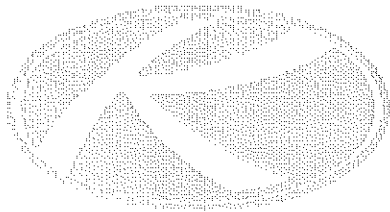


***Keystone RV
Company***

***Owner's Manual
September 1, 2005***



**Keystone RV
Company**

Table of Contents

Introduction 1

| | |
|-----------------------------------------|---|
| Warranty | 1 |
| Danger, Warning, Caution and Note Boxes | 2 |

Chapter 1:

Warranty

Information 3

| | |
|------------------------------------|---|
| Owner's Responsibilities | 3 |
| Dealer Responsibilities | 3 |
| LIMITED ONE YEAR WARRANTY | 4 |
| Inspection | 7 |
| Unit Information Packet | 7 |
| Owner Registration | 7 |
| Obtaining Warranty Service | 7 |
| Get To Know Your Unit | |
| Before Heading Out | 8 |
| If You Need to Make an Appointment | 8 |

Chapter 2:

Effects of

Prolonged

Occupancy 9

| | |
|---------------------------------------------------|----|
| To Avoid Condensation Problems, Follow These Tips | 9 |
| About Molds | 10 |

Chapter 3: Towing and Leveling 11

| | |
|------------------------------------|----|
| Towing Guidelines | 11 |
| Weight Ratings - Definitions | 11 |
| Weight Ratings - Labels | 11 |
| Federal Certification Label | 12 |
| RVIA Weight Label | 12 |
| Weighing Your Unit | 13 |
| Hitches and Towing | 13 |
| Towing | 14 |
| Before Heading Out | 14 |
| While Driving | 15 |
| Fifth-Wheel Leveling Procedures | 17 |
| Ramp Trailer Weight Distribution | 17 |
| Travel-Trailer Leveling Procedures | 18 |
| Stabilizing Jacks | 18 |

Chapter 4: Appliances and Equipment 19

| | |
|---------------------------------------------|----|
| What to do if you smell gas | 19 |
| Air Conditioner (Optional) | 19 |
| Antenna (TV) | 20 |
| Awning, Patio (Optional) | 21 |
| Awning, Slide-Out (Optional) | 21 |
| Cable Hook-Up | 22 |
| Fan-Tastic Vent™ (Optional) | 22 |
| Furnace | 22 |
| Fireplace, ElectraFlame™ (Optional) | 24 |
| Generator (Optional) | 24 |
| Microwave / Convection Oven (Optional) | 24 |
| Northern Breeze™ by VENTLINE (Optional) | 25 |
| Range / Cook-Top | 26 |
| What to do if you smell gas | 26 |
| Operation – Top Burners (Range or Cook-top) | 26 |
| Refrigerator | 27 |
| Roof Vents | 28 |
| Safety | 28 |
| LP Detector | 29 |
| Smoke Detector | 29 |
| Carbon Monoxide Detector | 29 |

Chapter 5: Electrical System 31

| | |
|------------------------------------------------|----|
| 12 Volt System - DC | 31 |
| 110 Volt System (Also referred to as 120) - AC | 31 |
| Power Cord / Shore Cord | 31 |
| 30 Amp, 50 Amp and Available Power | 32 |
| Converter | 33 |
| GFCI – (Ground Fault Circuit Interrupter) | 33 |
| Bargman 7-Way Plug | 34 |
| Brakes, Electric | 34 |
| Breakaway Switch | 35 |

Chapter 6: LP Gas System 37

| | |
|----------------------------------------------------|----|
| General Information | 37 |
| What to do if you smell gas | 37 |
| LP Regulator | 37 |
| Split-Bottle Systems – (Primarily on Fifth-Wheels) | 38 |
| LP Gas Lines | 38 |
| LP Gas Leak Detector | 39 |

Chapter 7: Plumbing System 41

| | |
|--------------------------|----|
| Water Pump | 41 |
| Fresh Water Tank | 41 |
| Water Heater | 43 |
| By-Pass Kit (Optional) | 44 |
| Monitor Panel | 45 |
| Winterization | 45 |
| Waste Water System | 47 |
| Holding Tanks | 48 |
| No Fuss Flush (Optional) | 48 |

Chapter 8 : Slide-Out Systems 51

| | |
|--------------------------------|----|
| Basic Slide-Out Tips | 51 |
| Hydraulically Operated Systems | 51 |
| Electrically Operated Systems | 52 |

Chapter 9: Care and Maintenance 55

| | |
|----------------------------------|----|
| Exterior | 55 |
| Roof | 56 |
| Seals and Adhesives | 57 |
| Windows (Exterior) | 57 |
| Frame and Chassis | 57 |
| Tires and Wheels | 58 |
| Battery | 62 |
| Bedspreads | 63 |
| Blinds and Shades | 63 |
| Cabinet Doors and Drawers (Wood) | 63 |
| Carpeting | 63 |
| Ceilings and Walls | 63 |
| Counter tops | 63 |
| Draperies | 64 |
| Faucets and Fixtures | 64 |
| Flooring, Vinyl | 64 |
| Flooring, Plank | 64 |
| Glass and Mirrors | 65 |
| Fabric and Upholstery | 65 |
| Sinks, Tubs and Toilets | 65 |

Chapter 10: Tire Safety Information 67

| | |
|---------------------------------------|----|
| Safety First – Basic Tire Maintenance | 68 |
|---------------------------------------|----|

| | |
|------------------------------------------------------------------|----|
| Finding Your Vehicle's Recommended Tire Pressure and Load Limits | 68 |
| Understanding Tire Pressure and Load Limits | 68 |
| Checking Tire Pressure | 69 |
| Steps for Maintaining Proper Tire Pressure | 69 |
| Tire Size | 70 |
| Tire Tread | 70 |
| Tire Balance and Wheel Alignment | 71 |
| Tire Repair | 71 |
| Tire Fundamentals | 71 |
| Information on Passenger Vehicle Tires | 71 |
| Additional Information on Light Truck Tires | 73 |
| Vehicle Load Limits | 73 |
| Cargo Capacities | 74 |
| How Overloading Affects Your RV and Tires | 74 |
| Tire Safety Tips | 74 |

Appendix **77**

| | |
|-------------------------------|----|
| Exterior Pre-Travel Checklist | 77 |
| Interior Pre-Travel Checklist | 77 |
| Glossary of Common RV Terms | 79 |

Introduction

September 1, 2005

Dear Keystone Owner,

Thank you for purchasing a Keystone RV Company product. Your decision to own a Keystone is what drives our efforts everyday, and we appreciate your vote of confidence.

As you may know, Keystone RV Company is the #1 selling RV brand in North America. We don't take that position for granted and want the experience with your new travel-trailer or fifth-wheel to be enjoyable. To help get you started, please take a few minutes and review our owner's manual. It is pretty straight forward and will help you understand many of the functions and required maintenance of your RV.

On behalf of everyone at Keystone RV Company, we hope you will enjoy our product as much as we have enjoyed creating it for you.

Your Keystone RV Company Team

2642 Hackberry Drive – Goshen, IN 46526
Phone: (866) 425-4369 – FAX (574) 534-9057

www.keystonerv.com

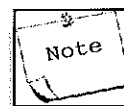
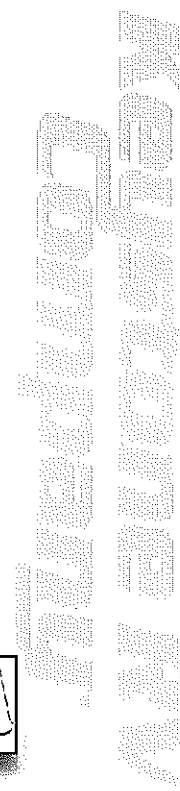
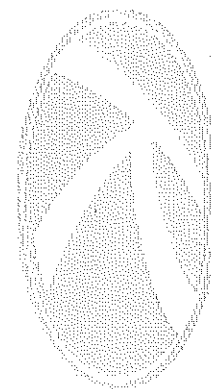
Warranty

Keystone RV Company has provided this manual solely for the purpose of providing instructions about the operation and maintenance of its recreational vehicle. Nothing in this manual creates any warranty, either express or implied. The only warranty offered by Keystone RV Company is set forth in the limited warranty applicable to your vehicle.

The Limited Warranty and limited warranties issued by the component manufacturers require periodic service and maintenance, and the owner's failure to provide these services and / or maintenance may result in loss of warranty coverage for that item. The owner should review Keystone RV Company's limited warranty and the warranties of all other manufacturers.

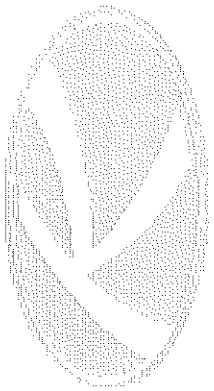
Instructions included in this manual are for operating some components, which may be optional on your vehicle. This manual is devoted to instructions on fifth-wheels and travel-trailers.

We hope you have many years of vacationing pleasure.



This manual is based on the latest information available at the time of publication. Due to continuous product development and improvements, Keystone RV Company reserves the right to make changes in product specifications and components without prior notice.

KEYSSTONE RV
LUBRICANTS



Danger, Warning, Caution and Note Boxes

We have provided many important safety messages in this manual. Always read and obey all safety messages.



DANGER indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.



WARNING indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.



CAUTION indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.



CAUTION used without the safety alert symbol indicates a potentially hazardous situation that, if not avoided, may result in property damage.



Important information regarding the maintenance of your recreational vehicle.

Terms and Symbols Used

(Optional)

This denotes items that may be an option on all or particular models. Additionally, some optional items can only be included during the manufacturing phase and cannot be added.

The inclusion of optional items does not imply or suggest the availability, application suitability or inclusion for any specific unit.

Chapter 1: Warranty Information

As the owner of a new recreational vehicle, you are responsible for regular care and proper maintenance. Proper maintenance will help avoid situations where the Limited Warranty will not cover items due to neglect. Maintenance services should be performed in accordance with this manual, as well as, the corresponding manufacturer's warranties on components included within your coach.

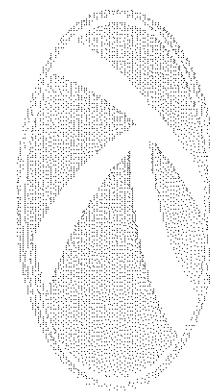
As the owner it is your responsibility and obligation to return the recreational vehicle to an authorized dealer for any repairs and service that may be required. Your Keystone dealer is responsible for proper service before delivery and will have a continued interest in your satisfaction. Therefore, we recommend that warranty and maintenance services be performed by your Keystone Dealer.

Owner's Responsibilities

1. Proper care and maintenance as outlined by this manual and the corresponding component warranty package
2. Returning your vehicle to an authorized dealer for any repairs or service that is required
3. Reviewing the information contained within this manual and all supplied component information

Dealer Responsibilities

1. Orient and familiarize the customer with the operation of all systems and components of the new recreational vehicle
2. Explain and review the Limited Warranty provisions to the customer
3. Assist the customer in completing all necessary registrations and warranty cards for your new vehicle and assist in locating serial numbers if they wish
4. Instruct the customer on how to receive local and out of town service on the vehicle and its separately warranted components, whether in or out of warranty
5. Service all Keystone RV Company products
6. Fill out and Mail Warranty Registrations within (30) thirty days from the date of delivery



**Keystone
RV
Company**

KEYSTONE RV COMPANY

LIMITED ONE YEAR WARRANTY

Except as specifically excluded below, Keystone RV Company (hereinafter "Keystone") WARRANTS for a period of one (1) year from the date of purchase that the recreational vehicle manufactured and assembled by Keystone shall be free from defects in materials and workmanship supplied and attributable to Keystone. Keystone, at its sole discretion, reserves the right to substitute parts or components of substantially equal quality, touch up cosmetic flaws, make design and/or manufacturing improvements or provide a replacement unit as the exclusive remedy under this Limited Warranty. All owners (original or subsequent) must be properly registered with Keystone RV Company to be considered for eligibility.

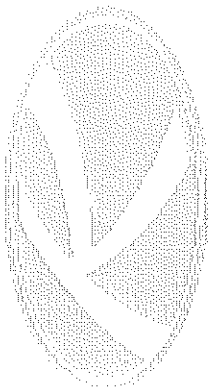
This Limited Warranty may be transferred during the one (1) year term by the original consumer purchaser to a subsequent purchaser. The limited one (1) year warranty, however, shall in no way be extended beyond the one (1) year from the original date of purchase by reason of the transfer from the original consumer purchaser to any subsequent purchaser(s). The subsequent purchaser(s) also has an obligation to notify Keystone immediately upon the transfer of the warranty and to further provide proof of purchase within the one (1) year.

WARRANTY EXCLUSIONS

THIS LIMITED WARRANTY AND THE OBLIGATIONS STATED HEREIN SHALL NOT APPLY TO:

- Equipment, products, components, appliances, or accessories not manufactured by Keystone whether or not warranted, including but not limited to, tires, batteries, washer, dryer, and other installed equipment or accessories;
- Trailers used for business, rental, commercial, residential, or disaster relief purposes, or any purposes other than recreational travel and family camping;
- Trailers which are not originally sold through an authorized Keystone dealer (i.e. sold through auction, repossession, salvage or an otherwise "distressed" condition);
- Damage or loss caused in whole or in part by the acts or omissions of any kind by any party other than Keystone;
- Damage or loss caused in whole or in part by the misuse, abuse, neglect, theft, vandalism, product modification, improper customer or dealer installation, incorrect line voltage, unauthorized repair or failure to follow instructions supplied with the recreational vehicle;
- Routine maintenance including, without limitation, caulking, re-caulking and waxing of the body of the recreational vehicle, tightening screws, brakes, latches, locks, combustion systems, changing fuses, or light bulbs, and maintaining the air conditioning and heating systems;
- Minor adjustments to doors and drawers beyond 90 days after retail sale;
- Damage or loss caused in whole or in part by the unauthorized attachments, modifications or alterations to the structure, body, pin box, or frame of the recreational vehicle including but not limited to trailer hitches for towing, or platforms for supporting cargo;
- Any upholstery damage including, but not limited to tears, punctures or misuse;
- Any fading of fabrics or carpet;

KEYSTONE RV
COMPANY



- Damage or loss caused in whole or in part by exposure to natural atmospheric elements, corrosive chemicals, ash or fumes generated or released by vehicles, collision, road hazards, rock chips, condensation, or any other source;
- Damage or loss caused in whole or in part by the overloading or the improper balancing of the load;
- Damage or loss caused in whole or in part by the willful or negligent acts of the driver of the vehicle pulling the recreational vehicle, an accident involving the recreational vehicle the condition of any road surface over which the recreational vehicle is pulled, or the striking or driving over a curb or any other object;
- Damage or loss to the recreational vehicle caused in whole or in part by the tow vehicle selected by the owner to pull the recreational vehicle including but not limited to the improper selection or installation of towing hitch on tow vehicle;
- Any injury, loss or damage, beyond warranty repairs, due to mold or fungi;
- Damage or loss caused in whole or in part by the owner's operation, use, or misuse of the tow vehicle;
- Any and all damage or loss to the owner's tow vehicle;
- Wheel alignment;
- Damage to electronics due to voltage issues are not covered under warranty;
- Representations made by any person (including your dealer) beyond those stated in this Limited Warranty;
- Any trailer licensed, registered, or primarily used outside the USA or Canada; and
- Any incidental and consequential damages including, but not limited to, transportation, fuel, food, lodging, telephone calls, towing charges, bus and taxi fares or car rentals, on-site service calls, as well as commercial use and loss of use.

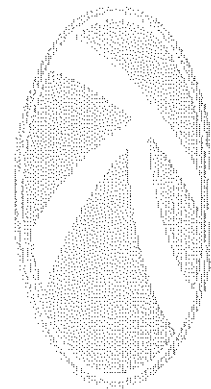
KEYSTONE'S RESPONSIBILITY

Please note the distinction between "defects" and "damage" as used in this Limited Warranty: "defects" are covered because Keystone is responsible; on the other hand, we have no control over "damage" caused by such things as collision, misuse and lack of maintenance which occurs after the recreational vehicle is delivered to the owner. Therefore, "damage" for any reason which occurs after the recreational vehicle is delivered is not covered under this warranty. Maintenance services are also excluded from the warranty because it is the owner's responsibility to maintain the recreational vehicle.

Keystone does not undertake responsibility to any owner beyond the original cost of the recreational vehicle to Keystone or for any undertaking, representation, or warranty made by any dealer beyond those expressed herein.

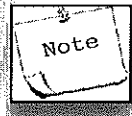
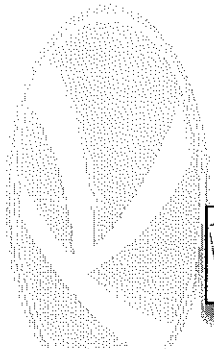
OWNER RESPONSIBILITY

It is the responsibility of the owner to maintain the recreational vehicle as described in the Care and Maintenance section of the Owner's Manual including taking whatever preventative measures necessary to maintain the exterior sealants of the unit and to prevent foreseeable secondary moisture or water damage to the unit from rain, plumbing leaks, condensation and other natural accumulation of water in the unit. Examples of secondary damage include, but are not limited to, stained upholstery, carpeting or drapes, mold formation and growth, furniture cabinetry or floor deterioration, etc. Mold is a natural growth given certain



Keystone RV
CORPORATION

Keystone RV Company



Please have the following available when you call:

- Vehicle Identification Number (17 digit Serial#- begins with 4YD)
- Model #
- Date of Purchase
- Description of the problem
- Previous repair history and location (if applicable).

environmental conditions and is not covered by the terms of this Limited Warranty.

HOW TO OBTAIN WARRANTY SERVICE

To obtain warranty service the owner must deliver the recreational vehicle to an authorized Keystone dealer (with proof of purchase and freight prepaid) within a reasonable time after discovery of the defect within the warranty period. All shipping or towing expenses incurred in transporting the recreational vehicle for warranty service shall be owner's responsibility. Upon requesting the warranty services you will be asked for:

- (a) Your name
- (b) Date of purchase
- (c) Keystone vehicle ID number
- (d) An explanation of the anticipated warranty claim

Appliance and Component Warranty Service/Administration – Appliance and component manufacturers may or may not provide their own warranties. These warranties are separate from the Keystone Limited Warranty and constitute the only warranty for those specific appliances and components. The terms, conditions and warranty periods of these items may vary from the Keystone Limited Warranty. For the appliance and component manufacturers providing warranties, Keystone does, however, administer those warranties during the term of this one year Limited Warranty except for tires, batteries, and generators. All warranty service claims on components must therefore be directed during the one year of this Limited Warranty to Keystone. After the one year period, all appliance and component warranty claims must be directed to the respective appliance and component manufacturers. Keystone is not warranting any appliance or components and is only representing that it is authorized to administer the services for such products. In no way shall Keystone's Limited Warranty be modified or amended by Keystone providing service for appliances and components.

If the dealer is unable to resolve any warrantable issues or for assistance in arranging repairs, please contact: Customer Service Department Keystone RV Company 2642 Hackberry Drive Goshen, Indiana 46526. Telephone Number (866) 425-4369. Upon receipt of notice of a claim, where the dealer was unable or unwilling to resolve the problem, either an alternate dealer or 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.

WARRANTY DISCLAIMERS

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, AND IN LIEU OF ALL OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF KEYSTONE. IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IF ANY, GIVEN BY LAW, SHALL BE LIMITED TO AND NOT EXTEND BEYOND THE DURATION OF THE WRITTEN LIMITED WARRANTY PERIODS SET FORTH HEREIN. NO PERSON HAS THE AUTHORITY TO ENLARGE, AMEND, OR MODIFY THIS LIMITED WARRANTY.

KEYSTONE WILL NOT BE RESPONSIBLE OR LIABLE FOR LOSS OF USE OF THE RECREATIONAL VEHICLE, ON-SITE SERVICE

CALLS OR SERVICE CHARGES, LOSS OF TIME, INCONVENIENCE, EXPENSES FOR GASOLINE, TOWING CHARGES OR TRANSPORTATION COSTS, LOSS OF USE, RENTAL OF SUBSTITUTE EQUIPMENT, TELEPHONE, TRAVEL, LODGING, DAMAGE OR LOSS TO PERSONAL PROPERTY, LOSS OF REVENUES OR OTHER COMMERCIAL LOSS, OR ANY OTHER SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND OR NATURE RESULTING FROM ANY DEFECT IN THE RECREATIONAL VEHICLE.

ANY ACTION TO ENFORCE THIS LIMITED WARRANTY OR ANY IMPLIED WARRANTY SHALL NOT BE BROUGHT MORE THAN ONE (1) YEAR AFTER THE EXPIRATION OF THE ONE (1) YEAR TERM OF THIS LIMITED WARRANTY.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY. FURTHER SOME STATES DO NOT ALLOW A REDUCTION IN THE STATUTE OF LIMITATIONS SO THE ABOVE REDUCTION MAY NOT APPLY.

Inspection

To assist you in avoiding problems, Keystone RV Company requests that each dealer review the limited warranty and inspect the unit along with you. The dealer has been provided with a pre-delivery checklist. Review this checklist with the dealer. Do not sign the checklist until this review is complete and any questions about anything you do not understand have been answered.

Unit Information Packet

In addition to this Owner's Manual, a unit information packet is located within your new recreational vehicle. Inside the packet are product manuals and information on systems and equipment in the coach. Individual product warranty registrations accompany this information and should be completed and mailed promptly. Some components in this manual or packet may be components of a differing product line and / or are optional equipment. Inclusion of these items does not suggest that they are or may be available for a specific recreational vehicle.

Owner Registration

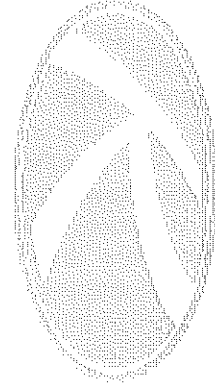
As a convenience to you, the owner registration form is completed at the dealership at the time of delivery. After an owner signs this form, the dealer will send the completed form to Keystone RV Company within 30 days. Please make sure this form is completed and signed prior to leaving the dealership.

Obtaining Warranty Service

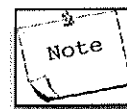
Keystone RV Company recommends obtaining service from your dealer or the nearest authorized repair facility. Service must be obtained within a reasonable time after discovery of the defect and prior to the applicable warranty expiration period. If assistance is needed in locating an authorized repair center, please contact Keystone RV Company Customer Service at 1-866-425-4369.

Get To Know Your Unit Before Heading Out

Throughout the manufacturing process, your recreational vehicle has



**Keystone
RV Company**

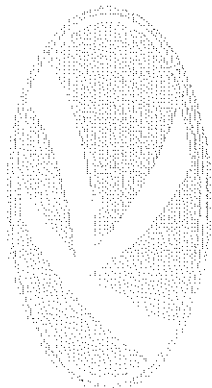


Please note, your Keystone RV Company Limited Warranty covers warrantable repairs that are performed by an authorized Keystone RV Company dealer at their service center or facility only. It is important for the owner to know that if you are unable to bring your unit in for repairs, Keystone RV Company is not responsible for any costs incurred for the service call charge, or time accrued to come out to your unit. Your unit is a recreational vehicle and not intended, nor manufactured, as a permanent residence.

CAUTION

Tow Vehicle Disclaimer

In connection with the use and operation of Keystone recreational vehicles, Keystone customers and owners of Keystone recreational vehicles are solely responsible for the selection and proper use of tow vehicles. All customers should consult with a motor vehicle manufacturer or dealer concerning the purchase and use of suitable tow vehicles for Keystone products. Keystone further disclaims any liability with respect to damages which may be incurred by a customer or owner of Keystone recreational vehicles as a result of the operation, use or misuse of a tow vehicle. **NOTE: KEYSTONE'S LIMITED WARRANTY DOES NOT COVER DAMAGE TO THE RECREATIONAL VEHICLE OR THE TOW VEHICLE AS A RESULT OF THE OPERATION, USE OR MISUSE OF THE TOW VEHICLE.**



been inspected by qualified inspectors and then again at the dealership. As the owners, however, you will be the first to camp and extensively use every system. Keystone RV Company wants the first camping experience to be happy one and recommends a "Trial Camping Experience" before heading out. Plan a weekend in the yard or driveway and really camp in your unit.

By camping for several days, full-time in your unit, you will have the opportunity to use and become accustomed to the systems within your unit and find out what items are needed/ not needed while camping. Note any questions that arise, difficulties encountered or problems that occur. After your trial, call your dealer and ask any questions that have arisen. Getting to know your unit before the first adventure can save a lot of frustration and leave more time for fun!

If You Need to Make an Appointment

Call Ahead

Give thought to an appointment time and call ahead. Mondays and Fridays are generally the busiest times at a dealer's service center, as are right before seasonal holidays.

Be Prepared

If warranty work is to be done, please have a copy of your warranty paperwork available and provide the service center with any helpful information on past repairs that may pertain and help the technicians in diagnosing the problem.

Make a List

Have a list ready and be reasonable with repair expectations. Some repairs may require special order parts or parts shipped from a manufacturer. Explain what you would like to have done over the phone or stop by ahead of time so that you and the service manager can discuss possible repair times.

While Waiting

Drop your unit off if possible. If you wait on your repair, do not be surprised if you cannot enter the repair area. Many insurance policies prohibit customers or non-personnel from entering into the work area for safety reasons.

Inspecting Your Repairs

Keystone RV Company and your dealer want you to be satisfied with any repair. After a repair is performed, inspect thoroughly. Check off your list and go over the repairs with the service center representative. Once satisfied, sign the Keystone RV Company Warranty Claim. In the event a problem should reoccur after you have left the dealership, contact the repair center or Keystone RV Company as soon as possible, so that the situation can be resolved expediently.

