

filled tanks will sometimes "blow off" excess pressure when exposed to direct sunlight or hot temperatures. If this becomes objectionable, remove the tank, take to a safe area, and open the supply line valve to allow excess pressure to escape.

SERVICING RANGE AND OVEN

Areas around burners should be regularly cleaned with a warm detergent solution and soft cloth. Avoid contact with the hot pilot shield and remember to put pilot flash tubes back in place. Burner head ports can be cleared with a toothpick. Avoid use of powders containing pumice when cleaning porcelain. Oven spillovers should be cleaned up as soon as possible.

CLEANING RANGE HOOD AND POWER VENT

Remove and clean filter regularly with detergent and warm water. When replacing filter, re-install with flow arrows pointing in toward housing. Periodically clean the housing of grease residues. The chrome back cover and trims should be cleaned with a good glass cleaner or with warm water and a soft cloth. Do not use chrome cleaners or chrome polishes containing abrasives.

GAS/ELECTRIC REFRIGERATOR

Clean the cabinet interior with lukewarm weak soda solution. Avoid use of strong chemicals or abrasives. To keep interior "sweet" when not in use, leave doors ajar and place an open cupful of soda inside.

Check the gas flame. It should be as blue as possible with proper adjustment. A yellow flame may cause sooting, especially if it impinges on any metal surface. If you cannot adjust the air mixture to the flame to prevent sooting, have your dealer make the adjustment.

If you have constant trouble keeping the refrigerator flame lighted during high wind, check to make sure that the refrigerator compartment sealing is still effective in maintaining separation of the refrigerator compartment atmosphere from the living area. Flame-outs are often caused by improper sealing of the compartment so that the wind can pass through. Do not install fiberglass filters over service vent ports. This may help keep the flame lit, but it will reduce efficiency of the refrigerator (slow to make ice). The efficiency of the refrigerator is dependent on proper venting in the heat exchange area. Do not make any alterations or block any vents that would reduce the air flow through the compartment.

THE WATER HEATER

The water heater requires little maintenance. If the gas/air mixture

becomes improper, a heavy soot formation will result. The air mixture should be adjusted for a blue flame to prevent sooting.

Keep the pilot light orifice clean of soot with a toothbrush and keep the pilot light adjusted to the proper length. If this flame is too short or deflected by soot it will cause delayed ignition of the main burner jet with a small explosion or "poof" that may extinguish itself and the pilot light.

FORCED AIR FURNACE

The furnace doesn't normally require routine maintenance. If improper burner operation causes a sooting condition, the combustion chamber can be cleaned out of carbon deposits using a vacuum cleaner via the access hole in front of each chamber. If the sooting is heavy have your dealer adjust the air/fuel mixture. The sealed bearing motor requires no lubrication. If motor bearings become noisy, refer to an authorized service agency for service or replacement. If the RV is not in regular use, check outside ports to insure they are free of birds' nests or mud-dauber nests.

LOADING THE VEHICLE

TRAVEL TRAILERS

Located on the left exterior wall of your trailer, near the front, is the Federal Certification Label which gives the maximum weight-carrying capacities of your trailer and each axle, designated by the letters "GVWR" and "GAWR," respectively.

The Gross Vehicle Weight Rating (GVWR) is the maximum your trailer should weigh with water and LP-gas tanks full, and with food, clothing and all other supplies aboard.

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

The load capacity is the difference between the GVWR and the actual weight. With standard equipment the load capacity is (See Formula). This means the total weight of all food, clothing and other supplies must not exceed the load capacity.

FORMULA:

$$L = GVWR - (GVW + W + LPG)$$

L = Load or cargo.

GVWR = Gross Vehicle Weight Rating

GVW = Total Weight as Shipped (dry)

W = Water (8.4 pounds/gallon)

LPG = LP-Gass — 4.24 pounds/gallon

When loading your trailer, store heavy gear first, keeping it on or as close to the floor as possible. Heavy items should be stored directly over or slightly ahead of the axles. Store only light objects on high shelves. Distribute weight to obtain even side-to-side balance of the loaded vehicle. Secure loose items to prevent weight shifts that could affect the balance of the trailer.

