling a trailer. Always check mirrors and exercise additional caution when entering or exiting freeways, or when changing lanes.

Travel

When to Go

Trailering is much more than a summertime activity. The true enthusiasts enjoy traveling year-round to experience the changing seasons and take advantage of wide-open highways, uncongested campsites, uncrowded tourist attractions and, in many instances, off-season rates.

Insulation

Your Avion is truly an "all-weather" trailer, thanks to a combination of sophisticated climate control systems and effective insulation. Avion utilizes urethane foam...the most efficient and versatile material on the market today. The insulation capability of urethane is almost twice that of the next best product, offering both low thermal conductivity and low moisture vapor permeability.

Avion constructs its coaches with the insulation as an integral part of the walls, rather than using batting or sheets of material. First, the outer skin is assembled, then foam is sprayed into all interior cavities, and finally the inner wall panels are attached. This method of construction not only provides better insulation, it also results in more rigid walls, making the aluminum skin less susceptible to dents.

Even the floor of your Avion trailer is fabricated with extra care. A full 1½ inches of rigid foam insulation is sandwiched between two layers of plywood flooring, and finished with sturdy sheet metal on the undercarriage.

Cold Weather Traveling

Avion trailers have been designed to make winter trips enjoyable and comfortable, even under prolonged sub-zero conditions. For maximum comfort, simply take the kind of steps you would to keep your home warm during cold weather.

1. **Keep your trailer heated.** Avion is equipped with a forced air furnace that operates equally well whether the coach is stopped or moving. Leave the heat on at all times to protect water systems. It is also more economical in the long run to maintain a constant "room temperature" than to warm the trailer from a cold start. All **internal** doors and folding partitions should be kept slightly ajar when the coach is occupied, to assure free air circulation throughout the interior.

2. **Carry ample LPG.** Because of increased fuel consumption during cold weather, you should always have a sufficient supply on hand when you need it.

3. **Use outside electricity.** The more external power you use, the less the drain on trailer batteries. For extended stays, especially, locate a 110-volt electrical hook-up. If none is available, you must use internal battery power, but sparingly. Avion's self-contained electrical system is designed to operate many hours on its fully-charged batteries. When recharging is necessary, find an external 110-volt power source or run your tow vehicle's engine at fast idle. One hour of recharging will give you about four hours of available power. See **Battery** section, page 78.

Caution: Carbon monoxide fumes from the car engine exhaust can be potentially dangerous. Whenever the trailer batteries are being charged by the tow vehicle, be sure the windows in the front end of the coach are closed to prevent fumes from entering. Do not run the engine in a confined area.

4. **Guard against heat loss.** Your Avion trailer has been constructed with extensive foam insulation to retain as much of the internal temperature as possible, but a few additional precautions will result in even greater heat retention. Driving during sunlight hours will take advantage of solar radiation on the trailer and avoid the heat-robbing effects of cold winds. Draw all window shades and drapes to prevent heat loss through the glass, and keep the exterior door closed whenever possible.

Caution: In sub-freezing weather, insulate the external water and solid waste lines to prevent possible damage.

Warm Weather Traveling

Trailering during the summer months will be a more pleasureable experience if you observe these travel tips.

1. **Park in shady areas whenever convenient.** This is especially important during midday hours, when the sun's rays are strongest. Under most conditions, the same superior insulation that keeps your Avion warm in the winter will keep it comparatively cool during the summer.

2. **Keep roof vents open slightly to maintain fresh air circulation inside.** The vents have been designed to remain open even when it rains. While traveling, crank open only the **rear** portion of the vents. All windows should be kept tightly **closed** while traveling, in order to avoid creating cross-ventilation air drafts that can pull in dust and dirt while the coach is in motion.

3. **Watch your tow car's cooling system closely.** Remember, the engine is pulling a heavier load than normal, causing it to run at higher temperatures, even with special heavy-duty components. Overheating is most likely to occur while driving in stop-and-go traffic or pulling up long or steep grades. Driving in hot weather under such conditions tends to magnify the possibility of overheating. See **Towing Tips**, page 12.

4. **Plan ahead.** Your daily itinerary should take into account the higher traffic volume during summer months. This can be offset somewhat by taking advantage of longer daylight driving hours. It is also prudent to write or phone ahead for campsite reservations during vacation seasons. If you intend to enter state and national parks, you may find it more economical to purchase season permits where available, rather than paying a fee every time you visit a controlled area. Also secure proper hunting and fishing licenses and observe the local seasons and limits.

Where to Stay

Your Avion provides you with a home environment virtually any place you travel. You can park in safety and comfort wherever you choose, as long as the site is relatively level and firm, and camping does not violate local ordinances. Once off the highway, you will encounter almost unlimited possibilities by using a little imagination and creative exploration.

Public and private campgrounds and trailer parks offer sites to satisfy many differing tastes and needs. Some have swimming pools, restaurants, general stores, playgrounds, sports areas, outdoor cooking facilities, cable television hook-ups, and just about any of the other conveniences of a modern resort hotel. Many sites offer complete facilities for power, water and waste disposal hook-up, while others have more primitive accommodations (usually national and state parks, forests and monuments). Because your Avion coach is completely self-contained, you can park in comfort regardless of the area you select.

We suggest that you pick up any of the campground guides available through automobile clubs, the National Park Service, or state and local tourist bureaus. These guides provide detailed information on locations, facilities, accommodations, activities, periods of operation, and fee schedules.

If you prefer not to stay in a campground, simply ask the local residents when you arrive in the general area where you plan to stop for the night. Also check with the police department, sheriff, ranger station or chamber of commerce. These people know the area and they are usually eager to help. If public land is not available, farmers will sometimes allow you to stay on their property, and local merchants or service station operators may give you permission to use their parking lots overnight.

Write or telephone ahead, whenever possible, and you will know what is likely to be available. If you are intent on staying at trailer parks or campgrounds, we recommend that you make advance reservations, especially during vacation seasons.

Brief Stopovers

Select a parking spot and position the trailer. If the site is relatively level, it is not necessary to use blocks or stabilizing jacks. **However, you should always chock the wheels and lower the post jack.** This will ease the pressure on the tow car's suspension and give the coach greater stability. If the only available site is on an incline, park facing **down** the slope. This will make it easier to level the trailer.

It is not necessary to hook-up to outside power and water for overnight stops, since your Avion is a completely self-contained unit. The refrigerator can operate on the trailer's LPG system, as well as from available 110-volt external power. Light the refrigerator pilot if you will be running it on LPG. Also light the range and oven pilots if you plan to use the oven. The water heater and furnace operate by electronic ignition and thus have no pilots.

That's all there is to it! When stopping for only one or two nights, it is unlikely that you will run down the batteries, exhaust the fresh water supply, or fill the rinse water and solid waste tanks. Just relax and enjoy your stay. There is not even a need to unhitch your tow car... unless you want to drive into town or go sightseeing. Whatever you choose to do, it's a nice feeling to know your luxurious accommodations are prepared for the night.

Lengthy Stops

Camping for an extended period requires a more complete setup, in order to utilize the trailer's full capabilities. Observe the following procedures.

1. **Select and prepare the site.** Look for a parking area that is as level as possible, but if you do find it necessary to select an incline, make certain the vehicles face **downhill.** Always carry a shovel and some boards to assist you in preparing the site. They come in handy for lowering bumpy areas and elevating ground depressions, which can cause the coach to lean.

2. **Check trailer for level.** Use a carpenter's or spirit level to determine whether the coach is on a horizontal plane. The level should be placed on top of a counter inside or on the A-frame of the trailer tongue. If leveling is required, it should first be done from side-to-side and then from front-to-rear. See Illustration, page 23.

3. **Level from side-to-side.** To bring the low side of the trailer up to level, place 4′x6″x2″ boards on the ground where the low-side trailer wheels will rest, then drive the coach onto this "ramp" until the wheels are centered. We suggest tapering the ends of the boards so that the tires roll onto them easily. Chock all wheels to prevent the coach from moving. Do not attempt to level the trailer by digging holes for the high-side wheels.

4. **Level from front-to-rear.** Uncouple the vehicles and adjust the trailer hitch jack post up or down until the trailer is level.

5. **Position stabilizing jacks.** If blocks or stabilizing jacks are used to steady the coach, they should be placed under the frame at the front and rear. Any additional jacks that may be needed for leveling on extremely bumpy terrain must be positioned **under the main frame rails only.** Use heavy-duty lifting jacks for this purpose. If your Avion is equipped with the optional stabilizing jacks, they are permanently attached to the trailer for ease and convenience.

   Caution: Stabilizing jacks are not designed to support the weight of the trailer; that is the job of the tires. The jacks should be extended only enough to support the frame and hold it firm. Never use them for lifting the coach.

6. **Hook up the utilities.** The water intake line and 110-volt electrical cable are located in a locked compartment on the road side at the rear. Open the hinged access cover and pull out the water hose and power cable far enough to reach the hook-up couplings, then connect them. For special instructions on grounding the power cable, refer to **Electrical** section, page 76. You can close the access cover to keep out dirt by seating the water and power lines in the built-in, adjustable-length slots. Connect the sewage and rinse water outlet hose to the outside sewer hook-up. The outlet is located behind a hinged door on the road side of the coach, behind the wheels. Drain rinse water holding tank and leave valve open. Disconnect hose from sewage outlet, swivel the sewage outlet down, swing door up and latch it, and reconnect sewer hose to the outlet. See **Drainage** System, page 72.

Important: If outside utilities are not available, regularly check the Monitor Panel for condition of batteries, fresh water supply, and solid waste and rinse water holding tanks. Service them as required.

7. **Turn on LPG.** Open the gas valve, then light the pilots on your refrigerator (if operating on LPG), range and oven. Turn on hot water heater at Monitor Panel. See **Appliances** section, pages 81.

8. **Raise television antenna.** If your Avion is equipped with the optional roof-mounted TV antenna, raise it and adjust for best reception. You may prefer to use the cable television hook-up, if this service is available at your campsite. Use the terminal housed inside the 110-volt power cord compartment, and switch your TV lead-in from the "TV Antenna" jack to the "Cable TV" jack. See page 33 .

9. **Recharge batteries.** Extended stays utilizing internal power place a burden on the trailer's storage batteries, so conserve electricity whenever you can. The on-board system will operate for many hours on fully-charged batteries. To recharge, run your tow car engine at fast idle. One hour of recharging will provide about four hours of electrical current. Be sure the 7-way connector is hooked up between trailer and tow car before charging.

Caution: Carbon monoxide fumes from the car engine exhaust can be potentially dangerous. Whenever the trailer batteries are being charged by the tow vehicle, be sure the windows in the front end of the coach are closed to prevent fumes from entering. Do not run the engine in a confined area.

Leaving the Campsite

Preparations for departure should follow this step-by-step procedure to assure that nothing is overlooked.

1. Disconnect power cord and water hose from the outside hook-ups and stow. Also disconnect cable TV, then close and lock compartment.

2. Disconnect sewer hose from utility hook-up and trailer sewage outlet, flush with clear water, and stow in hinged compartment located behind the rear bumper. Swivel sewage outlet up, replace outlet cap, secure dump valves and latch access door. See **Drainage** section, page 72.

3. Turn off the LPG supply valve and all pilot light valves on refrigerator, range and oven.

4. Store all gear as outlined in **Loading** section, page 4.

5. Close all windows (close roof vents or adjust for travel, if desired; page 48), lower the optional television antenna and lock the main door. Fold the step into its "traveling" position under the coach. Retract the optional front and side awnings and latch them securely.

6. Retract or remove the stabilizing jacks or blocks from underneath the trailer, hitch up the vehicles for travel, and unchock the wheels. Do not forget any leveling ramps that might have been used.

7. Clean up all litter that accumulated during your stay. You should leave the area in as good condition as when you arrived. Campers appreciate each other's consideration.

Final Check List

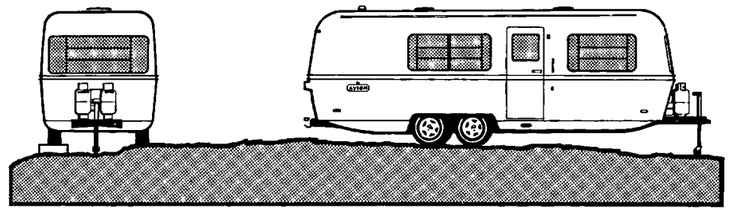
- 110-volt power cord disconnected
- Water hose disconnected
- Sewer hose disconnected
- Windows closed
- Roof vents closed
- TV antenna retracted
- Refrigerator doors locked
- Storage compartments closed and locked
- Interior lights off
- LPG appliances off
- Folding step retracted
- Main door locked
- Wheel lug bolts tight
- Coupler latched and secured with hitch safety pin
- Safety chains secured to tow car
- Break-away switch cable attached to tow car hitch frame
- 7-way connector plugged into tow car electrical cable
- Trailer batteries connected and charged
- Jacks stored and blocks removed
- Trailer running lights working
- Brake controller operating
- Mirrors adjusted
- Side and front window awnings up and latched

Waste Disposal

Stop at a sanitary dumping facility if you have used the internal water or waste holding systems for an extended period without being connected to a sewer line. Many service stations and roadside rest stops provide public facilities designed for discharging rinse water and solid waste holding tanks and taking on fresh water. Acquire a booklet listing available stations in the areas where you will be traveling. For detailed information on emptying the rinse water and solid waste holding tanks, see **Drainage** section, page 72.

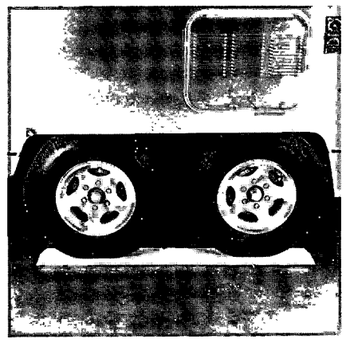
Spirit Level

Trailer Leveling

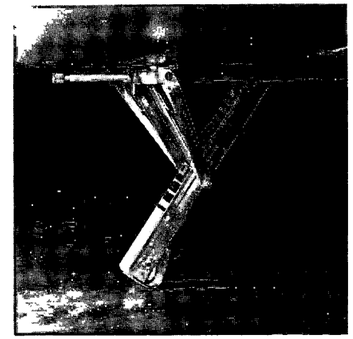


Step 1. Side to Side

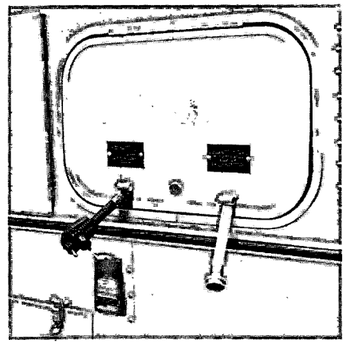
Step 2. Front to Rear



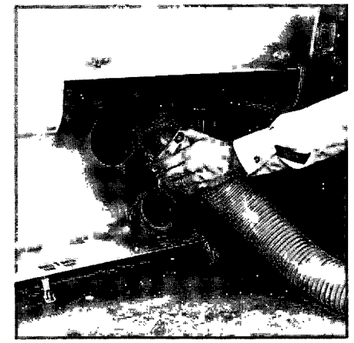
Trailer Leveling



Stabilizing Jacks



Utility Connections



Sewage Hose Connection

Avion Travelcade Club

New travel horizons will be open to you through the Avion Travelcade Club... a private, non-profit organization with a membership limited to Avion owners.

The club brings together families of different ages and diverse backgrounds who share interests common to all trailering enthusiasts: Love of the outdoors, the urge to travel, and a spirit of adventure.

Club gatherings foster goodwill and provide companionship, enjoyment, recreation, and the opportunity to make new and lasting friendships.

Organization

More than 3000 families belong to the Avion Travelcade Club worldwide. There are 35 separate units in the United States alone, each representing a state or larger area. These units are grouped geographically into larger entities to allow for efficient coordination of activities.

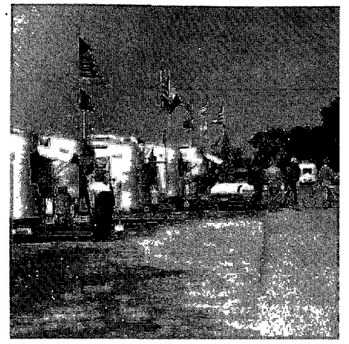
Avion owners who belong to their state units automatically receive membership status in the International Avion Travelcade Club, as well, and are welcome to participate in the rallies of any other unit.

Activities

Club programs include unit rallies, travelcades and international rendezvous assemblies.

1. **Unit Rallies.** Each unit holds at least two rallies per year, usually in the spring and fall. They generally take place over long weekends and in locations easily reached by unit members. Other units hold monthly rallies. Unit officers are elected by the membership at the annual fall gathering.
2. **Travelcades.** A travelcade is an organized trip over a predetermined route, for sightseeing and leisurely travel. Local units sometimes stage occasional travelcades lasting from a few days to two weeks, while regional, national and international travelcades may run several weeks and include trips to neighboring states, Mexico or Canada. Each is under the leadership of a travelcade director to assure a safe and enjoyable experience.
3. **International Rendezvous.** At least three of these large-scale rallies are held each year, in the north during the summer and the south during the winter. They run 4-5 days and are sometimes staged in conjunction with an international travelcade. International officers and regional district governors are elected by the membership at these events.

Avion travelcades are the ideal means of traveling for those who are hesitant about making long trips alone. Travelcades offer security in addition to the fun and fellowship of traveling together and participating in group activities.



International Rendezvous

Club Insignia

Membership Information

Members of the Avion Travelcade Club receive their own individual registration number decal for the coach, as well as Travelcade Club insignia and unit name crescent decals for the coach and car windshield. Decals are also furnished showing participation in each international travelcade.

Every member also receives a subscription to the monthly Avion Travel News and a yearly directory of membership, club bylaws, and other information.

For details on membership and dues, ask your Avion dealer for the descriptive brochure and the name and address of your local unit secretary.

Exterior

Exterior Identification

No.	Description	Page No.
1.	Air Conditioner (Optional)	94
2.	Patio Convenience Light	104
3.	Running Lights	104
4.	Radio Antenna	34
5.	LPG Tanks and Regulator	64
6.	Electric Jack (Optional)	32
7.	Safety Chains	10
8.	Hitch	2
9.	Electrical Connector	78
10.	Leveling Bars	10
11.	Batteries	78
12.	Folding Step	32
13.	Water Fill Spout	66
14.	Storage Compartment	—

No.	Description	Page No.
1.	Roof Vent	48
2.	Range and Oven Vent	86
3.	Refrigerator Vent	—
4.	T.V. Antenna (Optional)	33
5.	Bathroom Exhaust Fan	51
6.	Running Lights	104
7.	Stop, Tail, Turn and Backing Lights	104
8.	License Plate Light	104
9.	Utility Access	21
10.	Utility Convenience Light	104
11.	Waste Outlet	72
12.	Water Heater Access Compartment	93
13.	Furnace Vent	90
14.	Refrigerator Access Compartment	82
15.	Stabilizing Jacks (Optional)	32
16.	Storage Compartment	—

Care of Exterior Surfaces

The exterior skin of your Avion is fabricated of anodized aluminum for long-lasting beauty and freedom from corrosion or discoloration. You can keep it looking like new by giving it the same care as a fine automobile.

The trailer should be washed periodically with a warm solution of mild detergent or soap. **Avoid strong detergents, solvents or any abrasive cleaners.** The aluminum skin should be cool when you wash it. Pick a shady area or wait for an overcast day, but never wash it in direct sunlight.

Make sure all vents, windows, storage compartments, access panels and the main door are closed tightly, then apply the cleaning solution with a large sponge or soft cloth. Starting with the roof, wash one section at a time and rinse immediately to prevent the cleaning solution from drying on the surface. Road tars, sap, resin and other such materials should be removed as soon as you notice them, before they can harden. Use kerosene, turpentine or naphtha with a soft cloth, taking care not to scratch the surface. Rinse thoroughly with clear water and rewax the affected areas to protect the finish. **Never use abrasive powders or strong chemicals to remove caked-on foreign matter.**

The aluminum skin should be waxed every three to six months, depending on exposure to the elements. We recommend an aircraft polish, but you may also use any good automotive paste or liquid cleaner/wax. Periodic waxing will increase the life of the finish by protecting it from salt air in coastal regions, as well as from air pollution and minor scratches. It will also make subsequent cleaning easier.

The trailer hitch A-frame and back frame can be kept looking as new as the aluminum skin by painting them as needed, using a brush-on or spray lacquer.

Occasionally inspect all exterior seams for holes and cracks, which can sometimes develop from shrinkage of the sealer after prolonged exposure. A good sealant is available from recreational vehicle dealers and automotive supply stores.

Features

Main Door and Screen Door

The main door is located on the curb side of the coach and opens outward. It can be opened 180° and secured flush against the side of the trailer. Swing door open fully, then push on it until the doorstop pin engages the doorstop receptacle on the outside of the coach. The inside door handle is operated by pivoting it either up or down from its horizontal position. The outside recessed lever is operated by pulling it outward from the door.

A key-actuated dead bolt is built into the main door for maximum safety and security when locking the trailer from the outside. To operate, insert the key and turn it **clockwise,** locking the dead bolt in the extended position. The bolt must be fully engaged for the door to lock, and once in that position, it cannot be accidentally retracted or vibrate back into its recessed location inside the door.

Note: Do not turn the key while door is still open; the extended dead bolt will then hit the door frame and prevent closure.

To unlock, turn key **counter-clockwise** one-half turn and use handle to open.

The main door is locked from inside the coach by a lever at the lower left corner of the door handle panel. Lift upward on the lever to lock the door and push downward to unlock it. Moving the inside handle either up or down will automatically release the lock.

Your Avion is also equipped with a screen door, which can be opened and closed independently of the main door or coupled with it to operate as a unit. To link them together, simply push the screen door against the main door. To uncouple, press down on the release latch next to screen door handle. When joined together, access to the main door's inside handle is through a sliding aluminum panel on the screen door.

The main door is closed properly when there is no play in the handle. If you have difficulty locking the door, push or pull it gently to allow full travel of the bolt.

Important: Always close and lock the main door with dead bolt before towing. Road vibration may cause an unlocked door to unlatch and swing open while the trailer is in motion, resulting in possible damage.

Windows and Screens

All windows are made of tinted high-strength safety glass. The louvered vent panes are operated by an interior crank handle located at the bottom corner of the window frame. Turn the crank clockwise to open and counterclockwise to close. **The emergency escape window is not louvered and should never be opened except in emergencies or during practice drills.** For operation of this window, see **Interior** section, page 50.

Windows may be washed with the same solution used on the exterior skin, or with any type of household window cleaner. Never clean heavily soiled window glass with a **dry** cloth, which can cause scratches, and do not use strong solvents that can damage the rubber window seals. You can keep these seals flexible and weather-tight with an application of silicone lubricant after the windows have been washed and dried.

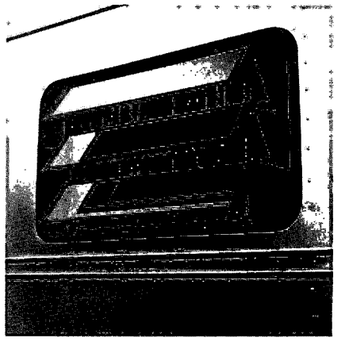
The window screens are made of fiberglas for durability and easy care. They can be taken out for cleaning by first removing the vent pane crank handle, then lifting the screen straight up until it clears the lip on the bottom channel. Swing the bottom of the screen outward and pull down to remove.

Lightly soiled screens may be hosed off or cleaned with a damp cloth or sponge. If they have heavy accumulations of dirt or other foreign matter, wash or soak them in a warm solution of detergent and water, then rinse and dry. Do not bear down on the screening material, to avoid stretching it out of shape or possibly warping the aluminum frame. **Never subject it to high heat, such as a lighted cigarette, which will cause the fiberglas to melt at point of contact.**

Main Door Handle and Lock

Screen Door

Handle Access, Doors Latched Together



Window Opening

Water Leaks

Water can sometimes collect inside the lower portion of window frames, usually as the result of driving in heavy rainstorms. Two or more "weep slots" in the bottom of the frame provide drainage to the outside. Keep them free of dirt, leaves and other obstructions.