Chapter 2: Effects of Prolonged Occupancy

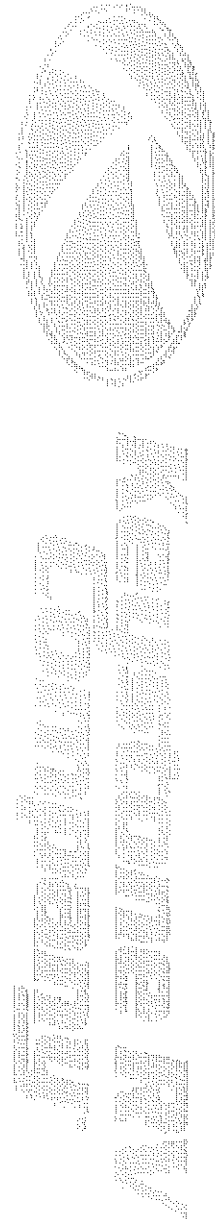
Your recreational vehicle was designed primarily for recreational use and short-term occupancy. If you expect to occupy the coach for an extended period, be prepared to deal with condensation and the humid conditions that may be encountered. The relatively small volume and tight compact construction of modern recreational vehicles means that the normal living activities of even a few occupants will lead to rapid moisture saturation of the air contained in the fifth-wheel and the appearance of visible moisture, especially in cold weather.

Just as moisture collects on the outside of a glass of cold water during humid weather, moisture can condense on the inside surfaces of the recreational vehicle during cold weather when relative humidity of the interior air is high. This condition is increased because the insulated walls of a recreational vehicle are much thinner than house walls. Estimates indicate that a family of four can vaporize up to three gallons of water daily through breathing, cooking, bathing and washing.

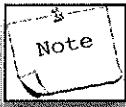
Unless the water vapor is carried outside by ventilation or condensed by a dehumidifier, it will condense on the inside of the windows and walls as moisture or in cold weather as frost or ice. It may also condense out of sight within the walls or the ceiling where it will manifest itself as warped or stained panels. Appearance of these conditions may indicate a serious condensation problem. When you recognize the signs of excessive moisture and condensation in the coach, action should be taken to minimize their effects.

To Avoid Condensation Problems, Follow These Tips

- Allow excess moisture to escape to the outside when bathing, washing dishes, hair-drying, laundering and using appliances and non-vented gas burners.
- Always use the vent hood when cooking.
- Keep the bathroom door closed and the vent or window open when bathing and for a period of time after you have finished.
- Do not hang wet clothes in the coach to dry.
- In hot weather, start the air conditioner early as it removes excess humidity from the air while lowering the temperature.
- Keep the temperature as reasonably cool during cold weather as possible. The warmer the vehicle the more cold exterior temperatures and warm interior temperatures will collide on wall surfaces creating condensation.
- Use a fan to keep air circulating inside the vehicle so condensation and mildew cannot form in dead air spaces. Allow air to circulate inside closets and cabinets (leave doors partially open). Please keep in mind that a closed cabinet full of stored goods prevents circulation and allows the exterior temperature to cause condensation.
- The natural tendency would be to close the vehicle tightly during cold weather. This will actually compound the problem. Simply put, you need to remove some of the warm air and allow some cool outside air to get inside the vehicle so the furnace will not recycle the humid interior air.
- Use fluorescent ceiling lights and minimize prolonged use of incandescent lights, which produce heat and contribute to condensation in the roof above the ceiling lights.



REMEMBER!



Remember, your trailer is not designed, nor intended, for permanent housing. Use of this product for long-term or permanent occupancy may lead to premature deterioration of structure, interior finishes, fabrics, carpeting and drapes. Damage or deterioration due to long-term occupancy may not be considered normal and may, under the terms of the warranty, constitute misuse, abuse or neglect and may therefore reduce the warranty protection.



If using a dehumidifier, please read and follow all manufacturer instructions and recommendations for use and cleaning.

About Molds

What are molds?

Molds are microscopic organisms that naturally occur in virtually every environment, indoors and out. Outdoors, mold growth is important in the decomposition of plants. Indoors, mold growth is unfavorable. Left unchecked, molds break down natural materials such as wood products and fabrics. Knowing the potential risks is important for any type of consumer to protect their investment.

What factors contribute to mold growth?

For mold growth to occur, temperatures indoors or outdoors must be between 40 degrees and 100 degrees Fahrenheit and there must be a source of moisture such as humidity, standing water, damp materials, etc. Indoors, the most rapid growth occurs with warm and humid conditions.

How can mold growth be inhibited?

By controlling relative humidity, the growth of mold and mildew can be inhibited. In warm climates, use of the air conditioner will reduce the relative humidity. Vents are located in the bathing and cooking areas and constant use is advised during food preparation and bathing even during colder weather. Additionally, opening a window during these activities will assist in ventilation. In extremely humid conditions, using a dehumidifier can be helpful.

Further Information About Molds

Frequent use of your coach and maintaining its cleanliness are important preventive measures. Further, any spills should be wiped up quickly and dried as soon as possible. Avoid leaving damp items lying about. On safe surfaces, use mold or mildew-killing cleaning products. Check sealants regularly and reseal when necessary to avoid water leaks. Proper preventive maintenance to the RV and its accessories, as described both in this manual and in accompanying literature, will provide the best protection for your unit.



Passengers are not permitted in the coach while it is in motion.

Chapter 3: Towing and Leveling

Towing Guidelines

Weight distribution is an important factor when loading your fifth-wheel and travel-trailer. A recreational vehicle with the cargo distributed properly will result in efficient, trouble-free towing. Loading the coach as evenly as possible and then weighing the loaded RV can accomplish proper weight distribution. Keep heavier items as low as possible and distribute evenly (front to back and side to side). Securing your possessions can prevent damage from shifting during towing and maintain the weight distribution balance achieved during preparation for travel.

You must not exceed the GVWR or GAWR of the unit (see definitions). To verify GVWR, total the loaded hitch and axle weights. If this total exceeds GVWR, you must remove items until the vehicle weight is within this limit. You can verify that the coach's axles are not overloaded by comparing the loaded axle weight with the GAWR. If the reading is above this limit, redistribute the item load.

Finally, make sure the pin weight of the loaded fifth-wheel falls within the limits of the tow vehicle.

Weight Ratings - Definitions

GVWR (Gross Vehicle Weight Rating)

The maximum permissible weight of this coach when fully loaded. It includes all weight at the unit's axle(s) and tongue or pin.

UVW (Unloaded Vehicle Weight)

The weight of this fifth-wheel as manufactured at the factory. It includes all weight at the coach's axle(s) and tongue or pin. If applicable, it also includes full generator fluids, fuel, engine oil and coolants.

CCC (Cargo Carrying Capacity)

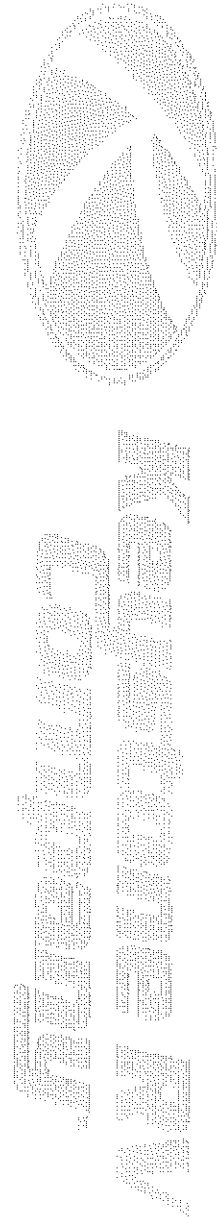
Is equal to GVWR minus each of the following: UVW, full fresh (potable) water weight (including water heater) and full LP gas weight.

GAWR (Gross Axle Weight Rating)

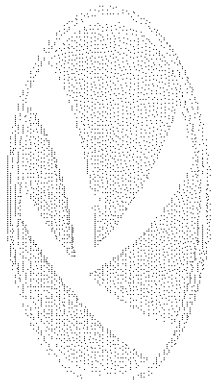
The maximum allowable weight that an axle system is designed to carry.

Weight Ratings - Labels

The information on the weight ratings is contained on two labels: The Federal Certification Tag and the RVIA Weight Label. Each label contains the Vehicle Identification Number (VIN) / Serial Number for the vehicle rated. These ratings are specific for each fifth-wheel and travel-trailer manufactured. Use only the ratings found on these labels:



KEMPTON
 CONTINENTAL
 R.V.



Federal Certification Label

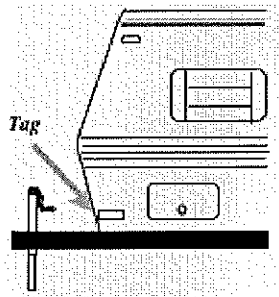
| | | | |
|---------------------------------|---------|----------------|----------------|
| MANUFACTURED BY (FABRIQUE PAR): | | DATE: | |
| COUNTRY | CS (LB) | LI (LBS/PONDS) | ROUS/DATE |
| FRONT/AVANT | CS (LB) | | CS/LB (PSI/KG) |
| REAR/ARRIERE | CS (LB) | | CS/LB (PSI/KG) |
| INTERNAL | CS (LB) | | CS/LB (PSI/KG) |
| EXTERNAL | CS (LB) | | CS/LB (PSI/KG) |

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
 CE VEHICULE CONFORME A TOUTES LES NORMES DU LH 807 APPLICABLES EN VERTU DU REGLEMENT SUR LA SECURITE DES VEHICULES AUTOMOBILES DU CANADA EN VIGUEUR A LA DATE DE SA FABRICATION.

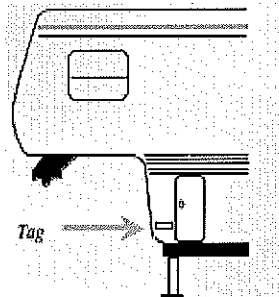
VEMALY: _____ TYP/TYPE: _____ FD-228

Location

The Federal Certification Tag on your fifth-wheel or travel-trailer can be located on the road side (off-door side) near the front of the unit as seen in the diagrams below. This tag contains the GVWR, GAWR (front and rear) and tire pressure limits.



Travel-Trailer



Fifth-Wheel

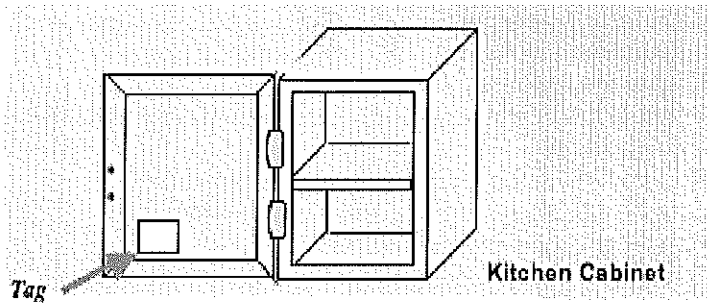
RVIA Weight Label

| TRAILER WEIGHT INFORMATION | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| VIN OR SERIAL NUMBER GVWR (GROSS VEHICLE WEIGHT RATING) IS THE MAXIMUM PERMISSIBLE WEIGHT OF THIS TRAILER WHEN FULLY LOADED. IT INCLUDES ALL WEIGHT AT THE TRAILER AXLE(S) AND TONGUE OR PIN. UVW (UNLOADED VEHICLE WEIGHT) IS THE WEIGHT OF THIS TRAILER AS MANUFACTURED AT THE FACTORY. IT INCLUDES ALL WEIGHT AT THE TRAILER AXLE(S) AND TONGUE OR PIN. IF APPLICABLE, IT ALSO INCLUDES FULL GENERATOR FLUIDS, INCLUDING FUEL, ENGINE OIL AND COOLANTS. CCC (CARGO CARRYING CAPACITY) IS EQUAL TO GVW MINUS EACH OF THE FOLLOWING: UVW, FULL FRESH (POTABLE) WATER WEIGHT (INCLUDING WATER HEATER), FULL LP-GAS WEIGHT. | |
| CARGO CARRYING CAPACITY (CCC) COMPUTATION | POUNDS KILOGRAMS |
| GVWR | |
| MINUS UVW | |
| MINUS FRESH WATER WEIGHT OF _____ GALLONS @ 8.3 LB/GAL | |
| MINUS LP-GAS WEIGHT OF _____ GALLONS @ 4.5 LB/GAL | |
| = CCC FOR THIS TRAILER* | |

* DEALER INSTALLED EQUIPMENT WILL REDUCE CCC
 CONSULT OWNER MANUAL(S) FOR SPECIFIC WEIGHING INSTRUCTIONS AND TOWING GUIDELINES. CD-158

Location

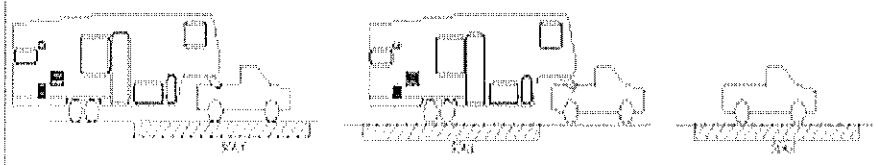
The RVIA Weight Label is located on the inside of an upper kitchen cabinet door. In general, the tag is affixed to the cabinet above or adjacent to the sink. This tag provides the GVWR rating, the UVW (Unloaded Vehicle Weight) and the computation for CCC (Cargo Carrying Capacity).



Weighing Your Unit

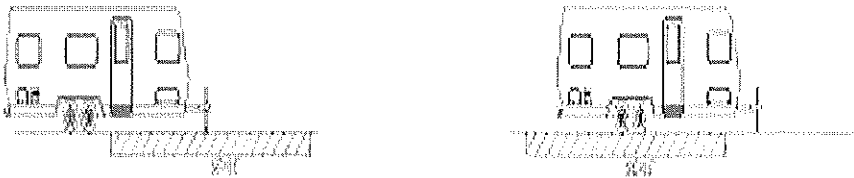
Fifth-Wheel

- Pull forward on the scales until only the coach's axles are on the scale. Record axle weight. Pull off the scales and unhook from the fifth-wheel. Weigh the truck by itself and record this weight.
- To determine hitch pin weight subtract the weight of the tow vehicle from the combined truck /coach weight. Write this number down.
- To determine overall weight, add the hitch weight plus axles



Travel-Trailer

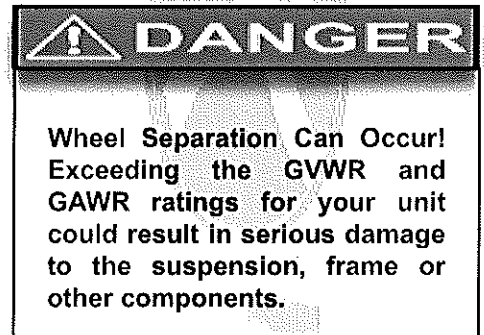
- Drive the loaded trailer onto the scales as shown in the picture below, making sure that the hitch will be the only contact point with the scales after unhooking. Unhook and drive the tow vehicle off the scales. Level the trailer and record hitch weight.
- Hookup to the trailer and pull forward on the scales until only the trailer axles are on the scale. Level the trailer and record axle weight.
- To determine overall weight, add the hitch weight plus axles.

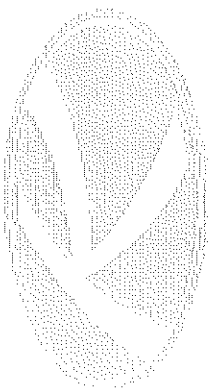
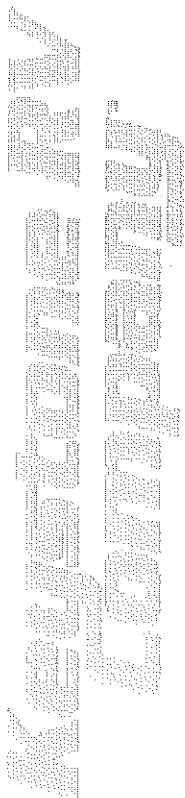


Hitches and Towing

Fifth-Wheel

1. Adjust the landing gear jacks until coach is at level for hooking to the tow vehicle.
2. Place wheel chocks behind fifth-wheel's tires.
3. Lower the tailgate on truck.
4. Release the fifth-wheel lock handle on the tow vehicle.
5. Line up the tow vehicle so the fifth-wheel will accept the kingpin.





6. Close and latch tailgate.
7. Back truck slowly until kingpin engages the fifth-wheel and automatically locks
8. Ensure the lock is closed.
9. Connect the power seven-way cord between the tow vehicle and the fifth-wheel.
10. Connect the emergency breakaway switch cable.
11. Test the fifth-wheel brakes and exterior lights
12. Completely raise the landing gear.
13. Store the wheel chocks.
14. Check the tire pressure while the vehicle tires are cold.
15. Re-torque the lug nuts. Refer to "Wheel Nut Torque"

Travel-Trailer

1. Crank the tongue of the trailer jack up until the hitch coupler is high enough to clear the tow vehicle.
2. Back the tow vehicle to the trailer until the hitch ball is directly under the coupler on the trailer.
3. Set the parking brakes, raise the locking latch on the coupler and crank it down on the ball.
4. Move the locking latch down to lock it on the ball.
5. Engage the lock and retainer clip.
6. Raise the tongue by cranking the jack down. (The tow vehicle will come up with it if the high coupler is properly latched.)
7. Connect the power cord between the tow vehicle and the trailer.
8. Connect the breakaway switch, assuring the breakaway cable is not attached to any part of the tow vehicle assembly.
9. Crank the jack all the way up.
10. Install and adjust side mirrors.
11. Check all lights on the trailer and tow vehicle.
12. Pull forward and check the operation of the trailer brakes with the hand control to assure proper operation. (Refer to manufacturer specifications on setting the brake control.)

Before Towing

- Ensure the TV antenna is down and in the correct position.
- Disconnect all park connections and are securely stored.
- Close and secure all doors, windows, awnings and roof vents
- Return the Entry step to the travel position.
- Refer to the "Pre-Travel Checklist" located in the Appendix

Towing

Towing a recreational vehicle can be enjoyable and worry-free if special attention toward safety is applied every time you hit the road and before heading out on our first camping trip, practice turning, stopping and backing in low traffic areas or large parking lots. In time, traveling with a recreational vehicle in tow will be as easy as driving the family car.

Before Heading Out

Weight Distribution

Proper weight and load distribution is absolutely essential to safe towing. It is necessary to maintain a certain percentage of gross vehicle weight on the tow vehicle. Common recommendations place approximately 10% - 15% of a loaded weight on a travel-trailer hitch and approximately 20-25% on a fifth-wheel pin weight, as the weight comes out of the tow vehicle payload capacity. Too much or too little weight upon the hitch leads

CAUTION

Check tires for proper inflation and wheel lug torque to meet manufacturer's specifications.

to dangerous driving conditions such as sway and reduced tow vehicle control. In no circumstance should the loaded weight ever exceed the GVWR or the GAWRs.

Safety Chains

Always use safety chains when towing. They maintain the connection between the travel-trailer and tow vehicle in the event of separation of the ball and trailer coupling. Safety chains are included with every travel-trailer and, in most states, are required when towing a travel-trailer. Hook them to the frame of the tow vehicle (not the hitch), crossing them under the trailer's tongue. Inspect the length of the chains once attached to the tow vehicle frame. They should be long enough to allow for turns, but short enough to avoid any drag.

Breakaway Switch

The breakaway switch is another safety device as it provides a means of automatically slowing and stopping your RV if it should become detached during traveling. The cable from the breakaway switch should be attached to the tow vehicle so that it remains connected in the event the trailer coupling detaches from the hitch ball. The breakaway switch is powered from the RV 12 Volt battery. If separation occurs the pin is pulled out of the switch and current from the RV battery is applied to the trailer brakes.

Tire Pressure

Maintaining proper tire pressure is another key to safety. The Cold Inflation Pressure for each axle is located on the Federal Certification Label. Cold inflation pressure refers to the pressure in the tire prior to traveling. Always check your tire pressure before traveling. Under inflated tires will cause excessive sidewall flexing and produce extreme heat, leading to early tire failure and possible loss of control. Over inflated tires can cause uneven tire wear and also lead to early failure. More information on tires and maintenance can be found in the Care and Maintenance section.

Level Towing

Having the tow vehicle and recreational vehicle level with each other will help improve towability as well as safe driving. A hitch that is too low can cause the front to drag. A hitch that is too high can cause the rear to hit those high spots in the road.

Lights

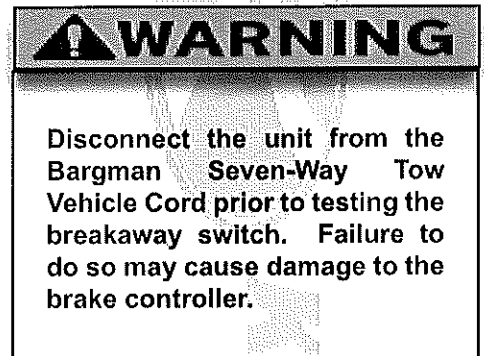
Check all electrical connections to ensure all lights on the tow vehicle and travel-trailer are functioning properly. The break lights, hazards and turn signals should be in synchronization with the tow vehicle.

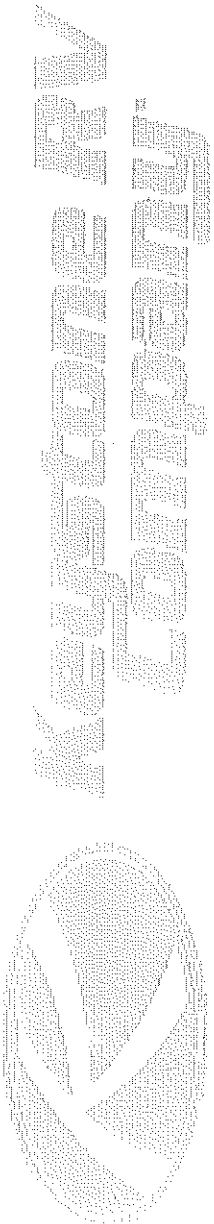
Mirrors

Adjust the mirrors on the tow vehicle prior to departure. Having someone to assist you will make this safety step quick and easy. First line up the tow vehicle and trailer. Next, sit in the driver's seat and adjust the left mirror to where you can see the entire left side of the trailer and well beyond. Finally, while still sitting in the driver's seat, have someone adjust the right mirror until the same result is achieved.

While Driving

Driving with a trailer in tow is different. Start out slowly, checking the traffic after signaling and being sure the road is clear. Accelerate slowly and evenly, checking the mirrors frequently as you move into the proper





lane. Try to drive with an anticipation of problems that may occur way ahead and prepare for them, even though they may never happen. As a motorist sharing the road, you are taller, heavier, longer and require more time and distance to stop. Weather and road conditions will require adjustments to speed. Anticipate dips, gutters, and depressions in the road, slowing down well in advance, these are the hardest jolts of any kind on your vehicle, hitch, recreational vehicle and items stored inside the unit. Take dips and bumps slowly and be certain the trailer wheels have passed the point before accelerating.

Backing

Back with care. Having a person outside to assist is a good idea. If no one is available to help, the driver should inspect the area behind the vehicle to avoid any unseen obstacles and unpleasant surprises.

Braking

Start sooner and lead with your trailer brakes. Prior to beginning any trip, make sure the brake control is adjusted. See your accompanying literature for the brake control you had purchased for your tow vehicle.

Passing and Accelerating

Remember when you pass another vehicle that it takes longer to accelerate and additional time must be allowed due to the added length of the trailer. Passing should be done on level terrain and downshift, if necessary for added acceleration. Whenever deciding to pass another vehicle, exercise caution and always use the turn signals.

Sharply Winding and Narrow Roads

Keep well to the center of the lane, equally away from both the center line and pavement edge. This allows the trailer to clear the edge of the pavement without the likelihood of the wheels dropping onto the shoulder, causing potential dangerous sway. Do not overcrowd or cross the center line.

All sharp turns should be taken at low speeds. Professional drivers, when rounding turns, slow down well in advance of the turn, entering it at reduced speed, and then accelerate smoothly as they come out again into the straightaway.

Steep or Long Grades

Down shifting into a lower gear or range in advance assists braking on descents and adds power on the climb. Avoid situations that require excessive and prolonged use of the brakes. Apply and release brakes at short intervals to give them a chance to cool.

Slippery Pavement

On slippery and icy pavement, reduce speed and drive slowly. Hydroplaning can occur with little water on the pavement. If skidding begins, remove your foot from the throttle and gently apply the trailer brakes only.

Freeways and Highways

Try to pick the lane in which you want to move and stay in it, preferably keeping to the slower lane on the right.

Turning Corners

Here is where you find a first basic difference when towing. The trailer wheels do not follow the path of your tow vehicle's wheels. The trailer will make a closer turn than the tow vehicle. Compensate by pulling further into the intersection so that the trailer will clear the curb or clear any parked vehicles along the road. Left turns require a wider than normal swing into the new lane of traffic to keep the trailer from edging into the opposing lane. Use the turn signals early to communicate to traffic behind and slow down well in advance.

Mud and Sand

Let the momentum of the tow vehicle and trailer carry you through. Apply power gently and stay in the tracks of the previous vehicle. If stuck, tow the trailer and tow vehicle out together without unhitching.

Parking

Whenever possible avoid parking on a grade with a recreational vehicle in tow. If it is necessary, turn the front wheels of your tow vehicle into the curb and set the parking brake. For added safety, place wheel chocks under the trailer wheels on the down roadside.

Fifth-Wheel Leveling Procedures

1. Choose a site that is as level as possible (Some sites are equipped with a prepared surface such as concrete or asphalt). Ensure the ground is not soft and will support the weight of the fifth-wheel on the stabilizing jacks or other support devices.
2. Before uncoupling, level the fifth-wheel from side to side with suitable lengths of 2" x 6" wood blocks under the coach's wheels. Place the wood blocks on the ground forward of the wheels and tow the unit onto the blocks. Block the wheels to be sure the fifth-wheel cannot roll.
3. Lower the "quick drop" landing gear legs before extending the landing gear. The positioning of the "quick drop" legs will depend upon how level your campsite is from side to side and front to rear. The landing gear is then extended. It may be necessary to place a sturdy 2" x 6" wood block under the foot pads to support the landing gear on soft ground surfaces.
4. After stabilizing the unit, be sure the fifth-wheel frame is not twisted, buckled or stressed. Check that all doors and windows operate freely and do not bind.
5. Before resuming travel, be sure the stabilizer jacks are fully retracted.

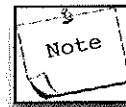
Ramp Trailer Weight Distribution

All loaded trailers must remain within GVWR and GAWR limits. However, proper load distribution is of particular importance for ramp trailers. These trailers are designed to carry a variety of internal combustion engine vehicles in the transportation storage area. These cargo items are typically

heavy and consideration must be given to how they are loaded. Because most storage areas are at the rear of the vehicle the biggest concern is maintaining the correct hitch or pin weight percentage. Vehicles loaded



Due to slower speeds, cars can become trapped behind you on a two-lane road. It is courteous and practical to signal and pull onto the shoulder when possible allowing them to pass. This reduces passing hazards and saves tempers.