With the trailer fully loaded, drive to a scale, unhitch the trailer from the tow vehicle, and weigh separately the load on the hitch coupler and the load on the axles. The load on each axle should not exceed its GAWR. The total of the axle loads and hitch load should not exceed the GVWR. For best towing stability the load at the hitch coupler should be between 10% and 15% of the fully loaded trailer weight. If a weight-distributing hitch is employed, the load on the axles should also be weighed with the trailer hitched to the tow vehicle to make certain the load on each axle does not exceed its GAWR. If weight ratings are exceeded, move or remove items to bring all weights below the ratings.

SELECTION OF A TOW VEHICLE

If you plan to tow your trailer with your standard sedan, station wagon or pick-up truck which have not been specially equipped for towing, you may do so with probably no trouble if you do not travel extensively in hot climates or on mountain roads and if your trailer weighs less than about 3,000 pounds.

If you are buying a new vehicle, however, and you plan to use it for trailer towing, you should follow the recommendations of the auto manufacturer in making your selection. All the major auto manufacturers have studied the special needs of their vehicles for towing use and have printed brochures to help you properly match the tow vehicle equipment to your particular sized trailer.

Among the optional items which may be important for optimum performance are:

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|----------------------------|--------------------------------|
| 1. Axle ratio | 3. Transmission cooling |
| 2. Engine cooling | 4. Alternator and battery size |
| a. Radiator size | 5. Suspension system |
| b. Fan design | 6. Tire size or rating |
| c. Coolant recovery system | |

Depending on the weight of your trailer and the type of driving you are planning, the vehicle manufacturer may or may not recommend all of the available options. Generally most of the options are recommended for:

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|---|-------------------------|
| 1. Extensive traveling under any conditions | 3. Hot climate driving |
| 2. Mountain driving | 4. Heavy class trailers |

Even with all the options, try to avoid any type of driving that will overheat your engine such as following a slow-moving truck up a long grade.

ABOUT HITCHES

EQUALIZER HITCHES

In addition to pulling the weight of a trailer, a tow vehicle must also support about 10% to 15% of the actual weight of the trailer at the hitch point. With a 6,000 lb. trailer, this additional weight might be 700 or 800 lbs. This much weight added to your rear bumper area causes the car to become out of balance, and traction on the front wheels is lost. This will result in poor steering control, poor braking control, and can be potentially dangerous. Use of heavier springs, spring helpers or stiffer tires will not correct the basic out-of-balance condition. The problems from this condition are compounded when traveling over bumps and dips in the road. The balance problem is solved, however, by addition of a suitably matched "equalizer hitch," sometimes called a "weight distributing hitch." Without getting into a lengthy technical discussion, we can say that the effect of an equalizer hitch is to distribute the hitch load equally between the front and rear tow vehicle axles and the trailer axle(s). If the weight at the hitch was 600 lbs. then the effect of the equalizing hitch would be to distribute this weight in approximately equal portions to the three axles.

Instead of having the entire 600 lbs. sitting on the car's rear bumper, it is evenly distributed, and your tow vehicle can remain relatively level. This will not only give you better steering and brake control but will keep your headlight beams down on the road where they belong.

Most hitch manufacturers offer equalizing hitches in three or four sizes, designed to handle trailers of various hitch-weight classes. Unless you pull only a little folding camp trailer or a small light hard-top travel trailer, don't kid yourself into the idea that you can get by without an equalizer hitch. You owe it to the safety of your family and safety of those in other vehicles to maintain the best vehicle control, and a properly installed and adjusted equalizer hitch will help you do just that. Get the hitch size that is right for your requirements. Your dealer will help you select it on the basis on your trailer weight.

SWAY BARS - SWAY CONTROLS

Except for the very light travel trailers, most trailers should employ some type of sway control device. There are several types of these devices available operating on different principles such as friction, cam action and computer operated braking of the trailer wheels. Each has some advantages over the others as their manufacturer's literature will tell you. They will all decrease the sway effects induced by passing trucks and strong side winds. They can make your towing safer when driving under adverse conditions.

THE SAFETY CHAIN

There are different safety chain requirements by the various states. Heavier and/or additional chains with case hardened quick connect links may be desired. Always have the safety chain(s) attached when towing. Install them in a manner so they do not restrict sharp turns of the tow vehicle-trailer combination but tight enough so they do not drag on the road.