If water collects and overflows the bottom channel while driving, even when the weep slots are clean, it is possible that a vacuum has been created inside the coach, drawing water through the window and preventing normal drainage. The condition can usually be remedied by slightly opening a roof vent or rear window.

In the event water enters around a non-opening window, remove the glazing bead and check condition of the sealing tape. Replace the tape, or caulk with a liquid sealer, if necessary.

It is also possible for leaks to occur at places other than window frames, such as through seams in the exterior skin or around outside light fixtures. You may be able to detect and seal possible areas of leakage by inspecting the seams as recommended earlier in this section, under **Care of Exterior Surfaces,** page 30.

Folding Step

A folding step is housed directly below the doorway to facilitate entry and exit from the coach. To extend the step, grasp the handle cutout on the hinged cover panel and pull straight out as far as it will go, then let it swing down. Pivot the step out into full horizontal position. Reverse the procedure to store the folding step for travel.

For your safety, the step comes with a non-skid rubber surface. An assist grip is located to the right of the doorway for added convenience in entering and leaving the trailer.

Storage Compartments

Your Avion features numerous storage compartments conveniently located all around the coach exterior. Some are positioned along the bottom edge of the trailer on the curb and road sides. They are hinged at the bottom and are secured with two latches at the top. A large locking trunk at the rear end of the coach can be used to store a spare tire, various jacks, lug wrench and other gear. The trunk is bottom-hinged and swings down for easy access. Another storage compartment is located directly behind the rear bumper. It may be used to stow the sewer hose and other miscellaneous equipment.

Power Jack

Raising and lowering the trailer will be easier and faster with the optional power jack, which is activated by a spring-loaded return switch located at the bottom of the motor housing. **Raise** the coach by pushing the switch **toward** the jack post; **lower** it by pushing the switch **away from** the jack post. When the jack has traversed its maximum distance in either direction, a built-in torque limiter engages with a clicking sound. **Release the switch immediately to prevent damage.** Prolonged operation of the torque limiter can cause excessive wear and ultimately reduce lifting capacity. The power jack is protected by a 30-amp fuse located in the battery box on the trailer tongue.

The power jack can also be operated manually in the event of electrical failure. Remove the power head from the jack post by loosening the two allen set screws with the wrench provided, then insert the emergency handle into the jack post coupling.

Minimum regular maintenance will keep the power jack operating up to design specifications.

1. **Once each year:** Remove the power head and apply a liberal amount of high-melting-point grease directly to the drive pin coupling. Make sure the pin is securely engaged when replacing power head.

2. **Once every two years:** Remove the housing cover and inspect gears for proper lubrication.

Stabilizing Jacks

Stabilizing jacks are available as optional equipment and are permanently installed on the frame under the coach prior to delivery.

The stabilizing jacks are deployed only after the trailer has been leveled side-to-side and front-to-rear. To operate, position the end of the crank handle over the stabilizer nut and turn until the jack is resting firmly on the ground. Start with the low or "downhill" side, then repeat the procedure on the opposite side, putting slightly less pressure on the "uphill" side jacks after they have made contact with the ground. To raise the stabilizing jacks for travel, crank them up as far as they will go, to assure maximum ground clearance.

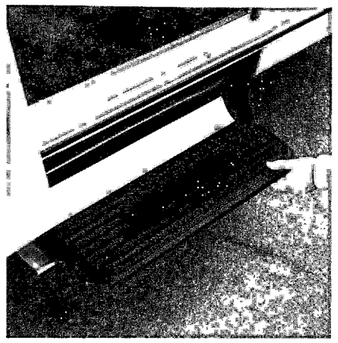
Caution: Never use stabilizing jacks to level or raise the trailer or to change a tire.

Sway Control Device

Some types of trailer sway can be moderated by taking preventive measures, such as maintaining proper tire pressure and sound suspension systems, and distributing weight loads in accordance with design specifications.

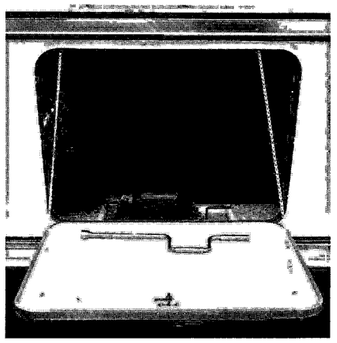
The primary causes of sway, however, are strong wind gusts and the compression and displacement of air by large passing vehicles. These effects can be neutralized by the installation of a friction-type sway control device. It attaches easily to most weight-distributing trailer hitches and can be activated or disengaged at will. Sway controls are available from most recreational vehicle supply stores and trailer hitch installers.

Important: Anti-sway hitches are required by law in some states. Make certain you comply where applicable.

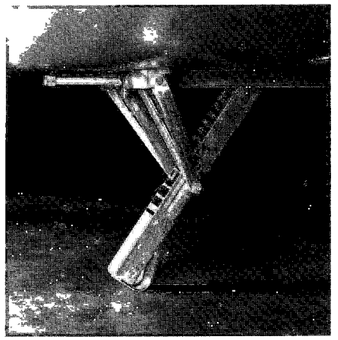


Folding Step Extended

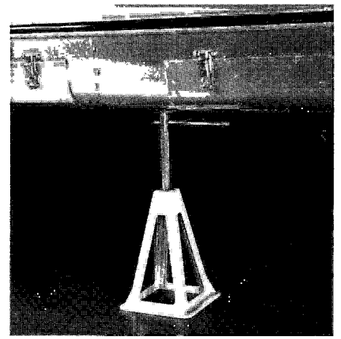
Main Door Assist Grip



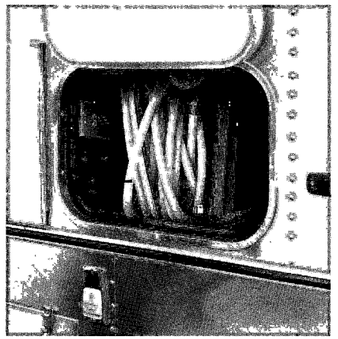
Rear Trunk, Spare Tire Storage



Attached Stabilizing Jacks



Freestanding Stabilizing Jacks



Cable TV Terminals

Television Reception System

Your Avion has been pre-wired to receive television signals over-the-air and by cable. Two hookups are located conveniently inside the coach. They feature a combination TV antenna jack/12-volt electrical outlet, and a separate cable TV jack. If your trailer is also equipped with the optional roof-mounted, all-channel Braund television antenna, made by the Braund Manufacturing Company, the main hookup location will include an amplifier switch and "power on" red light.

While staying at trailer parks or other facilities that offer cable television, you can take advantage of this service by hooking up to their coaxial line. A two-connection Cable TV terminal block is located in the 110-volt power cord compartment outside the trailer. Use a coaxial adaptor to connect the cable to the terminal screws, then unplug TV set lead-in wire from the TV antenna jack and plug into the adjacent Cable TV jack.

TV Antenna Operation

Before extending the antenna, check for overhead obstructions such as tree limbs. Raise the antenna by pulling the ceiling crank downward and rotating the knob **counterclockwise** until the "stop" is reached, then back off the crank handle approximately one-half revolution. Push the crank body upward and with a slight **clockwise** turn, to engage the rotation pin. The antenna can now be rotated in either direction with the crank body for best reception.

Important: The antenna is prevented from rotating 360° in either direction by "stops." Do not attempt to rotate it beyond these points. Instead, turn in **opposite** direction.

Whenever practical, you should select a parking place that allows line-of-sight reception from the television transmitter. If you are located in a canyon or mountainous terrain, TV picture quality will be adversely affected. Poor pictures or sound can be caused by other factors, as well. Check all wiring for loose or dirty connections and possible short circuits. Also make sure the TV antenna's power amplifier switch is turned on.

When you are ready to lower the antenna for traveling, first rotate it clockwise to a "stop" position, thus placing it in line to be retracted into the travel support. Pull down the crank handle to disengage the rotation pin and then turn the crank handle knob **clockwise** until it reaches the lower "stop." The sound of the antenna making contact with the travel support will be audible when this happens.

Important: Force is not required to operate the antenna. If it does not extend, rotate and retract easily, check the installation manual.

The antenna has been fully lubricated, but it is recommended that you use a silicone spray occasionally and add a good grade of grease to the gears once a year, if needed. Consult your Braund antenna installation manual for detailed instructions.

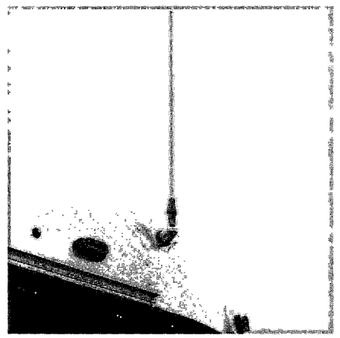
Important: Never travel with the television antenna in the raised position. Any contact with overhead obstructions can damage the gears and the antenna itself.

Radio Antenna

Standard equipment includes an AM/FM radio antenna mounted outside the coach at the front end. While the AM band is relatively unaffected by terrain, for optimum FM reception you should look for the same kind of line-of-sight location as television requires.

Note: The metal construction of your Avion acts as a shield against all radio and television signals. For satisfactory reception, therefore, you must always use an outside antenna or plug into a cable television source, where available.

TV Antenna Controls



Radio Antenna

Tires and Wheels

Your 1978 Avion is equipped with name-brand tires built to give thousands of miles of worry-free driving at sustained highway speeds. They are covered by the tire manufacturer's standard warranty. Any adjustments must be made by an authorized tire dealer who handles that particular brand.

Tire Care

Tires that run either under-inflated or over-inflated will not perform as intended and will suffer erratic and premature tread wear. Consequently, you should check air pressure frequently with an accurate gauge. Inexpensive gauges that will give precise readings every time are readily available. **Never rely on pressure indicators that are built into service station air hoses.**

Always check air pressure when the tires are **cold;** that is, after the trailer has been stopped for three or more hours, or has been driven less than one mile from a cold start. Never bleed air from a hot tire (one that has been driven 10 or more miles at speeds in excess of 50 mph). It is normal for tire pressure to increase as much as six pounds per square inch (psi) when hot. Recommended tire pressure can vary according to model, type and size of tire and by the weight load being supported. **Inflate as close to the maximum recommended tire pressure as possible for best tread life and trailer stability.**

Tire life can also be affected by frequency of rotation and adjustment of camber and toe-in, all of which influence tread wear. Regular inspection and maintenance of these items can add many miles of tread life. See **Supension**, page 41.

Tread is not the only part of a tire that can wear out prematurely. Sidewalls can weaken and crack from improper inflation, weight loads beyond design specifications, or the effects of air pollution and ultraviolet radiation. Park in shaded areas whenever possible and use tire covers in desert regions to block harmful rays from the sun.

If the trailer is to be out of service for any extended period, including winter storage, block up the axles to remove weight from the tires and to keep them from developing flat spots. Also reduce the air pressure to 10 psi in each tire.

Important: Inflate all tires to normal pressure before removing the blocks.

One additional tire care tip: Every time you check air pressure, also check tire valve stems for cracks, and tighten the valve cores. Air leaks from these sources can flatten a tire as quickly as a puncture.

Wheels

All wheels are balanced at the factory. If the tire is removed from the wheel (such as to repair a flat), place reference marks on the sidewall and rim, so that the tire can be lined up again to retain balance. See following section on **Tire Changing** for more information.

Wheel bearings should be repacked with grease and adjusted every 10,000 miles. Lug bolts should be torqued to 90-95 foot-pounds. Recheck them after the first 100 miles and before starting each trip.

Examine all suspension mounting bolts periodically to be certain they have not backed off and are snug.

Tire Changing

Changing a tire on your Avion is no more difficult than changing one on your automobile, but there are some notable differences.

1. Place a jack **under the axle** of the tire you are removing. Then chock all other wheels and raise the jack until the tire barely touches the ground. This will take most of the weight off the wheel but will give you enough leverage to break the lug bolts free without the tire spinning.

2. Break the lug bolts free with lug wrench, but do not loosen.

3. Raise jack until tire is completely off the ground, unscrew all lug bolts, and remove wheel.

4. To reinstall the tire, first make sure that drum and hub are free of dirt, then lift wheel into place and line up lug bolt holes.

5. Start all lug bolts and then tighten by hand.

6. Lower the jack until tire barely contacts the ground, then finish tightening the bolts with lug wrench, using a criss-cross pattern. Bolts should be tightened to a torque of 90-95 foot-pounds.

7. Lower the jack completely and remove it. Also remove wheel chocks.

8. Recheck tightness of lug bolts after 100 miles and before each trip.

9. Handle wheels with care to avoid damaging their appearance.

Caution: Use only tubeless tires with aluminum wheels to avoid tube damage.

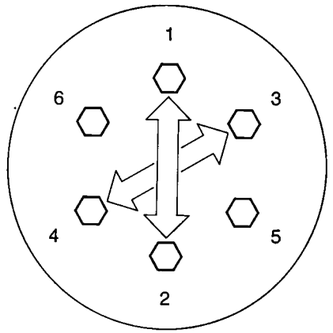
Tire Rotation

Trailer tires should be rotated every 5000 miles to promote even tread wear and long life. Rotate them sooner if irregular wear develops. The rotation pattern varies, depending on whether radial-ply tires or bias-ply tires are being used.

1. **Radial-Ply Tires.** Move front tires to the rear and rear tires to the front on the **same side** of the coach for dual axle trailers. For triple axle trailers move front tires to center position, center tires to rear and rear tires to the front on the **same side** of the coach.

2. **Bias-Ply Tires.** For double axle trailers move front tires to the rear on the **same side** of the coach. The rear tires **cross over** to the front; that is, left rear tire moves to right front and right rear tire moves to left front. For triple axle trailers move front tires to center positions, center tires to the rear on the **same side** of the coach. The rear tires cross over to the front.

The identical pattern should be used every time you rotate the tires, otherwise you will be nullifying the intended benefits.



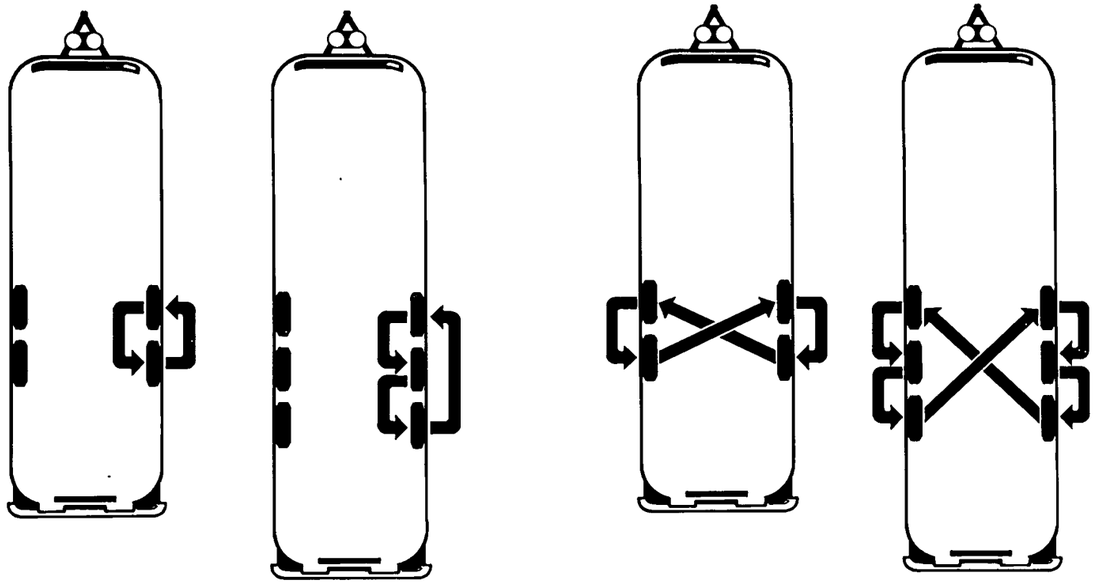
Lug Bolt Tightening Sequence

Note: The riding characteristics of radial and bias-ply tires differ. We recommend that you do not mix the two types on the trailer.

Wheel Balancing

The wheels on your Avion were balanced at the factory for a precision ride. Therefore, whenever a new tire is installed on a wheel, it must be balanced. Do this as soon as possible for smoothest, safest ride. Refer to **Tire Changing,** earlier in this section, for more details.

Tire Rotation



Radial-Ply Tires

Bias-Ply Tires

Braking System

The Kelsey-Hayes Company electric brakes on your trailer are operated by 12-volt direct current from the tow vehicle. The brakes have been factory-calibrated for smooth, positive response. Routine periodic adjustments should be performed only by an Avion dealer service technician or other qualified mechanic.

Components of the Braking System

The wiring system connecting trailer brakes with the tow car's electrical power begins and ends at the car battery and includes several major components, all of which must function properly for safety and responsive braking.

1. **Car Battery.** The connection is made at the starter solenoid's battery terminal or the positive post of the battery itself.

2. **Brake Controller.** The electric trailer brakes are automatically applied by the brake controller, which is mounted within easy reach of the tow car driver. When the car's brake pedal is depressed, the trailer brakes are actuated slightly before the tow car brakes, to keep the two vehicles in alignment. The lag time can be adjusted by turning the brake controller knob in accordance with instructions provided with the controller. **The new setting will be retained until a further adjustment is made.** The brake controller also has a manual feature, which allows you to apply the trailer brakes independently of the tow car brakes. To operate, move the control lever all the way to "manual" and hold it in that position. The lever is spring-loaded and will return to the "automatic" setting when released.

Select a brake controller that will be compatible with your Avion's electric braking system, such as Kelsey-Hayes or equivalent.

Caution: Do not install a fuse in the circuit between tow car battery and brake controller. A blown fuse would cause the controller to cease functioning both automatically and manually, causing loss of trailer braking power with no advance warning.

3. **Connector Plug.** The 7-way connector on the trailer hitch transfers electrical power from the tow vehicle battery to the trailer brakes and exterior lighting system. Keep the plug clean, tight, and protected from the elements.

4. **Break-Away Switch.** This fail-safe device is one of the most vital components in your Avion's braking system. It automatically actuates the trailer brakes instantly in the event tow car and coach accidentally uncouple while in motion. The break-away switch goes into operation when a pull pin linked by cable to the tow car is separated from the switch. This allows two contacts in the switch to close and complete an electrical circuit, which instantaneously applies the trailer's brakes and brings it to a stop. Power for this sequence is automatically switched to the on-board trailer batteries from the tow car battery, which stops furnishing power when the 7-way connector disengages during vehicle separation.

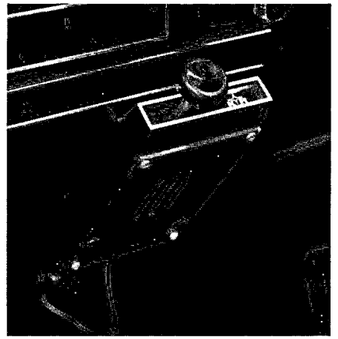
   The steel cable attached to the break-away switch pull pin must be anchored to the tow car at time of hookup. We recommend securing this cable loop to the permanent frame of the tow car hitch, not the removable section of the hitch.

   The pull pin should be removed and lubricated with light household oil every three months, to assure that it will operate as intended. Before reinserting the pin, spray the inside of the break-away switch with an electrical contact cleaner to prevent corrosion.

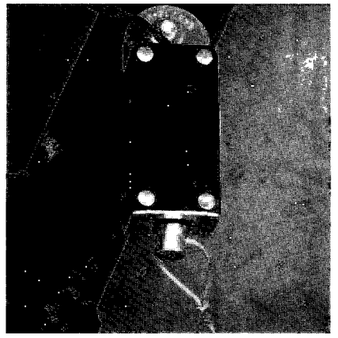
   Caution: Do not leave pull pin out of the break-away switch for more than a few minutes, or it will run down the trailer batteries. For the same reason, never use the break-away switch as a parking brake.

5. **Trailer Brakes.** Your Avion's brakes are actuated by electrical energy, which is converted to mechanical energy to provide the braking power for smooth, safe stops. The greater the braking effort from the brake controller, the greater the braking force applied to trailer brake drums. You can monitor the application of this braking force either by using a brake controller with built-in indicator light, or by installing a separate indicator light on the tow vehicle dashboard. The light will glow whenever trailer brakes are activated, and will become increasingly brighter as braking power is intensified.

6. **Grounding.** The electrical circuit that operates your trailer brakes can be completed only by proper grounding back to the tow car battery. **A poor ground circuit from brakes to battery can be as detrimental to efficient braking as a poor primary circuit from battery to brakes.**



Brake Controller



Break-Away Switch

Adjusting the Brakes

While it is recommended that brake adjustments be handled by qualified technicians, the following procedure should be used if you find it necessary to perform the job yourself.

1. Remove rubber plug from the adjustment hole at base of brake drum backing plate.

2. Raise wheel off ground with a lifting jack placed under the axle (see **Tire Changing,** earlier in this section).

3. Tighten brakes by inserting a brake adjustment tool or screwdriver blade into the backing plate hole. Turn adjustment screw while spinning the wheel. When wheel begins to drag heavily, back off just enough for it to spin freely. Replace adjustment hole plug, then lower and remove the jack and repeat the previous steps with all other trailer wheels.

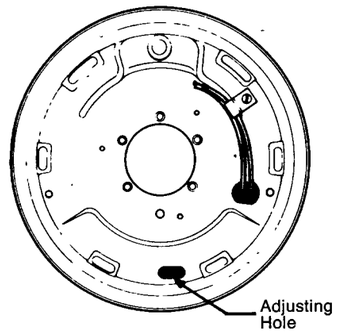
Braking Tips

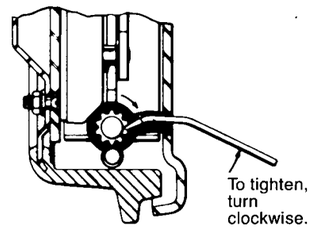
1. **Never use trailer brakes alone.** They were designed to stop the coach, not the tow car. Such action would place excessive loads on the brakes, causing overheating, loss of braking power (fading), and premature wear of shoe linings and drums.

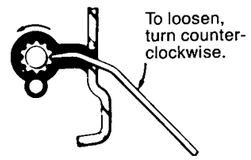
2. **Never use the tow car brakes alone.** The added weight of your trailer more than doubles the load placed on car brakes, leading to the same results as using trailer brakes alone: Overheating, brake fade and rapid wear. Driving control is also hampered when tow vehicle brakes are used alone, due to the force of the trailer pushing against the car hitch. This is especially true on slick pavement or loose gravel, and can cause jackknifing.

3. **Always use the automatic brake controller.** This synchronized braking system enables you to drive in the manner recommended by the experts: Both hands on the steering wheel. The brake controller is properly adjusted when there is a slight "lead" on the trailer brakes. This braking resistance, combined with the tow car's engine pulling power, will keep the two vehicles correctly. aligned and bring them to a safe, straight stop every time.

Brake Adjustment







Suspension System

Avion's exclusive Adjust-A-Ride™ All-Wheel Independent Suspension represents a significant advancement in trailer suspension systems, combining European-type independent suspension at each wheel with adjustable split axles, to meet a variety of traveling conditions. Adjust-A-Ride™ was subjected to thorough testing by an independent testing agency before being introduced as standard equipment on all 1978 Avions.

Adjust-A-Ride's split axles absorb road shocks and vibrations right at the wheel, instead of transmitting them to the opposite wheel and then through the entire coach frame and body, as happens with standard one-piece axles. Heavy duty springs and dual shocks at each wheel work in unison with the split axles to further cushion the smooth ride.

The result: Adjust-A-Ride™ keeps your new Avion tracking straight and true even over irregular surfaces, with no "whipping" action...just a stable, controlled, glass-smooth ride that makes it what we believe to be the easiest-towing travel trailer ever built.

The unique Adjust-A-Ride™ system has two additional features not found on solid axle coaches: Toe-in/toe-out adjustment and camber adjustment, which can be "fine-tuned" for each wheel by resetting a single bolt at the ends of each split axle.