Leveling

Put a small round bubble-level inside the refrigerator to determine proper level for refrigerator operation.

Slide-Outs

In extended use situations, it is advisable to add support blocks under the slide-room. Do not raise the room. Just touch the bottom.

⚠ WARNING

Secure cargo and vehicles as far forward as possible. Excess weight in the rear of this trailer can result in loss of stability when towing.

Consult the trailer Owner's Manual for loading and weighing procedures. Keep the loaded tongue weight between 10% and 15% of total weight for travel trailers, and between 20% and 25% of total weight for 5th wheels.

Move cargo and/or vehicles to maintain proper balance. Do not exceed GVWR (total weight rating) or GAWRs (axle weight ratings) of the trailer or tow vehicle. KBV102

⚠ WARNING

Secure cargo and vehicles as far forward as possible. Excess weight in the rear of trailers can result in loss of stability when towing.



Stabilizing jacks are designed to level and stabilize your coach. Do not attempt to lift the unit to change a tire or for any other purpose.

WARNING

After-market stabilizer stands must be placed only under chassis frame rails. Stabilizer jacks should not be placed at extreme corners of the frame. Locating stabilizers in these locations can cause slide-room damage if leveling blocks were to shift or settle. Do not attempt to level, raise or otherwise place all of the weight of the unit on the stabilizer jacks. Do not use stabilizer jacks for tire-changing.

incorrectly can have too little weight resting on the hitch or pin and can become unstable when towing. Therefore, a hitch weight percentage of 10 – 15% for travel trailers and 20 – 25% for fifth wheels must be maintained. For example, if the loaded vehicle weighs 8000 pounds, the hitch weight for a travel trailer should be between 800 – 1200 pounds (10 – 15% of the 8000 pound total). For a fifth wheel this same 8000 pound vehicle should have a pin weight of 1600 – 2000 pounds (20 – 25%). By maintaining the correct hitch percentage and staying within the limits of the GVWR and GAWR you can insure a safe towing experience with your trailer.

Travel-Trailer Leveling Procedures

1. Chose a site that is level as possible (Some sites are equipped with a prepared surface such as concrete or asphalt.) Ensure the ground is not soft and will support the weight of the trailer on the stabilizing jacks or other support devices.
2. Before uncoupling, level the trailer from side to side with suitable lengths of 2" x 6" wood blocks under the trailer wheels. Place the wood blocks on the ground forward of the wheels, and tow the trailer onto the blocks. Block the wheels to be sure the trailer cannot roll.
3. Put the foot pad on the hitch jack post, uncouple the trailer from the tow vehicle and level the trailer front to rear. It may be necessary to place a sturdy 2" x 6" wood block under the jack post foot pad to support the jack post on soft ground surfaces.
4. Check the level of the trailer with a carpenter's level both crosswise and lengthwise on the trailer floor.
5. After stabilizing the trailer, be sure the trailer frame is not twisted, buckled, or stressed. Check that all doors and windows operate freely and do not bind.
6. Before resuming travel, be sure all stabilizers are removed or fully retracted.

Stabilizing Jacks



Scissor Jack



"T"- Type Jack



Telescopic Jack

Dependent upon the type (travel-trailer / fifth-wheel), product and model purchased, the stabilizer jacks included will vary. Although stabilizer jacks come in different types and sizes, all perform the same function: To stabilize the front and rear of all recreational vehicles while parked for camping.

Always park the recreational vehicle on level ground and use tire chocks. It is extremely important to level the trailer front and rear using the tongue jack (travel-trailers) or landing gear (fifth-wheels). Using the crank for the particular stabilizer jack, lower the jack(s) on the lowest side of the trailer first and check the level. Adjust if necessary and then lower the other jack(s) to finish stabilizing the trailer.

Chapter 4: Appliances and Equipment

What to do if you smell gas

- Do not try to light any appliance
- Extinguish any open flames including cigarettes
- Do Not Touch Any Electric Switch
- Open windows and doors
- Exit trailer
- Shut off the gas supply at the gas container (bottle or source)
- Immediately call a service center or gas supplier from an outside phone and follow their instructions
- Do not turn on the gas supply until the gas leaks have been repaired

Refer to the individual manufacturer's owner's manual for operating instructions on the following equipment.

Air Conditioner (Optional)

Roof mounted air conditioners are operated by an 110V AC power source through a separate circuit breaker. Keep in mind that typically RV electrical systems are designed to handle 30 amps and that the air conditioner takes a sizable portion of that when the compressor starts. (Limited product models have an optional 50 Amp capability. (See Electrical Section) Reduce other loads as much as possible when using air conditioning to reduce the chance of overload and possibly tripping the main breaker. (For thermostat operation on the air conditioner, see "Thermostat" in this section)

Capability vs. Environment

The capability of the air conditioner to maintain the desired inside temperature is directly effected by the heat gain of the RV. During extreme high outdoor temperatures, the heat gain of the vehicle may be reduced by:

1. Parking in a shaded area
2. Keeping blinds down or drapes shut
3. Keeping windows and doors shut and minimize usage
4. Operation on High Fan/Cooling mode will provide the maximum efficiency in high humidity or high temperatures
5. Using awnings to block direct sunlight exposure on the unit
6. Avoiding use of heat producing appliances
7. Giving the A/C a "head start" by turning the air conditioner on early in the morning

Care and Maintenance

Periodically remove the return air filter and wash with hot soapy water. During extended use situations, cleaning is recommended after two weeks of daily usage.

WARNING

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

WARNING

When refueling tow vehicle, shut off all LP gas appliances. Most LP gas appliances are vented to the outside. Gasoline fumes could enter the appliance and ignite from the burner flame, causing an explosion or fire.

WARNING

LP Gas containers shall not be placed or stored inside the vehicle. LP Gas containers are equipped with safety devices that relieve excess pressure by discharging gas to the atmosphere.

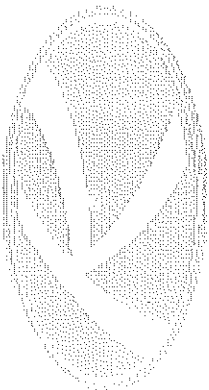
WARNING

DO not store or use gasoline or other flammable vapors and liquids in the vicinity of any appliance.

CAUTION

Never run the A/C without the filter. This could plug the unit evaporator cell, substantially effecting performance.

Keystone RV
CORPORATION

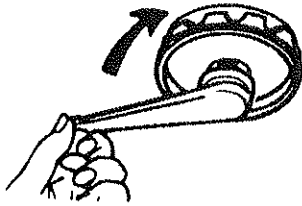


Antenna (TV)

The television antenna installed is designed for either color or black-and-white television. If reception is poor, make sure the power supply switch is on and connections are tight. Should the reception remain poor, check with your authorized dealer.

To Raise Antenna

1. Check location to ensure no obstacles will be encountered while raising the antenna.
2. Turn elevating crank (clockwise) in an "UP" direction about 13 turns or until resistance is felt.
3. Turn Power Supply switch to "ON" (If cable is being used the power supply switch needs to be set to "OFF".)



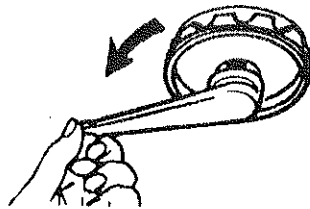
Rotate for Best Picture



1. Make sure antenna is fully raised.
2. Pull down on lower ceiling plate with both hands until it disengages and will turn.
3. Slowly rotate clockwise or counterclockwise for best picture and sound.

To Lower Antenna

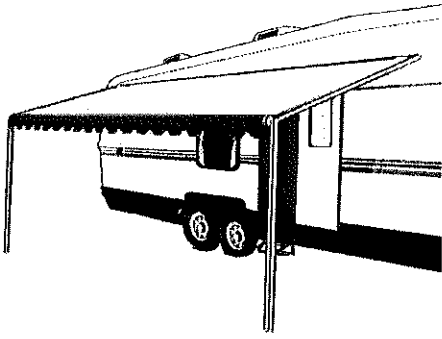
1. Rotate antenna until pointer on directional handle aligns with pointer on ceiling plate.
2. Turn elevating crank (counterclockwise) in "DOWN" direction about 13 turns or until resistance is felt. Antenna is now locked in travel position.



WARNING

Do not raise TV antenna near overhead electrical wires as contact may cause injury or death.

Awning, Patio (Optional)

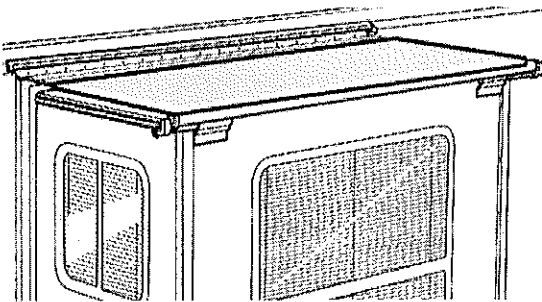


A patio awning is a very popular accessory on recreational vehicles. They provide additional living area for your campsite as well as protection. Keystone RV Company uses several awning models. The appropriate instructions for the equipped awning are included in the unit packet. Please review the manufacturer instructions carefully prior to using the patio awning.

Care and Maintenance

The best way to extend the life of the awning is to keep it clean and operating smoothly. At the start of every camping season or after extensive traveling, inspect the top and bottom brackets and tighten if loose. Moving parts, such as the lift handle, rafter and support arms, may become hard to operate due to weather exposure and use. If this occurs, spray the part(s) with a silicone spray. To keep the awning operation smooth, repeat the process on a regular basis. Mold and mildew on the fabric can be avoided by periodically cleaning the vinyl with a mild non-abrasive cleaner and inspecting it for leaves or other debris before closing. After cleaning, allow the fabric to dry completely before rolling up. When raining, lower one end of the awning so that the water will run off and not pool on the fabric, and avoid rolling it up when wet. If necessary, unroll as soon as conditions permit to allow the awning to dry.

Awning, Slide-Out (Optional)



When installed the A&E Slidetopper™ awning will automatically open and close along with the slide-room. Fully extended the awning is level, which may cause water to puddle on top of the canopy. As the slide-room is closed, the awning will roll up and cause any puddles to spill over the sides of the awning. Before retracting the slide-room, check to make sure the Slide Topper is free of any debris (leaves, twigs, etc.), which can damage the awning or slide-room components.

CAUTION

If heavy rain or wind is predicted, or whenever you leave the awning unattended, it is best to close the awning. Damage to the awning or unit due to weather is not covered under the Keystone RV Company Limited Warranty or the awning manufacturer warranty.

WARNING

DO NOT attempt any repairs to the awning. The awning roller tube is under extreme spring tension. Repairs should only be performed by an authorized dealer / repair center.

CAUTION

DO NOT USE the Slidetopper™ in snowing or freezing rain conditions as it may prevent the awning from retracting properly with the slide-room and cause damage to the awning and / or slide-room.

WARNING

Before operating the slide-room, assure there are no objects (or people) in the path of the room or the Slidetopper™.

Cable Hook-Up

At many commercial campgrounds, cable access is provided. To utilize the cable access, locate the exterior hookup on the side of the recreational vehicle. Attach cable to access hook-up and trailer hook-up. Finally, make sure the antenna power booster is set on "Cable" and not "Antenna".

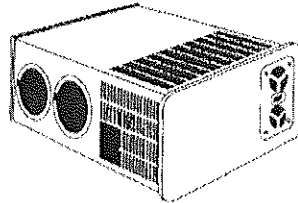
Converter: See Electrical Section

Fan-Tastic Vent™ (Optional)

The Fan-Tastic Vent™ runs on 12V. Dependent upon the model, operational control may be by a thermostat like control switch or by controls directly mounted on the vent. (See the information included in the unit packet for operating instructions concerning the installed model.). When using the Fan-Tastic Vent™, close all vents and slightly open the windows on a shaded side of the coach. The direction of the airflow is determined by which window(s) are opened. Please note that the dome of the vent must be opened at least three inches for the motor to operate. A safety switch will prevent operation if the dome is closed or open less than three inches.

Furnace

The furnace installed is a LP gas appliance. Carefully read the manufacturer's manual for complete operational and safety instructions, provided in the unit packet, prior to using the appliance.



The furnace utilizes a sealed combustion system, which means the combustion chamber is completely sealed from the inner atmosphere of your vehicle. Combustion air is drawn from the outside and combustion products are expelled outside through a vent.

New furnaces sometimes emit smoke and an odor during the first 5 - 10 minutes of initial use due to paint burning off the heating chamber. Do not mistake this for a malfunctioning furnace. Opening the windows and door prior to first lighting will help vent any smoke or odor.

Thermostat - Wall Mounted

Keystone travel-trailers and fifth-wheels have either a heat only thermostat or a combination air conditioner / furnace thermostat if an air conditioner is equipped at the factory. Please refer to the user's manual for the specific thermostat installed.

Operation - Heat Only Thermostat

To turn "ON": Set temperature to desired level.

To turn "OFF" set thermostat to lowest setting and follow instructions for furnace operation in the manufacturer's user's guide

⚠ DANGER

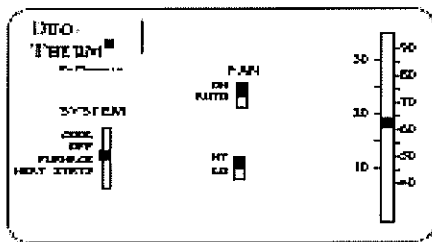
Failure to read the furnace user's information manual and follow instructions could cause a fire or explosion, causing property damage, serious injuries or loss of life.

Heat Operation - A/C and Heat Thermostat

Set the temperature select lever to the desired temperature level.
Set the system switch to "FURNACE".

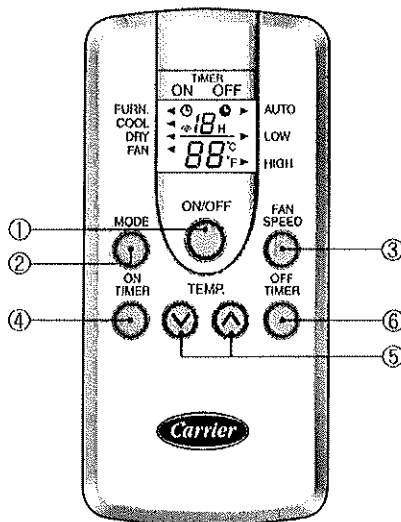
Cooling Operation - A/C and Heat Thermostat

Heat / A/C Thermostat



1. Set the temperature select lever to the desired temperature level.
2. Select the FAN speed.
3. "HI": Maximum cooling / dehumidification.
4. "LO": Maintaining temperature level / night use.
5. Select FAN AUTO/ ON switch.
6. "AUTO": Runs whenever cooling required and stops when not required.
7. "ON": Air conditioner fan runs continuously to circulate air.
8. Set the system switch to the "COOL" position.
9. When the SYSTEM switch is in the "OFF" or "FURNACE" and the "AUTO/ON"
10. Switch is in the "ON" position; the A/C fan will run continuously at the selected fan speed. This circulates air inside the RV.

Thermostat, Remote Control (Outback Only)

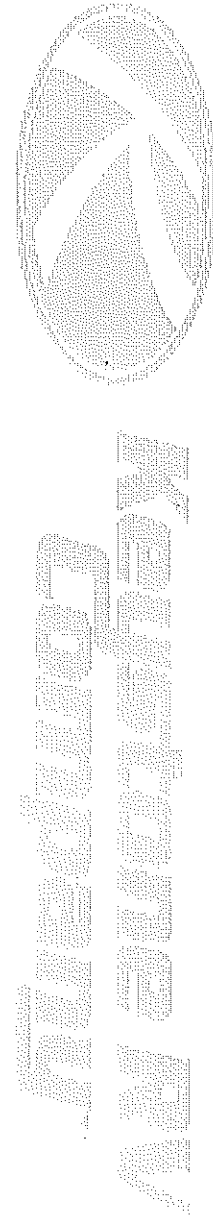


As Pictured in the Carrier AirV Manufacturer Owners' Guide

Some models are equipped with the Carrier AirV™ air conditioner unit, which includes a remote control thermostat. A basic outline of operational controls is included below. Extensive operating instructions are located in the unit packet. Please review carefully for all instructions and any maintenance needed.

Basic Button Functions

1. "ON/OFF": Press to begin operation of the unit. The unit will beep twice when on is pressed and once when turned off by the remote.





Remote Lost? For cooling or heating, press the FURN EMER. or the COOL EMER. button on the Ceiling Unit Display. For more information on this procedure, please refer to the owner's guide.

2. Mode Selector: "Cool / Dry / Fan / Furnace".
3. Fan Speed: "High / Low / Auto". Auto allows the fan speed to be controlled by the microcomputer in the unit.
4. On Timer: With the Unit "OFF", you may set a desired time in hours, for the unit to turn on.
5. Temperature Selectors- Use to set the desired temperature.
6. Off Timer: Use to set time, in hours, for the unit to turn off. The Unit must be "ON" to use this feature

Fireplace, ElectraFlame™ (Optional)

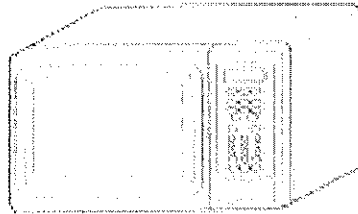
ElectraFlame™ Fireplaces run on standard 120V and have full electrical certification throughout North America. If you choose to activate the heat feature, the fireplace will provide up to 5,115 BTU's. Flame brightness is adjustable and the choice is yours whether or not to use the heat feature. Built in safety features include: impact resistant safety glass, cool glass upon touch and a safety switch for overheating with user reset. Read all documentation included prior to using.

Generator (Optional)

Any service or maintenance recommended by the manufacturer should be performed at an authorized service center and in accordance with all generator manufacturer recommendations. Please thoroughly read the accompanying manual.

Microwave / Convection Oven (Optional)

Installed microwaves operate on 120V AC power only and are a popular for quick and convenient heating and cooking. Due to differing models used it is recommended that the Owner's Guide in the Unit Packet be read to for use on special features and operations.



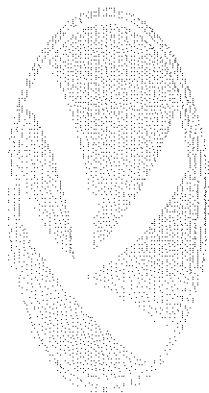
Care and Maintenance

To clean exterior surface and the oven interior, use only mild, non-abrasive soaps or detergents applied with a soft sponge or cloth. Never operate the microwave when oven is empty.

Monitor Panel : See Plumbing Section.

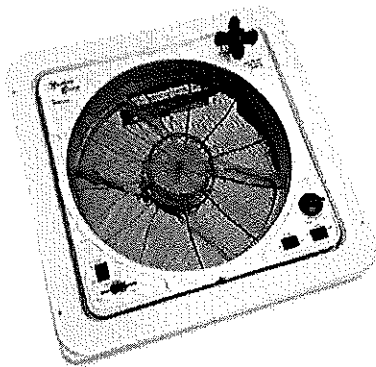
! DANGER

A generator produces carbon monoxide from exhaust fumes from its engine during operation. Carbon monoxide can be fatal! When the device detects carbon monoxide in the air it will sound. Consult the individual detector's user manual for specific instructions and / or audible warning meanings.



Northern Breeze™ by VENTLINE

(Optional)



The Northern Breeze™ is powered by 12V DC and has both exhaust or Intake ability. Fully integrated controls makes it possible to pre-set the vent for automatic operations or for manual control. A rain sensor with manual override will automatically close the vent during periods of rain and cut off the power to the fan. Power will only be resumed when the sensor is dry. During travel or vehicle storage, move the fan speed control to "OFF" and close the dome cover fully.

Care and Maintenance

In the interior, vacuum any dust or lint from the fan screen and use only mild detergent on a damp soft cloth to clean the garnish and area around the screen. To clean the exterior, always disconnect the power before attempting any care or maintenance. Frequent cleaning using a mild detergent on the dome, fan blades and related surfaces, will eliminate heavy dirt build up. Never use solvents or abrasive cleaners on the dome, surfaces or the seal.

Range Hood

The range hood operates on 12V power and should be used as a ventilating system when cooking. Operational switches for the fan and / or light are on the front panel of the range hood.

Care and Maintenance

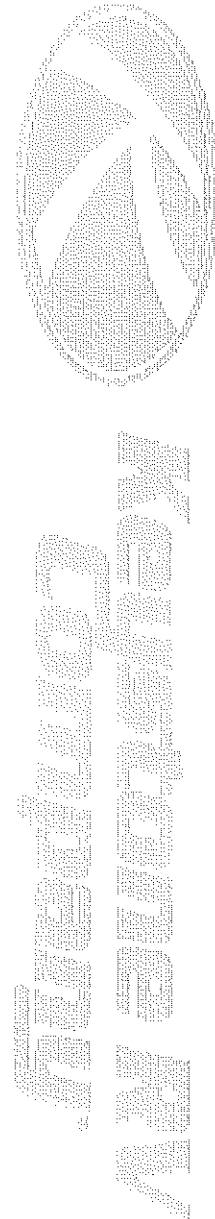
Care of the range hood is similar to the range. Use warm soapy water and wipe off any grease before staining can occur. Do not use harsh chemical cleaners or abrasives. Clean the plastic light lens and filter by removing and washing in hot soapy water. Frequency of cleaning is dependent upon range usage.

The range or cook-top installed is a LP gas appliance. Carefully read the manufacturer's manual for complete operational and safety instructions, provided in the unit packet, prior to using the appliance.

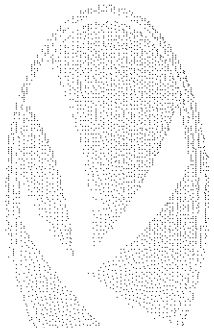
Range / Cook-Top

What to do if you smell gas

- Do not try to light any appliance
- Extinguish any open flames including cigarettes
- Do Not Touch Any Electric Switch
- Open windows and doors
- Exit trailer



KEATOR RV
CORPORATION



⚠ DANGER

LP-powered appliances produce carbon monoxide. Carbon monoxide can be fatal! When the device detects carbon monoxide in the air it will sound. Consult the individual detector's user manual for specific instructions and / or audible warning meanings.

Shut off the gas supply at the gas container (bottle or source)
Immediately call a service center or gas supplier from an outside phone and follow their instructions
Do not turn on the gas supply until the gas leaks have been repaired

Operation - Top Burners (Range or Cook-top)

Prior to Lighting

Assure the gas supply to the trailer is turned "on".
Open a window and / or vent for ventilation purposes.
Check for any hazards (flammable liquids, fabrics, objects near burners).
If gas smell is present, Do Not Light. -See "What to do if you smell gas"

Depress knob corresponding to burner to be lit and turn to "Lite" position.

Immediately Light Burner

Match-Light Models: Hold a long match or a hand held igniter*, near the burner port.
Piezo Ignition Models: Rotate the Piezo knob clockwise rapidly. This will produce a spark to ignite the gas.

After lighting adjust burner flame to needed level.
If flame on burner goes out after initial lighting or during cooking, turn burner knob to off and wait 5 minutes before attempting to relight. Before attempting to relight check to make sure gas smell has disappeared. If odor still present after 5 minutes, DO NOT relight burners. See "What to do if you smell gas".

To turn burner(s) off: turn the knob(s) to the "OFF" position.

*Make sure the hand held igniter is the type designed for open flame burners.

The Range or Cook-top installed is a LP gas appliance. Carefully read the manufacturer's manual for complete operational and safety instructions, provided in the unit packet, prior to using the appliance.

Operation - Oven (if equipped)

Oven pilot must be lit prior to operating.

Lighting Oven Pilot

Be sure all valves and oven control knob are in the "OFF" position
Assure the main gas supply is on.
Open oven door and smell for gas. If odor present – Stop! Read "What to do if you smell gas"
If no gas smell present, depress and turn oven control knob to "Pilot On".
Immediate light oven pilot with a match.

Operation of Oven Burner

Depress oven knob and turn to desired setting.
(A delay of appx. 45 seconds will occur before burner is lit- This is normal.)

To Shut Down Oven Burner

Turn oven control knob to "Pilot On" position – This will keep the oven pilot lit.

To Shut Down Oven Pilot

Turn oven control knob to "OFF" position.

Care and Maintenance

Before cleaning make sure all knobs are in the "OFF" position and wait until all surfaces, including burners, are cool. Use warm soapy water only. Do not use oven cleaners, bleach or rust removers on the range/cook-top surface. Wipe up any spills as soon as possible to avoid possible discoloration or pitting on the surface. Check burner ports when cleaning. If the ports or the orifice is clogged, carefully clean with a toothpick.

Refrigerator

The refrigerator installed is a LP gas appliance. Carefully read the manufacturer's manual for complete operational and safety instructions, provided in the unit packet, prior to using the appliance.

Operation

The refrigerator operates on either 120V AC or LP Gas and has a gravity-based cooling system. This system requires that the recreational vehicle be level for efficient operation. The cooling coils are sloped to allow continuous movement of the liquid chemicals and if the unit is not level for extended periods, the flow of these chemicals will slow and pool inside the tubing, resulting in a loss of cooling.

During towing, the leveling is not as crucial as the movement of the trailer will prevent the liquid inside the tubing from pooling. If needing to park for several hours, the trailer should be leveled if operating the refrigerator or the refrigerator needs to be turned off.

Placing a small bubble level inside of refrigerator will assist in determining if level for operational efficiency.

When starting the refrigerator for the first time or after extended storage, allow up to four hours for the cooling cycle to become fully operational.

Operational Controls

Auto Mode: The control system on the refrigerator will automatically select between gas and AC electric operation. AC will always be selected if available. If AC becomes unavailable, the refrigerator will switch to gas mode operation. When in auto mode the indicator lamp on the control panel will be lit.

Gas Mode: This mode when selected provides gas operation only. The indicator lamp for auto mode will not be lit.

Care and Maintenance

Exterior: Ventilation of the refrigerator is essential. Make sure the vents are clear of any obstructions such as bird/insect nests, spider webs, or any other debris. Periodically clean the coils on the back of the refrigerator with a soft bristled brush. At no time should any combustible materials, such as gasoline, flammable liquids or vapors be stored near the refrigerator.

