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## INTRODUCTION

Welcome to the family of NORTHWOOD recreational vehicle owners. We thank you for selecting a NORTHWOOD product.

Your new NORTHWOOD RV has been designed to provide carefree traveling for you and your family. This Owner's Manual provides helpful suggestions and useful information to help you get maximum enjoyment from your new truck camper.

Similar to your truck and tow vehicle, your Northwood RV will require some regular care before each use plus some annual maintenance. This manual is structured to equip you with a good working knowledge of your new truck camper. We want you to know what needs to be done and how to correct and prevent minor difficulties.

NORTHWOOD recommends that you become familiar with the contents of this Owner's Manual before using your RV. Every effort has been made to make this Owner's Manual as accurate as possible. Products are constantly being improved and manufacturers upgrade installations accordingly. In the event of conflicting instructions, illustrations or other descriptions, the information furnished by the respective manufacturer's separate publications should be followed. Often you can find updated information on our website. See [www.northwoodmfg.com](http://www.northwoodmfg.com) for the most current information.

Your new Northwood RV has been constructed to conform with or exceed federal and state safety requirements. Quality assurance methods and/or functions meet or exceed standards prescribed by ANSI/NFPA 501C or CSA Z240 as approved by the agency having jurisdiction in the United States or Canada.

Please contact your dealer should you have any additional questions as to operation, maintenance, or service.

# SECTION ONE

## LOADING / HITCHING FAMILIARIZATION & OPERATION OF SYSTEMS

### SPECIFIC TO TRUCK CAMPERS: (pg. 4)

#### TRUCK CAMPERS: SUGGESTED METHOD FOR SELECTING A TRUCK

To estimate the total cargo load which will be placed on the truck add the following:

- The weight of all passengers in the truck camper
- The weight of supplies
- The weight of tools and all other cargo
- The weight of installed additional or optional truck camper equipment and appliances
- The truck camper weight figure supplied by the manufacturer—be sure to add weight of options

The cargo weight rating for the truck must be equal to or greater than the total cargo load of the maximum combined loaded weight of the truck and camper.

#### RECOMMENDED LOADING PROCEDURE:

Caution should be taken when loading the truck camper to keep the center of gravity of the truck camper within the zone recommended by the truck manufacturer.

- Store heavy items first, keeping items close to the floor
- Store heavy items far enough forward to keep the center of gravity of loaded camper within the zone recommended by the truck manufacturer
- Store only light objects on high shelves
- Be sure to distribute weight equally on each side of camper for a balanced load side to side
- It is important to secure loose items to prevent a shift in weight that could affect the balance of the loaded camper

After the truck camper is loaded, drive to a scale and weigh the front and rear wheels separately to determine axle loads.

#### **- - - WARNING - - -**

**THE CAMPER MUST BE SUPPORTED EVENLY AND LEVEL ON THE PICK-UP BED FLOOR BEFORE TRAVELING.**

☺ (See Diagram E Section 4 at the back of this manual)

If the truck is equipped with a 5<sup>th</sup>-wheel hitch, the camper must clear hitch brackets and be supported by camper support blocking from riser to riser in three places—front, middle and rear of sub floor--as indicated by the diagram on page 21A. Incorrect placement of blocking will result in damage to the sub floor and/or waste and fresh water tanks.

## SPECIFIC TO TRAVEL TRAILERS & 5<sup>TH</sup> WHEELS: (PP. 5-10)

### PRE-TRAVEL CHECK LIST

#### EXTERIOR

1. Disconnect water, electrical, and drain lines.
2. Check roof top carrier (if installed).
3. Remove blocks from wheels. Retract steps.
4. Close front window and lower rockguard.
5. Check wheel nut torque. ☺ (See Diagram B Section 4 at the back of this manual)
6. Check LPG tank level and refill if necessary.
7. Check hitch and hitch ball.
8. Check the plug connection –Trailer to Tow Vehicle- ☺ (Wiring Diag. A Section 4 at the back of this manual)
9. Check tires and adjust pressures if necessary.
10. Check batteries.
11. Check running lights, turn signals, interior and panel lights.
12. Check brakes, brake fluid, brake lights.
13. Proper hitching procedure.
14. Check cooling system.
15. Lock deadbolt in entry door(s).

#### INTERIOR

1. Lower TV antenna.
2. Turn off water heater.
3. Turn off water pump.
4. Turn off furnace.
5. Turn off range pilot.
6. Close cooktop cover.
7. Close roof vents.
8. Close all doors, drawers, and windows.
9. Secure freestanding furniture.

### RULES FOR EQUIPMENT SELECTION AND PREPARATION FOR TOWING

Your towing equipment, its adjustments and how you load the trailer will have a great effect on trailer towing stability and handling. The following rules will help you select, adjust and load your equipment in a manner that will help produce acceptable towing characteristics:

- Use a tow vehicle that is large enough for your trailer and has the needed power and heavy duty running gear. The tow vehicle must be rated by its manufacturer both to tow the gross weight and to carry the hitch weight of the fully loaded trailer.
- Use a weight distributing hitch rated not less than the trailer Gross Vehicle Weight Rating (GVWR). Follow the tow vehicle and hitch manufacturer's instructions. Install the hitch ball as close as practical to the rear bumper to minimize rear overhang.
- Use a sway control system, installed and adjusted according to the sway control manufacturer's instructions.
- Use a brake controller that automatically applies the brakes in proportion to the tow vehicle brakes.

- Adjust the brake controller so that the brakes of the trailer operate as quickly as possible without sliding the tires of the loaded trailer during strong braking.
- Do not use an automatic speed control while towing.
- Inflate the rear tires of the tow vehicle to their maximum cold pressure.
- Inflate the trailer tires to their maximum cold pressure.
- Load the trailer placing heavy objects and goods as close to the trailer axle(s) as possible. Do not place heavy objects on the rear bumper or on the tongue.
- Adjust the hitch ball height so that the fully loaded trailer is level front-to-rear when attached to the fully loaded tow vehicle with the hitch spring bars tightened.
- When loading the trailer do not exceed the trailer Gross Axle Weight Rating(s) (GAWR). Weigh the fully loaded trailer from time to time to verify that trailer GAWR and GVWR are not exceeded, and that the loads on the right-hand and left-hand wheels are approximately equal.
- Do not exceed the tow vehicle Gross Axle Weight Ratings(s) (GAWR) or Gross Vehicle Weight Rating (GVWR). Weigh the tow vehicle from time to time to verify these loadings.

## ON THE ROAD

**TRAVEL TRAILER & 5<sup>TH</sup> WHEEL TRAILER LOADING:** A trailer chassis (springs, wheels, tires, axles, frame and tongue) is designed to carry a certain maximum load. This load consists of the weight of the empty trailer itself, and weight added in the form of water, food, clothing, and anything else that may be stored in or attached to the trailer. The maximum load for which the trailer is designed is called the **GROSS VEHICLE WEIGHT RATING (GVWR)** and is the total of the weight on the axles and the weight on the trailer tongue.

Another critical weight factor is the **GROSS AXLE WEIGHT RATING (GAWR)**. This is the maximum weight a specific axle is designed to carry. Again, the rating represents the empty vehicle's axle weight plus the added load. On trailers with more than one axle, the weight is divided between each axle and each has its own **GAWR**. The total of all axle loads plus the tongue weight must not exceed the trailer **GVWR**.

Tongue weight is the amount of pressure exerted downward on the hitch ball. Your trailer is designed for maximum tongue weight and hitch tongue weight ratings.

**- - - WARNING - - -**

**DO NOT EXCEED THE SPECIFIED TONGUE WEIGHT AS YOU COULD CAUSE DAMAGE TO THE TRAILER FRAME. ALSO, OVERLOADING COULD RESULT IN POOR HANDLING AND BRAKING.**

**DETERMINING AND DISTRIBUTING THE TRAILER'S LOAD:** The **GROSS VEHICLE WEIGHT RATING (GVWR)** for your trailer is found on the label attached at the front road side of the trailer. You must compare the **GVWR** to the actual loaded weight of your trailer. If the loaded weight of your trailer exceeds the **GVWR**, your trailer is overloaded, and you will have to remove items to bring the weight down to or below the **GVWR**.

**- - - WARNING - - -**

**DO NOT EXCEED THE RATED LOAD OF THE TOW VEHICLE, THE TRAILER, OR THE RATED LOAD OF ANY AXLE.**

**- - - NOTE - - -**

**IF OTHER EQUIPMENT OR OPTIONS SUCH AS LEVELING JACKS, AWNINGS, ROOF STORAGE PODS, ETC., ARE INSTALLED AFTER THE TRAILER LEAVES THE FACTORY, THE WEIGHT OF THESE ITEMS MUST BE SUBTRACTED FROM THE TOTAL OF THE LOAD AND CARGO CARRYING CAPACITIES.**

**- - - WARNING - - -**

**DO NOT INSTALL ANY TYPE OF WEIGHT CARRYING RACK, FRAME, OR HITCH TO THE REAR BUMPER, FRONT A-FRAME ASSEMBLY, CHASSIS OR BODY COMPONENT OF THE TRAILER. DAMAGE TO THE TRAILER BODY AND UNSTABLE HANDLING CHARACTERISTICS MAY RESULT. ADD-ONS TO THE REAR BUMPER, FRONT A-FRAME ASSEMBLY OR CHASSIS WILL VOID YOUR WARRANTY ON STRUCTURAL COMPONENTS.**

**- - - WARNING - - -**

**DO NOT STORE OR CARRY LP GAS CONTAINERS, GASOLINE, OR OTHER FLAMMABLE LIQUIDS INSIDE YOUR TRAILER.**

## **HITCHING UP YOUR TRAILER**

**GENERAL:** Hitching up your trailer will become routine with experience. Make it a habit to examine all hitch components before hitching up the trailer. If you have a conventional ball hitch, check for cracked or bent parts, cracked welds, deformed or stripped bolts. Inspect the weight-distributing hitch spring bars and chains. Be sure the hitch ball is tight and well lubricated. Check the trailer tongue for cracks. Be sure the ball locking device works freely. Inspect the safety chains. If you find defects in any hitch component, correct it before towing the trailer.

**HITCHING PROCEDURE FOR CONVENTIONAL TRAILERS:** Before attempting to hitch up your trailer, read the instructions provided by your hitch manufacturer. Your trailer coupler is built for a 2-5/16" hitch ball. **Your hitch ball must be this size.**

The following instructions are usable in most cases. If the instructions provided with your hitch deviate from these instructions, follow the hitch manufacturer's instructions.

1. Turn the tongue jack crank clockwise to raise the tongue and coupler. Raise the tongue sufficiently to clear the hitch ball on the tow vehicle.
2. Back the tow vehicle until the hitch ball is under the hitch ball socket. If you are working alone, a backing aid mirror may be helpful.
3. Be sure the coupler latch locking lever on the tongue is fully open. Lower the tongue jack until the ball is firmly seated in the socket. Close the coupler latch and secure it with a locking pin or bolt.
4. Raise the tow vehicle and trailer with the tongue jack high enough to allow room to install the weight distributing hitch spring bars.
5. Attach the spring bars according to the weight distributing hitch manufacturer's instructions.
6. After adjusting the spring bars, lower the jack, remove the dolly wheel or foot, and fully retract the jack. Note that the trailer must be relatively level, front to back. Any tilt must be very slight.
7. Install the sway control system according to the manufacturer's instructions.
8. Connect the safety chains. Loop each chain through a suitable attachment eye on the tow vehicle. To adjust the chain length, insert the chain quick coupler through an appropriate chain link.

**- - - WARNING - - -**

**NEVER ATTACH SAFETY CHAINS TO THE HITCH BALL OR ANY REMOVABLE PART OF THE HITCH.**

9. Connect the breakaway switch lanyard to an attachment eye on the tow vehicle. Be sure the switch lanyard is adjusted so that the switch is not actuated during a full "jackknife" turn.

**- - - WARNING - - -**

**DO NOT CONNECT THE BREAKAWAY SWITCH LANYARD TO THE HITCH BALL OR ANY REMOVABLE PART OF THE HITCH.**

10. Plug in the 12-volt electrical cord into the mating tow vehicle socket.
11. Run an operational check of stop lights, turn indicators, running lights, and electric brakes before driving off.
12. See "ELECTRICAL SYSTEM" for more details about the electrical system and wiring.

**HITCHING PROCEDURE FOR 5<sup>th</sup> WHEEL TRAILERS:** Before hitching up your trailer, read the instructions provided by the hitch manufacturer. The following instructions apply in most cases. If the instructions provided with your hitch differ from this procedure, follow the manufacturer's instructions.

Adjust the height of the receiver and trailer pin box so that the loaded trailer is level when hitched to the tow vehicle and ready to travel.

**NOTE: CHECK PIN BOX ADJUSTING BOLT TORQUE W/ TORQUE WRENCH TO 150 FT.-LBS.**

The tow vehicle and trailer should be on level ground. This makes connecting the receiver and pin box much easier if both height and side-to-side levels are carefully matched.

1. Raise or lower the front of the trailer so the king pin height matches the coupler assembly of the tow vehicle.
2. Open coupler locking device so the pin will engage the hitch plate jaws.
3. Lower tow vehicle tailgate.
4. Slowly back the tow vehicle toward the pin box until the tailgate can be raised after clearing the king pin. Keep king pin and coupler aligned.
5. Close tailgate.
6. Continue backing and engage king pin and coupler completely.
7. Close coupler locking device. Engage the safety latch.
8. Raise fifth-wheel landing gear.
9. Connect the breakaway switch lanyard. Make sure the lanyard is adjusted so that the switch is not actuated during a full jackknife turn.
10. Plug the 12-volt electrical cord into the mating receptacle on the tow vehicle.
11. Run an operational check of brake lights, turn signals, running lights, and electric brakes before heading out.
12. Reverse this procedure for unhitching your trailer.

## THE BRAKING SYSTEM

The electric brakes on your trailer are similar to the drum brakes on your car or truck. The basic difference between them is that your trailer brakes are operated by 12-volt direct current from the tow vehicle, rather than by direct hydraulic action. The brakes have been factory calibrated for smooth, positive response. During the break-in period, you may experience squeaking brakes. This is normal and will cease after a few miles of break-in wear.

**BRAKE SYSTEM COMPONENTS:** The braking system on your trailer consists of several major components, all of which must function properly for safe and responsive braking.