HITCH LOCKING DEVICES - SAFETY PINS

Make sure that locking devices and/or safety pins are in place before commencing to travel. Your first failure to secure the hitch may be costly. If your hitch utilizes a pin for securing the safety latch, carry a spare one.

BREAKAWAY SWITCHES

Breakaway switches are powered by either a large dry cell or the auxiliary 12 volt battery contained within the R.V. If the trailer becomes detached while towing, the pin is pulled out and current is applied to trailer brakes automatically. Occasionally pull the pin out and check the braking action. It is difficult to tell the condition of dry cell batteries. Storage batteries, kept well charged, are recommended for this emergency braking circuit.

POSITIONING THE HITCH BALL

The hitch ball should be installed as far forward (close to the bumper) as possible without limiting the turning radius of the combination of vehicles. Locating the hitch ball too far to the rear puts a greater strain on the equalizer spring bars and decreases stability when encountering side winds or gusts from large trucks.

HITCH ADJUSTMENT

If the spring bars on your equalizer hitch are fitted with chains for fastening to the trailer "A" frame, the selection of the proper link to be used at the connecting point can best be chosen by "hitching up" on a level road or driveway. Before hitching measure the distance from points on both the front and rear bumpers to the road surface. After hitching those two measurements should be diminished by the same amount. If the front bumper did not lower the same amount as the rear bumper, then a different link in the chain should be chosen for the connection. Making this adjustment properly is important for proper steering control, braking and to keep the headlight beams on the road where they should be.

HITCHING

Before starting the hitching operation, remove the jacks from beneath the trailer by raising and lowering the trailer hitch jack. As soon as the coupler is lowered over the hitch ball, fasten the latching mechanisms and fasten the safety pin or other safety device provided. Don't leave this until later for you may forget it. Next, attach the spring bars with chains or other devices provided, attach the electric connecting plug and position the pin in the breakaway switch. Crank the trailer hitch jack to its highest position and last, remove the chocks from before and behind the trailer wheels. Before starting down the road, check the trailer lights and brake operation.

UNHITCHING

The site for parking your trailer should be as level as possible so less jacking will be necessary to level the trailer. The ground should also be firm enough that the jacks will not sink.

Before unhitching, the trailer should be immobilized by use of wheel chocks placed both before and behind the wheels on both sides of the trailer. This is important to keep the trailer from moving downhill if the site should not be exactly level.

After removing the safety chains, the break-away switch pin and the trailer electrical plug from their receptacles, place a block under the hitch jack and extend the jack to meet it firmly. Next remove the equalizer hitch spring bars in accordance with the hitch manufacturer's instructions. The safety latch on the hitch coupler should now be released and the hitch jacked up until it just clears the hitch ball. You can now remove the tow car and proceed to level the trailer. Remember that such leveling is not only important to your comfort but also important to proper functioning of the gas refrigerator and the plumbing drain lines.

TOWING

ON HIGHWAY USE

Assuming your tow vehicle is reasonably adequate for the trailer to be used and that your hitch is suitable, towing is not much more difficult than driving the family car by itself unless adverse weather or traffic conditions are encountered.

Before traveling down the highway, double check your hitch to see that all is in order, safety pins engaged, breakaway cable connected, safety chains attached, and lights and brakes operating normally. Adjust mirrors for best coverage. Your mirrors should extend out far enough to see around and slightly behind the trailer.

If you are going to be driving through any large cities via multiple lane highways, check out the route in advance and using metropolitan blowups, determine the lanes you should be in at critical points. Remember that now you have another vehicle in tow and you cannot "jump" lanes at the last moment.

Never change lanes without first turning on indicators, looking to insure that you are going to be clear, and then cautiously proceed. If you miss a freeway exit because you are in the wrong lane, just miss it and get off at the next convenient one. If you continually "challenge" traffic and take chances in order to get the right of way, sooner or later you may encounter someone just as bullheaded as you and it may needlessly involve you and your family in a serious accident. Plan ahead, take it easy, and be courteous.