Interior: When cleaning the interior lining of the refrigerator, use a weak solution of soda and warm water. Use only warm water, however, when cleaning the finned evaporator, ice trays and shelves. Never use harsh chemicals or abrasive cleaners to

WARNING

Never use wire brushes or any metallic item for cleaning range ports or orifice, as wire brushes or metallic items may shed, leading to a fire or explosion.

WARNING

Never use the range or oven for extra comfort heating. Cooking appliances are not directly vented to the outside as are the furnace / air conditioning systems.

KAWASAKI
 MOTOR
 CORPORATION
 10000 W. 10th Ave.
 Denver, CO 80202

clean these parts or their protective coatings will be damaged.

Defrosting: When defrosting the refrigerator, shut off the power by turning the main power button to the off position. Remove any food and leave the drip tray under the finned evaporator. Remove light bulb or cover switch with a piece of tape. Leave the door(s) open and empty drip pan when necessary. Dry with a soft cloth when done.

ANY SERVICE TO THE REFRIGERATOR, MUST BE PERFORMED BY A QUALIFIED REPAIR TECHNICIAN.

Roof Vents

Manual and / or power roof vents are installed on Keystone Recreational Vehicles. (For Fan-Tastic Vent, see the information on this specific product in this section.) Operate the roof vents when showering, bathing, washing dishes, or anytime hot water is used, as it allows moisture to escape. Ventilation is extremely important in reducing condensation formation.

Safety

Fire safety is important whether at home or in a recreational vehicle. The best way to limit fire risk is by prevention. Follow the manufacturers' instructions on the use of all appliances and observe all safety warnings and instructions included.

Before camping, make certain the locations of all safety equipment inside the coach and all emergency exit windows as well as doors. An escape plan for emergencies whether at home or camping is always a good idea.

Egress Windows

Egress or "Emergency Exit" Windows are labeled from the factory with the word EXIT. All Egress windows can be distinguished by red operational handles or levers. Dependent upon the window type, an egress window may be a large section or an entire window. Review the locations and operational instructions posted upon the window with all passengers.

Fire Extinguisher

Each recreational vehicle includes a fire extinguisher, which is located near the main entry door. The fire extinguishers are rated for Class B (gasoline, grease, and flammable liquids) and Class C (electrical) fires. Test and operate according to manufacturer instructions.

Flashlight


For your convenience and security, a cordless rechargeable flashlight is available in some models. Located near the main entrance door, simply remove the flashlight from its charging case and turn on. After switching it off, replace the flashlight in its self-charging as 12V power is available.

LP Detector

See the LP section of this manual.

Smoke Detector

For safety a smoke detector is installed in the living/ cooking area. Smoke



⚠ DANGER

When refueling tow vehicle, shut off all LP gas appliances. Most LP gas appliances are vented to the outside. Gasoline fumes could enter the appliance and ignite from the burner flame, causing an explosion or fire.

detectors should be tested prior and during each camping trip, or weekly during the season. Most detectors are powered by a 9-Volt battery. Keeping fresh extra batteries on hand is a good idea.

Carbon Monoxide Detector

A carbon monoxide (CO) detector is installed in your coach. For specific information regarding the specific operation or functions of the particular detector in your unit, consult the individual manufacturer's owner's manual.

Common sources of CO are malfunctioning or misuse of gas appliances, vehicle engines, generators and many other fuel burning products.

Indications of CO poisoning are (but not limited to):

Mild Exposure

- Symptoms of the flu (minus a fever)
- Slight Headache
- Dizziness
- Fatigue

Medium Exposure

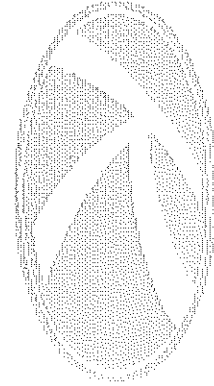
- Sever Throbbing Headache
- Drowsiness
- Confusion
- Fast Heart Rate

Extreme Exposure

- Unconsciousness
- Convulsions
- Cardiorespiratory Failure
- Death

For your safety and to keep your carbon monoxide alarm in good working order, follow the steps below.

- Verify the unit alarm, lights and battery operation by pushing the "Test" button weekly
- Vacuum the CO alarm cover with a soft brush attachment once a month to remove accumulated dust
- Instruct children never to play with the CO alarm. Warn children of the dangers of carbon monoxide poisoning
- Never use detergents or solvents to clean the carbon monoxide alarm
- Avoid spraying paint, hair spray, air fresheners or other aerosols near the CO detector
- Do Not paint the CO detector. Paint will seal the vents and interfere with the sensor ability to detect CO
- Do not place near a diaper pail
- Test the alarm operation after your coach has been in storage, before each trip and at least once a week during the camping season



! DANGER

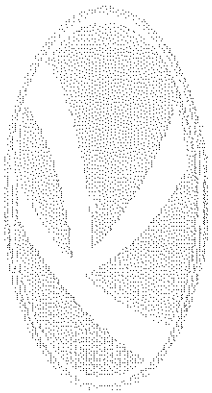
If the alarm sounds, provide ventilation by opening windows and doors. The CO build-up may dissipate before help arrives, but may be only temporarily solved. It is crucial that the source of the CO is determined and repaired.

! DANGER

The CO alarm can only warn you in the presence of CO. It does not prevent CO from occurring nor can it solve an existing CO problem.

! DANGER

Carbon monoxide can be fatal! When the device detects carbon monoxide in the air it will sound. Consult the individual detector's user manual for specific instructions and / or audible warning meanings.



**Корпорация
ТРЕДИНГ**

Chapter 5: Electrical System

The electrical system in recreational vehicles is a combination 12 Volt DC (Direct Current) and 120 Volt AC (Alternating Current) system. Every facet of the electrical system is carefully engineered and installed to comply with the "American National Standard #A119.2" and the "National Electric Code." To understand this system, simply put, the 12 Volt system is what an automotive uses and the 120 Volt system is what most households use.

12 Volt System - DC

The 12 Volt system can be powered in three different ways: a separate RV battery, the converter changing 120V AC to 12V DC or by the tow vehicle's 12 Volt system. The water pump, certain lights, power vents, and other appliances are powered by the 12 Volt system.

The heart of the 12 Volt system is the battery. Batteries are essentially storage devices for electrical energy. Most batteries used in RVs are RV / Marine Deep Cycle, Lead-Acid types. These batteries contain lead plates and liquid sulfuric acid electrolytes in sections called cells.

Electrolytes are lost whenever a battery discharges energy or is recharged. The level of the electrolyte must stay above the plate in each cell. Many premature battery failures occur because the electrolyte level was not maintained. For maintenance and storage information see the Care and Maintenance Section.

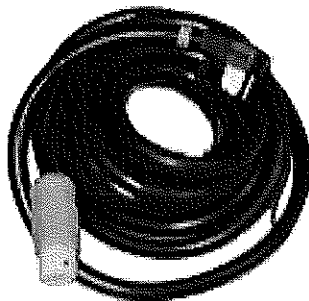
110 Volt System (Also referred to as 120) - AC

The 120 Volt system is supplied by plugging the power cord (shore cord) into an outside source. It furnishes current to the 120 Volt appliances and fixtures like the roof air conditioners, the refrigerator, lighting and all 110V receptacles. It also supplies power for the 12 Volt trailer system through the converter.

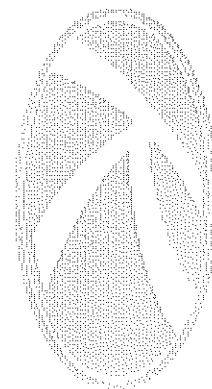
The AC circuits are protected by circuit breakers and can handle from 15 to 30 Amps depending upon the circuit. The most common cause of a circuit breaker to open is an overloaded circuit. An example of an overloaded circuit is when a space heater is plugged into the same outlet as the toaster. If this happens, reduce the load on the circuit and reset the breaker.

Power Cord / Shore Cord

The power cord, often referred to as shore cord or shoreline, is a heavy-duty cable with a 3 or 4 prong grounding plug on one end and connects directly to the power converter inside the unit on the other end. This cord is used to plug into an external 120V source. Most cords are typically 30 Amp plugs (3 prong), although certain components or ordered options on some units will require a 50 Amp (4 prong-plug).



Do not plug shore cord in while under load. Make sure all appliances are turned off prior to connecting shore cord.



Before plugging in the RV shore cord, turn off all electrical appliances so as not to start under a "load", which could cause a breaker to open. Reverse this process before unplugging.



The power cord prongs should always be clean and solid. Clean with a contact cleaner, emery cloth and or a nail file. Electrical connections work better when clean.

30 Amp, 50 Amp and Available Power

30 Amp Capability

30 Amp service is 120 Volt service limited to a total draw of 30 Amp. The power cord from the RV is three pronged. 30 Amp service is the most common in the RV industry and used widely in campgrounds through the United States. With 30 Amp service any appliance in the RV can operate by itself. However, due to the 30 Amp limitations, you may not be able to run a certain group or all appliances at the same time. For instance, most air conditioners will draw up to 16 Amps on start up and about 11 Amps when running continuously. While running the microwave and pulling 15 Amps, you decide to turn on the air conditioner, the initial draw of up to 16 Amps may overload the circuit, causing a breaker to blow. Below a reference chart has been supplied to show typical amperage draw on common appliances and fixtures.

⚠ WARNING

Never replace circuit breakers or fuses of higher current rating than those originally installed. This could overheat the wiring and start a fire.

| APPLIANCE | AMPERAGE CONSUMED |
|--------------------------------------|-------------------|
| Roof Air Conditioner (Continuous) | 11.4 |
| Roof Air Conditioner (Initial Start) | Up to 16 |
| Electric Water Heater | 12 |
| Microwave | 15 |
| Converter | 14 |
| Space Heater | 10-15 |
| Washer/Dryer | 10 |
| Refrigerator | 3.5 |
| TV or VCR | 1 |
| Hair Dryer | 2 |
| 110 Volt Light | 1 |

50 Amp Capability (Optional)

If the RV has 50 Amp built-in, the power cord will have 4 prongs, unlike the 3 of 30 Amp. service capable of running up to 50 amps of draw. 50 Amp capability is also 120 Volt service, however it retains unique properties. With the 30 Amp plug, only one prong carries the 120V power. With the 50 Amp plug, two of the four prongs carry 120 Volt, allowing for the ability to set up power needs according to appliance application. As such, a unit built with two air conditioners, can run both at the same time if they are routed on different feeds, while running other appliances commonly used within an RV.

Available Power

Despite the power system built into a recreational vehicle, the power system is only as good as the power supply. What this means is that if a campground has only 30 Amp service available, a recreational unit

with 50 Amp capability will only have 30 Amp service. A special adapter is required to reduce the 50 Amp plug to fit the 30 Amp campground receptacle. In other words, with only 30 Amps available only one air conditioner at a time may be used. As well, there are some campgrounds that may only carry 15 or 20 Amp power. The best way to know what amperage is available is to call ahead and always carry adapters, available at most Keystone RV dealers and RV parts stores.

About Campground Electrical Service

Campground electrical service varies. Make no assumptions when hooking up to a site for electric. Check the polarity before plugging in. An inexpensive polarity checker is available from your dealer and can save a lot of headaches. Just because the RV has 30 or 50 Amp power cord, it does not mean 30 or 50 is available. When reserving a site, ask what electrical service is available. Adapters from 50 to 30, and 30 to 15/20 are available. Ask your dealer or check any RV supply store.

Low voltage can damage RV electrical systems and / or components like air conditioners, televisions, microwaves, etc. Items such as voltage meters, surge and brownout protectors are available from electrical and RV accessories stores to help you monitor the electrical current entering the trailer.

Converter

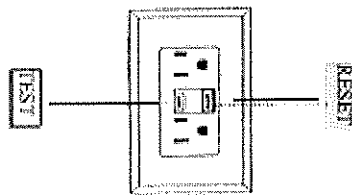
The main purpose of the converter in your RV is to provide 12 Volt power to the unit while plugged into an AC outlet, such as at a campground. The converter will, as its name indicates, convert the incoming alternating current to direct current, so as to operate the appliances and fixtures requiring 12 Volt DC power. In essence, utilization of the converter will reduce the usage of the RV battery.

The converter installed helps by trickle charging the RV battery when the trailer is plugged into AC power. When connected to the tow vehicle the RV battery will also be charged. When using AC power and having the RV battery hooked up, check the electrolyte level more often if staying connected to AC for a lengthy period of time.

If remaining plugged into AC power for extended periods, check the electrolyte level often in the RV battery.

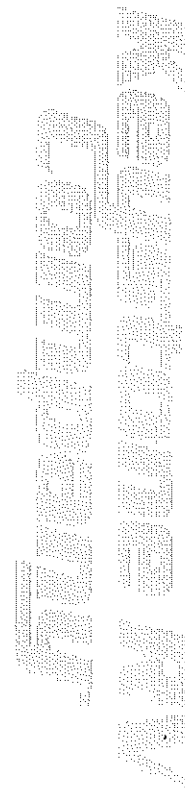
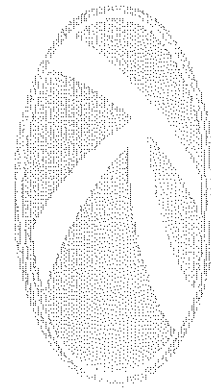
GFCI - (Ground Fault Circuit Interrupter

Bathroom and exterior receptacles are protected by a highly sensitive device, known as a "Ground Fault Circuit Interrupter", which is designed to sense the slightest electrical "short" at those receptacles and instantly disconnect the current before a person can be injured.

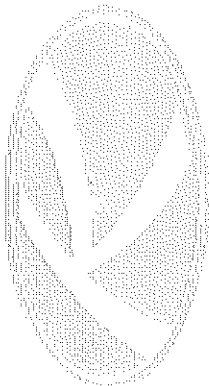


Testing

The GFCI receptacle should be tested at least once a month or prior to every trip. To test the GFCI, push the TEST button. The RESET button will pop out. Power is now off at all outlets protected by the GFCI receptacle. Push in the RESET button in to restore power. The test is complete when the reset button remains pushed in. If the RESET button does not pop out when testing, the GFCI is malfunctioning and no outlets



Keystone RV Corporation



should be used on this circuit, as protection is lost. Call your dealer if the GFCI malfunctions.

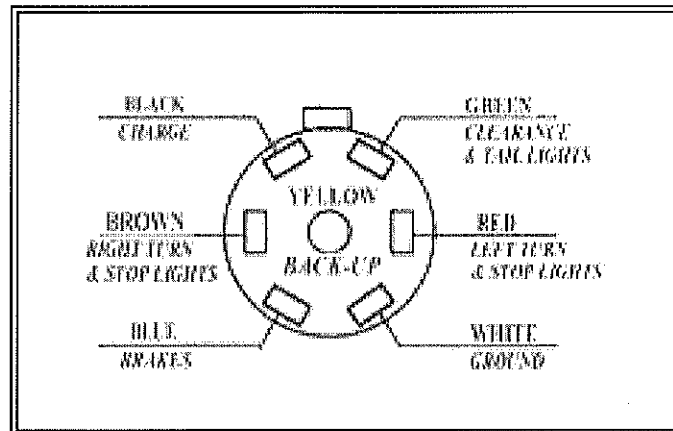
Maintenance

This item requires no maintenance other than periodic testing as described above. If for any reason, this switch malfunctions, do not attempt to repair yourself. Contact an authorized repair facility.

Bargman 7-Way Plug

A 7-pin plug supplies the electrical connection between the tow vehicle and the recreational vehicle. This plug connects into a receptacle on the tow unit to allow operation of the recreational vehicle's marker lights, taillights, brake lights and electric brakes. A charge line from the tow unit's alternator is also run to this receptacle, which allows charging to the RV battery.

| No. | Color | Item | Wire Gauge* |
|-----|--------|-------------------------|-------------|
| 1 | White | Common Ground | 8 |
| 2 | Blue | Electric Brake | 12 |
| 3 | Green | Tail Lights and License | 14 |
| 4 | Black | Battery Charge | 8 |
| 5 | Red | Left Stop and Turn | 14 |
| 6 | Brown | Right Stop and Turn | 14 |
| 7 | Yellow | Center Auxilliary | 14 |



Care and Maintenance

Maintaining the Bargman Plug requires little effort. Store safely when not in use and clean the prongs as needed. Please see your dealer if repair work is necessary.

Typically, the wires within the Bargman 7-Way Plug are color-coded as identified in the graphics on this page.

Brakes, Electric

Included in the unit packet is an extensive manual by the manufacturer

of the brakes, axles, hubs and drums. Please refer to this manual for information of any of these systems.

Breakaway Switch

The breakaway switch is designed to work in the event separation occurs between the tow vehicle and the RV while on the road. As separation occurs, the pin is pulled from the switch. A circuit from the trailer battery to the RV brakes becomes closed, and activation of the trailer brakes results.

Care and Maintenance

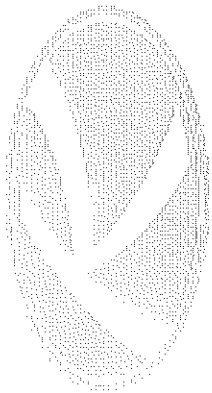
Do not let the lanyard, which is connected to the pin drag upon the ground. Inspect the condition of the lanyard prior to travel. As well, since the breakaway safety feature operates on the trailer battery, insure the battery is fully charged and the terminals are clean. Testing the switch prior to traveling is recommended (See below). If a problem is noted, or if the switch fails during testing, please call your dealer.

How to Test the Breakaway Switch

1. Disconnect the power cord from the RV to the tow vehicle
2. Pull the lanyard pin out to the first stage
3. Brakes should audibly engage
4. Double check by moving the tow vehicle forward slightly to be sure the RV brakes have locked and are operating correctly



Keystone RV
 Breakaway Switch



**KeyStone RV
Products**

Chapter 6: LP Gas System

Read all manufacturer appliance literature, including the information on the LP bottles and regulator, provided within the unit packet and follow any instructions given.

General Information

LP gas (also called LPG, Liquefied Petroleum, or Propane) when properly handled, is a clean burning dependable fuel for operating all LP gas appliances. The LP gas system involves the tank(s) (Also called bottles or cylinders), regulators, valves, supply lines and appliances. LP tanks contain liquid under high pressure, which vaporizes into a gas and passes through the regulator to automatically reduce the pressure. Low-pressure gas is then distributed through the supply lines to provide the fuel for LP appliances.

Consumption of LP gas depends upon the frequency and duration of use of the LP appliances. The furnace and oven have the highest consumption rates. During cold weather it is advisable to check the bottles often and always keep one full. Safety must be observed at all times when using the LP gas system. LP gas is colorless and odorless in its natural state. An odorant, similar to rotten egg smell, has been added for consumer safety purposes to help detect leaks and provide warning.

LP gas is highly flammable and is contained under high pressure. Improper use may cause fires and / or explosions. If a sulfur or "rotten egg smell" is detected in or around the trailer, perform the following steps immediately:

What to do if you smell gas

- Do not try to light any appliance
- Extinguish any open flames including cigarettes
- Do Not Touch Any Electric Switch
- Open windows and doors
- Exit trailer
- Shut off the gas supply at the gas container (bottle or source)
- Immediately call a service center or gas supplier from an outside phone and follow their instructions
- Do not turn on the gas supply until the gas leaks have been repaired

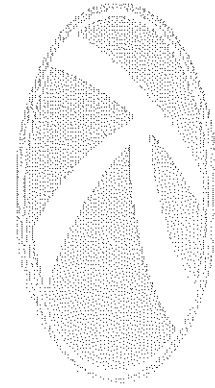
LP Regulator

The regulator is the heart of the LP system. LP gas is under high pressure in the bottle and the regulator reduces this pressure to allow safe use with the appliances in recreational vehicles.

The lower pressure is distributed to the appliances. The arrow on the automatic gas regulator will always point to the gas bottle in service. When the red flag appears in the inspection glass, this indicates that bottle is empty. In systems without automatic changeover, the arrow should be then turned toward the other bottle and the empty filled as soon as possible.

Care and Maintenance

The regulator has a vent that allows it to breath. If pressure builds too high within the regulator, it vents until pressure reaches a normal range. Check the vent frequently to keep the vent clean and clear of any debris, corrosion or obstruction. A clogged regulator can result in higher pressures, loss of fuel and / or component failure. The vent can be



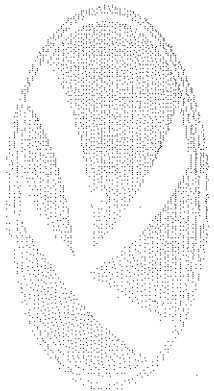
WARNING

LP-powered appliances produce carbon monoxide. Carbon monoxide can be fatal! When the device detects carbon monoxide in the air it will sound. Consult the individual detector's user manual for specific instructions and / or audible warning meanings.

! DANGER

DO NOT attempt to adjust or repair regulator. Adjustments and repairs require specialized training and tools. Contact a qualified LP Service Technician. Failure to follow these instructions could result in a fire, explosion and / or injuries, including loss of life.

Keystone
Company



cleaned by using a toothbrush and should be checked periodically by a qualified LP service center.

Split-Bottle Systems - (Primarily on Fifth-Wheels)

Keystone uses LP cylinders equipped with a safety valve to prevent over-filling the tank. Rapid changes in pressure during filling or when switching the regulator changeover valve can cause this safety feature to activate, causing a "no gas flow" situation. The problem occurs when the system downstream of the cylinder valve and above the regulator has less pressure than the bottle pressure. The check valve activates, sensing a break in the line. In order for the valve to reset, the pressure in the line must equalize with the tank pressure. Internal mechanisms allow for a very small bypass flow to achieve equalization. This usually takes 2-5 minutes. Filling instructions for the split bottle system are on the following page.

Filling LP Gas Bottles

Keystone LP systems are equipped with a Type I cylinder connection, making them as easy to connect and disconnect as a garden hose.

The Type I connection system uses the Excess Flow Pigtail Hose, distinguished by the large green nylon swivel nut. The green swivel nut attaches to the outside of the cylinder valve with right hand threads. Tighten the swivel nut by hand. DO NOT use tools.

The safety features of this system prevent gas from flowing unless the connection is tight and will limit excessive gas flow. In cases of extreme heat, 240° to 300°F, at the connection, the connection to the cylinder will be shut down.

Procedure For Filling LP Cylinders Equipped With An OPD Valve

1. Shut off tow vehicle and extinguish all appliance pilot lights when filling tanks
2. Ensure that the hand wheel valve is in the closed position
3. Attach the fill hose to the outlet on the valve
4. Turn on the LP source
5. Open the bleeder valve on the LP tank 10 percent
6. Slowly open the cylinder bottle hand wheel valve approximately one-quarter turn
7. As the cylinder starts to fill, the hand wheel valve may be opened more. One turn is all that is necessary to complete filling the tank.
8. When the bleeder valve begins to spit liquid, shut off the LP fill source, close the bleed screw on the cylinder, then close the valve.

LP Gas Lines

The primary manifold is a black pipe located beneath the unit. Copper tubing, with flare fittings, is used as secondary lines running to the gas appliances. If repairs are needed to these lines or any component of the LP system, DO NOT ATTEMPT to repair yourself and follow the above instructions.

Although your LP gas system was thoroughly inspected for leaks before delivery, gas fittings can loosen from vibration during travel. The LP gas system should be inspected at least once a year

LP Gas Leak Detector

Read the operating instructions, located in the unit packet thoroughly for the specific model installed in the unit.

The LP gas leak detector is a safety device that is permanently mounted near the floor and is powered by 12V (the RV battery and / or converter). The detector is operational only as long as sufficient battery power is available. If the power is disconnected, the monitor will not operate.

Should a propane leak occur, the detector will sound an alarm and continue until the gas has dissipated or until a mute button is pressed. The mute button will only stop the alarm from sounding for 60 seconds and will reoccur if gas is still present. Sometimes in new coaches, an alarm will sound due to the odor in a new trailer from glues and other materials used to build the unit. The alarm also may sound at times when no LP is present due to household product use such as aerosol hair spray, cleaners, adhesives, alcohol etc. Be sure to air out the trailer thoroughly after delivery and when using these products.

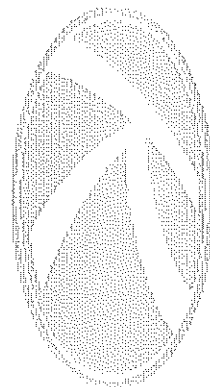
The LP gas leak detector has a self check circuit which runs at all times while receiving 12 Volt power. In the event that the circuitry fails, a failure alarm will sound and the operating indicator will cease to light.

When To Test Detector


Testing* of the detector is recommended every week, if power is interrupted or before each camping trip. The LP detector must be operating for at least 60 seconds before it can be tested.

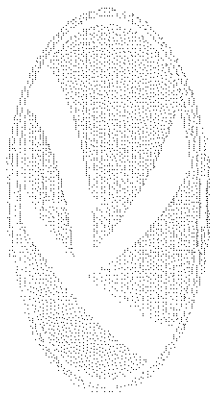
When the Alarm Sounds...

- Open all doors and major windows.
- Turn off the gas supply at the LP tank.
- Do Not re-enter until alarm stops sounding.
- Turn on gas supply.
- If alarm sounds a second time, turn the gas off and contact an authorized dealer or LP service technician.



**Keystone
Company**

| |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  WARNING |
| <p>LP gas may be present in other areas before it can reach the detector's location. The detector only indicates the presence of LP gas at the sensor. Never check for leaks with open flame. Use only a mild soap and water solution.</p> |



Computer
Network

Chapter 7: Plumbing System

A recreational vehicle plumbing system consists of two sub-systems: The fresh water system and the wastewater system.

Potable fresh water is supplied by either the fresh water tank aboard the unit or from an outside source connected through the city water connection. When using the fresh water tank, the water is pumped through the water lines by means of the water pump. When utilizing an exterior source, such as a campsite water supply, the pump is not needed as the water is already pressurized and will flow through the water supply lines within the trailer.

Water Pump

The 12 Volt water pump installed is self-priming and totally automatic, operating upon demand. When a fixture is opened the pump draws water from the tank and pressurizes the lines, providing water to the open fixture. The pump has an on/off switch and is located on the monitor panel. DO NOT turn on the pump if the fresh water tank is empty.