Toe-In Adjustment

Toe-in means simply that the wheels on a given axle are closer together at the front than at the back. **For accurate tracking and maximum tread life, your Avion should have ⅛-inch toe-in;** that is, the leading edge of each tire should be ⅛-inch inward from being parallel to the trailer's side frame. Avion's Adjust-A-Ride™ enables you to make toe-in corrections yourself with minimal equipment. You will need a lifting jack, an accurate ruler or tape measure, a 15/16-inch open-end wrench, two sets of elevating blocks whose height equals the distance from the ground to the center of the frame (see photo), and a perfectly straight, non-flexing metal rod.

Note: To set up measurement for one wheel at a time, use a 3-foot rod; to set up measurements for more than one wheel at a time, use a 7-foot rod for dual-axle models and a 10-foot rod for triple-axle models. The following procedure is based on setting up once to measure both wheels of a dual-axle trailer.

1. Tow the trailer **straight ahead onto a level surface,** such as concrete. If you pull onto the surface out of a turn, or are not in a straight alignment with the tow vehicle when you stop, it will be impossible to make accurate toe-in adjustments.

2. Place the elevating blocks alongside the trailer, 14-16 inches from the frame. One set should be about a foot ahead of the wheel being measured first and the other set should be about a foot in back of the same wheel. If you are setting up only once to measure either two or three wheels, the elevating blocks should be positioned one foot ahead of the front wheel and one foot in back of the rear wheel.

3. Lay the metal rod across the two sets of blocks, and use the ruler or tape measure to line it up **exactly parallel** to the frame. Do this by measuring the right angle distance between each end of the rod and the frame. Move the rod until the two measurements are exactly equal. **All subsequent steps in toe-in adjustment depend on the accuracy of these measurements.**

4. Taking care not to disturb the position of the rod, measure the right angle distance between the rod and the **leading edge of the wheel rim** on the tire you are checking first. Now measure the distance between the rod and the **trailing edge of the wheel rim.** If the first measurement is **¼-inch more** than the second one, the wheel has a correct toe-in of ⅛-inch, and no adjustment is necessary.

Note: The ¼-inch difference is accounted for by the fact that a **toe-in of ⅛-inch** from parallel at the leading edge would result in a **toe-out of ⅛-inch** from parallel at the trailing edge, or a total difference of ¼-inch between front and rear measurements.

If the **front** measurement is greater or less than **⅛-inch from parallel,** therefore making the **total difference between front and rear measurements greater or less than ¼-inch,** an adjustment is required to bring the wheel into the correct ⅛-inch toe-in.

5. Place a lifting jack under the axle and raise it until all weight is off the inboard end (see photo). Locate the toe-in/toe-out adjustment plate underneath the trailer. The inboard end of the split axle is connected to this plate by a bolt and locking nut. Note that several washers are positioned on both sides of the axle bushing. **Count the number of washers on each side of the bushing before removing the bolt.**

6. Remove locking nut from the bushing bolt with 15/16-inch wrench, then withdraw the bolt itself, cupping a hand underneath to catch the adjustment washers.

7. Adjust toe-in by switching a washer from one side of the axle bushing to the other. If your measurement indicated that the front of the wheel had a toe-in **greater than ⅛-inch,** move the washer from the **front side** of the axle bushing to the **back side.** This will shim the inboard end of the axle forward and therefore pivot the wheel assembly back, reducing toe-in.

   If the front of the wheel had toe-in of **less than ⅛-inch,** move the washer from the **back side** of the axle bushing to the **front side.** This will move the inboard end of the axle to the rear and pivot the wheel assembly slightly forward, thereby increasing toe-in.

8. With all washers repositioned on each side of the axle bushing, insert bolt and connect axle bushing to adjustment plate. Make sure the **original** bolt hole is used (the alternate holes are for camber adjustment). Tighten the locking nut securely, lower the jack and remove it.

9. Repeat steps 2-8 for all other wheels, then back up the trailer several feet and pull forward to original position. This will settle the wheels before you check any toe-in adjustments that have just been made.

10. Remeasure toe-in for each wheel (see steps 2-4). If additional corrections are necessary, repeat the appropriate steps.

Camber Adjustment

Positive camber refers to a condition whereby the wheels on a given axle are closer together at the bottom than at the top, when viewed from the front or rear of the trailer.

Your Avion's axles have been pre-set at the factory for **2° positive camber,** meaning the wheels angle inward at the bottom 2° from vertical when the coach is unloaded. This is the normal setting for most weight loads. **For extremely heavy loads within the prescribed limits for your trailer,** it is advisable to readjust camber to bring tire tread into proper contact with the road surface. You will need the following items to make the adjustments: A lifting jack, 15/16-inch open-end wrench, and a carpenter's bubble level or camber gauge.

1. Load the trailer to exact traveling weight and pull it straight onto a level surface, such as concrete (see step 1 under **Toe-In Adjustment**).

2. Check camber adjustment by placing a carpenter's bubble level in a vertical position across the full diameter of the wheel. Hold it flush against the **wheel rim.** The bubble will indicate "level" if the camber adjustment is correct.

   Important: Both ends of the level must touch the **wheel rim only.** If the level is too long or short to make proper contact, cut a flat-surfaced piece of wood to the exact length needed to span the wheel rim diameter. Hold the piece of wood against the rim diameter and then place the leveling device firmly against the wood to take a reading. Repeat for all wheels.

3. If camber adjustment is indicated for any wheel, raise trailer frame with lifting jack until all weight is off the outboard end of the axle. Locate the spring hanger brackets on side frame underneath the trailer.

4. Adjust camber using the vertical holes on the spring hanger brackets. Each hole equals 2° camber. Moving the spring hangers to the **lower hole** will pivot the wheel assembly **down and in,** to **increase positive camber.** Moving the axle back to the **higher hole** will pivot the wheel assembly **up and out,** to **decrease positive camber.**

Important: Your Avion was set at the factory for 2° positive camber (top adjustment hole). Extremely heavy loads call for **increased positive camber;** therefore, you should move the axle to the lower adjustment hole under such conditions. **The axles should be reset to the original 2° positive camber (bottom hole) when carrying normal weight loads.**

5. Insert bolt through each spring hanger and tighten the locking nuts until snug. Lower and remove the lifting jack.

6. Repeat steps 3-5 for all other wheels, then pull the coach straight ahead several feet to settle the wheels properly.

7. Use the bubble level to recheck the camber for each wheel. It should indicate "level" if the correct adjustment has been made. Refer to step 2 under **Camber Adjustment** for proper use of the bubble level.

Important: Camber angle should always appear **perpendicular to the ground** when the tires are viewed from the front or rear, provided the trailer is carrying a normal load and its weight is entirely on the wheels and axles.

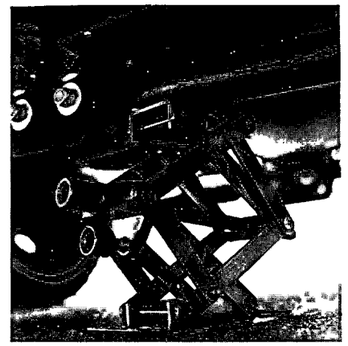
After changing a tire, however, camber will appear to angle **outward** when the wheel is first lowered to the ground. This is normal. Driving a few feet will settle the wheel into its proper vertical alignment.

Guidelines for Adjusting Toe-In and Camber

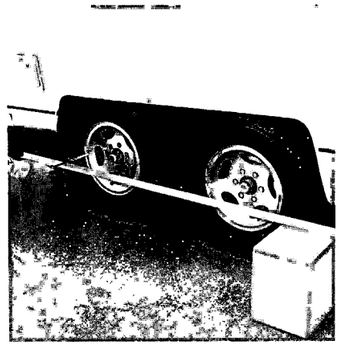
1. All adjustments must be made while the trailer is on a level surface, such as concrete. If you start with a non-level surface, all initial readings will be inaccurate, and any adjustments based on those readings will only compound the errors.

2. Do not assume that toe-in adjustments for one wheel apply to all others. Each wheel may require slightly different settings to arrive at the desired point, due to weight distribution and variable tolerances.

3. Periodic readjustments may be necessary, due to normal wear on moving parts, extensive travel over rough roads, expansion and contraction of metal components in different temperatures, and repeated hard impacts against such obstacles as curbs. We recommend checking toe-in and camber at least every 15,000 miles.

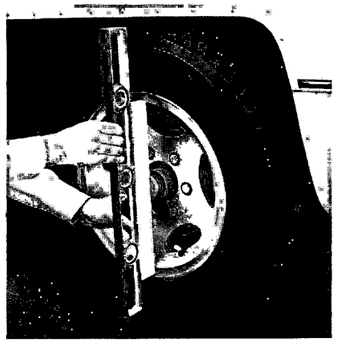


Toe-In Jacking Position



Toe-In Adjustment Set-Up

Toe-In Adjustment Washers



Camber Adjustment Check

Interior

Furniture and Features

The interior of your Avion has been crafted without compromise for comfort and convenience, using materials selected for long life and ease of maintenance. While a large number of features have been included in a relatively small amount of space, extensive planning assures that everything you need is at your fingertips, yet not in the way.

The best way to fully enjoy and appreciate all of the engineering and design systems built into your coach is to thoroughly understand them. The following material provides detailed information on the location, operation and care of all of Avion's amenities.

Beds

The beds in your travel trailer feature Sealy® Posturpedic mattresses, considered to be among the finest on the market for comfort, support and durability. Turn them periodically for maximum benefit.

1. **Sofa-Bed Into Double Bed.** To convert sofa-bed for sleeping, grasp the front rail of the seat at the middle, lift it up slightly, and pull it out as far as it will go. Then lower the back cushion until it falls into place.

   Revert to sofa arrangement by pulling the back cushion upright and pushing the front rail back to its original position.

2. **Sofa Into Bed.** To convert sofa into bed, simply remove back cushions.

3. **Lounge Into Double Bed.** To convert lounge into bed, remove boards stored under lounge seats, lay them across front edges of the facing lounge frames, and place seat back cushions in position on top of the boards. Reverse the process to set up lounge again.

4. **Dinette Into Double Bed.** To convert the dinette into a bed, stand the seat cushions on edge to allow room for table to swing down, then fold up the table leg and lift table free of its wall brackets. Swing the table downward to its lower position and rest it on the supports provided. Replace cushions to form the bed.

   Convert back to dinette by first positioning the cushions so they will not interfere with movement of the table. Pivot table upward and engage the wall brackets, then extend the folded leg to vertical.

5. **Making Up Fixed Beds (Twin or Double).** If your Avion is equipped with fixed beds, they can be easily prepared for sleeping by lifting the mattress slightly, pulling it away from the wall, and tucking in the bedding.

Sofa Bed Into Double Bed–Step 1.

Step 2

Step 3.

Sofa Into Bed

Dinette Into Double Bed –Step 1.

Step 2.

Step 3.

Step 4.

Extension Table

1. **Open the table** by swinging the table top up from the wall and into a horizontal position. Swing the leg down until it locks in a vertical position.

2. **Extend the table** by first releasing the latch located underneath, next to the leg. Lift table and leg slightly, and pull the telescoping frame all the way out. Insert individual leaves into the frame for desired table length, then push in the end leaf to close any gaps.

3. **Stow the table** by first removing the leaves, then lift table slightly off floor and push the frame back into its telescoped position under the table top. Fold the leg into stowed position, then swing table top down until it rests against the wall for traveling.

Folding Doors

Accordian-type folding doors allow you to change the interior configuration of the coach. They provide an open, spacious atmosphere when fully retracted, and serve as a room divider when partially extended. They can also be fully opened and latched together for complete privacy, closing off the lounge/sleeping area from the rest of the trailer.

Drawers and Storage Cabinets

All drawers are quality constructed of rugged poplar and feature dovetail joints for maximum strength and durability. They have been designed to remain tightly closed while traveling, and are opened by lifting slightly on the drawer knob and pulling out.

The overhead storage cabinets are hinged at the top and have two spring-loaded struts. Once opened, they will stay in that position until you close them. And once closed, they will remain that way to keep contents from spilling out during travel. Additional storage cabinets are provided under all beds and lounges.

There is even a swing-down utensil bin behind the front panel of the galley sink and a slide-out towel rack behind a door next to the gas range. They control clutter by keeping things out of sight yet handy.

Roof Vents

The roof vents have been designed to function in any weather, letting in fresh air while keeping out precipitation. Air flow is controlled by two crank handles located at opposite ends of the vents. Each crank raises one end of the vent cover and can always be operated independently. If the vents are left open while traveling, only the **rear** portion should be raised.

To open a vent fully, rotate both crank handles counterclockwise; to close, rotate them clockwise. An electric fan inside each vent can furnish additional air circulation when the vent is open. A three-position fan switch (low-off-high) is located on the side of each roof vent screen.

Vent screens may be cleaned periodically to maintain maximum air flow and fan efficiency.

1. Remove the two crank handles with a Phillips head screwdriver.

2. Remove the six clutch-head screws holding the screen frame in place.

3. Wash screens in soapy water, taking care not to push the screening material out of shape. Allow screens to soak if there is any caked-on material. Rinse and wipe dry.

4. Reinstall screens with the clutch-head screws and attach crank handles.

Extension Table Opening–Step 1.

Step 2.

Step 3.

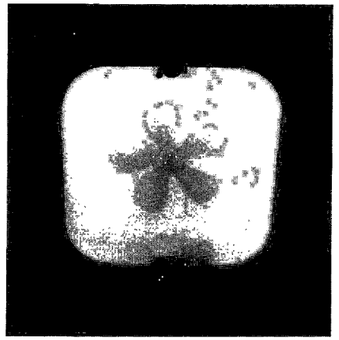
Step 4.

Step 5.

Folding Doors

Below Bed Storage

Towel Racks



Roof Vent

Emergency Window

The emergency escape window provides the safest and fastest exit when the main door is obstructed; it should be used only when absolutely necessary. Location varies with model. See **Floor Plans** for details.

The emergency window's escape mechanism is operated by two quick-release latches that fit over projections at the bottom of the window frame. **To open, grasp the latches and lift until they clear the retainers.** The window is hinged at the top and will swing outward when pushed at the bottom.

Caution: The emergency window has been designed to separate from the top hinge and drop out of the way when opened beyond a certain angle. You can familiarize yourself with this feature by opening the latches and holding the window on both sides while pushing out slowly until it releases from the top hinge.

We recommend that you practice the escape procedure until it becomes automatic, and that you review it periodically. **When practicing, do not permit the window to swing out far enough to disengage from the hinge.** If it does, be prepared to catch it.

Light Fixtures

The interior lighting system has been carefully planned to satisfy a variety of requirements throughout the coach. It gives you proper, convenient illumination when you need it and where you need it. See page 104 for bulb specifications.

1. **12-Volt fixture lights** are controlled by an on-off switch located on the individual fixture. For access to the bulb compartment, squeeze the flexible diffuser lens until it drops down (see photo). Reinstall by squeezing the lens and inserting it into the fixture frame.
2. **The range hood light** is operated by an on-off push button located on the hood frame between the light and exhaust fan. To replace the bulb, remove the retainer nuts from the hood light and exhaust fan on-off buttons and let the frame drop down, allowing access to the bulb compartment.
3. **Area lights and reading lights** are controlled by an on-off switch on the rim of the fixture itself. They have no lens diffuser and can be swiveled to concentrate light where desired. To remove the bayonet-type bulb, simply push up, give a ¼ turn and let it drop out. To install a new bulb, line up the bayonet studs with the slots inside the socket, then push up and give it a ¼ turn until it locks in place.

   Caution: The lamp cones on these fixtures become too hot to touch. Use a protective cloth when adjusting their position.
4. **Rear Bathroom mirror lights** house two bulbs and offer three lighting combinations: Lower bulb only, top bulb only, or both bulbs. They are operated by a switch at the bottom of the fixture. To remove the diffuser lens for bulb replacement, pull gently on one edge until it releases.

Shower/Tub Enclosure

The enclosure is molded of special fiberglas-reinforced polyester...a high-strength, long-wearing material specifically designed to retain its beauty for many years with proper care. Clean the shower/tub with soap or detergent, or a special tub and tile product. **Never use abrasive scouring powders.** We suggest applying a coat of paste wax before using the shower/tub for the first time, and again after each heavy cleaning. This will protect the surface from stains and discoloration.

The vinyl shower curtain should be sprayed with clear water from the hand-held shower head after each use, to remove soap spots. To launder the shower curtain, hand wash or machine wash on delicate cycle using medium temperature and a mild soap. **Do not use bleach.** Remove from machine before final spin cycle and allow to drip dry. **Do not iron vinyl curtains.** If your shower curtain has a fringe attachment, it should be hand washed only.

The shower/tub enclosure also features a removable clothes rod in addition to the regular shower curtain rod.

Shower Head and Bathtub Spout

A single mixer knob is used to control water flow and to adjust temperature. Push knob back to turn on water, pull forward to turn it off, and rotate to adjust temperature setting.

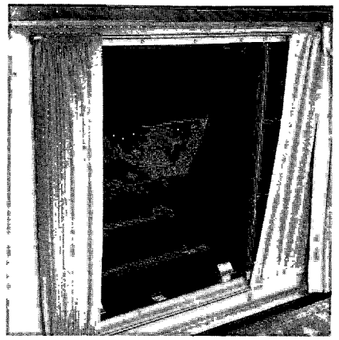
The shower/tub faucet also features a push button directly below the control knob to divert water from the bathtub spout to the shower head. To operate the shower head, turn on faucet. Water will flow through the bathtub spout until the diverter button is depressed. Hold button in until water flows through shower head. To restore water flow to the bathtub spout, simply pull out the diverter button. In addition, the diverter button will **automatically** reset to feed water to the bathtub spout when the faucet is turned off.

The telephone-style shower head can be used interchangeably as a hand-held unit or mounted on an adjustable wall bracket. When hand-held, it conserves water by allowing you to direct the spray over the entire body. First wet down, **then turn off the water by depressing the button directly under the spray nozzle.** Apply soap and lather thoroughly, **then press the button in the opposite direction to restore flow,** and rinse. The shower head can be turned off and on in this manner without affecting water temperature setting. Because it is a volume control rather than a shut-off valve, it is normal for water to trickle from the spray nozzle while the shower head button is in the "off" position.

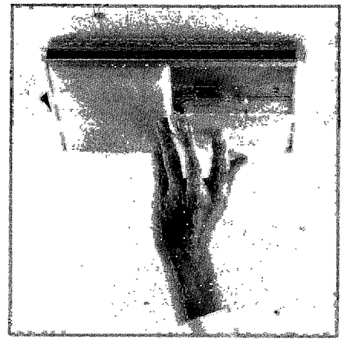
The **diverter button** should not be confused with the **shower head button.** The former diverts water flow from bathtub spout **through shower hose to shower head.** The latter simply cuts off the diverted water **at** the shower head.

Bathroom Sink

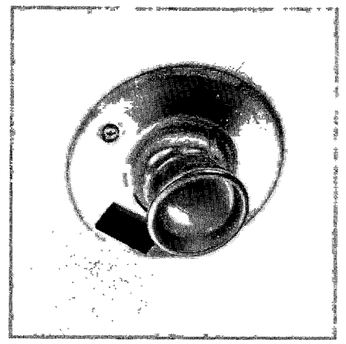
The sink is constructed of porcelain-clad steel and can be cleaned with any non-abrasive household product. The faucet is a single-control type: Push the knob back to turn on water and pull forward to turn off water. Rotate left or right to adjust temperature.



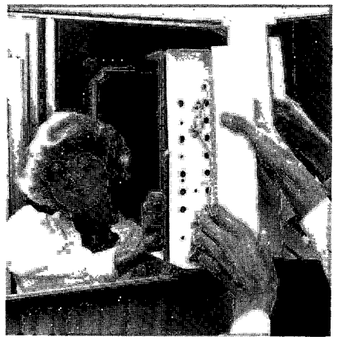
Emergency Escape Window



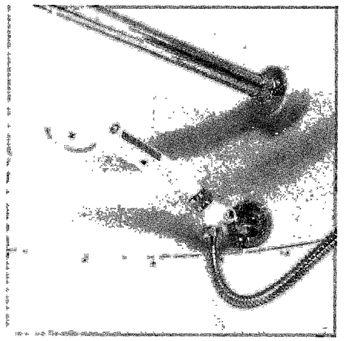
12-Volt Fixture Bulb Replacement



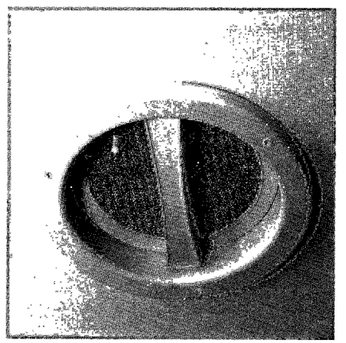
Area Light



Bathroom Mirror Light Bulb Replacement



Telephone Shower Head and Clothes Rod



Bathroom Exhaust Fan

Exhaust Fan

The bathroom exhaust fan keeps the air fresh and clean, and also removes excess heat and humidity resulting from hot water usage. The fan is located in the ceiling and is operated by an on-off push button. Grasp the handle and push straight up to open the vent. Pull down on handle to close vent. Do not op the fan when the vent is clos

Rear B oom Features

The l athroom mirror car ding to the u om edge ll until

Care of Interior Surfaces

Galley Sink

The sink is outfitted with a single-control faucet and spout. Push back on the lever to turn on water, and pull forward to turn it off. Water temperature is selected by moving the lever sideways: Left for hot, right for cold.

The stainless steel double sink will retain its original luster indefinitely with proper care. Boiling water will not harm the surface, but condiments such as salt, mustard, mayonnaise and ketchup can pit stainless steel if not cleaned up immediately. Ordinary soaps and detergents are recommended for routine cleaning and to prevent build-up of soap scale. Always rinse thoroughly and wipe dry with a soft cloth to prevent streaking or spotting.

Heavy food stains can be removed with a paste made of water and **slightly** abrasive cleaning powder. Always rub in the direction of the original polish marks or "grain" to avoid the formation of noticeable scratches.

An application of cleaner that leaves a thin wax coating is effective in controlling oily fingerprints. They can be removed by wiping with a soft dry cloth. The stainless steel surface should be washed and dried thoroughly before waxing.

Counter Areas

All counter tops and splashboards are made of high pressure laminates and can be cleaned with a mild detergent or water, or with an all-purpose household cleaner. **Do not use abrasive powders, which can scratch and dull the finish.** Always use a trivet or protective pad when placing hot utensils on counter tops.

Additional counter space is provided by two laminated boards that fit snugly over each tub of the galley sink. The bottom surface of these sink covers can be used as cutting boards.

Important: Never use counter tops as a cutting board. Nicks and scratches can result.

Wall Surfaces

The interior coach walls are covered with washable vinyl-clad aluminum and may be cleaned with a mild household detergent or vinyl cleaner. **Do not use abrasive powders or strong solvents; they can damage the vinyl and dull its finish.**

Fabrics

Interior appointments such as draperies, bedspreads, mattress covers, upholstery, and wall pads are manufactured from high quality synthetic materials and should be **dry cleaned only.** Frequent vacuuming will keep them free of dust and dirt. Minor spills should be cleaned up quickly to avoid staining. The affected area should be blotted. not rubbed, to prevent the stain from working deeper into the fabric.

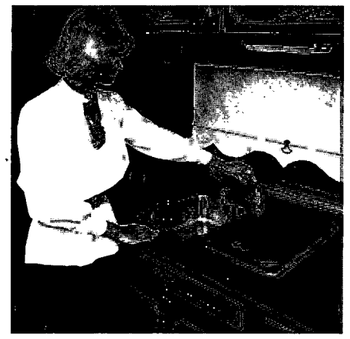
Wood Surfaces

Cabinets and other woodwork will retain their luster and beauty if you treat them as you would any fine furniture. Use a good liquid or spray product.

Carpeting

The wall-to-wall carpeting in your coach will require occasional cleaning due to heavy foot traffic. This should be done only by a professional carpet cleaning service. The carpeting can be cleaned in place, or it can be taken up and cleaned elsewhere. Simply remove the metal strips at the doorsill, roll up the carpet and carry it out.