**1. TOW VEHICLE BATTERY:** The tow vehicle is the primary electrical power source for the trailer braking system. The connection is made at the positive post of the battery or at the tow vehicle starter solenoid battery terminal.

**2. BRAKE CONTROLLER:** Note: The brake controller is not supplied with your trailer. The electric trailer brakes are automatically applied by the brake controller, which is usually mounted within easy reach of the tow vehicle driver.

### **- - - WARNING - - -**

**DO NOT INSTALL A FUSE IN THE CIRCUIT BETWEEN THE TOW VEHICLE BATTERY AND AN ELECTRIC OR ELECTRONIC BRAKE CONTROLLER. A BLOWN FUSE WILL CAUSE THE CONTROLLER TO CEASE FUNCTIONING BOTH AUTOMATICALLY AND MANUALLY CAUSING LOSS OF TRAILER BRAKING WITH NO ADVANCE WARNING.**

**3. CONNECTOR PLUG:** The multi-pin cord connector at the front of the trailer transfers electrical power from the tow vehicle battery to the trailer brakes, exterior lighting system, and battery.

**4. BREAKAWAY SWITCH:** The breakaway switch is located on the trailer tongue. It has a steel cable (lanyard) fastened to it which will reach to the frame of the tow vehicle. This device is one of the most vital components on your trailer's braking system. It automatically applies the trailer brakes if the tow vehicle and trailer become uncoupled while in motion. The breakaway switch operates when a pull pin linked by the cable to the tow vehicle is separated from the switch. When the switch closes, power for brake application is transferred to the onboard trailer battery. The steel lanyard must be anchored to the tow vehicle when the trailer is hitched up. Secure this cable loop to the permanent frame of the tow vehicle or a part of the hitch that is not removable.

### **- - - WARNING - - -**

**DO NOT FASTEN THE BREAKAWAY SWITCH LANYARD TO THE HITCH BALL OR ANY OTHER REMOVABLE PART OF THE HITCH.**

Remove the pull pin every three months and lubricate it with light oil. Before reinserting the pin, spray the inside of the switch with an electrical contact cleaner to prevent corrosion. Test the breakaway switch operation before each trip as follows:

1. Hitch the trailer to the tow vehicle.
2. Pull out the breakaway switch actuating pin. Never leave the actuating pin out for more than a few seconds as damage can result to wiring or the brakes. When the pin is out the full power of your battery(s) is channeled to the brakes, which could result in possible damage to the brakes or the wiring when the actuating pin is left out for an extended period of time.

3. Test brakes by attempting to drive away. The breakaway switch is functioning properly if the trailer brakes are activated. Complete this test quickly.
4. If the brakes are not activated, check that the trailer battery is connected and fully charged and the trailer brakes are properly adjusted.
5. Obtain service repair if the trailer brakes do not operate after making these checks.
6. Reinsert the breakaway switch actuating pin before towing the trailer.

**- - - WARNING - - -**

**DO NOT TOW A TRAILER WITH A BROKEN OR MALFUNCTIONING BREAKAWAY SWITCH.**

**- - - WARNING - - -**

**DO NOT LEAVE THE PULL PIN OUT OF THE BREAKAWAY SWITCH FOR MORE THAN A FEW SECONDS (30 TO 60 SECONDS) OR THE BATTERY WILL BE DRAINED. DO NOT USE THE BREAKAWAY SWITCH FOR A PARKING BRAKE.**

5. **GROUNDING:** A poor ground circuit from the brakes to the tow vehicle battery can be as detrimental to efficient braking as a poor primary circuit from the battery to the brakes.

**BRAKING TIPS:**

- Before moving your trailer, inspect all external braking system components. Inspect all wiring connections. Test the breakaway switch as outlined above.
- Never use the trailer brakes alone for extended periods.
- Never use the tow vehicle brakes alone.
- Always use the automatic brake controller. This synchronized braking system enables you to drive in the manner recommended by experts.

## **TOWING SPEED**

Reasonable vehicle speed is probably the greatest factor in safe, pleasant towing. With experience you will develop the special driving skills needed for safe trailer towing.

**- - - WARNING - - -**

**TOW AT MODERATE SPEEDS ALLOWING FOR ADVERSE HIGHWAY AND WIND CONDITIONS. INCREASED SPEED REDUCES TRAILER TOWING STABILITY, HANDLING AND STOPPING ABILITY.**

**- - - WARNING - - -**

**DO NOT USE A CRUISE CONTROL OR AUTOMATIC SPEED REGULATING DEVICE WHEN TOWING A TRAILER.**

**- - - WARNING - - -**

**DO NOT ATTEMPT TO STOP TRAILER SWAYING BY QUICK STEERING CHANGES OR BY FORCEFULLY APPLYING THE TOW VEHICLE BRAKES. IT IS BEST TO USE THE MANUAL LEVER LOCATED ON YOUR BRAKE CONTROL.**

Please review the Safe Driving Tips outlined in General Information and Helpful Hints.

## SAFETY REGULATIONS REGARDING LP GAS SYSTEMS & APPLIANCES

The manufacturer of this recreational vehicle is required to furnish the following consumer information as provided by the National Fire Protection Association and the American National Standards Institute. The information and warnings found here may also be found in other sections of this Owner's Manual. See sections titled "LPG SYSTEM" (PG.12) and "APPLIANCES & EQUIPMENT" (PG. 14) for other safety and operating information.

**- - - WARNING - - -**

LP GAS CONTAINERS SHALL NOT BE PLACED OR STORED INSIDE THE VEHICLE. LP GAS CONTAINERS ARE EQUIPPED WITH SAFETY DEVICES WHICH RELIEVE EXCESSIVE PRESSURE BY DISCHARGING GAS TO THE ATMOSPHERE.

**- - - WARNING - - -**

IT IS NOT SAFE TO USE COOKING APPLIANCES FOR COMFORT HEATING, COOKING APPLIANCES NEED FRESH AIR FOR SAFE OPERATION. BEFORE OPERATION:

***BEFORE OPERATION: OPEN OVERHEAD VENT OR TURN ON EXHAUST FAN AND OPEN WINDOW.***

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

**- - - WARNING - - -**

PORTABLE FUEL-BURNING EQUIPMENT, INCLUDING WOOD AND CHARCOAL GRILLS AND STOVES, CANNOT BE USED INSIDE THIS RECREATIONAL VEHICLE. THE USE OF THIS EQUIPMENT INSIDE THE RECREATIONAL VEHICLE MAY CAUSE FIRES OR ASPHYXIATION.

**- - - WARNING - - -**

DO NOT BRING OR STORE LP GAS CONTAINERS, GASOLINE, OR OTHER FLAMMABLE LIQUIDS INSIDE THE VEHICLE BECAUSE A FIRE OR EXPLOSION MAY RESULT.

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

**DO NOT FILL CONTAINER(S) TO MORE THAN 80 PERCENT OF CAPACITY.**

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

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

**- - - IF YOU SMELL GAS - - -**

1. Extinguish any open flames, pilot lights and all smoking materials.
2. Do not touch electrical switches.
3. Shut off the gas supply at the tank valve(s) or gas supply connection.
4. Open doors and other ventilating openings.
5. Leave the area until odor clears.
6. Have the gas system checked and leakage source corrected before using again.

LP Gas regulators must always be installed with the diaphragm vent facing downward. Regulators that are not in compartments have been equipped with a protective cover. Make sure that the regulator vent faces downward and the cover is kept in place to minimize vent blockage which could result in excessive gas pressure causing fire or explosion.

===== PLEASE FAMILARIZE YOURSELF WITH THE VERY IMPORTANT INFORMATION ABOVE =====

## LPG SYSTEM (LIQUEFIED PETROLEUM GAS)

The furnace, range, oven, water heater, refrigerator, and optional generator all operate on LPG.

### - - - CAUTION - - -

LPG is a colorless, highly flammable gas which has been treated chemically to have a pungent odor smelling like garlic. This helps the user to detect the presence of the gas. LPG is heavier than air; therefore, it displaces the air in low pockets and could cause suffocation or explosion if not detected.

The two most common types of LPG are butane and propane. Both types work equally well in the LPG system of your recreational vehicle. Butane can only be used down to a temperature of 32 F above zero. Propane can be used down to a temperature of 40 F below zero.

Your LP Gas dealer will supply you with the fuel mixture best suited for your area.

**LPG TANKS:** The LPG gas tanks are tested high pressure cylinders. LPG is stored in these tanks under high pressure which maintains the LPG in a liquid/vapor condition. The 10% valve or pressure relief valve has been located on the top of the tank so that it will always be in the vapor area. If the tank is over filled or if the temperature of the tank is raised, this valve will release. This valve should be **HAND TIGHTENED ONLY**.

**LP GAS PRESSURE REGULATOR:** The two-stage LPG pressure regulator reduces the high pressure vaporized LPG down to a pressure of a 13" water column. At this pressure LPG is piped to and used by the various LP Gas fired appliances. Do not make any adjustments to the LPG pressure regulator. Adjustments should only be made by an authorized LP Gas service technician.

**IMPORTANT:** LP Gas pressure regulators must always be installed with the diaphragm vent facing downward. Regulators that are not housed in a compartment have been equipped with a protective cover. It is very important that the regulator vent faces downward and that the cover is kept in place to minimize vent blockage which could result in excessive gas pressure causing fire or an explosion. This opening is located at the bottom of the spring case and should be checked periodically to see that it has not become plugged by insects, mud, ice or other debris.

**VENTING:** All LP Gas fired appliances use oxygen from the air. It is necessary to provide proper ventilation when occupying your unit to avoid the danger of asphyxiation. For best ventilation open a window and roof vent.

### FILLING LP GAS TANKS:

1. Close the tank valve on the empty tank.
2. Loosen and remove spud nut. **IMPORTANT: THIS IS LEFT HAND THREAD.**
3. Loosen the clamp holding the tank to the unit.
4. Remove tank from unit.
5. Have the tank filled by an authorized LP Gas dealer.
6. Observe labels and tags.

The **WARNING LABEL** located near the LPG container reads:

### **WARNING: DO NOT FILL CONTAINER(S) TO MORE THAN 80% OF CAPACITY**

Overfilling the LPG container can result in uncontrolled gas flow which could result in fire or an explosion. A properly filled container will contain approximately 80% of it's volume as liquid LPG.

## LPG TANK INSTALLATION:

1. Position filled tank.
2. Engage the spud-nut service connector to main tank valve. **IMPORTANT: THIS IS LEFT HAND THREAD.**
3. Tighten nut snugly with wrench. **DO NOT USE PLIERS.** **IMPORTANT: This is a mechanical brass seal, it does not require pipe sealer.**
4. Secure tank.
5. Check all tank and line connections to be sure they are tight.
6. Test for leaks using a soapy water solution and watch for enlarging soap bubbles.
7. Observe labels and tags.

## START-UP and OPERATION OF LP GAS APPLIANCES:

1. Check to be sure that all appliance gas supply valves are in the off position.
2. Read the manufacturer's start-up and shut-off instruction manuals for each respective appliance.
3. You are now ready to light your LPG appliances. **IMPORTANT: It may be necessary to purge air from the LPG supply lines on initial lighting of the LPG appliance.** To purge the air from the supply line, open a pilot or burner valve. Hold a flame near the burner, after several seconds the air will escape, and the gas will ignite and burn.

## LPG SAFETY PRECAUTIONS:

- Inspect the entire LPG system for possible leaks or damaged parts before each trip.
- When testing for leaks use soapy water.
- **WARNING: Never check for LP Gas leaks with an open flame.**
- Never lock the LPG compartments. The tank service valve should always be accessible in case of an emergency.
- **WARNING: Do not place or store an LP Gas container inside the vehicle.** LPG containers are equipped with safety devices which relieve excessive pressure by discharging gas into the atmosphere.
- Only have the LPG tank filled by an authorized LP Gas dealer.
- Always make certain that the tank is secured in place.
- Always extinguish all LPG appliance pilot lights before refueling the gasoline tank on your vehicle.
- Never use an upright tank in a laydown position or a laydown tank in an upright position.
- Use caution when drilling holes or fastening objects to the walls or floor of your camper. Gas lines could be damaged and present an extreme safety hazard.
- **WARNING: Never use natural gas in you LPG system.**

**USING LP GAS SYSTEM AT LOW TEMPERATURES:** Your gas system will function at low temperatures provided the system components are kept at a temperature above the vapor point of the LP gas.

**NOTE: Propane vaporizes at about 40°F below zero.**

LP gas systems can and do freeze up in very cold weather. It is a common misconception that the regulator or the gas itself freezes, when it is actually moisture or water vapor that gets trapped in the system or is absorbed by the gas that freezes and causes the problem. This ice can build up and partially or totally block gas supply.

There are a number of things you can do to prevent this freeze up:

1. Be sure the gas tank is totally moisture-free before it is filled.
2. Be sure the tank is not overfilled. This is also a safety consideration.
3. Keep the valves on empty tanks tightly closed.
4. Have the gas tanks purged by the LP gas service dealer if freeze up occurs.

## APPLIANCES & EQUIPMENT

Most LPG appliances have lighting instructions on a plate that is permanently attached to the appliance.

For detailed operating information please refer to the specific manual supplied by the respective manufacturer which has been included in your owner's packet. All appliances are warranted by the respective manufacturer.

**LP GAS (LPG) LEAK DETECTOR:** The LPG leak detector is located near the floor in the galley area. The LPG leak detector contains an alarm that will sound alerting you to the presence of low levels of potentially dangerous LP gas that may have been released due to a range top or oven burner flame loss, gas pipe leak, or an incorrectly adjusted appliance burner.

**IMPORTANT: THIS DEVICE DETECTS THE PRESENCE OF LP GAS-IT DOES NOT DISCONNECT THE GAS SUPPLY.**

Read the owner's manual supplied by the manufacturer for details on testing and maintenance of the LPG leak detector. This detector is an important safety device.

**--- IMPORTANT: ---**

**TEST THE LPG LEAK DETECTOR BEFORE EACH TRIP TO INSURE THAT IT IS WORKING PROPERLY.**

**REFRIGERATOR:** The 3-way refrigerator operates on LPG fuel, 115-volt AC electric power or 12-volt DC power.

**--- IMPORTANT ---**

It is not recommended to operate the refrigerator on LPG while traveling.

**IMPORTANT:** The refrigerator must be level in order to operate properly. Check the level by placing a bubble type level on the freezer shelf. If necessary, hold a small mirror above the bubble level to read the bubble. Use the jacks and blocking necessary to adjust the level of the camper to level the refrigerator.