Before Turning On The Pump Switch

1. Check the water level in the fresh water tank – if empty, refill. (See "Fresh Water Tank Fill")
2. Open kitchen and bathroom faucets, hot and cold valves, and any shower/tub fixtures.
3. Check to make sure Water Heater By-Pass Valve is set to "Normal Flow" to allow water into the hot water heater.
4. Turn on switch for water pump and allow the pump to fill the water lines and hot water heater tank.
5. Close each faucet after it delivers a steady stream of water.
6. The water pump should stop running after all faucets are closed.
7. Pump should now run on "demand" when a faucet is opened, and stop when the faucet is closed.

Fresh Water Tank

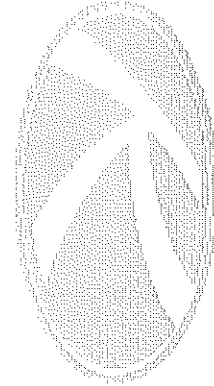
A fresh water tank is equipped on all travel-trailers and fifth-wheels. Tanks vary in size according to product and model. To determine how much fresh water the system can hold, refer to the RVIA TRAILER WEIGHT INFORMATION label located on the inside of the kitchen cabinet door near the sink.

The full capacity rating of fresh water for the travel-trailer / fifth-wheel includes the cumulative total of the tank, lines and the hot water heater tank.

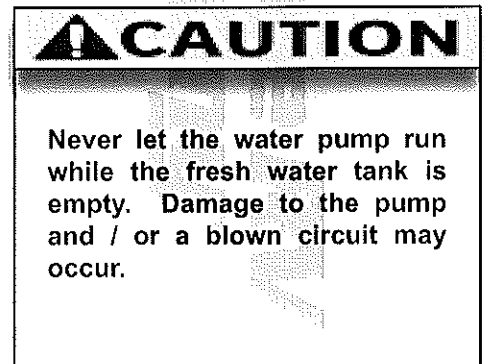
Fresh Water Fill

To fill the fresh water tank, remove the cap, on the exterior connection labeled "Fresh Water Connection", and insert a garden hose. Check the monitor panel to determine the level of water in the tank during filling. When full, water may spill out back through the valve, as there is no automatic cutoff. When filling the fresh water tank it is a good idea to also fill the hot water heater and lines to provide the maximum system capability.

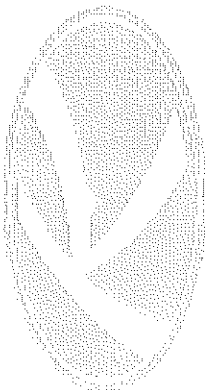
When traveling with the water tank full, the cargo carrying capacity is reduced.



K...
 C...
 S...



Keystone RV
Lifestyle



Water should be drained from the fresh water system when not in use for more than one week.

City Water Fill

The city water fill allows a direct connection to an outside source, such as campsites with water risers. There is no need to use the water pump as the water coming from the exterior source is already pressurized and will bypass the pump and tank. Connect the city water fill by using a hose manufactured for potable water use. Open faucets and allow any air to be purged.

City water fills are marked with a label and may be installed as a separate piece of equipment or as a part of a combination water inlet housing.

Sanitizing the Fresh Water System

Keeping the fresh water system clean and free of any potential contaminations is a top priority. Sanitizing the system before initial use and thereafter annually, or whenever water remains unused for prolonged durations, is recommended. This will help keep the water system fresh and discourage harmful bacterial or viral growth. To sanitize your system, perform the following:

1. Drain the tank by opening the low point drain for the fresh water tank.
2. Prepare a chlorine bleach solution of ¼ cup to one gallon of water for every 15 gallons of tank capacity.
Example: Use 2 ¾ gallons of the solution for a 40-gallon tank. If using Ultra bleach concentrations, reduce bleach to 1/8 cup to one gallon of water.
3. Add solution to tank and fill with water. Open each faucet/fixture until a distinct chlorine odor is smelled. Close faucets and let stand 4 hours.
4. Drain system and flush with fresh water until chlorine odor and smell is gone. (If a water filter has been added, change it at this time).

About Vibration While Traveling

Although the fresh water system was thoroughly inspected for leaks before delivery, fittings can loosen over time, from vibration during travel. Periodically check the fittings at the faucets and visible connections and tighten when necessary.

Water Heater

The Water Heater installed is a LP gas appliance. Carefully read the manufacturer's manual for complete operational and safety instructions, provided in the unit packet, prior to using the appliance.

The water heater installed is typically a 6-gallon (standard) or 10-gallon (optional on some units).

Dependent upon the model installed, the water heater will operate only on gas or on upon either gas or AC current. For specific water heater operating instructions, please consult the user's manual located in the unit packet. Prior to operating the water heater, be sure there is water in the fresh water tank and in the water heater.

Care and Maintenance

Proper maintenance of the water heater relies on inspection and awareness. *(Full maintenance requirements are listed within the manufacturer's user's manual located in the unit packet.)*

An anode rod within the tank increases the life of the tank and under normal use will deteriorate. Replacement of the anode rod should be done yearly or more frequently if water supplies contain high levels of iron or sulfate. Another important maintenance procedure is periodically checking the water heater screen in the exterior door for any obstructions, such as animal /insect nests or debris. Proper ventilation is essential to the safe operation of the water heater.

A qualified technician should do any repairs that need to be performed. If soot is present anywhere, immediately shut the unit down and contact a qualified service technician. Soot is a sign of incomplete combustion and must be corrected before operating the water heater.

Pressure Relief Valve - Weeping or Dripping

As in residential water heaters, the water heater equipped in recreational vehicles contain a pressure relief valve that is designed to open if the temperature of the water within reaches 210 degrees F or if excessive pressure is built up. When pressure reaches 150 pounds, the relief valve will open and water will drip from the valve. The valve will close automatically once the pressure falls below 150 pounds. This dripping is normal and does not indicate a malfunctioning or defective valve.

Also, as water is heated it expands and with the closed water system in a recreational vehicle, water expansion will cause weeping at the pressure relief valve. One way to minimize this weeping is by maintaining an air pocket at the top of the water heater tank. The air pocket forms naturally by design but will reduce overtime through normal use.

Replenishing the Air Pocket

1. Turn off water heater.
2. Turn off cold water supply.
3. Open a faucet in the RV.
4. Allow time for water to cool and Pull out handle of the Pressure Relief Valve and allow water to flow from the valve until it stops.
5. Release handle on valve-it should snap shut.
6. Close faucet and turn on cold water supply, as tank fills, the air pocket will be replenished.

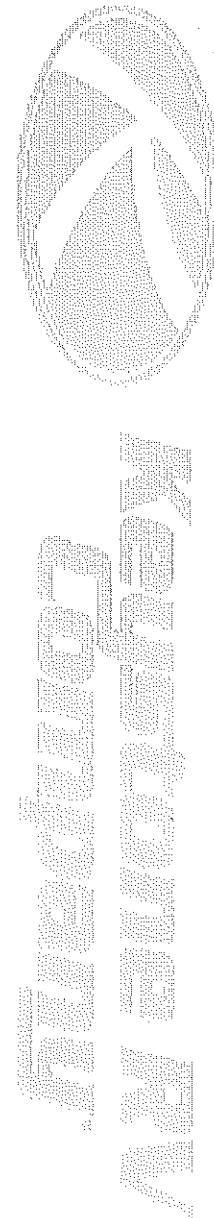
Water Supply and Odor

Water supplies sometimes contain high levels of sulphur, which causes an unpleasant smell, similar to rotten eggs. While unpleasant, the water is not harmful. Sanitizing the water system, as described earlier and allowing the sanitizing solution to remain for a few days, should eliminate the odor. Remember to thoroughly flush the system after sanitization. Adding a filtration system will help reduce such occurrences.

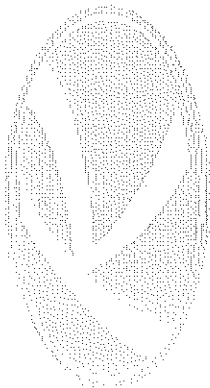
Draining and Storage

When not using for long periods or storing during the winter months, the water heater must be drained to avoid damage from freezing during the winter and / or deterioration of tank life from mineral content in water supplies.

To Drain the Water Heater



KEystone RV
CORPORATION



1. Turn off power to the water heater at the switch or the main breaker.
2. Shut off the gas supply and the water pump.
3. Open all fixtures, both hot and cold throughout the unit.
4. Place the bypass valve (if equipped) in the "by-pass" position.
5. Remove/open the exterior access door to the water heater.
6. Remove the anode rod from the tank. Water will drain out tank.

By-Pass Kit (Optional)

The by-pass kit is a popular convenience feature that allows for easier drainage of the hot water heater tank and winterization of the unit. The by-pass kit is installed near the cold water inlet of the water heater and allows for blockage of water flow into the water heater, saving time and reducing the amount of anti-freeze needed during winterization.

Monitor Panel

The monitor panel allows you to check the approximate liquid levels in the fresh water and the gray and black holding tanks. Dependent upon the type of monitor panel, 3 or 4 tanks can be monitored along with the charge condition of the battery. (The water heater switch is located on some models.)

Operation

Depress the button for the desired reading (tank or battery.) The levels readout for the tanks will read at Empty (E), 1/3, 2/3, or Full (F). All lights will be lit when full. The battery conditions are as follows:

- C Charge
- G Good
- F Fair
- L Low

Erroneous Readings

The monitor panel displays readings from sensors attached to the tanks. These sensors can send false readings when the following conditions occur:

1. Water with low mineral content. Minerals in water help conduct the electrical signal to the monitor display. Some water, which is very low in mineral content, may not conduct the signal properly. Although infrequent, this condition can exist. Check the panel reading when the fresh water tank is filled.
2. Material trapped on the sides of the holding tanks also may provide full readings when the tank is actually empty. Use of a spray to wash out the tank following dumping should help prevent this condition.
3. Grease build up on the sensor probes may indicate false readings or no readings at all. Avoid pouring any grease, oils or similar substances down drains or the toilet. If this occurs, wash the tank(s) out with soapy water.

Winterization

RV components can be damaged from the effects of freezing. Protection of the plumbing system and related components is crucial. Damages due to weather are not covered under warranty at any time. Many recreational vehicle owners choose to have their units winterized by their dealer, while others choose to do it themselves. Following are descriptions of two

methods used to winterize:

1. Compressed Air (Dry) Method

Uses compressed air to blow out any remaining water in the system after draining the system of all water. This method requires an air compressor and appropriate adapters.

2. RV Anti-Freeze (Wet) Method

Uses RV approved, nontoxic, potable, anti-freeze in the system and does not require any special tools.

Many Keystone products include an optional by-pass kit that allows the plumbing system to bypass the hot water heater, reducing the amount of anti-freeze that will be needed (by-pass kits are available at most RV service centers for a reasonable expense and can be installed during winterization). Without a by-pass kit installed, an additional 6 – 10 gallons of anti-freeze will be required.

On the following page are the procedures for both methods. Your local dealer is best suited to answering any questions as well as providing information on winterization and storage that may be particular to the climate in your area.

If using the compressed air method, a special adapter should be purchased to allow compressed air to be delivered through the city water fill. These adapters are available at most RV supply stores.

Method 1

Compressed Air
(With By-Pass Kit Installed)

1. Purchase 1-2 gallons of RV non-toxic anti-freeze.
2. Drain the fresh water tank and empty the waste water holding tanks* (see pg 6-12).
3. Turn water heater by-pass valve to by-pass position. (The by pass valve is located near the water heater incoming lines – an access panel may have to be removed depending upon the model.)
4. Drain water heater (see pg 6-6).
5. If installed, remove water filter from assembly and discard. Install diverter if included.
6. Open all faucets, including shower head sprayer, toilet flushing device and any other water lines that are closed.
7. Turn on the water pump for 30 seconds to clear out any water in the lines.
8. Connect an air hose with an adapter to the city water fill connection.
9. Set the pressure no greater than 30 pounds and blow out the water lines until no water can be seen coming out of the fixtures and lines.
10. Pour RV anti-freeze into drains, p-traps, toilet, and tanks.

Method 2

RV Anti-Freeze
(With By-Pass Kit Installed)

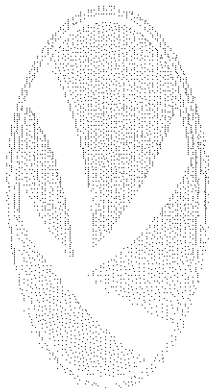
1. Purchase 4 -6 gallons of RV approved, non-toxic, anti-freeze.
2. Drain all tanks, fresh water and sewage tanks*(see pg 6-12).
3. Turn water heater by-pass valve to by-pass position. (The by



**For Winterization Procedures,
See the section "Winterization"
in this chapter.**

Keystone RV

Winterize RV Plumbing



pass valve is located near the water heater incoming lines – an access panel may have to be removed depending upon the model.)

4. Drain water heater.
5. If installed, remove water filter from assembly and discard. Install diverter if included.
6. Pour an amount of RV non-toxic anti-freeze into the fresh water tank to fill the tank above minimum water pump operating level. (Use of a long funnel may be helpful) Add more, if necessary, during procedure.
7. Turn on pump switch and open the cold water side of all faucet fixtures. Leave open until the anti-freeze comes out (generally, pink in color). Repeat for hot water side.
8. Flush toilet until anti-freeze begins to flow into the bowl and then pour one gallon of anti-freeze down the toilet to winterize the black tank.
9. Pour anti-freeze down each shower/tub, lavatory sink, and kitchen sink to fill p-traps.
10. To winterize gray tank(s) pour one gallon down each related sink drain.

De-winterization / Removal of Anti-freeze

If purchasing a coach which is winterized with RV anti-freeze, or having had an existing unit winterized before winter storage, the plumbing system must be flushed and sanitized prior to use. Do Not Attempt to turn on water heater if system is winterized. Perform the following prior to attempting to operate the water heater or use the plumbing system.

1. Drain all tanks, fresh water and sewage*
2. Attach garden hose to fresh water fill and fill tank.
3. Turn on pump switch and open cold water side of all faucet/shower fixtures. Leave open until water runs clear. Repeat for hot water side.
4. Flush toilet until clear water runs into bowl.
5. Dump tanks again.
6. Sanitize water system. (See page 6-3)
7. If a water filter is installed, drain lines, remove filter assembly, clean and reinstall with new filter.
8. When ready to use the water heater, turn by-pass valve to open position to allow water to enter hot water heater tank and fill according to instructions

Waste Water System

The wastewater system inside the recreational vehicle is self-contained, while on the road or set up in a campsite. The main parts of the waste system are the toilet, holding tanks and tank dump valves. As in residential households, the drainage system also includes p-traps and roof vents to allow escape of odors and gases.

Toilet

The toilet operates from water supplied either by the fresh water tank or from an exterior water supply connected at the city water hook-up. (The water pump must be turned on when utilizing the water from the fresh water tank.) The toilet flushes directly into the black water tank. Complete instructions and care for the model installed are located in the unit packet.

⚠ DANGER

DO NOT USE Automotive Anti-Freeze. Automotive Anti-Freeze is poisonous and not for use in potable water systems.

Solid Build-Up

The most common problem associated with the waste system is solid build up. Using plenty of water when flushing the toilet, and keeping the tank valves closed until ready to flush the system can reduce the risk of build up. Should you ever have a build up of solids, close the valves, fill the tanks about $\frac{3}{4}$ full with fresh water, drive a distance to agitate the solids and drain the tanks.

Do not put these items in toilet or drains

1. Facial tissues, paper towels, sanitary products (including those labeled flushable).
2. Detergents or bleach. Use a sewage tank deodorizer, available from dealer.
3. Automotive antifreeze, ammonia, alcohols, or acetones.
4. Grease from cooking, table scraps or other solids that may cause clogging.

Holding Tanks

Waste water is divided into two categories: *Black water* and *gray water*. The term black water refers to the waste flushed down the toilet and stored in a separate tank*, referred to as the *black tank*. Gray water is the wastewater from the sinks, tub and shower drains and is stored within one (or more) *gray tank(s)*. Waste tanks empty through a single outlet, but a separate valve controls each tank.

The dump valves should remain closed even if connected to an exterior sewer hook up. For proper dumping, empty tanks only when they are nearly full. The idea is to send a large volume of water through the tanks and hose at the same time to assist the solid waste in flushing from the system.

Dumping Instructions

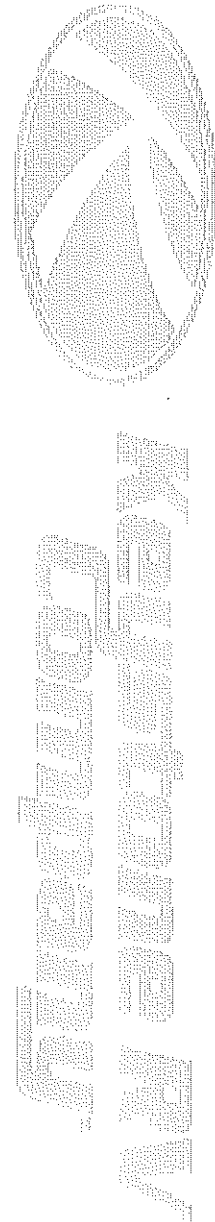
1. Twist off the termination outlet cap.
2. Connect the sewer hose by turning counterclockwise, locking the end levers over the termination end.
3. Place the other end of the sewer hose into an approved dump station inlet.
4. Open the black tank termination valve and drain.
5. Open the gray tank termination valve and drain. (If unit has 2 gray tanks, drain one at a time.) *
6. Close termination valves.
7. Disconnect sewer hose and store.
8. Replace termination cap on the outlet.
9. Add chemical deodorant / breakdown agent approved for RV use.

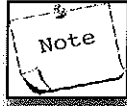
**If unit is equipped with the No-Fuss Flush System, perform flush at this time.*

After the sewage tank has been emptied, close the gate valves and put approximately five gallons of water in the sewage holding tanks. This will help prevent solids from building up. The addition of a deodorizing agent like Aqua-Kem® will help prevent odors.

No Fuss Flush (Optional)

If equipped, the no fuss flush kit has been installed to rinse the interior of the black tank. Similar to the water fills located on the exterior of the unit, a separate hookup is placed on the exterior.

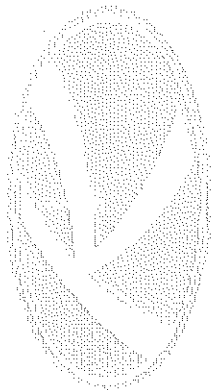




Wastewater tanks must be dumped at state approved locations.

Flush the tank after dumping by connecting the sewer hose and attaching a garden hose* to the inlet labeled *"Sewer Valve Must be Open When Using This Inlet"* OR *"Black Tank Flush."* Open the water supply to full pressure to flush tank. When water runs clear from sewer hose, shut off water supply and disconnect garden hose from source. Do not disconnect hose from flush inlet until water has drained from system.

WATERPROOF



Chapter 8 : Slide-Out Systems

Keystone uses basically three types of slide-room systems depending on the product application. For specifics concerning your type of system, please refer to the unit packet information.

Basic Slide-Out Tips

Ensure that your batteries are properly maintained and fully charged to avoid problems associated with low voltage. Limit the amount of 12 Volt lights and appliances in use when operating slide-rooms.

The recreational vehicle must be level to avoid binding the slide-rooms. Remember, leveling jacks are not capable of supporting the weight of you vehicle! They are intended only to stabilize the unit maintaining a level condition. Non-leveled conditions cause sticking situations providing damaging strains on the slide-out mechanism.

Weather and atmospheric conditions will in time cause rubber to deteriorate. The seals around slide-rooms should be regularly be inspected and replaced at the first sign of a problem. This maintenance is the owner's responsibility and is not covered beyond the terms of the unit warranty.

Slide-room adjustments and leveling are owner responsibility, which are not included in the warranty of your recreational vehicle. Professional setup and, adjustment, regular maintenance and replacement of weather seals will greatly extend the life of the unit. Weather seals, which are allowed to remain in service after deterioration will allow rain, snow, or ice to penetrate the roof and walls and will cause extensive damage. Inspect the seals twice a year and look closely for signs of cracking or damage.

Hydraulically Operated Systems

This system utilizes an electrical hydraulic pump operating on 12 Volts. The application will operate from battery power. A switch located inside of the recreational vehicle controls the application. These systems are extremely reliable however; in the event a problem should occur, user troubleshooting is limited. Please see the following page for simple troubleshooting tips.

See unit information packet for manufacturer operational instructions for the model installed.

System Operation

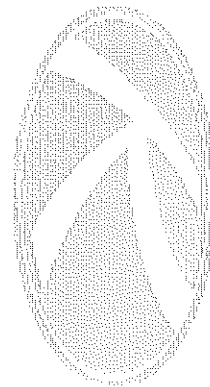
The HydraGear™ Slide-Out System uses a 12 Volt DC hydraulic pump which powers the double-acting hydraulic cylinder to move the room(s). Electricity for the pump assembly is supplied by the coach battery. Normal operation is performed by pressing the wall mounted slide-out switch to extend or retract the room.

Care and Maintenance

Preventive care and maintenance is an important part of keeping your system at peak performance. Care begins with checking the level of the hydraulic fluid in the pump prior to operation and making sure the breather cap is free of any debris. The pump uses type A automotive transmission fluid (ATF) and the see-through reservoir makes checking the level easy. For the best performance the fluid level should be within ½" of the top with the room retracted (closed). During operation and while checking

WARNING

Before operating the slide-room, assure there are no objects (or people) in the path of the room or the Slidetopper™.



Keystone RV

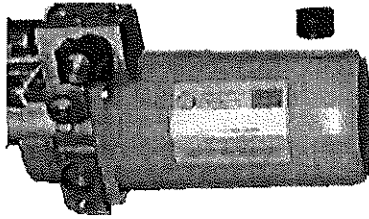


During extended travel stays, move the room in and out once or twice a week to help keep the seals and internal moving parts lubricated.

During long-term storage periods, it is advised to have the room retracted.

fluid levels, check for any visible signs of a hydraulic fluid leak. If a leak is suspected, call your dealer for further instructions.

Filling the Pump with Hydraulic Fluid



Breather Cap removed to fill reservoir

With the room retracted, locate the reservoir on the pump
Remove the breather cap.

Using Type A automotive transmission fluid (ATF), fill the reservoir within 1/2" of the top. (Do not allow any contaminants to enter the system while filling.)

Replace the breather cap, making sure it is free of any debris.

Electrical Maintenance

Electrical maintenance is also essential to the smooth operation of the slide-out system. Full battery current and voltage is essential for optimum performance. Regularly check the terminals of the battery, the control switch and the pump motor. Look for signs of any corrosion or loose or damaged terminals and connections from environmental conditions, as well as, road debris and vibration.

Manual Override to Retract or Extend the Slide-Out Room

The HydraGear™ system can be manually overridden in cases of hydraulic system failure or when electrical power is either interrupted or unavailable. See the HydraGear™ instruction manual for details on how to retract and extend the room with an auxiliary power source.

Electrically Operated Systems

The Lippert Electric Slide-out System uses a 12 Volt DC motor to power the rack and pinion style slide system room(s). Electricity for the motor assembly is supplied by the coach battery. Normal operation is performed by pressing the wall mounted slide-out switch to extend or retract the room.

Care and Maintenance

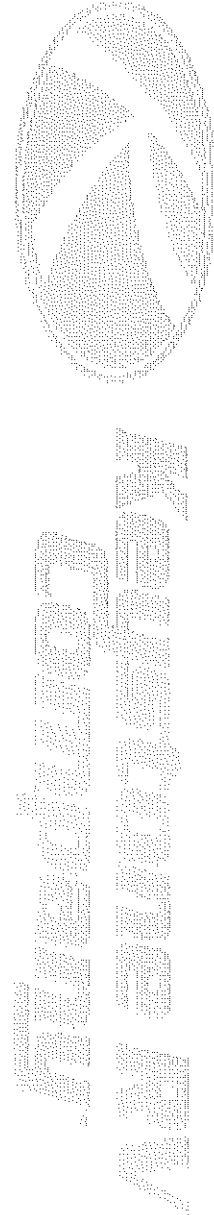
When operating the Lippert Electric Slide-out System™ it is recommended that the moving parts be kept clean, especially when operating in harsh climates or environments. Road salt, ice, sand, and salt water climates are examples of such conditions. The moving parts can be washed with a mild soap and water solution. Slide-out care does not require any grease or lubrication. Use of any grease or lubrication may effect the long term dependability of the system.

Electrical Maintenance

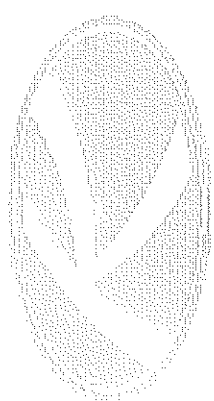
Electrical maintenance is also essential to the smooth operation of the slide-out system. Full battery current and voltage is essential for optimum performance. Regularly check the terminals of the battery, the control switch and the pump motor. Look for signs of any corrosion or loose or damaged terminals and connections from environmental conditions, as well as, road debris and vibration.

Manual Crank Option

The Lippert Electric Slide-Out System™ comes with a manual override system. This option can be utilized in case of power interruption or system failure. Detailed instructions on using this option can be found in the manual for this slide-out system.



Коллекция
New Europe



Chapter 9: Care and Maintenance

The instructions and recommendations located within this manual and the accompanying manufacturer's component literature should be read, as failure to perform necessary or preventative maintenance may limit or void all or part of a specific warranty.

Care and maintenance of the recreational vehicle is an important step in maintaining the safety, dependability and the appearance, both interior and exterior, of the unit. Keep good records of all maintenance performed as these may be necessary for warranty information or may assist in possible repairs needed.

Operational usage and climates may affect the frequency of maintenance needed on certain components. Preventative maintenance is important to the life and enjoyment of any recreational vehicle as many problems can be caught before they occur. Please do not hesitate to call your dealer with a question on the maintenance or care of any item.

The care and maintenance of appliances are discussed within the appliance chapter. Always refer to the manufacturers recommendations located within the literature contained within the unit packet.