Carpet Removal



Stainless Steel Sink

You can keep the carpet free of ground-in dirt between major cleanings by frequent use of an electric broom or carpet sweeper. If you camp in areas where dirt is likely to be tracked into the coach, you may prefer to take out the carpet ahead of time to keep it from becoming soiled. The floor underneath is covered with vinyl and will not be harmed by foot traffic.

Note: Vacuum the vinyl floor before replacing carpeting.

Monitor Panel

The Monitor Panel is the nerve center of your Avion trailer. It is located in the overhead cabinet at the front end of the coach, and displays in a single compact unit the condition of all major on-board systems and components.

For descriptive purposes, the Monitor Panel configuration may be divided vertically into three sections (see photo). The left-hand portion contains indoor and outdoor thermometers. The middle section includes a hygrometer and barometer at the top, eight rocker switches that deal with systems functions at the center, and a weather radio at the bottom. The right-hand segment features a cluster at the top consisting of an electric clock and two vertical banks of system status lights, and an AM/FM monaural radio or optional AM/FM stereo radio-tape player at the bottom.

Familiarity with the various components built into the Monitor Panel will make it possible for you to have a continual status report on every key system in your Avion.

System Status Lights

The two vertical banks of six lights each, located on the upper right side of the Monitor Panel, will be referred to throughout this section. Their functions are identified in the following chart, reading from top to bottom as they appear on the Monitor Panel.

Monitor Panel

Lefthand Bank

PUMP	Water pump on
F ¾ ½ ¼ E	Level in LPG, water and waste tanks. The highest illuminated light is the correct reading

Righthand Bank

PWR ON	External 110-volt power hooked up
REF	Refrigerator temperature not cold enough
HWH OFF	Water heater ignition not operating
GOOD FAIR POOR	Battery condition

System Rocker Switches

The primary internal systems are monitored or controlled by eight rocker switches, arranged in two rows of four each. They operate in conjunction with the system status lights described earlier. Following is an explanation of rocker switch functions, starting with the top row and reading from left to right across the Monitor Panel.

1. **1 LPG 2:** Gives the gas supply remaining in each bottle. The readout appears on the righthand bank of system status lights (F—¾—½—¼—E). Depress rocker switch to position "1" for a reading on the first bottle; depress to position "2" for a reading on the second bottle. LPG supply can also be read on a gauge located on each gas bottle.

2. **HWH IGNITE:** Push switch to ignite the water heater or turn it off. The "HWH OFF" status light (third from top, righthand bank) will glow if the water heater's electronic ignition circuit fails to work when you depress the "on" switch. If this happens, push rocker switch to "off" position, wait a few seconds, and push to "on" again.

Caution: Do not depress the HWH switch to "on" until you have checked to be sure there is water in the water heater tank.

3. **REF ALARM:** A buzzer will automatically sound and the "REF" warning light (second from top, righthand bank) will come on if the refrigerator temperature is not cold enough. This may be caused by an extinguished pilot light, electrical failure, extremely high outside temperature, high thermostat setting, or an open refrigerator door. Turn off the alarm by pressing the rocker switch, but be sure to reset it after problem is corrected.

4. **WATER PUMP:** Push switch to turn water pump on or off. The "PUMP" signal light (top, lefthand bank) will glow whenever the water pump rocker switch is in the "on" position. Always turn off the pump while traveling, or while the coach is unoccupied or hooked up to city water.

5. **BATTERY:** Press rocker switch to check condition of the trailer batteries. Depending on their level of charge, the "GOOD," "FAIR" or "POOR" light (lower three, righthand bank) will be illuminated. Readings should be taken with coach lights and fans turned off. If a "POOR" condition is indicated, reduce electricity usage to a minimum and recharge the batteries immediately. If two lights come on, the battery status is somewhere between the two conditions indicated.

   Important: This tester will not give an accurate battery condition reading while the trailer is operating on 110-volt outside power.

6. **SOLID WASTE:** Indicates the level in the solid waste holding tank. Press rocker switch for a readout on the lefthand bank of status lights (F—¾—½—¼—E).

7. **LIQUID WASTE:** Indicates level in the rinse water holding tank. Push rocker switch and read status on the lefthand bank of lights (F—¾—½—¼—E).

8. **WATER LEVEL:** Indicates the supply remaining in fresh water holding tank. Depress the switch for readout of water level on lefthand bank of lights (F—¾—½—¼—E).

Environmental Instruments

Your Avion's Monitor Panel is also a source of information on weather conditions. This instrumentation will enable you to plan ahead, by taking into consideration the current and predicted weather along your travel route.

1. **Weather Monitor.** Weather reports are at your fingertips 24 hours a day whenever you are in range of a monitoring station. The Avion weather monitor can be tuned to any U.S. Weather Service frequency (it picks up no other radio signals). The unit is wired to the external AM/FM radio antenna for maximum reception capability, and is activated by the orange on-off push button.

2. **Indoor and Outdoor Thermometers.** Dual thermometers allow you to check temperatures inside the trailer (left) and outdoors (right). The large, easy-to-read numbers and calibrations give accurate readings at a glance.

3. **Hygrometer and Barometer.** The hygrometer gives continuous readings of relative humidity, while the barometer provides accurate information on atmospheric pressure. The barometer is affected by both altitude and weather conditions. The lower the altitude, the higher the barometric pressure, and vice versa. In terms of weather conditions, a rapidly-falling barometer signals the approach of bad weather, while a marked rise indicates a clearing trend.

Electric Clock

The Monitor Panel clock runs on its own battery and will continue to keep accurate time to the limit of the battery's life. Replacement is made at the rear of the clock, as are time settings.

Radio

An AM/FM monaural radio and external antenna are standard equipment. An optional stereo model with eight-track tape player is also available. Both versions have a 3-amp in-line fuse located behind the Monitor Panel.

High fidelity speakers provide complete balanced sound throughout the coach. Two are built into the front overhead cabinet, one at each end. Location of the second pair of speakers, if provided, varies according to trailer model, but they are generally toward the rear, one on each side of the coach.

All wiring for the speakers, 12-volt power and standard equipment AM/FM antenna can be found in the overhead cabinet near the Monitor Panel.

1. **AM/FM Monaural Radio.** Operating features include a combination volume/on-off switch (lefthand inner knob), tone adjustment (lefthand outer knob), five pushbuttons that can be preset to any stations, and tuning control (righthand knob) with easy-to-read slide rule dial.

   AM Radio Operation. Turn on-off knob clockwise until a click is heard, slide AM/FM band selector to the left, and rotate tuning control knob to desired station. Adjust volume and tone controls.

   To set pushbuttons, select desired station, pull out button closest to the frequency indicator, then push in firmly. Repeat procedure for remaining pushbuttons.

   FM Radio Operation. Turn on-off knob clockwise until it clicks. Move AM/FM band indicator to the right and rotate tuner knob to desired station. Adjust controls for volume and tone. Use procedure outlined under AM Radio Operation to set pushbuttons.

   FM band interference can be reduced by using the distant/local switch. It is located in the volume/on-off control (lefthand inner knob). Pull knob for "local" setting (in areas with strong FM signals) and push for "distant" setting (normal or fringe reception areas).

2. **AM/FM Stereo with Tape Player (optional).** Operating features include a combination volume/on-off switch (lefthand inner knob), balance control (sliding lever), tone adjustment (lefthand outer knob), and tuning control (righthand knob) with easy-to-read slide rule dial.

   AM Radio Operation. Remove cartridge and turn on radio by rotating on-off switch clockwise until a click is heard. Slide AM/FM band selector to right (AM indicator will light up), then rotate tuning control knob to desired station. Adjust volume, balance and tone controls.

   FM Radio Operation. Remove cartridge and turn on radio by rotating on-off switch clockwise until it clicks. Move AM/FM selector to left (FM indicator will glow), then rotate tuning knob to desired station. The radio's automatic frequency control locks onto the signal and prevents it from drifting. Adjust for volume, balance and tone.

When an FM broadcast switches from monaural to stereo, the radio automatically receives the program in stereo, and the FM stereo indicator glows.

FM band interference can be minimized by use of the distant/local selector button. Push and lock the "D" button in "local" position when staying in areas with strong FM signals. Push button again for "distant" position when you are in normal or fringe reception areas.

Tape Player Operation. Turn on radio by rotating on-off switch clockwise until it clicks. Insert tape cartridge straight into tape slot until it snaps into position. It will now automatically start running. Adjust volume, balance and tone controls. To change program, push in the program selector (same knob as volume/on-off switch). Each time the knob is depressed, the tape will advance to the next program track. The program indicator always shows the track being played. If the program selector is not pressed, the tape will automatically play in sequence, from program 1 through 4 and back to 1.

Note: Do not leave cartridge in tape player when finished. It should either be removed completely or pulled out approximately 3/4-inch to disengage it from the magnetic tape head. Store cartridges open and down in their original packages. They should be kept in a cool place, away from the direct rays of the sun, and should not be exposed to high humidity or magnetic sources other than the tape head itself. Never tamper with the magnetic head inside the unit or subject it to other magnetized objects. It should be cleaned only with a magnetic head cleaner cartridge, available at most stereo equipment stores. See the radio manufacturer's literature for additional tips on care of your radio-tape player.

Power-On Light

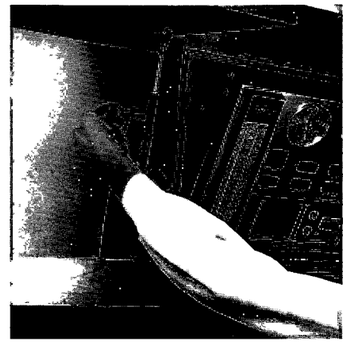
This signal light confirms that the trailer's electrical system is running on 110-volt external power. It also verifies that the AC/DC converter is working and that the on-board batteries are being automatically recharged.

The light is identified on the Monitor Panel as "PWR ON" and is positioned at the top righthand bank of the system status lights. If it fails to glow while on outside power, check the 3-amp fuse located at the Electrical Control Center.

Servicing the Monitor Panel

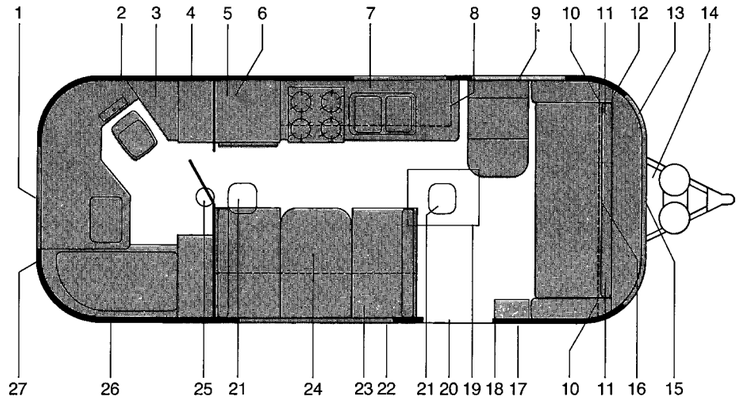
To replace light bulbs, clock battery or fuse, pull the spring-loaded release pin located inside the overhead cabinet immediately to the left of the Monitor Panel. The unit is hinged at the bottom and swings out and down for easy access. A cable holds the Monitor Panel in a horizontal position while it is being serviced. Use the knob provided to pull panel out and to return it to its locked position.

When closing the Monitor Panel, raise it fully upright until it makes contact with the release pin. Push it gently on upper portion of Monitor Panel with right hand, while pulling out the release pin with left hand until it just clears the edge of the Monitor Panel and allows it to pass. Now let go of the release pin and continue to push Monitor Panel gently until the pin clicks into locked position.

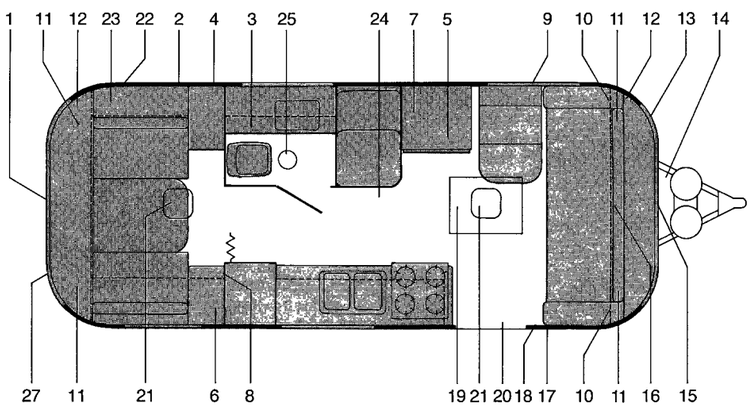


Monitor Panel Rear Access

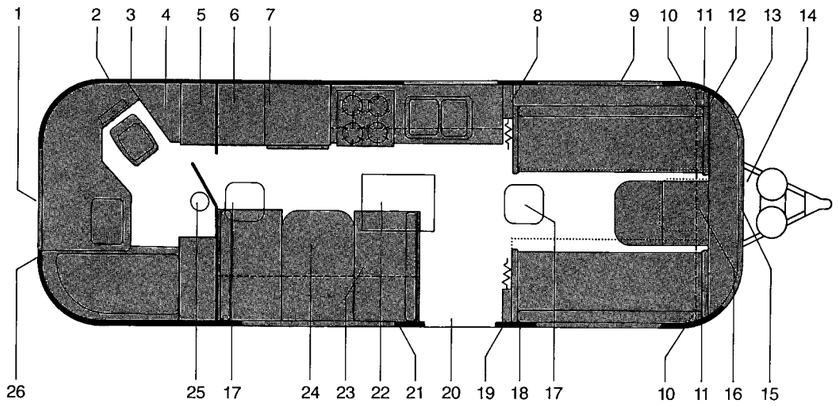
Floor Plans



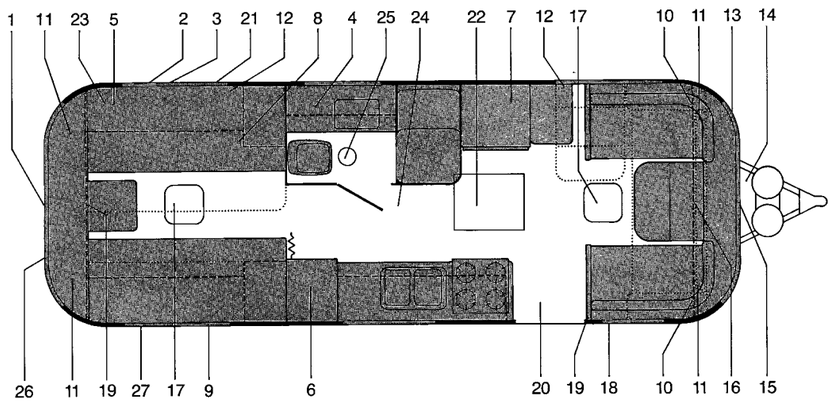
Model C—7.0 Metres (23′)
Model D—7.0 Metres (23′)



No.	Description	Page No.
1.	Trunk	32
2.	Utility Convenience Light	78, 104
3.	Electrical Control Center	76, 104
4.	110 Volt Electrical Inlet	78
	City Water Inlet	66
	Cable TV Hook-Up	33
	Sewage Outlet	72
5.	Refrigerator	82
6.	Furnace	90
7.	Water Heater	93
8.	Furnace Thermostat	90
9.	Emergency Exit	50
10.	Radio Speaker	56
11.	Reading Light	50, 104
12.	TV Jack	77
13.	Radio Antenna	34
14.	Batteries	78
15.	Hook-Up Convenience Light	78, 104
16.	Monitor Panel	54
17.	Patio Convenience Light	78, 104
18.	Switches	—
19.	Air Conditioner (Optional)	94
20.	Entry Light	50, 104
21.	Roof Vent	48
22.	Water Fill Spout	66
23.	Water Pump	66
24.	TV Antenna Control (Optional)	33
25.	Bathroom Exhaust Fan	51
26.	Exterior Storage	32
27.	Sewer Hose Storage	72



Model F—7.9 Metres (26′)
Model H—7.9 Metres (26′)



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1.	Trunk	32
2.	110 Volt Electrical Inlet	78
	City Water Inlet	66
	Cable TV Hook-Up	33
	Sewage Outlet	72
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4.	Electrical Control Center	76,104
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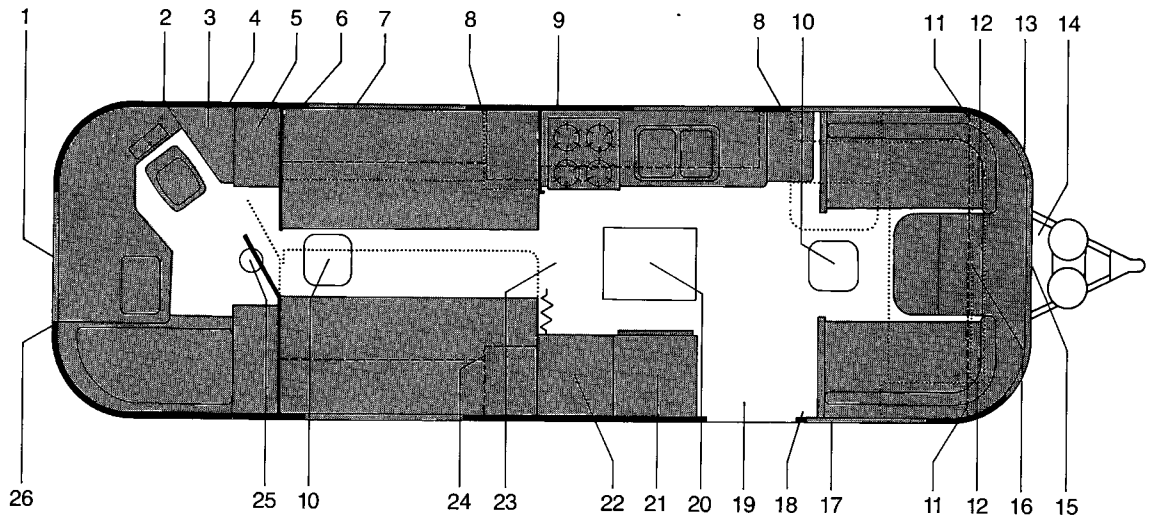
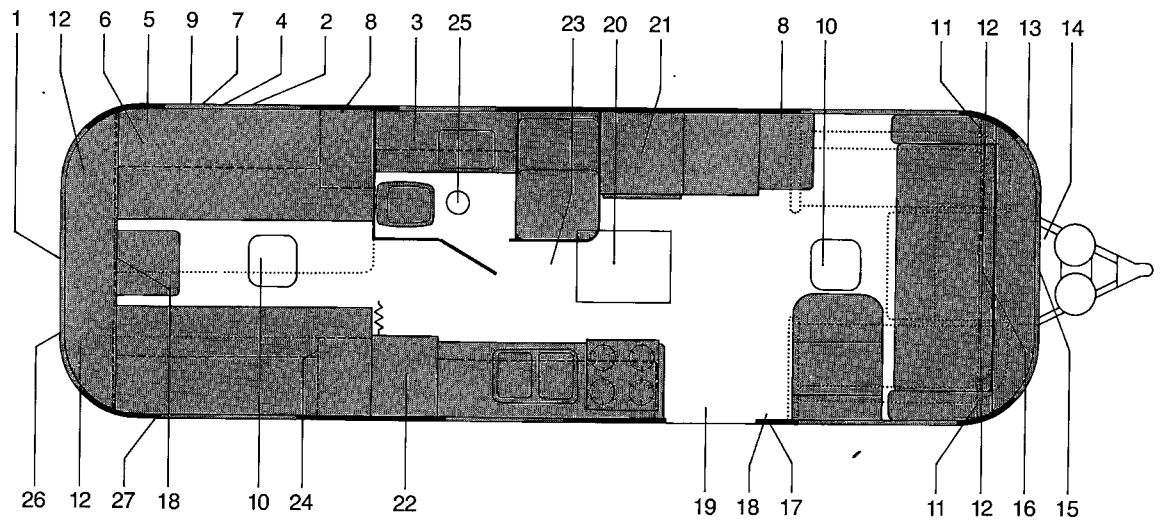
27.	Exterior Storage	32



Model J—8.5 Metres (28′)
Model M—8.5 Metres (28′)



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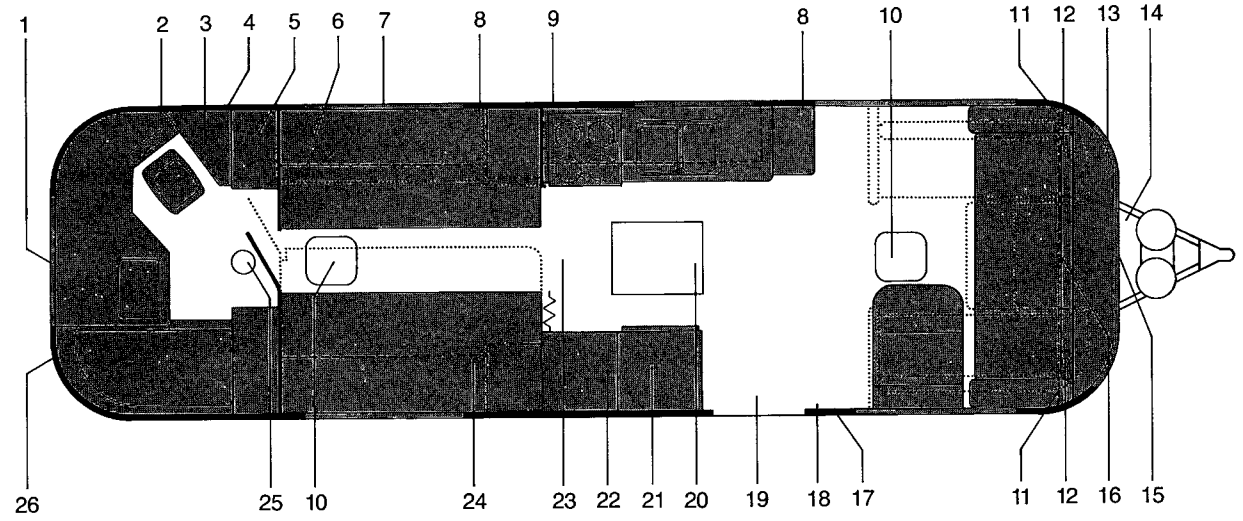
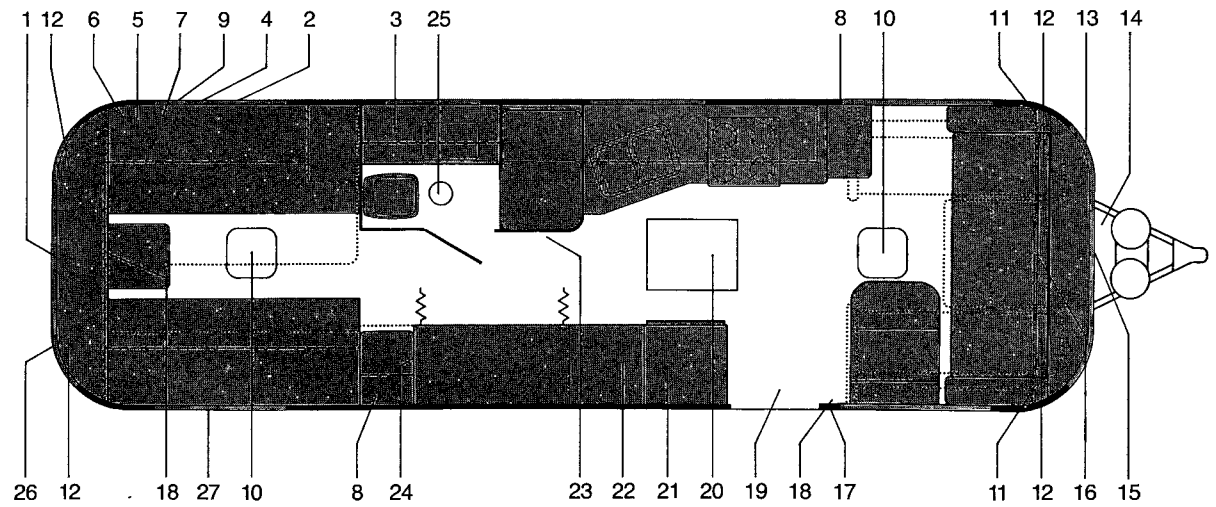