**RANGE TOP BURNER AND OVEN:** The top burners of the range and oven operate on LP Gas.

**--- WARNING ---**

**IT IS NOT SAFE TO USE COOKING APPLIANCES FOR COMFORT HEATING**

**--- IMPORTANT ---**

**LPG APPLIANCES NEED FRESH AIR FOR SAFE OPERATION.**

**--- BEFORE OPERATION ---**

**YOU MUST OPEN OVERHEAD VENT or TURN ON EXHAUST FAN, AND OPEN A WINDOW**

The above warning label has been placed in the cooking area to remind you to provide an adequate supply of fresh air for combustion. Unlike homes, the amount of oxygen supply is limited due to the size of the recreational vehicle. To avoid the danger of asphyxiation provide for proper ventilation when using cooking appliances. **IMPORTANT:** The danger of asphyxiation is greater when the appliance is used for long periods of time-

**DO NOT USE COOKING APPLIANCES FOR COMFORT HEATING.**

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

**- - - CAUTION - - -**

**IF YOU SMELL GAS:**

1. EXTINGUISH ANY OPEN FLAMES, PILOT LIGHTS AND ALL SMOKING MATERIALS.
  2. DO NOT TOUCH ELECTRICAL SWITCHES.
  3. SHUT OFF THE GAS SUPPLY AT THE TANK VALVE(S) OR GAS SUPPLY CONNECTION.
  4. OPEN DOORS AND OTHER VENTILATING OPENINGS.
  5. LEAVE THE AREA UNTIL ODOR CLEARS.
  6. HAVE GAS SYSTEM CHECKED AND LEAKAGE SOURCE CORRECTED BEFORE USING AGAIN.
  7. FAILURE TO COMPLY MAY RESULT IN EXPLOSION CAUSING DEATH OR SERIOUS INJURY.
- 

**FURNACE:** The furnace operates on LP Gas fuel. Before using the furnace read the owner's manual supplied by the manufacturer of the furnace for a complete understanding of how to safely light and use the furnace as intended by the manufacturer. Be sure all heat registers are open and unobstructed to prevent the furnace from cycling due to excessive heat buildup in chamber.

**WATER HEATER:** The water heater operates on LP Gas fuel. Before using the water heater read the owner's manual supplied by the manufacturer of the water heater for a complete understanding of how to safely light and use the water heater as intended by the manufacturer. Controls for the water heater are located behind the access panel on the outside of your recreational vehicle. Your RV is equipped with a Direct Spark Ignition (DSI) system. Please read owner's manual supplied by the manufacturer for proper lighting procedure. If you have the optional Direct Spark Ignition (DSI) system with LP Gas fuel and 120-volt element, please read the owner's manual supplied by the manufacturer for the optional DSI gas/electric water heater for proper lighting procedure.

**- - - IMPORTANT - - -**

Before turning on the water heater make sure that the water heater is filled with water. Be sure that the water heater by-pass valve is not in the by-pass position (see diagram C in section 4 at the back of this manual for correct position.)

**GENERATOR (optional equipment):** The generator operates on LP Gas. For detailed operating and maintenance instructions refer to the owner's manual supplied by the manufacturer. **IMPORTANT:** Always check to make sure that the generator has adequate ventilation and that vents and/or exhaust have not been blocked by snow or other objects that may damage exhaust pipe and restrict flow of exhaust away from vehicle. **AVOID THE DANGER OF CARBON MONOXIDE (CO) POISONING** read the owner's manual for a complete understanding of how to safely use the generator. It is never recommended to run the generator while occupants are sleeping. **IMPORTANT:** Always be sure that your CO detector is operating.

**GENERATOR POWER SWITCH.** If your RV is equipped with a factory installed optional generator or optional generator ready package, your RV contains the latest in technology. Your RV has an automatic transfer power switch that senses the presence of all available power sources. This generator power switch will automatically select the most suitable power source. There is no need to plug your shore power cord into a generator J Box. All you do is start the generator and the power switch will use that power source. If you plug into 120-volt shore power, the power switch will sense the availability of the new power source and automatically switch to the more economical source. For detailed operating and maintenance instructions refer to the owner's manual supplied by the manufacturer.

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- - - WARNING - - -

- This RV is equipped with a liquefied petroleum gas system (LP Gas System). Use caution as LP Gas is highly explosive. Avoid serious accidents by following instructions for maintenance and use.
  - Even though the components of your LPG system—including LP Gas tanks, appliances and optional equipment such as a generator—are manufactured to the latest standards set by the appropriate government agencies, due caution must be exercised.
  - Never tamper with or attempt to modify LP Gas equipment, lines or connections.
  - Never check for leaks with a lighted match.
  - Do not store explosives or flammable material near LP Gas appliances or equipment, i.e. lighter fluid or gasoline.
  - Do not set flammable items near a gas appliance in use, i.e. hot pads, gloves or other flammable objects.
  - All repairs, adjustments or modifications must be completed by an authorized LP Gas service technician.
  - Have your LP Gas system checked by an authorized LP Gas service technician at least once a year, and more frequently if you use your RV a great deal.
  - Always turn off the LP Gas supply at the tank before entering a gasoline station or LP Gas supply outlet or any other area that posts a notice to turn off LP Gas before entering. **IMPORTANT:** You also need to turn off all pilot lights and appliances individually. If appliances are not individually turned off, automatic ignition appliances may continue to spark when LP Gas is turned off at the container.
  - It is very important to read and understand all information supplied in this Owner's Manual and the owner's manuals provided by respective manufacturers of the LP Gas appliances & optional equipment used in your RV.
- 

**POWER RANGE EXHAUST HOOD:** The power range exhaust hood is located above the range burners and operates on 12-volt power. For detailed operating information and maintenance please refer to the owner's manual supplied by the manufacturer.

**MICROWAVE OVEN:** The microwave oven operates on 120-volt AC power accessed through 120-volt AC power from either a public utility or a generator (optional equipment). For detailed operating information and maintenance please refer to the owner's manual supplied by the manufacturer.

**ROOF MOUNTED AIR CONDITIONER (option):** The air conditioner operates on 120-volt AC power accessed through 120-Volt AC power from either a public utility or a generator (optional equipment). Be sure to turn the circuit breaker "ON." Before using the air conditioner read the owner's manual supplied by the manufacturer of the air conditioner for a complete understanding of operation and maintenance.

**FANTASTIC VENT (option):** The fantastic vent operates on 12-volt power. For detailed operating information and maintenance please refer to the owner's manual supplied by the manufacturer.

**A/M F/M STEREO TAPE OR CD PLAYER (option):** For detailed operating information and maintenance please refer to the owner's manual supplied by the manufacturer.

**TV ANTENNA (option):** For detailed operating information and maintenance please refer to the owner's manual supplied by the manufacturer.

**SMOKE DETECTOR:** A battery-powered smoke detector complying with ANSI A119.2/NFPA 501C is mounted on the ceiling in the living/cooking area of your RV. Please read the owner's manual supplied by the manufacturer for details on testing and caring for this important safety device.

**FIRE EXTINGUISHER:** The fire extinguisher is mounted on the wall near the entry door of your RV. Please read the owner's manual supplied by the manufacturer for details on testing and maintenance on this important safety device.

**CARBON MONOXIDE (CO) DETECTOR:** The CO detector is usually mounted in the ward above the bed in the cab-over of your Truck Camper, it is usually located in the main living area of your trailer.. **IMPORTANT:** This detector is designed to provide warning when low levels of carbon monoxide are detected in the surrounding air. **CARBON MONOXIDE GAS IS POISON.** Utmost care should be taken to avoid the danger of CO poisoning.

**IMPORTANT:** Read the owner's manual supplied by the manufacturer of the CO detector for details on testing and maintenance on this important safety device. The unit should be tested to insure that it is operating properly before each trip and frequently during the time you are staying in the RV.

## ELECTRICAL SYSTEMS

NORTHWOOD RVs are equipped with three separate and distinct electrical systems.

1. The 120-volt to 12-volt converter and a 12-volt DC wet cell, negative ground, deep cycle, storage battery system.
2. The 120-volt AC electrical system similar to the one used in your home.
3. The optional LP Gas generator.

### 12-VOLT POWER SYSTEM:

The power center is the nerve center of the 12-volt DC--as well as the 120-volt AC-- system.

Fuses for the 12-volt DC circuits are located at the power center panel. These fuses are automotive type and should always be replaced with the same type and amperage rating.

**- - - WARNING - - -**

**DO NOT INSTALL 12-VOLT FUSES WITH AMPERAGE RATINGS GREATER THAN THAT SPECIFIED ON THE FUSE BOX LABEL.**

Battery condition can be checked on the **MONITOR PANEL**. To check the battery charge:

1. Press "BATTERY" rocker switch on the panel.
2. Turn on a light or any 12-volt appliance. The battery should be checked with a load.
3. Read battery condition on the meter. 10-volt is poor, 11-volt is fair, and 12.6-volt is good. When meter reads below 12-volts you lose 30% of your battery charge. If your 120-volt power cord is plugged in to shore power or your optional generator is running a full battery charge should read 13.6-volts rather than 12.6-volts.

**- - - WARNING - - -**

**DISCONNECT THE 120-VOLT ELECTRIC CORD AND BOTH CABLES FROM THE TRAILER BATTERY ALSO DISCONNECT THE TWO CABLES TO THE GENERATOR BEFORE WORKING ON EITHER ELECTRICAL SYSTEM.**

Your Northwood RV equipped with a **12-VOLT KILL SWITCH**. The kill switch stops 12-volt power from the battery. The 12-volt kill switch should be used to avoid 12-volt drain if the unit is stored even for a short time period.

**BATTERY CHARGING:** Normally the battery will be kept charged by either the truck charging system while on the road or by the AC/DC power converter when plugged into AC service.

**IMPORTANT NOTE:** Always leave home with a full charge on your battery(s). A slow trickle charge is best for long battery life. It requires at least 52 hours to fully charge an RV battery on a trickle charger. Once your battery(s) is fully charged, your power converter will maintain the battery(s) to full peak while your unit is plugged into 120-volt shore power and your truck charging system will keep the battery(s) at full peak while traveling.

Do not smoke near batteries being charged or which have been recently charged. Please note that batteries are being charged while you drive and while you are connected to 120-volt AC power through the power center/charger circuit.

Check and adjust the electrolyte level before charging. Fill each cell to the indicator with distilled water.

**120-VOLT AC SYSTEM:** This system provides grounded electrical service for appliances such as the air conditioner, TV, microwave oven, 110-volt outlets, etc. The 120-volt system also provides a power source for the power center.

Your RV is equipped with a heavy duty power supply cord. Some RVs have cords that are not permanently connected to the main breaker box. In that case, you must connect the power cord to the power supply outlet which is located on the exterior of the unit. The other end of this cord has a plug that can be connected to an external 120-volt AC power outlet.

The breaker box (power center) is located on the inside of the unit. If a circuit breaker trips open a circuit, you may be using too many portable appliances. Unplug all of the appliances and reset the breaker. If the breaker trips off again, contact your servicing dealer or an electrician. Do not try to use the circuit again before it is inspected. If the breaker remains on, plug in only a few of your portable appliances at one time. The outlet receptacles only operate on 120-volt AC power.

**IMPORTANT:** Do not use a two-conductor extension cord or any cord or cable that does not assure appropriate and adequate ground continuity.

**THE POWER CENTER:** The power center will supply 12-volt requirements when your RV is operating on 120 AC volts. Thus, you will not have to worry about running down the battery. When you are plugged into 120-volt AC service, the power center automatically switches the load from the battery to the power center. The onboard battery will gradually be brought up to a full charge and maintained by the battery charger as long as 120-volt power is available.

**GROUND FAULT INTERRUPTER:** Kitchen and patio 120-volt electrical outlets are protected by a Ground Fault Interrupter (GFI). This device is provided in compliance with ANSI A119.2/NFPA 501C requirements and is intended to protect you against the hazards of line to ground electric faults and electrical leakage shocks possible when using electrical appliances in the kitchen, or damp areas inside or outside of the unit. Whenever you plug your 120-volt system into shore power, it is recommended that you verify that the adapter and power source are wired in proper sequence. Occasionally we have found that some home or garage wiring installations have been done improperly. Even though your RV may appear to operate properly, there is danger of electrical shock—especially in wet areas—if power source wiring has been incorrectly installed in the home, garage, or other facility. If the shore power has been improperly wired, the built in safety devices in your RV may not function correctly. A simple continuity checker (wiggie) will verify wiring integrity. If you suspect that an external extension cord or adaptor may not have been supplied by a properly licensed electrician, be sure to check the power source before use to avoid the danger of an electrical shock.

# WATER SYSTEMS

## FRESH WATER SYSTEM

Fresh water is supplied to the RV by two alternate sources.

1. The external hookup (city or park water).
2. Self-contained water (on board storage tank).

**EXTERNAL HOOKUP (City or Park Connection):** To use the external water system connect the water hose from the city or campground source to the hose connector on the side of your unit. Be sure to run the water for a few seconds to clear the hose before connecting to the unit. A check valve at the water pump prevents city water from being fed back through the pump and into the water tank. Another check valve prevents water from being pumped out through the city water connection when the self-contained water system is being used in the unit. The water heater is equipped with a safety-relief valve which will open if a surge of pressure should occur. The water system has been tested for leaks at the factory at 90-100 PSI.

**IMPORTANT: EXCESSIVE WATER PRESSURE.** Some city or campground water systems may operate at pressures that can damage the water system in your RV or cause water pump failure. If pressure at your site is over 70 PSI, you must use a pressure regulator. The recommended pressure range is from 35 PSI to 45 PSI. Your RV supply dealer can advise you on the best choice regarding water pressure regulators.

**IMPORTANT:** The 12-volt DC water pump switch should be in the "OFF" position when the RV is connected to a city or campground source.

**SELF-CONTAINED WATER SYSTEM:** ☺ (See Diagram C Section 4) The fill spout for the onboard fresh water storage tank is located on the outside of the RV. The electric 12-volt DC pump supplies the pressure for the self-contained water system. You can check the approximate water level by pressing the "water" rocker switch on the monitor panel. Erroneous readings could be caused by water with low mineral content.