Exterior

Fiberglass / Gel Coat Finish

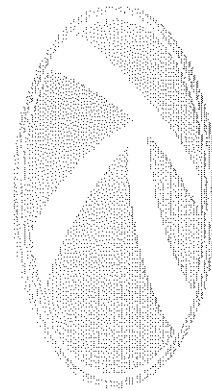
Care of the Filon™ finish is similar to caring for a new car. Any finish will deteriorate over time. Exposure to extreme sunlight, pollutants, and excessive moisture can cause dulling, fading and yellowing. Regular washing and periodic waxing will help maintain the glossy new look. When washing, use a mild, automotive or RV wash solution, available at your dealer, being sure to rinse off any loose debris first. Avoid spraying water directly into the furnace and refrigerator vents. Waxing the Filon™ areas twice a year is recommended. Wax with an automotive wax or polish developed for boats. Follow all directions by the wax manufacturer carefully and remember to wash and wax out of direct sunlight and when surfaces are cool.

Metal

The aluminum exterior has a baked on enamel finish. Washing frequently with an automotive or RV wash solution will help avoid staining from debris and soil build up. Always rinse unit with clear water prior to washing to remove any loose dirt. Waxing two to three times a year with a good automotive paste wax will help preserve the finish

DO'S and DON'TS

- Do Use Automotive / Marine grade non-abrasive waxes.
- Do Use Soft cloths to clean and wax
- Do be careful around graphics. Wax and wash with the graphic, not against it.
- DO NOT USE products containing ammonia or caustic harsh cleaners as they may cause discoloration to the fiberglass surface.
- Do Not use high-pressure washers, rotating brushes, such as in car washes, and power buffers. Use of these products can damage graphics and/ or paint finishes.
- Do not dry wipe surfaces
- Do not use rubbing compounds



Keystone RV

**WARNING**

The rubber roofing material, when wet, may be slippery. Always use caution when working on top of the RV.

ABS Plastic / Molded Parts

Some components of Keystone products are constructed of strong ABS molded plastic. A mild solution of soap and water should be used when cleaning. When using any product, make sure the product is recommended for use on plastics. Avoid harsh abrasive cleaners, ammonia or citric-based products as discoloration may result.

Carefully read the component manufacturer's manual for complete instructions and any applicable safety instructions, provided in the unit packet, prior to performing any maintenance.

Roof

The Brite-Ply™ roofing system is a polymer membrane that will not rust or corrode and is quieter than metal roof systems. The rubber roof material itself does not require annual coatings or additional sealants. Wrinkles may develop in the material due to expansion and contraction from heating and cooling but this does not affect the integrity of the roof and is not a cause for concern.

The roof material can, however, be cut by sharp objects. Use caution when walking on or loading articles on the roof. Care is needed when driving or parking to avoid punctures. If damage does occur, the roof may be patched with a special kit available through your dealer. If accessories or new equipment is added, be sure the installer is qualified to work on the rubber roof material.

Maintenance

Inspect the roof at least every 90 days, paying particular attention to the seams where the areas of sheet metal, moldings, rubber and/or fiberglass are joined. Carefully inspect the sealant around any vents, skylights, air conditioners, etc.

Exposure to the elements will cause sealants to deteriorate over time. Variations in climate and weather may accelerate deterioration. Inspection and periodic resealing is essential as preventative maintenance. If cracks or shrinkage is noticed, immediately follow the rubber roof manufacturer's recommendations for repair or resealing. Special sealants are used due to the composition of the roofing material. For the appropriate sealant, please see your dealer.

Cleaning

Prior to cleaning the roof, rinse the roof off to remove any debris. Be sure to keep the sidewalls wet to reduce streaking. Standard household detergents can be used for normal cleaning. Do not use petroleum solvents, harsh abrasives or citric-based cleaners that can damage the membrane. Appropriate cleaners such as Dicor Roof Cleaner™ are available through your dealer. Remember to rinse thoroughly after cleaning.

For stubborn stains, a cloth dampened with mineral spirits is suggested. Do not, however, pour mineral spirits directly onto the roof material or allow a stain to "soak". Keeping the roof free of debris and clean will help prevent staining. Avoid parking in areas where fruit or tree sap may fall and remain directly on the roof for extended periods, causing irremovable stains.

Seals and Adhesives

The seals and adhesives used perform an important job, keeping out an RV enemy – water. Close inspection and routine maintenance are crucial to the longevity of the trailer. While many types are used, none have a pre-set lifetime, as exposure to the elements and regional variances of climate can accelerate any sealants deterioration. Therefore, every six months, inspection of all seals is recommended and a quick inspection prior to every trip will help reduce potential problems down the road.

When inspecting, check for cracks, voids, shrinkage, or any sign of deterioration. If any of these signs are noticed, have your dealer inspect and replace the sealant if necessary. It is important to use the same kind of sealant that was previously used.

Windows (Exterior)

As with seals, check the sealant around the windows at least once every six months. If any interior leaks are noticed, contact an authorized dealer immediately. To ensure window operation, adjust and lubricate latches and any moving parts annually. A light oil or powdered graphite can be used for lubrication. Periodically use a vacuum attachment to clean any debris out of the window weep holes, which are necessary to drain any condensation or moisture from hard driving rains that may collect.

Frame and Chassis

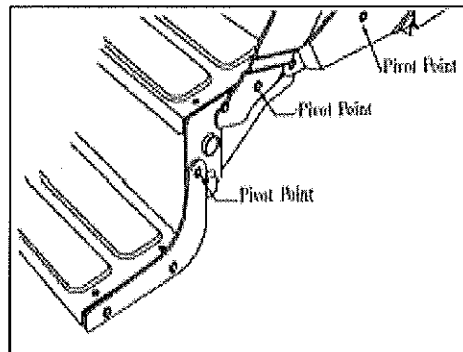
Frame and Bumper

Over time, weather and climate such as rain, snow, salt, etc lead to corrosion. Rinse the undercarriage, wheel wells, hitch and bumper when needed to remove dirt, oil, tar, salt and other debris. Periodically inspect for rust. Near coastal regions, inspect more frequently. If needed, lightly sand and repaint with a rustproof enamel.

Steps

Clean regularly to remove dirt, salt, mud, etc. and lubricate pivot points with a quality automotive grade lubricant every 30 – 60 days.

Seal any nicks or scratches with primer and then cover area with a quality high-gloss paint to prevent rusting. If rust is noticed, sand the area lightly and then cover with primer. Follow with high gloss paint.

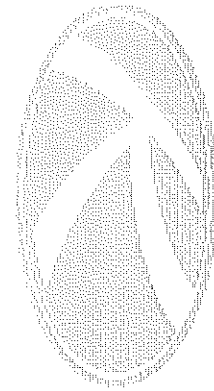


Hitch Couplers

Inspect prior to each trip. The ball socket and clamp should be cleaned and lubricated monthly with wheel bearing grease. If coupler or coupler components appear damaged or worn, contact your dealer upon notice of the problem.

Fifth-Wheel Coupler

Inspect monthly or prior to each trip. The hitch plate and locking mechanism should be generously lubed with a high temperature rated



**Kodiak
Construction
RV**



If equalizer (weight distribution) bars are attached to vehicle while attempting to operate a power tongue jack, the motor may clutch and/ or seize upon attempting to bear the load. Damage to the jack under these circumstances will not be covered by Keystone RV Company or the jack manufacturer.

grease at all times. Consult the paper work that accompanied the hitch purchase for manufacturer recommendations.

Safety Chains

Safety chains should be inspected monthly. If chains are damaged or weakened, replace immediately. Never tow without use of the safety chains.

Carefully read the component manufacturer's manual and any safety instructions, provided in the unit packet, prior to performing any maintenance

Jacks

- Tongue Jacks, Manual (travel-trailers)

Whenever preparing to travel, inspect the jack for any damage and test operation. If jack is difficult to operate, clean and oil lightly. If jack is still difficult to operate or freezes, call your dealer. Service on any jack should be performed by qualified service personnel only.

- Tongue Jacks, Power (travel-trailers)

Prior to traveling, inspect the jack for any damage and test operation. Check connections at battery and keep contacts clean and secure. If the power jack malfunctions at any time, call a local dealer. Service on all power jacks should be performed by trained service personnel.

- Fifth-Wheel Jacks

Prior to each use inspect drop tube and inner ram tube. Replace or repair as required per component manufacturer instructions. Follow all preventative maintenance instructions provided on the specific component installed. If malfunction occurs, immediately call your local dealer. Service on any jack should be performed by qualified service personnel only.

Carefully read the component manufacturer's manual and any safety instructions, provided in the unit packet, prior to performing any maintenance

Tires and Wheels

The tires should be checked before starting out on any trip (See chart on following page). Check them regularly and keep inflated to recommended pressures. The recommended tire pressure is on the side of the tire. A tire gauge is a very inexpensive and valuable tool for checking tire inflation. Rotate the tires at least once every 5,000 miles. You may want to have a spare tire with you in case of an emergency.

All travel-trailers and fifth-wheels are equipped with tubeless tires. They are designed for today's turnpike speeds are rated to carry the weight of the trailer plus your family's personal needs for an extended vacation. If you should require an adjustment on a fault or defective tire, secure the name of the nearest tire dealer or distributor and request an adjustment according to the conditions and terms of the tire warranty.

! DANGER

Some procedures require the use of special tools for safe and correct maintenance. Do not attempt to service, repair or work on any axle, brake, or wheel system unless you have appropriate skills and knowledge. Lack of proper training, failure to follow procedures or use special tools and safety equipment could result in property damage, serious injury or loss of life.

Tire Changing Basics

1. Use emergency flares when near a road or highway.
2. Block the wheels on the opposite side from the tire you wish to change to prevent accidental movement.
3. Position a hydraulic jack on the frame close to the spring hanger. (Never attempt to use a stabilizer jack to lift the unit)
4. Raise the trailer until the tire clears the ground.

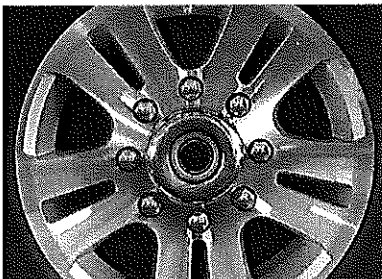
Tire Inspection

The chart below is a useful guide for use during inspections. When replacing tires consult the wheel and tire manufacturers' specifications for compatibility.

Wheel Nut Torque

The information contained in these printed instructions outlines the most recently recommended processes involving Lug Nut Torque and takes precedent over any information regarding Lug Nut Torque shown in your Keystone, Dexter or AL-KO Owners' Manuals.

The axle and wheel assemblies of your RV are designed differently than those on your car. The overall size, weight and center of gravity of a recreational vehicle subject the wheels to pressures unique to trailering. During normal cornering, the tires and wheels experience a considerable amount of stress called "side-load". Therefore, the lug nuts on your recreational vehicle require periodic retorquing.



These instructions will show you how to maintain proper lug nut torque by following these important steps:

1. Check torque before every trip
2. Use proper tools
3. Follow the appropriate star pattern sequence (at right)
4. Torque lug nuts in the correct stages and follow-up intervals after any wheel reinstallation.

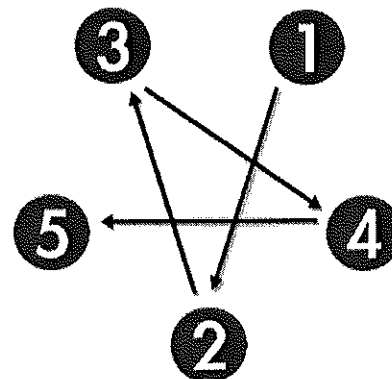
| STEP 1 | Wheel Reinstallation | STEP 2 | Follow-up |
|--------|----------------------------------------------|--------|----------------------------------------------|
| 1 | 20-30 ft/lbs 50-60 ft/lbs (Cambridge) | 3 | 110-120 ft/lbs 140-150 ft/lbs (Cambridge) |
| 2 | 55-60 ft/lbs 90-100 ft/lbs (Cambridge) | | |
| 3 | 110-120 ft/lbs 140-150 ft/lbs (Cambridge) | | |

Re-torque after first:
10 miles → 25 miles → 50 miles

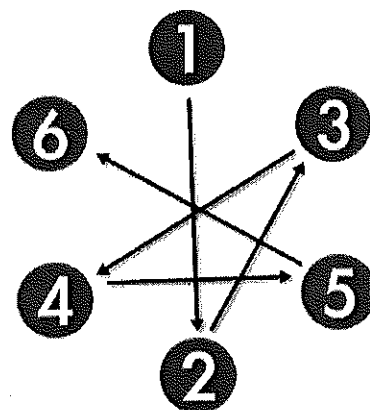
For further information on these steps, you may want to refer to the axle manufacturer's owner's manual that accompanied your unit.

Remember, torque is the amount of rotating force applied to a fastener, such as a lug nut. Proper torque of lug nuts can only be achieved by using a torque wrench and a socket.

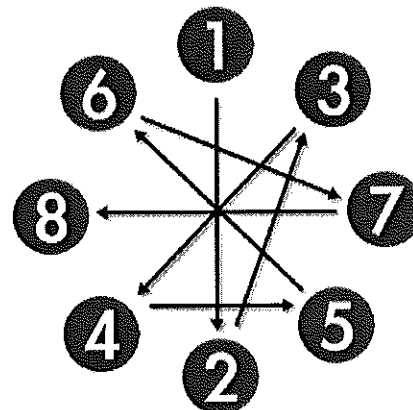
- Dial indicator or Adjustable dial torque wrench
- 7/8" or 13/16" socket



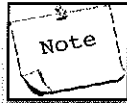
5 Hole Star Pattern



6 Hole Star Pattern



8 Hole Star Pattern



Some wheel assemblies require an extension. **DO NOT USE** a flexible extension. Also, **DO NOT USE** a 4-way socket or any other type of wrench (Figure E), which **does not** measure the actual pressure applied to the lug nut.



If uncertain or unfamiliar with any procedure, please call your local dealer.

WARNING

WHEEL SEPARATION CAN OCCUR

On the first trip, check for the proper torque every 10, 25 and 50 miles traveled in your coach. This procedure should also be repeated every time a wheel is replaced.

WARNING

Always torque wheel nuts to the wheel manufacturer's specifications. Over or under-torqued wheel nuts can cause the wheel to separate from the wheel mounting surface during operation, causing property damage, personal injury or loss of life.

Using Torque Wrenches:

- Most torque wrenches are required to be set at "0" when not in use to maintain calibration.
- Please refer to the manufacturer's instructions for further information on use and maintenance.

Setting Torque Value on a Dial Indicator Wrench:

1. Make sure your indicator needle is set to "0".
2. As you apply clockwise pressure to the lug nut, both needles will show the current amount of torque being applied.
3. When you reach your desired torque value, stop applying pressure and your indicator needle will stay at the highest torque value reached.

Setting Torque Value of Adjustable Dial Wrench:

1. Unlock the handle and set the dial to your desired torque value.
2. Lock the handle back in place.
3. As you apply clockwise pressure to the lug nut, you will hear and audible "click" when the desired torque wrench value is reached. Do not apply further pressure once you hear the "click".

Always remember:

- Check lug nut torque before every trip. Keystone RV recommends this maintenance procedure to ensure proper torque has been applied to lug nuts before heading out on the road.
- Lug nuts should be torqued to 110-120 ft/lbs on all units except for the Cambridge, which requires 140-150 ft/lbs. This is due to the use of a 9/16" stud versus a half inch stud used on other units.
- Always follow the appropriate star pattern as indicated on the previous page or in your axle manufacturer's owner's manual to assure proper torque.

Pre-Trip Procedure:

1. Set your torque wrench to 110-120 ft/lbs (140-150 ft/lbs for the Cambridge).
2. Begin with the appropriate bolt for your wheel (12 o'clock position for 8 and 6 hole wheels and 2 o'clock position for 5 hole wheels, as illustrated) and apply torque to all lug nuts following the star pattern indicated.
3. Complete the procedure on each wheel. Before moving to each new wheel, be sure to verify your preset torque wrench value.

After removing a wheel from your RV for any reason, you must carefully follow a 2 step process:

- 1) Wheel Reinstallation
- 2) Follow-up

Step 1) Wheel Reinstallation

- During wheel reinstallation, the lug nut torque must be applied in 3 stages. This will ensure the wheel studs are centered in the wheel holes, and will help the lug nuts maintain proper torque.

3 Stage Installation

- 1 20-30 ft/lbs
50-60 ft/lbs (Cambridge)
- 2 55-60 ft/lbs
90-100 ft/lbs (Cambridge)
- 3 110-120 ft/lbs
140-150 ft/lbs (Cambridge)

1. Start all lug nuts by hand.
2. Stage 1: Set your torque wrench to 20-30 ft/lbs (50-60 ft/lbs for the Cambridge, which uses a 9/16" versus 1/2" inch stud).
3. Begin with the appropriate bolt for your wheel (12 o'clock position for 8 and 6 hole wheels and 2 o'clock position for 5 hole wheels, as illustrated) and apply torque to all lug nuts following the star pattern indicated on the previous page.
4. Stage 2: Increase your torque wrench setting to 55-60 ft/lbs (90-100 ft/lbs for the Cambridge).
5. Begin with the appropriate bolt for your wheel and apply torque to all lug nuts following the star pattern indicated in Figure H.
6. Following stage 2, the wheel can support the weight of the trailer and can be lowered off of the jack stands.
7. Stage 3: Increase your torque wrench setting to 110-120 ft/lbs (140-150 ft/lbs for the Cambridge).
8. Begin with the appropriate bolt for your wheel (as illustrated) and apply torque to all lug nuts following the star pattern indicated on the previous page.

Step 2) Follow-Up: Retorque after 10, 25, and 50 miles:

1. After the first 10 miles of your trip, pull your recreation vehicle off the road into a safe work area.
2. Set your torque wrench to 110-120 ft/lbs (140-150 ft/lbs for the Cambridge).
3. Begin with the appropriate bolt for your wheel and apply torque to all lug nuts following the star pattern indicated in Figure H.
4. Reapply torque (at 110-120 ft/lbs or 140-150 ft/lbs for the Cambridge) and repeat steps 1, 2, & 3 again at 25 miles and at 50 miles of your first trip.
5. The follow up process is complete and you should refer to the general lug nut torque maintenance process described in section C "Pre-Trip Maintenance".

Summary

1. Check torque before every trip
2. Use proper tools
3. Follow the appropriate star pattern sequence
4. Torque lug nuts in the correct stages and follow-up intervals after any wheel reinstallation

Wheel Bearing Lubrication

Wheel bearings should be repacked every 6000 miles or every 6 months. Every time the wheel hub is removed, the wheel bearings must be adjusted. Turn the hub slowly to seat the bearings while tightening the spindle nut until the hub will no longer turn. Loosen the spindle nut so it may be turned by hand. Tighten nut finger tight then loosen to first hub slot allowing alignment. Install cotter pin.

The spindle nut and hub should be free to move with the cotter pin being the only restraint.

Prepare bearings by cleaning with solvent to remove the old grease. Repack by pressing fresh bearing grease into bearing roller area. Repack bearings more often if subject to extremely wet conditions. If trailer has not been used for more than 2 months, the wheel bearings should be inspected and repacked if necessary.

Repack bearings using a high temperature, automotive type wheel bearing grease produced by a reputable manufacturer. The soap type

WARNING

Do not tow the trailer with missing lug nuts or faulty lug bolts.

WARNING

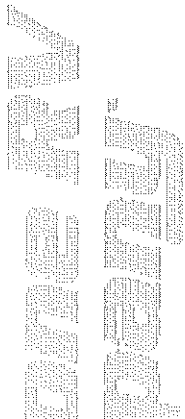
It is critical that the wheels be properly torqued every 50 miles during the first 200 miles of road operation. Although the wheels have been properly torqued before leaving the manufacturing plant, settling and wearing in of components during the first few miles of operation may cause some loosening of the wheel nuts.

DANGER

Installation of wheels which are not compatible with the manufacturer installed axle assembly could result in wheel separation, which can lead to property damage, serious injuries or loss of life.



When storing a battery, do not place the battery directly on concrete, as the battery will discharge more rapidly.



WARNING

The acid in batteries is highly corrosive and hydrogen gas is produced which is extremely flammable. Avoid placing near a possible ignition source such as open flame or potential spark producing wiring.

WARNING

Before performing any maintenance on the battery, always disconnect the battery, removing the negative (-) cable first and then disconnecting the positive (+).

WARNING

Always disconnect the negative (-) cable prior to working near batteries to reduce risk of arcing and igniting.

should be polyurea, lithium complex or equivalent. Use a NLGI Grade 2 product with a minimum dropping point of 440F.

ULTRULUBE®

If the Recreational Vehicle is equipped with Ultrulube, there is no need to lift the RV prior to greasing axles. To grease follow these simple steps:

1. Remove the rubber plug from the grease cap
2. Insert grease gun on the grease zerk
3. Pump until new grease begins to appear
4. Replace rubber plug

Hubs and components still need to be inspected and maintained per the manufacturer's guidelines.

Carefully read the component manufacturer's manual and any safety instructions, provided in the unit packet, prior to performing any maintenance.

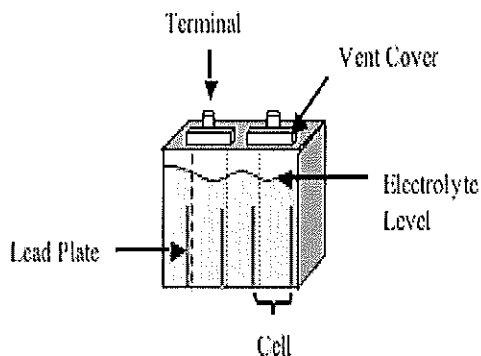
Brake Adjustment

The electric brakes are of the drum and two-shoe type and adjust the same as most automotive brakes. Adjust brakes after the first 200 miles. Every 3 months or 3000 miles, test the brake drag and adjust if required. Full procedures are outlined in the component manufacturer's guide, included in the unit packet. Never adjust just one brake. When adjusting brakes on any vehicle, either replace or adjust all brakes at the same time, or at least both brakes on the same axle.

Battery

Before performing any maintenance on the battery, always disconnect the To inspect the electrolyte level, remove the vent covers and visually ascertain the electrolyte level in each cell, using a small flashlight may help. (If a maintenance free battery has been purchased – no way exists to check these levels.) If the level needs to be replenished in any or all cells, carefully pour in distilled water only. Never use acid or tap water. Tap water contains minerals and chemical impurities that will permanently damage the battery.

Besides maintaining the electrolyte level, visually inspect the battery for loose terminals, corrosion, or any damage to the vent covers or case. Tighten any loose clamps on the terminals of the battery and clean any corrosion off the terminals. An inexpensive device for cleaning these terminals can be purchased at automotive stores.



When working with batteries, be extremely careful. The acid in batteries is highly corrosive and flammable. Batteries produce a flammable hydrogen gas that will explode if ignited. Never place batteries in any compartment or near anything that could spark, even a 12 Volt switch. Never smoke or use open flames anywhere near the battery. Secure batteries in a battery box or in a compartment specially designed for battery storage. Wear safety glasses and appropriate clothing when performing any

maintenance on a battery. In case of a spill or splash, immediately flush the affected area with cold water for 15 minutes and call the poison control center for further instructions.

Battery Storage

When storing the RV for an extended period, fully charge the battery before storage. Batteries will self-discharge over time and are subject to freezing, especially if in a discharged condition. Inspect batteries while in storage every 2 to 3 weeks. Hook up a battery charger at least once a month to prevent discharge and sulfation. An easy solution is to remove the battery completely from the unit during storage and place it at home in a warmer location, such as a garage, so that the battery condition can be monitored and charged as needed during storage periods.

Appliances: See Chapter 4

Bedspreads

Refer to the label attached to the bed spread by the manufacturer. Care instructions should be given. In most instances or whenever in doubt, dry – clean all fabric products such as drapes and bedspreads for best appearance and prolonged life. Washing draperies and bedspreads in washers will cause premature deterioration, fading, shrinkage and / or possible damage.

Blinds and Shades

Venetian blinds and day / night shades should be vacuumed regularly with a soft brush attachment. Use of a soft cloth and mild cleaner on blinds will help keep them new looking. For fabric shades, upholstery cleaners are not recommended. Instead, spot clean when necessary, using a mild soap and water solution on area.

Cabinet Doors and Drawers (Wood)

The cabinet doors and drawer fronts are solid wood and should be cared for similar to the fine furniture in your home. Using a quality furniture polish will help maintain the beauty and luster of the wood as well as keep the wood from drying out. The accidental scratches can be covered satisfactory with a good quality commercial furniture scratch remover.

Carpeting

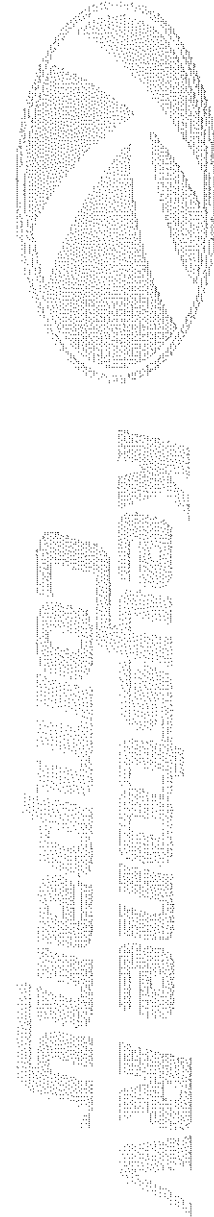
The carpeting installed is made of nylon and is easy to maintain. Vacuum regularly to remove abrasive grit. Water based spills and spots should be removed immediately with a damp cloth. Grease or oil based stains and spots should be spot cleaned with a good commercial spot cleaner made for this purpose. If complete shampooing is desired, it is best to have it done by a competent professional carpet cleaner. Never soak or water-log your carpeting.

Ceilings and Walls

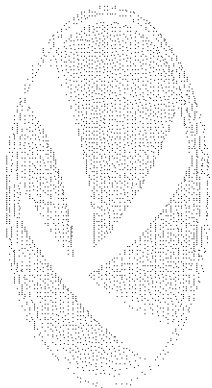
Clean only with a mild detergent in warm water, using a damp cloth to clean the ceiling. Never use strong chemicals or excessive water / moisture, as either can damage the ceiling or walls.