Model P—9.1 Metres (30′)
Model R—9.1 Metres (30′)



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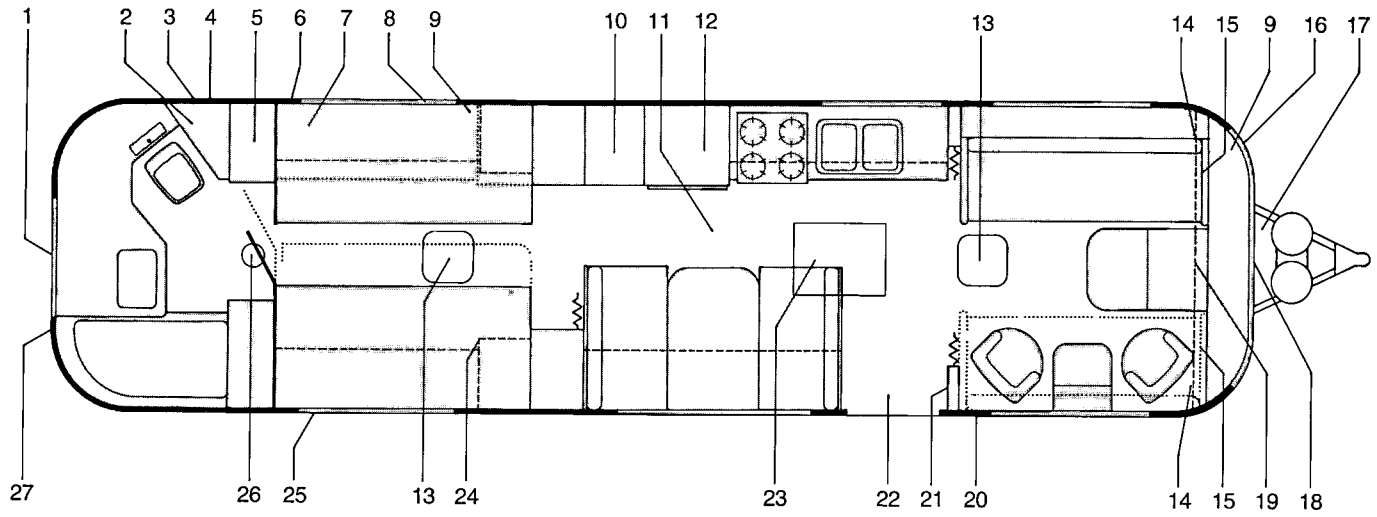
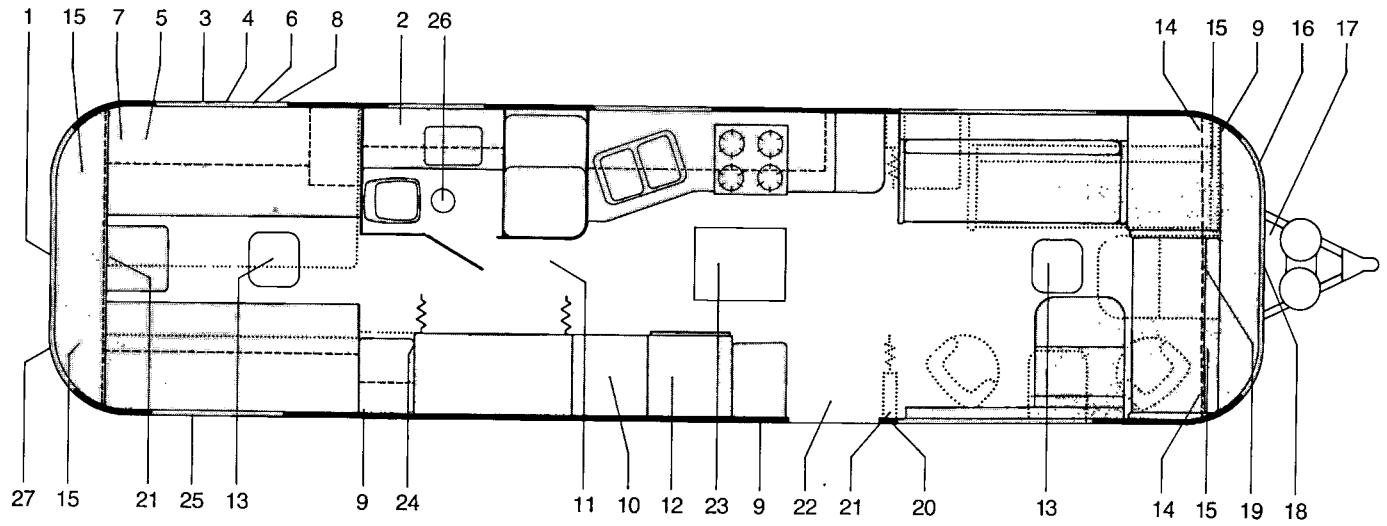


Model V—10.3 Metres (34′)

Model W—10.3 Metres (34′)



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Systems

LPG System

Your Avion's gas system consists of two 30-pound-capacity LPG bottles (40-pound bottles are optional), a pipe network for distribution, and various gas-fueled appliances in the coach. The entire system is engineered specifically to operate only with **liquified petroleum gas,** commonly known as LPG.

The two most widely used types of LPG are propane and butane. While your Avion can operate efficiently on either one, we strongly recommend **propane,** because of its ability to remain in a gaseous state down to 40°F. below zero. Butane, on the other hand, will remain gaseous only to 32°F. above zero (the freezing temperature of water), making it impractical for use in cold climates.

Gas Bottles

The two LPG cylinders are located on the trailer tongue A-frame at the front of the coach. Each is equipped with a gas flow control valve. You will find that one bottle gives approximately three weeks' service in "normal" use. Consumption will increase substantially in cold weather operation, when the furnace is running and large amounts of hot water are used. Extensive cooking can also result in higher than average LPG consumption.

Automatic Regulator

An automatic regulator is located at the LPG bottles. It has been calibrated at the factory to maintain a pressure of about 6.5 ounces per square inch throughout the system. All appliances have been adjusted to operate most efficiently at this pressure.

Caution: If any adjustment is required, it must be made by a qualified LPG service mechanic, using special equipment.

When the gas supply in either bottle becomes depleted, the regulator will automatically switch over to the full one for uninterrupted service.

The valves on **both** bottles must be open to permit automatic changeover. A red indicator will appear on the regulator when this has occurred, and the arrow on the flip-over lever will be pointing to the empty cylinder. Moving the lever to the opposite position will change the **reserve** (full) bottle to the **service** bottle and cause the red indicator to disappear.

Note: If the system is under heavy load, especially in cold weather, the **service** bottle pressure may drop enough to indicate **"reserve,"** even though it still contains fuel. Do not consider the service bottle exhausted until the red indicator appears under a **light** load.

The amount of fuel remaining in each tank at any given time can be verified by checking the Monitor Panel LPG system status lights or by visual inspection of the gauges on the bottles.

Replacing the Gas Bottles

1. Shut off the gas flow control valve on the bottle being replaced.
2. Remove gas level sensor gauge wires, then disconnect the gas line by loosening the lock nut with a wrench. The nut is **left** threading; therefore, turn it **clockwise to loosen and counterclockwise to tighten.** Tape the end of the gas line closed, even if it will be out of service for only a few minutes. Insects attracted into the tubing can often plug the line.
3. Loosen the retaining clamp nut enough to provide clearance, then remove tank. It should be moved at least 25 feet away from the trailer before being filled. Observe caution (no smoking or open flames in the area).
4. Reinstall the gas bottle by first connecting the gas line, then tighten the retaining clamp securely and turn on the flow control valve.
5. Test for gas leaks at bottle gas line connection.

Reactivating the LPG System

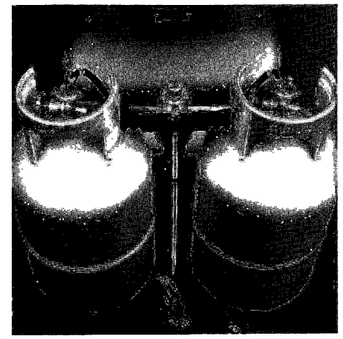
Special steps must be taken to restore service in the event both cylinders have been depleted, or if your LPG system has not been used for a long period, thereby allowing air to enter the gas lines. If this happens, gas pressure must be used to force out the air before relighting the pilots.

1. Fill the gas bottles and reinstall if gas supply has been depleted.
2. Shut off all valves and gas appliances.
3. Open LPG bottle flow control valves.
4. Test for gas leaks at bottle gas line connection. (See next section.)
5. Starting with the appliance **nearest** the front of the coach (where the LPG tanks are located), turn on the pilot valve and hold a match to it until it ignites and holds a steady flame. Then move on to the next-closest appliance, and so on, until all pilots have been relighted.

Testing for Gas Leaks

Before turning on the LPG system, make certain that appliance valves are closed, unconnected outlets are capped, and gas connections are tight. All gas fittings, except those at individual appliances, are located outside the coach for safety and serviceability. Several connections are underneath, where the main LPG line branches off to supply the separate appliances. These gas lines and fittings should be inspected and tested periodically for possible damage and leaks.

1. Close all appliance valves and cap unconnected outlets.
2. Turn on gas supply at LPG bottle flow control valves.
3. Brush or spray a biodegradable soap solution over all fittings and any damaged areas in the gas lines. **Do not use products containing chlorine or ammonia.**
4. Look for the appearance of soap bubbles in the area being tested. If they grow larger, there is a gas leak present.
5. LPG is intentionally "marked" with a discernible odor. **If it is detected inside the trailer, immediately extinguish all open flames, including pilot lights, and test for leaks.** Check out every location in which there is a valve, fitting or possible gas line damage.
6. Turn off the LPG supply at the gas bottle flow control valves if a leak is detected but cannot be traced to its source. Consult your Avion dealer or a competent gas appliance service center. **Do not use the system again until the leak is pinpointed and eliminated.**



LPG Bottles and Regulator

Maintenance

The only maintenance you should perform personally consists of testing for leaks on a regular basis and refilling the gas bottles. All other service functions must be handled by a qualified service technician to insure against potentially serious accidents.

Important: It is illegal in some states to leave the gas bottle valves open while traveling. Check with proper authorities and observe local laws.

Caution: Always extinguish all gas appliance pilot lights before refueling your tow vehicle.

Fresh Water System

Your Avion is outfitted with a system designed to provide fresh water service from a city hookup or from the trailer's own self-contained supply. The system consists of a fresh water holding tank, fill spout, water pump, water heater, optional water purification system and pressure regulator, and all of the faucets, fixtures and plumbing required to deliver the water on demand.

Fresh Water Holding Tank

The molded plastic fresh water holding tank is located below the coach floor at its axles. Avion Models C, D, F and H are equipped with a 45-gallon tank; Models J, M, P, R, V and W have a 65-gallon tank. A hot air duct running from the forced air furnace to the water tank compartment provides heat for cold weather operation. Access to water tank fittings and drain valve is through a cutout in the trailer floor. Water level can be checked instantly on the Monitor Panel (see page 54).

Fill Spout

The fresh water holding tank is filled through a fill spout located behind a locking door on the outside of the coach. Simply swing down the hinged door and pull out the filler spout far enough to insert water hose. A bypass line is also provided, enabling you to fill the tank while the trailer is connected to an outside water supply (see illustration, page 70). Check fresh water holding tank at the Monitor Panel and turn off bypass valve when tank is full.

Caution: For proper venting, always open the locking access door and pull out the fill spout before opening bypass fill valve.

Water Pump

The automatic water pump is mounted on the floor near the fresh water holding tank access cutout. It has been designed specifically for use with self-contained, multi-fixture water systems, and is self-priming for operation under any conditions. The pump will run even when dry, thereby preventing possible burn-out. A built-in discharge valve insures against back-flow into the fresh water holding tank when the system is hooked up to an outside source. The unit's hydraulic pulsation dampener and large vibration-absorbing pads provide smooth, quiet operation.

The water pump is an automatic "demand" type. It instantly begins operating when a faucet is opened, pumping a constant three-gallons-per-minute flow from fresh water holding tank to spigot. The pump automatically shuts off when the faucet is closed. Water pressure in the line must be at least 16 psi for the pump to function properly. After the water system has been out of use for an extended period, the pressure must be brought up to minimum requirements or the pump will not operate.

Activate the water pump using the following procedure.

1. Check level in fresh water holding tank at Monitor Panel.
2. Clean the filter located in water line between pump and fresh water holding tank. Disassemble filter, remove the screens and clean them. Also clean all faucet aerators.
3. Open faucets on galley sink, bathroom sink and shower/tub. Each has a single control knob, which should be set midway between the maximum hot and cold settings to assure equal flow from both lines.
4. Turn on water pump switch at the Monitor Panel.
5. Close faucets when they start delivering a steady stream of water. Rotate control knob to **maximum hot setting** before turning off.
6. Check water pump to make sure it shuts itself off after the last faucet has been closed.

The water pump is now ready for automatic operation. It will start up whenever a faucet is opened and shut down when the faucet is closed.

Important: When traveling, always turn off the water pump at the Monitor Panel. If it is left on, surges of water that sometimes occur when the coach starts and stops may actuate the pump automatically. The pump will then continue to run indefinitely, since there would be no running water to allow normal cycling.

The water pump, as any other component in the Avion fresh water system, can be damaged by sub-freezing temperatures. Refer to **Winter Storage** section, page 98, for proper steps to be taken if you do not plan to travel during cold weather.

Minor malfunctions in the water pump may be corrected by using the trouble-shooting guide on page 69. Never attempt to service the pump without first turning off the power at the Monitor Panel and opening all faucets to relieve pressure in the water system.

Water Heater

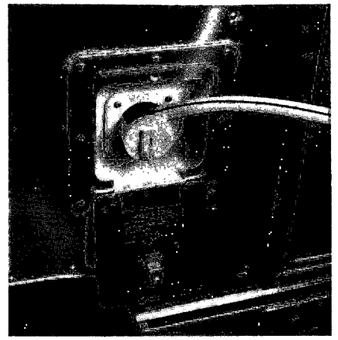
The six-gallon-capacity gas water heater features pilotless electronic ignition. It is actuated by a switch on the Monitor Panel. A signal light on the Monitor Panel glows automatically in the event of a malfunction in the ignition system. See **Appliances** section, page 93, for operating instructions.

Water Purification System

The optional water purification system is located in the cabinet below the galley sink and is connected to the **galley cold water line only.** It is designed to remove a variety of impurities, including suspended particulate matter and unpleasant odors and tastes, but it is not intended to eliminate bacteria. Such contamination can be treated by adding 1/6-ounce liquid chlorine bleach per 10 gallons of water to the fresh water holding tank.

The water purification system will keep water sparkling clear for cooking and drinking to the limit of the filter life. Inspect the filter cartridge periodically for accumulations of foreign matter that might impair water flow. Replace the cartridge when flow becomes noticeably restricted or once each year.

1. Shut off water by rotating the cartridge housing valve handle **counterclockwise** as far as it will go.
2. Rotate the colored ring all the way to the **left.** It will drop approximately ⅝-inch.
3. Lift the cartridge slightly and turn it to the **left** until it can be disengaged.
4. Lower cartridge to disconnect it from the ring, and discard.
5. With the colored ring still in the lowered position and turned all the way to the left, align the cutout under label on ring with the lug on the new cartridge.
6. Insert new cartridge upward into ring as far as it will go.
7. While holding colored ring steady, turn cartridge to the **right** until it stops. Do not force.
8. Turn colored ring to the **right** until it drives the cartridge up into the head.
9. Lock the ring in place and turn on water by rotating purifier valve handle **clockwise.** Make certain that the handle leg engages the ring locking nut to assure correct operation.



Water Tank Fill Spout

Water Pump

Water Pressure Regulator

The optional water pressure regulator is available as part of Avion's Accessory Kit. It maintains a safe and constant water pressure in the on-board fresh water system while connected to an outside water supply. Sometimes these sources are subject to wide pressure variations, which can damage plumbing or water delivery components. The water pressure regulator safeguards the trailer's water system in the event of such variations. Always connect the regulator **directly to the city water hookup,** then attach your water hose to the regulator. With the regulator positioned in this manner, it will also protect the hose from pressure variations.

Faucets

The fixtures are triple chrome plated for long-lasting beauty and ease of care. All faucets except center bath shower/tubs operate with a single control knob or lever that turns water on and off and adjusts mixture to desired temperature. The shower/tub faucet also features a pushbutton to divert water from the bathtub spout to the shower head. See **Interior** section, page 50, for additional information on faucet operation.

Operating the Fresh Water System

The water pump is turned on to operate your trailer's stored water system. A switch is provided on the Monitor Panel for this purpose. **The pump is not required** if you are hooking up to a city water supply.

When using outside water sources for any lengthy period, you should drain the fresh water holding tank, then refill it when you disconnect from the external supply and are ready to get under way. Make certain that the fill spout is closed and the access door locked before traveling.

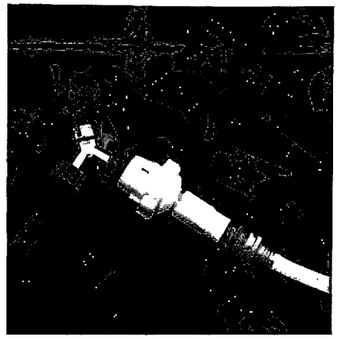
Shared Hookups

If you are traveling in a caravan and find it convenient or necessary to share a city water hookup, this can be accomplished by using a standard garden hose "Y" fitting. First affix the stem of the "Y" fitting to the regulator, and attach water hoses from the two legs of the "Y" connector to the city water inlet on each coach. Then connect the optional water pressure regulator to the outside water supply coupling (see photo).

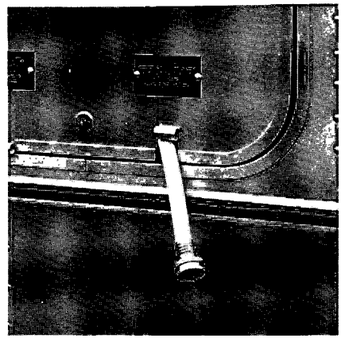
Water Sanitation

In addition to adding small amounts of chlorine as described under **Water Purification System,** we recommend you observe the following measures to assure complete sanitation of your potable water system...whether it is brand new, or has been out of service for a lengthy period, or has possibly become contaminated.

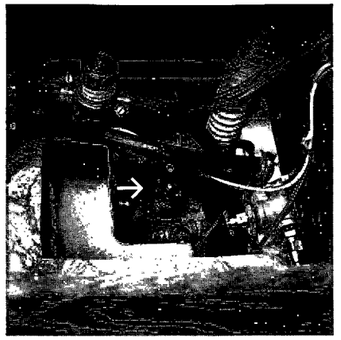
1. Turn on water pump switch at the Monitor Panel and drain the fresh water holding tank. This can be done either by opening any faucet inside the coach or by opening the holding tank drain valve, which is located under a cutout in the coach floor (see photo). In Models C and F, the cutout is on the **curb side** under the dinette seat. In Model J, it is on the **road side** under the gas range. In Models P, V and center bath floor plans, it is on the **road side** at the rear, under either the bed or dinette seat, depending on the floor plan.
2. Prepare a solution of ¼-cup household liquid chlorine bleach (5% sodium hypochlorite) to one gallon of water for each 15 gallons of holding tank capacity.
3. Close drain valve and faucets and pour chlorine solution into the fresh water holding tank filler spout, then complete filling with plain water.
4. Open sink and tub faucets individually until water flows steadily, then turn off. This will purge any air from the lines.
5. Top off holding tank with plain water and wait three hours.
6. Drain and flush the entire system with potable water (drinking quality) by opening fresh water holding tank valve or sink and tub faucets.
7. Remove any lingering chlorine taste or odor by preparing a solution of one quart vinegar and five gallons of water and pouring it into the fresh water holding tank filler spout, after closing drain valve and faucets. The solution should be allowed to agitate in the tank for several days by the normal motion of the trailer.
8. Drain the tank again and flush with potable water, with all sink and tub faucets open, then close tank valve and faucets and refill. The system is now sanitized and ready for use.



Water Pressure Regulator With "Y" Fitting



City Water Connection

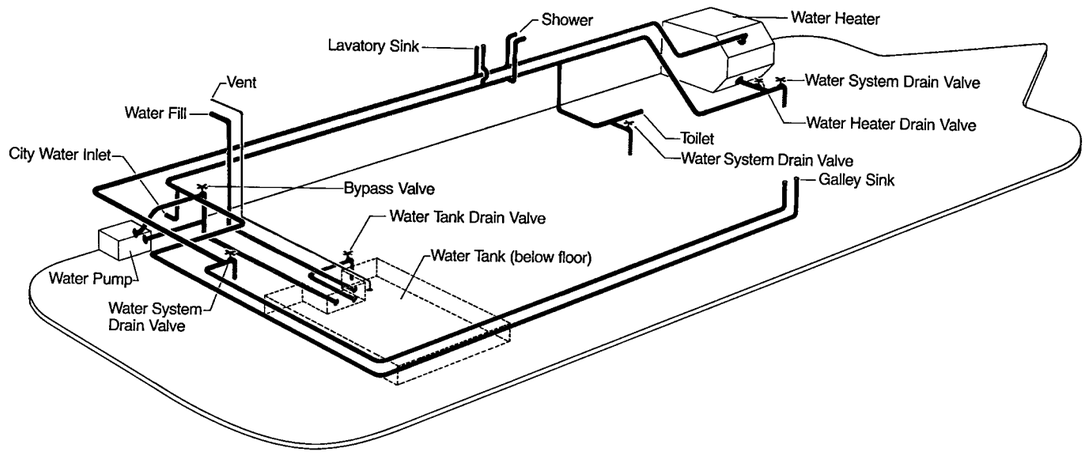


Water Tank Drain Valve

Trouble-Shooting

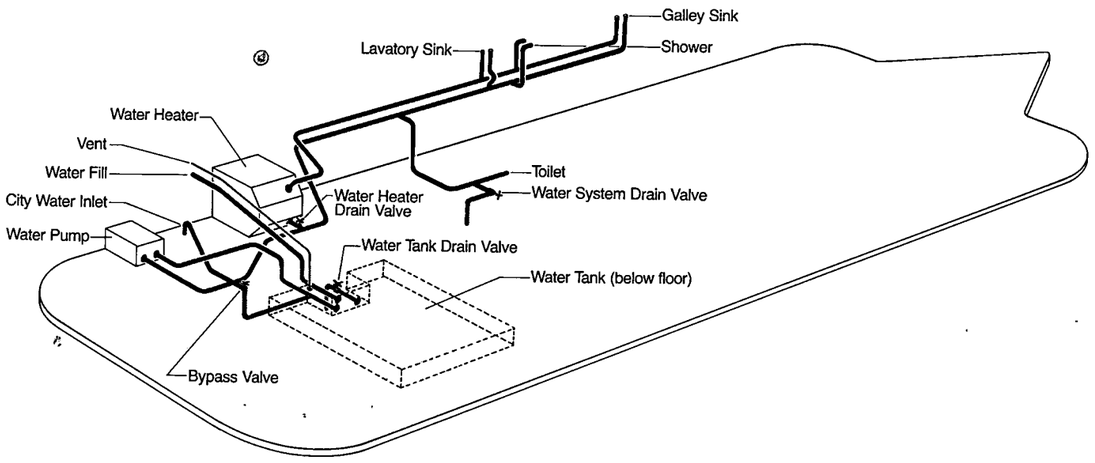
Symptom	Cause	Remedy
Pump operates but no water flows through faucet.	Low level in fresh water holding tank.	Fill tank.
	Suction line clogged or kinked.	Check for obstructions.
	Air leak in suction line.	Repair or replace line.
	Loose suction line clamps or fittings.	Tighten all hose clamps and fittings.
Pump cycles on and off when faucets are closed.	Leak in plumbing.	Check for leaks and reseal.
	Defective toilet slide valve.	Replace valve.
	Internal leak in water pump.	Repair or replace pump.
	Outlet valve not sealing.	Check for proper seating and sealing.
Rough, noisy operation and excessive vibration.	Intake line restricted, kink in suction line, or fittings too small.	Check for line obstructions or restrictions and correct them. Change fittings if too small.
	Faulty pulsation dampener.	Replace dampener.
	Screws loose at pulleys or connecting rod.	Tighten screws.
Pump does not start when faucet is opened.	No electrical power to pump.	Check Monitor Panel switch and fuses.
	Outlet line clogged or kinked.	Remove obstruction.
	Defective pressure switch.	Replace switch.
Pump does not shut off when faucets are closed.	Fresh water holding tank is empty.	Fill fresh water holding tank.
	Outlet valve not sealing.	Check valve for proper seating and sealing.
	Low electrical power to pump.	Recharge batteries.
	Air in system.	Open all faucets until steady stream of water flows.
	Faulty pressure switch.	Replace switch.
	Air leak in filter.	Check filter seal and hose clamps.