**FRESH WATER FILL INSTRUCTIONS:** ☺ (See Diagram D Section 4) The access door for the fresh water fill spout is located on the exterior sidewall of the RV. The fill spout is connected by a hose to the onboard fresh water storage tank. There is a small vent hole adjacent to the filler spout. This vent relieves air from the onboard fresh water tank.

1. Fill slowly and be sure that the hose you use to fill the on-board water storage tank is smaller than the water fill opening to allow excess water and air to escape as tank fills. The higher the pressure of water you force into your water tank the greater the likelihood of damage to your RV. When you force water into a water tank you can actually balloon a 40-gallon tank to accept 60 gallons of water swelling the tank to a size too large to be contained in the area that houses the tank. This pressure can actually tear apart the structure of the floor on your RV.
2. Do not leave the RV unattended while filling.
3. Do not wedge the water hose into the fill spout.
4. "Full condition" indication is water back flushing by the water hose and out of the air vent adjacent to the fill spout.
5. Discontinue filling immediately on observation of "full" signal.

**CAUTION:** Improper filling can cause hydraulic force which can damage your RV floor sections. You must leave space around fill hose (AN OVERSIZED HOSE WILL NOT ALLOW THE SPACE REQUIRED TO PREVENT PRESSURE BUILD UP). The vent can only release a fraction of the pressure created when filling tank.

**CAUTION:** ☺ (See Diagram D Section 4 at the back of this manual)

BEFORE FILLING YOUR RV FOR THE FIRST TIME YOU NEED TO READ AND UNDERSTAND THE WARNINGS SET OUT IN THE WATER SYSTEM / OVERFILL DIAGRAM. ☺ (See Diagram D Section 4 at the back of this manual).

**WARNING: ONLY USE POTABLE WATER IN THE WATER TANK. SANITIZE, FLUSH AND DRAIN THE WATER TANK BEFORE USING.**

**SANITIZING THE FRESH WATER SYSTEM:** The following procedures are recommended to assure complete sanitation of your potable water system. This applies to a new system, one that may have become contaminated or one that has not been used for a period of time.

1. Prepare a solution of 1/4 cup household liquid chlorine bleach (5% sodium hypochlorite) to one gallon of water. This solution will treat 15 gallons of fresh water. You will need to increase solution proportions to the tank capacity of you RV.
2. Close drain valves and faucets, pour chlorine solution into the fresh water tank filler spout. Fill tank completely with fresh water.
3. Turn water pump switch "ON." **Be sure you have 12-volt DC power.** Open all faucets individually until water flows steadily and you detect a distinct odor of chlorine--then turn faucets off. Do not forget the hot water taps. This will purge any air from the lines.
4. Top off water tank with fresh water and wait 3 to 4 hours.
5. Drain the entire system by opening all fresh water tank valves, faucets and plumbing line drain valves.
6. Flush the system with drinking quality water, close drain valves and refill the water tank with fresh water and repeat the steps set out in step 3 (omitting the chlorine solution). Let the fresh water flow through the system for several minutes to flush out the chlorine solution.
7. After you finish flushing the fresh water system drain the entire system by repeating the steps set out in step 5. You can now close the tank valve, faucets, and drain valves and fill the tank with fresh drinking quality water. The system is ready to use.
8. To remove any excessive chlorine taste or odor which might remain in the potable water system, prepare a solution of one quart vinegar to five gallons water. Allow this solution to agitate in tank through vehicle motion. Drain tank and flush again with potable water.

**ELECTRIC 12-VOLT DC WATER PUMP:** The onboard fresh water system is pressurized by a self-priming, 12-volt DC pump. The water pump operates automatically when the water pump power switch is "ON" and a faucet or valve is opened. Turn the water pump "ON" to pressurize the system. When a faucet is opened after the initial filling of the tank, the water may sputter for a few seconds. This is normal and is not cause for concern. In the "ON" position the water pump delivers water to the water heater and faucets and maintains a positive pressure through the system. **IMPORTANT:** It is recommended to turn the water pump switch "OFF" whenever you are away from the RV. **IMPORTANT:** Do not run the water pump without water in the system.

## WASTE WATER SYSTEM

The waste water system in your RV is made up of sinks, tub, shower, toilet, plumbing drain, vent lines, "gray water" holding tank and a "black water" holding tank. The holding tanks make the system completely self-contained and allow you to dispose of waste water at your convenience. A flexible sewer hose is required to connect the holding tank outlet to the inlet of an approved waste water dump station or sewer system. The drain plumbing is very similar to that used in your home. The system is trapped and vented to prevent waste gases from backing up into the RV. The drain plumbing is durable and resistant to most chemicals. All drain plumbing except the toilet connection terminates in the gray water holding tank. The toilet is mounted on the black water tank and flushes directly into it.

The holding tanks terminate in a valve arrangement that permits dumping each tank separately. The valves are called "knife valves." A blade closes the opening in the sewer drain pipes. The blade is connected to a T-handle that is pulled to release the contents of the tank(s). During self-containment use, the sewer line is securely capped to prevent leakage of waste material onto the ground or pavement. **DO NOT PULL THE HOLDING TANK KNIFE VALVE OPEN WHEN THE PROTECTIVE CAP IS INSTALLED ON THE PIPE.** Always ensure that the tank is evacuated into an acceptable sewer inlet or dump station.

**WARNING: HOLDING TANKS ARE ENCLOSED SEWER SYSTEMS AND AS SUCH MUST BE DRAINED INTO AN APPROVED DUMP STATION. BOTH TOILET AND GRAY WATER HOLDING TANKS MUST BE DRAINED AND THOROUGHLY RINSED REGULARLY TO PREVENT ACCUMULATION OF TOXIC MATERIALS.**

It is recommended that you only dump the holding tanks when they are at least 3/4 full. If necessary, fill the tanks with water to 3/4 full. This provides sufficient water to ensure complete flushing of waste material into the sewer line.

#### **DUMPING THE HOLDING TANKS:**

1. First make sure the dump valve is closed.
2. Remove the sewer drain cap and attach the sewer adapter and drain hose to the dump valve drain outlet. Place the other end of the drain hose into the sewer or dump station inlet. Push the hose firmly far enough into the opening to be secure. In some cases adapters may be necessary between the line and the inlet.
3. Arrange the sewer hose so it slopes evenly and is supported to maintain the slope.
4. Dump the black water holding tank first. Grasp the handle of the black water knife valve (the large one) firmly and slide the valve open with a quick, steady pull. **IMPORTANT:** Always open the dump valve with a quick jerk to give the desired flushing effect.
5. Allow enough time for the tank to drain completely. Rinse and flush the tank and drain hose through the toilet with a bucket of water or a hose. When the tank flow stops, push the handle in to close the valve. Run enough water into the tank to cover the bottom. This will aid the break-up of solid wastes.
6. When using a sewer hook-up system in a park, it is recommended to keep the dump valve closed on the black water tank until it is full. This will help prevent accumulation of waste material that could clog the system.
7. To dump the gray water tank, repeat the steps above using the small knife valve. The gray water knife valve may be left open in a semi-permanent hookup.

**IMPORTANT:** Do not dump both tanks at the same time. Also, it is recommended that you add several gallons of water to each holding tank and dump a second time in order to thoroughly rinse tanks and drain hose.

If solids become lodged in the tank, add water to the tank and drive the unit a few miles. The vibration and motion should dislodge the solids. If an obstruction should remain, contact your dealer or RV supply store for a suitable cleaning compound.

#### **- - - WARNING - - -**

**SEWER DRAIN CAP MUST ALWAYS BE SECURELY IN PLACE WHILE THE VEHICLE IS IN MOTION. PLEASE PRACTICE GOOD HOUSEKEEPING WHEN DRAINING WASTES AT A CAMPSITE OR DISPOSAL STATION. LEAVE THE SITE IN GOOD ORDER.**

## **HOLDING TANK CARE AND MAINTENANCE:**

1. Keep the black water tank knife valve closed. Fill tank to at least 3/4 full before dumping. Be sure to cover the tank bottom with water after dumping.
2. Use only toilet tissue formulated for use in septic tank or RV sanitation systems.
3. Keep both knife valves closed and the drain cap tightly in place when using the system on the road.
4. Do not put facial tissue paper, ethylene glycol-based or other automotive antifreeze, sanitary napkin, or household toilet cleaners in the holding tanks.
5. Sometimes the holding tank valve will get clogged. In this case, a hand operated auger may be necessary. Be ready to close the valve quickly once the clog is cleared. If the seal gets damaged, it is easily replaced.

**- - - WARNING - - -**

**FULL HOLDING TANKS CAN RADICALLY CHANGE HOW YOUR TRUCK HANDLES ON THE ROAD. DO NOT TRAVEL WITH FULL HOLDING TANKS.**

**TOILET:** The marine toilet operates in a manner similar to a household type toilet except it is designed to flush using a minimum amount of water. Read the manufacturer's instructions for operating procedures on the specific type of toilet installed in the RV.

## **WINTER PROTECTION & WINTERIZATION**

**WINTER PROTECTION WHILE RV IS IN USE:** When using the RV in cold weather be sure there is adequate circulation of warm air from the furnace around all water pipes. Leaving the bath door and cabinet doors open will help to avoid freezing pipes. Keep the ceiling vent slightly open.

You can reduce or eliminate interior moisture condensation during cold weather by partially opening one or more roof vents and windows to provide controlled circulation of outside air into the interior of the RV. You can also install storm windows to help reduce or eliminate condensation on window glass.

**- - - WARNING - - -**

**DO NOT COVER THE EMERGENCY EXIT WINDOW. DO NOT HEAT RV WITH RANGE OR OVEN.**

## **PREPARING FOR LONG-TERM STORAGE:**

**DRAINING THE WATER SYSTEM:** Protecting the plumbing systems in the RV is the most important aspect of long-term winter storage.

1. Drain the fresh water tank by opening the water tank drain valve. Leave valve open.
2. Open the hot and cold water line drain valves.
3. Drain the water heater by opening the drain valve (remove the plug) at the bottom of the heater and open the safety valve by lifting up the lever on the relief valve. Open the hot water faucets.
4. Open all cold water faucets and activate the flush mechanism on the toilet. When each faucet has been opened, drained, and closed, close the water line drain valves and fresh water tank drain valve.
5. Drain the shower head by opening the valve. Let all water drain out of the tub spout. Leave the valve open.
6. Apply graphite lubricant to the knife valve actuator rod.

**WINTERIZING WITH NON-TOXIC ANTIFREEZE:** There are non-toxic antifreeze type additives which have been specifically designed for use in recreational vehicle fresh water and waste systems. This non-toxic antifreeze when rinsed out of the fresh water system should leave no residue or bad taste.

**--- WARNING ---**

**DO NOT USE ETHYLENE GLYCOL BASE (AUTOMOTIVE) ANTIFREEZE IN FRESH WATER SYSTEM.**

**--- CAUTION ---**

**DRAINING THE WATER SYSTEM ALONE MAY NOT PROVIDE ADEQUATE COLD WEATHER PROTECTION. IF THE TRAILER IS TO BE UNHEATED DURING FREEZING TEMPERATURES, CONSULT YOUR DEALER FOR THE BEST WINTERIZING PROCEDURE FOR YOUR CLIMATE. YOUR DEALER CAN WINTERIZE YOUR TRAILER FOR YOU OR CAN SUPPLY YOU WITH ONE OF THE SPECIAL ANTIFREEZES WHICH ARE SAFE AND APPROVED FOR USE IN RV WATER SYSTEMS. FOLLOW THE INSTRUCTIONS FURNISHED WITH THE ANTIFREEZE.**

**SEMI-AUTOMATIC WINTERIZATION SYSTEM (DIAGRAM ON PAGE 20A)** Winterizing the RV for storage during freezing temperatures can be accomplished easily with the semi-automatic winterization system. See your dealer or RV supply store for the amount of non-toxic antifreeze to use in your RV.

1. Drain all tanks: fresh water, black water and gray water. Drain hot water heater.
2. The water system in the RV is equipped with two each two-position valves. The first is located inside your RV in the back of your water heater, turn it to the by-pass position as indicated in the diagram. (Page 20A)
3. Next locate valve between your water tank and water pump. Turn the valve to the up position to draw potable antifreeze into the system as indicated in the diagram. (Page 20A)
4. Place open end of the hose into a bottle of approved non-toxic RV antifreeze.
5. Turn the water pump master switch ON.
6. Open each water faucet. Run the water pump and let about one cup of non-toxic antifreeze solution flow continuously through each faucet to circulate the non-toxic antifreeze throughout the entire fresh water and gray water waste systems and traps. Close each water faucet. Flush toilet until you see the colored non-toxic antifreeze draining into the black water tank.
7. Turn the water pump OFF. Open water faucet to remove pressure-then close.
8. Winterization of the Freshwater System is complete.

**IMPORTANT: ALL FRESH WATER LINES MUST BE FLUSHED WITH FRESH WATER TO CLEAR THE FRESH WATER SYSTEM OF ANY ANTIFREEZE PRIOR TO USING FRESH WATER SYSTEM.**

## **OUTDOOR WINTER STORAGE INSTRUCTIONS:**

**EXTERIOR:** Outdoor winter storage requires certain precautions to prevent condensation of excessive moisture which can cause musty odors and mold. If you decide that it is important to protect your vehicle in areas of heavy precipitation through the use of a vinyl type tarp, do not cover the unit in such a way that no air can circulate. If your unit is covered, it is important to provide some air circulation within the unit by cracking a roof vent and a window.

Check the roof for areas that may need resealed. Snow should not be allowed to accumulate on the roof. The action of thawing and freezing could cause damage to vents and other items attached to the roof.

If the unit is stored uncovered, it is necessary to close roof vents, windows and door tightly to prevent moisture from entering the unit.

## IMPORTANT NOTE FOR TRUCK CAMPER OWNERS:

Always support the CAMPER at the corners and outside walls. ☺ (See Diagram E Section 4 at the back of this manual).

--- IMPORTANT ---

**You must support camper correctly as set out in the diagram E - Section 4. Incorrect placement of blocking will result in damage to the sub floor and/or waste and fresh water tanks.**

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**INTERIOR:** The interior requires little preparation for winter storage. All appliances, both electrical and LP Gas should be turned off. Make sure that the LP Gas tanks are also turned off. All electricity going into the unit should be disconnected. It is recommended that you disconnect your 12-volt system by using your 12-volt kill switch. This will stop any drain on the battery caused by your LP and CO detectors while unit is in storage.