Countertops

Most countertops are made of high-pressure plastic laminates and are highly resistant to normal spills and scuffs. Soap and lukewarm water or



KESKONNE RV
CORPORATION



a mild, non-abrasive cleaner are recommended. Avoid use of abrasive pads and scouring powders, which can dull the surface and make it more stain-prone. Always use a chopping block or cutting board when using knives. Pots and pans straight from the burner or oven should be placed on lined hot pads and not directly on the counter surface.

Solid Surface Countertops

The solid surface composite countertops in the Montana series can be cleaned with soap and mild detergents, which will remove most stains. Do Not Use products containing bleach. Stubborn stains may require the use of a white Scotch Brite pad and a non-abrasive cleaner like Soft Scrub. Scratches may be removed carefully using a green Scotch Brite pad and an abrasive cleaner like Ajax or Comet. Cover an area large enough to blend the area needing repair, using a circular motion while applying.

Laminate Countertops

The countertops in the Outback series use Korad™ laminates. Dust and clean with a soft, damp cloth or chamois, wiping surface gently. Use pure soap and lukewarm water to clean. The manufacturer also suggests cleaners, like 409™ or Fantastik™. (A complete list can be found in the unit packet.) Strong soaps and abrasive cleaners should not be used. Light scratches can be removed by waxing with Simonize™ wax.

Draperies

Draperies and upholstery fabrics should always be dry cleaned like any other fine fabric by a competent dry cleaning establishment. Many window treatments and bedspreads are fire retardant. When dry cleaning, be sure to inform attendant of fire retardant items. Spots and stains should be removed with a non-water based commercial spot remover manufactured for this purpose.

Faucets and Fixtures

To protect the finishes on your kitchen and bath faucets and fixtures, use only a damp soft cloth or sponge. Do not use abrasive cleaners or materials as they can damage the finish.

Flooring, Vinyl

For routine cleaning, sweep or vacuum regularly. Follow by using a damp mop with warm water and clean a small area at a time. Rinse the mop frequently as to not redistribute the dirt picked up. If washing is needed, use a quality product designed for no-wax flooring. To polish the floor, do not use solvent-based waxes or polishes as damage to the flooring may result. Use only polishes recommended for no-wax flooring.

Flooring, Plank

For routine cleaning, sweep or vacuum regularly to remove loose dirt / grit. Lightly soiled floors can be damp-mopped with clear water. Do not use cleaners that contain abrasives or solvents or promise one-step "mop and polish". Permanent damage may result from use of these cleaners. Wipe up any spills immediately. Certain inks, mustards, polishes, tars, paints, varnishes etc., can cause stains. If normal clean up does not remove the substance, use a cloth dampened with mineral spirits and wipe lightly. DO NOT USE MINERAL SPIRITS NEAR A FIRE HAZARD

Glass and Mirrors

Clean glass and mirrors as you would at home using a cleaner designed

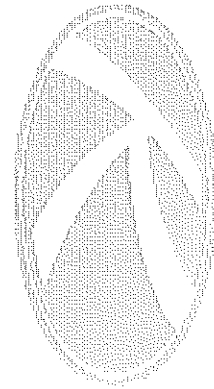
for glass. To reduce "spotting" on outside windows, use a squeegee promptly after rinsing with water. For stubborn spots, cleaning with a mixture of vinegar and water is recommended and is safe for most finishes.

Fabric and Upholstery

Do not laundry upholstery fabrics. Blot up stains promptly and use an upholstery cleaner or mild solvent, depending on the stain. Never soak the fabric and use as little water as possible. Blot rather than rub. Towel dry or have professionally cleaned. Upholstery can be vacuumed regularly using a soft brush attachment.

Sinks, Tubs and Toilets

Many of these products are made of acrylics, plastics or composite materials and use of non-abrasive cleaners is recommended to protect the finish. Use of harsh cleaning products can cause premature deterioration and/or yellowing of the surface finish.



**Keystone RV
Company**

Chapter 10: Tire Safety Information

This portion of the Owner's Manual contains tire safety information as required by 49 CFR 575.6.

Section 1, based in part on the National Highway Traffic Safety Administration's Brochure entitled "Tire Safety-Everything Rides on It," contains the following items:

Tire labeling, including a description and explanation of each marking on the tires, and information about the DOT Tire Identification Number (TIN).

Recommended tire inflation pressure, including a description and explanation of:

1. Cold inflation pressure
2. Vehicle Placard and location on the vehicle
3. Adverse safety consequences of under inflation (including tire failure)
4. Measuring and adjusting air pressure for proper inflation

Tire Care, including maintenance and safety practices.

Vehicle load limits, including a description and explanation of the following items:

1. Locating and understanding the load limit information, total load capacity, and cargo capacity.
2. Calculating total and cargo capacities with varying seating configurations including quantitative examples showing/illustrating how the vehicles cargo and luggage capacity decreases as combined number and size of occupants' increases. This item is also discussed in Section 3.
3. Determining compatibility of tire and vehicle load capabilities.
4. Adverse safety consequences of overloading on handling and stopping on tires.

Section 2 contains "Steps for Determining Correct Load Limit"

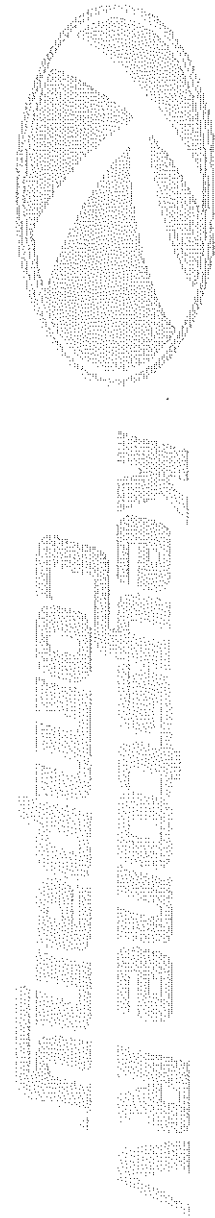
Section 3 contains a Glossary of Tire Terminology, including "cold inflation pressure", "maximum inflation pressure", "recommended inflation pressure" and other non-technical terms.

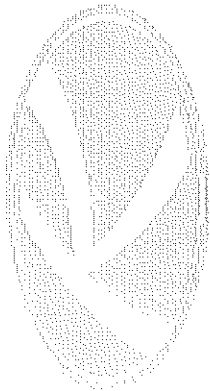
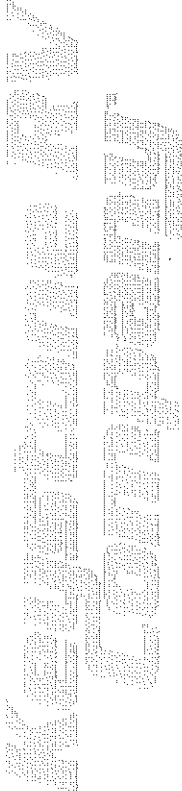
SECTION 1

The National Traffic Safety Administration (NHTSA) has published a brochure (DOT HS 809 361) that discusses all aspects of Tire Safety, as required by CFR 575.6. This brochure is reproduced in part below. It can be obtained and downloaded from NHTSA, free of charge, from the following web site:

http://www.NHTSA.dot.gov/cars/rules/TireSafety/ridesonit/tires_index.html

Studies of tire safety show that maintaining proper tire pressure, observing tire and vehicle load limits (not carrying more weight in your vehicle than your tires or vehicle can safely handle), avoiding road hazards, and inspecting tires for cuts, slashes, and other irregularities are the most important things you can do to avoid tire failure, such as tread separation or blowout and flat tires.





These actions, along with other care and maintenance activities, can also:

- Improve vehicle handling
- Help protect you and others from avoidable breakdowns and accidents
- Improve fuel economy
- Increase the life of your tires.

This booklet presents a comprehensive overview of tire safety, including information on the following topics:

- Basic tire maintenance
- Uniform Tire Quality Grading System
- Fundamental characteristics of tires
- Tire safety tips.

Use this information to make tire safety a regular part of your vehicle maintenance routine. Recognize that the time you spend is minimal compared with the inconvenience and safety consequences of a flat tire or other tire failure.

Safety First - Basic Tire Maintenance

Properly maintained tires improve the steering, stopping, traction, and load-carrying capability of your vehicle. Under-inflated tires and overloaded vehicles are a major cause of tire failure. Therefore, as mentioned above, to avoid flat tires and other types of tire failure, you should maintain proper tire pressure, observe tire and vehicle load limits, avoid road hazards, and regularly inspect your tires.

Finding Your Vehicle's Recommended Tire Pressure and Load Limits

Tire information placards and vehicle certification labels contain information on tires and load limits. These labels indicate the vehicle manufacturer's information including:

- Recommended tire size
- Recommended tire inflation pressure
- Vehicle capacity weight (VCW—the maximum occupant and cargo weight a vehicle is designed to carry)
- Front and rear gross axle weight ratings (GAWR— the maximum weight the axle systems are designed to carry).

[For TT] Both placards and certification labels are permanently attached to the trailer on the forward half of the left side, and are easily readable from outside the vehicle without moving any part of the vehicle. You can also find the recommended tire pressure and load limit for your vehicle in the vehicle owner's manual.

Understanding Tire Pressure and Load Limits

Tire inflation pressure is the level of air in the tire that provides it with load-carrying capacity and affects the overall performance of the vehicle. The tire inflation pressure is a number that indicates the amount of air pressure— measured in pounds per square inch (psi)—a tire requires to be properly inflated. (You will also find this number on the vehicle information placard expressed in kilopascals (kPa), which is the metric measure used internationally.)

Vehicle manufacturers determine this number based on the vehicle's design load limit, that is, the greatest amount of weight a vehicle can safely carry and the vehicle's tire size. The proper tire pressure for your vehicle is referred to as the "recommended cold inflation pressure." (As you will read below, it is difficult to obtain the recommended tire pressure if your tires are not cold.)

Because tires are designed to be used on more than one type of vehicle, tire manufacturers list the "maximum permissible inflation pressure" on the tire sidewall. This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

Checking Tire Pressure

It is important to check your vehicle's tire pressure at least once a month for the following reasons:

- Most tires may naturally lose air over time
- Tires can lose air suddenly if you drive over a pothole or other object or if you strike the curb when parking
- With radial tires, it is usually not possible to determine under-inflation by visual inspection

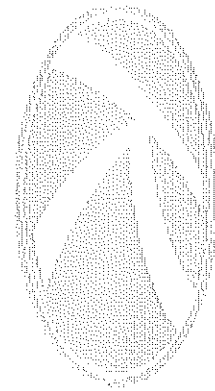
For convenience, purchase a tire pressure gauge to keep in your vehicle. Gauges can be purchased at tire dealerships, auto supply stores, and other retail outlets.

The recommended tire inflation pressure that vehicle manufacturers provide reflects the proper psi when a tire is cold. The term cold does not relate to the outside temperature. Rather, a cold tire is one that has not been driven on for at least three hours. When you drive, your tires get warmer, causing the air pressure within them to increase. Therefore, to get an accurate tire pressure reading, you must measure tire pressure when the tires are cold or compensate for the extra pressure in warm tires.

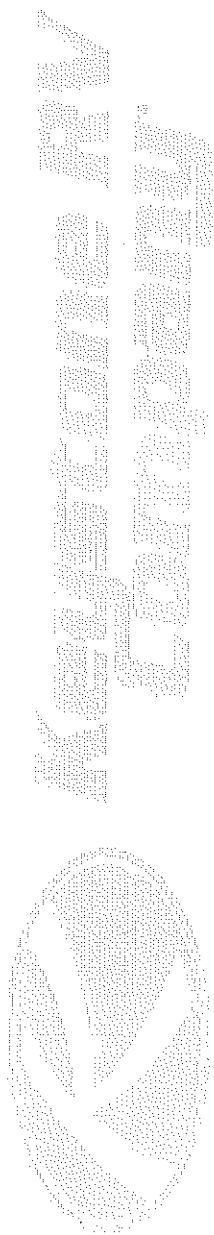
Steps for Maintaining Proper Tire Pressure

1. Locate the recommended tire pressure on the vehicle's tire information placard, certification label, or in the owner's manual.
2. Record the tire pressure of all tires.
3. If the tire pressure is too high in any of the tires, slowly release air by gently pressing on the tire valve stem with the edge of your tire gauge until you get to the correct pressure.
4. If the tire pressure is too low, note the difference between the measured tire pressure and the correct tire pressure. These "missing" pounds of pressure are what you will need to add.
5. At a service station, add the missing pounds of air pressure to each tire that is under-inflated.
6. Check all the tires to make sure they have the same air pressure (except in cases in which the front and rear tires are supposed to have different amounts of pressure).

If you have been driving your vehicle and think that a tire is under-inflated, fill it to the recommended cold inflation pressure indicated on your vehicle's tire information placard or certification label. While your tire may still be slightly under-inflated due to the extra pounds of pressure in the warm tire, it is safer to drive with air pressure that is slightly lower than the vehicle manufacturer's recommended cold inflation pressure than to drive with a significantly under-inflated tire. Since this is a temporary fix, don't



Recommended
 Cold Inflation
 Pressure



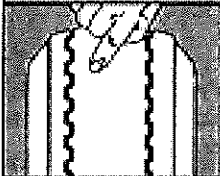
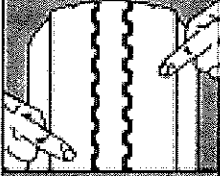
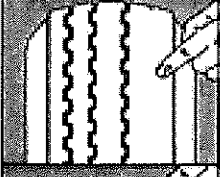
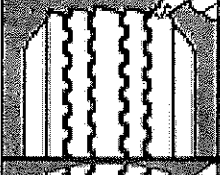
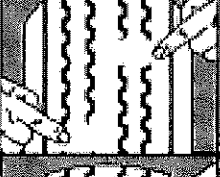
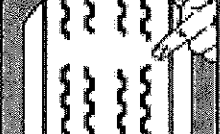
forget to recheck and adjust the tire's pressure when you can obtain a cold reading.

Tire Size

To maintain tire safety, purchase new tires that are the same size as the vehicle's original tires or another size recommended by the manufacturer. Look at the tire information placard, the owner's manual, or the sidewall of the tire you are replacing to find this information. If you have any doubt about the correct size to choose, consult with the tire dealer.

Tire Tread

The tire tread provides the gripping action and traction that prevent your vehicle from slipping or sliding, especially when the road is wet or icy. In general, tires are not safe and should be replaced when the tread is worn down to 1/16 of an inch. Tires have built-in tread-wear indicators that let you know when it is time to replace your tires. These indicators are raised sections spaced intermittently in the bottom of the tread grooves. When they appear "even" with the outside of the tread, it is time to replace your tires. Another method for checking tread depth is to place a penny in the tread with Lincoln's head upside down and facing you. If you can see the top of Lincoln's head, you are ready for new tires.

| | Condition | Possible Cause | Remedy |
|-------------------------------------------------------------------------------------|--------------------------------|----------------------------------------------|-------------------------------------------------------------|
|  | Even Center Wear | Over-Inflation | Check & Adjust Pressure When Cold |
|  | Inside & Outside Wear | Under-Inflation | Check & Adjust Pressure When Cold |
|  | Smooth Outside Wear (One Side) | Loss of Camber or Over-Loading | Check & Unload as Necessary and / or Have Alignment Checked |
|  | "Feathering" Across the Face | Axle Not Square to Frame or Incorrect Toe-In | Square Axles and / or Have Alignment Checked |
|  | Cupping | Loose Bearings or Wheel Balance | Check Bearing Adjustment and Wheel & Tire Balance |
|  | Flat Spots | Wheel Lock-Up | Adjust Bakes |

Tire Balance and Wheel Alignment

To avoid vibration or shaking of the vehicle when a tire rotates, the tire must be properly balanced. This balance is achieved by positioning weights on the wheel to counterbalance heavy spots on the wheel-and-tire assembly. A wheel alignment adjusts the angles of the wheels so that they are positioned correctly relative to the vehicle's frame. This adjustment maximizes the life of your tires. These adjustments require special equipment and should be performed by a qualified technician.

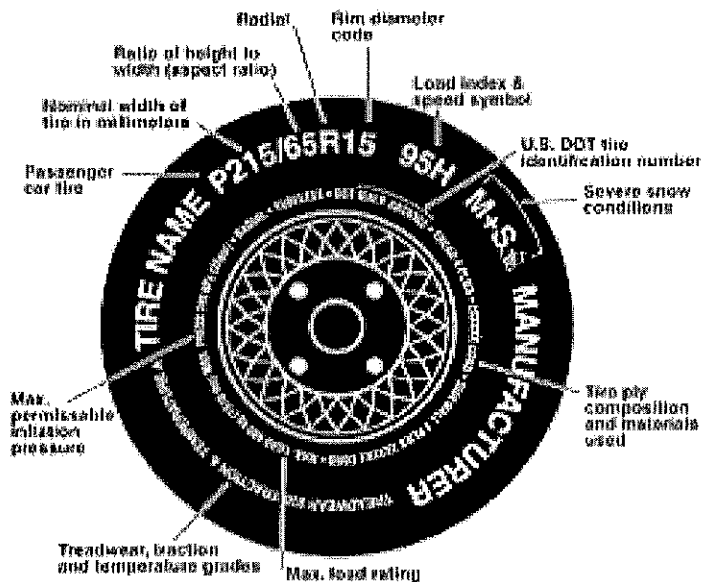
Tire Repair

The proper repair of a punctured tire requires a plug for the hole and a patch for the area inside the tire that surrounds the puncture hole. Punctures through the tread can be repaired if they are not too large, but punctures to the sidewall should not be repaired. Tires must be removed from the rim to be properly inspected before being plugged and patched.

Tire Fundamentals

Federal law requires tire manufacturers to place standardized information on the sidewall of all tires. This information identifies and describes the fundamental characteristics of the tire and also provides a tire identification number for safety standard certification and in case of a recall.

Information on Passenger Vehicle Tires

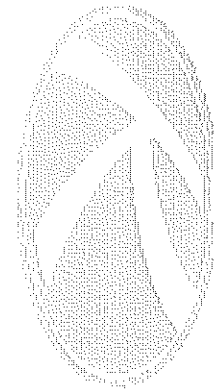


P - The "P" indicates the tire is for passenger vehicles.

NOTE: Passenger car tires are not recommended for use on trailers, because the capacity ratings are not marked on the side walls of these tires. In the event a passenger car tire is used, the capacity must be derated by 10%.

Next number - This three-digit number gives the width in millimeters of the tire from sidewall edge to sidewall edge. In general, the larger the number, the wider the tire.

Next number - This two-digit number, known as the aspect ratio, gives the tire's ratio of height to width. Numbers of 70 or lower indicate a short sidewall for improved steering response and better overall handling



Michelin
MANUFACTURER

on dry pavement.

R - The "R" stands for radial. Radial ply construction of tires has been the industry standard for the past 20 years.

Next number - This two-digit number is the wheel or rim diameter in inches. If you change your wheel size, you will have to purchase new tires to match the new wheel diameter.

Next number - This two- or three-digit number is the tire's load index. It is a measurement of how much weight each tire can support. You may find this information in your owner's manual. If not, contact a local tire dealer. Note: You may not find this information on all tires because it is not required by law.

M+S - The "M+S" or "M/S" indicates that the tire has some mud and snow capability. Most radial tires have these markings.

Speed Rating - The speed rating denotes the speed at which a tire is designed to be driven for extended periods of time. The ratings range from 99 miles per hour (mph) to 186 mph. These ratings are listed below. NOTE: You may not find this information on all tires because it is not required by law

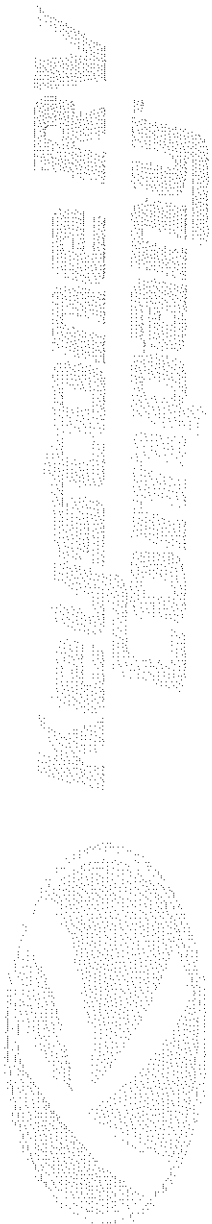
| Letter | Rating Speed Rating |
|--------|---------------------|
| Q | 99 mph |
| R | 106 mph |
| S | 112 mph |
| T | 118 mph |
| U | 124 mph |
| H | 130 mph |
| V | 149 mph |
| W | 168* mph |
| Y | 186* mph |

* For tires with a maximum speed capability over 149 mph, tire manufacturers sometimes use the letters ZR. For those with a maximum speed capability over 186 mph, tire manufacturers always use the letters ZR.

U.S. DOT Tire Identification Number - This begins with the letters "DOT" and indicates that the tire meets all federal standards. The next two numbers or letters are the plant code where it was manufactured, and the last four numbers represent the week and year the tire was built. For example, the numbers 3197 means the 31st week of 1997. The other numbers are marketing codes used at the manufacturer's discretion. This information is used to contact consumers if a tire defect requires a recall.

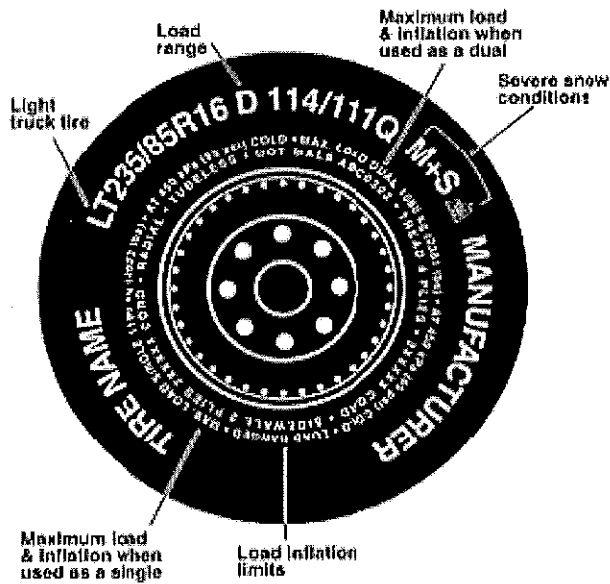
Tire Ply Composition and Materials Used - The number of plies indicates the number of layers of rubber-coated fabric in the tire. In general, the greater the number of plies, the more weight a tire can support. Tire manufacturers also must indicate the materials in the tire, which include steel, nylon, polyester, and others.

Maximum Load Rating - This number indicates the maximum load in kilograms and pounds that can be carried by the tire.



Maximum Permissible Inflation Pressure - This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

Additional Information on Light Truck



Tires

Tires for light trucks have other markings besides those found on the sidewalls of passenger tires.

LT - The "LT" indicates the tire is for light trucks or trailers.

ST - An "ST" is an indication the tire is for trailer use only.

Max. Load Dual kg (lbs) at kPa (psi) Cold - This information indicates the maximum load and tire pressure when the tire is used as a dual; that is, when four tires are put on each rear axle (a total of six or more tires on the vehicle).

Max. Load Single kg (lbs) at kPa (psi) Cold - This information indicates the maximum load and tire pressure when the tire is used as a single.

Load Range - This information identifies the tire's load-carrying capabilities and its inflation limits.

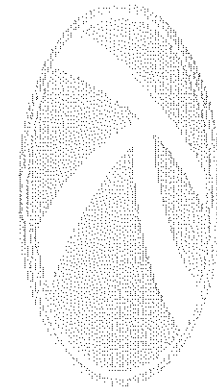
Vehicle Load Limits

Determining the load limits of a vehicle includes more than understanding the load limits of the tires alone.

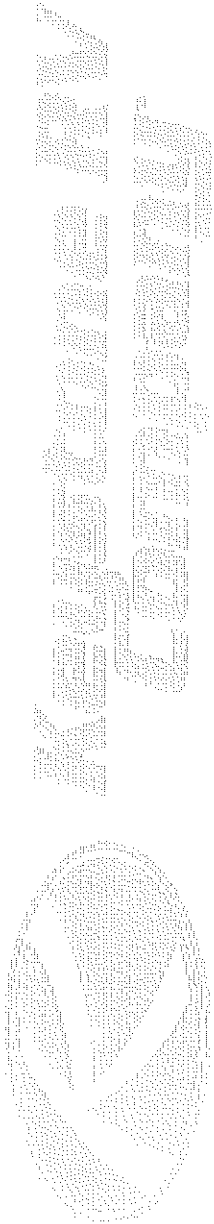
[For TT] On a trailer, there is a Federal Certification Label that is located on the forward half of the left (road) side of the unit.

[For TT] The certification label will indicate the vehicle's gross vehicle weight rating (GVWR). This is the most weight the fully loaded vehicle can weigh. It will also provide the gross axle weight rating (GAWR). This is the most a particular axle can weigh. If there are multiple axles, the GAWR of each axle will be provided.

[For TT] In the same location as the certification label described above, there is a vehicle placard. This placard provides tire and loading



Michelin
Company
RW



information. In addition, this placard will show a statement regarding maximum cargo capacity.

Cargo Capacities

[For TT] Cargo can be added to the vehicle, up to the maximum weight specified on the placard. The combined weight the cargo is provided as a single number. In any case, remember: the total weight of a fully loaded vehicle can not exceed the stated GVWR.

[For TT] Water and propane also need to be considered. The weight of fully filled propane containers is considered part of the weight of the RV before it is loaded with cargo and is not considered part of the disposable cargo load. Water however, is a cargo weight and is treated as such. If there is a fresh water storage tank of 100 gallons, this tank when filled would weigh about 800 pounds. If more cargo is being transported, water can be off-loaded to keep the total amount of cargo added to the vehicle within the limits of the GVWR so as not to overload the vehicle. Understanding this flexibility will allow you, the owner, to make choices that fit your travel and camping needs.

[For TT] When loading your cargo, be sure it is distributed evenly to prevent overloading front to back and side to side. Heavy items should be placed low and as close to the axle positions as reasonable. Too many items on one side may overload a tire. The best way to know the actual weight of the vehicle is to weigh it at a public scale. Talk to your RV dealer to discuss the weighing methods needed to capture the various weights related to the RV. This would include weights for the following: axles, wheels, hitch or pin (in the case of a trailer) and total weight.