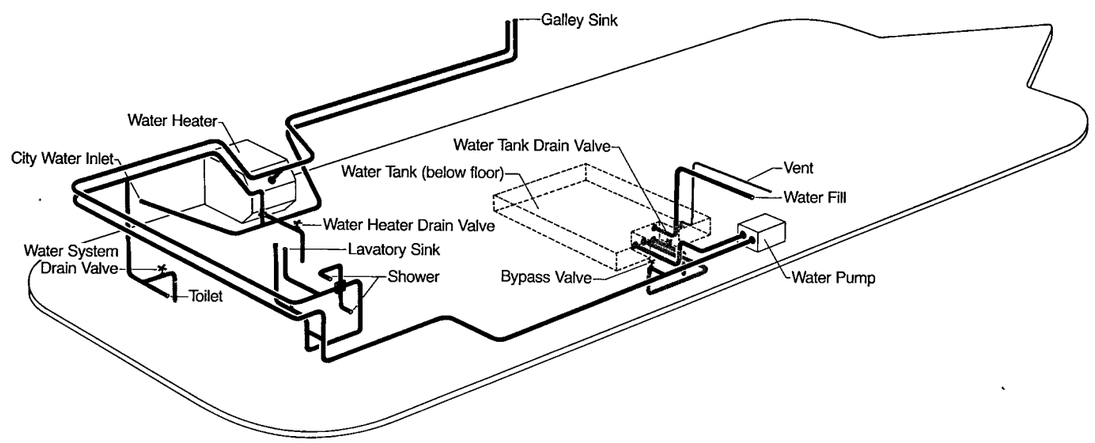
Water System Diagrams



Center Bath—Models D, H, and M

Center Bath—Models R and W





Rear Bath

Rear Bath

Drainage System

The drainage system in your Avion consists of two major components: a 30-gallon-capacity rinse water holding tank, which stores water that has been used in the sinks and shower/tub; and a 45-gallon waste holding tank, which collects waste matter from the toilet.

The rinse water and solid waste holding tanks are located adjacent to each other on the road side of the coach near the back end. They discharge liquids and solid waste through a single sewage outlet, also located at the rear road side, behind a hinged door at the lower edge of the coach. This compartment also houses separate "T" handle dump valves for the rinse water and solid waste holding tanks.

Hooking Up to City Sewer Inlet While Camping

1. Remove sewer hose from the rear bumper storage compartment.
2. Unlatch sewage outlet door and let it swing down.
3. Remove the drain cap and connect hose by pressing bayonet fitting onto the sewage outlet and turning clockwise until secure.
4. Connect other end of sewer hose to the city hookup inlet.
5. Open and drain solid waste holding tank, if necessary (see next section).
6. Open rinse water holding tank dump valve by pulling straight out on the "T" handle.
7. Swivel sewage outlet down, disconnect sewer hose from outlet, then close and latch the access door.
8. Reconnect sewer hose through opening in access door.

Important: The solid waste holding tank dump valve should never remain open, even if you are camped where a city sewer hookup is available. The volume of water used with each flush may not be adequate to fully discharge solid wastes, resulting in an unpleasant build-up that is difficult to remove.

Emptying the Solid Waste Holding Tank While Camping

1. Run 5-6 gallons of clear water into the solid waste holding tank before using, and add an appropriate amount of chemical.
2. Disconnect sewer hose from trailer sewage outlet, lower the door for access to dump valves, and reconnect the sewer hose.
3. Open solid waste holding tank dump valve by pulling out on the "T" handle. Close valve when tank has been completely drained.
4. Fill solid waste holding tank part way (5-6 gallons) and repeat draining procedure. Make sure solid waste holding tank dump valve is closed following drainage.
5. Disconnect sewer hose from sewage outlet, close and latch access door, and connect sewer hose.

Overloading the Solid Waste Holding Tank

Check the level in the solid waste holding tank often enough to prevent filling it completely. A system status light on the Monitor Panel will tell you the level on command. See **Interior** section, page 54. If this holding tank becomes too full, the toilet will not drain. Since the toilet uses less than one pint of water for an automatic flush, the tank can easily accommodate the requirements of two adults for a period of several days. This can be extended to more than a week by using the water saver package, in the event you are camping where no sewer facilities are available.

Overloading the Rinse Water Holding Tank

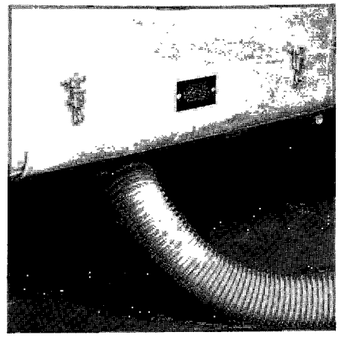
This tank accumulates rinse water from the galley sink, bathroom sink, and shower/tub. If your coach is connected to a city sewer inlet with the rinse water holding tank dump valve open, the tank will drain continuously and cannot overload. If you are camping where no such facilities are offered, you should store the rinse water until a sanitary dump is reached. The level in the rinse water holding tank can be observed at the Monitor Panel. See **Interior** section, page 54.

Important: We recommend that you do not discharge the rinse water or solid waste holding tanks anywhere except approved disposal stations. Besides creating an unsanitary environment, it is unlawful in many areas.

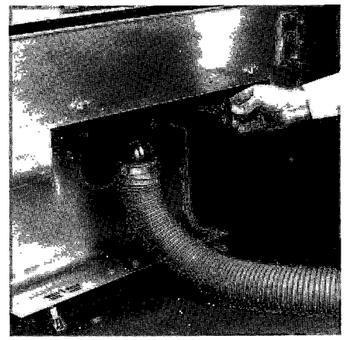
Shared Hookups

You can share sewage facilities with another trailer through the use of a special "Y" fitting, available from recreational vehicle stores. The stem of the "Y" connector should be attached directly to the city inlet. Connect the sewer hose from each trailer to one of the legs of the "Y" fitting. Never empty the rinse water or solid waste holding tanks from both coaches simultaneously. If the other trailer unhooks from the "Y" fitting, remove it and reconnect your sewer hose directly to the sewer inlet.

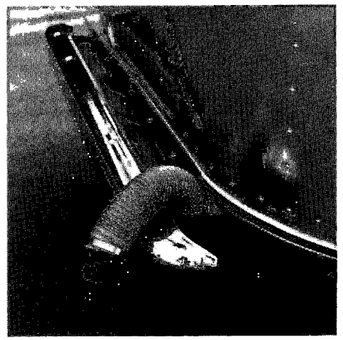
Sewer Hose Connection (Dumping)



Sewer Hose Connection (In a Park)



Waste Holding Tank Drain Valves



Sewer Hose Storage

Disconnecting from City Sewer Hookup

Always observe the following procedure before disconnecting from a city sewer inlet in preparation for travel.

1. Empty the solid waste holding tank and close its dump valve.

2. Empty the rinse water holding tank and close its dump valve. This will help flush the sewer hose. If the rinse water holding tank dump valve had remained **open** while you were connected to a city sewer inlet, first close it, then fill tank by opening any water faucet inside the coach. The rinse water holding tank dump valve can now be opened to flush the sewer hose, then closed.

Important: Always drain the solid waste holding tank first; then drain the rinse water holding tank.

3. Uncouple sewer hose at the trailer sewage outlet and flush with plain water. Then disconnect other end of hose from the city sewer hookup and stow it in the rear bumper compartment.

4. Replace drain cap on the trailer sewage outlet to prevent accidental dumping, then swivel the outlet upward into its "traveling" position.

Important: The sewage outlet cap must be in place while traveling, but must be removed before opening the dump valve on either tank.

5. Close and latch the sewage outlet/dump valve access door.

Dumping at a Sanitary Facility

The same basic procedures outlined earlier in this section should be followed when using a sanitary dumping facility. Remember to empty the solid waste holding tank first and the rinse water holding tank second. When you are hooking up to a sewer inlet only long enough to drain the tanks, it is not necessary to swivel the trailer sewage outlet down and run the sewer hose through the access door hole. Simply connect the sewer hose to the sewage outlet in its "traveling" position and leave the access door open while the tanks are being emptied.

Toilet Operation

The Thetford Aqua Magic® toilet in your Avion is pedal-operated and has a sliding, self-cleaning, positive-seal blade to prevent solid waste holding tank odors from escaping into the coach. The toilet can be operated in four different ways, depending on the amount of water you desire to use.

Automatic Flush and Refill

1. **Depress both foot pedals** (located side by side at the right front of the toilet). This opens the slide valve and releases solid and liquid waste into the holding tank. The **small** pedal turns on the water; the **large** pedal actuates the slide valve.

2. **Keep both pedals depressed approximately one to three seconds,** until water begins to swirl in the bowl and rinses it. This time lag also fills the rim storage, which will subsequently refill the bowl and then allow it to drain.

Toilet Pedal Operation

Toilet Hand Spray

3. **Release both pedals** to close the slide valve and stop the flow of fresh water. The rim storage will then drain into the bowl and refill it.

Flushing with Slide Valve Open for Minimum Time

1. **Depress the small (right) pedal only.** Hold it down until water begins to swirl in the bowl, then release it.

2. **Depress the large (left) pedal** to open the slide valve and discharge waste into the holding tank. The water will immediately swirl into the bowl to provide rinsing action. When the **large** pedal is depressed, it automatically operates the **small** pedal, as well. However, the time lag in the flush is eliminated because the **small** pedal turns on the water flow, and the rim storage is filled when **both** pedals are depressed.

3. **Release both pedals** to close the slide valve and stop the flow of fresh water. The bowl refills automatically from the rim storage.

Flushing with the Water Saver Package

1. Hold the hand spray unit (left side of toilet) directly over the bowl and push the thumb button.

2. **Depress both foot pedals.** This will open the slide valve, drop waste matter into the holding tank, and automatically release fresh water through the hand spray into the bowl.

3. Spray the bowl clean, then release the button to shut off water at the spray head.

4. **Release both pedals** to close the slide valve and to stop the flow of water through the hand spray hose.

5. Make sure the slide valve is seated properly. Be especially careful to flush bathroom tissue completely, otherwise it might prevent the valve from closing fully and sealing.

Flushing with the Hand Spray Only

1. **To flush liquid waste only,** wet the bowl with the hand spray before and after use. More water is required to rinse a dry bowl than a wet one.

2. **To flush liquid and solid waste together,** have just enough water in the bowl to allow for flotation of solid material. Depress the **large** foot pedal to open the slide valve and discharge waste into holding tank. Keep the valve open while rinsing bowl with the hand spray, then release the pedal. The toilet is again ready for use.

3. To refill the bowl, depress the **small** pedal until desired water level is reached, then release it.

The Aqua Magic toilet does not require any maintenance or lubrication to provide reliable service.

Drainage Tips

1. Never attempt to dispose of facial tissues, paper towels or other materials with "wet strength" through the toilet. They do not dissolve easily and can clog the solid waste drainage system.

2. Use only water and approved chemical additives in the drainage system to avoid possible permanent damage and costly repairs.

3. Take precautions when using your trailer during cold weather. A permanent-type antifreeze may be added to the rinse water holding tank and solid waste holding tank, but never use fluids that can cause damage to the drainage system. See **Winter Storage** section, page 98, for more information.

4. Use mild household cleaners to keep the drainage system fresh and sanitary. Regular toilet bowl products can be used, but they must be flushed through the system within four hours. They should never be left in the solid waste holding tank for an extended period, because such products have an adverse effect on holding tank chemicals.

Electrical System

Electricity for your Avion is furnished by on-board 12-volt batteries or by 110-volt external power. Some of the 110-volt current is fed to the AC/DC power converter, which in turn supplies the trailer's 12-volt system when it is not operating from the self-contained batteries.

Electrical Control Center

The heart of Avion's 110-volt and 12-volt power systems is the Electrical Control Center. It incorporates the latest solid state technology and advanced features to insure an uninterrupted source of electricity, whether you are operating from an external 110-volt hookup or the on-board 12-volt batteries.

The Electrical Control Center is located in the bathroom, behind a storage cabinet door. It consists of three basic modules designed for years of reliable service.

1. **AC/DC Power Converter.** This module converts outside 110-volt alternating current to the 12-volt power necessary for operation of interior 12-volt lights, appliances, fans, water pump and outlets when they are not drawing current from the trailer's 12-volt batteries. The converter unit's components include a low-hum power transformer to reduce current from 110-volt AC to 12-volt AC, and solid state rectifiers or diodes to change the 12-volt AC to 12-volt DC (similar to battery current). The power converter cord plugs into a 110-volt outlet built into the Electrical Control Center.

2. **12-Volt DC Distribution Panel.** This module supplies current to 12-volt outlets, water pump, refrigerator (when operating on 12-volt power), water heater and furnace electronic ignitions, fans, and most interior lights. It contains individual fuses to protect all 12-volt circuits leading from the power converter (see page 105 for fuse sizes). The DC panel's other components include a transfer relay that automatically switches the electrical system from battery power to converter operation when the power is plugged into a 110-volt source, and a removable printed circuit board.

If the printed circuit board should malfunction, it can be replaced without exchanging the entire power converter. First remove the face plate, which is attached by two slotted hex head screws located above the 12-volt fuses. Disconnect the white nylon plug and remove the two retainer screws holding the circuit board in place. The board can now be lifted out and replaced with a new one.

Caution: Disconnect the power cord from 110-volt supply before attempting to perform any service work on the Electrical Control Center.

3. **110-Volt AC Distribution Panel.** This module delivers electricity to refrigerator (while operating on 110-volt current), power converter, optional air conditioner, and 110-volt receptacles.

The panel is equipped with a 30-amp main circuit breaker and a series of branch circuit breakers. In the event of a 110-volt short or overload, a main circuit breaker will automatically trip and cut off power. The breaker switch will be positioned halfway between "on" and "off" at this time. To reset, move breaker switch all the way to "off," then all the way back to "on." If it trips again, check exposed wiring for breaks and disconnect any appliances that might be overloading the circuits. The circuit breaker will not trip again if the problem has been corrected.

Battery Charger

Whenever the trailer is connected to an external 110-volt source, the power converter will automatically bring the batteries up to full charge and then reduce to a small trickle charge to keep them in that condition. You can verify battery status by observing the "Charge Sentinel" light on the Electrical Control Center. It will glow continuously while the batteries are being charged, and then flash on and off when 90% of charge capacity has been reached. The light will continue to blink several times per second as long as the batteries are at least at 90% of full charge, and will again glow continuously when the level drops below this point.

Important: The "Charge Sentinel" will not function without batteries in the trailer or when the power converter is not hooked up to a 110-volt source.

Automatic Power Relay

The Electrical Control Center features a transfer relay, which automatically switches the interior electrical system from battery power to outside power when you plug into a 110-volt supply. When the power cord is connected, a clicking sound will indicate that the transformer has been energized and all 12-volt systems are operating directly from the converter.

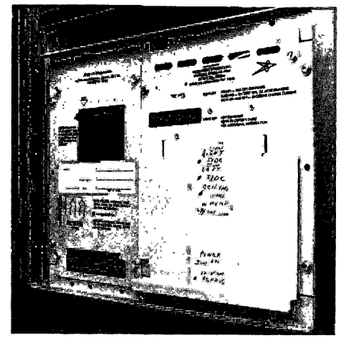
The transformer relay will automatically switch back to the battery mode when the power cord is unplugged, bypassing the power transformer. **Always operate the electrical system on 110-volts whenever possible, in order to conserve your batteries and keep them fully charged for use when no outside power is available.**

Electrical Outlets

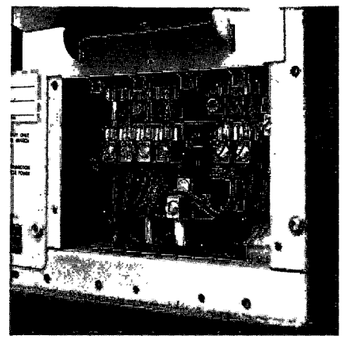
Receptacles for 110-volt use (toaster, blender or similar appliances) are located throughout the coach interior. One is also located outside, in the locking utility compartment on the road side near back end of trailer. This outlet is convenient for plugging in a heat tape, when cold weather operation requires that the water lines be wrapped to prevent freezing.

Receptacles for 12-volt use are also found at each television antenna jack.

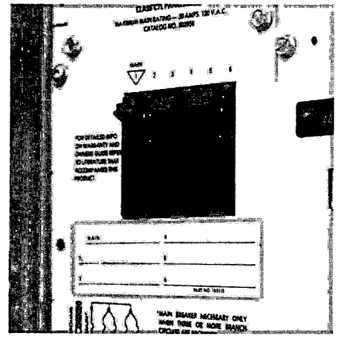
Note: 110-volt outlets will function only when the coach is connected to outside power; 12-volt outlets will operate regardless of power source.



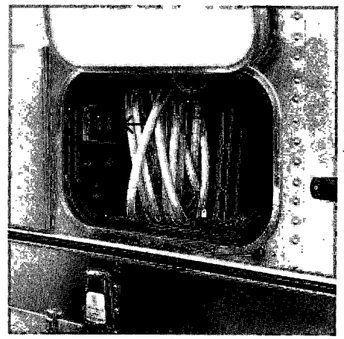
Electrical Control Center



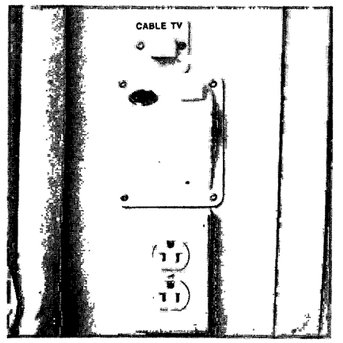
12 Volt Fuse Panel



110 Volt Circuit Breakers



Exterior 110 Volt Outlet



110 & 12 Volt, TV & Cable TV Receptacles

Power Cord for 110-Volt Hookup

A 25-foot power cable for city hookup is stowed in the locking utility compartment on the road side of the trailer. Pull out the necessary length of cord and plug into 110-volt power source, making certain that the connection is secure. Position the cord so that its weight does not pull the plug loose.

Keep the utility compartment door closed and locked while outside power is being used. Slide the cord into the adjustable slot in the door.

Caution: Never attempt to plug into 220-volt power. The electrical wiring and safety devices built into your Avion coach were not designed to handle high-level voltage, which may cause extensive damage and pose a personal safety hazard.

Exterior Lighting System

The electric brakes and all exterior lights (except patio, utility and hookup fixtures) operate on a separate 12-volt circuit from the tow car. They are also fused at the car. Dual fixtures on the back end of the coach, left and right, pair turn signal/brake lights (outboard) and tail/backup lights (inboard). Five clearance lamps are located at the top edge of the coach on the front end (amber), and five at the top edge on the back end (red).

The patio light (white) is to the right of the main door and operates from an inside wall switch. The utility light (white) is located below the utility door and is operated by a switch inside the compartment. The hookup light (white) is located near the LPG bottles at the front end of the coach. See page 104 for bulb sizes.

7-Way Connector Power Cable

Power to the trailer's exterior 12-volt lights and electric brakes is provided through a 7-way connector cable from the tow car battery to the trailer hitch connector plug.

Take the following precautions to prevent battery drain.

1. Uncouple the 7-way connector cable when camping without 110-volt hookup for extended periods. This will keep the 12-volt appliances from drawing power from the tow car battery while it is operating on 12 volts.
2. Do not lay the trailer hitch connector plug in water; it will short and drain the trailer batteries.

Caution: Tow car wiring for the 7-way connector cable should be done only by a qualified installation technician to assure that adequate wire sizes are used for all circuits.

Charging Trailer Batteries from Tow Vehicle

The exterior 12-volt electrical system provides a backup method for keeping the on-board trailer batteries charged between hookups to 110-volt power. The 7-way connector that supplies current from tow car to exterior coach lights and electric brakes also charges the trailer batteries while the car's engine is running. The black wire of the connector (No. 4 terminal) attaches to the positive terminal of the trailer batteries if the tow car has a standard "negative ground" system.

Batteries

The 12-volt electrical energy for your trailer can be provided either by the on-board storage batteries or by the AC/DC power converter, when connected to a 110-volt outside supply.

Two 12-volt recreational vehicle batteries (Group 24; 85-ampere hour) are standard equipment. They are connected in parallel to give greater reserve energy, so that if one battery should fail, the other will continue furnishing power to the limit of its capacity. Check the inoperative battery with a hydrometer to verify its condition. If defective, remove it from the circuit and allow the other battery to operate alone. **Always reconnect batteries properly to avoid damage** (see photo).

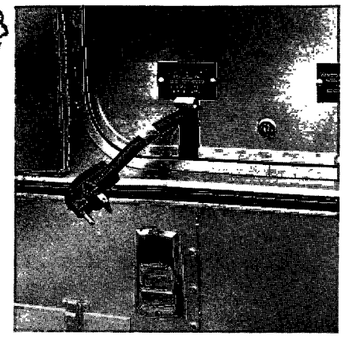
The trailer batteries are protected by a 40-amp in-line fuse located at the batteries. If you are connected to 110-volt power and the batteries do not charge, and the Charge Sentinel light on the Electrical Control Center goes out, it indicates that the battery fuse has blown.

The batteries should be checked periodically to verify that they are fully charged. In addition to observing the Monitor Panel and Electrical Control Center "Charge Sentinel" for condition, you should also use a hydrometer to test the individual cells. The batteries are located inside a covered compartment on the trailer tongue A-frame, behind the LPG bottles. A fully charged battery will have a specific gravity reading of 1.260 to 1.280 at 80° F.

The electrolyte level should always cover the tops of the plates inside battery casings. **Permanent damage may occur if the plates are not fully submerged.** You can bring the electrolyte up to the correct level by adding filtered or distilled water. **Always check every cell when examining the batteries.** Evaporation rates may vary from one to the other.

Caution: Exercise proper care when checking batteries. They contain strong, concentrated acid, which can burn holes in clothing and cause skin irritation. If electrolyte should splash accidentally, rinse immediately and generously with an acid-neutralizing solution of baking soda or ammonia.

Inspect the wires and battery terminals for corrosion and poor connections, both of which can rob batteries of power. **Again, be careful, since the corrosion is actually concentrated acid**

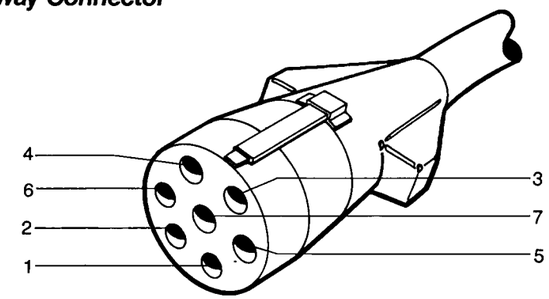


110 Volt Power Cable

Battery Hydrometer Check

Battery In-Line Fuse

7-Way Connector



Terminal Number	Wire Color	Connects To
1	White	Brakes (ground)
2	Blue	Brakes (hot)
3	Green	Tail and clearance lights
4	Black	Battery charging by tow car
5	Red	Left turn signal and brake light
6	Brown	Right turn signal and brake light
7 (center post)	Yellow	Back up lights

deposits. Keep terminals clean by wiping them with a cloth saturated in a baking soda or ammonia solution. Heavy corrosion deposits can be removed from the terminals with a stiff wire brush. After cleaning, make sure all connections are snug and then apply a light coat of grease to protect them from further corrosion.