Since air circulation is virtually eliminated when the RV is totally closed, the following suggestions listed below will help to reduce musty odors, mold and excessive moisture:

1. Leave the door open on your refrigerator. Be sure to remove all food items.
2. Spread out your upholstery so that air can reach all portions.
3. Open all cabinet doors and drawers.
4. Place one or more containers of moisture gathering beads in the RV. This will help to reduce condensation and excessive accumulation of moisture inside the RV.

Winterize the water system by following instructions provided above.

## EXTERIOR MAINTENANCE

The RV has been engineered to provide many years of trouble-free service and a minimum amount of maintenance. The following guidelines indicate items that require periodic maintenance and inspection.

**EXTERIOR FINISH:** The exterior structure of the RV is made of fiberglass. Metal, rubber and plastic components are also attached to or part of the exterior structure of the RV. The finish on those materials is durable but not indestructible. Any material or finish will deteriorate in time. Exposure to the elements and airborne pollutants can chemically alter the composition of many materials causing dulling and fading to the finish. Most often these changes due to weathering are on the surface and do not affect the strength of the exterior components of the RV

### SIGNS OF WEATHERING:

1. Chalking. The surface finish has broken down into a fine powder that will usually wash off.
2. Fading. The color of the finish has changed. This can be caused by chemicals, pollutants in the air, ultraviolet rays of the sun, or by changes in the pigments used in the finish. Some fading is normal over a period of time.
3. Yellowing. Usually caused by chemical changes in the material and pigments.

Routine maintenance is the best way to insure against these cosmetic changes on the exterior components. Routinely wash and wax the exterior of the RV thoroughly to deter surface deterioration. Wash the exterior on a monthly basis. Never use strong solvents or harsh abrasives to clean exterior surfaces. Wax the exterior at least once a year, following the instructions given by the manufacturer of the wax. **IMPORTANT:** Some cleaners and waxes are recommended for use only on certain types of surfaces. Note the recommended uses supplied by the manufacturer.

More frequent washing and waxing reduces the exterior streaking caused from the accumulation of dirt particles and other pollutants setting for prolonged periods on the roof and sides of the coach.

**WINDOWS, DOORS, VENTS AND LOCKS:** Keep moving parts of windows and latches adjusted and maintained. Lubricate the windows with a light oil or powdered graphite at least once a year. Periodically check and tighten the screws holding the windows in place. Lubricate lock sets, hinges on entry door and exterior storage compartments at least annually with oil or silicone lubricant. Check the weather sealant. If the RV is exposed to salt air or winter road chemicals, more frequent lubrication will be required.

**SEALANT RENEWAL:** The adhesives and sealants used in the construction of the RV were developed to remain waterproof under sustained effects of weather and vibration. However, even the finest materials eventually dry out and lose their effectiveness under constant heat of the sun and attack by other elements. This section outlines the procedures that you must follow to maintain the weatherproof integrity of your RV. Leak damage caused by neglect could affect warranty.

**DOORS AND WINDOWS:** Inspect the sealants around windows and doors at least every six months. If any of the following defects are evident, the affected areas must be resealed:

- Sealant cracked or peeling
- Voids in sealant
- Shrunken or separated sealant

Upon inspection you find that it is necessary to reseal, remove the excess sealant with a plastic scraper and clean all areas to be resealed with mineral spirits and clean rags.

**WARNING: MINERAL SPIRITS IS A FLAMMABLE LIQUID. USE EXTREME CARE WHEN HANDLING AND USING. DO NOT EXPOSE TO OPEN FLAME, SPARKS OR SMOKING MATERIALS. DO NOT USE IN UNVENTILATED AREAS.**

Make sure that all areas to be resealed are absolutely dry before new sealant is applied.

Your dealer can inspect the RV and complete the resealing if necessary. The dealer can also recommend the appropriate sealants to use if you prefer to do this job yourself. **IMPORTANT:** Always use the recommended sealants.

#### **RUBBER ROOF:**

- **Cleaning.** For normal cleaning, standard household detergents can be used to wash the rubber roof material. Rinse thoroughly after cleaning. Be sure to keep the sidewalls wet to reduce streaking when cleaning roof.
- **Care.** The rubber material itself does not require annual coatings or additional sealants. Periodic washing with soap and water is all that is required.
- Inspect the roof at least every six months in areas that have sealant added (around roof vents, tv antenna, etc.) and any seams or patch in the roofing material. If resealing is necessary, use the same type of sealant as originally applied. See your dealer for approved sealants.
- The rubber roof material can be cut by sharp objects. Use caution when loading sharp articles on the roof. If you add accessories or new equipment on the roof, be sure the installer is qualified to work on the rubber roof material.
- Repair kits are available through your dealer if the roof material is cut or torn. Remember that the roof requires special adhesives and material.
- Additional information regarding the roof material is provided by the manufacturer.

## INTERIOR MAINTENANCE

**UPHOLSTERY AND WINDOW TREATMENT:** Professionally clean only. Frequent vacuuming or light brushing between periods of professional cleaning will prevent accumulation of dirt. Use of water based or detergent based cleaners may cause shrinking. Water stains may become permanent.

### - - - WARNING - - -

**DO NOT USE LACQUER THINNER, NAIL POLISH REMOVER, CARBON TETRACHLORIDE, GASOLINE, OR NAPHTHA FOR ANY CLEANING PURPOSE. THESE PRODUCTS MAY CAUSE DAMAGE TO THE MATERIAL BEING CLEANED AND ARE HIGHLY FLAMMABLE OR POISONOUS.**

**WALL AND CEILING PANELS:** The paneling and ceiling of your RV may be any of several finishes and textures. Never use harsh detergents or abrasive cleaners on walls or ceilings. Most surfaces will clean with a soft cloth moistened with a mild liquid detergent in warm water. Do not use large amounts of water which could saturate the material.

**FLOORS AND CARPETING:** Vinyl flooring requires only washing and periodic waxing. Vacuum carpeting regularly and clean with a quality carpet cleaner.

**TUB AND SHOWER:** For routine cleaning use a non-abrasive cleaner. Never use harsh detergents or abrasive cleaners. Never use a razor blade or steel wool to clean surfaces.

**WOOD PRODUCTS:** Remove dust with a clean, slightly damp cloth. Apply a quality furniture polish and buff with a soft, dry cloth. Never use harsh detergents and solvents.

**LAMINATE COUNTER TOPS AND TABLE:** Use a mild dishwashing liquid with warm water for cleaning all laminate surfaces. Use a soft cloth to wash and dry the laminate surface. Abrasive cleaners or steel wool will damage the surface.

## OPERATING THE SLIDE OUT ROOM

### EXTENDING THE SLIDE OUT ROOM:

Before operating your slide-out room the RV should be level and stable. The switch extends and closes the slide-out room and is located by the entry door on the lower left side of the truck camper, in the convenience center by the entry door in trailers, or near the slide room itself for secondary slide outs such as wardrobe slides.

Before operating the slide out room:

Check around the room for any obstructions such as open cabinet doors or loose items.

Check outside the room to be certain no obstacles will interfere with extending the slide out room

You are now ready to extend the slide out room.

Locate the slide-out switch.

Hold the switch in the "OUT" position until the room comes to a stop.

Release the switch.

### - - - IMPORTANT - - -

**YOUR BATTERIES NEED TO BE ADEQUATELY CHARGED AND YOU NEED TO BE CONNECTED TO YOUR TRUCK OR 120-VOLT POWER IF IT IS AVAILABLE TO ENSURE PROPER FUNCTION OF THE SLIDE OUT MECHANISM.**

**--- WARNING ---**

**NEVER ATTEMPT TO MOVE YOUR CAMPER OR TRAILER WITH THE SLIDEOUT ROOM EXTENDED.**

**CLOSING THE SLIDE-OUT ROOM:**

1. Look for any obstructions around the slide-out room both interior and exterior.
2. Locate the slide-out switch and hold in the "IN" position until the room is in and stops, then release the switch.
3. Now the slide-out room is ready for travel.

**NOTE: BE SURE TO REFER TO MANUFACTURER'S INSTRUCTIONS FOR THE SPECIFIC SLIDE MECHANISM ON YOUR UNIT. REFER TO MANUFACTURER'S INSTRUCTIONS FOR MANUAL OPERATION OF SLIDE MECHANISM IN CASE OF ELECTRICAL FAILURE.**

## **WINDOWS AND DOORS**

**ENTRY ASSIST HANDLE:** An entry assist handle is located outside the entry door on most units—otherwise the roof ladder serves as the entry assist handle.

**ENTRY DOORS, SCREENS, AND LOCKS:** Entry door locks and deadbolts are keyed alike. Be sure to record all key numbers and keep them in a safe place. The screen door may be separated from the main entry door. Most Northwood products are now equipped with friction hinges and no longer need a hold back mechanism. On older models, a on the exterior wall will secure the main door against the side of the trailer.

**IMPORTANT:** It is always a good idea to lock the entry door deadbolt before traveling. This will reduce the possibility of the door opening on the road.

**WINDOWS:** Windows in your camper are either slider or torque pane type. Slider windows may be opened by pulling out the latch knob—when the slider window is closed the latch will automatically lock into place. Torque windows may be opened and adjusted by turning the knob or crank located at the bottom corner of the window.

**EMERGENCY EXIT WINDOW:** The emergency exit window provides an escape route in case the RV must be evacuated under emergency conditions. To operate the window, pull the red handle(s) and push the window out.

**--- IMPORTANT ---**

**DO NOT BLOCK THE EMERGENCY EXIT WINDOW INSIDE YOUR CAMPER OR TRAILER.**

## SECTION TWO

### **NOTICE TO NORTHWOOD RV OWNERS – BE AWARE OF THE EFFECTS OF CARBON MONOXIDE:**

- Campers, Trailers and 5<sup>th</sup>-wheels need adequate ventilation at all times.
- Make sure that the fresh air vent to the heating system is not blocked. Be careful not to pile snow over the fresh air vent. Do not seal windows, doors or ventilator openings with tape.
- If heavy snowfall piles up around vents on roof, the snow should be removed.
- When using LP Gas appliances provide adequate ventilation. Check burners for proper combustion. Your attention to these details at all times is the only way to assure the safety of your family.
- Never use an unvented LP Gas fired heater for additional heat in the camper.
- Never try to interchange LP Gas or natural gas in a heater unless the appliance has been specifically approved or converted for the change by a licensed technician.
- Always shut off the LP Gas supply while in route and routinely check connections in the line.
- Always check to make sure that the generator--optional equipment--has adequate ventilation and that vents and exhaust have not been blocked by snow or other objects.
- Be sure to have your generator--optional equipment--checked at least once a year to insure the unit is in proper running order and exhaust system is free of leaks and damage.

**SYMPTOMS OF CARBON MONOXIDE POISONING:** Tight feeling across the forehead, headache, chest tightness, nausea, vertigo, and general malaise. Such symptoms are too often ignored or blamed on the “flu bug.” The nervous system may be so suddenly and completely impaired that there is no chance to escape. **PREVENTION IS THE BEST PLAN.**

**- - - IMPORTANT - - -**

**Be sure your CO Detector is functioning properly anytime a generator is in use.**

### **EMERGENCY LIFESAVING TREATMENT FOR CARBON MONOXIDE POISONING:**

- Remove the victim to fresh, but not cold air.
- Administer artificial respiration if breathing has stopped or is difficult.
- Contact a physician as soon as possible.
- Administer oxygen if available.
- Assist the circulation by applying blankets to keep the victim warm and by rubbing the victim’s arms and legs.
- Never let a CO victim get up and walk around until a doctor says the victim is recovered. Exercise speeds up the attack of CO on the heart.

## SECTION THREE

### GENERAL INFORMATION AND HELPFUL HINTS

**CONDENSATION AND YOUR RV:** Condensation is a process where molecules of moisture in the air (water vapor) condense into droplets of water. Condensation is a natural process. You may not be able to eliminate condensation completely, but you can control the effects of condensation inside your RV.

Several factors can affect the amount of condensation that may occur in your RV. As you know moisture in the air comes from many sources. What is surprising, though, is the amount.

Cooking for a family of four can add up to eight pounds (one gallon) of water per day into the air. Washing the dishes can add another pound.

An average shower adds between one-quarter to one-half pound of water into the air.

Mopping and rinsing an 8'x 10' area of floor space could add up to two and one-half pounds of water. When you wash ten pounds of clothing and spin-dry in the washing machine, that load of clothes still contains about ten pounds of water. That amount of water is released into the air as the clothes dry.

People and animals contribute a large amount of water to the air. One person can add up to four pounds of water into the air per day through breathing and perspiration. Multiply that amount by a family of four and that is almost twelve pounds of water per day.

Use of humidifiers, vaporizing inhalers or similar mechanisms will also add excessive water to the air. Your RV has gas appliances. When gas is burned, carbon dioxide, nitrogen and water are given off into the air.

The average RV is much smaller than your home plus your RV is built with much tighter construction than your home. Your home has cracks and spaces that allow moisture to escape while your RV is tightly sealed.

You can reduce moisture inside your RV by running your power vent fans when cooking and bathing. When possible dry wet clothing outside. When drying clothing inside your unit you can run your power vent fans, open ceiling vents or windows to force the excess moisture outside.

Partially open one or more roof vents or windows to provide circulation of air in your RV. In cold weather this will increase the operation of your furnace but it will reduce or eliminate condensation inside your RV.

If you use your RV for a long period of time during cold weather, leave cabinet and closet doors partially open to warm and ventilate storage compartments. The airflow will warm the exterior wall surface and prevent possible ice formation. Limit the articles in each storage compartment because tightly packed storage areas will restrict air flow.

Keep your shades up and curtains open as much as possible to allow air flow around windows. Do not seal windows or doors tightly with tape as this will restrict further the air flow in your RV.

Dehumidifying appliances are available and recommended. Use of a dehumidifier will reduce the amount of outside air needed for ventilation of your RV. A dehumidifier is very effective for removing excess moisture from the air inside your RV--especially during continuous use.

Keeping a window partially open while on the road can also help to ventilate your RV and help to reduce the moisture that has collected inside your RV before traveling.

Regular maintenance such as keeping registers and furnace blower clean and unobstructed and cleaning your furnace air filters will help promote good air circulation in your RV.