When driving over two-lane roads, take special care in passing. Remember that your car-trailer combination cannot accelerate as fast as the car alone. Be sure you have plenty of clear space for passing and don't return to the right-hand lane until you are sure your trailer clears the passed vehicle. Truck drivers often flash their headlights to indicate clearance for safe return to the right-hand lane. Many trailerists return the favor.

Drive sensibly when it comes to speed. You may need more space to safely stop a trailer combination than your car by itself — allow for this. Trailer brakes should be adjusted to set-in well ahead of tow vehicle brakes. Be especially cautious about applying brakes heavily when in anything but a straight line position. Slow down on wet surfaces.

When turning with trailer attached, the trailer will "cut inside" of the tow vehicle track. Remember to allow for this when making sharp turns around obstacles such as curbs, trees and gas pumps.

Make full use of a convex mirror at least on the right side. This will give you vision where the flat mirror may not. On viewing moving traffic in the convex mirror, be especially cautious until you become accustomed to the perspective it displays. Vehicles appear to be a greater distance behind you than they are when viewed through the convex mirror.

If your model trailer is a "wide track," take extra care when towing on narrow roads. Your car wheels could be well on the concrete while the trailer wheels are off and on the shoulder. In some areas, shoulders are extremely soft after heavy rains and you must make every effort to keep the trailer on hardtop. If the hardtop has a sharp edge with a drop of several inches to the soft shoulder, don't try bringing the trailer back onto hardtop until you have reduced your speed. If a trailer is sharply returned at high speed, sometimes it will "catch" the concrete edge suddenly and swerve dangerously towards the other side of the highway before finally straightening out!

Avoid driving on ice-covered highways. Driving on packed dry snow is not advisable but you can be reasonably safe under these conditions if you are used to them and use caution. Sometimes a highway is ice free but

overpasses and bridges are frozen over. When crossing iced bridges maintain constant speed in a straight line to avoid skidding.

TOWING - OFF HIGHWAY USE

When traveling off the hard surface road, remember that gravel, sand or dirt offer less traction to your wheels in both accelerating and stopping situations and especially in hill climbing. If you must take your trailer to the bottom of a steep hill, be sure the return route up to the top of the hill is straight enough that you can make a run for it. Loosening your equalizer bar chains or adding rocks or other weights to your car trunk might get you out of a tight spot if you stall, slipping your drive wheels on a very steep hill — if not, you may have to call for help from another tow vehicle. Roads causing this kind of problem are rare but some of the most beautiful campgrounds might have just such an entrance.

A good rule to follow on deciding whether to go "down into" a camp area from a major road, is to stop on the main road and walk down first. Observe the size trailers already parked and what type tow vehicles brought them in. If yours is comparable, it's reasonable to assume you can get in and out also. Take a good look at where you can park and plan your approach to maneuver for parking. Take into consideration any sharp turns, low branches, large boulders on road's edge or any other obstacles on which to avoid contact. If you have a heavy trailer and all you see in camp is lightweights, you had better check and make a careful estimate on whether you can navigate the route through camp and also whether you can get out over any steep loose graveled grade. Remember that now you are dealing with the requirement for traction and unless you can get it, all the horsepower in that oversized engine won't help one bit. If you are careful not to compromise yourself into getting committed into a situation you cannot get yourself out of without help, then almost all regularly designated camp areas are open to you.

Some RVs have better clearances than others. If your model vehicle has an extra low holding tank and/or plumbing traps, etc., take that into consideration when traveling unsurfaced roads. Roads with a high center crown containing boulders can damage under chassis plumbing.

When navigating through camp areas, be aware of overhead obstacles which could cause extensive damage to roof mounted TV antennas in folded position, vents, etc. Trees that lean in towards the roadway at an angle can be deceiving and it is easy to misjudge clearance and badly scrap a top edge. If you have an expensive awning on that top edge, damage can be extensive. A good way to pass by obstacles is to position an observer where they can guide you by safely. If you have a side mounted TV antenna, watch out for clearances on that side.

You are going to be amazed at the size of RVs you'll find in the remote area campgrounds. The people operating them have probably had a lot of

experience and really understand the full capabilities of their rigs. Take it easy until you get some experience. Luck can only carry you so far!