To prevent damage to the batteries, never allow them to become fully discharged. **Specific gravity should not be permitted to drop below 1.150.** The surest way to avoid battery drain is to use an external 110-volt electrical source whenever possible. It conserves battery power and also provides automatic charging to keep them in top condition.

Important: Always make sure the 110-volt power cord is securely plugged into the outlet. A loose connection could break the circuit and cause batteries to drain. The Monitor Panel "power on" light would go out in this event.

Trouble-Shooting

Take the time to study your Avion's electrical system, and you will discover that many minor difficulties can be corrected by referring to the following trouble-shooting guide. Major electrical repairs should be handled by an Avion Service Center.

Symptom	Cause	Remedy
No 12-volt power to lights and appliances when operating on 12-volt only.	Input line and/or trailer batteries disconnected.	Reconnect input line and trailer batteries.
	Trailer batteries discharged.	Charge batteries using 110-volt power or tow car alternator.
	Trailer batteries on wrong polarity.	Reverse the polarity. Should be: (+) on hot, (−) on ground.
	Blown fuse.	Replace blown fuse.
Blown fuses or tripped circuit breaker.	Overloaded circuit (over 20 amps).	Turn off lights, appliances and other switches to reduce load. Replace blown fuse at Electrical Control Center or reset breaker.
	Electrical short.	Check Electrical Control Center for blown fuse and replace it or reset breaker. If fuse blows again or breaker trips again, see dealer to have short corrected.
Dim lights and/or sluggish fan motors.	Not operating on 60-cycle power.	Locate 60-cycle power source and hook up to it.
	Trailer batteries discharged.	Charge batteries using 110-volt power or tow car alternator.
	Trailer batteries low on water.	Check all cells and refill to correct level with distilled or filtered water.
	Trailer battery terminals not connected properly or are corroded.	Make proper connections or clean terminals and connectors and coat with light layer of grease.
Electrical Control Center will not charge batteries.	Outside 110-volt power not hooked up.	Connect power cord.
	Trailer batteries not connected or polarity reversed.	Connect batteries or reverse the polarity. Should be: (+) on hot, (−) on ground.
	Trailer battery defective.	Replace battery.
	40-amp battery fuse blown.	Replace fuse.

Refrigerator

The Dometic LP gas/electric refrigerator has been engineered for long life and trouble-free service. It has many of the same qualities you expect to find in a model for your home, plus additional features especially convenient for trailering.

Leveling

To get the most out of your refrigerator, it is essential for it to operate on a level plane when the coach is stationary. Otherwise, the liquid ammonia used in the refrigeration system can collect in pockets around the evaporator coil and impede proper coolant circulation. This can cause the cooling process to stop completely in extreme cases, and may damage the cooling unit.

Check for correct positioning of the refrigerator by placing a small bubble level on the freezer shelf and observing it with the aid of a hand mirror, if necessary. If the refrigerator is not level, realign the trailer to horizontal. See section in **Lengthy Stops,** page 21, for more details.

Power Sources

The refrigerator can operate on any of three types of energy: LPG, 12-volt battery or 110-volt external power. We suggest using LPG or 110-volt whenever possible, since excessive usage of the internal 12-volt system can result in battery drain. Use 12-volt power only while traveling, when the onboard batteries are being charged by the tow vehicle. Operating controls for all three power modes are located inside the refrigerator at the bottom of the food storage compartment.

LPG Operation

1. Turn the selector knob (A) to the "gas" position (see photo). This opens the LPG valve and automatically renders the electrical circuits inoperative.

2. Rotate the gas thermostat knob (C) to position "4."

3. Pull the knob on the flame failure safety device (D) and press the button of the piezo lighter (E). Repeat pressing of the button until gas is ignited at the burner. Ignition can be observed through the reflector (F).

4. After ignition, hold the flame failure safety knob (D) in the pulled-out position for 15 seconds, then release it and look through the reflector to verify that the burner flame remains lit. If the flame goes out, wait five minutes and repeat steps 3 and 4.

5. Reset thermostat, if necessary, to retain desired freezer and food compartment temperatures.

Note: If the gas system has been out of service for a long period, such as for replacement of an LPG bottle, the gas line is likely to become filled with air. If this happens, the lighting procedure must be repeated until the air is purged from the line and gas has reached the burner (see **LPG System,** page 64).

Electric Operation

1. For 110-volt operation, be sure the flexible power cord is plugged into the 110-volt outlet behind the refrigerator. This can be checked at the refrigerator access compartment outside the coach: Lift cover grille straight up, swing out at bottom, and pull down to remove.

   The hookup for 12-volt operation has been connected at the factory.

2. With the power selector control (A) turned to the "off" position, push in and rotate the knob clockwise to the desired electric voltage setting. The first "stop" is for 12-volt battery operation. If you are running 110-volt external power, push in the knob again and continue turning it clockwise to that setting.

3. Turn the electric thermostat knob (G) to position "4."

Using the Refrigerator

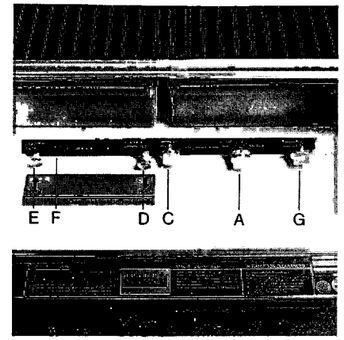
1. **Food storage compartment.** This area of the refrigerator is completely closed and unventilated, in order to maintain the low temperature required for proper food storage. Consequently, foods having a strong odor, or foods liable to absorb odors, should be placed in sealed containers. Vegetables, salads and the like should be covered to retain their crispness. The **coldest** positions inside the refrigerator are underneath the cooling evaporator and at the bottom of the unit, and the **least cold** positions are on the upper door shelves.

2. **Ice Making.** Fill ice cube trays to within ¼-inch of the top and place them in the freezer section. The ice cubes are released from their trays by pulling upward on the handle. Keep unused cubes in the tray and return it to the freezer compartment. When refilling trays, always wipe the outside surfaces to prevent accumulation of water droplets, which will freeze and cause the trays to stick to the freezer shelf. If the refrigerator is shut down for traveling, empty the trays to prevent spillage when the ice thaws.

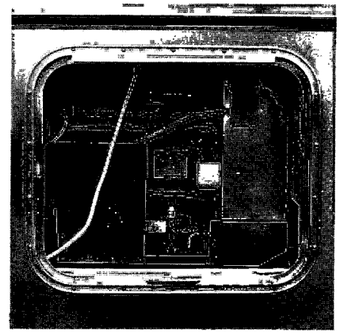
   Ice making can be accelerated by setting the thermostat to "max." Do this a few hours before the ice will be needed, but always turn back the thermostat to its former setting once the ice is formed, or the foodstuffs in the storage compartment may freeze solid.

3. **Cleaning.** Remove all food to avoid possible contamination from cleaning agents. The interior lining of the refrigerator can be washed with a weak, lukewarm soda solution. All other parts must be cleaned with warm water and a mild soap or detergent **only. Never use strong chemicals or scouring powders; they can damage the protective surfaces.** Wipe all surfaces dry with a clean, absorbent cloth.

4. **Defrosting.** All Dometic refrigerators (except those on Avion Models C and D) are equipped with automatic defrosting in the main food compartment. It has been engineered to eliminate thawing or warming of foods stored either in the freezer or main compartment. When the freezer compartment becomes covered with frost, shut down the refrigerator until the frost has melted. Dry the compartment, wash ice cube trays and refill with fresh water before restarting the unit.



Refrigerator Controls



Refrigerator Outside Access Compartment

5. **Shut Down.** To turn off the refrigerator temporarily, set the thermostat to "zero" and rotate the power selector knob (A) to "off" position. If the unit is to be out of operation between trips, empty and clean the food compartment and freezer as previously described. Ice cube trays should be emptied, wiped dry and stored in one of the galley storage cabinets. Leave the refrigerator doors slightly ajar, or place containers of activated charcoal inside to prevent the formation of mildew and odors.

Periodic Maintenance

The refrigerator burner assembly will require cleaning and adjustment once or twice a year, depending on usage.

1. Unplug electrical power cords at the refrigerator terminals and turn off the gas flow control valves at the LPG bottles.
2. Disconnect the gas pipe from the burner assembly.
3. Remove the burner bracket.
4. Remove the burner housing.
5. Clean the jet with alcohol and compressed air **only.** Never use a pin; this could widen the orifice, requiring a replacement jet.
6. Clean the burner tube and the gauze with a brush, then blow out with compressed air.
7. Reassemble the burner.
8. Relight the burner and check it with full flame.

At the time you are servicing the burner assembly, you can also check the flue baffle to see that it is clean and reasonably free of soot. If cleaning is necessary, use a good flue brush. Cover burner when cleaning flue to prevent soot from falling down inside burner.

The refrigerator has been designed to run with a minimum of service, but in the event a problem should arise while you are traveling, you will want to know how to locate and correct it, in order to keep the unit functioning until it can be checked by a qualified, factory-trained technician. Remedies for the most common minor malfunctions are presented here.

Trouble-Shooting

Symptom	Cause	Remedy
Refrigerator does not freeze satisfactorily.	Jet orifice clogged.	Disengage gas pipe from burner. Unscrew nipple with jet, blow clear, and wash in alcohol. Do not use wire or pin to clean orifice.
	Refrigerator not level.	Level the trailer.
	Flame has gone out.	1. Gas supply exhausted; refill. 2. Feeler point of flame safety device not heated enough. 3. Clogged bypass screw; clean or replace it.
	Air circulation around cooling unit restricted.	See that refrigerator is properly ventilated.
	Evaporator heavily coated with frost.	Defrost refrigerator.
	Flue baffle not inserted into central tube of cooling unit.	Insert flue baffle.
	Thermostat incorrectly used.	See section on thermostat. In hot weather, setting should be one or two numbers colder than usual.
	Gauze in burner head clogged.	Clean burner head.
	Burner damaged.	Replace burner.
	Burner positioned incorrectly.	Reposition burner.
	Wrong gas pressure at burner.	Check pressure at burner and at LPG bottles. Burner pressure must not fall below 11" W.G. when thermostat is on "max."
	Thermostat operating improperly.	Check position of capillary tube between evaporator fins. End of tube must be in proper direct contact with evaporator either of these ways: (1) Capillary tube is inserted in spring-clip, which is fastened between two fins; (2) Capillary tube fastened between two fins with sheet brace and two screws. Adjust position of capillary tube end. If no improvement, replace thermostat.
Odor from fumes.	Flame touches side of burner.	Burner positioned incorrectly. Reposition it.
	Burner damaged.	Replace burner.
	Flame touches flue baffle.	1. Burner damaged; replace it. 2. Flue baffle too low; reposition it.
	Flue tube is dirty.	Cover burner and jet, remove flue top and baffle, clean flue with special flue brush, clean baffle.
Burner flame keeps going out.	Burner and bypass screw require service.	Clean or replace burner jet. It must conform to type of gas used (different sizes required for propane and butane). Bypass screw is accessible at top of thermostat.
	Windy conditions.	1. Move coach so that wall with refrigerator vent outlets does not face into wind, causing flame blow-out. 2. If trouble persists, **temporarily** set thermostat to "max" while coach is either stationary or traveling. Do not leave at "max" for more than one day, or food will freeze.

Range and Oven

Your Avion is equipped with a Magic Chef® LP gas range and oven, Model BT22GS-4TX, for cooking ease and dependability. The unit has been especially designed for recreational vehicles, and features such home-like conveniences as four large top burners, an oven big enough to cook a 17-pound roast, and automatic-lighting burners. This fine appliance will give years of excellent service when operated according to instructions.

Lighting the Range Top Pilot

The range top pilot has been closed at the factory to prevent accidental gas build-up in the trailer interior. For brief stops, we recommend bypassing the pilot system entirely by using matches to light the top burners. When stopping for an extended length of time, however, use the following procedure to activate the range top pilot light.

1. Be sure range top and oven gas controls are in the "off" position, to avoid venting any potentially dangerous gas into the trailer.

2. Lift the hinged main top panel and light the top burner pilot with a match.

3. If necessary, adjust the pilot so that the tip of the flame is about ⅛-inch above the lower edge of the flash tube (see illustration). The pilot adjustment screw can be reached by removing the thermostat knob.

4. Range burners should light within four seconds when using the pilot. If lighting is difficult, intermittent or uncertain, check the height of the pilot flame and make sure the flash tube is unobstructed.

5. **Always observe caution. Take steps to insure that gas will not flow into the coach whenever you are making any adjustments, performing maintenance functions, or lighting the burners manually. Be certain all valves are in the "off" position, and do not use the pilot adjustment valve as a pilot shut off.**

Using the Range Top Burners

Your Magic Chef is equipped and adjusted for use with LP gas only. The burners have pre-set air openings, and adjustments are unnecessary to assure a proper, blue flame.

To light the burner, simply push in the control knob and turn it **counter-clockwise** as far as it will go to insure ignition, then turn it back in the other direction (clockwise) until the desired flame height is reached.

If the flame burns with an impure orange color, or the blue is tinged with green, it is probably due to metal filings left in the burner during manufacture or excess dust in the air. Clean the burners if condition persists for more than a few minutes. For more information about flame adjustment, refer to the Magic Chef manual provided with each unit.

Caution: Never close the top cover when the range is in operation; this could extinguish the flame and allow gas to escape into the trailer.

Lighting the Oven Pilot

1. Observe the same precautions against escaping gas noted earlier in this section.

2. Push in the oven thermostat and turn **counterclockwise** to the "off" position.

3. Open the oven door and light the pilot with a match. The flame height is pre-set at the factory.

Using the Oven

The oven is controlled by a low-temperature thermostat. It has no bypass setting and will automatically cycle on and off at all temperature settings except "broil" ("B") to maintain constant, even oven heat.

To light the oven after activating the pilot, depress the thermostat control dial and turn **counterclockwise** to the desired temperature setting. The oven is equipped with a safety ignition system that requires approximately 45 seconds delay before the main burner ignites. This is normal, and there is no gas escaping during the delay.

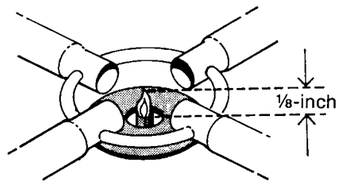
Always turn the thermostat control to "off" when the oven is not in use. The pilot will remain lit and ready for use in this position. When you travel, turn the control knob to "pilot off" and follow the complete procedure for lighting the pilot during your next stop. **Never travel with the pilot light functioning; it might be extinguished and cause gas to enter the coach.**

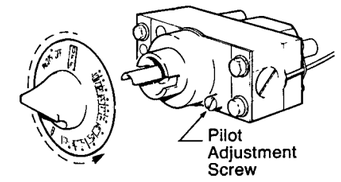
A properly-functioning oven burner will have a blue flame that is about three inches long and sitting on the burner. If the flame is a different length, or if it is dancing on or above the burner, the air shutter is out of adjustment. Correct the situation by fully opening the shutter to produce a blowing condition, then close it slowly until the blowing stops. At this point, the air shutter is correctly set.

Range and Oven

Range Exhaust Hood and Light

Range Top Pilot Adjustment





Range and Oven Shut Down

To shut down the range and oven for traveling, cleaning, or extended periods of non-operation, turn the thermostat control dial to the "pilot off" setting.

Cleaning

You can keep your range and oven looking bright and new by wiping all surfaces with each use. Wait until it cools down, then use a warm detergent solution and a soft cloth or sponge. The range top is hinged for easy raising or removal when cleaning around the burners. The burner heads themselves should also be cleaned, but always make certain that all air and gas ports are unclogged when you are finished. Use a toothpick or similar device to clear the holes.

The variety of materials and finishes on your range require special care. Follow these tips for best results.

1. **Porcelain Enamel.** Spilled foods with high acid content should be wiped up immediately to avoid damaging the finish. **Do not use harsh abrasive cleaners or steel wool.**

2. **Chrome.** Wipe with damp cloth, then dry. Use chrome polish to remove stubborn stains.

3. **Glass.** Wait until surface cools, then wipe with detergent and hot water. Rinse and polish with soft cloth.

4. **Aluminum.** Use a steel wool soap pad to remove stains and restore luster. **Do not use caustic solutions.**

5. **Broiler Pan and Insert.** Sprinkle with liquid or powdered detergent and cover with damp cloth or wet paper towels as soon as possible after spilling, to help loosen drippings.

6. **Oven Interior.** Wipe clean with damp cloth. If oven bottom is removed for cleaning, lock it in place when reinstalling.

Caution: If you use a commercial oven cleaner, protect the aluminum gas tubing, thermostat sensing bulb, and electrical components by covering with masking tape or similar material. Rinse oven thoroughly with a solution of one tablespoon vinegar to one cup water.

Tips for Safe Operation

1. **Never light matches inside the coach if gas odor is present.**

2. Always open an air vent or window slightly while using the range or oven, to assure proper combustion.

3. **Do not tamper with burner orifices.**

4. Do not leave top burners lit without cooking utensils on them. Overheating may damage porcelain finish of the grates.

5. **Do not leave the top cover of your range in a down position if the top burners are on.**

6. **Never use your range or oven as a space heater.**

7. **Clean up oven spillovers immediately. Any accumulation may cause smoking or ignition.**

8. Use aluminum foil properly, otherwise it could adversely affect oven performance. If foil is used to catch drippings, allow at least two inches around it on all four sides of the oven bottom. **Never cover air holes in the oven bottom.**

9. **Do not store utensils in the broiler area. They could damage or dislocate the oven burner and pilot.**

The following guide covers some of the most common problems you might encounter, and how to handle them without the need for outside service.

Exhaust Hood

The range exhaust hood draws in cooking fumes, odors, heat and smoke from the galley and discharges them outside the trailer. To operate the exhaust fan, push the on-off button under the hood.

The exhaust filter should be cleaned at least twice a year. To remove it, unscrew retainer nuts from the on-off buttons that run hood fan and light, and let the cover plate drop down. Wash the filter in a detergent solution, then rinse thoroughly and dry before reinstalling.

Access to the range hood bulb compartment is also gained by removing the push button retainer nuts. See page 104 for replacement lamp size.

Trouble-Shooting

Symptom	Cause	Remedy
1. Oven too hot (burns food). 2. Oven burner will not shut off. 3. No gas to oven pilots.	Pilot Select-A-Key cartridge incorrectly set for type gas being used.	Adjust the Select-A-Key cartridge setting. See owner's manual.
1. Slow-heating oven. 2. Poor baking. 3. Poor ignition of burners. 4. Pilots will not stay lit. 5. Popping sound from top burners. 6. Carbon on pilot shield. 7. Burner flame too low or high.	Defective gas pressure regulator.	Have gas pressure regulator tested by dealer and replace if necessary.
Oven pilots will not light or stay lit.	Incorrect pilot adjustment for type thermostat being used.	Adjust pilots.
	Pilot tubing is kinked, clogged or leaking at fittings.	Check pilot tubing and make necessary corrections.
	Defective gas pressure regulator.	Have gas pressure regulator tested by dealer and replace if necessary.
	Thermostat dial set in "pilot off" position.	Move thermostat to "off" position and light pilot.
Top burner pilot will not light or stay lit.	Pilot flame too high or low.	Adjust pilot flame.
	Pilot cup assembly not level.	Turn pilot filter clockwise or counter-clockwise with wrench until cup assembly is level.
	Defective gas pressure regulator.	Have gas pressure regulator tested by dealer and replace if necessary.
Top burners will not light.	Burners and/or flash tube not positioned correctly.	Reposition burners and/or flash tube.
	Pilot light out.	Relight pilot.
	Air shutter not adjusted properly.	Adjust air shutter.
	Burner parts clogged.	Clean burner parts with toothpick.
	Loose igniter port.	Tighten igniter port by pressing in or replace.
1. Oven burner will not light. 2. Excessive heat burns food. 3. Pilot outage.	Constant pilot light is out.	Relight pilot.
	Pilot assembly out of position.	Reposition pilot assembly.
Gas odor.	Possible gas leak.	Check all connections with soapy water (do not use chlorine or ammonia), and make necessary repairs. **Shut down LPG system until symptom has been corrected.**
Cakes rise higher on one side.	Pans set too close to side of oven.	Position pans at least two inches from sides of oven.
	Range not level.	Level the range.
Oven door not closing properly at left or right corner.	Normal expansion and contraction of metal parts.	Adjust door as follows: (1) Open oven door and slightly loosen four sheet metal screws holding door panel to liner; (2) Close door with a potholder inserted at opposite lower corner of door. While holding door in at bottom corner where potholder is located, press top of door at opposite corner in toward the over; (3) Open door and tighten screws.

Furnace

Your Avion coach is equipped with a Suburban Manufacturing Company Dyna-Trail gas furnace specifically engineered for trailer use. The forced air, direct vent system unit is certified by the American and Canadian Gas Associations for safety and performance when used with LPG fuel. Avion Models C, D, F and H are equipped with a 24,000 BTU furnace (No. NT-24M), while Models J, M, P, R, V and W feature a 30,000 BTU version (No. NT-30M).

Features

The furnace has a number of features that make heating precise and convenient. Dual blower systems function independently to provide efficient heating and maximum air distribution. The **combustion air blower** draws air from outside the trailer and into the combustion chamber, then out through the exhaust tube. The **circulating room air blower** recycles interior air by pulling it through the intake grille, then forcing it across the heat chamber and out the heat registers. The blower systems are sealed to prevent mixture of combustion air and circulating air.

Heated air is also delivered to and around the fresh water holding tank by a duct network, to aid in preventing freezing during cold weather operation.

Dyna-Trail's solid state electronic ignition system eliminates the pilot light and manual ignition of the furnace.

The furnace is turned on and off automatically by a wall thermostat. Simply set it to the desired temperature and forget it.

Operation

The furnace will be activated whenever the wall thermostat calls for heat. First the combustion air blower comes on to evacuate any gases that may have accumulated in the combustion chamber prior to burner ignition. When the combustion fan is turning at close to full speed, the burner will light and continue to operate until the trailer has been heated to the thermostat setting. During burner operation, the circulating room air blower will start when furnace air has been warmed sufficiently. It will continue to run after burner shut down, until all heated air has been forced out of the ducts. At the same time, the combustion air blower will remove any gases remaining in the heat exchanger before shutting down.

Follow these steps to start the furnace operation.

1. Turn off the manual gas valve located at the furnace (see photo).

2. Allow the blower to run five minutes to purge the system of accumulated air.

3. Move wall thermostat to its **lowest** setting.

4. Turn on the manual gas valve. It must be fully opened for correct operation. **Never attempt to run the furnace with this valve partially closed.**

5. Reset thermostat to desired temperature.

6. Allow 15 seconds for the main burner to light. If it does not ignite, set the thermostat to the "off" position, wait 15 seconds, and try again.

7. If ignition is not successful after three tries, shut down the furnace and refer to **Trouble-Shooting,** page 92.

8. Shut down is accomplished by turning off the manual gas valve and setting the thermostat to "off."

9. The furnace will automatically go into a lockout condition if the LPG supply is depleted. To reset, turn off the manual gas valve and set the thermostat to the "off" position. With a replacement LPG bottle installed, wait at least two minutes, then restart the furnace by repeating the steps previously listed.

Helpful Hints

1. Excess humidity can be removed from inside the coach while the furnace is on by creating cross ventilation. The recommended method is to slightly open a roof vent and one window.

2. Do not block the flow of air through the furnace exhaust/air intake grille or through the heat registers. **Blocking any air duct will severely hamper furnace efficiency.**

Caution: Never cover the flue exhaust gas vent, located on the outside wall of the coach. Obstruction of this vent can cause dangerous exhaust gases to remain inside the trailer. Check the exterior exhaust vent often to insure against clogging. Do not touch the vent during or immediately after the furnace has been running, since it becomes very hot during operation.

Burner Adjustment

Although the main burner on your Dyna-Trail furnace was set at the factory for proper mixture of fuel and air in the combustion chamber, further adjustments may be required because of variations in the combustion characteristics of different shipments of LPG. Altitude changes can also affect combustibility.