Your first indication of excessive moisture in the air could be foggy windows. In very cold weather frost or ice can form on the inside of the glass. Excessive moisture could be indicated by water dripping from walls, ceilings or fixtures. When this happens you might think that your RV has a leak. That is usually not the case. Excessive water can penetrate almost any material. It will go through walls, floor covering, plywood, paint. The water that gets absorbed into these materials can cause warping, mildew, paint chipping and rotting. This type of damage can be invisible and costly to repair so it is extremely important for you to take steps to control excessive moisture buildup inside your RV. Problems caused by excessive moisture and condensation will not be covered under your warranty.

Your new RV has been specifically designed for your camping and traveling requirements. Understanding that condensation is a natural occurrence which can be controlled will help you and your family to utilize your RV for your family's camping needs and provide many years of camping enjoyment.

**DUST SEEPAGE:** Travel over unpaved, dusty rough roads inevitably generates quantities of dust which has a way of leaking into RVs. The problem can be reduced by partially opening a roof vent. This will help keep the dust out. From time to time it is advisable to adjust the striker plate on the entry door. Road vibration can cause the entry door to get out of adjustment. This could allow access for dust and moisture to leak into the RV.

**SAFE DRIVING TIPS:** Your RV has been designed by NORTHWOOD to be driven at legal highway speeds without unusual handling characteristics. Driving with a recreational vehicle may be a new experience for you. The following tips are outlined to assist you.

**TRAVELING SPEED:** Reasonable vehicle speed is probably the greatest factor in safe, pleasant traveling with your RV. With experience you will develop the special driving skills needed for safe traveling.**WARNING: TRAVELING AT MODERATE SPEEDS ALLOWS FOR ADVERSE HIGHWAY AND WIND CONDITIONS. INCREASED SPEED REDUCES STABILITY OF THE TRUCK AND RV AND THE SAFE MANEUVERING AND STOPPING ABILITY OF YOUR TRUCK.**

#### **OTHER TRAVELING TIPS:**

- Try the RV out on short trips to get the feel of how the truck handles with the camper or trailer loaded. Backing a vehicle while using only mirrors may appear difficult, but with a little practice you will become proficient at backing with your mirrors. You can also have someone stand to the rear to guide you. The best place to practice is a large empty parking lot.
- Before departing on a trip check your routes. Remember that some tunnels prohibit travel trailers and campers with LP gas systems.
- Before traveling make sure all cabinet doors are closed and drawers and loose objects are secure.
- **Truck Campers:**
- When securing your camper to the truck make sure you do not over tighten the tie downs. The tie downs should be hand tight plus ½ turn. Be sure to check approximately every fifty miles until you are sure that the tie downs are secure and not loosening from travel vibration.
- Be sure that you have traffic clearance before pulling out from the curb. Apply power slowly and evenly avoiding over acceleration when starting from curb or other stopping point.

- Watch for dips or obstructions in the road which could cause damage to the undercarriage of your truck or RV.
- **Drive at moderate speeds, particularly in traffic and adverse weather conditions.** Gusty or strong wind conditions can radically and violently change the stability of your truck and RV. Take precautions when passing another vehicle, especially trucks. Be aware that another vehicle passing you can also radically change the stability of your truck and RV. When in doubt, slow down or pull off of the road especially in adverse weather conditions.
- Safe stopping depends upon brakes, speed, road surface, tire condition, and many other factors. Be sure to keep a safe distance between you and the traffic ahead of you. Remember that the weight of the RV adds an additional stopping burden to your truck. Allow extra distance for passing and stopping.
- Do not travel with full holding tanks. Empty holding tanks before traveling. Be aware that full holding tanks can radically change the weight distribution and balance of the camper or trailer on your truck and will alter how your truck handles.
- Instruct your family on what to do in case of a fire. Hold fire drills periodically. Practice using the emergency exits. Maintain proper charge in the fire extinguisher.
- Insure that the LP gas detector provided with your unit is in proper working condition.
- Keep a well-stocked first-aid kit handy.
- Become familiar with the position of truck and RV in traffic. Be cautious when maneuvering to allow for the length and width of the vehicle. Always allow extra room to corner and to change lanes. Learn to use the side mirrors to view the road behind. Check your mirrors often.
- The engine and transmission on your truck may overheat when you are driving in hilly or mountainous terrain. If this happens, pull off to the side of the road and allow your engine to idle while your transmission is in neutral. This will help return engine and transmission temperature to normal.
- Emergency braking may, under certain road conditions, cause a skid. Turn the front wheels of the truck in the direction of the skid to counteract the effects of the skid. Never lock the brakes on the truck. Apply the brakes lightly until the skid is reduced.
- When traveling off the highway in the country or mountains you must be careful of overhanging tree limbs and other overhead or side obstacles. Light branches will brush aside, but heavier branches and limbs may cause damage to the roof or sidewall of your RV. Consider your roof height, vents, jacks, antennas, air conditioner and other equipment attached to the roof or side of your truck and RV when you are calculating clearance.
- Avoid parking too close to the curb as signs, telephone poles and other obstructions can cause problems.
- Watch for overhead and side clearance at drive-in restaurants and gas stations or other drive-in areas so you do not crunch the side or roof of your RV and truck.
- Watch for sharply crowned roads which can tip your unit into obstructions when parking close to a curb or roadside.

**SAFETY CONSIDERATIONS:** The following list contains important safety checks to review and keep in mind while traveling:

1. Never overload your vehicle. Improper load distribution can cause serious handling problems on the road.
2. Never attempt to repair or alter a gas or electric appliance. Always consult an authorized and qualified service agency or technician.
3. Portable fuel-burning equipment, including wood and charcoal grills and stoves, cannot be used inside the RV. The use of this equipment inside the RV could cause fire and/or asphyxiation.
4. Do not bring or store LP Gas containers, gasoline or other flammable liquids inside the RV. Doing so could risk the danger of fire or explosion.

## MORE TRUCK CAMPER SPECIFIC ITEMS

**CAMPER JACKS:** Consult the manufacturer's instruction manual for safe operation and regular maintenance required for the type and style of jacks mounted on your camper.

- **MANUAL CAMPER JACKS:** Manual camper jacks are raised and lowered with a crank handle which inserts in the receptacle located at the top of each individual jack.
- **ELECTRIC POWER JACKS (optional equipment):** Electric power jacks operate with a remote control or rocker switches. **IMPORTANT:** Because of the weight distribution of the camper (the camper is heavier in the front than in the rear) the back jacks will go up faster than front jacks because of the additional weight. Monitor the up and down level of the camper by intermittently leveling the front and back and side to side. The front of the camper will go up slower and down faster. Should a malfunction occur, unplug remote chord immediately and/or shut off the 12-volt kill switch. Do not exceed the full extension of the jacks (noted by red marks on each jack leg) Over extension may damage the jack and may result in a blown fuse or circuit breaker in the system.

Check to be sure all four jacks are in the full UP position when traveling.

**REAR AWNING OR SIDE BOX AWNING (optional equipment):** Consult the manufacturer's instruction manual for operation and maintenance of the optional rear awning and/or side awning. **IMPORTANT:** Check to make sure that the awning(s) are locked in the closed position before traveling.

**CAMPER TIE DOWNS:** When securing your camper to the truck make sure you do not over tighten the tie downs. The tie downs should be hand tight plus ½ turn. Be sure to check approximately every fifty miles until you are sure that the tie downs are secure and not loosening from travel vibration. Spring loaded camper tie downs are recommended.

## MORE TRAVELTRAILER 5<sup>TH</sup> WHEEL SPECIFIC ITEMS

### SUGGESTED GUIDELINES FOR CHANGING TIRES:

The chore of changing a flat tire on your travel trailer or 5<sup>th</sup> wheel trailer almost never happens at a convenient time or place when you are traveling. By following the suggestions below, you can reduce the risk of injury to yourself and/or damage to your recreational vehicle.

**WARNING: FOLLOW THESE TIRE CHANGING GUIDELINES TO HELP PREVENT PERSONAL INJURY OR DAMAGE TO YOUR UNIT. IF IN DOUBT, CALL A PROFESSIONAL.**

4. If you blow a tire on your unit while you are towing, do not slam on your brakes, gradually reduce speed while keeping your hands firmly on the steering wheel until you find a safe place to park.
2. Park as far off the road as possible. If practical, try to find an area that is level. Do not attempt to change a tire on the roadside close to moving traffic. Pull far enough off the road to avoid the danger of being hit by another motorist while operating the jack and changing the tire. Avoid icy and slippery areas.
3. Be sure that your tow vehicle is in APark@ position (gear selector in PARK for automatic transmissionBuse 1st gear for standard shift)Bset the hand/parking brake and turn off the ignition. Turn on your hazard warning flasher.
4. Use suitable warning devices in front and in back of your unit to warn other motorists that you are stopped. It is advisable to carry flares or reflective markers with you for use in any emergency situation that might happen on the road.
5. Place blocks in front and in back of the wheels on the opposite side of the unit from the side where you are changing the tire. This helps prevent accidental movement.
6. Position your jack on the frame of your unit close to the spring hanger. **DO NOT PLACE JACK ON THE AXLE.** Be sure you are familiar with how your jack operates and that the jack you have is rated to lift the weight of your unit. **WARNING:** Not all jacks are suited to lift the weight of your travel trailer or 5<sup>th</sup> wheel. Before raising unit, loosen the lug nuts**DO NOT REMOVE THEM.**
7. Raise the trailer until the tire clears the ground. Do not raise the unit any higher than necessary to change the tire. Raising unit too high could cause it to become unstable and cause an accident. The unit could fall off the jack and hurt someone. Remove damaged tire and replace with spare. Snug up lug nuts.
8. Do not get under the unit when it is raised on the jack.
9. Lower the unit and torque lug nuts. **WARNING:** Check wheel nut torque at 50 miles.

# PRODUCT IDENTIFICATION INFORMATION

Please take a few minutes to fill out the following information for future reference:

YOUR NAME	
RV MODEL	
SERIAL NUMBER	
DATE PURCHASED	
DEALER NAME	
DEALER ADDRESS	
DEALER PHONE	
INSURANCE POLICY NO.	
INSURANCE AGENT	
AGENT'S PHONE NO.	

**KEY NUMBERS**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**RANGE/OVEN**

MANUFACTURER \_\_\_\_\_

MODEL \_\_\_\_\_

SERIAL NO. \_\_\_\_\_

**REFRIGERATOR**

MANUFACTURER \_\_\_\_\_

MODEL \_\_\_\_\_

SERIAL NO. \_\_\_\_\_

**FURNACE**

MANUFACTURER \_\_\_\_\_

MODEL \_\_\_\_\_

SERIAL NO. \_\_\_\_\_

**WATER HEATER**

MANUFACTURER \_\_\_\_\_

MODEL \_\_\_\_\_

SERIAL NO. \_\_\_\_\_

**AIR CONDITIONER**

MANUFACTURER \_\_\_\_\_

MODEL \_\_\_\_\_

SERIAL NO. \_\_\_\_\_

**MICROWAVE OVEN**

MANUFACTURER \_\_\_\_\_

MODEL \_\_\_\_\_

SERIAL NO. \_\_\_\_\_

**AM/FM CD/DVD PLAYER**

MANUFACTURER \_\_\_\_\_

MODEL \_\_\_\_\_

SERIAL NO. \_\_\_\_\_

**TV**

MANUFACTURER \_\_\_\_\_

MODEL \_\_\_\_\_

SERIAL NO. \_\_\_\_\_

**GENERATOR**

MANUFACTURER \_\_\_\_\_

MODEL \_\_\_\_\_

SERIAL NO. \_\_\_\_\_

**OTHER**

\_\_\_\_\_

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**OTHER**

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**OTHER**

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**OTHER**

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**ONE YEAR LIMITED WARRANTY**  
FOR TRUCK CAMPERS, TRAVEL TRAILERS AND 5<sup>TH</sup> WHEELS  
MANUFACTURED BY NORTHWOOD MANUFACTURING  
SOLD IN THE UNITED STATES AND CANADA

**COVERAGE PROVIDED**

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

This limited warranty extends to the first retail purchaser and his transferee(s) and begins on the date of original retail delivery or the date the RV is first placed into service as a rental, commercial or demonstrator RV (whichever occurs first). This limited warranty extends for a period of one year from such date. Written notice of defects must be given to the selling dealer or the manufacturer not later than ten (10) days after the expiration of the applicable limited warranty. Warranty repairs, if required, will be made without charge after your RV is taken to the dealer or manufacturing plant location.

**OWNER'S OBLIGATIONS**

The owner is responsible for normal maintenance as described in the Owner's Manual; however, minor adjustments (such as adjustments to the interior or exterior doors, LP regulator pressure, cabinet latches, TV antenna control, etc.) will be performed by the dealer during the first 90 days of warranty coverage. Thereafter, such adjustments are the responsibility of the owner as normal maintenance unless required as a direct result of repair or replacement of a defective part under this limited warranty.

**DEALER'S OBLIGATIONS**

By agreement with the manufacturer, the dealer is obligated to maintain the RV prior to retail sale, to perform a detailed predelivery inspection and to repair or replace any parts necessary to correct defects in material or workmanship.

**WHEN A DEALER DOES NOT RESOLVE A PROBLEM**

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

**MANUFACTURER'S OBLIGATIONS**

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

**WHAT IS NOT COVERED BY THIS LIMITED WARRANTY**

THIS LIMITED WARRANTY DOES NOT COVER THE FOLLOWING:

1. All major appliances, which are covered by the separate warranty of the manufacturer.
2. Damage caused by or related to:
  - A. Accidents, misuse or negligence
  - B. Failure to comply with instructions contained in the Owner's Manual
  - C. Alteration or modification of the RV.
  - D. Environmental conditions (salt, hail, chemicals in the atmosphere, etc.)
3. Normal deterioration due to wear or exposure, i.e., fading of fabrics, drapes, carpet wear, etc.
4. Normal maintenance and service items such as light bulbs, fuses, lubricants, etc.
5. Extra expenses such as transportation to and from dealer or manufacturing plant location, loss of time, loss of pay, loss of use of the RV, inconvenience, commercial loss, towing charges, bus fares, vehicle rental, incidental charges such as telephone calls or lodging bills, or other incidental or consequential damages.

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

Dealers or any other persons are not authorized to make modifications to this limited warranty, any additional statements concerning this limited warranty, whether oral or written are not the responsibility of the manufacturer.