Loosen tension of sway bars when maneuvering in and out of camp areas to reduce stiffness in turning. In slick conditions of snow and ice, let up on sway bar adjustments. In extreme cases, two overtightened sway bars could possibly "steer" your tow vehicle into going straight instead of turning in the direction you turn it.

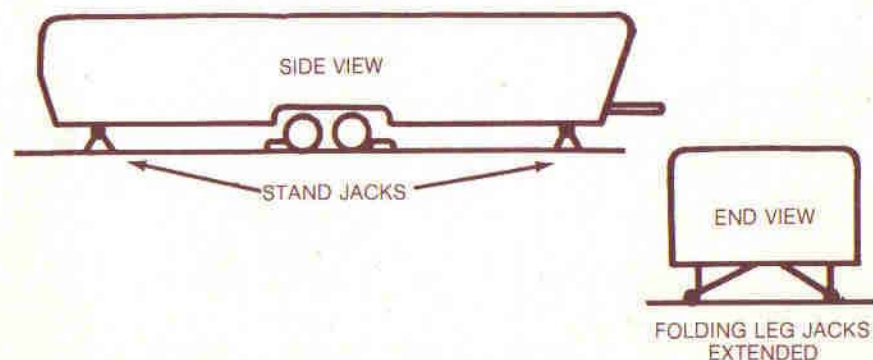
LEVELING AND STABILIZATION

GENERAL

Most RVs require leveling and stabilizing (blocking up) with some kind of jacks for comfortable occupancy. The absorption-type gas operated refrigerator requires good leveling for efficient operation.

It's recommended that soon after taking delivery of your trailer, install two small levels on the front left trailer corner — one on the side and one on the front. Place the bubble refrigerator leveler in the freezer compartment and adjust vehicle until refrigerator is level. Adjust the outside corner levels until they also show level and secure in this position. From then on, use the outside levels to indicate level. Use leveling block(s) for wheels when necessary. After leveling, check that the wheel chocks are tight against tires.

To block trailers in a level position using stand jacks, first level the RV. Lower the hitch jack a couple of crank turns. Set rear stand jacks snugly against frame and then raise the hitch jack a couple of crank turns **plus** another couple of turns. Place the front stand jacks snugly under the frame and then lower the hitch jack a couple of turns. This will equalize pressure on your jacks all the way around and leave the vehicle level.



If you do a lot of traveling and especially if you are stopping for overnight status often, you will appreciate the installation of permanently mounted folding leg jacks which are permanently and solidly mounted underneath and are attached to frame members. By use of a cranking tool, legs are easily extended to the ground without requiring much physical strength. It is best to place short 2" x 4" blocks under each leg for continued stability. Some of these type jacks are so strong that the entire side of an RV can be lifted by cranking the jacks for that side. They are also handy to stabilize the RV in a raised position when changing flats, used in conjunction with a scissors jack.

MISCELLANEOUS

HOT WEATHER OPERATION

When possible, always select a parking site where your RV will be shaded during the hottest part of the day. Awnings over each window, or especially those covering the full length of the RV, are especially helpful in keeping the inside temperature down.

Roof mounted air conditioners are very desirable for very hot climates. One precaution should be kept in mind for their operation, however. For proper operation of any motor, especially those in an air conditioner, it is important that the live voltage not be too low. Low voltage causes motors to run hotter than they should and their life is therefore shortened. The live voltage in many campgrounds is unfortunately not as high as it should be, especially when there is a heavy load on it such as many other air conditioners. The use of an extension cord to supply power to your RV should be avoided for it often causes a drop in your available voltage. Dim lights and a narrowing of your TV picture are indicators of low voltage. It is a good idea to keep a voltmeter plugged into your electrical system. Air conditioners are designed to operate properly between 110 Volts and 120 Volts. Running them at lower voltages will shorten their life.

COLD WEATHER OPERATION

Certainly the most important precaution in cold weather operation is to heed the warning:

DO NOT USE COOK STOVE OR OVEN FOR COMFORT HEATING.

The furnace, water heater and gas refrigerator are all designed to seal the combustion area from the inside of the RV. This is for your safety to prevent asphyxiation from carbon monoxide or depletion of oxygen. If your furnace does not have sufficient capacity to heat your RV comfortably in the climate where you are using it, you should replace it with a larger capacity