Correct combustion can be restored by adjusting the air flow to the burner. If **too much air** is being fed to the burner, there will be a howling or screeching noise when the burner is on. If **too little air** is reaching the burner, there will be an accumulation of soot on the exterior vent of the unit and a distinctly yellow and floating flame. Adjust the air flow as follows.

1. Open furnace cabinet door and remove end panel from furnace housing.

2. Remove the small sheet metal cover located just below and to the right of the lighter opening.

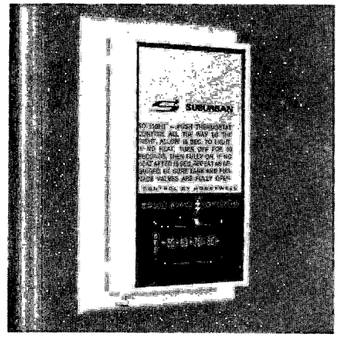
3. Behind the cover is a slotted screw head, which can be turned with a screwdriver to regulate the air flow. To **reduce** air flow, turn it **counterclockwise;** to **increase** air flow, turn it **clockwise.**

4. Check the burner through the observation window. **A slight trace of orange should remain in the tips of the flame when properly adjusted.**

5. Replace the sheet metal cover. **The traces of orange should now be gone; if not, the air flow is still slightly low.** Readjust according to the preceding instructions.

Note: Proper adjustment of the burner can be confirmed only with the cover plate in place. **Do not run the furnace with the cover off the unit.**

Furnace Gas Valve



Furnace Thermostat

Maintenance

The Dyna-Trail furnace is equipped with a sealed motor that is lubricated for life. The furnace itself does not require any routine maintenance or cleaning, if properly adjusted. However, carbon deposits may form on the inside of the combustion chamber if the main burner has been operated with a high yellow flame (indicative of restricted air flow).

Heavy carbon deposits require cleaning, using the access hole on the front of each radiation chamber. Use a vacuum cleaner for best results.

Caution: Always shut down the furnace before attempting any service or maintenance. This is accomplished by turning off the manual gas valve located at the furnace and setting the wall thermostat to the "off" position.

You can expect many years of trouble-free service from your Dyna-Trail furnace in normal use, if you follow the manufacturer's operating and maintenance instructions. Should a problem arise, however, you will probably be able to correct it yourself by using the following guide. See manufacturers literature for additional trouble-shooting suggestions. If the difficulty persists, consult a Dyna-Trail authorized service center.

Trouble-Shooting

Symptom	Cause	Remedy
Furnace does not generate heat.	Thermostat set improperly or malfunctioning.	1. Reset if too low or in "off" position. 2. Reconnect thermostat wire to terminal if loose. 3. Replace relay if "click" is heard when setting is raised but blower motor does not start.
	Gas valve closed.	1. Open valve.
	Electrical malfunction.	1. Recharge batteries if blower fan runs below full speed. 2. Tighten connections at battery terminals.
Furnace does not operate.	Faulty wiring.	1. Tighten all connections. 2. Correct short circuits. 3. Check for proper wiring connections to AC/DC power converter.

Water Heater

Standard equipment includes a six-gallon capacity Atwood Vacuum Machine Company gas water heater, Model G6A2E, the finest unit available for recreational vehicle use. It incorporates a number of exceptional features for safety and ease of operation.

Electronic ignition completely eliminates the pilot light and therefore the problems of pilot outage, bad weather lighting, and shut down. One switch at the Monitor Panel ignites the water heater and operates it automatically until you turn it off.

Atwood's unique triple-gap construction insulates side walls from hot flue gases, keeping the water hot but not the coach interior. In addition, the through-tube sealed combustion chamber vents both air intake and exhaust gases through a single opening. This design not only eliminates the possibility of fumes entering the trailer, it also provides one of the most efficient heat transfer systems available.

A 75-psi capacity temperature relief valve in the water heater prevents the release of excessive water pressure through the faucets when they are turned on. Instead, as the rising temperature inside the closed system causes pressure to increase as the heated water expands, the pressure will automatically be released through the exterior relief valve when it reaches the 75-psi limit.

Operation

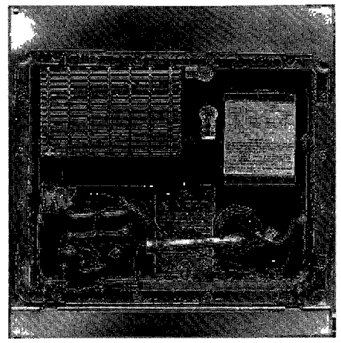
The water heater is located on the road side of the coach, near the back end. A compartment is provided for access to the gas controls and drain valve. To open the louvered panel, pull the spring-loaded lever at top, rotate until it is lined up with the slot on the panel, then release. The door is hinged at the bottom and swings down. It may be padlocked for security, if desired.

Activation of the water heater requires only two simple steps.

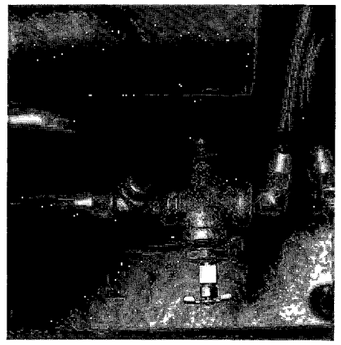
1. Check to be sure there is water in the water heater tank.

2. Press the HWH switch on the Monitor Panel to "on." This activates the pilotless ignition and lights the burner.

ON



Water Heater Outside Access Compartment



Water Heater Drain Valve

To shut down the water heater, merely press the ignition switch to "off."

OFF

Maintenance

The Atwood water heater is virtually maintenance-free. All that is necessary is to drain it if the trailer will be out of service during winter months. The drain valve is located in the exterior access compartment, at the front of the water heater. Refer to **Winter Storage** section, page 98, for more information on water system draining.

Air Conditioner

The optional Duo-Therm® air conditioner is roof-mounted and may be used for cooling, heating (optional), or recirculating air throughout the coach. Its 13,500 BTU cooling capacity assures maximum comfort at all times.

Operation

All functions are controlled by three knobs located on the interior air box cover in the ceiling. These controls operate the blower, thermostat and air flow (see photo). Models with optional heating do not have an air flow control.

1. **Cooling.** Set thermostat to desired temperature setting. Turn blower fan switch to high, medium or low cool position. **The air conditioner will not operate until this speed selection has been made.** Adjust the air flow knob and air box louvers for desired air circulation pattern. To shut off the unit, simply turn the blower switch to "off."

2. **Heating (Optional).** Set thermostat to the desired setting. Turn blower fan switch to high, medium or low heat. **The unit will not operate in its heating mode until blower speed selection has been made.** Adjust louvers for desired distribution. Shut off the unit by turning blower switch to the "off" position. This feature is not intended for heating the trailer but rather to take the chill off.

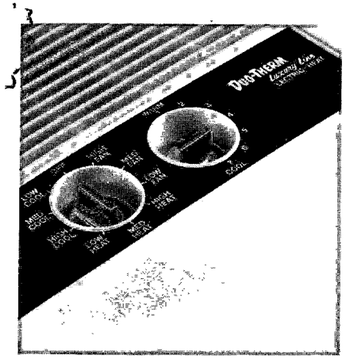
3. **Air Circulation.** Air can be recirculated through the trailer without cooling or heating by setting the blower control to high, medium or low fan. Set air flow knob and side louvers for desired air flow pattern. Turn off the unit by moving fan switch to "off" setting.

For maximum operating performance and economy, always close windows, vents and the main door before using the air conditioner. **Make sure the gas furnance thermostat is set at "off."**

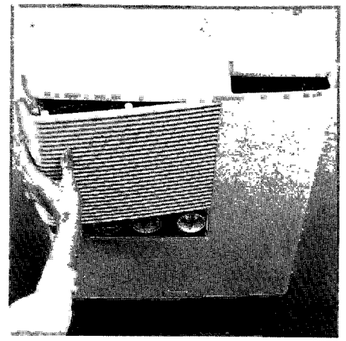
The air conditioner is equipped with a delayed start feature, which operates only when the blower switch is set for **cooling.** The compressor will not start until approximately two minutes after the blower is turned on, and it will not restart for about two minutes after the blower has been turned off and then on again. This automatic feature protects the compressor from possible overload.

Maintenance

Although the Duo-Therm air conditioner requires little maintenance, the air filter should be cleaned or replaced periodically to keep the unit running at peak efficiency. To remove filter, turn the two screws on side of air box with a screwdriver or coin. The louvered cover will drop down, permitting access to the filter. Wash filter in warm sudsy water, then rinse it and dry between two paper towels before reinstalling. **Do not operate the air conditioner without an air filter.** Replacements are available from Duo-Therm dealers and dsitributors.



Air Conditioner Controls



Air Conditioner Filters

Trouble-Shooting

Symptom	Cause	Remedy
Unit will not run.	Power cord not making good connection.	Check connection. Make sure cord weight does not pull plug from receptacle.
	Circuit breaker is in "off" position.	Reset circuit breaker at Electrical Control Center.
Unit does not cool properly.	Dirty air filter.	Clean or replace filter.
	Voltage too low for compressor to operate.	Hook up to power source of at least 110 volts.

Maintenance

Winter Storage

Your new Avion requires special attention during the winter months in colder climatic regions. In extreme cases, increased pressure caused by the expansion of freezing water can burst plumbing. You can avoid the possibilities of such damage by winterizing the fresh water system, rinse water drainage and solid waste drainage systems, and the trailer batteries. Observe the following procedures.

1. **Level the coach from side-to-side and front-to-rear.**

2. **Turn off water heater at Monitor Panel and gas system at LPG bottles.**

3. **Disconnect the fresh water inlet hose.**

4. **Inspect the drain lines.** Avion's water lines have been engineered to permit draining by gravity, and should be checked to verify that they are intact and have not been bent out of position.

5. **Locate the fresh water holding tank drain valve.** On Models C and F, it is on the curb side under the dinette seat. On Model J, it is on the road side under the gas range, and on Models P and V, it is under the bed. On all center bath models, it is on the road side of the coach at the rear, under either a bed or dinette seat. See water system diagrams, page 70, for specific locations.

6. **Drain the fresh water holding tank.** Switch on water pump at the Monitor Panel and open the drain valve located at end of fresh water holding tank. Open all sink and shower/tub faucets to **full cold position.** Open the bypass valve. Any fresh water remaining in the lines will now flow into the sinks and bathtub and then drain through the rinse water plumbing into the rinse water holding tank.

7. **Drain the water heater tank.** Turn off water pump at the Monitor Panel rocker switch. Leave sink and shower/tub faucets open to full hot to provide a vent. Open the outside panel of the water heater access compartment, then open valve and allow tank to drain. A second drain valve is located in the cold water line near the water heater on Models C, D, F, J, P and V. Place a shallow pan under this valve and drain off any water trapped by the water pump back-flow discharge valve.

8. **Drain the toilet.** With the bathroom sink faucet open to full cold, depress both foot pedals at base of toilet. This operation will clear the water line to the toilet and allow the system to drain into the solid waste holding tank. Open drain valve behind toilet, and with the sink faucet still on full cold, again hold down both pedals to clear the line. **This drain valve must be closed before using the water system again.**

Note: Do not attempt to flush a frozen toilet. If water is inadvertently left in the bowl, the unit should be allowed to thaw at room temperature before flushing.

9. **Drain the water saver spray gun.** Hold the spray head over a receptacle placed on the bathroom floor, depress the valve button, and keep it in the "open" position with tape or a rubber band. Allow the spray hose to drain completely. The spray head should then be removed from its hose and stored to prevent damage from freezing.

10. **Drain the telephone-style shower head and hose.** With the shower/tub faucet open and set midway between hot and cold, move shower head volume control button to "on" position and drain the hose completely. Remove shower head and store it.

11. **Drain the water pump.** Open the fresh water tank drain valve and bypass valve (see #4 for location), then turn on water pump and allow it to discharge any remaining water. The water pump should then be switched off, but both valves should be kept open to allow gravity draining of any water that may be left in the lines.

12. **Drain all remaining water from the lines.** Place chocks in front of and behind all trailer wheels. Crank the post jack until fully extended. This will raise the front end of your Avion high enough to permit most water remaining in the lines to drain. Then retract the jack to its lowest position to complete the draining process. Return coach to its level position.

13. **Drain the traps.** They are located in the galley sink, bathroom sink and bathtub. Use a suction pump to remove any water from these traps, or pour one cup of **ethylene glycol-base antifreeze** into each trap. Avoid spilling the solution on plastic surfaces to prevent discoloration. Do not travel with antifreeze in sink or tub traps unless the drain plugs are inserted securely to preclude splattering.

    Important: Never use an alcohol-base antifreeze.

14. **Drain the rinse water and solid waste holding tanks.** Connect sewer hose from the trailer sewage outlet to a sanitary dump station, open the valves on both holding tanks, and drain completely. Then flush the tanks with clean water.

15. **Drain the check valve.** Insert a stiff wire or thin rod into the water inlet fitting located in the utility storage compartment. Push inward to release the spring tension in the check valve, allowing any water to drain from it. All sink and shower/tub faucets should be open to clear the line properly.

16. **Protect the water purification system.** Remove cartridge from the optional water purification system and allow it to dry thoroughly, then store for the winter.

17. **Remove the batteries.** Your Avion's batteries should be removed and stored in a temperate environment during sub-freezing weather. Battery life can be prolonged by making regular checks of fluid level and maintaining a full charge. This is especially crucial in cold weather, when a full charge can prevent internal freezing.

18. **Remove easily damaged items.** Foodstuffs, cosmetics, liquids, etc., should not remain in the trailer during winter storage. Such products might suffer freezing damage or could burst their containers and harm the interior of your Avion.

Additional Winter Protection

If you desire a further measure of protection, add an antifreeze solution to the entire water system. **Use only a non-toxic type approved for drinking water systems,** and proceed as follows:

1. Close all drains and reconnect all lines. Disconnect the water pump inlet hose.
2. Attach a length of antifreeze hose to the water pump inlet port. The hose should be long enough to reach the bottom of the antifreeze container.
3. Dilute the antifreeze according to manufacturer instructions.
4. Open all sink and shower/tub water faucets fully, with the setting midway between hot and cold.
5. Insert the free end of the hose into the antifreeze container until it touches bottom.
6. Switch on the water pump and run it until the antifreeze solution fills all fresh water lines and the water heater.
7. Flush the toilet, and run water saver spray gun and shower head until the lines are filled.
8. Close all faucets and switch off the water pump.
9. Remove the antifreeze hose from water pump inlet port and reconnect the water pump inlet line.

Service Intervals

We recommend that you visit your authorized Avion dealer after winter storage for a preventative maintenance check-up and cleaning of the LPG-operated appliances. **This insures against potentially dangerous gas leaks.** When preparing your trailer for a new season of use, be sure to flush any antifreeze solution thoroughly and to close all valves before refilling the system with fresh water.

If you use your Avion year-round, see your dealer every six months for preventative maintenance.

Full One-Year Warranty

For travel trailers manufactured by subsidiaries of Fleetwood Enterprises, Inc.

Coverage Provided

Your new travel trailer, including structure, plumbing, heating and electrical systems, and all appliances and equipment installed by the manufacturer, is warranted under normal use to be free from manufacturing defects in material or workmanship.

The warranty extends to the first retail purchaser and his transferee(s), begins on the date of original retail delivery or the date the travel trailer is first placed into service as a rental, commercial or demonstrator unit (whichever comes first), and extends for a period of one year from that date.

This warranty covers only those defects which become evident within one year from the date of original retail delivery or the date the travel . trailer is first placed into service as a rental, commercial or demonstrator unit, and where written notice was given to the selling dealer or the manufacturer not later than one year and ten days after such date.

Owner's Obligations

The owner is responsible for normal maintenance as described in the Owner's Manual.

If a problem occurs which the owner believes is covered by this warranty, the owner shall contact the **selling dealer,** or other authorized dealer, giving him sufficient information to resolve the matter. The owner shall deliver the travel trailer to the **dealer** or manufacturing plant location for warranty service.

Dealer's Obligations

By agreement with the manufacturer, the dealer is obligated at no charge to the owner to repair or replace any parts necessary to correct defects in materials or workmanship.

When The Dealer Does Not Resolve The Problem

If the dealer is unable or unwilling to resolve a problem, which the owner is convinced is covered by the warranty, he should contact the **manufacturing plant** at the address listed below and provide the manufacturer with a description in writing of the problem and attempts made to resolve it.

Manufacturing Plant Obligations

Upon receipt of notice of a claim, where the dealer was unable or unwilling to resolve the problem, the manufacturing plant will repair or replace any parts necessary to correct defects in material or workmanship, or will take other appropriate action as may be required.

When The Manufacturing Plant Does Not Resolve The Problem

If the representatives of the manufacturing plant are unable to resolve the problem and the owner is convinced that it is covered by the warranty, the owner shall call the toll-free number listed below to describe the problem and the attempts made to resolve it.

What Is Not Covered By The Express Warranty

THIS WARRANTY DOES NOT COVER:

1. TIRES AND BATTERIES, WHICH ARE COVERED BY THE SEPARATE WARRANTIES OF THE RESPECTIVE MANUFACTURERS OF THESE COMPONENTS.

2. DEFECTS CAUSED BY OR RELATED TO:
   A. ABUSE, MISUSE, NEGLIGENCE OR ACCIDENT;
   B. FAILURE TO COMPLY WITH INSTRUCTIONS CONTAINED IN THE OWNER'S MANUAL;
   C. ALTERATION OR MODIFICATION OF THE TRAVEL TRAILER; OR
   D. NORMAL DETERIORATION DUE TO WEAR OR EXPOSURE.

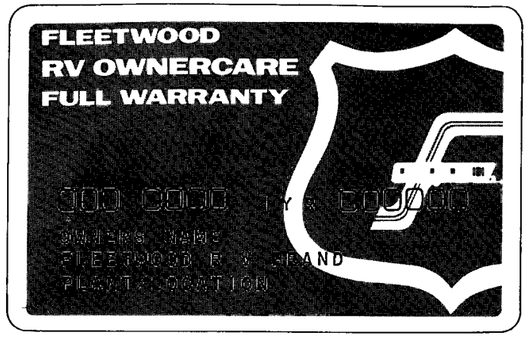
3. TRANSPORTATION TO AND FROM DEALER OR MANUFACTURING PLANT LOCATION, LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS, LOSS OF USE, TOWING CHARGES, BUS FARES, CAR RENTAL, INCIDENTAL CHARGES SUCH AS TELEPHONE CALLS OR HOTEL BILLS, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES.

   SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

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

The manufacturer is not responsible for any undertaking, representation or warranty made by any dealer or other person beyond those expressly set forth in this warranty.

Corporate Headquarters:
Consumer Affairs Department
Fleetwood Enterprises, Inc.
P.O. Box 7300
Riverside, California 92523
From Outside of California:
(800) 854-4755
From California: (800) 442-4804



Ownercare Card

Ownercare Card

You will automatically receive an Ownercare Card approximately 3-4 weeks after delivery of your new Avion. This plastic card is imprinted with your name, trailer serial number and manufacturing plant location, and should be presented to the dealer whenever service is required.

Always return your coach to the selling dealer for warranty service. If this is not possible, you may contact any other authorized Avion dealer or any authorized Fleetwood dealer having a travel trailer service facility.

While all installed appliances and equipment (except tires and batteries) come under Avion's warranty, they are also covered by separate warranties of the individual manufacturers. Copies of manufacturers' warranties and operating instructions should be provided by the selling dealer at time of delivery.

We recommend that you contact the manufacturers' own service organizations directly for all warranty adjustments and repairs. If you are unable to locate a convenient service point through their literature or the Yellow Pages, contact your Avion dealer for assistance.

Maintenance Schedule

Item	Every 1,000 Miles or 30 Days	Every 5,000 Miles or 90 Days	Every 10,000 Miles or 6 Months	Procedure
All Exterior Door Locks	●			Lubricate by shooting in dry graphite.
Axle		●		None, except wheel bearings.
Batteries	●			Check water level—fill with distilled water only.
Brakes			●	Inspect and replace as necessary.
Break Away Switch		●		Lubricate with light household oil.
Folding Step	●			Lubricate moving parts.
Hitch Ball Latch	●			Lubricate with engine motor oil.
Hitch Jack	●			Lubricate with light household oil (put oil can spout up under handle and allow oil to run down post).
LPG System Leak Test		●		See page 65.
Main Door Hinges	●			Lubricate with light household oil.
Overhead Cabinet Struts			●	Lubricate with light household oil.
Range Exhaust Hood				Clean fan blades and wash filter.
Refrigerator Flue Cleaning		●		See page 84.
Roof Vent Elevator Screws	●			Lubricate with light household oil.
Strike Pocket on Main Door	●			Coat with paraffin.
T.V. Antenna	●			Lubricate exterior moving parts with silicon spray.
Tire Rotation		●		See page 37.
Tires	●			Check for foreign objects. Air pressure—page 35.
Water Pump		●		Check belt for wear and proper tension.
Wheel Bearings			●	Clean, repack, and adjust.
Wheel Lug Bolts		●		Check for tightness.*
Window Seals/Door Seals		●		Clean with mild detergent and coat with silicone.
7-Way Plug and Receptacle		●		Clean contacts and coat with a spray cleaner.

*On new trailers check every 200 miles for the first 1,000 miles.

Maintenance Record

Date	Dealer	Address	Service Performed

Specifications

Tank and Appliance Capacities

Tank	Capacity
Fresh Water Holding Tank Models C, D, F, H Models J, M, P, R, V, W	 45 gal. 65 gal.
Rinse Water Holding Tank	30 gal.
Solid Waste Holding Tank	40 gal.
L.P.G. Tanks—Standard Optional	30 lb. 40 lb.
Water Heater	6 gal.

Bulb Replacement

Description	Location	Number
Single square fixture	Center bath, center bath shower and trunk	1141
Dual square fixtures	Ceiling lights and below overhead cabinets	1141
Mirror lights	Rear bath	1141
Indirect lighting	Behind front valance	1141
Interior convenience lights	Below front and rear overhead cabinets, and above entry door	1143
Range hood lights	Over range	1156
Exterior convenience lights	Hitch, roadside rear utility door, and above entry door	T 105
Glass ceiling fixture	Over dining table	25 watt, 12 volt, standard base
Oven light	Oven	25 watt, 12 volt, standard base
Running lights	5 front, 5 rear and side markers	GE 1895
Back-up lights	Taillight housings	1156
Stop/turn and taillights	Taillight housings	1157
License plate light	License plate	GE 67

Component Specifications

Appliance	Manufacturer	Model
Range and Oven	Magic Chef (Gaffers-Sattler)	BT 22GS-4TX
Refrigerator	Dometic	RM 66E, Models C, D RM 100, others
Monitor Panel	Jensen Wemac	Avion
Range Hood	Strawsline	—
Water Heater	Bowen	G6A-3E
Furnace	Suburban	NT 24M, Models C, D, F, H NT 30M, others
T.V. Antenna (optional)	Braund	Skyliner
Toilet	Thetford	Aquamagic D8445
Electrical Control Center	Progressive Dynamics	—
Water Pumps	PAR (ITT Jabsco)	36950
Galley Faucet	Delta	111
Shower Faucet (center bath)	Bristol	2IT-53-U
Tub Faucet	Delta	636
Lavatory Faucet	Delta	522
Radio	Conrad	CT-2
Stereo Radio/8-Track Tape (optional)	Panasonic	CQ 969-EU

Fuses and Circuit Breakers

Electrical Control Center

12 Volt Circuit Number	Circuit Location	Rating
1	Door side	20 amp
2	Road side	20 amp
3	Ceiling	20 amp
4	Water pump	6¼ Slo Blo
*5	Rear	20 amp
6	Open	—
7	Monitor Panel POWER ON light	3 amp
8	Refrigerator, outlets, radio	20 amp
110 Volt Circuit Number	**Circuit Location**	**Rating**
1	Main	30 amp
2	Receptacles	20 amp
3	Appliance (Model W only)	20 amp
4	Air conditioner	20 amp
Radio fuse	Behind Monitor Panel	3 amp
Battery fuse	At batteries	40 amp
Power jack fuse	In battery box	30 amp

*Avion Models V and W only

Index