BRAND NAME \_\_\_\_\_ MODEL \_\_\_\_\_ SERIAL NO. \_\_\_\_\_

ADDRESS OF MANUFACTURING FACILITY:  
59948 Downs Road:  
La Grande, OR 97850  
Telephone: 541-962-6274

MAILING ADDRESS  
PO Box 3359  
La Grande, OR 97850  
Fax: 541-962-6217

## about this OWNER'S MANUAL

Consider this owner's manual a permanent part of your Northwood RV. Keep it with the RV at all times. If you sell the unit, the new owner will appreciate the operating, safety and maintenance information contained in this owner's manual. Also keep all manuals and tags furnished with the appliances and other equipment installed in your RV.

### **--- IMPORTANT NOTICE: ---**

**THIS OWNER'S MANUAL IS OF A GENERAL NATURE ONLY AND DOES NOT COVER EVERY ASPECT OF ALL MODELS OF RVS MANUFACTURED BY NORTHWOOD MANUFACTURING.**

**DUE TO ONGOING DESIGN DEVELOPMENT AT NORTHWOOD, IT IS POSSIBLE THAT RECENT PRODUCT CHANGES MAY NOT BE INCLUDED IN THIS OWNER'S MANUAL. THIS MANUAL IS INTENDED AS A GUIDE ONLY AND IN NO WAY EXTENDS THE RESPONSIBILITY OF NORTHWOOD BEYOND THE WARRANTY PRINTED IN THIS MANUAL.**

**ALTERING OR MODIFYING YOUR CAMPER, 5<sup>TH</sup> WHEEL OR TRAVEL TRAILER.**

### **--- WARNING ---**

**IF YOU PLAN ON MAKING ANY ALTERATIONS OR MODIFICATIONS TO YOUR RV, CHECK WITH YOUR DEALER OR CALL THE FACTORY BEFORE GETTING STARTED. EVEN WHEN DOING SOMETHING THAT SEEMS SIMPLE, THE POTENTIAL HAZARD OF A DRILL, SCREW OR NAIL PENETRATING AN UNSEEN LP GAS LINE OR ELECTRICAL CIRCUIT MIGHT BE AVOIDED BY CHECKING WITH TECHNICAL SUPPORT BEFORE YOU START. DOUBLE CHECK TO MAKE SURE THAT ANY ALTERATIONS OR MODIFICATIONS THAT YOU PLAN TO DO TO YOUR RV WILL NOT VOID YOUR WARRANTY.**



# ADDENDUM

## APPLIANCE OPERATION WHILE USING 2500 ONAN GENERATOR

### - - - IMPORTANT - - -

Operation of the microwave and air conditioner simultaneously while using the 2500 Onan Generator as the power source may not work under certain heat and/or altitude conditions. If this heat/altitude condition occurs, the generator may stall. You will need to turn off the air conditioner and restart the generator. The air conditioner must be left off for a minimum of 3 minutes. Upon completion of using the microwave, the air conditioner may be turned back on to resume normal operation. This will allow sufficient time for the compressor on the air conditioner to equalize in pressure before restarting.

## SAFETY REGULATIONS REGARDING REFUELING

### - - - WARNING - - -

TURN OFF LP MAIN VALVE AND INDIVIDUALLY TURN OFF GAS APPLIANCES OR ELECTRICALLY DISCONNECT AUTOMATIC IGNITION APPLIANCES BEFORE ENTERING AN LP GAS BULK PLANT OR MOTOR FUEL SERVICE STATION.

### - - - WARNING - - -

ALL PILOT LIGHTS, APPLIANCES AND THEIR IGNITORS (SEE OPERATING INSTRUCTIONS) SHALL BE TURNED OFF DURING REFUELING OF MOTOR FUEL TANKS AND/OR LP-GAS CONTAINERS. WHEN NOT INDIVIDUALLY TURNED OFF, AUTOMATIC IGNITION APPLIANCES MAY CONTINUE TO SPARK WHEN LP GAS IS TURNED OFF AT THE CONTAINER.

### - - - WARNING - - -

DO NOT OVER FILL LPG TANKS - DO NOT FILL LP GAS CONTAINERS TO MORE THAN 80% OF CAPACITY.

## PERIODIC CHASSIS / SYSTEMS CHECK LIST – Travel Trailers & 5<sup>th</sup> Wheels

Check	Function Required	Daily	Weekly	Every 1000 Miles or 30 days	Every 3,000 Miles or 6 Months	Every 6,000 Miles or 12 Months
Trailer brakes	Test that they are functioning properly	X				
Air pressure	Inflate tires to manufacturer's specifications	X				
Lug bolts or Nuts (1)	Tighten to proper torque specifications			X		
Breakaway switch	Test switch operation, inspect connections				X	
Breakaway battery	Maintain charge, inspect connections		X			
Wheel rims	Inspect for dents, damage, or out of round				X	
Brake shoes (2)	Test brake drag and adjust if required				X	
Brake magnets	Inspect for uneven wear					X
Wheel bearings & cups	Inspect for wear or damage and lubricate					X
Hub / drum	Inspect for heavy scoring or wear					X
Seals	Inspect for heavy scoring or wear					X
Shackle links	Visually inspect for wear or bends					X
Equalizers	Visually inspect for wear or bends					X
Hangers	Visually inspect welds and bolt tightness					X
Springs	Visually inspect for broken, separated, or flattened (loss of camber) springs					X
Slide out room	Check slide out room function & sealing		X			

(1) Tighten wheel bolts or nuts every 50 miles for the first 200 miles and after every change in wheel mounting.

(2) Adjust brakes after first 200 miles, then at above intervals.

## SERVICE CHART - Travel Trailer 5<sup>th</sup> Wheel

### SERVICE TO BE PERFORMED

### MINIMUM SERVICE INTERVAL

Description	Each Trip or Weekly	1,000 Miles or 30 Days	2,500 Miles or 90 Days	5,000 Miles or 6 Months	10,000 Miles or Yearly
Pack wheel bearings					X
Inspect brakes					X
Inspect safety chains	X				
Inspect brake wiring	X				
Inspect tires	X				
Inspect hitch components	X				
Lubricate locks					X
Lubricate coupler latch & socket		X			
Lubricate hinges					X
Inspect & clean vents					X
Torque lug nuts		X			
Sanitize water tank (if trailer has been stored)			X		
Clean drapes & interior fabrics					
Clean battery cables & terminals, check fluid levels			X		
Inspect suspension					X
Check all seams & openings & reseal as needed				X	
Check water system components					X
Balance tires (after 1st 1,000 miles; as req. thereafter)		X			
Complete LPG system check & pressure check					X
Visually inspect exposed LPG system components (BEFORE EACH USE)	X				
Check generator (if equipped) exhaust system (BEFORE EACH USE)	X				

## SERVICE CHART – Truck Campers

### SERVICE TO BE PERFORMED

### MINIMUM SERVICE INTERVAL

Description	MINIMUM SERVICE INTERVAL				
	Each Trip or Weekly	30 Days	90 Days	6 Months	Yearly or more frequently
Inspect Camper Tie Downs components	X				
Lubricate locks					X
Lubricate hinges					X
Inspect and clean vents					X
Sanitize water tanks (if camper has been stored)			X		
Clean drapes and interior fabrics					X
Clean exterior					X
Clean battery cables & terminals and check fluid levels			X		
Inspect truck suspension					X
Check all seam, openings & reseal as needed				X	
Check water system components					X
Complete LPG system check and pressure check					X
Visually check exposed LPG system components BEFORE EACH USE	X				
Check generator exhaust system (if equipped) BEFORE EACH USE	X				

# SECTION 4

## PLUG WIRING, LUG NUT TIGHTENING, WATER SYSTEM

### 7 CIRCUIT RECEPTACLE

VIEW LOOKING INTO THE TOW VEHICLE RECEPTACLE

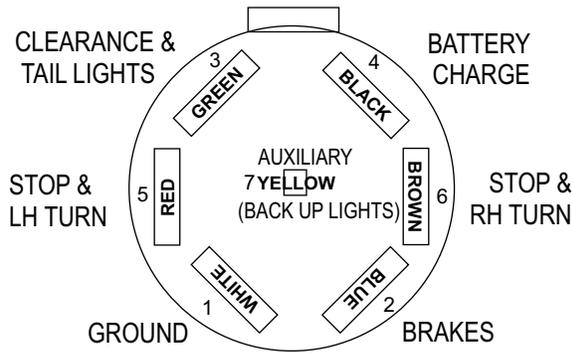
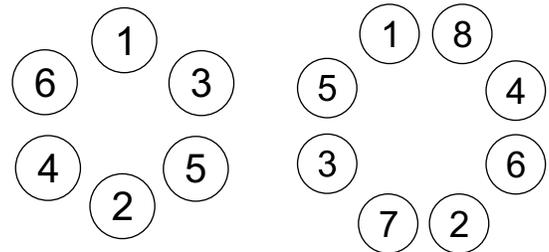


FIGURE A

### LUG NUT TIGHTENING ORDER

USE A TORQUE WRENCH TO TIGHTEN LUG NUTS. TIGHTENING BY HAND OR WITH AN IMPACT WRENCH IS NOT RECOMMENDED.



6 BOLT

8 BOLT

TORQUE TO 90 - 120 FT. LBS.

FIGURE B

### WINTERIZATION PROCEDURE

- STEP 1. DRAIN WATER HEATER BYPASS VALVE FROM THE IN LINE POSITION AS INDICATED IN THE DIAGRAM.
- STEP 2. DRAIN FRESH WATER TANK BY PULLING FRESH WATER HANDLE UNDER COACH.
- STEP 3. DRAIN WATER HEATER BY REMOVING WATER HEATER DRAIN PLUG.
- STEP 4. DRAIN ALL WATER LINES BY TURNING ON ALL WATER FAUCETS IN UNIT.
- STEP 5. EMPTY ALL WASTE TANKS IN UNIT.
- STEP 6. REINSTALL DRAIN CAPS OR CLOSE DRAIN VALVES ON LOW POINT DRAINS, FRESH WATER TANK AND WATER HEATER AND CLOSE ALL KNIFE VALVES.
- STEP 7. TURN THE BYPASS VALVE AT THE FRESH WATER TANK FROM THE IN LINE POSITION AS INDICATED IN THE DIAGRAM AND PLACE THE WINTERIZATION TUBE IN A CONTAINER OF POTABLE ANTIFREEZE.
- STEP 8. TURN ON THE WATER PUMP AND STARTING AT THE CLOSEST WATER FAUCET TO THE PUMP, HOT AND COLD ONE AT A TIME, OPEN EACH FAUCET UNTIL PURE POTABLE ANTIFREEZE COMES OUT THEN CLOSE FAUCET, BATHROOM SINK, KITCHEN SINK, INTERIOR AND EXTERIOR SHOWER, AND TOILET.
- STEP 9. THE LAST STEP IS TO POUR POTABLE ANTIFREEZE INTO ALL P-TRAPS UNTIL YOU CAN SEE A LEVEL LINE OF POTABLE ANTIFREEZE IN THE TRAP.

### WATER SYSTEM DIAGRAM

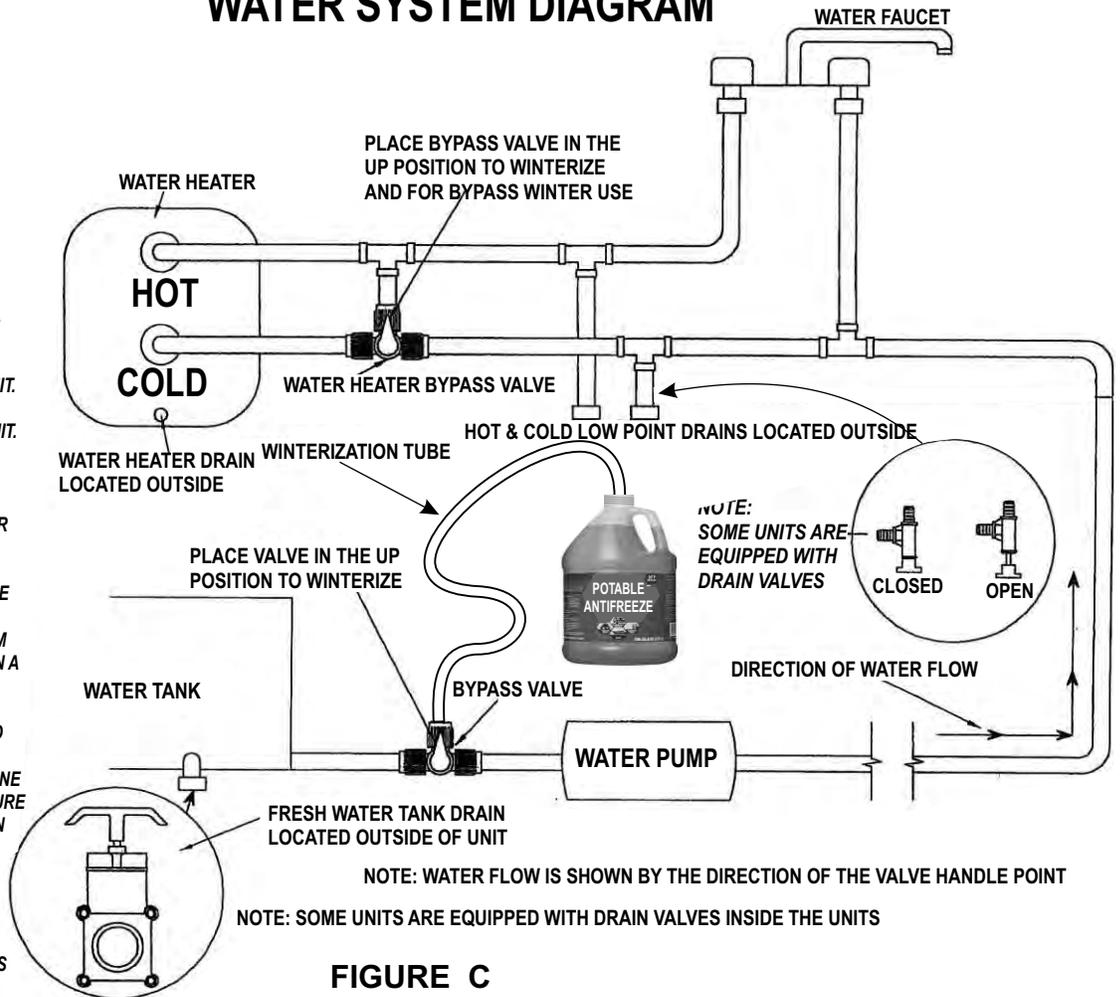
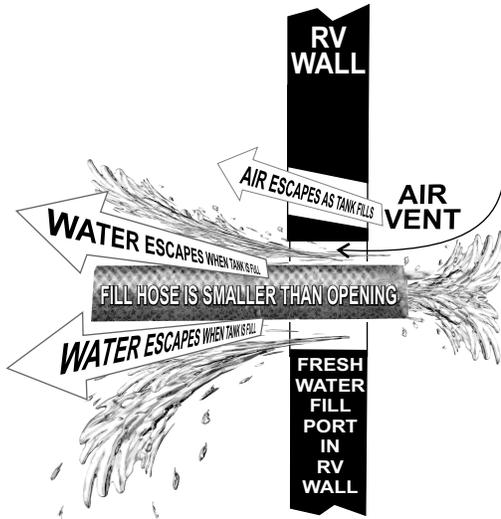


FIGURE C

# FRESH WATER FILLING PROCEDURE

--- WARNING ---

FILLING FRESH WATER TANK WITH MORE THAN 50% OF THE FAUCET VOLUME AND A HOSE LARGER THEN 5/8" O.D. WILL CREATE HYDRAULIC PRESSURE WHICH CAN CAUSE THE FRESH WATER TANK TO SWELL AND DAMAGE THE RV.