How Overloading Affects Your RV and Tires

The results of overloading can have serious consequences for passenger safety. Too much weight on your vehicle's suspension system can cause spring, shock absorber, or brake failure, handling or steering problems, irregular tire wear, tire failure or other damage. An overloaded vehicle is hard to drive and hard to stop. In cases of serious overloading, brakes can fail completely, particularly on steep hills. The load a tire will carry safely is a combination of the size of tire, its load range, and corresponding inflation pressure. Excessive loads and/or under-inflation cause tire overloading and, as a result, abnormal tire flexing occurs. This situation can generate an excessive amount of heat within the tire. Excessive heat may lead to tire failure. It is the air pressure that enables a tire to support the load, so proper inflation is critical. Since RVs can be configured and loaded in many ways, air pressures must be determined from actual loads (determined by weighing) and taken from the load and inflation tables provided by the tire manufacturer. These air pressures may differ from those found on the certification label. However, they should never exceed the tire limitation for load or air pressure. If you discover that your tires cannot support the actual weights, the load will need to be lightened.

Tire Safety Tips

Preventing Tire Damage

Slow down if you have to go over a pothole or other object in the road. Do not run over curbs or other foreign objects in the roadway, and try not to strike the curb when parking.

Tire Safety Checklist

Check tire pressure regularly (at least once a month), including the spare.

Inspect tires for uneven wear patterns on the tread, cracks, foreign objects, or other signs of wear or trauma.

Remove bits of glass and foreign objects wedged in the tread.

Make sure your tire valves have valve caps.

Check tire pressure before going on a long trip.

Do not overload your vehicle. Check the Tire Information and Loading

Placard or User's Manual for the maximum recommended load for the vehicle.

SECTION 2

STEPS FOR DETERMINING CORRECT LOAD LIMIT

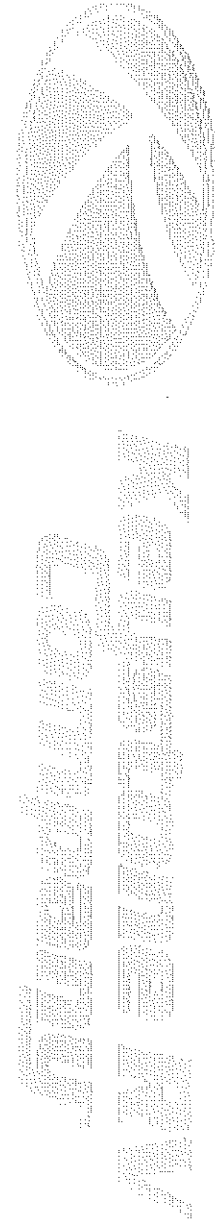
1. Locate the statement "The combined weight of occupants and cargo should never exceed XXX lbs" on your vehicles placard.
2. Determine the combined weight of the driver and passengers that will be riding in your vehicle.
3. Subtract the combined weight of the driver and passengers from XXX kilograms or XXX pounds.
4. The resulting figure equals the available amount of cargo and luggage capacity. For example, if the "XXX" amount equals 1400 lbs. and there will be five 150 lb. passengers in your vehicle, the amount of available cargo and luggage capacity is 650 lbs. ($1400 - 750 (5 \times 150) = 650$ lbs.)
5. Determine the combined weight of luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage capacity calculated in Step # 4.
6. If your vehicle will be towing a trailer, load from your trailer will be transferred to your vehicle. Consult this manual to determine how this reduces the available cargo and luggage capacity of your vehicle.

For further information about wheel and tire safety:

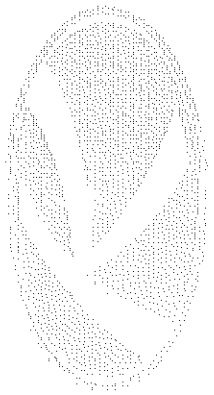
1-888-327-4236 (TTY: 1-800-424-9153).

<http://www.safercar.gov> and

NHTSA
400 Seventh St. S.W.
Washington, DC 20590.



Коллекция РВ
Коллекция РВ



Appendix

For assistance with this manual, warranty information or information on Keystone Products, please visit us on the web or contact Keystone RV Company Retail Customer Service.

Address:
Keystone RV Company Customer Service Dept.
2642 Hackberry Drive
Goshen, IN 46526

Fax: 574-537-3990
Toll Free Phone: 866-425-4369 (US)
E-Mail: www.keystonerv.com

Business Hours:
7:00AM – 5:00PM (EST) Monday – Friday

Exterior Pre-Travel Checklist

- Fill the LP bottles
- Empty the holding tanks
- Connect the trailer to the tow vehicle and test all of the exterior lights
- Inspect the awning and ensure that it is properly retracted and secured for travel. It is recommended that a tie wrap be used on the awning arms preventing the possibility of the awning deploying while in travel.
- Inspect all exterior baggage doors and hatches ensuring they are locked
- Inspect the tires and check the pressures. Refer to Chapter 9
- Loosen and Torque the lug nuts. Refer to Chapter 9
- Connect the breakaway switch and test the brakes on the trailer. Adjust the tow vehicle brake controller in accordance with the manufacturer's recommendations
- Secure the rear leveling jacks in the "up" position
- Position the battery disconnect to the on position. This is required to engage the trailer's brakes in the event of an emergency
- Ensure the steps are retracted

Interior Pre-Travel Checklist

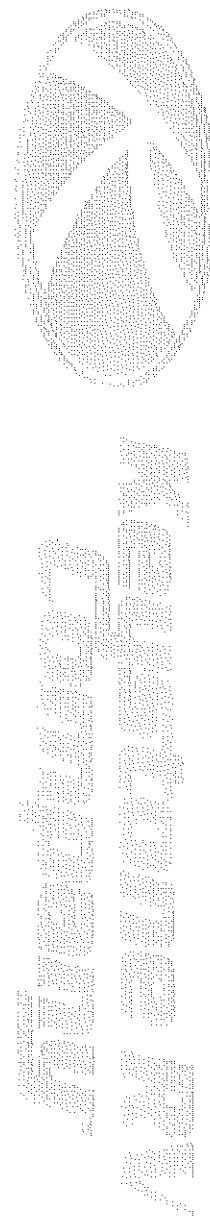
- Close all vents and windows
- Place the television antenna "down" position
- Retract the slide rooms
- Inspect the interior of the unit ensuring that all cabinet, interior, and the shower doors are closed and secured
- Secure all loose items in storage compartments
- Ensure that the travel latch is closed on the refrigerator
- Test the smoke, carbon monoxide and LP alarms.

Battery

- Check the electrolyte levels in the battery cells. Refer to Chapter 5
- Clean the battery terminals and ensure they are securely tightened. Refer to Chapter 5

Exterior

- Wash and wax the exterior of the coach at least monthly. Pay particular attention to the graphics when washing and waxing.



Power buffers and high pressure washers can remove or damage the graphics. This type of damage is not covered under the warranty. Refer to Chapter 9

- Inspect the seals around the windows, doors and appliance vents. Clean and reseal as required. Refer to Chapter 9
- Remove debris from the window weep holes. Refer to Chapter 9

Frame and Chassis

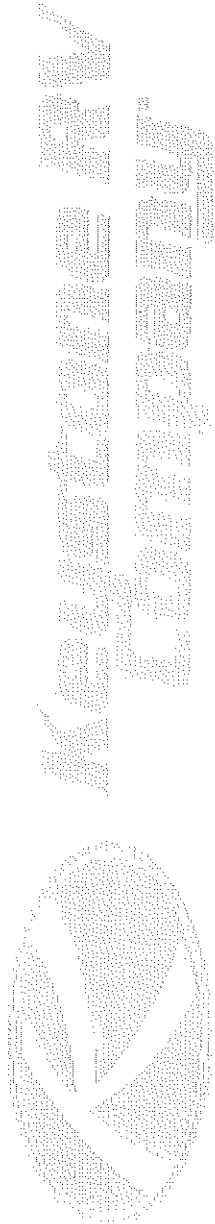
- Inspect the frame for signs of corrosion. Clean and lightly sand any corroded areas and touch them up with good quality paint. Refer to Chapter 9
- Inspect the steps for corrosion. Clean and touch up any corroded areas. Lubricate the pivot points on the steps. Refer to Chapter 9
- Check the tire pressure. Refer to Chapter 9
- Generator - Review the preventative maintenance requirements in the manufacturer's owner manual. Refer to Chapter 4

Plumbing

- Flush the waste water system and sanitize. Refer to Chapter 7
- Flush the water heater tank. Refer to Chapter 7
- Replenish the water tank air pocket. Refer to Chapter 7
- Winterize your coach prior to the onset of freezing temperatures. During extreme freezing temperatures it is recommended that the unit be winterized. Damage to the plumbing system due to freezing is not covered under the warranty.

Roof

- Remove all debris from the roof and thoroughly clean using a mild detergent. Refer to Chapter 9
- Inspect the roof seals for signs of deterioration. Reseal areas as required. Refer to Chapter 9



Glossary of Common RV Terms

ACCESSORY WEIGHT: The combined weight (in excess of those standard items which may be replaced) of automatic transmission, power steering, power brakes, power windows, power seats, radio and heater, to the extent that these items are available as factory-installed equipment (whether installed or not).

AC ELECTRICITY: Alternating Current. Standard Household 110 Volt AC current.

ANODE ROD: Part of the water heater that attracts impurities in the water that cause corrosion.

BEAD: The part of the tire that is made of steel wires, wrapped or reinforced by ply cords and that is shaped to fit the rim.

BEAD SEPARATION: This is the breakdown of the bond between components in the bead.

BIAS PLY TIRE: A pneumatic tire in which the ply cords that extend to the beads are laid at alternate angles substantially less than 90 degrees to the center line of the tread.

BLACK TANK: The holding tank into which the toilet directly drains.

BLACK WATER: The term associated with sewage contained within the black tank.

BRAKE CONTROLLER: Device located under the dash of a towing vehicle that controls the braking system of the fifth-wheel.

BTU: The measurement of the amount of heat required to raise the temperature of one (1) pound of water, one (1) degree F.

CARCASS: The tire structure, except tread and sidewall rubber which, when inflated, bears the load.

CHUNKING: The breaking away of pieces of the tread or sidewall.

CITY WATER: Refers to exterior water source, not water from the fresh water tank that you hook up to at campgrounds. "City Water" refers to pulling water from a central source (like in a city).

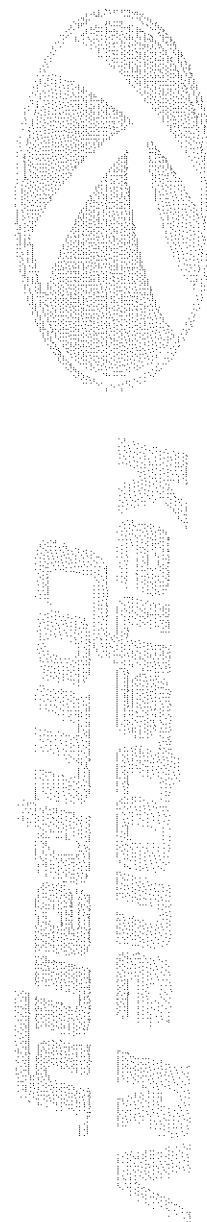
CONDENSATION: The result of warm humid air coming in contact with cold glass also known as 'Sweat'.

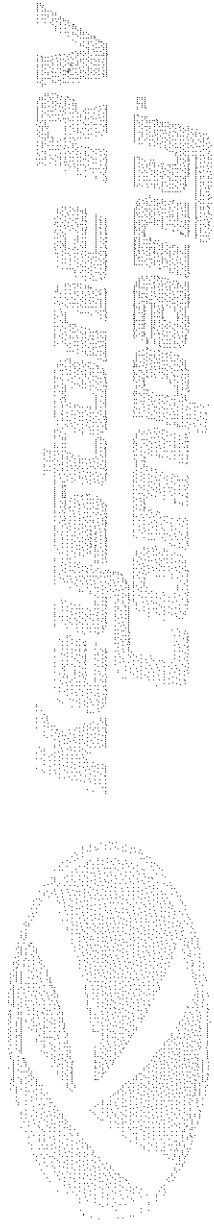
CONVERTER: Device that converts 110V AC to 12V DC.

CURBSIDE: Term used to refer to the side of your coach, which faces the curb or shoulder when parked. Also called DOOR SIDE (the main entrance door) or OFFROAD SIDE.

DC ELECTRICITY: Direct Current. Also termed Battery Power. Used to run all 12 Volt powered systems or lighting.

DRY CAMPING: Refers to camping using only the resources within your unit and without amenities such as city water hook-ups, electrical hook-ups, etc., often provided at commercial campsites.





DSI IGNITION: Direct Spark Ignition – The method of lighting a main burner on a LP fired appliance.

COLD INFLATION PRESSURE: The pressure in the tire before you drive.

CORD: The strands forming the plies in the tire.

CORD SEPARATION: The parting of cords from adjacent rubber compounds.

CRACKING: Any parting within the tread, sidewall, or inner liner of the tire extending to cord material.

CT: A pneumatic tire with an inverted flange tire and rim system in which the rim is designed with rim flanges pointed radially inward and the tire is designed to fit on the underside of the rim in a manner that encloses the rim flanges inside the air cavity of the tire.

CURB WEIGHT: The weight of a motor vehicle with standard equipment including the maximum capacity of fuel, oil, and coolant, and, if so equipped, air conditioning and additional weight optional engine.

DUCTED AC: Air conditioning distributed through a ducting system.

DUCTED HEAT: Warm air distributed through a ducting system.

DUAL ELECTRICAL SYSTEM: Coach equipped with appliances and lights, which operate on 12V power when self-contained, and with a converter, on 110 AC when in campgrounds or run off of a generator.

DUMP STATION: Term used for locations to drain the waste holding tanks (gray and black tanks). In most states, it is illegal to dump your tanks anywhere except at dump stations.

DUMP VALVE: Another name for the T-Handle used to drain the black and gray tanks.

EGRESS WINDOW: Term for the emergency exit windows within recreational vehicles: Usually identified by a red handles or levers.

EXTRA LOAD TIRE: A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.
Groove - The space between two adjacent tread ribs.

FULL HOOK-UP SITE: A Campsite that offers full amenities: City water, sewer, and electrical hook ups – many have cable and phone available.

GALLEY TANK: A gray water holding tank used specifically for the kitchen waste water.

GENERATOR: Powered by LP gas, generates 110 Volt power.

GRAY TANK: the waste holding tank into which water from the kitchen and bath sinks, shower and tub drains.

GRAY WATER: Water drained into the gray holding tank.

GROSS AXLE WEIGHT RATING (GAWR): Maximum amount of weight (in lbs.) that can be placed on the axle.

GROSS COMBINED WEIGHT RATING (GCWR): Maximum load weight (in lbs.) allowed for the coach and tow vehicle.

GROSS VEHICLE WEIGHT RATING (GVWR): Maximum load weight (in lbs.) allowed for the vehicle.

GROSS Fifth-Wheel WEIGHT (GTW): Weight of the fully loaded coach in its actual towing condition.

HITCH WEIGHT: Amount of a coach's weight that rests on the tow vehicle's hitch.

HOLDING TANKS: Refers to the tanks typically known as fresh water, gray and black, where the water is held.

HOOK-UPS: Where you connect to a campground's facilities.

INNERLINER SEPARATION: The parting of the innerliner from cord material in the carcass.

INTENDED OUTBOARD SIDEWALL: The sidewall that contains a white-wall, bears white lettering or bears manufacturer, brand, and/or model name molding that is higher or deeper than the same molding on the other sidewall of the tire or the outward facing sidewall of an asymmetrical tire that has a particular side that must always face outward when mounted on a vehicle.

LIGHT TRUCK (LT) TIRE: A tire designated by its manufacturer as primarily intended for use on lightweight trucks or multipurpose passenger vehicles.

Load rating - The maximum load that a tire is rated to carry for a given inflation pressure.

NET CARRYING CAPACITY (NCC): Maximum weight without exceeding the GVWR. Also referred to as 'Payload Capacity'

LOW POINT/LOW POINT DRAIN: Lowest point in the plumbing system. Drain valves are placed at these points for sewage dumping.

LP GAS: Liquefied Petroleum Gas – Used to fuel appliances.

MAXIMUM LOAD RATING: The load rating for a tire at the maximum permissible inflation pressure for that tire.

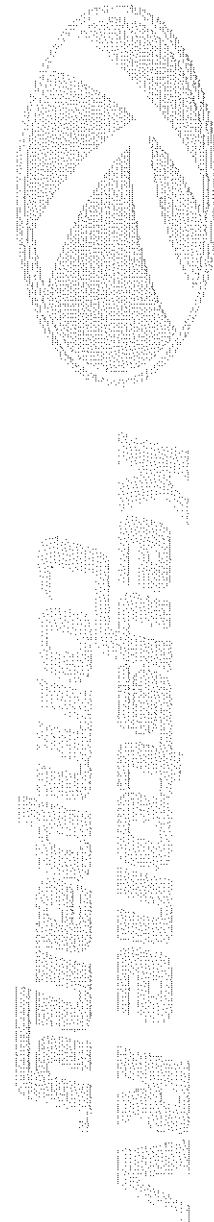
MAXIMUM PERMISSABLE INFLATION PRESSURE: The maximum cold inflation pressure to which a tire may be inflated.

MAXIMUM LOADED VEHICLE WEIGHT: The sum of curb weight, accessory weight, vehicle capacity weight, and production options weight.

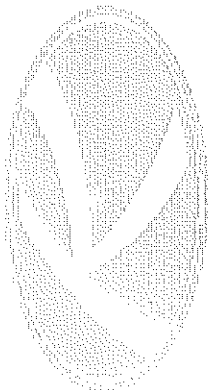
MEASURING RIM: The rim on which a tire is fitted for physical dimension requirements.

NON-PNEUMATIC RIM: A mechanical device which, when a non-pneumatic tire assembly incorporates a wheel, supports the tire, and attaches, either integrally or separably, to the wheel center member and upon which the tire is attached.

NON-PNEUMATIC SPARE TIRE ASSEMBLY: A non-pneumatic tire assembly intended for temporary use in place of one of the pneumatic



Keystone RV
CORPORATION



tires and rims that are fitted to a passenger car in compliance with the requirements of this standard.

NON-PNEUMATIC TIRE: A mechanical device which transmits, either directly or through a wheel or wheel center member, the vertical load and tractive forces from the roadway to the vehicle, generates the tractive forces that provide the directional control of the vehicle and does not rely on the containment of any gas or fluid for providing those functions.

NON-PNEUMATIC TIRE ASSEMBLY: A non-pneumatic tire, alone or in combination with a wheel or wheel center member, which can be mounted on a vehicle.

NORMAL OCCUPANT WEIGHT: This means 68 kilograms (150 lbs.) times the number of occupants specified in the second column of Table I of 49 CFR 571.110.

OCCUPANT DISTRIBUTION: The distribution of occupants in a vehicle as specified in the third column of Table I of 49 CFR 571.110.

OPEN SPLICE: Any parting at any junction of tread, sidewall, or innerliner that extends to cord material.

OUTER DIAMETER: The overall diameter of an inflated new tire.

OVERALL WIDTH: The linear distance between the exteriors of the sidewalls of an inflated tire, including elevations due to labeling, decorations, or protective bands or ribs.

PILOT: Small flame that is used to ignite the main burner of a LP-fired appliance.

PIN WEIGHT: The vertical trailer load supported by the king pin of a fifth-wheel hitch.

PLY: A layer of rubber-coated parallel cords.

PLY SEPARATION: A parting of rubber compound between adjacent plies.

PNEUMATIC TIRE: A mechanical device made of rubber, chemicals, fabric and steel or other materials, that, when mounted on an automotive wheel, provides the traction and contains the gas or fluid that sustains the load.

PRODUCTION OPTIONS WEIGHT: The combined weight of those installed regular production options weighing over 2.3 kilograms (5 lbs.) in excess of those standard items which they replace, not previously considered in curb weight or accessory weight, including heavy duty brakes, ride levelers, roof rack, heavy duty battery, and special trim.

PRIMITIVE CAMPSITE: Campsite that offers limited connections. May have city water or electrical available but not both.

PULL-THROUGH SITES: Camp sites that you can pull your recreational vehicle through, eliminating the need to back in.

RADIAL PLY TIRE: A pneumatic tire in which the ply cords that extend to the beads are laid at substantially 90 degrees to the center line of the tread.

RECOMMENDED TIRE INFLATION PRESSURE: This is the inflation pressure provided by the vehicle manufacturer on the Tire Information label and on the Certification / VIN tag.

REINFORCED TIRE: A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

RIM: A metal support for a tire or a tire and tube assembly upon which the tire beads are seated.

RIM DIAMETER: This means the nominal diameter of the bead seat.

RIM SIZE DESIGN: This means the rim diameter and width.

RIM TYPE DESIGNATION: This means the industry of manufacturer's designation for a rim by style or code.

RIM WIDTH: This means the nominal distance between rim flanges.

ROADSIDE: Refers to the side of the unit that faces the road when parked. Also commonly referred to as "Off DOOR SIDE."

RV: Short for Recreational Vehicle.

RVIA: Recreational Vehicle Industry Association

SECTION WIDTH: The linear distance between the exteriors of the sidewalls of an inflated tire, excluding elevations due to labeling, decoration, or protective bands.

SHORE LINE: The electrical cord that connects 110V from an exterior outlet (such as campgrounds) to the RV. Also called 'Power Cord'

SHORE POWER: The 110V outlet that connects to the Shore Line.

SIDEWALL: That portion of a tire between the tread and bead.

SIDEWALL SEPARATION: The parting of the rubber compound from the cord material in the sidewall.

TEST RIM: The rim on which a tire is fitted for testing, and may be any rim listed as appropriate for use with that tire.

TREAD: That portion of a tire that comes into contact with the road.

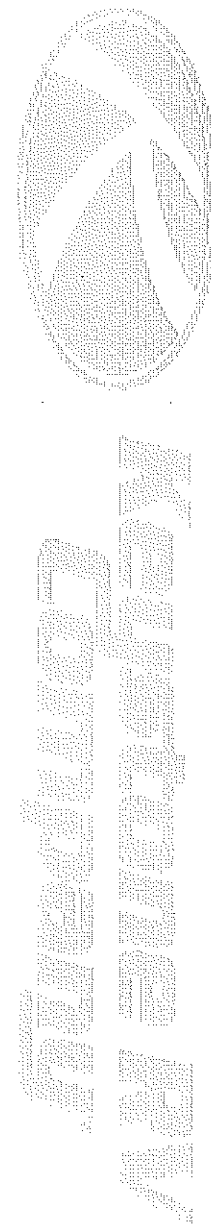
TREAD RIB: A tread section running circumferentially around a tire.

TREAD SEPARATION: Pulling away of the tread from the tire carcass.

TREAD-WEAR INDICATORS (TWI) - The projections within the principal grooves designed to give a visual indication of the degrees of wear of the tread.

UNLOADED VEHICLE WEIGHT (UVW): Weight of the unit without adding fuel, water, propane, supplies and passengers. Also referred to as 'Dry Weight'

VEHICLE CAPACITY WEIGHT: The rated cargo and luggage load plus 68 kilograms (150 lbs.) times the vehicle's designated seating capacity.



Vehicle maximum load on the tire - The load on an individual tire that is determined by distributing to each axle its share of the maximum loaded vehicle weight and dividing by two.

VEHICLE NORMAL LOAD ON TIRE: The load on an individual tire that is determined by distributing to each axle its share of the curb weight, accessory weight, and normal occupant weight (distributed in accordance with Table I of CRF 49 571.110) and dividing by 2.

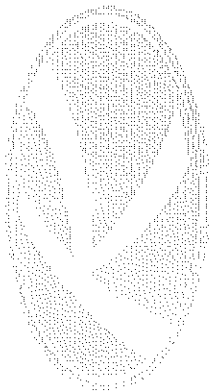
WEATHER SIDE: The surface area of the rim not covered by the inflated tire.

WET WEIGHT: Weight of the coach with fuel, fresh water and LP tanks full.

WHEEL CENTER MEMBER: In the case of a non-pneumatic tire assembly incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the nonpneumatic rim and provides the connection between the non-pneumatic rim and the vehicle; or, in the case of a non-pneumatic tire assembly not incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic tire and provides the connection between tire and the vehicle.

WHEEL HOLDING FIXTURE: The fixture used to hold the wheel and tire assembly securely during testing.

VEHICLE
TESTING



Index

- 110 Volt System 31
- 12 Volt System 31
- Air Conditioner 9, 10, 19, 22, 23, 32, 33
- Antenna 14, 20, 22, 77
- Awning 21, 77
- Bargman 7-Way Plug 34
- Battery 15, 29, 31, 33, 34, 35, 39, 45, 51, 52, 58, 62, 63, 77, 79, 82
- Brakes 14, 15, 16, 34, 35, 62, 74, 77, 79, 82
- Breakaway Switch 14, 15, 35, 77
- Carbon Monoxide Detector 29
- Condensation 9, 28, 57
- Convection Oven 24
- Converter 22, 31, 32, 33, 39, 80
- Fan-Tastic Vent 28
- Fifth-Wheel 1, 9, 11, 12, 13, 14, 17, 18, 41, 57, 58, 77, 79, 81
- Fireplace 24
- Fresh Water 41, 42, 43, 45, 46, 47, 48, 74, 79, 81, 84
- Furnace 9, 22, 24, 27, 37, 55
- Generator 11, 24, 78, 80
- Hitch 74, 81, 82
- King Pin 82
- LP Detector 29, 39
- Microwave 24, 32
- Mold 10, 21
- Monitor Panel 25, 41, 42, 45
- No Fuss Flush 48
- Power Cord 83
- Refrigerator 17, 27, 28, 31, 32, 55, 77
- Regulator 37, 38
- Roof 9, 14, 19, 28, 31, 32, 47, 51, 56, 78, 82
- Slide-Out 21, 51, 52, 53
- Stabilizing Jacks 17, 18
- Toilet 79
- Torque 14, 16, 59, 60 77
- Travel-Trailer 1, 11, 12, 13, 14, 15, 17, 18, 41
- Warranty 1, 3, 7, 8, 21, 45, 51, 55, 58, 77, 78
- Waste Water 46, 47, 78, 80
- Water Heater 11, 32, 41, 42, 43, 44, 45, 46, 47, 78, 79
- Water Pump 41
- Winterization 44, 45, 46, 47