## PROPER FILLING METHOD

ADEQUATE GAP MUST BE MAINTAINED AROUND FILL HOSE TO PREVENT BUILD-UP OF HYDRAULIC PRESSURE THAT CAN DAMAGE THE TANK AND RV FLOOR

WATER INTO FRESH WATER TANK

## IMPROPERLY / OVERFILLED FRESH WATER TANK

RV FLOOR IS FORCED UP BY POWERFUL HYDRAULIC PRESSURE IN OVER FILLED TANK

FRESH WATER TANK OVERFILLED WILL EXPAND AND BEYOND THE SPACE AVAILABLE INSIDE THE FLOOR. A 40 GALLON TANK CAN BE PRESSURIZED TO HOLD AS MUCH AS 60 GALLONS BULGING THE TANK AND BREAKING THE FLOOR STRUCTURE.

40 GALLON TANK

60 GALLONS FORCED INTO 40 GALLON TANK

WITH A PROPER FILL HOSE, EXCESS WATER WILL ESCAPE INDICATING YOUR TANK IS COMPLETELY FILLED.

IF THE FILL HOSE IS TOO TIGHT, EXCESS AIR AND WATER CAN NOT ESCAPE CAUSING THE TANK TO PRESSURIZE AND ALLOWING IT TO OVER FILL.

FIGURE D

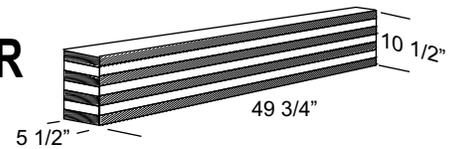
## A PROPERLY SUPPORTED TRUCK CAMPER FLOOR

Truck campers MUST be supported evenly on a flat pickup truck bed floor.

It is also a good idea if you are putting your camper in extended storage.

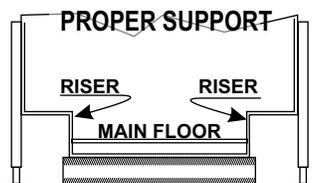
Support should span across the entire width of the sub-floor to the outer riser walls on each side.

Place a support at the 1. Front 2. Middle 3. Rear of the floor for proper load distribution.

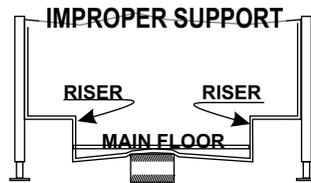


SUGGESTED SUPPORT DESIGN

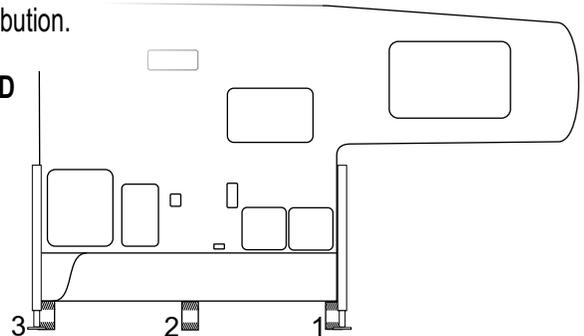
**WARNING: CAMPER MUST HAVE FULL LEVEL SUPPORT IN THE TRUCK BED**



SUPPORT MUST SPAN THE FULL DISTANCE BETWEEN RISERS ACROSS CAMPER MAIN FLOOR WIDTH.



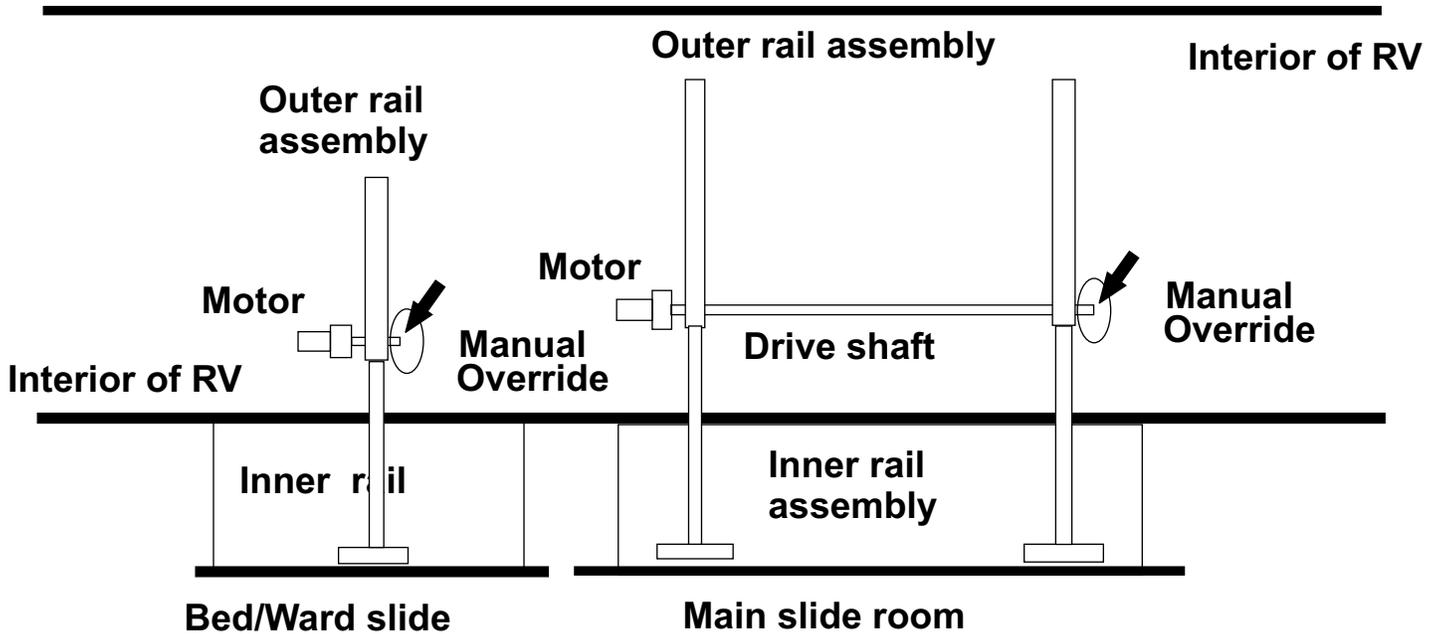
IMPROPER SUPPORT CAN DAMAGE THE FLOOR.



SUPPORTS MUST BE LOCATED AT FRONT, CENTER & REAR OF THE MAIN FLOOR. IF YOU HAVE A 5TH WHEEL HITCH IN THE BED, THE CAMPER SUB FLOOR MUST CLEAR THE BRACKETS AND BE SUPPORTED IN THREE PLACES (FRONT REAR AND CENTER)

FIGURE E

# SLIDE OUT Manual Override: Power Gear



**Note: Motor and override may be located on opposite sides on certain installations.**

When the room is fully in or out, have one person put pressure on the wrench / ratchet to and return the brake lever to its engaged position. This will ensure that the room is locked into a sealed position.

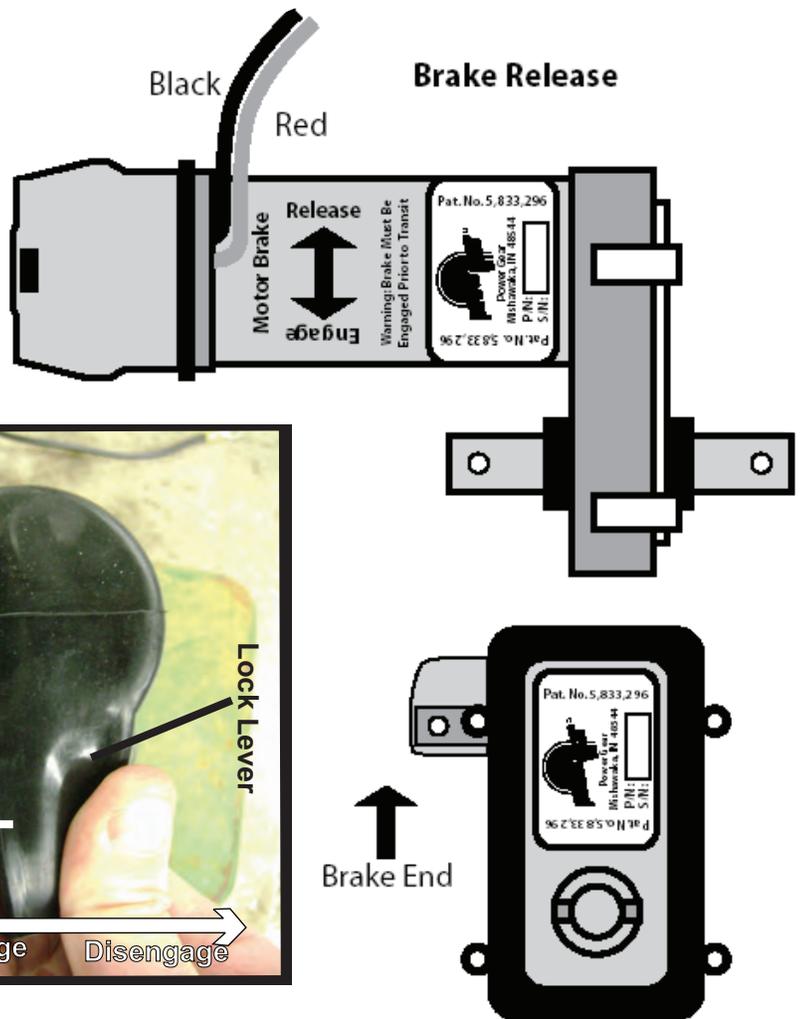
**--- WARNING ---**

- When the Slideout room Motor Brake Lever is released, the room will not lock into place and, therefore, not be sealed from the outside elements.

- When the room has been manually retracted, be sure to install the transit bars (if so equipped) and return the motor brake lever to its normal engaged position, in order to seal and lock the room into position.

**--- WARNING ---**

- Do not work on your system unless the battery is disconnected.



**FIGURE F**

# SLIDE OUT Manual Override: Schwintek

- - - WARNING - - -

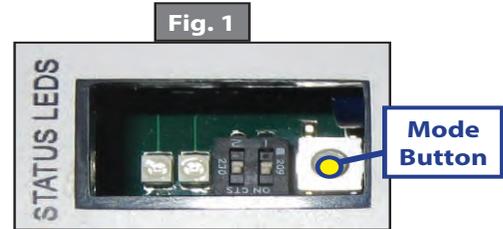
DO NOT MOVE THE RV UNLESS THE MOTORS ARE PLUGGED IN!



## SCHWINTEK IN-WALL™ SLIDEOUT TROUBLESHOOTING

1. Electronic Manual Override (available on board revision C1 and newer):

- A. Locate the circuit board.
- B. Press the "mode button" six times quickly, then press a seventh time and hold for approximately five seconds (Fig. 1).
- C. The red and green LED lights will begin to flash, confirming the override mode.
- D. Release mode button.
- E. Back inside coach; use the normal slide control switch to retract the room.



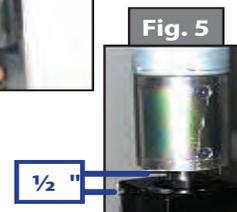
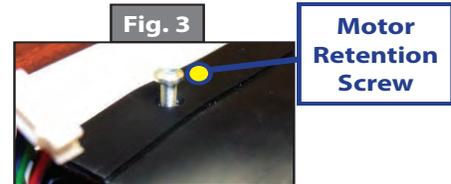
2. Manually Push Room in Override:

- A. Locate the circuit board.
- B. Unplug both motors from circuit board (releases motor brake). (Fig. 2).
- C. Push or pull slide room in as desired; larger rooms may require several people to push.
- D. Keep both sides of room relatively even.
- E. When room is completely in, plug both motors back into the control board (this applies the brake for road travel).



3. Disengage Motors, Manually Retract Room and Travel Lock:

- A. Locate and remove motor retention screw located near the top of each vertical column (Fig. 3).
- B. Bend back wipe seal & visually locate motor (Fig. 4).
- C. Pull the motor up until disengaged, about 1/2". Replace the motor retention screw to hold the motor in this position (Fig. 5).
- D. Repeat this process for both sides of the slide room.
- E. Push or pull room back in to the opening, keeping sides relatively even.
- F. Re-engage motor to be ready for travel.
- G. The room must be travel locked to keep room in place for road travel.



### Error codes

During operation when an error occurs the board will use the leds to indicate where the problem exists. For motor specific faults the green LED will flash once for Motor 1, and two times for Motor 2. The red LED will flash from two to nine times, depending on the error code.

The error codes are as follows:

2. Battery drop out: Battery capacity low enough to drop below 6 volts while running.
3. Low battery: Voltage below 8 volts at start of cycle.
4. High battery: Voltage greater than 18 volts.
5. Excessive motor current: High amperage, also indicated by 1 side of slide continually stalling.
6. Motor short circuit: Motor or wiring to motor has shorted out.
8. Hall signal not present: Encoder is not providing a signal. Usually a wiring problem.
9. Hall power short to ground: Power to encoder has been shorted to ground.

Usually a wiring problem.

When an error code is present, the board needs to be reset. Energizing the extend/retract switch resets the board. Energize the extend/retract switch again for normal operation.

FIGURE F